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Global Health: a Local Issue

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Luise Parsons

Introduction

As we start a new Millennium, interest is growing in the effect of globalisation on health. This Nuffield Trust programme will contribute significantly to our understanding of these issues. At the centre of the programme is a commitment to shaping the UK's response to globalisation and health, through the Action Plan and the Conference on 31.1.00 at the Royal College of Physicians. The programme was launched in February 1999, and has been informed by papers presented at a series of seminars throughout the year that have stimulated discussion and recommendations for the Action Plan. The publication in full of these papers from the seminars is welcome because independently their viewpoints will also contribute to the debate about Global Health. Although the collected papers vary in style and content, written by authors from very different academic and service backgrounds, overall there is a sense of optimism, with a number of common themes and a positive message that local action will make a difference to Global Health.

There is universal agreement amongst the authors that globalisation is real, that it won't go away, and it is having an impact on health. Globalisation has emerged as a late 20th century phenomenon in response to sweeping political, economic, technological, environmental and social changes. The impact on health and healthcare is complex, and we are only just beginning to measure that impact on health status. The impact of local health activities on globalisation have not yet been studied extensively.

During the late 1980s and early 1990s a series of events that included the break up of the Soviet Union, the rapid expansion of the Pacific Rim economies, and the move toward European integration, transformed the environment for international trade and investment. There was also an unparalleled technological revolution in developing, storing and communicating information that had the effect of reducing the barriers between individuals and societies. What followed was a moving away from an economic system in which national markets were distinct entities. Facilitated by innovations such as the Internet and the WWW, national markets were no longer isolated by trade barriers and barriers of distance, time and culture. Nation states were also weakened by internal conflicts and inter-racial conflicts leading to unrest and massive population movements. These monumental changes in the international environment reflected the interdependence of national markets and the growth in regions particularly North America, Europe and Japan. Globalisation of economic markets meant increased wealth for these regions, but increased poverty for others. These political and economic changes, although comparatively recent, are having a profound impact on the wealth and health of nations and communities of people.

Many of the papers are based on Lee's definition of globalisation as "a process of closer interaction of human activity, with spatial, temporal and cognitive dimensions. In addition, globalisation is changing the nature of human interaction across a wide range of spheres e.g. economic, political, socio-cultural, technological and environmental." This definition of globalisation, as a process that occurs across different dimensions and spheres, can be used to

develop a conceptual framework for understanding in greater detail the diverse changes that are being brought about, and provides a basis for developing policy responses. The Nuffield programme used this framework to discuss policy issues under the following headings:

- Global Health and Environmental Risks
- Economic Trade and Aid
- Technology and Knowledge
- Cultural and Social Factors
- Political and Institutional Context.

Defining the concept of a global health and environment risk requires an understanding of the distinct nature of global health, and the particular risks associated with globalising forces. Lee's paper on health risks suggests that global health may be defined in terms of geography, population-level health, unequal vulnerability of certain individuals and groups, blurred linkages between the immediate causes and wider effects of health risks, and the involvement of a wider range of stakeholders. The limited empirical research available suggests that globalisation may be having two effects: (a) increasing or worsening many existing health and environmental risks; and (b) creating new risks to human populations.

The changing features of the emerging global social environment pose a number of opportunities and risks. The early twenty-first century will be an important period of transition as individuals, governments, private companies and civil society groups struggle with the challenge of creating a sustainable and stable global society. A major part of this challenge is to address the health and environmental risks that accompany these profound changes. After reviewing the extent to which environmental changes may contribute to global health risks, McMichael urges a Precautionary approach. The Precautionary Principle states that where the consequences of environmental change are uncertain but potentially serious, perhaps irreversible, then that scientific uncertainty does not justify delaying taking precautionary preventive action. This requires a change in attitude towards health and its determinants. Regarding health as a sustainable resource leads us to measure the social and ecological factors that are required for a healthy community. McMichael concludes that the UK is well placed to take a lead in this field, adding to its history of leadership in environmental and public health. It is to this task that the Nuffield Agenda for Action could contribute.

Globalisation has positive and negative effects, winners and losers. Elsewhere, the debate about globalisation sometimes appears polarised between those that consider the triumph of market forces on a world scale to be in their interests, and those that attribute the growing inequity between the rich and the poor regions, and the 1 billion people in poverty to global capitalism. The debate in this volume is more positive and measured, and seeks ways that the UK might mitigate the divisive effects of globalisation and extend the strengths of our domestic health and technology sector to the most Highly Indebted Poor Countries.

Engaging the public and a wide range of stakeholders is repeatedly identified as an important component of good global health governance. Public involvement will contribute to: raising awareness of the impact of globalisation on health; assessment of environmental and health risks; priorities and public policy (Lee.)

Perspectives from the Pharmaceutical Industry, (Webber and Gentry) and the Information Technology Industry (Beard) are represented among the papers, both showing the fine balance that has to be achieved between accelerating growth in health and development through technology (eg through promoting partnerships to develop appropriate and affordable vaccines

for Malaria and HTV) and deepening inequities by creating a knowledge divide. This is illustrated by the current controversy over the role of the World Trade Organisation in Intellectual Property agreements (Kanavos et al.) The global investment in pharmaceutical Research and Development was US$ 36.9 billion in 1997. The success of the pharmaceutical industry depends on innovation and guaranteed markets. Lists of priorities for pharmaceutical research benefit almost exclusively the developed, richer world. Developing incentives and policies that would direct the considerable scientific resources of the Pharmaceutical Industry onto the health problems of poor countries such as Malaria, TB and HTV/AIDS, is an important recommendation in the Action Plan.

The dissemination of medical knowledge and the evidence base for many health interventions is also not without complexities (Murray and Dopson.) Policy makers need to consider developments in the different bodies of medical knowledge and their complex inter-relationships and the cultural specificity of much medical education. The UK has a unique contribution to make by supporting networks of doctors and others to set standards, gather and exchange new medical knowledge, establishing systems to quality mark reliable medical knowledge on the Internet, and building a greater understanding of the cultural and practical context in which medicine is practised. New information systems are needed for global health surveillance to be effective, and we need new ways of using the internet for the communications revolution to be inclusive. More research is needed to assess and quantify the health impact of globalisation on populations.

Many of the papers describe in different ways a relationship between local and global that is both bottom up as well as top down. Even the global pharmaceutical industry has local interests. A health impact assessment of globalisation on the population of London (Parsons and Atkinson) suggests that community development and urban regeneration may provide local solutions to minimise the harmful effects of globalisation, and that "Globalisation should be on every Health Agenda," particularly for the NHS and research institutions in the UK. The NGOs (Non Governmental Organisations also known as the voluntary sector) can help by empowering communities and engaging their participation both in the UK and abroad (Poore.)

Local and international NGOs have shown great innovation and are having a real impact on civic society in many countries. The lessons from such experience are often best communicated not simply by statistical measures but by anecdote and story telling. A facility to capture lessons in a learning knowledge base accessible to ordinary people through Internet, digital television films and books, as well as experts, could be of great value.

The Action Plan proposes that the UK Partnership for Global Health should provide a forum for discussion with NGOs. Poore suggests that resources should be provided to facilitate this, recognising that NGOs rightly devote as many resources as possible to front line services and that as an aftermath of debt relief there is likely to be a great demand for NGO support.

It is also suggested that there will be considerable benefit from learning from best practice in expressing and responding to local community views in Sector Wide Action Programmes and in national and international agency policies and plans.

Tourism is projected to be the world's largest industry by the year 2010. By 1997, 625 million tourists arrived in different countries around the world, with the UK having the fifth largest tourism market for the last 10 years. The UK receives up to 24 million visitors a year, 17 million to London alone, projected to rise to 23 million visitors in the next 5 years. In 1997 there were nearly 50 million visits abroad by UK travellers, with nearly a million visits to Africa, half a million to the Indian sub-continent, and a quarter of a million to South America.

With the increasing speed and convenience of Travel, patterns of disease will change. HTV is an example of a disease where the natural history and epidemiology has been changed by global travel. While most of the medical problems experienced by 15-50% of travellers-will not be serious, about 5% of them will need medical attention, and 1% will be admitted to hospital. Action proposals include a national policy on travel related diseases (Habib and Behrens.)

Globalisation has also contributed to the less voluntary migrations of 12 million refugees who cross international borders each year because of civil and economic unrest caused by the instability of certain nation states. In 1997, 32,500 refugees applied for asylum in the UK, the vast majority in London. The health needs of the estimated 250,000 refugees and asylum seekers in London are significant, and an example of a negative impact of globalisation on health.

The links between good health and governance at all levels between local and global are explored taking one public health problem, Tuberculosis, (TB). By linking "Rights" to "Responsibilities" incentives are demonstrated that would drive local and global programmes. A recent review of TB services in London found that in practice it is rare for good governance for a TB programme to be in place at all levels, so the benefits of linking "Rights" to "Responsibilities" are lost. (Parsons and Atkinson.)

Each of the papers describes some part of the complexity of inter-relationships between Globalisation and Health, and the multiplicity of players. One of the papers gives a comprehensive overview and commentary on the institutions and systems of government in the UK, Europe and globally that are part of the process and mechanisms of health governance.(Buse and Dodgson) This review of four distinct systems of health governance (multi-lateral, regional, bilateral and local,) found significant accomplishments and barriers to improved governance, and weak linkages. All of the papers acknowledge that there probably is no single solution or single agency that is responsible. However, there is also a strong consensus that global health governance must be strengthened.

The seminars would not have been successful without some contradictions and controversy. In one example, Webber and Gentry call for more Public-Private Partnerships with the Pharmaceutical Industry, while in another paper, Buse and Dodgson urge caution. It is important to ensure that the public's need is not obscured by powerful vested interests and different value systems.

The debate, of course, has already moved on since the papers were first presented at seminars throughout 1999. Many papers quote the seminal analysis of the Global Burden of Disease by Murray and Lopez (1997) projecting that non-communicable diseases in old age are rising in importance relative to other causes of ill-health as populations age, and as progress continues against communicable diseases in infants and children. However, these global and regional estimates do not adequately reflect conditions that prevail amongst the poor. Gwatkins, Guillot and Heuvelline (1999) estimated the burden of disease amongst the 20% of the global population living in countries with the lowest per capita incomes, compared with the 20% of the world's people living in the richest countries. This study demonstrated that a faster decline in communicable diseases would decrease the poor-rich gap in 2020, but if resources are diverted to non-communicable diseases, the poor-rich gap would widen. The health transition is certainly not complete, and vigilance against communicable diseases must continue or be increased if we do not want the health divide to widen.

This volume concludes with the Programme Report and Action Plan (Lister). This excellent summary of the year long programme concludes that the first step in the Agenda for Action is

to form the UK Partnership for Global Health and to raise awareness of the issue for individuals, communities, corporations, NGOs and Government. One of the final papers proposes a Global Health Award to recognise a public or private organisation, "or group of organisations, that demonstrate global citizenship and responsibility through a significant contribution to global health. Such an award would form part of a new order of mechanisms to enhance global governance for health. The challenge for the new millennium is to develop new partnerships for health, to apply appropriately the UK's unique strengths in medicine and technology to developing countries, and to develop systems of global governance for health that will share the health and wealth dividend from globalisation more equitably, and minimise the harmful side effects. The Nuffield Trust programme "Global Health: a Local Issue" will contribute significantly to these aims. We hope you enjoy and are stimulated by these papers.

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All other references in this introduction relate to papers in this collection.

THE GLOBAL DIMENSIONS OF HEALTH

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Introduction

Globalisation is a term which has been used frequently in recent times to describe a wide range of processes and events, including many developments in the health field. As a convenient catch-all, it has been cited as both cause and effect of many things - as both a source of widespread integration and disintegration of social groupings and structures; as both a creator of shared identities and a force behind individual alienation; as leading to both the "end of geography" and reinforcement of nationalism and regionalism; and as a facilitator of both greater cooperation and competition among individuals and groups. These varied, and seemingly contradictory, views of globalisation are undoubtedly a result of its complex and multifaceted nature.

The purpose of this background paper is to provide a brief overview of the potential impacts of globalisation on health, and how we can begin to better understand these impacts. A more detailed review of the existing literature can be found elsewhere (Lee 1998). The paper begins with a discussion of the often variably used term globalisation. Recognising that the term remains highly contested, often subject to intense ideological debate and hence variably defined, a broad approach to globalisation is encouraged which seeks to understand how it is changing human societies and relationships in varied ways. These changes are is occurring along three dimensions - spatial, temporal and cognitive. Each of these are then described in relation to their potential direct and indirect impacts on health.

A Definition of Globalisation

The existing literature on globalisation is abundant and fast growing, offering a virtual mountain of publishing across a number of different fields and from a broad range of perspectives. A cursory glance at selected works from some of these fields - economics, politics/international relations, business and management studies, cultural and communication studies, futurology, sociology/social policy and international law - soon reveals a clear difference of opinion as to what precisely is globalisation. Like the story of the three blind men asked to describe the characteristics of an elephant[1], each field understandably emphasises different aspects. For example, globalisation has been described as changes to patterns of economic production and exchange, increased inequalities in power within and across countries, corporate strategies towards global economies of scale, increased concentration of ownership of the mass media worldwide, the declining ability of states to make effective social policies, and changing legal concepts of sovereignty and national citizenship. Among these, the emergence of a global economy has perhaps received the bulk of attention. Yet all of these, and much more of course contribute individual pieces to a large and rather complicated puzzle.

[1]The story goes that three blind men, standing around an elephant, are asked to describe the characteristics of the animal by touch. The man standing at its trunk describes the elephant as a long flexible hose. The man standing at its tail describes the elephant as a soft hairy brush on a rope. The man standing at its side describes the elephant as leathery and tough. Each inteprets the elephant, in short, from a different and limited perspective.

In this paper, globalisation is defined as a process which is changing the nature of human interaction across a wide range of spheres (e.g. economic, political, sociocultural, technological, environmental.) This process can be described as globalising in the sense that various boundaries hitherto separating individuals and societies have become increasingly eroded. Most prominent have been spatial boundaries (e.g. national borders), but increasingly, other types of boundaries that have defined human experience, temporal (e.g Concorde) and cognitive (e.g. cultural beliefs, academic disciplines) are being changed. It is these changes to spatial, temporal and cognitive boundaries that this paper defines as the three dimensions of globalisation.

The above definition of globalisation, as a process occurring across different spheres and dimensions, can be used to develop a conceptual framework for understanding in greater detail the diverse changes that are being brought about. Beginning with the different spheres of human interaction, which are by no means wholly separable nor comprehensively listed below, the **economic sphere** concerns the production, distribution and consumption of wealth. The organising principles for achieving this, in terms of inputs, modes of production, scale of operation and so on, are argued to be changing as a consequence of globalisation. It is generally argued that we are moving towards a global economy by which there are large economies of scale, greater trade of goods, services and capital, increased mobility of labour, and an overall closer integration of economic activity worldwide. However, evidence suggests that this has been an uneven process, with alimited number of sectors (e.g. automobile, food,) demonstrating globalising features, while many do not.

The **political sphere** concerns the distribution and use of power, in its most organised form through government. Because of globalising forces, it is argued by many writers that who holds power, the forms of power being wielded, and the means by which power is being used are changing. One frequently cited example is the increased gap between haves and have nots within and across .countries. Increased income differentials have meant a greater concentration of wealth in fewer hands, accompanied by a growing number of marginalised individuals and groups in many societies.[2] Another believed change is the balance of power between the public and private sectors, and more specifically a diminished capacity of the state to represent the interests of national constituencies when an increased range of activities lie beyond state control (e.g. toxic waste dumping). This has led to discussion of the need to encourage new forms of political representation (e.g. global civil society, public-private partnerships) and authority (i.e. global governance).

The **social/cultural sphere** concerns characteristics of human communities or societies including collective activities, shared identities and traditions (e.g. values, beliefs, ideas) and support structures. Perhaps the greatest impact of globalisation on this sphere comes from the emergence of a global mass media which, it is argued, is changing the underlying cultural foundations of many societies. Many believe that there has been a shift away from communitarianism, for example, towards individualism resulting in weakened support for social responsibility and fragmentation of local communities. Others believe, however, that globalisation is contributing to new social identities across hitherto separated communities through, for instance, the Internet (e.g. global environmental movement).

The **technological sphere** can be defined as the application of knowledge and skills in human society for industry, commerce, arts and science and other uses. Globalisation may be

[2] This is often referred to as the champagne glass of inequality in global wealth whereby the richest fifth of the world's population receive 83% of total world income, and the poorest fifth receive 1.4%.

affecting technology through its wider dissemination worldwide through, for example, foreign investment by transnational corporations. Perhaps the most globalised technology sector is information and communications which has become a core infrastructure for a diverse range of human activities.

The **environmental sphere** concerns both the natural and manmade surroundings within which people live and interact. It has become increasingly recognised in recent decades that local environments are intimately linked with the global. The globalisation of particular forms of economic activity (e.g. unsustainable use of natural resources, toxic waste dumping), lifestyles (e.g. consumerism) and social structures (e.g. rapid urbanisation) has contributed to both local and global environmental degradation. Global climate change, a collective consequence of the emission of greenhouse gases by individual societies worldwide, is perhaps the best known example of this. At the same time, greater awareness of these impacts has been enabled by global linkages, thus resulting in at least limited changes in behaviour (e.g. recycling, international agreements).

As well as impacting upon different spheres of human societies, the changes resulting from globalisation can be understood along three dimensions. The first, the **spatial dimension,** concerns changes to how we experience and perceive physical space. On the one hand, there is a growing "sense of the world as a single place" (Robertson 1992) due to increased travel, communication, trade and other shared experiences. In contrast with a world divided into 190-odd sovereign and territorially distinct states, globalisation seems to be challenging the organisation of societies along strictly defined national borders. The popular image of the borderless "global village" where people interact across vast geographical distances, derives from this perception.

On the other hand, there is also evidence that globalisation may be reinforcing geographical boundaries or creating new divisions within and across countries. Rather than physical space becoming irrelevant, it is being redefined along different parameters. While many activities are becoming global in scale (e.g. automobile manufacturing), others may be becoming more local, national or regional. The rise in nationalist conflict in central and eastern Europe, for example, illustrates the continued importance of geographical territory. Furthermore, novel ways are emerging which redefine physical space in innovative ways. The advent of cyberspace and virtual realities (e.g. virtual conferencing, offices), for example, are changing our experience of space. Thus, the spatial dimension of globalisation represents diverse changes in the way people interact. Geography continues to be a fundamental feature of human societies, but how we experience and perceive space is being changed in different ways.

The second dimension of globalisation, the **temporal dimension,** concerns changes to the actual and perceived time in which human interaction occurs. In many ways, there seems to be a speeding up of timeframes. A notable example is communications which, with the development of satellite technology, facsimile and the internet (including email) since the 1960s, allows messages to be sent and received within microseconds. The sheer pace of technological change also means that investment in new computer hardware and software, and acquiring the knowledge to use it, is needed more rapidly. Such technologies, accompanied by deregulation, have led to an acceleration of global trading in currencies which totals US$1.7 trillion daily worldwide, two-thirds of this trade for less than seven days *{The Economist* 1997). Similarly, mass transportation, in the form of high-speed trains and supersonic airplanes, enables travel to distant locales within a few hours.

As well as an acceleration of timeframes, there also seems to be increased frequency of human interaction. Globalisation is characterised by intensification. For the average senior manager,

this means more frequent travel abroad, more people to network with, more publications to review, and more emails and voicemails to respond to. To some extent, this can lead to a slowing of human interaction. The experience of "information overload"[3] can mean that we need longer to understand tasks and make decisions. Policy makers who need to consult with a larger number and wider range of stakeholders may find the process more time-consuming. Hence, rather than an "end of history" (Fukuyama 1989), globalisation is bringing diverse changes to how we perceive and experience time.

Third and finally, the **cognitive dimension** of globalisation concerns changes to the creation and exchange of knowledge, ideas, norms, beliefs, values, cultural identities and other thought processes. Put simply, how we think about ourselves and the world around us is being changed by globalisation. The causes of this are varied including the mass media, educational institutions, think tanks, scientists, consultancy firms, public relations offices such as "spin doctors", the Internet, international organisations and tourism. Once again, there is evidence of diverse changes. On the one hand, there is a greater sharing of thought processes through, for instance, the growth of popular global culture (e.g. Hollywood films, pop music, fashion), worldwide dissemination of scientific research, and adoption of international agreements (e.g. human rights, environmental protection, reproductive health). Increasingly, members of a mobile and well-educated elite, often with dual or multiple nationalities, see themselves as "global citizens", sharing interests and identities across hitherto cultural divides. On the other hand, there is resistance to the global spread of thought processes through, for example, the exemption of cultural industries from free trade agreements, resurgence of religious fundamentalism and assertion of ethnic identities.

Together, changes to these three dimensions has accounted for the diverse and, at times, contradictory nature of globalisation. Defined in this way, globalisation can be seen as a complex process with wide-ranging consequences (see Table 1). The integrated nature of human societies requires a broad understanding of the many different spheres affected by globalisation. Such an approach is now taken to consider the potential impacts of globalisation on health.

The Global Dimensions of Health

The above definition of globalisation can be used to identify and explore potential ways in which globalisation may be affecting health (see Table 2). Health, broadly defined, concerns many spheres of human societies. It accounts for significant economic activity through, for instance, substantial public and private expenditure, large workforces and manufacturing of medical supplies and pharmaceuticals. It is highly political, for example, because of allocative decisions concerning treatment, research and salary levels. There are clear cultural aspects in the form of lifestyles, and cultural beliefs about health and illness. And there are clear environmental implications such as urbanisation, climate change and resource depletion.

Beginning with the **spatial dimension,** one of the most prominent features of globalisation is an increased mobility of people, animals, plants and objects across national boundaries. The most direct consequence for health is the increased potential for the spread of communicable diseases. Greater movements of people through business activities, immigration, rural-urban migration, displacement and tourism create more opportunities for the transmission of disease because of more widespread, frequent and close physical contact. Air travel, for example, brings large numbers of people into close proximity within an enclosed space (Box 1).

[3] It is estimated that 40 000 articles in the field of medicine are published each month.

Passengers may then disperse far and wide, with at best only cursory checks on their physical health, thus posing potentially serious consequences for public health.

There are numerous examples of how disease patterns have been influenced by increased global mobility. Lee and Dodgson (1998), for example, find that the seventh pandemic of cholera differs from the previous six in its geographical spread, reaching Latin America from the early 1990s where the disease had disappeared for almost a century. Furthermore, the disease has been unpredictable by "jumping" continents (e.g. India to the U.S., China to Peru) via air travel, trade in food products (e.g. shellfish) and shipping. There are similar fears that globalisation is facilitating the spread of HTV/AIDS (Lee and Zwi 1996), yellow fever (Harvard Working Group 1997), tuberculosis and malaria (Phillips-Howard et al. 1990). One recent example is the current economic crisis in Asia which is raising fears that governments will reduce public health services under financial pressures. The threat of a resurgence of tuberculosis is particularly worrying for a region which experiences two-thirds of the world's new cases annually, in part because of the high rate of HIV-infection. Such a scenario has already been experienced in the former Soviet Union and eastern Europe as a result of economic and political instability.

Box 1: Influenza and its global transmission

The annual influenza outbreak experienced in the UK is part of the worldwide transmission of the virus each year. While the current outbreak is known as A/Sydney/5/97, strains normally originate from Asian cities such as Shanghai, Beijing and Hong Kong. The strengths of the virus is that it is easily spread from person to person. In addition, the A strain has the ability to mutate, changing its surface protein coat and thus enabling it to avoid the body's immune response. This makes influenza an annual and, for vulnerable groups, potentially deadly threat.

Historically influenza outbreaks have been slow to spread from country to country. Today, however, frequent air travel between countries means that worldwide transmission can occur in a matter of days.

As well as the movement of people, there are concerns that increased mobility of animals, plants and objects are creating new health risks. Kaferstein et al. (1997) write that the global production and trade of food products is creating transnational challenges for controlling foodborne diseases (e.g. e coli, salmonella). Francy et al. (1990) found that unregulated trade in rubber tires, which contained mosquito eggs, led to the introduction of *Aedes albopictus* into the U.S., Brazil and parts of Africa from Asia, raising concerns over the possible transmission of encephalitis and dengue fever. Perhaps more worrying has been the deliberate or otherwise introduction of non indigenous animal and plant species to many parts of the world, with unknown long-term impact on local ecosystems including human populations.

While communicable diseases may pose the most immediate concern, the significant impact of globalisation on non-communicable diseases is also beginning to be recognised. Much of this impact arises from the global production and trade of health-related goods. Notable are pharmaceuticals, food and drink (including alcohol), biologicals such as blood products (Kimbrell 1993; Starr 1998), and increasingly health informatioa Most immediately, this creates the potential for spreading health risks far wider than previously. Infected blood products traded globally in the 1970s, for example, resulted in the worldwide spread of Hepatitis B and HTV/AIDS (see Box 1). More subtle are influences over lifestyle through the global marketing of fastfood diets, tobacco products and alcoholic drinks.

Box 2: The global tobacco industry and public health

The tobacco industry is a US$400 billion industry dominated by a small number of transnational corporations led by British-American Tobacco (BAT) and Philip Morris. In a few countries, such as China, tobacco production is controlled by a state monopoly. The industry is both global and local, with complex linkages between TNCs, inland revenue agencies, retailers and farmers. As a consequence, many economies around the world are heavily dependent on tobacco.

There are over one billion smokers worldwide, one-half of whom will die from their habit. Tobacco currently causes 3.5 million deaths annually, expected to rise to 10 million by 2030. The biggest growth market is in the developing world where 85% of the world's smokers will be located by 2025 and seven million deaths will occur.

Source**:** Tobacco Free Initiative, World Health Organisation

Perhaps more indirect, but with potentially profound implications for human health, are the organising principles currently underlying a globalised economy. While liberalised trade, global economies of scale and capital mobility make economic sense to many, such principles can have adverse and sometimes irreversible consequences for public health. The "imminent crisis" of antimicrobial resistance has resulted from the uncontrolled and often irresponsible use of antibiotics worldwide (Carbon and Bax 1998), perhaps most worryingly in developing countries (Hart and Kariuki 1998). Similarly, the unregulated collection of blood supplies from socially marginalised people in developing countries during the 1970s was a highly profitable means of meeting growing global demand, but has had widespread human costs. (Box 3). Even less regulated is the illegal drug trade that has been enabled by many features of globalisation. As Stares (1996: 5-6) writes,

"The drug trade...has increasingly become a transnational phenomenon, driven and fashioned in critical ways by transnational forces and transnational actors. Thus the global diffusion of technical expertise and the internationalization of manufacturing have made it possible to cultivate and refine drugs in remote places of the world and still be within reach of distant markets....The expansion in trade, transportation networks, and tourism has not only made it easier for them to distribute drugs to the long-established markets of North America and western Europe, but it has also opened up new parts of the world to exploit. The growing integration of the global financial system, moreover, with its rapidly expanding array of services and instruments, has also provided traffickers with many more opportunities to launder money and invest in other activities - licit or illicit."

Box 3: The global trade in blood products

Blood is one of the world's most precious liquids, worth an estimated US$20 000 a barrel and, if fractionated into its various components US$67 000 (compared with crude oil at US$13). The world market for blood and its derivatives[4] is about US$18.5 billion annually. Plasma, in particular, is a US$5 billion global industry because it is transportable and can be made into long-lasting drugs.

From the early 1970s, rapidly increasing demand for plasma led to substantial supplies being obtained from marginalised communities in developing countries. Major suppliers to the U.S. were Haiti, Mexico, Belize, Dominican Republic, El Salvador, Costa Rica, Colombia and Nicaragua. Many suppliers were profit-making companies who, under minimal regulation, collected blood and processed it without adequate testing or safe storage. While these companies operated legally and profitably, their practices led to widespread infection of populations with HTV/AIDS and Hepatitis B. The global structure of the industry spread these risks farther afield than would have otherwise occurred.

In the U.K. the demand for blood is rising by 3-4% per year. There are two million blood donors in the U.K. but a recent study shows a decline in altruism in giving blood voluntarily. In 1998 it was decided to import safe supplies of anti-D immunoglobulin to replace British supplies which carry a hypothetical risk of transmitting nvCJD. However, this has been delayed by worldwide shortages.

Sources: Starr D. (1998), *Blood, An Epic History of Medicine and Commerce* (New York: Alfred A. Knopf); Ferriman A. (1998), "Decline in altruism threatens blood supplies," *British Medical Journal,* 317, 21 November: 1405; and Warden J. (1998), "Delay in plasma replacement," *British Medical Journal,* 317, 21 November: 1409.

Finally, the long neglect of the environmental impact of many economic activities on a global scale - unsustainable use of natural resources, dumping of pollutants, deforestation, overly intense agricultural practices - are beginning to reveal wider health consequences (Patz et al. 1996; McMichael and Haines 1997). One example of the link between the global economy, environmental degradation and public health is the recent dumping of toxic waste in Cambodia. In the coastal province of Sihanoukville, concrete from Taiwan with dangerous levels of mercury were dumped in thin plastic bags. Local people recovered the bags for use as roofing material, bedding and storage. Widespread illness has since been reported including nausea, fevers and skin conditions. Overall, people have destroyed more than 30% of the natural world since 1970 and the pace of destruction continues to accelerate.

The health impacts of the **temporal dimension** of globalisation are also varied. Foremost is the speed in which health risks arise and are spread within and across countries. The seventh cholera pandemic, beginning in Indonesia 1961, has been both the longest pandemic in history (i.e. 38 years), as well as the most rapidly spread. Within two years of being introduced to Peru in 1991, it had spread to nineteen other countries in Latin America (Lee and Dodgson 1998). Relatedly, it is expected that global climate change will affect the seasonal range of

[4]Whole blood is spun in a centrifuge to divide it into red cells, platelets, white cells and plasma. Each is used for various therapeutic products. Red cells can be transfused directly; white cells and platelets to restore resistance and clotting ability in, for example, chemotherapy; and plasma (albumin) for restoring circulationo, clotting factors for haemophilia, antibodies for vaccine production and various other reagents and pharmaceuticals. While red cells perish more easily and is generally not traded internationally, plasma is suitable for longer term storage and transport (Starr 1998: x, 260).

many vector-borne diseases (e.g. malaria, Lyme disease, dengue fever). As Kaferstein (1997) writes, "over the last two hundred years, the average distance travelled and speed of travel has increased one thousand times, while incubation periods of disease have not." Similarly, the Harvard Working Group on New and Resurgent Diseases (1997:165) observe,

"Modern transportation has cut travel time to almost anywhere in the world to a few days at most, less than the average incubation period of many pathogens. Travel time, therefore, presents a less significant barrier to the spread of disease than it once did. In Christopher Columbus's time, for example, crossing the Atlantic Ocean was slow compared to the progression of, say, the smallpox virus. Since all carriers of smallpox manifest symptoms of the disease, any infected traveler would have either become sick and died or recovered before reaching the New World. As a result, smallpox did not reach the Americas until several decades after Columbus's voyage. Today, travelers routinely arrive home with diseases thay have picked up abroad."...

Such scenarios raise policy implications concerning the adequacy of disease monitoring and surveillance systems, and the capacity of public health officials to mount a sufficiently rapid response to health emergencies.[5]

As well as different rates and duration of disease transmission, there is an acceleration in the pace of technological change and dissemination of knowledge and ideas, but perhaps greater challenges to the capacity of policy makers and practitioners to apply them to meet health needs (i.e. information overload). Advances in microchip technology and fibre optics, for example, has meant greater potential to harness new information and communication technologies for faster data collection, analysis and application. The prominent advisory role of donor agencies, such as the World Bank, within many developing countries has led to an acceleration of health policies being spread throughout the world. More indirectly, the greater volatility of the global economy, and vulnerability of national economies to frequent cycles of boom and bust, raises implications for the ability of governments to formulate and implement effective health policies.

The cognitive dimension is perhaps the most neglected aspect of globalisation despite its centrality to health. The impacts are both broad and specific. In general terms, there appears to have been a shift towards a global paradigm which frames our thinking about what is health, who should have access to health services (e.g. disability adjusted life years), what health services should be provided, and how these services should be paid for. As part of a broader policy debate concerning the changing role of the welfare state, Zielinski and Kendall (forthcoming) argue that health has been seen by some in largely economic terms by which it is a commodity to be purchased by consumers within a competitive marketplace. Within this paradigm, public expenditure on health, investment in research (e.g. Viagra versus malaria prophylaxis), the setting of health priorities, access to health services and other policy decisions have become increasingly defined by measures of economic return (in contrast to clinical or ethical criteria). This can be observed both within and across countries. The priorities of health sector aid, for example, have been notoriously defined by the perceptions and often interests of aid donors rather than recipients. Thus, infectious diseases and family planning have historically received far greater amounts of aid than health systems development, poverty alleviation and long-term capacity building (Vaughan et al. 1995).

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[5]The European Union has recently funded a joint project by the London School of Hygiene and Tropical Medicine, Public Health Laboratory Service Communicable Disease Surveillance Centre and the Institute of Public Health, North Rhine, Westphalia to evaluate European responses to epidemiological emergencies involving more than one country.

The more specific impacts of the cognitive dimension on health include influences, led by the mass media, on healthy or unhealthy lifestyles. For instance, the population of the U.K., along with those of other higher-income countries, has been getting heavier. About 50% of British men and women are now overweight, with average weight increasing between 1984 and 1995 by 6.5 and 4.55 kilograms respectively (Appleby 1997). Changes in diet, exercise and overall lifestyle are believed to be the main factors. Perhaps somewhat contradictorily, globalisation may also be leading to more health-conscious and informed societies, with the potential for greater access to health information, and self-diagnosis and treatment.

Finally, globalisation holds implications for the training of health professionals around the world. Increasingly, the training of health professionals is defined by a western biomedical model of health and disease. There is an acceptance of this tradition as a universal "gold standard" by which to measure good practice and sound scientific method, with implications for the validation and legitimation of certain forms of knowledge and practice. While this form of globalisation facilitates crossborder understandings through, for example, shared nomenclature, language, concepts and recognised research practices, there is also the danger that health traditions of a more alternative or traditional nature will be marginalised. This is a potentially useful and valid source of knowledge and application, particularly in local contexts, that could be increasingly excluded by a dominant medical tradition.

In summary, globalisation poses a diverse range of potential impacts for health of which only some have been discussed in this paper. Global changes to the spatial dimension of human interaction is perhaps creating the most directly observable consequences. There is growing recognition that health risks and determinants increasingly cross geographical boundaries through a variety of means, and we need to think in different spatial terms about how to protect and promote public health. Equally important, but given less attention so far, are changes along the temporal and cognitive dimensions. Globalisation is changing the timespans and frequencies of many health issues, raising concerns as to the capacity of public health systems to respond in a timely manner. And globalisation is influencing in often subtle ways our underlying values, principles, beliefs, ideas and knowledge about health. How we are increasingly thinking about health is, in turn, shaping our individual and collective actions.

Conclusions

This paper seeks to offer a broad framework for understanding the global dimensions of health, illustrated by varied examples. Indeed, the complexity and multifacted nature of globalisation makes it difficult to categorise the many interrelated health issues that it raises. The essential feature of globalisation, as defined in this paper, is that it is a process changing the nature of human interaction. Foremost are changes to spatial (e.g. state) boundaries, but temporal and cognitive boundaries are also being crossed. As a result, many health issues are also being changed by these global dimensions.

Towards an effective response to these health issues, the most immediate need is for a better understanding of globalisation through sound empirical research. Two key questions may begin to guide such research: (a) to what extent is globalisation of health occurring within different spheres and along different dimensions? and (b) what positive and negative effects is globalisation having (or expected to have) on the health of particular individuals and groups? Complementing this research, and being informed by it, is the need to facilitate policy initiatives at local, national, regional and global levels. This might begin with encouraging greater awareness of the global dimensions of health among policy makers and health practitioners, but could then be followed by specific policy decisions to optimise the benefits, and mitigate the costs, of globalisation for health.

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Table 1: Spheres and Dimensions of Globalisation: Selected examples

D I M E N S I O N S

SPHERES	SPATIAL	TEMPORAL	COGNITIVE
ECONOMIC	global production and trade (e.g. food, cars, illicit drugs) global financial markets (i.e. big bang)	increased speed of global financial transactions (e.g. currency speculation)	global spread of neoliberal economics global revival of stakeholder capitalism
POLITICAL	global level political representation (e.g. global civil society, global governance)	increased speed of political change (eg collapse of Soviet bloc)	development of global support for basic human rights
SOCIAL/ CULTURAL	global mass media and communication (e.g. CNN, Internet) transnational social movements (eg global women's movement) pressures on social welfare systems worldwide	increased speed of communication (eg email vs letter) faster social mobilisation across countries (e.g. environmental movement) increased social instability (e.g. breaking of iron rice bowl)	global youth culture multiple nationalities/ citizenship global shifts in social values (e.g. individualism versus communitarian principles
TECHNO-LOGICAL	global application of technologies	rapid change in computer technology (486, 586, pentium) exponential growth in scientific knowledge	investment in science and technology by TNCs
ENVIRON-MENTAL	global climate change (e.g. greenhouse effect, El Nino)	accelerated resource depletion	global environmental awareness (e.g. Green movement)

Table 2: Potential impacts of globalisation on health

	D I M E N S I O N S		
SPHERES	**SPATIAL**	**TEMPORAL**	**COGNITIVE**
ECONOMIC	global production and trade of health goods and services	faster spread of diseases due to global trade and production (e.g. foodborne diseases, cholera) faster development of drug resistance due to commercially driven use of antibiotics slower development and dissemination of control and treatment for "unprofitable" diseases	global mindset of national policy makers in applying economic rationale to health sector reform (e.g. WDR 1993)
POLITICAL	transnational health policy networks (epistemic community, world civic politics) health needs of refugee populations within and across state boundaries	faster deterioration of health status due to political instability (e.g. former Soviet Union) slower response to public health threats due to unclear global authority	change in expectations towards role of state in health financing and service provision (i.e. welfare state)
SOCIOCULTURAL	mobilisation of global women's health movement at ICPD (1992) global changes in distribution of poverty within and across countries	faster dissemination of health education and training through global communications faster spread of communicable diseases through social mobility (e.g. tourism)	worldwide adoption of healthy or unhealthy lifestyles worldwide reforms in social welfare systems western biomedical discourse in training health professionals
TECHNOLOGICAL	global surveillance and monitoring systems	faster production of health knowledge and information	increased self diagnosis and prescribing
ENVIRONMENTAL	change in altitude and latitude of tropical diseases due to global warming (e.g. malaria)	extension of seasonal range of vector-borne diseases increased rates of transmission in higher temperatures e.g. Lyme disease	threats to potential health applications due to reduced genetic diversity from rainforest destruction

GLOBAL HEALTH: IMPLICATIONS FOR POLICY

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Introduction

The economic globalisation of the health industry and the underlying global trends in health and care pose myriad challenges and opportunities for health policy. This paper is intended to help the seminar groups to select from and debate these issues. It uses the framework of the previous paper (Lee 1999) to identify current policy dilemmas and invites the participants at the seminars to identify further issues and to consider the next steps in developing local responses to global health.

Health policy issues are listed under the headings suggested by Dr Kelley Lee :

- Political and Institutional Context
- Economic Trade and Aid
- Cultural and Social Factors
- Global Health and Environmental Risks
- Technology and Knowledge

While health and its determinants may be seen as a global tide, this programme is aimed at promoting local awareness and response. It is therefore important to consider how local interests are affected, whether at a community, home country, UK or European Union level. And because it will be impossible to address all potential issues it will be sensible to select those with the greatest impact. It will also be helpful to focus on issues for which current national or international policy and regulatory mechanisms may be inappropriate. The final section of this paper therefore provides a basis for discussing how to select issues for further review.

Political and Institutional Context

Health care is the world's largest industry absorbing some 8% of the total world product. It is also the most heavily regulated , but this has largely been at national level, health policy has been claimed to show the greatest degree of variation between nations of any area of social policy. It is notable that health was not seen as an area of convergence for the original European Economic Community and was specifically excluded from The Treaty of Rome.

The right to the highest attainable standard of physical and mental health is embodied in the UN Declaration of Human Rights. The WHO, and other UN agencies and the World Bank, together with other aid agencies have tried to focused on affordable ill-health prevention since the 1970's (water supply, health education, immunisation) and basic care provision (including malnutrition and maternal and child health) in third world countries. They have also attempted to reduce or eliminate diseases such as: malaria, cholera, dengue and tuberculosis (less successfully), polio and smallpox (with greater success). In some cases such efforts may have been driven more by the priorities of higher income countries. Polio, for example, is not a major health burden for many poor countries, though it may have been seen as a global threat by richer countries

There were perceived to be fundamental differences between the health issues faced by "Developing" and "Developed Countries", this terminology seems to imply that the former have not yet achieved the success of the latter. Low-income countries were able to spend 2-4% of GDP on health, which would be most effective if spent mainly on basic care and communicable diseases (but in practice hospital care often accounts for 60- 70% of spending). High-income countries spend 7-10% of GDP on health (12.4% for USA) mainly on non-communicable diseases and about 0.27% on development aid (0.1% USA, 0.29 % UK) of which about 10% is directed towards health needs. Aid usually constitutes less than 20% of a low-income country's expenditure on health, though some countries, such as Bangladesh, Cambodia, Mozambique and Sudan are very dependent on aid to support health care. High income countries are now some 60 times richer per capita than low income countries.

This view of health policy as a national issue with some aid implications for distant countries with entirely different health problems, is increasingly found to be inadequate to respond to emerging threats and opportunities. The globalisation of the health industry, and global trends in trade, travel and communications referred to in previous papers have created a much more immediate link between the health, social and economic conditions of high and low income countries:

Investment decisions made by pharmaceutical companies on a world wide basis increasingly focus on the markets which offer the highest rates of return on research and development (which constitutesl7.5% of cost), these are USA, Europe and Japan. Diseases with greatest relevance to low income countries receive very little investment but these diseases are returning.

More than 1 million people travel between OECD countries and low-income countries each week. The UK receives *V2* million visitors per week and almost 1 million people make overseas trips from the UK each week. About 2500 of these have malaria a year.

Methicillin-resistant Staphylococcus aureus (MRSA) took less than seven years from first detection in an Australian hospital to becoming a significant common problem for hospitals in Scotland. Vancomycin-resistant Enterococcus (VRE) is now an emerging threat in US hospitals and Vanomycin resistance has been noted in Japan and may become a significant problem in the UK in a much shorter time.

In Cambodia it is possible to buy single doses of most fourth generation antibiotics from roadside informal pharmacies. The development of drug resistance, whether it arises from the uncontrolled access to fourth generation antibiotics peddled from a wayside shack in Cambodia or from overuse in Australian, US or Japanese hospitals, has both health and economic implications on a global scale. While measures to control the use of antibiotics and antimicrobial agents in this country are important they are not sufficient to counter this threat.

Non-communicable illnesses such as ischaemic heart disease, depression and diabetes may soon be the leading causes of mortality in low-income countries, This is in part due to changing age structures and the rise of affluent groups within low-income countries. It may also be attributed to the global spread of lifestyle trends and products by films and television programmes and companies such as Cadbury Schweppes* United Distillers and BAT. Export of lifestyles is dangerous. The effects of smoking have already been noted. Alcoholism affects 5-10% of people and is the 4th most important cause of disability world-wide. Genetic an diet factors make South Asians 4-5 times more susceptible to Diabetes than Europeans the potential for diabetes to damage the health of up to one fifth of South Asians has been described as an impending "epidemic".

For these reasons local health policy must increasingly be seen in a global context. The report by the US Institute of Medicine "America's Vital Interests in Global Health" concludes that "Distinctions between domestic and international health problems are losing their usefulness and often are misleading". The European Union has accepted health as an area for convergence in the Maastrict Treaty and an accord has been signed by Clinton and Santerre to work together on global health issues this has produced a joint EU-USA Task Force on Communicable Diseases.

European health systems, are all undergoing reforms that may be described as a move towards a European version of managed care. In the UK Sweden and Holland, Alain Enthoven an American academic and an example of the globalisation of ideas, was a significant contributor to the reform debate. Common elements of reforms include: clearer health objectives and priorities at a community level with distinct responsibilities for agencies regulating, commissioning and providing care, evaluation of health care interventions by evidence based medicine and monitoring the cost and quality of health care services. They are also seeking to develop better models for primary care, There are important lessons for other countries particularly the former socialist republics of East Europe. These have received considerable support from the European Office of the WHO (see the Ljubjlana Charter on Reforming Healthcare). However, EU health systems have been slow to learn from other countries, unlike the Japanese Health Ministry that sent delegations world wide during its 15 year programme of reforms.

The 1999 World Bank Report, "Knowledge for Development" stresses the importance of the power of knowledge to support development and in particular to assist in heahh improving. The 1993 report had shown that appropriate health policy measures could greatly increase the impact of health expenditure on the burden of disease. At a personal level the education of women was the single greatest potential contributor to health and family wellbeing. The UK is a major provider of education and training in health and has much to offer in this field, particularly in relation to puBBc health and the economics and management of heahh and care systems. The European Network of Health Promoting Schools supported by the European Union, the Council of Europe and WHO may be an important reference point. There is also much to learn from the experience of low income countries and significant medical discoveries have been made, as examples community based approaches to behaviour change in relation to diabetes and discoveries in China in relation to malaria.

There are many health lessons to be learnt from comparisons at national and sub-national regional levels, within Europe, as examples, understanding the link between health and diet, best practice in responding to teenage pregnancy and drug abuse. A "Europe of Regions" with a variety of health policies, different diets, genetic factors and lifestyles with well-developed information on the outcome and impacts on patients could provide valuable lessons for health policy. For example better understanding the benefits of the Mediterranean diet. Sadly the Treaty of Amsterdam did not establish a good basis for this, partly because the UK, which has one of the strongest traditions of public health in Europe was not then particularly active in respect of the European dimension of heahh policy.

Due to its history, there is not a clear focus on health within the European Commission. A Health Council has been established bringing together Health Ministers and Chief Medical Officers (or the equivalent) but responsibility at Commissioner level is shared with employment, industrial relations and social affairs. Responsibility within the Commission is spread across at least five DGs. Perhaps partly for this reason co-ordination with the European Office of the WHO is poor and there may also be some lack of co-ordination on

health issues with the OECD and the Council of Europe For whatever reason appears that these powerful and resourceful bodies appear to achieve less than they might. It is notable, for example, that the best sources of information about the performance of European health systems are the OECD health data base and the WHO HFA data base and both show significant errors and omissions in relation to the UK.

The UK's level of participation in such bodies is partly a matter of political will. This now seems to be in place both in respect of the UK's role in Europe and in supporting the NHS, in particular its focus on public health and the root causes of poor health. It would be helpful to underline the importance of global health care by stating Government aims and intentions in respect of global health. It may also be helpful to clarify the roles and responsibilities of government departments in dealing with these issues since as discussed later in this report they affect: development aid, trade, agriculture, consumer safety, security, environment and culture as well as health.

The House of Lords Select Committee report on "Resistance to Antibiotics and other Antimicrobial agents" and the Government response to h, illustrates the range of measures required to respond to this aspect of global health. This includes: setting national priorities, developing an action plan, surveying current arrangements and performance and strengthening where required, establishing an interdisciplinary steering group, and multi-disciplinary expert group, funding basic and applied research, raising public awareness, providing guidelines for doctors and veterinarians, extending information systems to provide relevant information, improving the education and training of clinical staff in this field, developing new drugs to combat resistance (particularly low cost treatments for tuberculosis and malaria) in partnership with the pharmaceutical industry, support for international agencies engaged in surveillance and joining in recommendations to the World Health Assembly.

While national direction is essential there are important roles for home country departments and health authorities in providing management, monitoring and local guidance for the implementation of policy. At the present time there is some uncertainty as to how the interests and concerns of the home countries will be managed in relation to global health. This is an issue of "joined up government" that crosses both departmental and home country boundaries. It would be useful to see a mapping exercise to show where responsibilities lie in Government Departments, for global health and in relation to international agencies including the Council of Europe, EU, WHO, WTO (which is taking an increasing interest in health) and other bodies. Equally important would be to determine how leadership is taken, how co-ordination occurs and how quickly action can be initiated and followed through.

Economic Trade and Aid

The importance of health to economic growth is increasingly apparent. It has been shown that high infant mortality rates in low-income countries can reduce economic growth by 25%. For high-income countries the cost of healthcare is also a significant factor in economic prosperity. During the 80s the uncontrolled growth in US health expenditure was a major reason for the lack of real increase in the spending power of American workers. In Europe curtailment of health expenditure was a major drive for countries seeking to meet the convergence criteria for the Euro.

Failure to contain resistant forms of tuberculosis, sometimes associated with AIDS, is estimated to cost USA $lb per annum. Resistant forms of tuberculosis are rare in the UK's but incidence is rising. This is an example of a disease formerly associated with poor countries and poverty, for which a strategy of containment has been pursued on economic grounds. It is

now presenting a global health threat, illustrating the importance of taking a long term and global perspective when considering health and economic impacts in low-income countries. It may be both morally and economically wrong to take such a limited view of health risks and people's lives.

Health is largely provided by local and national organisations, there are no global health providers, though some patients do go overseas for treatment. Medicine may be considered to have some characteristics of a global profession. For example, a relatively common terminology is used and even the Institute Pasteur in Paris publishes in English.. Both doctors and nurses often move from one country to another, for example, it is reported that 28% of NHS Dental and Medical staff received primary qualification outside the EU.

Economic globalisation is a feature of health supply companies. As noted in a previous paper the pharmaceutical sector (which accounts for some 15% of global health costs) is highly globalised. Pharmaceutical wholesaling (accounting for about 1% of total costs) is also concentrated in a limited number of regional operators. Medical equipment (about 4% of costs) is becoming more globalised and health information systems and technology supply (1.5% of costs) is dominated by a decreasing number of international companies.

The ten leading global pharmaceutical companies have developed by merger and acquisition (1 Novartis, 2 Glaxo Welcome, 4 Hoechst Marion Roussel, 5 Bristol Myers Squibb, 6 Johnson & Johnson, 7 American Home Products, 9 Smithkline Beecham, 10 Roche) and by internal growth (3 Merck, 8 Pfizer). Globalisation was driven by three key factors, first the need to achieve economies in research and development (each new chemical entity marketed costs $500 million) and sometimes in production, though this is a less important cost factor for most products. Second drug companies can achieve economies and increased sales by global branding. Third these mergers have seen companies increase their market share in particular therapeutic areas. While the top ten companies account for only 34% of prescription medicines (the top 20 companies account for 52%) they often have a much larger share in specific areas, for example, one relatively "small company supplies 70% of the world market in infertility treatment.

Increasing dominance in specific therapeutic fields enables companies to control and lead research and development, information about effectiveness and disease management programmes. Disease management has both positive and negative connotations. It can lead to more cost-effective total programmes of care and treatment with an evidence base for continuous improvement. It may play a valuable role in sharing information between different health systems and for example, it may be an important factor in limiting the misuse of antibiotics. But it may also be seen as a method for controlling markets and limiting doctors' clinical freedom. For these reasons there is unease at the prospect of the spread of disease management programmes from the USA. This suggests the need for international co-operation with pharmaceutical companies to share the benefits of disease management while guarding against its dangers.

Pharmaceutical companies tend to define their world largely in terms of the three major markets for branded prescription products - USA ($100 billion), Europe ($ 70billion) and Japan ($ 50 billion). This excludes low cost generic drugs that account for about 40% of prescriptions but only 10% of the market value in high-income countries.

In low-income countries essential pharmaceuticals defined in national formularies will be very largely drawn from generic drugs. These may be manufactured locally or imported, from regional and global producers. No low-income country, except China, is self sufficient in

essential pharmaceuticals. The EU provides about 75% of all drugs imported to low-income countries. Inefficiencies and corruption in the supply system and lack of an effective cold chain mean that some 2.5 billion people have little or no access to essential drugs: Branded drugs are still openly available in many third world countries sometimes with little effective regulation on their dispensing and use. This is leading to drag resistance and the period of effectiveness of new drugs is shortening as a consequence. Pharmaceuticals make up 10-30% of public healthcare costs in low-income countries and in some cases the amount spent by the public on pharmaceuticals exceeds the public sector health budget for the country.

Low-income countries are still dependent upon high-income countries for the supply of new drugs and vaccines. Even though the market for drags in low-income countries amounts to some $44 billion it may not prove sufficiently attractive to support pharmaceutical company research and development at affordable price levels. European pharmaceutical companies supply drugs and vaccines through UNICEF at prices below those applied in high-income countries, a multi tier pricing arrangement that supports the provision of existing drugs. The pharmaceutical industry also experiences problems with parallel imports (the resale of drugs back to countries with higher prices) and patent infringements.

Intellectual property rights are key to this issue since these rights confer value on products which enable pharmaceutical companies to make returns on investment. When patents lapse the price of a drug as a generic will often reduce to perhaps 30% of it's former price. It might be possible to manipulate the market in favour of low-income countries that would otherwise simply not be able to afford the product (i.e. by extending the patent protection period). This in turn requires strict control of the distribution of the drags and prevention of parallel importing by corrupt practices.

The high cost of research and development and the low prices affordable lead to the neglect of many drugs of greatest relevance to low-income countries. This results in so called "orphan drags" that are not developed because they have poor prospects of profitability, for example, there has been very little research into new anti malarial drugs for this reason. The European Commission has put forward proposals to designate orphan medical products and provide incentives to bring them to market. The UK has no comparable orphan drag policy.

Drugs marketed in the UK must undergo clinical trials approved by the Medicines Control Agency. There are exemptions in the case of drugs with small target markets in the UK, which may be required to undergo more limited trials. Having demonstrated its safety and efficacy in an approved trial in this country or elsewhere in the EC it may be approved by the European Medicines Evaluation Agency. This will enable a drag to be licensed for use in this country. It does not necessarily follow that it will then be accepted for reimbursement by the NHS, as restrictions may be placed on its use on wider medical or economic grounds, as in the case of Viagra.

The other main instrument relevant to the marketing of drags in the UK is the control of prices through the retail pricing agreement, this basically limits the total return on capital employed by pharmaceutical companies in the UK after certain allowable expenses. The scheme is designed to encourage investment in the pharmaceutical industry in this country as well as controlling prices. In practice the UK has higher drugs prices than some other European countries but lower than others. The EU has not yet brought common pharmaceutical prices across Europe. It has been suggested that the regulation and pricing regime at an EU and UK level could play a role in supporting global health by encouraging research into areas relevant to global health threats and better control of the use of drugs both in the UK and in other countries.

There are many other aspects of trade which affect health in this country and globally. The export of bovine spongiform encapalopathy (BSE) through trade in animal feed and livestock, and the subsequent impact on blood product export due to fears of new variant Creutzfeld-Jakob disease are clear examples of the need for vigilance not only with regard to imports but also in relation to exports. Trade in food and animals and other chemically or biologically hazardous material pose clear health threats. This may include genetically modified food or animals and the use of pesticides and growth promoters, hormones and other additives. For example there is currently a major issue concerning the import of beef from the USA where use of hormonal growth enhancers is permitted. The immediate responsibility for guarding against such threats lies with the Food Safety Agency, the Ministry of Agriculture and the Ports Health Authority, but it is clearly not possible to detect and detain all such matter at the point of entry. There is a need for a better scientific base and international agreement and monitoring of health and environmental risks. This must go hand in hand with the simplification and elimination of trade barriers in respect of low-income countries.

Trade with low-income countries increasingly dominates aid, about $70 billion is provided in aid and loans from official OECD sources while some $250 billion net inflow arises from private sector sources (though this is not true of sub Saharan Africa). The White Paper on International Development, "Eliminating World Poverty" notes the importance of the globalisation of lifestyles and trade. It makes proposals for working with the United Nations Conference on Trade and Aid to improve trade procedures and reform of agricultural trade, linking this to reform of the EU's Common Agricultural Policy and environmental standards. In particular the paper states the Government's intention to ensure that the advertising of pharmaceutical products and other items such as tobacco and baby milk are conducted in a responsible way. This mirrors proposals at WHO to introduce the first public health treaty by 2003. The White Paper proposes to strengthen support for trade and aid by building partnerships between government departments and British businesses. This could be an important keystone for developing an understanding of global issues in relation to trade and aid.

The White Paper sets clear objectives for development including "Better education, health and opportunities for poor people". The particular targets for UK contribution in this field are: lower child and maternal mortality, basic health care for all, including reproductive services, effective universal primary education, literacy, access to information and lifeskills, safe drinking water and food security and emergency and humanitarian needs. The paper also places emphasis on the development of women, noting that they constitute 70% of the 1.3 billion people living in extreme poverty and are key to improved health and child spacing.

The paper does not attempt to quantify the link between health improvement and economic development as suggested in the World Development Report of 1993, perhaps this is simply too difficult to demonstrate. An analysis of the burden of disease measured as disability adjusted life years lost shows the effectiveness of low cost measures aimed largely at communicable diseases. As non-communicable diseases become more important it is increasingly difficult to find affordable health strategies. The UK has a strong tradition of Public Health and links with low-income countries, not least through the Commonwealth and the work of the London School of Hygiene and Tropical Medicine. It might therefore be appropriate for the UK to provide particular support for the search for appropriate and affordable health policies in low-income countries.

It might also be useful to attempt to evaluate the overall impact of trade and aid on health and the environment. The exercise might serve to clarify relative priorities in relation say to

support for water development, education and health compared to measures to control tobacco and alcohol consumption. It might also help to examine issues such as the UK role in training health professionals from low-income countries and in taking trained professionals from those countries.

Cultural and Social Factors

The increased volume and speed of travel is clearly a threat to health. The fact that travellers may pass through airports before symptoms of diseases are apparent to the carrier makes the detection and prevention of the spread of diseases by travellers almost impossible. In some countries evidence of immunisation against certain diseases is still required of travellers but, for most of the world, this once familiar aspect of world travel is not observed. This applies to travellers from this country going to areas with high risk of diseases such as Typhoid and Hepatitis A. A survey by Pasteur Merieux MSD showed that about 33% of travellers to Typhoid risk areas and 40% of travellers to Hepatitis A risk areas were not vaccinated. Travellers arriving in this country could carry diseases such as Ebola before the outbreak had been recognised. The dilemma is, how can high-risk travellers be identified and, having done so, what measures could be taken in the interests of the traveller, fellow travellers and the community.

The UK is the most ethnically mixed country of Europe. Over the years it has seen the immigration of many people with distinctive cultures and genetic factors that give rise to specific health needs. Recent immigrants, for example, refugees from Somalia, Sudan, Ethiopia and the former Yugoslavia and immigrants from Cyprus and Turkey have distinctive health needs as well as a common need for effective contact and communication with the NHS. Failure to meet these needs is one reason for the disparity in the health outcomes achieved by people from minority ethnic groups. What is required is not only a greater understanding of the health needs of all our communities but also the ability to respond more quickly to these distinctive needs. For example, it has been known for at least 20 years that Afro Caribbean people in this country have a high susceptibility to schizophrenia, and sickle cell disease and yet the development of specific responses to these needs has only recently been given priority. The 1991 report of the Chief Medical Officer dedicated a chapter to the health of black and ethnic minority groups, but this seems only to have appeared as an issue of special concern to Government in the most recent White Paper of 1997, "The New NHS: Modern, Dependable" .

In a broader sense health is also a product of global trends from pre-industrial society to urbanisation and industrialisation and now post-industrial society, with only 23% of UK workers engaged in manufacturing. The history of Public Health in this country has mirrored these trends. It provides a valuable perspective on the public health needs of the Newly Industrialised Countries and the legacy of health and environmental issues facing the former socialist republics of Eastern Europe. The WHO Healthy Cities Project shows how lessons can be shared across European cities facing similar public health issues. There are also lessons for cities in low income and newly industrialised countries.

For the UK it may be time to look towards models of social and community support required for post-industrial society. In particular there may be important lessons to be learnt from trends in regions such as southern Scandinavia, the Netherlands, Switzerland and parts of the US where community, career and family structures are changing, giving rise to new social and health needs. One such need has arisen from increased drug abuse. This may also be seen as a reflection of the global scale of criminal trade and a failure to find an effective response to it. The scale of drug taking suggests that in many societies "youth culture" and its manipulators are more influential than traditional family and community authority in respect of such

behaviour. A study of 15-26 year old, UK school children in 1996 showed over 40% claimed to have tried drugs, mostly cannabis. As family support breaks down, with more single parent families and older people living alone new methods of support become essential. For example in the Netherlands one in five people belong to a group associated with the National Patient Consumer Association. The development of NHS Direct that is most heavily used by mothers seeking advice about their children's health is another important response to these changes.

The spread of aids illustrates the link between health and global trends in lifestyle and economics, not only with respect to sexual behaviour and the use of condoms but also in relation to urbanisation. In Sub Saharan Africa AIDS is leading to overall reductions in life expectancy in several countries. Because it has a disproportionate impact on urban communities, it is reducing the productive life of some of the most educated people and those most important to the cash economy. Poor health in the poorest of countries initiates a cycle of economic and social collapse. Merely providing relief on debt repayments is not going to resolve this.

The dominance of "western-culture" and the English language in medicine has been noted in a previous paper. One of the issues that this raises is that when technology fails to provide an affordable solution, as in the case of AIDS, the undeimining of local cultures may have cut away traditional forms of social support. This has lead to calls for a reappraisal of the value of traditional healers and methods. The problem is how to support the "positive" aspects of such traditions while avoiding "negative" features, such as female genital mutilation. (At this point it seems impossible to avoid making value judgements).

The global rise of fundamentalist religions and other extreme cults can be seen partly as a response to the hegemony of western culture and the steadily increase in disparity between the rich and powerful and the poor and powerless of the world. While rich nations increased income per capita by about 2.2% per year from 1975 to 1990, income per capita fell at about 1% per annum in_Sub-Saharan Africa and the Middle Eastern Crescent. Extremist groups together with the odd psychopath, whether leading a country, an army of the aggrieved or fanaticising alone, seem to represent one of the main security threats to this country. With the availability of the information from the internet and the materials required to develop them biological and chemical weapons are now seen pose a very significant threat. The BMA has called for international action to outlaw such weapons. President Clinton recently proposed to double the budget to $2.8 billion to prepare for terrorist acts by creating preparedness offices in 120 cities and for research into vaccines. Since the UK is perhaps second in line as a target for terrorist attack it may be relevant to ask what action might be required here.

Global Health and Environment Risks

The Chief Medical Officer's Report of 1997 dedicates a chapter to environment and health. It deals, amongst other things, with global warming, environmental chemicals, genetically modified organisms and the possible link between oestrogenic chemicals in food and the fall in human sperm counts. Actions have been set in hand to reduce UK's contribution to the increase in global warming and to prepare for its consequences (e.g. the HEC has funded a "Sun Know How" campaign). The DH is to set up a research programme into the effects of chemicals in the environment. Following a national conference a public consultation exercise has been set in hand which may lead to some modification of the regulatory mechanism in relation to genetically modified foods. The link between oestrogenic chemicals and falls in sperm count is under continued study involving the DETR, DH, MAFF, HSE, the Environment Agency, and MRC. OECD and the European Chemicals Industry Council are also involved.

While it may be reassuring to know that so many agencies are involved in research and regulation activities it is also apparent that such issues are longstanding and global. For example, concern over the impact of oestrogens was expressed some forty years ago when it was observed in Holland that cows were aborting as a result of eating grass fed by the seepage from cesspits used by women with early versions of the birth control pill. As cattle are important to the Dutch, economy regulations were passed to control the use of cesspits. While studies of the fall in human sperm count are not conclusive and as yet show no proven link with human fertility it is possible that a threshold will be reached which could have a profound impact on human reproduction.

Concerns about the possibility of damage to the ozone layer and global warming were expressed for many years before it was seen to be a man made phenomenon and to have very serious consequences. Even then national interests, particularly those of the USA, have held back international action. Since the Rio Earth Summit of 1992 this issue has gamed greater prominence and some countries have taken action to promote sustainable local development under the "Local Action 21" programme. A European conference on the environment and health, held in Helsinki in 1994 agreed that each country would prepare their own national environmental action plans. The UK's action plan was first published in 1996. The 1997 Kyoto Treaty on climate control requires ratification by 55 countries but so far less than 10 (including the UK) have done so.

Convention in science seems to demand clear proof of significant damage to the environment and a demonstration of cause and effect, before action can be mobilised. Yet the risk to global health of environmental damage may be so great that by the time damage is detected and cause proved it may be too late to prevent millions of deaths (as in the case of global warming) or worse. The concept of Gaia " an entity comprising the whole planet and with a powerful capacity to regulate the climate," while bringing some elements of mysticism, it at least suggests more humility with respect to the environment of which humans are part.

Bio-diversity is an environmental resource for health that is increasingly valued by pharmaceutical companies, who are now able to analyse, understand and test the efficacy of chemical entities derived from plants, and other living organisms much faster than has been possible in the past. This is partly due to the greater understanding of genetic structures and their relationship to disease. And partly a consequence of developments in combinatorial chemistry and the speed and efficacy of automated laboratory equipment enabling screening of chemical entities to be carried out very much faster. At the same time bio- diversity is being lost. Species and eco-systems such as the coral reefs and rain forests are being destroyed by the global spread of tourism and the increase it brings in fishing and hunting and pollution. While there are many reasons for preserving animals and eco systems the impact on health is also an important factor which is not yet given prominence in the public understanding of such issues. One important recent step has been that one pharmaceutical company has made a payment to the country where a new agent was discovered, Madagascar. This is important in recognising the intellectual property rights of a low income country in which a drug discovery is made.

The recent discovery of the link between the HTV-1 virus strain and the Pan troglodytes troglodytes chimpanzee provides a vivid illustration of these issues. It is now believed that the HTV-1 virus probably passed from chimpanzee to humans as a result of commercial hunting for meat in West Africa. This was the product of increased demand arising from logging activities attracted by the hardwoods of the rain forest and the European demand for these woods. Now this species of chimpanzee, which shares 98% of its genetic make up with

humans has been hunted to the edge of extinction. Yet the Pan troglodytes troglodytes has developed an immunity to HTV-1 and may hold the key to the development of human vaccines.

The possible risks to health arising from current and potential environmental damage, coupled with the loss of potential health resources suggests that as yet national and international mechanisms to support research and regulation in this field are inadequate. The US Environmental Protection Agency published a broad calculation of the possible increase in deaths in one city Atlanta. While overall temperature rises of about 5 degrees may occur, their estimate was based on a rise of only 2 degrees. It suggested increased deaths of between 20 and 170 per year from the effects of heat and unknown numbers from the return of tropical diseases. It points out that the lower estimate of deaths could be achieved by moving those at greatest risk to air-conditioned rooms. Such options are unlikely to be available to many people living in low-income countries. A more thoroughgoing global assessment of the risk from all health and environmental changes would be a useful starting point.

Technology and Knowledge

Marshal McLuhan described the Global Village created by radio and television; the internet now allows the villagers to chat to one another across their walls. Health is the second most common use of the internet, most frequently by patients seeking information relevant to their condition. They will find plenty of sites, enter a term like "cancer" in a web search engine, which typically search 10% of the web and some 750,000 world wide sites will register . Some information will be useful, some may be misleading or even dangerous. A study to examine 41 sites claiming to provide guidance on treating child fever showed that all but a few contained errors and omissions. For this reason several countries including Canada, USA and now UK are attempting to provide a form of quality "kite-marking" for approved sites. While many villages and local health dispensaries in developing countries lack electricity or telephone connection it is possible that internet based advice services may play an increasing role in local health services.

Health provision is a knowledge-based industry, doctors in this country spend almost as long dealing with information (25% of their time) as they do in contact with patients. IBM forecast that health would be the major market for information technology suppliers in the next ten years. Many countries are now seeing a rapid increase in expenditure on health information systems. In the UK the information strategy for the NHS that has recently been updated provides strategic direction and a framework of standards and definitions. However, success in implementing such a strategy depends upon the market.

Herein lies the problem, most Health Authorities and Trusts have lacked skills in implementing and using health information and health information suppliers have often found the UK too small a market and too difficult to work with. The market for health informatics is dominated by the USA. It represents over 65% of the world market, but has many fundamental differences from European, social welfare health systems. The solution may lie in a greater emphasis upon European standards in health informatics and the development of a European market. European approaches and standards have been developed through a series of European Advanced Informatics in Medicine Programmes (EUROAIM).

The development of information and systems standards for health is very relevant to poor countries and to the former socialist states of Eastern Europe. In many cases they have been encouraged to invest in information systems to control health cost and provision. At present health information suppliers will often offer tailored versions of systems developed for the US

market. A global approach to the specification of systems suitable for low- income countries may help.

Doctors are increasingly using evidence based medicine. Knowledge based systems are now available in many areas of medicine and a European sponsored research programme is seeking to develop appropriate standards and guidelines. Some of the early lessons suggested by this project are: that it is vital to ensure that information on actions and outcomes is well managed by those contributing to evidence based studies, that information on the quality of outcomes will inevitably reflect local values, expectations and culture and that evidence based systems have to meet acceptable technical standards i.e. they must work.

The WHO surveillance networks are intended to capture information on the outbreak of diseases and conditions, that pose a threat to global health. They build on the strength of the USA Centers for Disease Control and Prevention, the UK Public Health Laboratory Service, the US Department of Defense Global Infections System and centres in 191 countries. Existing surveillance networks such as Sentinel and the influenza network referred to in a previous paper are linked by a network of networks established by WHO. The EC-USA, and USA Japan collaborations andG-7/G-8countries all support these steps. There is a feeling of real urgency on this issue. In 1997 outbreaks detected included; Elboa haemorrhagic fever, Monkeypox, resistant tuberculosis, Meningitis, Myocarditis, Rift Valley fever, dengue fever and avian influenza. The WHO also provides an internet based notification system. The Emerging Medical Conditions Division of the WHO is also setting up a system to monitor antimicrobial resistance

However such systems can only work if there is an effective local health system, including hospitals, specialists and laboratories, some of the elements that may be considered of low priority by health funding agencies. In some of the poorest low-income countries health systems are very close to collapse as a result of under-funding, overwhelming demand and corruption. This reinforces ^he need to consider the support for health in such countries as not only an issue of humanitarian aid but also of economic and global significance.

Table 1 Policy Issues: Summary

Political and Institutional Context

Providing and sharing knowledge for development in health and care.
UK engagement at EU level and with other international agencies
EU health focus
Roles and co-ordination of CE, EU, OECD, WHO, WTO
UK statement of aims for global health
Clarity of leadership and responsibilities for global health

Economic Trade and Aid

Response to disease management
Multi tier pricing, parallel imports and patents
Orphan drug policy
Regulation, pricing and global health
Control of hazardous imports and exports

Trade barriers for low income countries
Public private partnerships in global health
Health policy research and training for low income countries
Health and environmental impact assessment

Cultural and Social Factors

Traveller health support and controls
Recognising ethnic community health needs
Support for Healthy Cities projects
Responding to post industrial society health needs
Support for failing health systems
Building on positive aspects of traditional healers
Response to biological and chemical threat

Global Health and Environmental Risks

Recognising global risks
Respecting the environment
Valuing bio-diversity
Increasing public awareness
Global risk assessment

Technology and Knowledge

Information quality on the World Wide Web
Focus on European standards for health informatics
Developing information systems for low income countries
European and world standards for evidence based systems
Support for surveillance systems, and
For the health systems of low-income countries on which they depend.

Next Steps

This is the first step in a review that is intended to culminate in a conference in January 2000. It is therefore very important to agree its direction at this stage. It is, however, too soon to attempt to draw specific conclusions. It may be sufficient simply to agree that global health is a vital issue worthy of further consideration by the seminar group. It is hoped that the seminar group to wish to continue to work together to develop recommendations.

The task of this paper is to review and select from the many policy issues raised by global health trends, as shown at Table 1, those on which this work programme should focus its efforts. It may first be helpful to ask some basic questions:-

- Are there errors or omissions to be corrected?
- Are the analytical frameworks and approach to policy issues helpful?
- Is the perspective of the review appropriate?

Second it may be relevant to consider the angle of attack to be taken:-

- Are some issues simply too vague or general to be helpful?
- Are some of these issues already well covered by existing actions? and
- Conversely are there areas where the range and freedom of the group provide a particular advantage in raising policy issues, for example, taking a broad look at how all the different aspects of global health can be addressed?

Third it may be appropriate to try to identify the particular interests and strengths of the UK in this field, including:-

- UK's multi ethnic society.
- UK's dependence on trade, travel and tourism.
- UK's links with Commonwealth countries.
- UK's strength in public health.
- UK's strength of research in universities and pharmaceutical companies.
- The cost effectiveness of the NHS and the strength of primary care.

Finally, if a list of relevant issues can be confirmed it may be helpful to ask:-

- What should be the headings under which policy options are reviewed?
- What further background information, facts and figures would be helpful?
- Are there any specific case studies or examples of good practice or problems that it would be helpful to review ?
- Who should be involved and consulted during the review?

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AN OVERVIEW OF GLOBAL HEALTH AND ENVIRONMENTAL RISKS

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Introduction

As a contribution to understanding the potential implications of globalisation for health in the UK, this background paper provides an overview of current and anticipated global health and environmental risks. The paper begins by defining a global risk in the context of present discussions about the nature of globalisation. The concept of risk[1] is a complex one that has been analysed within an extensive and muhidisciplinary literature. The focus here is on how existing concepts of risk might be adapted to take account of the global dimensions of health. Global health and environmental risks are then described in terms of current and, as far as existing data allows, projected major burdens of disease, and in relation to changes in the natural and social environments. The paper concludes with a brief discussion of a potential agenda for action on global health and environmental risks by the UK.

What is a Global health and Environmental Risk?

While the term "global health" has become widely used in scholarly and policy circles, it is important to separate familiar health issues (and the risks associated with them) relabelled as global, from those that are distinct and new in nature. As well as the concept of global, it is necessary to briefly explore how risks may be changing as a consequence of globalising forces. The full development of a concept of global health and environmental risk, building on the extensive and multidisciplinary literature in existence, cannot be wholly achieved in this paper. However, for the purpose of better understanding the potential impacts of globalisation on health, it is necessary to explore how the definition; measurement and experience of risk may be changing as a consequence of globalising processes. Hence, it is possible to extend some of the existing thinking about health risks to global health issues. At the same time, however, we may need to consider new ways of thinking about risk which reflect the particular nature and impacts of globalisation.

First, a health issue may be considered global in that it occurs, or has the potential to occur, in populations located geographically throughout the world. For example, accidents and injuries, reproductive health, and pandemic diseases such as influenza can be described as global. In contrast, non-geographicalry global health issues occur in the populations of selected countries or regions, and can be confined so. So-called "tropical diseases" (e.g. schistosomiasis, onchocerciasis), for example, presently occur only in warmer regions of the world with the exception of imported cases.

Importantly, globalisation may be contributing to changing spatial patterns of risk so that health issues not currently global may become so in future. Global climate change, for instance, is expected to lead to a wider geographical distribution of diseases such as malaria, yellow fever and dengue haemorraghic fever as global temperatures rise (McMichael and Haines 1997). Communicable diseases such as HTV/AIDS, tuberculosis and many foodborne diseases may also become more geographically widespread as a

[1]In everyday usage, the concept of risk can be defined as "the possibility of incurring misfortune or loss; hazard" *(Collins English Dictionary* 1979). Risk, in this sense, is distinct from the concept of chance, and implies that the risk event is necessarily negative. In this paper, the possibility for globalisation to lead to positive impacts however is not excluded from the analysis.

result of changes in human behaviour, (e.g. sexual behaviour, urbanisation, global food production). Biological change in infective agents (e.g. influenza, multidrug resistant tuberculosis, *vibrio cholerae* Bengal 0139), again generally related to changes in human activity, also contributes to a greater risk of geographical globalisation. Furthermore, non-communicable diseases such as coronary heart disease, asthma, diabetes and certain types of cancers may occur more widely as more societies adopt "western" diets and lifestyles. More positively, globalisation may lead to the wider dissemination and application of health knowledge and techniques that would also change the occurrence of certain conditions of ill-health. Immunisation programmes for polio and other childhood diseases, for example, have reduced substantially and, in some cases eradicated, their worldwide occurrence. In short, a health issue can be described as global if it presently occurs, or has the potential to occur, in populations located geographically throughout the world. Health issues that are not so widespread may be described as local or regional.

A second possible characteristic of a global health risk is that it has the capacity to affect relatively large populations rather than single individuals. The health consequences of genetic predisposition, substance abuse or dietary habits are, at least in the short term, incurred by individuals. A global health risk, however, creates externalities whereby the risk can be transferred to others. Global environmental changes, for example, have major implications for human health in terms of food production, air quality and water supplies (Epstein 1995; McMichael et al. 1999). The emergence of antimicrobial resistance, as a result of irresponsible use of medicines in many parts of the world, represents a subsequent risk to the global population. The importance of an immunisation programme is the public externalities that can reduce the risk of a disease for the entire community, as well as the vaccinated individual. Again, timeframe is an important factor. In the shorter term, patterns of diet and lifestyle can be associated with individuals and comparatively small population groups. However, globalisation may be contributing to worldwide changes in diet, lifestyle and food production that could lead to new global patterns of obesity and its associated diseases. This impact on relatively.large populations requires, as McMichael et al. (1999) argue, a population-level, rather than an individually-centred perspective, on global health. Indeed, it is the collective nature of the risks and consequences of global health issues that make it of central importance to the field of public health.

A third feature of a global health and environmental risk is the current inequality of risk creation and distribution resulting in an increased vulnerability of certain individuals and groups, or the creation of new patterns of vulnerability. One of the main criticisms of present forms of globalisation is that it is reinforcing, and even exacerbating, inequalities in wealth, living standards, environmental conditions, access to basic needs and life opportunities within and across countries (Martin and Schumann 1996). Inequalities in health have received increased attention in recent years amidst recognition that there is a "widening gap" in life expectancy, access to basic health care, safe water and sanitation, infant mortality rates and other health status indicators (WHO 1995). Political and socioeconomic changes being created by current neoliberal forms of globalisation can be linked to the deteriorating health status of certain population groups (UNFPA 1998a). Furthermore, the "winners" of globalisation are creating a greater proportion of risks, through inequalities of resource consumption and environmental impact, which are in turn unequally shared.

Yet, while current risks are being born more heavily by the poor and marginalised, the externalities created by such risks (as described above) means the potential spread of such risks to a wider population. As WHO (1995:v) warns, "The challenge is to prevent the world heading towards a health catastrophe in which many of the great achievements in health of recent decades will be

thrown into reverse". This wider distribution of risk can be related to the epidemiological distinction between so-called "democratic" (e.g. influenza) and "undemocratic" diseases (e.g. cholera). A global disease can be seen as more democratic in that traditional boundaries of social class or geographical location do not exempt one from risk. The rapid growth in interest in recent years in emerging and reemerging infectious diseases, for example, lies in the recognised risk of hitherto "exotic" or relatively confined diseases (e.g. Ebola, multidrug resistant tuberculosis) spreading to a wider population. The dangers of antimicrobial resistance lies in the vulnerability of any infected individual if not prevented from developing and spreading more widely. The potential for a global health risk has the potential to be "democratic" should thus make inequalities in initial vulnerability a concern to all.

Fourth, an important feature of some global health and environmental risks is the blurring of the creation of risk (cause) and its immediate experience (effect) across time and space. Globalisation is characterised by the capacity of certain actions to have consequences far away from their source. For example, toxic waste dumping by Taiwanese companies of mercury-contaminated bags in Cambodia has created health risks for the local population, but little immediate risk for the companies themselves. Alternatively, risks may be experienced by their creators, but also spread far and wide beyond their source. The Chernobyl nuclear accident, for instance, has represented far-reaching risks over many years that are continuing to be studied closely. Similarly, actions taken in one point in time, such as the use of genetically-modified crops, can create widespread and even unknown risks in the distant future. The longer-term effects of global climate change, and uncertainty of many associated factors contributing to actual impact, lends greater complexity to understanding the risks being created (Jamieson 1997). It is important to recognise the blurred nature of individual risk behaviour, and the creation of structural risks that have collective consequences, as a result of globalisation. Indeed, as Hart (1999:7) writes, as we move as a consequence of globalisation to "a more complex modernity, or 'risk society'... consideration has to be given to the distribution of risks - a move from class position to risk position." This raises key issues about rights and responsibilities regarding the creation and experience of global health risks.

Finally, a global health and environmental risk can be defined as one whose implications require the involvement of a wide range of stakeholders to effectively address it. The history of international health cooperation has been largely characterised by a focus on biomedical science and statecentric approaches. Given greater recognition of the complexity of cause and effects associated with global health issues, and the wide distribution of risks among individuals and populations, effective policy responses need to be initiated at different levels (e.g. local, national, regional, global) and involve different sectors (e.g. health, trade, agriculture, environment).

Key Global Health and Environmental Risks

This section identifies some of the key risks that might be associated with globalisation. This task is hindered foremost by existing data sources. Data on the health status of populations within and across countries is notoriously fragmented over place and time. Mortality data remains imprecise and incomplete for many parts of the world, while data on non-fatal outcomes of disease and injury are even weaker. This has made knowledge of worldwide patterns of health and disease largely unavailable. The most concerted effort to address this information gap has been development of the concept of global burden of disease. The measure is different in that it seeks to capture the impact of both premature death and disability within a single measure, and to achieve this systematically across all countries (Murray and Lopez 1996: 6). While drawing on this useful work, this paper also acknowledges the limitations and continuing debate surrounding its methods and underlying assumptions.

Apart from disease-focused data, global health and environmental risks arise from the natural and social environments being created or changed by globalisation. Recognising the importance of these risks, apart from measuring their degree of importance, is only beginning to be explored. The discussion below draws on the limited empirical data that is currently available.

The globalisation of the burden of disease and disability

There are many factors that influence the vulnerability of individuals and populations to disease. Understanding the potential impact of globalisation has been assisted by improved data on the global burden of disease and disability carried out since the early 1990s under the auspices of the World Bank. Among the substantial analysis carried out over the past decade, a fuller picture of patterns and trends is being built up that indicate "dramatic changes in the health needs of the world's populations" over the next two decades (Murray and Lopez 1996:1). Overall, the data suggests a health (epidemiological) transition characterised foremost by a shift, in lower-income countries, from communicable to noncommunicable diseases, a shift that has already largely occurred in higher-income countries. By 2020, noncommunicable diseases are expected to account for 70% of deaths in the developing world, compared with less than 50% today. Similarly, communicable diseases are expected to become relatively less important. More specifically, calculations of disability adjusted life years (DALYs) provides a useful picture of disease and disability burdens across all the world's geographical regions (Murray and Lopez 1996:261).

This initial step in developing more comprehensive and comparable data of disease patterns geographically across all countries suggests that populations in different parts of the world might be sharing certain risk factors. A next step might be to disaggregate this data further in order to identify subnational and transnational patterns of disease and disability, and whether they can be linked to the process of globalisation. For example, Beaglehole and Bonita (1997) write that there are three main types of factors behind the health transition: health determinants, demographic and therapeutic. Research to explore how each is being affected by globalisation could be pursued.

At the same time, a fuller understanding of the extent to which we are facing a globalisation of disease and disability, or where unequal risk patterns are being created, need more detailed analysis within and across specific populations. The limited disaggregated national data that is available shows persistent and widening inequalities in health status indicators in both richer and poorer countries (Wilkinson 1996). Emphasis on the health transition should not lead us to neglect priorities of the immediate future and, in particular, the prospect that many low-income countries will carry a "double burden" of both communicable and noncommunicable diseases for some time to come. Of the 50 million deaths worldwide each year, 78% (39 million) occur in the developing world. Forty percent of those deaths are due to communicable diseases and 25% to noncommunicable diseases (Beaglehole and Bonita 1997:16-18). An estimated 1.3 billion DALYs were lost in 1990 or 259 per 1000 population, with premature death represents a higher proportion of the burden of disease in poorer countries than rich. One-quarter of the global burden of disease is due to preventable or readily curable diseases such as measles, respiratory infections, worm infections and malaria.

Examining emerging global patterns of disease in more detail, the possible globalisation of risks from communicable disease has perhaps been the most readily discussed in recent years. Today communicable diseases remain the world's leading cause of premature death, killing at least 17 million annually including 9 million young children. About half of the world's 5.7 billion people are at risk of many endemic diseases (WHO 1996:1). Global epidemics (pandemics) are not, of course, exclusive to the late twentieth century although they are rarer than sometimes assumed. Indeed, there have been relatively few true pandemic diseases in human history defined by disease

incidence worldwide. Influenza is one example. Eleven pandemics have been recorded since 1720 (Palmer et al. 1999), the most lethal in 1918-19, the so-called "Spanish flu", which killed 100 million (1% of the world's population) (Oxford & Daniels 1999). Genetic mutation of the influenza virus makes it a continuous global threat, particularly if a new pandemic strain emerges and spreads globally. Other epidemic diseases have gradually spread over centuries (e.g. tuberculosis, syphilis, cholera) or decades (e.g. HTV/AIDS, Hepatitis B) to other parts of the world to become global in geographical incidence.

Of future concern is how globalisation may be leading to formerly regional and periodic epidemics becoming global pandemics. Changing patterns of communicable diseases suggests that certain risk factors have emerged as part of the globalising process. The increased incidence of tuberculosis in certain populations (e.g. HTV/AIDS infected, impoverished, immigrant communities) in richer countries, as well as continuing to be a major burden in many poorer countries, is an example of a familiar disease once thought defeated by public health efforts. The spread of HTV/AIDS and cholera in recent decades offers evidence that particular features of globalisation have contributed to the epidemiological patterns of the diseases. Similar observations have been made for dengue haemorraghic fever (DHF) which, during the eighteenth and nineteenth centuries, occurred in intermittent epidemics affecting Asia and the Americas. Troop movements during and after the Second World War led to multiple dengue serotypes being transported worldwide, with dissemination of the virus and vector facilitated by rapid population growth and urbanisation in the postwar period. As a result, the incidence of DHF increased from 30 000 in the 1950s and 1960s, to 250 000 annually in the 1970s and 1980s.. Similar fears have been expressed regarding many foodborne diseases (e.g. salmonella, listeria, cyclosporiasis and Escherichia coli) as a consequence of global patterns of food production and trade.

Table 1: Selected communicable diseases posing a global health and environmental risk

COMMUNICABLE DISEASE	SELECTED DATA
Tuberculosis	• One-third of world's population carries bacilli • Kills 3 million people annually • DOTs cost US$3-5 per healthy year of life and prevents drug resistance which costs up to 100 times more to treat
HIV/AIDS	• Infected up to 24 million adults of whom at least 4 million have died
Viral hepatitis	• At least 350 million people are chronic carriers of hepatitis B and 100 million of hepatitis C • At least one-quarter will die of related liver disease
Malaria	• Affects up to 500 million people annually • Kills 2 million people annually

Sources: WHO (1996); WHO (1998).

There are also fears that globalising forces may be contributing to changes in the nature of the infectious agents of communicable diseases resulting in new diseases. This threat has received substantial attention in recent years (WHO 1996:8). Of the numerous new diseases that have emerged in the past two decades, a few (e.g. HIV/AIDS, hepatitis B) already pose a global risk, while many others have the potential to become global risks (e.g. multidrug resistant TB, nvCJD).

Similar concerns are related to the capacity to prevent and treat communicable diseases in future in the face of widespread antimicrobial and antibacterial resistance. With 75% of antibiotic use (in humans and animals) of questionable therapeutic value, and widespread use of antimicrobials in agriculture and horticulture, there are fears that resistant strains of bacteria such as *Staphylococcus aureus,* will evolve and spread globally with serious impacts on morbidity and mortality (O'Brien 1997). The world market for antibiotics in 1997 was US$17 billion of which US$12 billion was for community use (Carbon and Bax 1998). The current weakness of surveillance systems worldwide means an unclear picture of the geographical extent and intensity of resistance (Williams and Ryan 1998) but reported cases in different parts of the world support concerns that the nature of the problem cannot be restricted within national boundaries.

Global risks from non-communicable diseases have received less attention perhaps because they do not create public health externalities in the same way as communicable diseases. However, linkages to globalising forces and the population-level risks created by them, are beginning to be recognized. Non-communicable diseases account for about 25% of all deaths in poorer countries and 50% from richer countries. These figures are expected to increase as populations age (see below). Global trends in lifestyle (i.e. increased consumption of fats and alcohol, obesity, tobacco use and sedentariness) also raise concerns that the future global burden of disease will shift towards non-communicable diseases.

Table 2: Selected noncommunicable diseases posing a global health and environmental risk

NON-COMMUNICABLE DISEASE	SELECTED DATA
Cardiovascular diseases	• Accounts for major proportion of adult deaths in richer and poorer countries • Kills over 13 million annually
Diabetes mellitus	• Affected adult populations worldwide predicted to increase by 122% (135 to 300 million) between 1995-2025 • Ranked as 14th most important cause of global burden of disease • Attributed with 1.3 million total number of deaths in 1990
Violence and injuries	• Rapidly overtaking infectious diseases as principal cause of morbidity and premature mortality worldwide • Number one cause of premature death among young people
Cancers (notably stomach, lung and liver)	• The global nature of the tobacco industry (worth US$400 billion), and patterns of tobacco-related diseases, are expected to account for a greater burden of disease by 2020 than any communicable disease including HTV/AIDS. • Tobacco accounts for up to 90% of lung cancers • Currently over 1 billion smokers, half of whom will die from the habit; kills 3.5 million people annually and projected to kill 10 million annually by 2030

Sources: WHO (1999); Beaglehole and Bonita (1997); and Nissinen (1994).

Overall, the global burden of disease and disability remains an unclear one due largely to the paucity of disaggregated and comparative data. Nonetheless, there is evidence of communicable and non-communicable diseases posing global risks or likely to become global risks in future.

Global health and environmental risk: The changing natural environment[2]

The global health and environmental risks associated with changes to the natural environment (i.e. air, water, soil and food) are truly global, in the sense that, they reach across territorial boundaries and can affect the well-being of populations throughout the world. In broad terms, there is substantial evidence from the environmental field that the ecological and biophysical systems that sustain life on earth are being degraded at an accelerating rate. The process of globalisation, in its present forms, is contributing to this degradation by encouraging human activity and lifestyles that are environmentally unsustainable. Some of the changes to the natural environment that are expected to influence health risks are:

- Global temperature will increase between 1 and 3.5 degrees celcius in the next century (McMichael 1993).
- Humans have destroyed more than 30% of the natural world since 1970. Populations of freshwater animal and plant species have halved, and natural forests have declined by 10% during this period (WWF 1998).
- The world's population has quadrupled this century and human consumption rates have doubled over the last 25 years, mainly in the industrialised world (WWF 1998).
- Between 200-400 major chemicals are estimated to contaminate the world's rivers. About 450 cubic kilometres of waste water are discharged into rivers, streams and lakes annually, with an additional 6000 cubic kilometres of clean water used to dilute pollutants. The latter is equivalent to two-thirds of the world's total annual useable fresh water runoff (Population Reports 1998).

The global health and environmental risks arising from the above types of changes include:

- increased geographical spread of certain communicable diseases (e.g. malaria, DHF) due to global warming;
- emergence of new diseases or strains of diseases (e.g. *vibrio cholerae* Bengal 0139, influenza) with widespread vulnerability of populations;
- increased respiratory ailments, skin cancers and cataracts due to ozone depletion and air pollution especially in urban areas;
- increased diseases from lack of safe drinking water (currently 2.3 billion people in the world suffer from diseases linked to water) (Population Reports 1998);
- nutrition-related ailments, especially for poor and vulnerable populations, from changing patterns of food production, population displacement and rising sea levels due to global warming, unstable weather patterns etc.

Overall, the global risks from changes to the natural environment are likely to be profound, widespread, long-term and, in large part, irreversible. For this reason, detailed risk analysis and concerted efforts at risk prevention will be especially urgent in this context.

[2]This broad distinction between the social and natural environment is taken from the work of Professor A.J. McMichael.

Global health and environmental risk: The changing social environment

Global risks are also arising as a result of changing social environments. Indeed, globalisation can be seen as influencing the broadest social context for health and ill-health of human populations. The key question is how are human societies changing as a result of globalisation and what health and environmental risks are being affected by this process?

The first set of global changes occurring in the social environment are demographic in nature. Population studies is a vast area of research but a crude summary of global trends indicates an overall decline in fertility rates worldwide (with exceptions in some countries/regions), continued growth in world population and a changing age distribution towards aging populations. The world's population is expected to grow by 80 million annually and reach 8-10 billion by 2050, with 90% of this growth occurring in the developing world (UNFPA 1998a). Two specific features of global demographic change that are expected to affect health risks are: (a) urbanisation; and (c) the global migration of populations.

Urbanisation can be defined as "a relative increase in the urban population as a proportion of the total population" (Harpham & Reichenheim 1994). By 2030 it is expected that urban populations will be twice the size of rural populations. In the developing world, cities are predicted to grow by 160%. This rapid rate of urbanisation will lead to the growth of megacities - 21 cities by 2000 over 10 million inhabitants, 17 in lower-income countries. The key feature of this trend for health will be a growth in urban poor that UNDP (1990) predicts "will become the most significant and politically explosive problem in the next century". With overcrowded housing and inadequate basic services such as health care, clean water and sanitation, there is likely to be an increase in health risks from infectious diseases, chronic diseases, cancers, traumas and injuries and mental health problems. For example, an estimated 3 billion people lack a sanitary toilet and over 1.2 billion lack safe drinking water. From a global perspective, externalities from these health risks might include degradation of the natural environment, political instability, antibiotic resistance and the spread of communicable diseases to a wider population. During the fourteenth century, when plague raged through European cities, the middle and upper classes were able to flee into rural areas. In a globalised world, there will be far fewer places to escape such health risks.

The increased global mobility of populations is a second demographic feature of globalisation and is expected to continue to intensify. The greater and more frequent intercontinental movement of people is reflected in the following data:

- Since the 1970s the annual number of refugees has increased from 2-3 million to 10-15 million. In 1993 20 million people were officially identified as refugees living in countries other than their birthplace.
- Approximately 120 million people live outside the country of their birth (WHO 1996:4).
- Two million people cross national borders dairy (Palmer 1999:5).
- 100 million people cross national borders by airplane each year. There are approximately 5000 airports with scheduled worldwide services, and air travel has increased by almost 7% annually in the past twenty years. This is predicted to increase by 5% annually over the next 20 years (WHO 1996:3).
- Since the 1960s mass travel has been growing at a faster rate (7.5-10% annually) than world population (1.5-2.5% annually) (Habib and Behrens 1999).

- Tourism is one of the world's fastest growing industries, generating an estimated US$423 billion in revenues annually and 10.7% of the global labour force. It is expected to increase to US$6.3 trillion by 2007 when it will account for 11% of the global economy (UNRISD 1998).
- UK residents made 29 million visits abroad in 1990 (Porter et al. 1996).

An increasingly mobile human population can bring with it greater sharing of knowledge, technology, experiences and awareness, as well as changing identities and interests, all of which can benefit global health. At the same time, there is growing evidence that greater mobility also brings the transport of disease agents, vectors, cultural practices and other means by which global health can be adversely affected (Porter et al. 1996; Lee and Dodgson 1999). The health risks arising from increased global mobility are multiple and are described in greater detail elsewhere in this series (Habib and Behrens 1999).

A second set of global changes is a trend towards greater social, political and economic instability in many parts of the world as a consequence of globalisation. The causes of increased instability are complex but can be summarised by political and economic changes following the end of the Cold War, the trend towards a neoliberal global economy, increased social inequalities within and across countries, and the renewal of historical conflicts (e.g. Yugoslavia). There has been limited research so far analysing the health impacts of global instability. A study by UNFPA (1998b) examines the impact of the financial crisis (i.e. slowed economic growth, growth in short-term external debt, overvalued exchange rates, outflows of speculative capital) on the social sectors of four Southeast Asian countries. The study found cuts to social sector budgets including health and population services, greater employment instability and increased poverty. Similarly, McKee et al. (1999) has found significant increases in communicable diseases (e.g. syphilis, HTV/AIDS), violence and injuries, cardiovascular diseases, and a 1/6 decline in life expectancy in the former Soviet Union since its breakup in 1991. Sanders (1999) writes that the introduction of Economic Structural Adjustment Programmes (ESAP) in southern Africa by the World Bank as a global policy initiative has had profoundly adverse effects on levels of poverty and health status indicators.

More indirectly, but posing a broader risk to global health, is the rise of criminal activity amidst increased social, political and economic instability. A good example is the illicit drug industry which has become truly global, in the sense that, its activities, from production to consumption, permeates across state authorities. The transnationalisation of the drug trade has been closely linked to globalisation; for example, the use of the global financial market to launder proceeds. As Stares (1996:5) writes, the world "is becoming increasingly 'borderless[1], in which non governmental or 'transnational' actors play an ever-growing role in shaping the social, political, and economic life of the planet." Accurate data of the scale of the global drug trade, and its specific impact on health, is difficult given the secretive nature of its activities. The OECD estimates that the U.S. and Europe spends about US$122 billion annually on heroin, cocaine and cannabis, with up to 50-70% of proceeds laundered and invested through other enterprises. In comparison, the worldwide market for licit drugs of controlled substances is US$150 million. The risks and costs to health are varied: increased violence and injuries, pressures to engage in commercial sex work and other high risk behaviours (e.g. injecting drug users), health effects of drug use, and the cost of treatment and prevention programmes.

Towards an Agenda of Action by the UK

The multiple and complex health and environmental risks affected by globalisation require action on many fronts to understand and effectively manage them. This paper has only begun to develop

a fuller understanding of the global dimensions of emerging health and environmental risks. From this initial exploration the following actions might be considered:

l.The development of global risk analysis and management

A key task for future research will be to explore how existing methods and data on health and environmental risks can be further developed and extended to take account of the impacts of globalisation .With fuller data on global health and environmental risks, risk management is needed to address the specific nature of these risks. As described above, the distinctiveness of global health risks lies in their geographical breadth, size of populations affected, inequality of .vulnerability, blurring of cause and effects, and need for broad participation in addressing them. Added to these features is the danger of creating widespread and irreversible risks such as the loss of biodiversity or concerns over genetically modified organisms spreading to the wider natural environment.

The UK could make an important contribution to the development of global health risk analysis and management by building on its historical strengths in international health research. Initiatives to support such work could be adopted nationally by the research councils, Department of Health and other bodies, and globally by the European Union, WHO and other international health organisations.

The UK could contribute in the following way:

- Support for the development of measures and analysis of global health and environmental risks and benefits

2.Setting priorities among global health and environmental risks

Adopting a research and policy agenda on global health and environmental risks will require setting clear priorities among the many and diverse issues addressed in this paper. It is apparent that current health research priorities reveal startling inequities, known as the 10/90 Disequilibrium[3] (Global Forum for Health Research 1999).

An initial task will be to draw up a comprehensive list of research and policy priorities concerning health and environmental risks facing the global community. This task would be strongly informed by the data needs described above. A second task might then be to shortlist UK priorities according to agreed criteria that might be:

- Particular capacity of UK institutions to contribute to research or policy development both independently and collaboratively;
- Global health risks that pose a particular threat to the health of the UK population (e.g. global environmental change, food safety);
- Geographical incidence of the global health risk (e.g. aging, cardiovascular disease);
- Absolute size of the population affected globally by the health risk (e.g. malaria, TB, tobacco); or
- Relative urgency of the global health risk (e.g. global environmental degradation, antibiotic resistance);

[3] The 10/90 disequilibrium refers to the fact that 10% of the US$50-60 billion spent worldwide by the public and private sectors on health research annually is devoted to the health problems of 90% of the world's population).

- Long-term or irreversibility of the global health risk (e.g. genetically modified organisms).

A consultative process should be initiated in the UK to begin setting priorities on global health. This process should be broadly participatory, and be held in consultation with non-UK institutions concerned with global health.

3. **Strengthening the capacity of UK and other institutions to assess and address global health risks**

There is growing recognition of the importance of globalisation to health in the UK, but so far limited institutional responses to understand and respond to its potential impacts. The following are potential institutional needs:

- Designation and clarification of institutional responsibility for analysing and responding to global health and environmental risks;
- Review of institutional needs for assessing and addressing global health and environmental risks, and the capacities of UK institutions;
- Improvement of surveillance and reporting systems on global health risks and trends including mapping of UK institutions responsible of global health risks, and development of clear communication between these institutions and regional/global institutions (e.g. EU, WHO);
- Establishment of an early warning and rapid reaction system for communicable disease threats in partnership with regional and global health organisations;
- Review of contingency plans for global health emergencies (e.g. influenza pandemic);
- Review of how devolution in the UK will impact on capacity to recognise and respond to global health risks;
- Review and development of appropriate and clear regulatory mechanisms for issues that pose a global health risk (e.g. genetically modified organisms);
- Explore how effective management of global health risks could be used as a criteria for the receipt of development assistance (e.g. DfiD);
- Clarification of how UK institutions will support and work with emerging mechanisms of global governance for health (e.g. Framework Convention on Tobacco Control, voluntary ethical trading standards); and
- Articulation and representation of public health position in trade negotiations that are relevant to global health issues (e.g. TRIPS, MAI) such as a UK position on issues concerning pollution standards, taxation system (e.g. global insurance fund, Tobin Tax) to compensate for inequalities in global risk.

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GLOBAL ENVIRONMENTAL CHANGE: THE NEED FOR A PRECAUTIONARY APPROACH

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Introduction

We usually think of the environment as a combination of external factors that impinge upon human health, primarily in relation to chemical and microbiological agents. However, we must also recognise that human society is both part of the environment and the cause of some of its greatest health risks. In this paper we examine the categories of health and environmental risk, the impact of globalisation on these risks and health outcomes and the actions which can be taken to recognise and respond to risks.

Categories of Health and Environmental Change

Environmental change can be classified by differentiating between the natural environment and the social environment, between naturally occurring and human made changes and between those that are local and those that are global in their impact.

Natural environmental^ changes include local influences such as extremes of weather, local infectious agents, physical disasters and local micronutrient deficiencies reflecting soil composition. For example almost one-fifth of the world population lives on ancient leached and often mountainous sou's which are deficient in iodine, likewise there are pockets of exposure to selenium deficiency and widespread exposure to arsenic from both soil and water. These have serious human health consequences.

While most such natural environmental risks arise from local phenomena, some are larger in scale, for example natural variations in global weather patterns and El Nino events occurring every 5-7 years. The distinction between natural and human-made is not always clear for example; arsenic poisoning has increased as a result of greater use of deep tube wells made necessary by the faecal contamination of surface waters.

A second and qualitatively different type of external environmental influence on human health can be seen in the disruption, by human activity, of the fundamental systems of the biosphere that ensure: climatic stability, food yields, clean, fresh water, recycling and cleansing of air, water and nutrients. Disruption or depletion of these systems can effect human health over the long term in ways that are not always so apparent as other specific environmental risks. These human-made risks tend to be global in their impact though it is also clear that some areas of the globe will be at greater risk. For example in the US contingency plans have been established in many southern cities to bring people at risk into air-conditioned.

[1] Abridged from the Environment Chapter of the Oxford Textbook of Public Health 1999 and Globalisation and Health: the Environment background paper for WHO Geneva May 1999 by Graham Lister, the Nuffield Trust.

shopping malls in the event of excessive heat waves, such a contingency plan is unlikely to benefit many people in the tropical regions of Africa.

The changing social environment of human kind creates health risks. Family structures and supportive communities are a resource for health, providing skills, knowledge and resources to counter health threats. Where family structures break down, for example, as a result of AIDS this resource is endangered. Our ways of living and working also create health risks such as exposure to toxic substances, stress and depression. On a larger scale urbanisation creates health risks for many reasons, including the potential for rapid transmission of infection, local air and water pollution threats, and the breakdown of stable family and community structures.

Poverty is also a social phenomenon and can be seen as the greatest threat to health. Absolute poverty leads to malnutrition and ill health with no resources available to counter health threats. Even in rich countries relative deprivation is closely associated with poor health and exclusion from the social and economic resources required to maintain health.

These social environmental factors are usually considered to be local in their impact reflecting the political, economic and social structures of a particular nation, but they are also the consequences of international forces such as trading relationships. These in turn are a consequence of geo-political power structures. Thus the human social environment is also a product or failure of global political systems.

Global environmental changes are complex and multidirectional, the social environment creates the conditions for action or inaction~in relation to natural environmental threats and local health risks may become global risks due to travel and growth of trade. The intertwined relationship of environment, population, poverty and health is often described as a vicious cycle. Poor health conditions limit peoples' capacity to produce and earn, poverty makes people vulnerable to exploitation of their labour and environmental resources, poverty and poor heath provision lead to increased family size, which increases poverty and environmental pressures. With such complex relationships it is difficult and probably ill founded to attempt to draw a single causal pathway, for example, to claim that increased incomes will automatically resolve health and environmental problems, we must understand the systemic nature of these links. Logie and Benatar (1997) estimate that the two way relationship between poverty and ill health erodes African economic productivity by at least one sixth.

The Impact of Globalisation on the Environment

Globalisation refers to a set of processes whereby human populations are becoming more connected with one another and human activity is becoming more integrated. It also refers to the shifts in the scale of human processes and impacts. Globalisation is occurring in the economic sphere of trade and investment, in physical mobility and contact, cultural mixing and convergence and information sharing.

The primary influence on health is from economic globalisation, via its impact on both the social and natural environment, as examples:

- The deregulated free market tends to exacerbate income differentials both within and between countries thereby maintaining and perhaps extending absolute poverty for a significant minority of humankind (World Business Council on Sustainable Development 1998). This poverty creates and maintains the conditions for much ill health, particularly malnutrition, infectious diseases, occupational hazards and physical injury.

- Fragmentation and weakening of labour markets as internationally mobile capital acquires greater power relative to labour, results in job insecurity low wages and lowest denominator approach to occupational health and safety and hence health threats to workers and their families.

- Environmental damage is increased by the growth in consumption and the intensification of environmentally damaging economic activities; atmospheric pollution, land degradation, biodiversity depletion, increases in invasive species and dispersal of persistent organic pollutants.

- Consumerism has accompanied and accelerated the growth of trade due to the spread of western cultural values.

- Tourism is also a conduit for disease transmission.

- Climate change illustrates the difficulty of global governance for environmental and health protection.

Globalisation of trade

Advocates of free trade argue that it will eventually bring greater equality and choice as a result of international competition but the evidence of the past 20 years suggests that while global average incomes have increased, the current trade regime exacerbates the disadvantage of the poorest countries. Since 1965 the discrepancy in wealth between the top and bottom quintiles of the world population has increased threefold.

In many African, Asian and Latin American countries average life expectancy is now 20-30 years less than in rich Western countries. Infectious diseases remain the main killers particularly of children under 5. Two thirds of the world's poorest countries are in Africa, trends in the region's health, education and material living standards have reversed in the last two decades from gradual improvement to steady and sometimes catastrophic decline. More than half the population still lacks safe water, 70% lack sanitation. Infant mortality rates are over 50% higher than in the world's other low income countries. Malaria and tuberculosis are widespread and increasing, while in parts of central , southern and eastern Africa one in three pregnant women are HTV positive.

Yet in the name of economic development low income countries have come under pressure to grant unrestricted access to their markets, their resources and their populations to global trade and investment.

They have been urged to subordinate environmental and social welfare programmes to the goal of economic development. Indeed following the international debt crisis of the early 1980s the World Bank and International Monetary Fund "structural adjustment programmes" often entailed reducing spending on health. This resulted in a weakening of public health capacity with long term negative consequences for both health and economic development

Fragmentation of labour markets

The increase of Hepatitis A in the USA as a result of imported strawberries from Mexico illustrates the impact of labour market fragmentation. In negotiating the North American Free Trade Agreement (NAFTA) human welfare and occupational health issues such as the provision of decent wages and toilet facilities for field workers and their enforcement were nMninrised. The subsequent faecal contamination of strawberries is a consequence.

Environmental damage

Economic development has often meant industrialisation with a change in scale from traditional agrarian based societies that consume and trade on a local scale, with relatively simple technologies to intensified production and global trade. This brings with it a much greater threat both to the local environment and health and to the global environment. Moreover since global investment seeks out lowest cost advantages it also creates pressure to reduce the cost of environmental and occupational health controls. For example much of the asbestos producing industry has shifted to countries such as Brazil, India, Pakistan, Indonesia and the Republic of Korea. Even-as high-income countries phase out the use of asbestos consumption of asbestos in Brazil has increased at 7% per annum. The USA Environmental Protection Agency has estimated that the ratio of illegal to legal shiploads of toxic waste sent from rich to poor countries is 8:1.

Consumerism

The spread of dominant western cultural values such as urban consumer lifestyles is also having a deleterious effect on the environment and health. Consider for example the spread of car ownership. In China, starting from a low base car numbers are compounding at 10-15% per annum, contributing to the poor quality of China's air and contributing to global warming.

Tourism and health

In a recent analysis of seven pandemics of cholera since 1817 Lee and Dodgson (1999) argue that the current pandemic is clearly different from earlier pandemics reflecting amongst other things the volume and speed of intercontinental travel.

Climate change

The two best defined "global environmental changes" are the accumulation of heat trapping greenhouse gases in the lower atmosphere and the depletion of stratospheric ozone by the emission of ozone destroying

gases (especially chlorofluorocarbons CFCs). These are both the cumulative results of local emissions that result in global climate change.

It is estimated that greenhouse gas emissions will result in an average increase in world temperature of approximately 1-3° Celsius over the coming century. The overall impact on health is too complex to calculate, it will include the direct effect of deaths from heat stroke, respiratory problems exacerbated by pollution (including photochemical pollutants and spores and moulds) and the physical hazards of storms, floods and droughts. Indirect effects would include the spread of vector borne diseases to former temperate regions (including Malaria, Dengue fever Leishmaniasis, Encephalitis and Lyme disease). Other impacts could include increased transmission of infections (especially food poisoning and water borne diseases) and the impact on nutrition of changes in agricultural production.

The impact of ozone depletion is already being felt, ambient ground levels of ultraviolet irradiation are estimated to have increased by up to 10% over the past two decades. Forecasts suggest that European and US populations will experience a 5-10% excess in skin cancer incidence during the middle decades of the next century (Slaper et al 1996).

While action is now being taken to reduce the rate of increase of emission of greenhouse gases it is already clear that too little action is being taken too late. This is also apparent in the control of chlorofluorocarbon emission by the Montreal Protocol of 1987, updated in the mid 90s. In this case black market sales and the production of halons by China and other low income countries temporarily exempted from the ban are compounding the problem.

In both these cases long-term damage was done to the environment before a clear cause and effect chain could be demonstrated and it was even longer before the consequences were accepted by some countries, putting their own economic self interests before the health consequences for others. Global companies could not be controlled by national legislation, since they could simply switch their production base. International legislation requires not simply consensus but virtually universal agreement and we still lack practical methods of enforcing agreements once made.

Measuring the Impact of Environmental Exposures on Health

Even if we do not take into account the impact of the social environment and limit our definition of the environment to direct impacts, the consequences for health are immense, as shown in table 1.

Table 1 Estimated proportion of global burden of illness, injury, and premature mortality attributable to environmental exposure measured with a common unit (disability adjusted life years DALYs based on Murray and Lopez 1996)

Disease/injury	Global DALYs (Thousands)	Environmental Fraction	Percentage of all DALYs
Acute respiratory infection	116.696	60	5.0
Diarrhoeal diseases	99.633	90	6.5
Vaccine-preventable infections	71.173	10	0.5
Tuberculosis	38,426	10	0.3
Malaria	31,706	90	2.1
Injuries			
unintentional	152,188	30	3.3
intentional	56,459	Not estimated	
Mental Health	144,950	10	1.1
Cardiovascular disease	133,236	10	1.0
Cancer	70,513	25	1.3
Chronic respiratory disease	60,370	50	2.2
Total of these diseases	973,350	33	23.3
Other diseases	403,888		
All diseases/injury	1,379,238		100

This broad analysis based on past experience and current indicators of health status illustrates both the importance of the issue of environmental exposure and health and the paucity of current measures at a global level. Historically, epidemiology has played a crucial role in identifying environmental health hazards for local communities faced with local health hazards with relatively high levels of exposure and a directly discernible link between cause and effect. With global health threats we face the challenges of:

- Exposures that are often relatively low level (by comparison with historical and occupational levels but which impinge on very large populations (in some cases literally everyone) so that while individual risk may be small the overall population effect may be very great.

- Exposures to risk that are involuntary and often unequal because poor people do not have the resources to protect themselves from risks.

- Environmental risks that can only practically be controlled at source but where the sources may be multiple and not local or within the control of one country

- Complex relationships between cause(s) and effects on health, typically entailing multiple causal factors and/or exposures that reach people via several different routes.

- Long time lags between the causes of the environmental changes, exposure to resultant risks and discernible impact on health.

- Disruptions to the stability, functioning and productivity of various biophysical systems, especially ecological systems. Many of these systems will be affected by large-scale environmental changes, such as climate change, ozone depletion, biodiversity loss, spread of invasive species, and over-exploitation of food-producing ecosystems. Various adverse impacts on infectious disease patterns, local; food production, and population displacement would result.

Global Governance of Environmental Health

Overlaying these problems of measurement and analysis is the issue of global governance, highlighted by Ilona Kickbusch (2000). In the absence of clear and respected global governance for environmental health issues governments and industries (particularly global ones) seek short term economic advantages for countries and sectors, particularly where the burden of the health impact may disadvantage people elsewhere. As global corporations switch investment to reduce their costs, governments may feel forced to compete to attract investment by lowering environmental and health standards and costs. Global corporations, whose experts sit on many of the international advisory committees, have immense direct and indirect influence on environmental controls. Thus measurement, analysis and the estimation of health burdens (including those occurring in remote place and time) must be used to influence those whose vested interest lies in denial, doubt or delaying action.

One demonstration of the impact of uncertain measurement and self interest can be seen in relation to international response to climate change. Successive international conferences gradually developed consensus on the need for action. However, commitments to reducing greenhouse gas emissions have so far been modest: national governments have been hampered by the need to maintain near-term domestic economic indicators, and global corporations have typically sought to maintain short-term self interests.

With approximately 40% of the world's population living with some level of water shortage and pollution of ground water an increasing problem it seems likely that similar issues and interests will arise in some of the most volatile regions of the world.

The Need for a Precautionary Approach

Faced with these issues a clear principle is required for international agreement and action on global health and environmental threats. The Precautionary Principle as enunciated at the 1992 UN Conference on Environment and Development in Rio de Janeiro provides a basis for agreement. This states that where the consequences of environmental change are uncertain but potentially serious, perhaps irreversible, then that scientific uncertainty does not justify delaying taking precautionary preventive action.

The Precautionary Principle moves our thinking towards uncertainty based decision-making. This takes us beyond the realm of evidence based quantitative risk assessment. We must now take action recognising what we do not know as well as what we do know. This requires us to model possible futures based on our understanding of complex systems (such as the weather) which we do not fully understand. Fortunately there are tools such as mathematical modelling and scenario based health risk assessment which can help, but further research and development is required both to develop these tools and to generate a consensus around risks to our environment and health.

This in turn requires a change in attitude towards health and its determinants. Health and health services are often regarded as a cost to society, we must consider them an essential resource both for individuals and for society. Regarding health as a sustainable resource leads us to measure the social and ecological factors that are required for a healthy community. Measures such as GNP per head or life expectancy at birth provide only a simplistic snapshot, where a full inventory of resources is required. We need indicators of sustainable health and environmental development that will take into account: infra structure (water supply, housing, safe transport), the physical environment (clean air and unpolluted groundwater, sustainable emissions), and the social investment (strong families and communities, education, democratic government), that are required for sustainable health.

The UK is well placed to take a lead in this field adding to its history of leadership in environmental and public health. We believe it would be a very valuable contribution to global health.

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PHARMACEUTICALS: A GLOBAL INDUSTRY WITH LOCAL INTERESTS

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1. The Concept of Globalisation and its application to pharmaceuticals

Globalisation in Context

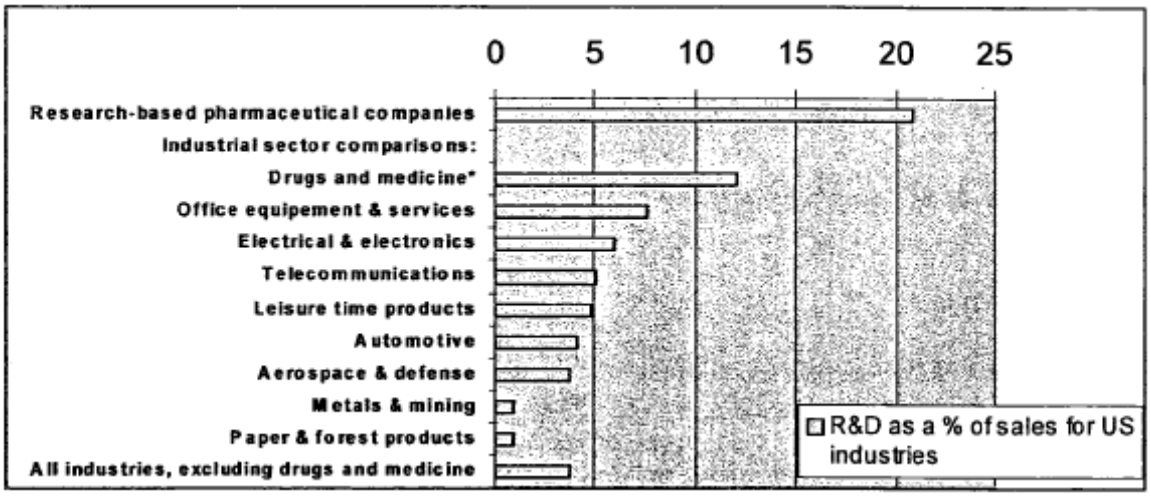
The term globalisation has generally been taken to refer to economic, social, cultural, communications and political factors leading to the 'shrinking world'. Pharmaceutical companies also use this term to refer to their business response to the global environment. The focus of globalisation in the pharmaceutical industry is the activities of multinational enterprises (MNEs). The parent company of MNEs may be owned and headquartered in one country but generally exercises direct control over the policies of its affiliates or local operating companies in several countries. MNEs also engage in foreign production, marketing and R&D through their affiliates. From the perspective of industrial dynamics, globalisation can be characterised by the responses of MNEs to more global competition through the adoption of global, regional or transnational strategies in production, marketing, research and development (R&D), finance and employment.

Pressures of globalisation versus localisation of the pharmaceutical industry

The phannaceutical industry like every other industry is confronted by two sets of imperatives: pressures to globally integrate and pressures to be locally responsive. In general, firms pursue an international strategy to transfer skills and products to markets where local competitors lack those skills and products. In the case of products, the transfer is eased when little local adaptation is required. Often firms must customise the product and marketing to different national conditions as is the case for pharmaceuticals. Localisation is the process of enhancing a product to meet the requirements of the foreign country. Pressures for local responsiveness arise from a number of sources: differences in consumer tastes and preferences; differences in infrastructure and traditional practices; differences in distribution channels; and differences in host government demands. For example, local differences in regulatory hurdles are important but these differences are diminishing. (Beamish, Killing, Lecrau and Morrison, 1994.)

While there are pressures to reduce R&D costs the greatest pressure is on time to market. The pharmaceutical industry, unlike most consumer-related industries, also faces strong pressures for cost reductions associated with R&D. Like other high-tech industries, the pharmaceutical industry relies on innovation to drive market growth. However, the pharmaceutical industry is the most research-intensive manufacturing industry that is not dependent on government contracts for its innovative activities (Figure 1). Consequently, the strategies used by pharmaceutical companies in the global market place are as much a response to high pressures for cost reductions associated with R&D, as they are a response to high pressures for local responsiveness. Responding to pressures of cost reduction requires a firm to try to lower the costs of value creation by mass producing a standardised product at the optimal location in the world to realise location and experience curve economies.

Figure 1. R&D as a percent of sales for research-based pharmaceutical companies and US industrial sectors, 1998



Drugs and medicine category based on total R&D and sales for companies classified within the drugs and medicine sector as tabulated by Standard & Poor's Compustat Source: PhRMA, 1999

Pharmaceutical MNEs generally exploit experience-based cost economies and location economies, transferring distinctive competencies within the firm, while paying attention to pressures for local responsiveness. There is a need to seek out new markets as growth in experienced markets slows. This is particularly true in national markets that emphasise cost containment and price regulation. Increasingly, customers and payers are demanding that manufacturers of pharmaceuticals provide evidence on the cost-effectiveness of their products. In most developed countries other than the US, the payer is in general the national government. In the US, payers include government agencies and private insurers. A large number of countries have implemented price regulation which limits incentives for investment in R&D as manufacturers are precluded from selling their products based on market considerations. With public and private payers making reimbursement more restrictive, there is an incentive for pharmaceutical firms to seek new markets to remain competitive. For example, China is one of the fastest growing markets and has attracted much entry from multinational pharmaceutical companies. Mexico, Brazil, Argentina, South Korea, Russia and India have considerable potential for growth and are all included in the top fifteen global pharmaceutical markets.

The pharmaceutical industry has taken advantage of declining tariffs and other equivalent measures, and the emergence of regional trading blocs such as the EU and NAFTA that have served to open up borders to the import and export of medicines. The World Trade Organisation, promoting trade without barriers, is also expected to have a considerable impact in the future. At the same time communication technology has made international management easier, making it possible for management to operate at the hub of a business network. Greater international communications and the sharing of information has led to an emerging common view of how pharmaceuticals should be managed and delivered, as well as a common approach to scientific medicine.

Expanding globally allows firms to increase their profitability in ways not available to purely domestic enterprises. Operating internationally allows firms to take advantage of their core competence or skills within the firm that competitors cannot easily match or imitate. These skills may exist in any of the firm's value-creation activities (production, marketing, R&D, human resources, general management etc). For such firms global expansion is a way of further exploiting the value-creation potential of their skills and product offerings by applying those skills and products in a larger market.

Simultaneously to these pressures towards greater globalisation of the pharmaceutical industry, exist pressures towards localisation. Pharmaceutical trade is often hindered by non-tariff barriers. For example, local subsidies may support the R&D based drug industry, and government regulation may set prices of medicines in the market. In most countries there is a trade off between health policy and industrial policy objectives. Globally, only the US and a few European countries support the industry through policy developments. For example, the UK operates a Pharmaceutical Price Regulation Scheme, which attempts to reward national R&D while ensuring that medicines are supplied to the NHS at reasonable prices. In general, most countries are considered by the pharmaceutical industry to be free riders, in that local pricing policies do not take into account incurred R&D costs. This is of course an issue related to the affordability of new products by many countries and their health systems, the issue of what is innovative R&D (and should therefore be rewarded accordingly), and on what basis should mark-ups on R&D intensive products be calculated.

Localisation may be required because of government regulation that restricts market entry by requiring safety and effectiveness standards to be met in sovereign local markets. Similarly, governments very often regulate product reimbursement, or may have their own regulatory requirements regarding Good Manufacturing Practice for medicines manufactured elsewhere, as indeed for labelling, packaging, packet sizes and packet inserts. At the same time there is a dimension of sovereignty in local markets that is reflected in the regulatory, trade and investment regimes as applied to pharmaceutical companies. Drug markets are highly regulated and comply with local regulatory regimes. MNEs spend large amounts on R&D to develop innovative drugs. Often these firms will be induced to engage in Foreign Direct Investment (FDI) in order to manufacture locally. Local sovereignty over markets has been protected from globalisation of trade or harmonisation of practices by local political factors such as equity in access to health care and cultural differences in its provision. Increasingly countries are attempting to streamline their regulations regarding pharmaceutical products. This includes avoiding overlap in their procedures for developing and registering new drugs. For instance, in the European Union (EU), since 1998, all new products must be submitted through the mutual recognition procedure or the central approval system except for products marketed in only one Member State. The European Medicines Evaluation Agency "(EMEA) is responsible for product licensing in the EU. Greater harmonisation may follow from an increased exchange between the FDA, EMEA and Japanese regulators. For the above reasons the pharmaceutical industry sits somewhere between globalisation and localisation.

2 Strategic response to globalisation

Pharmaceutical production and consumption

Pharmaceutical production and consumption are linked to developments in both domestic and international markets. The introduction of new products and the expansion of foreign markets have kept domestic drug production growing. In 1997, the worldwide pharmaceutical market grew by seven percent and was estimated to be worth US$293.9 billion (IMS-global, 1999). The distribution of the worldwide market is less than global. It is estimated that 15 of the largest pharmaceutical markets in the world account for 83.5 percent of the worldwide market The pharmaceutical market can also been seen to be concentrated in three regions: North America (36.5%), Europe (29.0%) and Japan (15.8%) (PhRMA, 1999 citing IMS Health, 1999). Of these regions, only North America is expected to remain amongst the fastest growing regions into the next millennium which is also estimated to include high levels of growth in the Middle East, Australasia and Southeast Asia, including China (IMS-global, 1999). Growth in Western Europe and Japan will continue to be constrained by cost-containment pressures.

The export market is becoming an increasingly important determinant of the level of domestic production. Many EU Member States export between 10 and 99 % of their production. Domestic manufacturers have incentives to seek out potential profit opportunities though exports particularly as the growth in domestic consumption is further constrained by cost-containment efforts.

Health care provision is an issue of national policy making to the extent that it is funded through taxation or social insurance contributions. The use of specific policy mechanisms within national health care markets to control pharmaceutical expenditure has an effect on national consumption patterns. Consumption also varies from product category to product category in different regions. For example the leading product category in the US was psychiatric drugs (US$5.8 billion), while in Europe systemic antibiotics dominated (US$5.36 billion) (Scrip Magazine, 1999). Trends in pharmaceutical consumption also emphasise the resulting medical, social and economic consequences of the marketing, distribution, prescribing and use of medicines (WHO Expert Committee, 1977). Pharmaceutical consumption is dependent on the demographic and epidemiological characteristics of a population, as well as socio-economic status. Drug utilisation is also dependent upon prescribing and dispensing decisions. Other explanations for differences in utilisation include medical practice variations associated with cultural differences and idiosyncrasies of the health care system. The level of regulation of promotional activities is expected to influence prescribing choices.

Innovation

The success of the pharmaceutical industry depends on innovation. Future R&D is financed entirely by reinvestment of profits generated through pharmaceutical sales. However, discovering a new treatment that shows therapeutic advantages over existing products is expensive, risky and time consuming. The global investment in pharmaceutical R&D was US$36.9 billion in 1997 (Centre for Medicines Research, 1999). Table 1 shows that in 1997 the 20 leading companies in terms of R&D, devoted between US$781 and 1,892 million to developing new products or between 11 and 21 percent of their pharmaceutical sales. While this expenditure on R&D is considerable, it only underlies the fact that the cost of bringing a drug to market is very expensive. It is estimated to cost over US$500 million to bring a new chemical entity (NCE) to market and take between 7 to 10 years (Centre for Medicines Research, 1999). These figures would be higher if they included cost associated with unsuccessful products. Despite the significant investment made in R&D, the number of NCEs introduced onto the worldwide market has steadily decreased from 100 in 1963 to 37 in 1998 (Centre for Medicines Research, 1999). Pharmaceutical companies depend increasingly on profits from "Blockbuster Drugs', which are also sometimes called world drugs. The increasing dependence on these major innovative products provides further evidence of the pharmaceutical industry's global dependence. The potential risk involved in the R&D process is the main argument advanced to justify the better then average profits enjoyed by the pharmaceutical industry. It is the need to generate revenues for future innovation that pharmaceutical companies have attempted to justify the higher prices and have successfully obtained patent extensions to safeguard future revenues.

Given the resources invested in new product development, exclusive monopoly patents are granted to innovating companies so that they may remain profitable and are able to continue R&D activities. There is a consistent relationship between the strength of patent protection and the stage of a countries economic development (Rapp and Rozek, 1990). Innovation as an engine to technological change and economic development therefore argues in favour of strong protection.

Table 1 Leading R&D Spenders World-wide, 1997

Company	Pharma R&D spend ($ million)	% change from 1996	% pharma sales
Glaxo Wellcome	1,882	-1.1	14.4
Novartis	1,813	14.7	18.6
Roche	1,760	21.1	21.1
Pfizer	1,710	12.4	16
Merck & Co	1,684	13.2	11.9
Eli Ully	1,382	16.2	16.2
Hoechst Marion Roussel	1,374	10.3	17
Abbott	1,302	8.1	11
Johnson & Johnson	1,285	NA	16.7
SmithKline Beecham	1,272	17	17.5
American Home Products	1,246	11.7	16
Pharmacia & Upjohn	1,217	-3.9	18.5
Bristol-Myers Squibb	1,200	20	12.1
Astra	1,146	23.9	19.5
Bayer	1,134	13	14.4
Rhone-Poulenc	1,012	3.5	17.7
Shering	913	25	20.6
Schering-Plough	847	17	12.5
Boehringer Ingelheim	833	23	20.7
Zeneca	721	12.8	17.2

Source: Scrip Yearbook, 1999, p. 139

The effective life of the patent is much shorter then the length of the nominal patent term which is 20 years from filing in the US and 20 years from filing in Europe. Extensive safety and efficacy testing for the market approval of drugs reduces the length of time a drug can be marketed while still under patent. To ensure that producers were not faulted for a lengthy regulatory process and that incentives to continue the innovative process were restored, patent extensions were granted in both the EC and US to compensate for market time lost during the regulatory process. The US patent extensions were introduced in 1984 as part of the Drug Price Competition and Patent Term Restoration Act (DPC&PTR).[1] Similar legislation was not adopted in the EC before 1992 with the adoption of Supplementary Protection Certificates (SPCs).

Patents give companies monopoly power over consumers who have no alternatives. Life-saving drugs such as the anti-AIDS drug AZT, the cholesterol-reducing drug Lovastatin and other similarly innovative drugs are often priced very high and remain out of the reach particularly of people in developing countries or those without insurance. However, such examples should not result in fear of stronger patent protection. Over 90 percent of the drugs on the World Health Organisation's Essential Drugs List are no longer under patent protection in the US (Rapp and Rozek, 1990). In addition, many products face extensive competition in certain chemical and therapeutic classes, which is why product differentiation strategies have become so important to securing brand loyalty and market share.

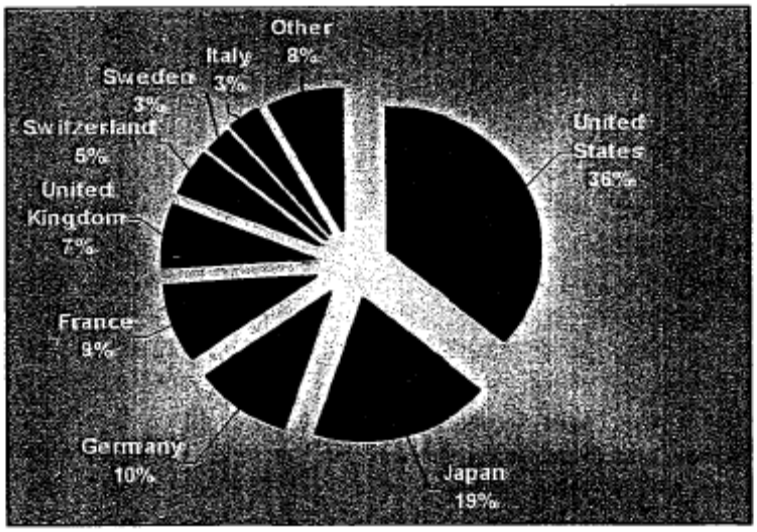
[1] The DPC&PTR is also known as the Waxman-Hatch Act.

Location of manufacturing and R&D

Initially most pharmaceutical firms will locate their manufacturing and R&D facilities in a single country from where they can serve both domestic and foreign customers. At some point, to further expand their customer base, trade barriers and transportation costs may drive firms to set up operations outside their home market. Pharmaceutical firms will benefit from basing manufacturing and R&D activities in locations where economic, political and cultural conditions, including relative factor costs, are most conducive to the performance of that activity.

Performing manufacturing and R&D in optimal locations, wherever in the world that may be, firms can benefit from location economies by lowering the cost of value creation. Government imposed barriers to entry such as tariffs and local content requirements provide firms the opportunity to participate in protected markets. Local operations can help a firm to adjust its products to meet regulatory and other requirements, facilitating market penetration.
Historically, the centres of global manufacturing and research have been in countries with large pharmaceutical markets. Foreign direct investment (FDI) is an important driver of globalisation and a crucial step in internationalisation. The major motives for FDI are market and cost oriented. Most FDI is focussed on the 'triad' economies of the USA, the EC and Japan. (Figure 2)

Figure 2: Company-financed pharmaceutical R&D by country, 1995



Source: PhRMA, 1999 citing Centre for Medicines Research, UK, 1997

Market size is only one determinant of where a firm will decide to locate manufacturing and R&D. When a company decides to invest in a country, they must consider both factors of production as well as the regulatory environment. These conditions include resources and location, presence of related and supporting industries, demand and structure. Foreign manufacturing and R&D operations can enhance a firm's efficiency if the country is particularly strong in a desired capability. Of the 152 major global drugs developed between 1975 and 1994, 45 percent were of US origin, 14 percent originated in the UK and 9 percent were of Swiss origin. (PhRMA, 1999). Similar trends in drug development are observed between 1980 and 1997.

Conducting R&D in another country allows the company to take advantage of foreign knowledge and skills. Increasingly industry sponsored research occurs outside the home market both within and

outside company facilities. Global R&D networks may foster greater exchange of information and more rapid innovation.

Often governments introduce policies that are intended to give firms incentives to locate part of their manufacturing or R&D in a foreign country. For example, the UK Pharmaceutical Price Regulation Scheme sets out as one of its objectives to encourage pharmaceutical R&D in the UK. British laboratories developed 5 out of the world's top 20 medicines (ABPI, 1998). Pharmaceutical R&D expenditure in the UK in 1997 was £2.2 billion. The pharmaceutical industry carries out 70 percent of all R&D in Britain, spending more than 20 percent of its output on R&D.

Intellectual property protection will also attract industry. For example, since the passage of Bill C-22 in Canada in 1987 that strengthened patent protection, R&D spending has nearly doubled rising from CND$159 million in 1988 to CND$630 million in 1996 (Scrip Yearbook, 1999, citing Scrip 2303 p. 16).

FDI also benefits host countries in terms of employment.. Not surprisingly the vast majority of employment in the pharmaceutical industry is concentrated in the three largest markets.

Financial performance and profitability

The bottom line of any investment is expected profitability. From this perspective the pharmaceutical industry has been very successful. Table 2 shows that the leading pharmaceutical companies have high profit ratios. As compared to other industries, the US pharmaceutical industry was ranked either first or second in terms of median after-tax profit returns on stockholders' equity between 1960 and 1991 of the Fortune 500 companies (Scherer, 1996).

Table 2 Leading companies by pharmaceutical profitability (profit as a % of sales) 1997

Company	Profit (US$mill)	Sales (US$ mill)	Margin (%)
Glaxo Wellcome (UK)	4,626	13,082	35.4
Johnson & Johnson (US)	2,669	7,696	34.7
Pfizer (US)	3,309	10,689	31
Schering-Plough (US)	1,885	6,110	30.9
Zeneca (UK)	1,289	4,205	30.7
Astra (Swe)	1,775	5,885	30.2
Bristol-Myers Squibb (US)	2,945	9,932	29.7
Merck & Co (US)	6,592	23,637	27.9
SmithKline Beecham (UK)	2,025	7,495	27
Novartis (Swi)	3,451	12,926	26.7

The pharmaceutical industry has continually had high rates of return on capital employed (ROCE) as compared to other industries. Pharmaceuticals is the only UK sector to have remained amongst the top 5 sectors in terms of ROCE in the ten year period from 1986 to 1996.

Sustained profitability is fuelled by innovation. In the first six months of 1998, Merck & Co.'s performance was fuelled by the hypolipaemic, Zocor (simvastatin) with a growth of 10 percent in sales worth a total of US$1.8 billion. The profitability associated with innovation is dependent on patent protection. After the patent expired on Glaxo Wellcome's anti-ulcer, Zantac (ranitidine) and the

antiviral, Zovirax (aciclovir) the sales for each of these products declined 49 percent and 38 percent respectively, while the company's prescription sales dropped 6 percent.

Financial performance is judged internationally. Investors are international and have access to a vast amount of information over the Internet. The financial performance of Pfizer during 1998 can be linked to the rapid rise of its widely publicised drug Viagra (sildenafil) which achieved sales of more than US$400 million after only three months on the market and made Pfizer the fastest growing pharmaceutical company world-wide (Scrip Magazine, 1999). usually little capital is involved. Costs of product adaptation, tariff and non-tariff barriers and transport costs may dictate local operations rather than exporting.

European integration and NAFTA have removed trade barriers, and opened up national borders to foreign competition. Since 1994 the international market for pharmaceutical products has been free of any tariff barriers. This has meant that markets are merging at least initially according to regional trade zones. Trade in the European pharmaceutical industry has improved by EU regulations for the manufacturing, authorisation and distribution of medicinal products and by extension, the harmonisation of laws and regulations involved. In particular, the European marketing authorisation procedure has led to a considerable simplification of the market access for medicinal products in the EU since 1995. However, this improvement has been impeded by different regulations in individual EU member states concerning pricing and reimbursement of medicinal products. Therefore, a single European market for medicine is still non-existent.

Barriers due to distance have been lessened by better communication technology and travel. The Internet and the WWW have facilitated the globalisation of markets. The increasingly global nature of information dissemination particularly resulting from the expansion of the Internet, direct-to-consurner advertising is increasingly being used by pharmaceutical companies to increase the awareness of prescription products. Product differentiation has long been an important way to increase product market share. The domestic US drug industry employed the largest number of people in marketing (34%) followed by production (26%) and medical R&D (24%) (PhRMA, 1999).

The Internet is a global communication tool and has become an important part of the globalization strategy of the pharmaceutical industry. The web is increasingly becoming an important means of communicating information to patients, health professionals and other stakeholders for the pharmaceutical industry. The majority of pharmaceutical companies and industry associations have developed websites. Historically the drug industry has relied on getting information to doctors about their products by using a network of local reps. This practice is expensive, particularly since it must take place in each country, and, increasingly, within different parts of a single country. The web makes possible the global communication of strategic messages for a fraction of the cost.

Globalization is the top IT-related priority for the pharmaceutical industry. Prospects for the future include virtual pharmacies, and a single reference regarding regulatory standards and requirements. The International Conferences on Harmonisation (ICH) are a long process that aims to standardise regulatory procedures and the submission documents across Europe, the US and Japan. IT solutions are necessary to overcome the communication and information management challenges that globalization represents. Globalization and IT will increase the amount of knowledge shared across the pharmaceutical industry and geographical boundaries. This includes information regarding the effectiveness of different drugs and therapies. The result will enable global discovery and alerting regarding adverse drug events and the relative clinical efficacy of drugs and interventions.

Mergers, acquisitions and strategic alliances

Most of the ten leading global pharmaceutical companies have developed to their current size largely through a process of consolidation entailing mergers and acquisitions (M&As). M&As represent an opportunity to increase product range and sell in a wider geographic area. Consolidation is driven by a number of factors; particularly the desire to achieve cost savings and scale economies. Cost savings may be possible by eliminating duplicate departments and functions as well as benefiting from economies of scale in production, R&D, sales and marketing. It is difficult to say whether these cost reductions are actually achieved given problems that include maintaining strategic control over subsidiaries, meeting the demands of their multicultural environment and integrating the decision-making process.

Most integration in the pharmaceutical industry has been horizontal such as the mergers that formed Glaxo Wellcome, Novartis and Aventis. Horizontal integration amongst the top-tier of companies has been seen as one of the best ways to achieve competitive growth through the cost rationalisation. The need to reduce costs is an important determinant of trends in M&As in the European pharmaceutical industry given the pervasive air of cost-containment in national markets and their fragmentation, which necessitates some form of presence in each market. For example, the 1998 merger of Astra and Zeneca was expected to generate benefits of scale through rationalisation and an R&D pipeline that fit together well. This follows a trend of similar consolidation between the European top-tier: the Hoechst and Rhone Poulenc merger in 1998 to form Aventis; the Sandoz and Ciba merger in 1996 to form Novartis; and the merger of Glaxo with Wellcome in 1995 to form Glaxo Wellcome.

Some manufacturers chose vertical integration and have purchased distributors.

Diversification by acquiring a biotechnology company represents an important way to gain access to new technologies and potential future sales. Other diversifications have focused on generic, diagnostic and information technology companies. In 1998, Elan, an Irish drug company acquired four companies (Sano, Canrick Laboratories, Neurex and NanoSystems) with the objective of broadening its sales and marketing infrastructure as welTas its technology and R&D portfolios.

Merging with or acquiring a foreign company is a fast way for pharmaceutical manufacturers to gain profits from abroad through the internationalisation of their market. European firms commonly pursue US firms in a bid to gain a larger chunk of the lucrative US market. For example, in 1997 Schwarz (Germany) and Shire (UK) both purchased US companies. A number of acquisitions in 1998 had Western European companies forging stronger links with Eastern Europe: Glaxo Wellcome purchased an 80% share in Poland's Polfa Pozna; SmithKline Beecham purchased the Romanian pharmaceutical companies Europharm and ICN. For the most part, developing countries have been largely ignored by foreign multinationals. However, M&As are becoming more common in countries with large pharmaceutical markets such as India and South Africa (PricewaterhouseCoopers, 1998). Interestingly Japanese corporate culture views M&As negatively. Consequently, consolidation has remained very limited in Japan particularly between Japanese companies (PricewaterhouseCoopers, 1998). This explains why although there are more than 1500 pharmaceutical manufacturers in Japan, there are no Japanese drug manufacturers among the world's top ten. Takeda is the largest Japanese pharmaceutical company and it ranked 17* in 1998 (Scrip Magazine, 1999). Nevertheless there is a foreign presence in the Japanese market.

Competition in product markets

The pharmaceutical product market is highly segmented. In 1998, the top-ten therapy classes accounted for only 30 percent of the world market (IMS Health, 1998.) Even within therapy classes there is much segmentation. For example, drugs for the gastro-intestinal system (a single therapeutic category) may be divided into multiple market segments (therapeutic sub-categories): anti-

ulcerants, antispasmodics, antidiarrhoeals, laxatives and others. Within the market for anti-ulcerants, which is the largest market segment, Losec (omeprazole) accounts for nearly 30 percent of all the sales. Losec is part of a new generation of anti-ulcerants called proton pump inhibitors. Competition for Losec comes not only from other proton pump inhibitors, but also from other classes of anti-ulcerants such as IE-receptor antagonists of which Glaxo Wellcome's Zantac (ranitidine) is one. There is much competition among anti-ulcerant agents, despite the fact that, for example, Zantac is not a perfect substitute for Losec, but may be viewed so by policy-makers in different countries (Vandergrift and Kanavos, 1997).

It would be expected that investments in R&D most often focus meeting the unmet health needs of the markets which offer the highest rates of return, mostly USA, Europe and Japan, as well as a number of emerging second and third world markets. Ischaemic heart disease was the leading cause of death in developed regions and the second major cause in developing regions in 1990. Worldwide, the leading cause of disease or injury in 1990 was lower respiratory infections followed by diarrhoeal diseases. By 2020 the leading cause of disease or injury is expected to be ischaemic heart disease and unipolar depression. These diseases represent areas with considerable therapeutic needs.

Between 1976 and 1990 cardiovascular and anti-infective drugs accounted for nearly half (47%) of all NCE approvals in the US .(Kaitin, Bryant and Lasagna, 1993.). The large number of drug approvals is a reflection of the high levels of research activity directed toward the development of drugs in these areas. In 1996 anti-infectives and cardiovascular were the third and fourth largest therapeutic classes in terms of R&D expenditure in the US accounting for 14.4% (US$2billion) and 14.3% (US$1.9 billion) of the total respectively (Centre for Medicines Research, 1999). The largest therapeutic class for R&D expenditure in the US in 1996 was Central Nervous System (CNS) (22%; US$3 billion) (Centre for Medicines Research, 1999).

3 The driving forces of pharmaceutical globalisation and their implications for national governments

Globalisation of pharmaceutical business is not only the result of endogenous market forces that drive different industrial sectors to internationalise and widen their production base, as analysed in the previous sectioa Although endogenous market forces provide a necessary condition for globalisation, their existence is not sufficient to drive the pharmaceutical industry to globalise. Other forces are at play in the pharmaceutical sector and these include the special characteristics of the pharmaceutical market, the nature of the technology employed in this sector, and, in particular, advances in technology, the process of health care reform in most OECD economies, economies in transition an Latin American economies, the innovative potential of the industry, and the need for new medical therapies for the benefit of consumers/patients. The contribution of these factors is analysed in the following paragraphs.

Special Characteristics of the Pharmaceutical Market

Given the impact that medicines have on promoting health and in the alleviation of disease and disability, the attention given to the pharmaceutical industry may seem exaggerated (Abel-Smith, 1976). Yet, the pharmaceutical market possesses special characteristics suggesting that the requirements applicable to product development and the elements of competition and consumer sovereignty may not be sufficient to produce both adequately low prices and acceptably safe and effective products. Several relevant factors can be identified.

The characteristic three-tier demand system - the doctor prescribing the product, the patient taking it and health insurance meeting the cost - produces an important imperfection in the

pharmaceutical market (Aaron, 1981; Arrow, 1963; Cullis & West, 1979). With the exception of OTC drugs, the demand for medicines is not controlled by the final consumer, but by the doctor who neither pays for the product nor consumes it. The financial costs of consumption for the patient are blurred by the insurance system, which bears part or all of the direct costs of medicines. Furthermore, the consumer's ability to transform information into knowledge is limited. Many types of treatment are not repeated and, as health care is an inherently technical subject, there are few consumers who could 'prescribe' without themselves becoming doctors (McGuire et al, 1988).

Delegating decision-making power to a public regulatory agent (where it exists) is driven by the notion that profit incentives and market competition are insufficient to generate socially acceptable levels of information or to produce socially desirable decisions by the pharmaceutical companies. This is an old argument, which, in turn, gives rise to the following issues: firstly, it is argued by the industry that excessive stringency of regulations on safety, prices, and profits may discourage the industry from spending on research and development (R&D), resulting in declining rates of innovation (Teeling-Smith, 1986). The counter argument is that the problem is not solely caused by strict regulation. Dependence on new scientific discoveries and increasing R & D costs may also have a dwindling effect on innovation. Secondly, governments' interest in maintaining or increasing national income may lead to the strengthening of this innovative industry and its promotional activities through the pursuit of an active industrial policy.

Continued product innovation characterises the industry and all major companies are heavily involved in research. In the case of patented products, they compete on the basis of product suitability and differentiation, but price competition can be important where there are several therapeutic alternatives. The ability to develop novel medicines is the driving force of growth in the industry. The institution of intellectual property rights protection is of prime significance here providing legal protection to innovators for 17-20 years in most countries, although its effective life is shorter, due to the time lag between registering a patent and bringing a product to the market. It has been argued that long patent life prolongs companies' monopoly position, keeps prices at a high level (where pricing is free), with a consequent impact on drug budgets and disallows generic competition, which in the public interest would be desirable sooner rather than later.

The role of marketing in creating and maintaining the position of a company is crucial. The medical profession itself depends on pharmaceutical companies for information to a significant degree. It is argued that doctors could obtain all essential knowledge on new products solely by reading their medical journals and participating in continuing medical education on the subject. But they rarely do. As most of this information is transmitted predominantly in terms of brand names, further market power may be in the hands of pharmaceutical companies. As patent terms are eroded, the role of marketing increases in significance to the pharmaceutical company wishing to preserve its margins. This makes doctors more vulnerable to the marketing powers of the industry, particularly since the role of the State is either limited or non-existent in that respect.

The determination of an adequate profit margin, although an important issue given the R&D-intensive nature of the industry and the associated investment risks, is a sensitive issue especially in light of the industry's profit margins, which only seem to be high by international comparisons with other industries.

State intervention is intense and concerns the safety of products, profit or price control, the regulation of marketing and advertising and the regulation of overall pharmaceutical consumptioa Intervention is generally exercised by a variety of agencies and in pursuit of a multiplicity of aims. The objective of these regulations, it is usually alleged, is to supplement the working of the market. However, these regulations are very much concerned with means and not with the evaluation of performance in relation to ends.

New Technologies

The majority of drugs currently in the marketplace are designed for symptomatic and palliative treatment, rather than the cure of disease. While the process of discovering clinically useful New Chemical Entities (NCEs) appears to have reached a point of diminishing returns, the question is whether the focus of scientific research could achieve a qualitative shift in emphasis from "diagnosing and treating illness" to "predicting and preventing disease". For this purpose, the role of biotechnology and new technologies at large is perceived to be crucial. There has been an explosion of molecular biology research over the past three decades. As a result of the new knowledge and understanding gained, there is the possibility now of manipulating genetic material and using genes for a wide range of hitherto unimagined purposes. Some of the applications may profoundly influence medical practice and human health; these include not only the production of proteins or the use of recombinant DNA as a pharmaceutical manufacturing tool, for example in the development of biopharmaceuticals or vaccines, but also exploring the mechanisms that determine the origins of human disease and direct intervention in its causes, for example, by replacement of rogue genes, or the potential use of "naked" DNA in influencing cell biology in the treatment of cancer. These developments can be exploited by biotechnologjsts, chemists and pharmacologists to synthesize in a more rational way new drugs and therapeutic agents.

The discovery of new drugs implies screening an enormous number of molecules-a very costly approach. In the last few years the scenario has slowly started to change with the introduction of a new approach consisting of structure-based drug design (rational drug design), which is a major challenge to people working to develop novel therapeutic agents. This approach employs powerful computers using sophisticated and complex software and new screening systems based on new recombinant tests. Although these technical aids have been available for several years, they have yet to be fuDy exploited and are largely dependent on new generations of chemists who can handle them.

Health Care Reform and Impact on Pharmaceutical Industry

Most OECD countries, economies in transition, and upper-middle income economies have implemented, or are in the process of implementing, profound reforms in their health systems aiming at increasing (macro- and micro-) efficiency, improving equity and patients' choice (OECD, 1992; OECD 1994). Reforms have been directed towards managed care, with the trend to introduce budgets: i) for individual providers, ii) for pharmaceutical consumption, and iii) for overall health spending. Such policies create more pressure on pharmaceutical spending in the different Member States. Individual reform measures have comprised:

- the separation of purchasers from providers
- internal market competition, particularly price competition between providers
- development of priority-setting methodologies
- overall budgets for health care expenditure with the principal aim to contain costs
- generalising capitation payments for first contact doctors
- attempts to introduce changes in the financing of health systems
- monitoring doctors' authorisation patterns
- gradually increasing patient co-payments

Over the past twenty five years or so, health policy has shifted from the imposition of indirect and direct controls on aspects of health care provision, such as pharmaceuticals, towards budget setting, and, increasingly towards budget shifting, rationing and more user charges (Mossialos & Le Grand, 1999).

Need for new medical therapies

The need for new medical therapies as seen by pharmaceutical companies are not necessarily the same as world health needs. Companies, regardless of their country of origin, or capital ownership, are in constant search of environments which are conducive to both quantitative (in terms of number of NCEs, patents and products), and qualitative innovation (advancement of knowledge, new technology development). Pharmaceutical R&D expenditure, measured as private sector outlays and taken as a proportion of the industry's sales, increased manifold over the past twenty years (1976-95). However, over the same period, the proportion of registered new and innovative molecules (NCEs), has fallen in absolute terms, leading to lower productivity per dollar employed.

Measurement of the industry's innovative potential is a difficult task and can be subject to criticism. Many indicators have been used in the past with varying degrees of success. Among them are R&D intensity, New Chemical Entity (NCE) discovery, patents per million spent on R&D and so oa However, none of these alone can conclusively argue the case for a competitive pharmaceutical industry, partly because each of them refers to different stages of the R&D process and cannot provide full insight into the overall performance of a company or the industry. For instance, high R&D spending is a necessary but not sufficient condition to the development of innovative drugs. By contrast, a considerable amount of R&D may be devoted to imitation and duplication of research performed by others. Similarly, a high number of patents does not imply commercial success of the products involved. Nevertheless, a combination of all the above indicators can provide some guidance on the future path of the industry as a whole or of individual companies (BPTS, 1997).

An alternative way of looking at R&D future potential, is the extent of unmet need in medical treatments. Several conditions exist mat do not have an effective treatment The lack of effective treatments or even cures in a number of therapeutic categories can be attributed to risk, namely it is not always clear which therapeutic areas are the most promising ones. Available evidence from Japan and the US attempting to identify those therapeutic areas in which research is difficult or with few therapeutic alternatives, suggests that the highest scientific uncertainty concerned cancer, genito-urinary diseases, CNS (particularly neurodegeneration, cognitive impairment and autism) and metabolic/endocrine disorders (JPMA, 1992).

Specific areas of research that would need special support include: cardiovascular diseases; new classes of broard-acting antibiotics; treatment of asthma; and pain relief (IPTS 1997.)

The above areas reflect pressing needs the industrial or meta-industrial societies face in view of their lifestyles and epidemiological profiles. They do not necessarily reflect needs that the developing world may have. Nor is the list of'needs' complete for the group of advanced countries. Two areas, with large socio-economic impact, that remain under-developed in advanced countries because of their limited commercial potential, are drugs for rare (orphan) diseases and vaccines. In the case of vaccines, improving the quality of research and the quality of surveillance are of paramount importance. There are needs for new vaccines, including, among others, AIDS, hepatitis, tuberculosis and malaria, which could benefit both developed and developing countries. Nevertheless, stimulating R&D requires four obstacles to be overcome. These obstacles are low profit margins for industry, a potentially long regulatory approval process, a high possible litigation liability, and the existence of different immunisation and surveillance policies and practices across different countries.

The stimulation of R&D to discover new drug therapies and therapies that are not palliative but curative, is not only an issue for the pharmaceutical industry, but also an issue where public policy

could play a key role either at the national level or at the international level, through co-ordination of various types of activities. In particular, such activities may include a combination of the following measures:

- Establishing partnerships between governments, industry and academic organisations on common projects in R&D, including areas with large socio-economic impact, such as vaccines and rare diseases;
- Establishing general criteria for the identification of priorities;
- Creating a co-ordinated flow of information between governments concerning the relevant activities of different specific programmes;
- Creating networks of scientific resources for optimising strategies in vaccine research;
- Universities and research laboratories could provide the initial seedbed for basic discovery research. These, rather than private companies, could be the main beneficiaries from available government-sponsored research grants.
- Policy-makers could also set priorities for research either formally or informally, and, in this way, encourage R&D in areas where there are specific social needs.
- Collaboration among researchers and with industry is needed and should be encouraged with a view to harnessing and co-ordinating the range of expertise and facilities required for successful enterprise in such research.

4 The Dynamics of Globalisation

Health Policy and Pharmaceuticals

The broad objectives of health policy can be described as attempting to satisfy five principles (OECD, 1994): equity, microeconomic efficiency, macroeconomic efficiency, choice and quality. Governments in the developed world, and beyond to a certain extent, pledge to be subscribing to all the above objectives and list these as broad policy priorities. A closer look, however, makes clear that the above objectives often contradict each other. It is impossible to have a cost efficient system that would guarantee wide choice as well as satisfy all equity considerations. A key attribute that very often determines all others is cost and, in fact, this has become the epicentre of health policy making in several countries worldwide.

A primary target of cost containment policies in the EU has been pharmaceutical expenditure as one of the most dynamic parts of rising health costs. Pharmaceutical spending can be targeted easily and directly compared with other parts of the health economy, for instance hospital spending, or the total expenditure on salaries of health care professionals. Although all OECD countries have implemented pharmaceutical cost containment policies, the amplitude and intensity of such policies presents enormous variations across countries and is also dependent on individual Member States' industrial policy considerations for the pharmaceutical sector. At the same time that the cost of medicines has been recognised to be of major importance to payers, the pharmaceutical industry is widely recognised to be one of the most important high technology industries creating value added for national economies, contributing to exports, requiring highly trained employees because of its high R&D content, generating highly paid and stable jobs and contributing to economic growth. Pharmaceuticals is therefore an area where health policy goals confront in a most direct way those of a specific industrial interest, the pharmaceutical manufacturer. Pricing for or re-imbursement of new pharmaceutical products is thus often linked to local manufacturing and/or R&D facilities.

There also exists a fourth regulatory hurdle whose significance has been increasing over the past few years. Alongside clinical effectiveness, manufacturers now have to demonstrate that their product is also cost effective in relation to existing therapeutic alternatives. Australia and the Canadian province of Ontario explicitly require independent studies on economic

evaluation when deciding the price at which a given product will be reimbursed. The UK and France increasingly require such studies to be taken into consideration by the relevant bodies.

Until the regulatory hurdles have been overcome, the manufacturer cannot sell in the market, which effectively implies erosion in the patent term. Although patent protection is valid for 20 years, 10-12 of these are taken up by clinical testing, review, approval and pricing process, leaving only a small period in which the manufacturer can recoup the R&D costs incurred. It is therefore in the manufacturer's interest to reduce this period as much as possible in order to exercise the highest benefit in terms of sales and profits.

Issues in intellectual property rights protection

The pharmaceutical sector, more than any other industrial sector, regards patents as the most important form of protecting and commercialising technological innovation (Wyatt et al, 1985; Howells & Neary, 1995). Under the new WTO agreement, patent protection is granted for 20 years and guarantees exclusive rights to the innovator, nevertheless significant issues arise within the overall framework of protection. One is the development of biotechnology and biotechnological-derived pharmaceuticals and the extent to which life forms such as transgenic animals can be patented. The lengthiness of the review of patent applications and action by patent offices is frequently cited as an impediment to commercialisation of pharmaceutical products, since delays in obtaining a patent can slow efforts to commercialise a discovery. The adequacy of existing patent laws to protect inventions is a major concern to the extent that patent protection may be narrow and the inventor or company must provide in their application the exact products or product types that will emerge from the invented process. Other factors pertinent to the nature and scope of patent systems contribute to the creation of international differences. The costs associated with patent applications can be considerable, particularly for foreign applicants and, at times, may not be easily affordable by smaller companies. Practices of pre-grant opposition may also exist, whereby third parties can file opposition to patent applications which they believe should not be granted (pioneering inventions are often the target because of their high technological and commercial value). Finally, compulsory licensing mechanisms that ensure supply of a given product from other sources than the innovator can be an impediment to investment. There is some evidence that a favourable patent system with no compulsory licensing can lead to an increase in investment (Heller, 1995.)

Pharmaceutical globalisation and the developing world

The developing world has not been a major focus of the pharmaceutical industry and has been somewhat excluded from their view of global. This is partly due to the fact that the combined pharmaceutical market in developing countries is roughly 5 to 7 percent of the global market in terms of value. Developing countries have been largely viewed as unprofitable for the large research-based multinationals for three main reasons. Firstly, the majority of developing countries offer very weak or no patent protection. Secondly, most developing countries have weak indigenous chemical industries, which provide an adequate base for the production of bulk chemicals used in pharmaceutical production. Thirdly, developing countries have a limited ability and/or willingness to pay for new and relatively expensive medicines.

The lack of patent protection makes it unprofitable for pharmaceutical multinationals to locate in countries that would face competition by generic manufacturers operating inside the patent term without sanctions. As a result, multinational companies have left it to local generic manufacturers to produce copies for the purposes of local consumption. The World Trade Organisation agreement through the TRIPS agreement will eventually end the illegal copying of original branded medicines by establishing a statutory 20-year period of patent protection in all countries that have signed the agreement. Most developing countries have agreed to comply with the 20-year patent term set by the negotiations. Obviously, there is a transition period for several countries to bring their legislation and standards up to the new statutory requirements. Despite that, the agreement is likely to have a

significant negative impact on many countries' indigenous industries that were hitherto relying on producing copies of known in-patent products.

The existence of an indigenous chemical industry, is a necessary condition for the development of pharmaceutical products. A significant proportion of the bulk chemicals that pharmaceutical MNEs use to synthesise known medicines, are imported from a handful of developing countries. For example, India has had a long history of pharmaceutical manufacturing. India has strengths in process chemistry and is also able to produce bulk chemicals at very low cost.

Finally, in sensitive areas such as health care, particularly in nations with widespread poverty, there is a genuine concern that pharmaceuticals should be priced so as to maximise the benefit to society. This objective is in conflict with those of MNEs to maximise returns to shareholders. In many ways the issue is not whether or not developing countries can afford the latest blockbuster but is more one of meeting basic need. The needs of developing countries are not necessarily the same as in developed countries. Very often basic essential medicines are either not available or are prevented from getting to those in need by severe breakdowns in distribution infrastructure. However, conflict arises when the needs of developing countries are the same as those of developed countries and the inability to pay of the former becomes an ethical issue. An example of this is the case of AZT, a medicine used in the fight against AIDS. In such circumstances, as South Africa has argued, there may be a case for circumventing patent legislation in order to meet the health needs of poorer countries.

Summary

- The international pharmaceutical industry remains largely fragmented due to the nature of pharmaceutical business and the special characteristics of pharmaceutical markets; in terms of global market share, the largest multinational controls approximately 8% of the market; however, looking at the therapeutic and product category levels, concentration rates are very high;

- The mature markets of the EU, the US and Japan account for approximately 80 - 85% of the global pharmaceutical sales and a number of emerging markets, among them, Brazil, China, Mexico, Argentina, India, and Korea, account for another 7-8%. The developing world has a total market share in the region of 5-7%;

- Globalisation in the pharmaceutical industry is quite intense and is a result of greater competition between pharmaceutical manufacturers, falling innovation rates in terms of patents and global new chemical entities, and opportunities related to the exploitation of economies of scale internationally;

- Globalisation is also a result of national regulatory requirements, which forces pharmaceutical multinationals to adapt their products and processes to national standard setting mechanisms; although international conferences have taken place aiming to harmonise the regulatory requirements between the three main pharmaceutical markets, parts of the regulatory process still remain under strict national control (e.g. pricing and reimbursement issues) and are likely to remain so in the foreseeable future;

- New discoveries have had positive impact on human health, and pharmaceutical research has focused quite intensively on the needs of its major markets;

- Most treatments are palliative and there is need for the industry to dedicate more resources on the cure of diseases. Additionally, a large number of conditions remain under-researched, including infections, and rare diseases;

- Inequity in access to new treatments is due to the nature of pharmaceutical business, government policy, the peculiarities of pharmaceutical markets, and affordabitity/willingness to pay for such treatments.

- Regulation is necessary due to the nature of pharmaceutical markets and the agency relationships that arise, at all stages of pharmaceutical production (patenting, safety, efficacy, effectiveness, pricing, reimbursement, and post-marketing surveillance);

- Government can provide the framework in which industry can develop further; although industry (at least the large multinationals) has global perspectives, clearly, national policies may contribute to these objectives;

- The role of government can be instrumental in the development of policies that contribute to the research and discovery of new molecular entities for the benefit of patients world-wide; examples of such action are policies that encourage research in areas with large socio-economic impact (vaccines, orphan drugs, drugs for the developing world), setting national (and supra-national) priorities for research, encouraging public sector research and university-industry collaborations.

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GLOBALISATION AND HEALTH: PERSPECTIVES FROM THE PHARMACEUTICAL INDUSTRY

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Introduction

This document represents a broad sweep of views put together by David Webber of Glaxo Wellcome and Simon Gentry of SmithKline Beecham. It should not be taken to represent the 'official' views of the two companies, or that of the industry as a whole.

The pharmaceutical industry has a relatively short history. It is just over 100 years since the advent of Aspirin which in turn lead to the creation of the world's first research-based pharmaceutical companies. In that time we have witnessed a profound improvement in health for most people in developed countries. Unfortunately the benefits have not been evenly spread around the world. New avenues need to be sought to remedy this situation.

The UK pharmaceutical industry

Britain's pharmaceutical industry is one of this country's most successful manufacturing industry sectors, with a trade surplus of more than £2.4 billion in 1998. The industry's long history of pharmaceutical innovation is supported by intensive research activity. The vast majority of medicines research (71% in 1998) carried out in the UK is funded by the pharmaceutical industry and many of the major global pharmaceutical companies have established research and manufacturing bases in this country. As a result, the industry is an important employer, with around 60,000 people employed directly and many more in feeder industries. The UK home market accounts for just over three percent of the overall world market, yet the industry has a nearly seven percent share of the world's pharmaceutical production. The top destinations for UK pharmaceutical exports are the USA and France.

There is an established view that the British pharmaceutical industry is successful and that the reasons for that success are somehow inherent within our national character. This is not the case. The UK industry was successful but an industry which was dominated by 6 major companies only five years ago has now shrunk to three major organisations, the others having been taken over or having merged (Fisons and Wellcome). The success of the industry was built on a benign relationship with the National Health Service, a robust education system, the unique position occupied by the UK in the international community and a generally scientifically literate population. All of these and other factors to which success can be attributed are currently under pressure.

Consumption and expenditure on medicines

As far as its economy is concerned, the UK is fairly typical among the advanced economies. In terms of expenditure on medicines, though, the British are not notable consumers, and at £154 per person per annum spend less than a third of the expenditure in Japan, and around half of the average spent in France, Germany and the USA (Association of British Pharmaceutical Industry, ABPI, figures). While the size of the domestic market is growing, the cost increase of prescription medicines is below the rate of increase in retail prices. In real terms, medicines now cost six per cent less than ten years ago.

Research and development

Science and technology is changing rapidly, and particularly in areas which affect the pharmaceutical industry, such as cellular and molecular science, genetics, biotechnology, combinatorial chemistry, electronics and robotics and I.T. These are the direct drivers of the enormously high commitment required of research-based pharmaceutical companies today, and the relative levels of R&D investment required in this sector result in an average investment of some 15% of sales. By contrast, the average R&D spend in 1998 for most other industrial sectors as a percentage of sales - that is, the "R&D Intensity" - was between 0.4% and 2.2% (R&D scoreboard 1999).

In terms of regional breakdown of pharmaceutical R&D expenditure over time, Europe had the highest expenditure on pharmaceutical R&D in 1990. Levels converged with the USA in 1991 and since then the proportion of global R&D expenditure being spent in Europe has decreased from 33% in 1992 to an estimated 30% in 1997. The proportion being spent in the USA increased from 37% in 1992 to an estimated 42% in 1997 (source: Centre for Medicines Research International, CMR).

In the UK, total R&D expenditure is increasing. There are some signs which suggest that investment in the development area is continuing to rise while the amount spent on discovery research is decreasing, as is capital expenditure on UK R&D (CMR). It is too early to tell whether this is an established trend or an artefact e.g. of mergers or of completion of recent major capital expenditures.

Globalisation and health

The major players in the pharmaceutical industry have for some time been established as globally-focused corporations with R&D in various locations, and commercial operations in most markets. To globalised companies such as Glaxo Wellcome and SmithKline Beecham, the UK market is important for sentimental-historical reasons and for the signals that it sends out as a 'home market'. But in practice, UK operations are handled separately and in a truly global-corporate outlook the UK carries no more weight than Germany, France or the United States. This is not to suggest that pharmaceutical companies are in any sense global mega-corporations run by faceless individuals who are somehow above or beyond national juridictions. It merely makes the point that the 'globalisation' of health is not a new or particularly useful concept to the multinationals, which have sought to supply the many conflicting requirements of individual global markets, for many years. In other words the view is that health per se is, and will remain, fundamentally a local issue.

Under globalisation, what is changing is communications and information technology, which are providing far more information about global health issues. Awareness of other peoples' health challenges is higher than ever before. At the current time at least 1 billion people have no access to modern medicine at all. A further 4 billion only get patchy and inadequate access. This situation is in large measure historical, but is also due to apparent market failure - it is expensive to undertake research and those who need the medicines cannot pay for them. Various models, proposals and initiatives are being proposed and promoted by various groups and organisations. These are examined later in this document.

The focus of the rest of this document is on the following aspects relating to globalisation and the pharmaceutical industry, and represent three broad areas of the industry's current agenda:

1. Investing in R&D - why and where companies place their R&D

Pharmaceutical companies need to pursue the best R&D possible to produce winning medicines. Equally, innovation in pharmaceuticals is important for the social and the economic well-being of countries, and it is therefore in all parties' interests to have policies that support the industry's ability to innovate. There is a strong link between a nation's economic success and its capacity to carry out research of an international standard. Government investment in the public and private research base will help create new products and earn the revenue needed to maintain that investment, and thereby provide for the needs and wants of society.

Companies establish their R&D operations in a particular geographical location for a number of reasons. History or legacy still plays a major part in this - companies tend to remain where they first established their operations. Linked to this point is merger-acquisition activity, in which location of R&D is not usually a primary consideration.

In a globalising world it is appropriate to question the relevance of the concept of 'national champions' or 'home base' for global companies such as Glaxo Wellcome or SmithKline Beecham. Perhaps the idea of a national champion is out of place for international companies answerable primarily to shareholders who ultimately provide the resources for this process. But in practice most senior executives retain their historical attachments, so long as the price is not too high, and the attractions offered for moving elsewhere are insufficient.

There are two broad areas that will determine the choice of location of successful R&D, and health sector innovation, in future. These are the areas for further policy development to support, retain and encourage R&D. Firstly, the incentives for investment. One of the most important roles for Government in fostering innovation is the creation of the right fiscal and regulatory environment. Secondly, he scientific resource infrastructure available: - the labour base, physical infrastructure and an environment which support clusters of capabilities. Underpinning both of these is a sense that new types of relationship have to be forged, that get away from the simple previous lines of demarcation.

Starting with incentives for investment, the goal is for a strong European-based pharmaceutical industry serving the interests of patients and competing successfully on world markets. The following are key factors:

- Strong IP protection
- Efficient and effective regulatory system
- Supportive Governments providing leadership and a well educated workforce
- Pricing flexibility, market-driven system

Strong IP protection: The research based pharmaceutical industry exists largely because of robust intellectual property protection which incentivises individuals to make public the results of their research. There is a direct correlation between the robustness of the research based industry and the patent system. It is therefore, in our view, encouraging that the WTO have signalled their intention to seek the full implementation of the TREPs provisions of the Uruguay Round. In time this will foster new research based companies developing new technologies and approaches to a wider range of diseases, many of which are currently under-researched.

Efficient and effective regulatory system: Regulatory hurdles are an accepted reality of the pharmaceutical business. We all want our medicines to be safe, to work as we expect and to be of good quality. Already there are difficulties when one regulatory authority accepts a new medicine but another does not because of differences in models for analysing the clinical trials data. A research programme initiated on a new compound on the expectation that it will be used in patients in Europe, Japan and the United States may not be undertaken if European or American authorities refuse to grant a license.

The overriding impact of scientific and technological advance will be to put enormous pressure on the regulatory bodies. Financial pressures and patient advocacy have contributed to the pressure. The potential increase in the number of drug candidates will eventually translate into a huge rise in the number of applications for new drugs. The complexity of the dossiers supporting these applications will also increase, as the new fields of research start to yield fruit - for example the inclusion of sophisticated surrogate markers such as SNP maps for judging efficacy. And the new gene and protein therapies are bound to raise medical and ethical issues outside the previous experience of the regulators.

Recently governments around the world have begun imposing new hurdles. These are nominally designed to prove the cost/benefit of new medicines except that there are wide differences of opinion regarding what costs are used to measure the burden of disease and the impact of the drug. In England and Wales this body is called the National Institute for Clinical Excellence (NICE). Similar bodies exist in many developed countries, but increasingly their methods and models are being questioned. Are disability costs to be taken into account? Are costs resulting from the inability to work to be taken into account? Many poorer countries grant marketing authorisations based on whether European or American licenses. What happens if Europe refuses to grant a license on the basis of its analysis of the cost/benefit ratio? Are patients in other countries to be denied access because of the idiosyncrasies of the European health and social security systems?

The Viagra and Relenza decisions have brought into the open in the UK the issue of rationing, based on the political will to fund certain types of treatment. It exposes clearly the myth of a comprehensive NHS providing whatever treatment is justified by clinical need. NICE, the Selected List Scheme, and other mechanisms to restrict the uptake of new technologies in the NHS are often positioned as being (at least in part) driven by desire to improve "quality". However, in truth, they are all fundamentally driven by lack of money in the NHS system. This situation is likely to increase over time, driven by demographic pressures; rising societal expectations of what the NHS should provide; and a continuing disparity between public and private sector levels of pay, leading to NHS staff problems.

For the industry, it raises a number of issues, based around our traditional fact that lack of NHS reimbursement equals commercial failure for any product. What is the possibility, in the absence of NHS reimbursement, of pharmaceutical companies being able to access a viable private market in the UK? What is the relationship between the location of a company's headquarters, the home market, and global success of new products?

As stated previously there has been a slow but steady migration of R&D investment to the US over the last decade. The relevance of this is clear: companies are duty-bound to orientate and serve their most important customers.

Supportive Governments providing leadership and a well educated workforce: Moving on to the third of the key conditions for encouraging health sector innovation. These are the resources available, in terms of infrastructure, and the labour pool, and the quality and quantity of both

of these things. Quality scientific and technological education at primary, secondary and tertiary levels are critical. Attractiveness to foreign talent is a particular feature of the US, where the science base is continuously refreshed by a large intake of new scientific talent from countries like Singapore and Taiwan. Look at this years' 4 science Nobel prizewinners. None of them was born in America, but three of them work, or worked there, drawn, presumably by better laboratory facilities and better salaries.

By no means least of these things is public acceptance of science. In the UK, the public tends to judge the value of scientific advances by their end purpose, and scientific developments aimed directly at achieving improvements in human health are valued. However, there is scepticism and mistrust in government and business alike, and the scientists trusted by the highest proportion of people are- incredibly - those working for environmental lobbying groups.

Lastly, basic infrastructure must not be overlooked. Earlier this year, Pfizer warned that it would not be able to continue to grow at its present rate in the UK unless improvements are made to South east Kent's infrastructure. Its site at Sandwich needs better road, rail and bus links, hotels, executive housing and schools. The UK government disappointed many by turning down the Wellcome Trust's application to build a £100 million biotech park next to its genomics complex in Cambridge - only weeks after repeating its pledge to promote the formation of biotech clusters. The Trust sought permission to expand to provide space for an 'incubator' or innovation centre - for growing firms being spun off, or for more mature companies wishing to maintain a connection on site.

Pricing flexibility, market-driven system: An important incentive for pharmaceutical companies would be a free, single market based on competition and choice. Such a system exists in reality only in the United States, which has rapidly overtaken Europe largely as a result of its free market. Some may even agree that a means to accomplish this is through the progressive deregulation of pricing systems - on the basis of collective confidence in the competitiveness of the pharmaceutical market. The current situation of fragmented markets introduces many inefficiencies, although everyone recognises the impediments to change.

At the moment of course there is not a single market, and price controls in many countries lends itself to parallel trade - to the benefit of the abitrageurs, rather than for the benefit of patients or the public purse. In a different example, Japan, government-mandated cost control mechanisms have over time held back the competitiveness of the country's domestic pharmaceutical industry, and discouraged inward investment in pharmaceutical innovation. The ultimate result is weakened domestic companies, and chronic trade deficits for Japan in pharmaceuticals as illustrated previously.

2. Access to Medicines

Patterns of disease are closely linked to the stage of economic development of a country, through the basic requirements of sanitation, proper nourishment and healthcare infrastructure. Pharmaceuticals play little meaningful role in the absence of this basic infrastructure - a point which is often neglected when blame is being allocated. In many cases, the necessary medicines (WHO Essential Drugs) are cheap, off-patent generics but these remain unavailable due to local barriers. The globalisation of communications and the media expose these iniquities much more effectively and quickly than ever before. The basic solutions remain the same, however - the need to address chronic under-investment and healthcare infrastructures. In this section we examine firstly, the problem of poorer countries inability to access new, innovative treatments and secondly, the problem of a lack of research into diseases in developing countries where there has been an apparent 'market failure'.

Current contributions of the pharmaceutical industry to global health

The greatest contribution made by the pharmaceutical industry to health is in the developed markets, through vaccines and therapies for the diseases prevalent in these markets. This is not to suggest that developing countries are neglected, although according to WHO, in 1992 the research-based industry contributed 50% of total global R&D investment in health care, but less than 5% of that was spent on diseases specific to less developed countries. This does not detract from the major drug discoveries and developments produced by the industry for serious diseases such as malaria, TB, hepatitis B, river blindness, meningitis, leprosy, sleeping sickness, lymphatic filariasis and trachoma. Also, such an analysis ignores the important contribution that globally-applicable drugs and vaccines for infectious and non-infectious diseases make to advancing public health in developing countries, including drugs for respiratory infections, STD's, tobacco addiction, heart disease and psychological disorders.

Nevertheless, new mechanisms and incentives to encourage the industry to channel more resources into diseases specific to developing countries are needed. Antibiotic resistance, the ageing of populations, the need for further improvements in current therapies, the inequities of the lack of access to quality medicines, etc. demand greater attention. The focus here is on the factors that deter companies from making these investments and policy options to offset these disincentives - but this must be seen in the broader context outlined above. At the most basic level, for any new drugs to reach the targeted patient populations, access barriers must be eliminated.

It is worth observing that the pharmaceutical industry by virtue of its success is often targeted for adverse press coverage. An example of this is with respect to so-called 'lifestyle' medicines. In fact there is no universally accepted definition of 'lifestyle' medicines, and that they can not represent a separate, objectively definable category. Medicines do not fall into two distinct boxes - for serious and non-serious conditions. Rather they fall across a continuum and even those which may be considered non-serious are likely to be viewed differently by the sufferers themselves. The search for a scientifically or clinically-founded definition is therefore misguided because any resulting definition is soon surrounded by exceptions. Obesity is a good illustration: chronic obesity is a major cause of morbidity and mortality, and is a worthy target for pharmaceutical development. The potential 'social' use of anti-obesity drugs is the area that receives all the attention, however.

Access to new patented medicines

For two of the leading global developing country diseases, tuberculosis and malaria, adequate treatments actually exist and in a developed market, individuals with these diseases can reasonably expect treatment and cure. In less developed markets, the practicalities of treatment, and the costs involved, mean that treatments are often not available.

The point here is that what is being globalised is not so much the disease, as the public perception of the local effects of the disease. This is a fundamental distinction because it identifies that the first requirement is to address the economic and infrastructural considerations that apply. Research into new medicines, drug donation programmes and other activities of pharmaceutical companies are useful but secondary activities for developing markets.

Some observers of the industry believe that the answer for poorer countries is for them to "Compulsory License" the drug i.e. unilaterally grant a local manufacturer the right to produce the drug whilst paying only a small royalty to the patent holder. The difficulty with this approach is that it will further discourage companies from doing research into diseases which

are predominantly suffered in poorer countries. Why conduct research into Malaria if the moment you create and effective treatment every country issues a compulsory license?

The argument against patents is further undermined by the fact that the industry does not tend to have global prices. Most, if not all, companies operate "differential prices" which means that lower prices are set in poorer countries with higher prices in wealthier countries. In effect, it is the developed world which pays for research and development of new drugs, and which subsidises lower prices for poorer countries. This informal system ensures that research continues and enables the poorest countries to access modern medicines.

Some activists are encouraging governments to demand parallel importing of drugs from other countries where the price is lower. If this became the global norm prices would in fact rise for the poorest and only result in lower prices for the rich as the price averaged out. In addition, supply distortions would mean that medicines destined for poor countries would be re-routed by the middlemen back to the countries in which the margins were greater. This has already occurred in some European countries where the Single European Market means that drugs can be bought in say Greece for much lower prices than in say Germany. This has lead to supply problems in Greece. It is in all our interests to protect differential pricing by combatting parallel trade.

Industry is actively involved in discussions with governments of developing countries, Non-Governmental Organisations and activists on potential solutions to the problem of access by the poorest to new medicines. It is worth mentioning however that very few of the drugs on the World Health Organisation Essential Drugs List are still under patent. Drugs which have gone off patent can be manufactured by anyone and the price is usually very low. We should also repeat that price is only a small componant of the challenge: much more complex and vexing is the challenge of getting the infrastructure to deliver the medicine appropriately.

Research into diseases where the market mechanisms may not apply

At the moment, insufficient incentives exist to further motivate global research-based pharmaceutical companies (the primary actors in new drug development) to invest in the research and development of new treatments of neglected diseases. In order to survive, the R&D-based industry must cover its high costs of drug discovery and development. The expected returns from sales in the poorest developing countries are generally insufficient to cover the risky and expensive R&D process.

Sales revenues from developing country-specific products are expected to be low because:

- Limited public and private financial resources are available in developing countries for pharmaceuticals in general and new innovative drugs in particular.
- Where intellectual property protection is poorly enforced, research companies risk losing market share through sales of counterfeits, fakes or copies and parallel traded products from lower-priced markets.
- Price controls often exist and discourage R&D investment in any market. In developing countries, they also prevent companies from using differential prices within a country to earn back some of their costs by charging more to the wealthier private market than to the cash-strapped public sector.

On the cost side, the average total costs of R&D for developing country-specific products are expected to be as much as for products in other disease areas. So, given the choice, companies pursue investments in disease areas with growing demand and market in countries that enforce intellectual property protection. Indeed, over time, as R&D costs continue to escalate and the

amount of time companies enjoy market exclusivity for new product declines with more rapid entry of follow-on products, companies' investments in developing country-specific disease areas are also likely to continue to decline in the absence of policy intervention

To increase industry's participation, steps must be taken to reduce the costs and risks of R&D and secure (increased) demand. For research-based companies, the enforcement of intellectual property protection is a necessary (though not always a sufficient) condition to encourage developing country-specific investment. One strategy is to offer companies incentives such as those included in orphan drug legislation. This package would include tax credits, research grants, guaranteed purchasing and market exclusivity rights.

The approach adopted for identifying possible incentives that would stimulate R&D in neglected diseases was to look at ways of changing the balance between R&D investment and subsequent returns. This is likely to be through incentives which may offset R&D costs, and/or measures which may improve market viability. It was the working assumption that for senior management to countenance the allocation or diversion of R&D funds to a neglected disease requires that the resulting incentives are broadly equivalent to the rewards anticipated from conventional areas.

The objective is to establish whether a 'structural' solution can be found, and does not preclude approaches, which are based on charitable contributions from companies and other concerned groups. It should be noted, however, that many Non-Governmental Organisations are opposed on principle to the idea of charitable donations becoming the mainstay of the health services in developing countries. They rightly point out that beggars are rarely chooses and that in the longer term developing countries need to become consumers able to demand and obtain the same privileges which consumers in developed countries expect.

Various incentives have been considered. There are clearly financial, practical, and other factors which come into consideration and which limit the number of realistic alternatives available. ~ ~"

Conclusion re 'offsetting R&D costs'
Based on a review of current legislation and evaluation of the instruments for offsetting R&D costs, it is concluded that the cost of R&D per se is not the root cause of the market failure to undertake sufficient R&D in neglected diseases. The key problem is more one of insufficient market attractiveness or viability. As a consequence of this, it is concluded that none of the instruments for offsetting R&D costs provides sufficient inducement to divert funding from other programmes into neglected diseases. Consistent with this is the view that current legislation - such as the Orphan Drug Act - is more effective in stimulating R&D more for small (e.g. biotech) companies, rather than for the pharmaceutical majors.

This conclusion notwithstanding, some of these incentives remain valuable for the purposes for which they were designed e.g. tax incentives to encourage the location of R&D facilities. Furthermore, some of these instruments may have a part to play as part of an overall package of incentives, and this recommendation is carried forward.

Conclusion re 'developing market viability'
A number of the incentives to market viability are potentially attractive, and could be effective in encouraging R&D in neglected diseases. Particularly attractive are 'roaming' patent extensions or market exclusivity, and guarantees on in-market price or size. However, there are reservations about the feasibility of these approaches in terms of their practicality and their acceptability to governments. For example, it is easy to foresee the criticism that the

pharmaceutical industry is merely looking for mechanisms to increase profits by use of a 'corporate subsidy'.

The key underlying presumption is that in the final analysis, the developed countries will agree to be the payers with less developed countries being the beneficiaries. This remains to be agreed.

The idea of a guaranteed market has been floated by Prof. Jeffrey Sachs, director of the Centre for International Development and Professor of International Trade at Harvard University. He envisages that rich countries would make a firm pledge to purchase an effective vaccine e.g. against AIDS or malaria. A guaranteed minimum purchase price - say $10 per dose - would be promised for a vaccine that meets a minimum profile, with possibly a higher price for a better product. It is presumed that such a pledge would galvanise research into vaccines for such diseases. The recognition of the value and importance of viable markets as the key driver of medicines development is welcome, and the fact that it would be a joint and multi-party approach. Thus the emphasis placed on the payer being the rich countries (with a proportionate contribution from the recipient countries) is welcome. This recognises that it is not the sole responsibility of pharmaceutical companies to tackle and fund the problems of neglected diseases. If achievable, there is significant potential benefit in the involvement that would be necessary from many different stakeholders, including governments, the pharmaceutical industry, and the WHO. The World Bank may have an important role to play in providing/guaranteeing 'interest free' loans over the long periods necessary.

Problems and issues

Both problems of access to currently available medicines and problems of stimulating research into diseases primarily affecting developing countries depend on the central question of whether or not governments and their voters will pay. Governments of the developed countries would be required to allocate future funds or put money aside in escrow to pay for a successful product. Changes of government during the decade or so required to develop new medicines may result in differing emphases. Government's willingness to commit to these schemes in the face of competing demands on government expenditure needs to be explored.

- A guaranteed price is not automatically a viable market.

A guarantee on price is not a guaranteed market, the difference being the issue of non-financial barriers to access to medicines. What proportion of Africa's 25 million newborn children would actually be vaccinated if an inexpensive vaccine for malaria existed? Whilst it should be assumed that these barriers will be overcome, additional resources and effort would be needed to achieve this.

- Competition or guarantee?

The issue of whether the guaranteed price is offered on a competitive basis, or on a 'winner takes all' basis, has significant implications to the overall feasibility of the scheme. On the basis of normal competition, company R&D directors will judge the market share that they might expect to achieve, and that is material to their judgement as to whether a particular programme is worth pursuing. A 35% market share of a $250 million market is much less attractive compared with one where there is market exclusivity. On the other hand, a 'winner takes all' approach presents problems. This could discourage competition, and any collaboration between companies could be misrepresented as anticompetitive collusion.

- Scientific and technical limitations.

Current scientific knowledge means that diseases vary in their tractability. For example, it may be argued that the reason that no AIDS or malaria vaccine is available is due as much as

anything to the difficulty of finding an appropriate target for the vaccine. This is relevant both to specific neglected diseases, and to the question of how generalisable a guaranteed price approach might be.

- Vaccines are different to other medicines.

Prophylactic vaccines differ from other medicines in a number of respects, and further work is necessary to understand how generally applicable a guaranteed price model would be. For example, many vaccines are effective in a single shot, and the unit cost of manufacture is often low. This cost structure permits the idea of a $10 a shot guarantee, but this is not necessarily applicable to other types of medicine.

- Other approaches?

The preceding comments focus on the idea of a guaranteed minimum price. Alternatives considered include the following, but these ideas are considered impractical for the reasons shown.

- Guaranteed market (i.e. $250 million p.a. for 25 million doses of vaccine). Unlikely to be agreed to by donor governments?
- Other large or long term contracts would be difficult to construct with the necessary guarantees, many years ahead of their implementation. Unlikely to be a believable inducement to pharmaceutical companies to undertake R&D?

In summary, there would appear to be clear difficulties in price guarantee schemes. However, these difficulties do offer the opportunity for the pharmaceutical industry to engage alongside other interested parties such as governments, academics and the WHO to see whether they can be overcome.

3. New relationships between stakeholders (and the role of donation programmes)

Given the large number of^changes that are occuring in political, economic, scientific and technical areas, it is right that all parties should look for new ideas to address the type of problems described above. One approach is to further develop public/private partnerships. These may be focused on achieving various mutual objectives, for example in developing the science/technology infrastructure, or on research in a particular disease area, or on the supply of medicines to indigent populations.

There is a strict limitation however to the ability of the pharmaceutical industry to underwrite financially substantial programmes, and the search for alternative funding mechanisms is an important part of the dialogue. In this context it is worth observing that donation programmes by pharmaceutical companies, whilst much appreciated by all parties, are not infinitely extensible and are unlikely to satisfy all patient needs. In this section a few examples of new collaborations are described.

Medicines for Malaria Venture (MMV)

Under the new Medicines for Malaria Venture (MMV) public and non-governmental organizations provide money for a capital venture fund (managed by an advisory board) to finance the discovery phase and early clinical trials for a number of projects targeted at producing anti-malaria medicines. Private industry will contribute gifts in kind (access to combinatorial libraries, high through put screening systems, laboratory space and so on). The MMV board will seek to license out successful compounds to pharmaceutical companies to manufacture and market.

Academic institutions (sometimes teamed up with pharmaceutical companies) will compete for the funds and it is anticipated that the winning projects would be housed in academic institutions though some may be pharmaceutical company based. The most promising development candidates will be fed into a 'virtual' drug development unit, also financed and administered by the MMV. This unit should be capable of taking compounds through to registration but its management would seek industrial partners for the final phases of clinical trials, and for the manufacturing and commercialisation phases. Such partners might either be large or small pharmaceutical companies.

In the short term, MMV seeks to create a portfolio of properly funded and adequately manned projects on par with industry-run discovery projects. In the long term, once fully operational, the goal would be to secure the production on average of one registered new anti-malarial drug every 5 years.

'Action TB'

Glaxo Wellcome launched Action TB in June 1993 with the goal of developing new therapies for the treatment and prevention of multidrug resistant tuberculosis. Years of neglect by the research community and difficulties in handling the organism combined to slow efforts to discover and develop new treatments. The initiative initially received funding of £10 million for five years. Glaxo Wellcome has recently committed a further £10 million to take Action TB forward for another five years. The programme's goals are to deliver a new medicine that will either shorten treatment duration or effectively tackle MDR-TB and a vaccine that provides universal protection.

In the long-term, a vaccine may well prove the most effective way to control and possibly eradicate TB. However, under current conditions, developing a prophylactic vaccine to prevent infection is probably unrealistic. Until reliable surrogate markers of infection are available, clinical trials of such a vaccine would take at least 15-20 years, an expensive and time consuming proposition. A more realistic approach, in the short-term, would be to seek a therapeutic vaccine, or a vaccine that prevents reactivation of latent disease.

During phase I of the Action TB programme, significant advances were made in the areas of target identification, development of molecular biology tools and an improved understanding of the immunology behind the host-pathogen interaction. This, combined with the completion of the project to sequence the M. tuberculosis genome by the Sanger Centre at the Wellcome Trust Genome Campus in Cambridge, UK, means that Action TB is poised to make real progress towards the twin goals of a truly novel new therapy and an effective vaccine. In its second phase, Action TB has initiated a major collaboration with the aim of developing a TB vaccine. The Howard Hughes Medical Institute researchers at Albert Einstein College of Medicine are providing expertise in manipulating the Mycobacterium tuberculosis genome in order to generate rationally attenuated strains as potential vaccine candidates.

Edward Jenner Institute for Vaccines Research

The Edward Jenner Institute for Vaccines Research was established in 1994, a few years before Jenner's bicentenary, between three Government departments - the Medical Research Council, Biotechnology and Biological Sciences Research Council and the Department of Health - and Glaxo Wellcome.

The company provided £10 million in capital funding to build and equip the Institute at Compton in Berkshire. It has also guaranteed £3 million pa for 10 years towards the running costs, a sum which is matched by the partners. This provides security for the Institute to pursue its scientific goals in the early years. Besides finance, GW also contributes scientific input and management. The Institute is set up as an independent establishment, registered as a

charity, employs its own staff, but also engages in collaborative projects with groups in universities and research institutes. It is entitled to own and expected to exploit any intellectual property it develops so that royalty revenues make the Institute self-financing hi the future. This represents a true partnership - where a company and government have invested resources in almost equal measures, and share the risks. Action TB currently funds 35 researchers at a number of institutions.

SNP consortium

The SNP Consortium (SNP - single nucleotide polymorphism, or 'snip') is a collaboration between research-based multinational pharmaceutical compames, academic centres and The Wellcome Trust. The mission of the SNP consortium is to advance the field of human medicine and the development of genetic based diagnostics and therapeutics through the creation of a high-density single nucleotide polymorphism (SNP) map of the human genome. The specific goals are to:

- Identify up to 300,000 SNPs and map at least 150,000 distinct SNPs within two years
- Place the SNP map in the public domain to make it freely accessible to biomedical researchers worldwide

In this case, the Wellcome Trust and industry are contributing the finance and therefore bear the risk. The academic centres are doing the work to generate the maps. The benefits are shared beyond the immediate consortium because the resulting SNP map is placed in the public domain. So any organisation or individual has equal access to all of the information, and can use it to make further discoveries which may then be patented and exploited for financial gain.

HIV Drug Access Initiative - UNAIDS

Following several months of discussion between companies and UNAIDS, the first phase of the HIV drug access initiative was launched in November 1997. Pharmaceutical companies undertook to provide subsidised prices for diagnostics and drugs, and partial funding to develop public sector health infrastructure.

UNAIDS provides technical support and advice to the pilot countries (Chile, Cote DTvoire, Uganda and Vietnam) to build capacity for diagnosis and treatment of HIV/AIDS. It also facilitates the relationship between governments and the private sector. Governments have to approve the collaboration, provide the leadership, policies and additional resources to set up the necessary infrastucture.

Phase 1 seeks to address health infrastructure barriers - public health facilities, professional training, drug distribution channels, and counselling support for patients. In addition the objective is to create collaborative relationship between governments, donors, healthcare providers, NGOs, pharmaceutical companies and patients living with AIDS.

Progress has been slow, but situation analysis and next steps have been drafted in two of the four pilot countries (Cote dTvoire and Uganda). However, the initiative has been stimulated by the demonstration in Thailand that zidovudine, administered to HTV +ve pregnant women could halve the transmission of the virus to their babies.

This represents a manageable and worthwhile intervention for developing countries. So in an initiative developed with WHO (technical support), UNAIDS (coordination) and UNICEF (impementation through in-country staff), and announced in July 1998.

CHANGING MEDICAL TECHNOLOGY: COMPLEXITY OR CHAOS?

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People will not accept modern medical knowledge unless those offering it show an understanding of local knowledge and a sensitivity to cultural norms.... Appropriate institutions, whether public or Traditions and other social factors influence a community's absorption of medical knowledge. private, are often required to facilitate [knowledge] acquisition and adoption. (World Bank 1999.)

The broad spectrum of medical research and development (R&D) undertaken this century has had a profound impact on global health. Although the sources of progress were highly concentrated in a small number of developed countries, including the UK, the new medical technology that has emerged is often of global as well as national significance. In the next century we suggest that the contribution to global health of UK medical R&D will be of increasing importance as new communications technology raises connectivity and the policy push for evidence-based medicine codifies knowledge and in so doing facilitates its transmission. Conversely, global connectivity will increase the influence of international medical knowledge on UK healthcare providers and patients. However, these effects will only be significant if the social context in which medicine is practised is fully understood. This social context arises at the level of individuals, organisations and institutions. Medical R&D is shaped by, and shapes the context of its adoption. These processes are complex but must be understood if medical knowledge is to reach its full potential.

The medical technology created by R&D embodies a broad spectrum of constantly changing and evolving medical knowledge. The implications of the dynamics of medical knowledge for the delivery of clinical care at a national and a global level have always been significant. Indeed the national embeddedness of these dynamics has at times been a barrier to global knowledge flows. However, in recent years, several technological developments have arisen which have the potential to dramatically change the nature, use and flowT of medical knowledge, particularly in a global context. Of the many changes that might be discussed, we have selected the rise of evidence-based medicine, the human genome project, and the use of information technology for the transmission and integration of medical knowledge for consideration in this paper. Each of these developments highlights the growing links between the UK base of medical knowledge and the global healthcare environment.

In this chapter we identify the broad types of medical knowledge that are relevant in healthcare and discuss how medical knowledge is changing and growing dramatically. We start by sketching the types of medical knowledge that currently exist and how each of these bodies of knowledge is changing as a result of scientific invention, technological change and institutional or managerial innovations. We then assess how changes in different types of medical knowledge changed knowledge flows. These changing knowledge flows arise because once disparate and unconnected knowledge suddenly has a value when brought together. To illustrate the discussion of knowledge flows, we make a brief assessment specific shifts in the use of medical R&D in the complex globalising system of medical knowledge. A number of brief case studies are given that are illustrative of the possibilities for healthcare that arise as traditionally disparate bodies of medical knowledge converge. These examples illustrate the complex forces that will shape changing knowledge flows. We suggest that these forces will have an impact at the individual level, but also on the organisations and institutions that are engaged in and support healthcare. Our conclusion is that if these complex multi-level interactions are ignored, the potential benefits of new medical knowledge will not be felt either in a national or international context. The implications of these trends for UK policy makers, the Health Service, and our ability both to disseminate UK best practice and to integrate best practice from abroad are outlined at the end of the paper.

A central argument of the paper is that it is critical for both policy-makers and practitioners to consider the developments in the different bodies of medical knowledge and their complex inter-relationships. Equally important, and often forgotten, is the fact that developments in medical knowledge, whatever their source are diffused within a complex world of clinical practice. This often nationally centred clinical world is being increasingly forced to interact in a more global clinical context. While this presents opportunities, its also represents a significant challenge to UK healthcare. An understanding of the subtle and varied ways in which clinicians practice, as well as what influences clinicians to change, is therefore vital for domestic and global policy intentions to be translated into practice.

What Types of Medical Knowledge Exist?

The influence of medical knowledge on healthcare is often narrowly described in terms of the impact that new medical technologies might have on the range of options available to physicians. These medical technologies are essentially a series of artefacts such as the drugs, devices, protocols and procedures. However, defining medical technology in this way ignores the dramatic reconfiguration of medical knowledge and knowledge flows that will undoubtedly be necessary for the new medical technologies to fulfil their potential. This is clearly illustrated by new genomic technologies that require knowledge of the human genome be brought together with population and patient histories if the promise of the science is to be delivered. The human genome example also raises the question of the nature of the patient-physician-researcher relationship and the ways in which such relationships may be transformed by genomics. Equally, these relationships will also be subject to change because of the developments of informatics and evidence-based medicine. A narrow focus on medical technology would not allow us to explore these crucial issues; rather it confines us to developing a shopping list of technologies. While we start with such a list of medical knowledge this serves only as the basis for further analysis.

Current medical knowledge can arise from academic disciplines such as the life sciences, engineering, and information science; from people such as physicians, public health specialists, patients, and managers; and from databases on diseases, populations, families, and histories. Medical knowledge therefore incorporates people and what they know as well as databases and the knowledge contained within them and the various disciplinary bodies of expertise. It would be naive to suggest that listing these sources of medical knowledge is the end of the complexity. Each source is shaped by a complex process of knowledge generation, a particular social context and organizational culture.

Downie and Caiman (1994) differentiate between three types of medical knowledge: knowledge 'that' (factual information), knowledge 'how' (practical skills) and knowledge 'by acquaintance' (the moral dimension of attitudes and value judgements). The lessons from such studies is that approaches to medicine are often replete with unresolved technical complexities and that in reality, as clinicians practise they draw on more simple models based on fewer technical and scientific principles.

Patients, managers, scientists and technologists also interact in this complexity of knowledge generation. For this range of users, a useful framework for categorising knowledge is not through "subject" boundaries or from a single perspective but rather by the degree of knowledge codification. Following Nonaka and Takeuchi (1995) we can think of knowledge lying along a continuum from codified to tacit. Codified knowledge is that which can be easily articulated and shared. Tacit knowledge is more difficult to articulate or capture fully in text, it can often only be transferred through traditional routes such as apprenticeships (Polanyi, 1958). A considerable amount of medical knowledge is codified - case histories, large population studies, categories of medicines and medical devices - shared through medical journals, pharmaceutical literature, lectures etc. and therefore widely available to the many stakeholders in healthcare. Indeed the use of journals and paper publication has been a traditional method of sharing codified knowledge among scientists and physicians for over 500

hundred years. More recently, reductions in the cost of information storage and transmission have made it much easier to share codified knowledge among larger numbers of people including patients who have access to information over the Internet from a growing range of web' sites. This has introduced into medicine greater incentives for knowledge codification in much the same way as they have entered other knowledge-based sectors of the economy. However, much medical knowledge remains complex and hard to codify, and there is some reluctance to make available to patients newly codified but still highly specialised medical knowledge.

Medical knowledge of different levels of codification can be thought of as encompassing a number of distinct but overlapping bodies of knowledge: disease patterns and patient information; scientific knowledge; technical and infrastructural knowledge and the knowledge of clinical practice.

Complex Changes in Flows of Medical Knowledge

The brief discussion of the different elements of medical knowledge serves to highlight the ways in which medical knowledge is changing. However, change *within* the different identified bodies of knowledge are relatively straightforward to create and subsequently manage. In contrast, many of the most significant changes that will arise in healthcare in the twenty-first century will arise as different bodies of knowledge collide, are integrated in new ways and are continually exchanged. Any change in patient knowledge will influence the other bodies of medical knowledge and the way in which the traditional owners of the knowledge interact to promote knowledge flows. The ways in which knowledge might collide are explored in this part of the essay.

The table below highlights the way in which changing knowledge flows are arising in three different areas: the Internet and the Human Genome Project, and Evidence-Based Medicine. Each can be considered within an UK context but also has an important international dimension and implications for the globalisation of healthcare.

	Technical Knowledge	*Scientific Knowledge*	*Knowledge of Clinical Practice*
Source of change	**Communications & the Internet**	**Growing understanding of the Human Genome**	**Codification of Clinical Knowledge**
Influence on Knowledge Flows	Rapid sharing of medical knowledge across institutional & national boundaries Highly informed customer or patient, using information from global sources.	Genetic-basis of disease, gene therapy, population genetics Demand for use of genomics information e.g. genetic testing with possible access to international resources	Rapid generation and dissemination of guidelines for treatment of specific conditions Growing desire to standardise medical practice & share it rapidly

For each example, we consider some of the organisational and institutional changes that are taking place to facilitate knowledge flows. We also highlight areas in which more could be done and outline a brief policy agenda for action for the main players involved.

Case One: Communications & the Internet

Over the past two decades, there has been a growing awareness of the importance of the changing technical knowledge of communications and information processing. Indeed, medical knowledge flows are likely to be facilitated by rapid advances in communications technology and thus we focus our attention on changing technical knowledge - the Internet and other forms of connectivity - that will itself improve medical knowledge flows. Growing connectivity provides a conduit for existing medical knowledge, but it also allows us to share new bodies of knowledge and render them more valuable in the process.

In general, information technology firms have shaped these new patterns of knowledge exchange, with only limited experience in the healthcare sector. These often-fledgling businesses are continually arising, each with different models of the knowledge flows that can be facilitated through information technology.

CareMonitor – Healthcare, IT & the Patient

US firm CareMonitor provides web-based software that connects healthcare providers directly to consumers in their homes for monitoring, education, and support of lifestyle changes that are necessary in response to illness.

All a patient requires to connect is a regular phone line and a WebTV or an Internet enabled PC. The consumer can view today's schedule, enter values for assigned orders, and answer health questionnaires. To facilitate its application in the home, CareMonitor has linked with WebTV, the leading supplier of set-top boxes that permit Internet access through the use of any television set with a standard phone line.

CareMonitor, based in the US is just one example. As the Box describes, it is trying to bring a range of technologies together - both hardware and software - to shape the way in which patient information flows among patients, physicians, healthcare institutions and insurance companies. Other firms have other patterns and combinations to shape the flows of patient knowledge.

However, patients also have a role to play in the increasing use of IT and the Internet in the flow of medical knowledge. Traditionally, the GP has been the provider of healthcare knowledge. Recently, the Internet and particular on-line medical information services - including those from Universities - have been important in patient's decision-making. Thus the Internet makes it possible to bypass typical conduits of medical knowledge and gather information independently and over national boundaries.

However it is only recently that healthcare organisations have chosen to address and engage these challenges directly rather than be the recipients of new communications technology:

"after several decades of development of the disciplines relating to the application of modern telecommunications to the requirements of public health, we have entered a new era in which the initiative should come from those responsible for public health rather than from suppliers of technology" (Dr Hiroshi Nakajima, Director-General of WHO)

DOLPHIN

Data On-Line for Population, Health & Nutrition (DOLPHN), is an interactive program that gives users access to international data in an easy-to-use format. Data for this tool are standardised and drawn from a variety of sources, including Demographic and Health Surveys, WHO, UNICEF, and other UN agencies, the U.S. Bureau of the Census, and the World Bank.

The initiatives in the health sector are largely focused on creating new information processing systems to bring previously dispersed information together. The NHS is accomplishing this through its Information Strategy that includes a "cradle to grave" computer health record held in a single file -including birth registration, family doctor and hospital treatments to death. However, this and other activities lead to specific concerns of the type described above: reputation, security and standards.

The British Medical Association has stated its worries over patient confidentiality in the NHSNet - a NHS information network that forms part of the plans for managing patient information. This issue was tackled directly by the Caldicott Report. The issue of information standards - essential if knowledge of patient information is to be used in a wider context and in conjunction with scientific knowledge, is being addressed through a wide range of activities:

- The DOLPHIN programme "described above is an initiative of the World Health Organisation and the USAID to increase information use.
- The NHS Information for Health strategy aims to address a number of information-based issues: a National Electronic Library for Health will contain information on the latest medical advances; Electronics Health Records will be held using an agreed security model and Security Protocols; further debate on the format for reliable, consistent and automated data.
- In the United States, the Consumer Health Information Group of the Department of Health and Human Services is assessing the policies for a National Information Infrastructure and engaging in debate over information standards and data exchange.

There is another possible arena in which knowledge flows can be facilitated by information standards and higher connectivity and that is telehealth and telemedicine. Telehealth is understood to mean the integration of telecommunications systems into the practice of protecting and promoting health. Telemedicine is the incorporation of these systems into curative medicine. These important concepts have widespread applicability within the UK and also in a more global context where they facilitate the flow of medical knowledge beyond the traditional boundaries of the mobility of the physician. In a global context, the potential of telemedicine is increasingly recognised:

WHO fully realises that the rapid development of modern telecommunication technologies presents countries with a unique opportunity to improve the health of their populations...Developing an adequate and affordable telecommunication infrastructure can help to close the gap between the haves and the have-nots in health care. (World Health Organisation 1997.)

However, building on our observations in Part I of this paper, difficulties must be recognised associated with first disrupting the traditional conduits of medical knowledge - the personal interaction between in the physician and the patient - and second bringing medical knowledge from a different cultural context. The World Bank notes this potential problem when it states that:

Traditions and other social factors influence a community's absorption of medical knowledge. People will not accept modern medical knowledge unless those offering it show an understanding of local knowledge and a sensitivity to cultural norms.... Appropriate institutions, whether public or private, are often required to facilitate [knowledge] acquisition and adoption. (World Bank 1999.)

In the UK context these issues represent less of a challenge. Nonetheless, progress in telemedicine has been limited, perhaps because the demand for expertise can be met more easily through the traditional organisation of medical knowledge flows. However, telemedicine, like other forms of information-centred medical practice will require information standards that are as extensive and sophisticated as the new knowledge is to healthcare. In the past, information was exchanged on a smaller scale, or in the context of clinical trials which did in fact define sophisticated protocols for information exchange and comparison. However, if healthcare institutions are to be provided with software systems for data management at a reasonable cost, then standards are critical. They also facilitate information sharing and make security and other institutional challenges such as verification, easier. Therefore, policy actions in the realm of information and communications technology ought to include:

- Creation of a nationally or internationally recognised quality mark for medical information available over the Internet to help patients distinguish appropriate sources of information more clearly.
- Standards for the recording of a simple but comprehensive range of patient health criteria to facilitate data exchange and detailed comparative analysis.
- Establishment of a comprehensive telecommunications infrastructure for use in healthcare, in conjunction with technology experts but paying special attention to medical needs.

Case Two: Knowledge of the Human Genome

Advances in knowledge of the human genome highlight the synergies that are created by sharing different types of medical knowledge. Traditional understandings of disease have been described in terms of their clinical symptoms and a growing understanding of chemical pathways and the influence of the disruption of these pathways on the body. A new approach is based on the genotype i.e. the identification of the genetic changes or defects that give rise to a particular disease. Diseases that exhibit apparently similar symptoms and have therefore been categorised together on the basis of the phenotypic system may in fact have a different genetic basis and respond to quite different treatments.

However, in order for our growing knowledge of the genetic basis of disease to lead to effective treatment, scientific knowledge of the genome must be combined with knowledge of patient records and family histories. This requires a range of new organisational arrangements to support new knowledge flows. In the first instance, the body of scientific knowledge associated with information and methods surrounding the human genome is generally the domain of both public and private institutions. Like the biotechnology firms that emerged to appropriate the scientific and medical knowledge related to the techniques of Cohen and Boyer, work on the human genome has also introduced many new businesses into the medical knowledge complex.

Diabets research in Oxford

In January 1999, the Danish pharmaceutical company Novo Nordisk, specialising in diabetes, announced a £4 million contribution to the Oxford Centre for Diabetes, Endocrinology, and Metabolism, created together with the NHS and University of Oxford. This innovative relationship signals a broader trend towards sharing ol medical information that was once typically quite separate, owned and processed by very different organisations.

These new businesses are important conduits of knowledge and provide a link between scientific knowledge in Universities and that in pharmaceutical firms. This they accomplish through a plethora of alliances and other organisational interactions. These interactions are also changing the nature of the relationship between pharmaceutical companies and teaching hospitals.

Specifically, it requires both formal organisational interactions such as networks, alliances and acquisitions as well as informal and individual relationships between teams of scientific researchers and practising clinicians. As the examples or Novo Nordisk, above and Glaxo-Wellcome, below, outline, these arrangements are in their infancy but are likely to become an increasing feature of the healthcare system.

Asthma Clinical Genetics Network

The Asthma Clinical Genetics Network brings together academic physicians, expert in the diagnosis of asthma and care of patients, within a centre in order to combine genetic and clinical data. This international network will conduct a study into the genetic basis of asthma that is among the largest of its type.

Asthma tends to run in families and thus has a significant genetic component. The six European clinical sites and one US clinical site in the Network will enrol 100 families that have at least one asthma sufferer plus affected or unaffected siblings and natural parents. Participants will be recruited either from patients at the Network clinics or through GP referrals.

The Network centres will conduct standard clinical tests for asthma with all the family, including skin prick allergy tests and airway responsiveness tests, and also collect blood samples for DNA analysis from each patient and his or her family members. The genetic and clinical information will be collated in a database in the US and the results analysed to find regions of the genome that are altered in asthma sufferers.

This scale and the comparative data we will be getting from family members who are unaffected by asthma are vital if we are to uncover the genetic clues that matter most in asthma. We hope that within four years the Network will have identified regions of the genome that will eventually tell us more about what causes asthma, about inherited predispositions to developing asthma and how we at Glaxo Wellcome can find new therapies to treat asthma. (Glaxo Wellcome Worldwide Director of Genetics, Allen Roses)

In policy terms, today's healthcare institutions are inadequate to cope with the changes wrought by genomics. The regulation of genomics will therefore require new rules and perhaps new institutions. What then are the new regulatory and institutional needs of genomics? The greatest needs lie beyond the scope of single organisations first in the standardisation of information to maximise the effectiveness of exchange and integration and second in determining the acceptable use of information in this new medical context. Whoever drives the process, institutional evolution is likely to develop new rules around three areas: standards, property rights, and processes.

Genomics requires standards in several areas: patient information, gene sequences, gene maps, patient electronic data exchange and property rights. The standards must define information content, information structure, information ownership and most importantly quality or reliability. Information standards will be required to render patient data most valuable in the pursuit of clinical advances. Further, genomics will change the nature of drug testing because it will require information outside the realm of the traditional clinical trial in order to establish the genetic basis for disease and for efficacy. Property rights are closely linked to the use of patient information. In the context of genomics, the use of genetic information for both scientific and other purposes must be carefully monitored. The recent

UNESCO Universal Declaration on the Human Genome suggests one step towards these broad goals, but more detailed regulations will become a necessary part of the new rules of genome-based medicine.

The widespread introduction of genetic information into the healthcare delivery system will have significant clinical benefits; a better understanding of disease mechanisms, disease classification, the development of more target drugs and better risk management. However these benefits will only be realised when new modes of health care organisation and more significantly, new institutional arrangements, are created. Therefore the policy agenda is emerging that includes:

- Guidelines for information sharing in order to facilitate sharing of knowledge in the pursuit of genetic insights into disease.
- Privacy, particularly with regard to genetic testing in order to make patients more likely to give permission for knowledge use and knowledge flows
- Standards for genetically relevant knowledge within medical records.
- Creation of appropriate drug approval protocols to take into consideration genetic information and the use of sub-populations.

Case Three: Attempts at managerial codification of clinical practice

A third area in which knowledge flows are changing is through attempts to codify medical practice. These attempts aim to transform a particular body of knowledge and in doing so perhaps improve or at least changes the ease of its communication and transfer. Clinicians have traditionally held clinical judgement and decision-making in high regard and have remained largely suspicious of attempts to explore them systematically with a view to making explicit their precise character. In recent years there has been increased attention on clinical judgement and decision-making from both inside and outside the medical profession. The reasons for this growing interest are well known: the growth of both bio-medical knowledge and technological developments have vastly expanded the range of investigative and therapeutic possibilities available to practitioners. Externally, rising public expectations concerning both the length and quality of life, along with the general growth of 'consumerism', has changed the attitudinal basis of professional-client relations. There have also been major changes in the institutional and legal context in which professional-client relations occur, many of which have served to increase the accountability for professional judgements and decisions. The question of how clinicians make judgements and decisions and how well they make them is becoming a major interest of those managerial and policy stakeholders who see themselves bearing the costs. The wide variation in clinical practice discovered by virtually all studies of clinical behaviour - whether the comparison is colleagues, communities or countries - has been an important empirical focus for those attempting to assess professional performance.

In the UK, the evidence-based medicine (EBM) movement has emerged as important in raising awareness of the benefits to policy makers, managers of the NHS and professional groups, of relating the results of research into practice. The EBM movement is influencing clinicians on many different fronts. Firstly, medical education. Some medical schools are actively reconstructing their undergraduate curriculum, moving away from traditional textbook teaching methods towards case base teaching where students have to search, sift and evaluate evidence in making their diagnosis. Secondly, a variety of post-graduate medical degrees on EBM are emerging, some of which are limited to post-graduate clinical qualifications issued by the various Royal Colleges of medicine. Thirdly, EBM forms a crucial aspect of the new arrangements for the NHS as described in A First Class Service, (NHS Executive 1998). A variety of organisations - the National Institute of Clinical Excellence (NICE), Centre for Health Improvement Progress (CHIMP) - have been created, in part to simplify the sources of possible advice on clinical conditions and issue robust guidelines on clinical effectiveness that clinicians will be expected to take note of in their practice. Such guidelines will also be accessed and used by managerial groups in dialogue about clinical practice with clinicians. The introduction of

clinical governance which puts the responsibility for the decisions about the shape and nature of health series firmly with clinicians, will profoundly influence the knowledge transfer process. There is, however, a crucial dilemma surrounding the implementation of nationally generated guidelines. They are clearly not optional; local NHS organisations will be required to implement them no matter how receptive or otherwise their local context may be. Yet the findings from empirical studies that have looked at the implementation of guidelines suggest that change is complex and context-dependent and that there is no easy formula for success; even if a number of helpful factors are in place, this offers no guarantee that change will be achieved. How can these findings be reconciled with a requirement to implement national, top-down initiatives? At one level, perhaps the answer is that they cannot be reconciled. National initiatives will remain likely to flounder if they rely purely on a top-down, mandatory and punitive system, although sanctions against unacceptable and dangerous poor practice are of course right and proper. As the editor of the British Medical Journal has recently argue in the wake of the Bristol paediatric heart surgery case:

"if the Bristol case leads to an environment where we concentrate on removing bad apples rather than improving the whole system then both patients and doctors will suffer. There must be mechanisms for responding to doctors whose performance has deteriorated to an unacceptable level, but such mechanisms will never bring about the systematic improvements that we need." (Smith 1998)

To some, EBM is seen as *fine in principle,* or a good Idea for other (but not for me).
Is it for consultants?
I think that is the problem with practice at my level, it is very individual, that is why I don't agree with EBM; there isn't any evidence to help you deal with the difficult patients and we get largely the difficult patients because the routine patients are dealt with by general practitioners. (Consultant, Juniper)
Is it for GPs?
I don't think GPs are the people to do EBM - GPs just simply don't have the time or in many cases the necessary statistical ability to separate the wheat from the chaff of these papers they get presented. (GP, Chestnut)
Is it for registrars?
We are just too busy to be able to stop on a ward round and discuss evidence-bases medicine for every patient - it's inappropriate. (Registrar, Juniper)

Furthermore it is important to acknowledge the views of clinicians on EBM. A study in which one of us was involved is one of the few empirical sources of comment (Dawson et al, 1998). In general, there was a marked variation in how the term 'EBM' was understood and whether it was something beneficial. Many respondents spoke about their view that clinical practice is based on many different types of evidence or cues, largely collected and interpreted at an individual level. Thus the 'legitimacy' of evidence is interpreted in very different ways from those of the EBM gurus or indeed, policy makers.

The term EBM, with its multitude of interpretations received broad support, except for those who saw it as a sleight on their professional standing, or a hoax. Nonetheless, it is not seen as an alternative to

individual autonomy and the primacy of clinical judgement, rather it is re-interpreted to fit with existing models of clinical practice.

It is vital that policy-makers give adequate recognition to the realities of implementation, and to the importance of taking clinicians with the policy rather than working against them. A few policy recommendations that will influence the flows of clinical knowledge are given below:

- It is important to acknowledge that there is no single body of evidence. Evidence exists locally in many forms.
- The NHS can offer many past examples of national planning requirements that have been diluted or altered by local practice, these local influences on knowledge flows must be acknowledged and encouraged.
- The assumption that planning and implementation is a rational, linear process is at odds with the complexity and apparent irrationality of the way change is actually achieved. IF these realities are genuinely acknowledged and planned for, it may be possible to reconcile top-down policy and enforcement with bottom-up enthusiasm and ownership.
- Although rarely acknowledged by clinicians, organisational and managerial factors are important in encouraging or discouraging evidence-based practice. An understanding of the ways in which organisational and managerial factors serve to influence practice is an important consideration for policy makers.

Multi-level Implications of New Information Flows

Bringing about changing flows in medical knowledge that have been described above is likely to be complex because both knowledge itself and its typical flow and exchange patterns are strongly bounded by social norms, individual identities, and organisational and institutional structures. This problem is rendered all the more complex when we consider that these changes can and must take place within a global context, characterised by nationally-oriented institutional arrangements on the one hand and ever more globally aware patients on the other.

In this section of the paper we reflect upon the complexity and range of challenges that confront organisations and institutions involved in managing new medical knowledge. This leads us to examine how changing knowledge flows might be supported by new organisational arrangements and by national and international institutions. Although there is a strong driving force that propels knowledge flows, there are barriers associated with changing patterns of interaction that are often difficult to overcome or that limit the effectiveness of knowledge flows. These are typically individual, organisational and institutional in origin.

Changing Individuals

As the previous discussion of the role of the physician in managing clinical knowledge suggests individuals play a central role in transforming the flow of knowledge and adapting to new knowledge. Organisational research suggests a number of sources of resistance to change at the level of the individual actor that may influence knowledge flows. One of the most significant is the *cognitive bias*[1]

[1] *Cognitive dissonance* - the state of discomfort or anxiety that a person feels when there is an inconsistency between his or her beliefs and actions; *Illusion of control* - causes individuals to overestimate the extent to which the outcomes of an action are under their personal control; *Frequency* - deceives people into assuming that extreme instances of a phenomenon are more prevalent than they really are; *Representativeness* - leads individuals to form judgements based on small and unrepresentative samples; *Projection* - allows individuals to justify and reinforce their own preferences and values by attributing them to others; *Ego-defensiveness* -leads individual to interpret events in such a way that their actions appear in the most favourable light;

which systematically bias an individual's cognitive structure have been shown to affect organisational learning and decision-making. In particular such biases affect the way people process information. Related to this is the *selective perception* that individuals exhibit - the general tendency for people to selectively perceive information that is consistent with their existing views. In this regard, *group norms* also play a crucial role in shaping behaviour. Groups develop strong informal norms that specify appropriate and inappropriate behaviours and that govern the interactions between members of groups.

However, the clinician or the scientists - both members of coherent professional communities - are not the only individuals who are instrumental in adapting the flows of knowledge. The informed patient is becoming more and more important to the flow of medical knowledge. The experience of a patient entering a doctor's surgery with a sheaf of documents downloaded from the Internet is no longer a rarity. Over 30% of the British population now has access to the Internet. Patients therefore introduce new knowledge, of variable quality or reliability, into the clinical interaction. They also bring with them, their own personal history, which is as important in the way in which clinical knowledge is received as the biography of the clinician is in how, and what knowledge is transferred. This highlights the human aspects of medical knowledge flows - one that is often missing in the institutional and organisational analyses that often take place.

Changing Organisations
New knowledge often leads to the creation of new organisations such as the biotechnology firms and the array of new organisations currently being formed within the NHS to facilitate clinical effectiveness. (See Case 3). Many organisational factors have been shown to affect the capacity to change. For example, *organisational structure,* the *distribution of power* within an organisation, and *organisation's culture,* and its strategy are all crucial in shaping whether and how new knowledge will be incorporated and integrated into the firm (Murray, 1998).

Changing Institutional Roles
Institutions create a framework of rules and regulations within which organisations can function efficiently. This framework facilitates market interactions and replaces inefficient knowledge sharing by setting standards, regulating activities, and creating structures for smooth knowledge exchange. Few sectors of the economy function without these rules however a central problem in the flow of knowledge is that of knowledge (or more traditionally information) failure. These failures mean that knowledge is not fully utilised or exchanged because too little is known about its quality and the enforceability of knowledge sharing transactions (World Bank, 1998). To overcome these knowledge failures it is crucial to be able to verify the quality of knowledge and monitor its exchange. The solution to these problems of market failure is often institutional and is therefore an important focus for government policy making. Typically the government is usefully directed towards creating the institutional environment in which knowledge flows can be fostered. While much new knowledge can be incorporated within existing institutions, new knowledge *flows* often prompt institutional as well as organisational change when the existing rules and information processing structures are inadequate to cope with the new information needs

The analysis above highlights three things: first, that individuals play a central role in adapting and changing knowledge flows, second, that the way in which organisations are structured can facilitate the sharing of fragmented information and third, that institutions provide the rules, regulations, standards and procedures to guide the repeated exchange of information among organisations or individuals. New medical knowledge poses a challenge to the system when and if it creates entirely new information needs at any level. An analysis of the management and regulation of a new medical knowledge must therefore focus not only on detailed technical effects but also on the nature of knowledge.

Escalation of commitment - leads individuals to remain committed to a losing course of action and refuse to admit that they have made a mistake.

How might changing knowledge flows be supported by new organisational arrangements? Drawing on organisation theory developed largely in contexts outside health, it is possible to argue that given the complexity and uncertainty associated with medical knowledge, well-functioning teams will learn more effectively and be more receptive to change than loose collections of individuals (Ancona, et al, 1996). This suggests some possible actions for healthcare organisations:

- Well functioning teams must be established. This is especially important in medicine given that a great deal of medical knowledge is held and built tacitly (Dawson, 1998).
- Teams must be developed both within and between organisations (that generate knowledge) in order to build shared understandings about important issues (Drucker, 1995; Belbin, 1998).
- New inter-organisational links must be established to facilitate new knowledge flows. These can be both formal and informal in nature, as evidence from the biotechnology industry suggests.
- Organisational and team-based interactions must follow the need for knowledge sharing rather than flows following established interactions.

At an institutional level, there are a number of mechanisms that might be considered to overcome the problems of knowledge flows. In the context of developing nations, the World Bank has identified a series of mechanisms:

- First, developing countries must institute policies that enable them to narrow the knowledge gaps separating poor countries from rich.
- Second, developing countries must invest in technologies that hasten knowledge sharing and the dissemination of knowledge to wider populations.
- Third, developing country governments, multilateral institutions, NGOs, and the private sector must work together—to strengthen the institutions needed to address the information problems that cause markets and governments to fail.

Governments and international jnstitutions must also invest in knowledge generation when spillovers reduce the level of private investment. For example, investments that may lead to a cure for AIDS are likely to be too low in the private sector and therefore must be supplemented from public sources, or incentives increased through effective pricing subsidies on eventual medicines (World Bank, 1998).

Within countries such as the UK, global knowledge flows must be addressed not only in terms of the flow of knowledge out into developing nations, but also internal flows of knowledge (particularly the integration of different types of knowledge) and the flows of knowledge into the UK healthcare system. A number of changes might assist:

First providing information about the quality of medical knowledge and the quality of clinical care.
Second providing approved, trusted sources of medical knowledge, or establishing a means of verifying the quality of knowledge, particularly as the personal role of the GP in small communities is supplemented by medical knowledge available through the Internet.
Third setting standards of quality and format of medical knowledge to facilitate exchange both for software/hardware but also in databases, protocols etc. by engaging in discussions over standards and institutions in order to build the support system for global knowledge flows.

Conclusions and Recommendations

Below we have drawn some of policy implications from our deliberations to facilitate debate:

- Policy-makers need to consider developments in the different bodies of medical knowledge and then-complex inter-relationships. This paper has attempted to discuss such developments.

- Whatever the developments in medical knowledge, knowledge is diffused within a complex world of clinical practice and to a variety of local communities with particular cultural norms. An understanding of the relevant social context into which knowledge is disseminated is important.

- The NHS can offer many past examples of national planning requirements that have been diluted or altered by local practice, these local influences on knowledge flows must be acknowledged and encouraged.

- The assumption that planning and implementation is a rational, linear process is at odds with the complexity and apparent irrationality of the way change is actually achieved. If these realities are genuinely acknowledged and planned for, it may be possible to reconcile top-down policy and enforcement with bottom-up enthusiasm and ownership.

- Although rarely acknowledged by clinicians, organisational and managerial factors are important in encouraging or discouraging evidence-based practice. An understanding of the ways in which organisational and managerial factors serve to influence practice is an important consideration for policy makers.

Following a preliminary consultation process we also propose some concrete policy actions that support the more general conclusions outlined above:

- Invest in systems and networks to support doctors in the gathering of new medical knowledge e.g. groups of mutual exchange created by the Royal Colleges

- Quality mark for electronic medical information available on the Internet - there is urgent need for some kind of system of accreditation for medical knowledge to help patients identify reliable information from the mass of information available on the Internet.

- Build a greater understanding of the need for and barriers to public-private partnerships in healthcare, recognising that different groups all have an important contribution but that confidence building is needed in order to efficiently share knowledge. The could be encouraged by bodies such as the World Bank or WHO.

- Sharing best practice through a Forum of healthcare chief executives and members from the private sector, this forum could also encourage networking across organisational boundaries and ensure the dilution of unhelpful stereotypes about groups.

- Understanding the national embeddedness of clinical practice through more comparative analysis and in the way in which we implement ideas and knowledge from, abroad.

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GLOBAL HEALTH: ROLE OF THE INFORMATION TECHNOLOGY INDUSTRY

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Summary

The human population is increasingly globally interconnected. Many anecdotes of globalisation highlight telecommunications and the Internet. We are also connected through our mutual interests in health - one person's health affects another, and a nation's health affects other countries, including not just their neighbors.

The technology that has driven the rapid globalisation of trade - information technology - may also be used to improve global health. The products and services of the health care information technology industry can make a significant contribution to global health. They can do this by helping to improve access to timely, accurate and relevant information, which helps health care professionals to better treat patients, and to enhance individual professional development and the development of improved health care delivery organizations.

The 'developing' world has similar needs for health care information technology to those of the 'developed' world - yet also has different needs. Some of the required developments are 'horizontal' in nature - general improvements in computing and telecommunications infrastructure, including policy changes to deregulate telecommunications industries around the world. Others are health-care specific, such as the development of information resources (software products and services, and information resources) designed specifically for countries with less technology infrastructure. The goal of health care information technology deployment in the developing world should be to provide immediate benefits while seeking to continue to develop an improved infrastructure. A great emphasis must be placed on appropriate development - the world of *aid* is full of anecdotes of unhelpful projects. However, it is important that developing countries should not seek to re-develop products and services that have already been developed - at great cost - in other parts of the world.

Several research and policy initiatives may be considered, including 'market guarantees' for the development of suitable products and services; extension of export guarantee/credit programs to the health care software industry, and enhanced collaboration between World Bank and World Health Organization initiatives and global health are information management specialists in industry and academia.

Global health and global economics

There is a well established and proper moral case for seeking to improve the health status of people in developing countries. The history of aid and charitable efforts in this regard is long and noteworthy. There is also an increasing awareness that, because the economies comprising the global economy are increasingly interconnected, we all benefit from general improvements in global health status.

Health can be considered a *global public good.* Public goods (nationally) are *goods* (qualities, states-of-affairs, 'things') not typically efficiently or equitably produced by markets. Simple examples are street names and traffic lights. Efficient markets rely on several public goods, that cannot be supplied by the market itself: property rights, safety, nomenclature, etc [(1)]. At a national level, there remains debate about the proper scope of the definition. In the UK, availability of health care is usually considered as being a public good. A stricter definition requires that a public good be *non-excludable,* in that no one can be barred from benefit [street lights are not selective in who may benefit from them] and *non-rival,* in that 'consumption' [or use] of the good does not deplete it [street crossings do not become less effective as each person crosses the road]. *Global* public goods are those goods that transcend national boundaries - such as peace, or human rights. Mechanisms to effect or manage global public goods are considerably less mature than those for national public goods[(2)].

Within a specific economy, the connection between health and prosperity is firm, though complex. As countries become more affluent, they spend an increased proportion of their wealth on health care concerns. High income countries (those with a per-capita income above US $8,500) account for 89% of global health expenditure - even though they account for only 16% of the global population [(3)]. Conversely, according to Gro Brundtland, Director General of WHO, a five year increase in life expectancy may yield generate 0.5% in annual economic growth (World Health Report 1999: Making a Difference).

International organizations such as the World Health Organization & the World Bank, to name two of the more important institutions in this realm, recognize this, and are leading initiatives that seek to enhance global health.

The Information Technology Industry

The information technologyThdustry comprises the following major sectors:
- Telecommunications
- Hardware
- Software
- Services

Together they represent a multibillion business globally, accounting for around 4% of global average GDP. Within the US, estimates range from 5% of GDP [Goldman Sachs] to 8% of GDP [US Department of Commerce]. This figure is expected to continue to grow. Continued increase in the use of information technology in all aspects of global trade, affecting products and services, is anticipated[(4,5)].

The information technology industry comprises *horizontal* and *vertical* aspects. The former describes generic goods and services that may be provided to a broad range of other industries -examples would be word processors, spreadsheets, etc. The latter describes industry specific goods and services - such as pharmaceutical industry clinical trial automation software. The same spreadsheet may be used across virtually any area of business, while clinical trial software is unlikely to be used outside the pharmaceutical industry.

The telecommunications industry has already become a global market. Some aspects of computing (hardware, software and services) have begun to globalise, though this is by no means

a 'complete' phenomenon. Vendors of 'low level' software such as operating systems, or horizontal software applications such as word-processors have tended to globalise to a greater degree. Vertical market vendors will take longer to do so - though it is likely that this is a matter of 'when,' not 'if,' as evidenced by its occurrence in areas such as finance and accounting, or manufacturing process support. Evidence for the effectiveness of information technology in improving productivity is now finally emerging in US/Western services sector.

The telecommunications industry is largely a *horizontal* industry, primarily concerned with moving voice and data from place to place. It does not offer a large degree of specialisation of goods and services to specific industries. There may be special requirements in, for example, military telecommunications, and there are 'niche players,' but these are the minority. Similarly, the computer hardware industry has become almost entirely a horizontal industry: specialised hardware is unusual[1].

Industry sector specialisation occurs in the software and services fields. Banking software specialists tend to work, fairly exclusively, in banking. Globalisation occurs as vertical markets begin to share 'best practice' experiences globally, such as through professional organizations, resulting in increasing similarity across nations in how particular structures (companies, Government and non-Government organization) organise and manage key operational and business processes.

The information technology industry typically also generates considerable 'spin off activity, assisting with economic growth and development. Additionally, the software and services sectors of the industry are not particularly geography dependent, and can be established almost anywhere. The main demand is for a high-skill work force, and *relatively* low levels of investment are needed to initiate projects, as compared to capital intensive sectors such as mining or manufacturing.

The Health Care Information Technology Industry

The health care information technology industry is primarily segmented around software application specialties. The industry is usually divided into clinical, financial and administrative applications. Within the US, expenditure on health care information technology is forecast to rise to almost $40 billion in the next three years:

Table 1: Total US health IT market in US $ billions

	TOTAL US HEALTH IT
1999	$27.2 B
2000	$30.4 B
2001	$34.2 B
2002	$38.8 B

Source: Gartner Group

[1] There is some growth in the ASIC market, but this is primarily aimed at OEMs - there is no evidence of a widespread move away from industry-non-specific *programmable* hardware.

The *information* sector (such as publishing) and the information *technology* sector increasingly intersect. This intersection has grown with the increased use of the Internet as both a 'static' information delivery mechanism (e.g. providing access to literature, document delivery) and as an important aspect of *software architectures* (e.g. the use of the Internet to access software applications, such as purchasing or reservation systems). Software intended to be accessed over the Internet is provided by companies known as application service providers (which are not significantly different from the remote computing or 'timeshare' service providers of one or two decades ago).

As the health care industry has consolidated, so has the health care software industry. There is now a relatively small number of significant players:

- McKesson/HBOC
- SMS
- IDX
- Cerner
- Eclipsys
- Meditech

The industry also includes a number of much smaller companies, although the industry perception is that many such companies have not survived - or will not survive - the temporary downturn in information technology purchases associated with the 'Year 2000' diversion. Additionally, in the services sector, there are several large companies who act as 'systems integrators,' working with a_ variety of software and hardware technology companies to install systems for specific clients.

Recent developments also include the emergence of a new cadre of 'Internet' companies, such as ChanelHealth, and Healtheon/WebMD (now merged). These companies use the Internet to provide information management software and services to the health care industry, and seek to compete with established health care software companies. Almost all the established health care information technology vendors are either supplementing (through new development, or acquisition) or altering (by re-development) their product lines to respond to the availability of web technologies and demands for web-based products and services.

Specialized health care technology manufacturers, producing equipment such as physiological monitoring technologies, pacemakers, magnetic resonance imaging machines, etc. are not discussed further in this paper, though they overlap in some areas with the information technology sector (for example, Marquette's 'MUSE' cardiology information management system, or clinical image management products from General Electric Corporation). Additionally, the pharmaceutical industry is a major user of information technology, and although there is a *potential* overlap with the rest of the health care information technology industry, to date this has tended not to be manifest. Pharmaceutical industry systems include applications to support data collection, analysis, and process management, in support of clinical trials and regulatory submissions to medicines control and licensing agencies. While there are opportunities for greater interaction between the main health care information technology companies and the pharmaceutical industry, this is not explored further in this paper.

The main strategic trends affecting the US software industry are:

- Increasing clinical emphasis
- The Internet
- Continued cost pressures on customers
- Increased emphasis on regulatory compliance

The pressures on the US health care industry to find ways to reduce expenditure and manage care quality while doing so will create an increased focus on clinically oriented applications. This may have the coincidental consequence of creating applications that are more portable to other health systems. The historical predominance of software application development for the health care industry was primarily financial and administrative in nature. This typically resulted in systems that were not readily portable to different countries. For example, the greatest level of investment in health care information technology has been made in the US. Until recently, this resulted in the bulk of available applications directly 'embedding' the astonishing complexity of the US health care system.

None of the established vendors are particularly active outside USAVestem Europe. However, this is largely a reflection of perceived lack of market demand. Non-US activities are typically accomplished by strategic partnerships, or by setting up partly owned subsidiaries.

The health care industry lags considerably behind other industries in its adoption of information technology. Annual investment in the US, which is typically ahead of the rest of the World in this sector, is around 3-4% of annual expenditure. In contrast, banking, insurance, and manufacturing industries spend up to 10% on IT. However, certainly within the US, it is increasingly widely agreed that this will not - cannot - remain the case, as pressures within the health care sector force adoption of services standards - and thus business methods - that are expected elsewhere, such as in the airline industry.

In addition to direct investment in health care specific infrastructure (such as enhanced data networking, improved levels of information management skills in health care organizations), general improvements in information technology infrastructure (continuing improvements in price: performance ratios for hardware and telecommunications services, enhancements in software development process productivity) also create benefits for the health care industry.

What can Information Technology do for health care?

What does the health care information technology industry do? As a highly information intensive industry, virtually every area of health care delivery is potentially capable of being supported to some degree by modern information management technologies. Health care information technology is now established as being capable of reducing the cost and/or increasing the quality of care delivery. The core themes of modern health care information technology are the increasing automation of the financial/administrative and clinical aspects of

care (e.g. scheduling systems; laboratory test results access); the provision of additional clinical feedback at the point of care (such as "the patient is allergic to the drug you have just prescribed - do you wish to continue?"), and analysis of clinical data from multiple to assist in the formulation of improved treatment programs.
In addition, the emergence of the Internet as a 'universal' technology has dramatically increased the role of information technology in information delivery, making real the long predicted 'convergence' of computing and communications (as evidenced by mergers between computing and telecommunications companies, and between internet and 'entertainment/news' companies -MS/NBC, AOL/Time-Warner). Thus, areas not traditionally considered part of the health IT industry are becoming more closely associated with it (e.g. access to medical literature, the dissemination of clinical protocols, etc.)

As the technology infrastructure to which health care facilities have access continues to improve, information systems projects become easier to accomplish, including the ability to provide access to many health care services remotely via advanced telecommunications technologies and services (e.g. telemedicine).

The main applications of health care information technology are:

- Automation of basic processes of care, to make them more efficient, cost effective and reliable.
- Capture of critical clinical information, and automation of its interpretation (such as automated notification of potential adverse drug reactions).
- Provision of tools for decision support and information analysis, to support clinical research and clinical quality improvement programs.
- Extensions to the scope and reach of clinical services through telemedicine.

Each of these is explored imnore depth below.

In addition, information technology is also increasingly a key method of enabling of *information distribution* and *information access*. Examples include access to 'MedLine' on the Web, and more recently deployed web-based health care information resources, such as WebMD and DrKoop.COM, which are intended for use by consumers/patients as well as by health care professionals.

In most Western countries, the health care information technology industry has to date tended to emphasize administrative and financial systems. However, increasing health consumerism, continuing rising cost pressures, and opportunities created by horizontal technology infrastructure are now beginning to increase the focus on c/£rac<z//v-oriented information management[6].

Automation of Basic Care Processes

Health care information systems are often grouped into three broad realms: financial/administrative systems, clinical systems, and ancillary systems. Alternatively, systems are grouped according to the type of health care facility for which they are intended: hospital, out-patient/ambulatory clinic, primary care center, etc. Yet others categorize applications by

their intended user group, such as physicians, nurses, pharmacists, etc. Successful products tend to cover many of these areas in a single integrated product.

The activities supported by health care software today are:

- Patient demographic information management
- Clinical record keeping
- Test and investigation results access
- Drug and test request/order management
- Scheduling of tests, appointments, etc.
- Billing, account and financial management
- Inventory and supply chain management

These uses of information technology can provide considerable value. They may focus on making facilities run more smoothly, more cost-effectively. They may also provide opportunities for enhancing the quality of clinical care by improving access to up-to-date clinical information (in contrast to most health care facilities, where medical records are very frequently absent or delayed).

Application of Automated Clinical reasoning

With 'basic' clinical computing infrastructure in place, more attention is being turned to incorporating 'knowledge based' systems into mainstream health care information technology. Such systems are intended to assist in providing safe, effective and cost effective diagnosis or treatment. The evidence for effectiveness of such technologies is now well established.

It is doubtful thaf it will for much longer be considered ethically acceptable for physicians in most Western countries to prescribe drugs and investigations on paper (given the demonstrated ability of information technologies to intercept and prevent clinical errors). Several 'definitions' are used, to varying degrees of precision, to describe this arena, including expert systems, artificial intelligence, rules-based systems, and decision support systems. All tend to have a common theme: the codification of clinical and other decision making such that a computer can usefully mimic that reasoning. An expert system is a type of software that enables computers to perform 'reasoning' of a kind that normally requires human expertise.

"Expert systems allow a computer program to use expertise to assist in a variety of problems..." - Buchanan & Smith, 1989
"Expert systems employ human knowledge to solve problems that ordinarily require human intelligence." - Hayes-Roth, 1983

In healthcare, expert systems have a research history going back some 25 years. The technology required to 'capture' and embed expert decision making into an automated clinical process is now established. Applications are divided into *consultative* approaches (where the expert systems is approached deliberately to seek advice) and *embedded* approaches (where the expert system 'sits in the background' and intervenes as required). The latter has been far more effective - though it is reasonable to speculate that a well designed consultative system could be perceived as more valuable where quite access to specialists is not possible.

Examples of effective use include detection of potential drug interactions or allergic reactions, *prior* to drug administration. Others include more complex interventions - such as highlighting abnormal blood potassium levels if digoxin is prescribed; an antibiotic advisor, which provides guidance on choice of antibiotics to physicians on the basis of sensitivity and other information, and an 'agent' that monitors blood platelet count for precipitous fall in response to heparin administration.

. The importance of systems that provide 'real time decision support' is enormous. The costs -J in human and financial terms - of inappropriate treatments, shocks almost everyone investigating this realm: it is not a sufficiently well known problem.

October 31,1999

214 Feared Dead in EgyptAir Crash Filed
at 3:04 p.m. EST
BOSTON (AP) — An EgyptAir jetliner with 214 people on board, including dozens of U.S. tourists, plunged into the ocean off Nantucket Island on Sunday en route from New York to Cairo. Searchers found debris and human remains scattered across the sea but no sign of survivors. Authorities said there was no distress call from the pilots before the Boeing 767 plummeted from 33,000 feet. Though the FBI and other intelligence agencies began checking on the possibility of sabotage, President Clinton and other officials said there was no immediate indication of foul play.

The airline disaster in October 1999, understandably, attracted considerable news coverage. Few people realize, though, that there are over 100,000 *avoidable* deaths per year in the US -equivalent to a comparable disaster *every day*. In addition to the human cost, this account for millions of dollars worth of avoidable cost. A recent study by the Institute of Medicine (To Err is Human) has highlighted this problem[7].

While drug administration policies and procedures are somewhat safer in the UK than the US [Trans-Atlantic process differences mean there are usually fewer opportunities for drug-prescription transcription errors], the problem is by no means solved in Europe. It is unlikely that this level of *avoidable* iatrogenic injury will be tolerated indefinitely. Modern health care information technology is known to be able to substantially alleviate these problems.

Decision Support and Continuous Quality Improvement

Decision support is typically divided into *real time* and *retrospective* systems. Real time systems include expert systems technology as outlined earlier. Retrospective decision support is an established technology in many industries, but less widely used in health care.

The basic premise of retrospective support in health care is to apply the tenets of "total quality management" or continuous quality improvement to health care processes; seeking to drive out inappropriate variation of care processes, using methods founded on sound data analysis. Thus, automated care processes offer great benefits in that the information needed to measure care quality is potentially available as a bye-product of the care processes themselves.The basic premise of retrospective support in health care is to apply

the tenets of "total quality management" or continuous quality improvement to health care processes; seeking to drive out inappropriate variation of care processes, using methods founded on sound data analysis. Thus, automated care processes offer great benefits in that the information needed to measure care quality is potentially available as a bye-product of the care processes themselves.

Telemedicine

Telemedicine can be defined as "the use of telecommunications systems to provide access to expert advice and patient information to enable the management of patients, and the education of patients and clinical staff, irrespective of their location." An alternative definition is *telecommunications-supported medical practice.* Instead of moving the patient to the doctor, or *vice-versa,* information is transmitted digitally, saving transport, time and money. The term may also be extended to include remote access to specialist library and other information services.

Once confined to expensive demonstrations, telemedicine is quickly becoming an integral component of the delivery of modern healthcare. Using a 'hub and spoke' model, telemedicine programs in the US are extending the scope of academic medical centers to primary care clinics at the spokes. Some hubs in this model are also now being linked, using higher capacity telecommunication lines, expanding their effectiveness. The technology enables both 'real time' bi-directional communication and 'store and forward' approaches.

Telemedicine offers opportunities to enhance direct patient care, either by supplementing local clinician care with specialist physician consultation, or by enabling direct referral to a specialist, increasing the effective scope and range of specialist services available in remote areas. [A recent dramatic example of~this was the US physician on the Antarctic expedition, who was managing her own treatment of a breast lump with advice provided by email and telephone, after she sent digitized histological images back to the US for interpretation.]

Telemedicine can offer much to developing countries. The main barrier to its development is the exorbitant cost of highly regulated state telephone companies.

Health care information technology in the Developing World

The case for increasing use of modern health care information management technologies in the developed world is clear. However, health care information technologies designed for the developed world cannot always be applied directly to the developing world. It is nevertheless the case that modern health care information technology is an important part of the improving health care delivery systems, in many areas. Moreover, health care information technology may be a key component of entirely new health care delivery strategies.

Developing countries suffer from major health threats: epidemics, spread of infectious diseases, high level infant and maternal mortality, low level of life expectancy and limited healthcare facilities. Governments thus concentrate basic health care availability; stressing preventive medicine, health care professional training, health care facility construction, and development of national capacity in health research. These priorities are often more

Immediately important for policy makers and health care managers than investment in information and communication technologies.

Although at first sight perhaps insignificant compared to overall health demands, investment in health care information technology complements the priorities cited above. Moreover, the cost of *not* using information and communication technologies in the health sector may be dramatic, as highlighted earlier. The opportunities to be gained from investment in new information arid communication technologies are wide and diverse[8]. These include:

- enhancement of opportunities for professional support and development within the health care profession;
- enhancement of health administration and management;
- establishment of general information "health profiles" and patient "information profiles" or community health information to support decision making regarding curative and preventive measures at local, regional and national levels;
- linking health centers, medical services and support institutions to enable the patient to access these facilities and to provide more effective services to the patient;
- improved access to skilled remote diagnostics through telemedicine;
- improving distribution and reducing costs of medical supplies;
- linking researchers and technical personnel to share information and knowledge on general medicine, medical equipment and tools.

The World Bank and World Health Organization have now recognized this. Health care information technology is just as important in developing countries as in developed countries -the difference is one of emphasis, and even then perhaps temporarily.

The majority of commercial applications presuppose the existence of high degrees of general infrastructure, such as reliable telecommunications networks, Internet access and availability of equipment and skills required to maintain suitable computing hardware environments. Such infrastructure cannot always be presumed in the developing world.

It is important to distinguish between the health care application of general technology infrastructure, and the application of health care specific information technology. Additionally, there are important differences between *health information distribution; health application software* and *health knowledge management software.*

Table 2:Health information management: some definitions

Health information distribution	Providing access to necessary scientific and medical literature. May entail a variety of electronic and paper distribution media, and be aimed at health care professionals and healthcare consumers.
Health application software	Software that automates some aspect of health care provision; clinical, administrative or financial.

Health knowledge management software	Software that embeds clinical knowledge 'actively,' such that it directly assists the program user in making a clinical (or other health care related)decision that would normally require skills or knowledge that they do not possess; or that provides a 'safety net[1] against common human errors.

Throughout this section, it is presumed that the goal is the provision of health care information management capacities that are as good as those found anywhere. It is also presumed, however, that - at least for the near term - lower cost measures and lower 'infrastructure-demanding' measures are called for.

Health Information Distribution

"Providing access to reliable information for health workers in developing countries is potentially the single most cost-effective and achievable strategy for sustainable improvement in health care."

- INASP-Health, Directory 1999

Health information distribution is important for many reasons: health education, research, policy making, service delivery and training. Access to medical information is often scarce. Libraries in developing countries often suffer a paucity of journals. Charitable donations of textbooks are not always relevant. Internet access is frequently extremely expensive, and commonly slow -while increasingly, websites are designed to presume high-bandwidth access, and so are peppered with graphics that slow download speed. Free resources on the internet are often irrelevant to developing countries, or of unknown or dubious quality [9, 10].Nevertheless, the Internet offers unprecedented opportunities to supplement established media and information distribution programs with easier-to-maintain and cheaper-to-establish techniques.

Recent proposals to assist in the distribution of medical information include two related concepts: "Information Waystations" and "Staging Posts" [11]"

Table 3: Definitions of "Information Waystations" and "Staging Posts"

Information Waystations	Information resource centers equipped with computers), CD-ROM, printers, internet connectivity, telephones and links to other IWs and to IW network management resources. Maintenance and training would be available at the IW periodically.
Staging Posts	A local publisher or 'dessemination center[1] that receives materials from various sources, and carries out what ever necessary translation, reworking, and adaptation of the materials is required to make them locally appropriate.

Source: Christopher Zielinski, Co-Chair, HEF Staging Posts Action Group

Additionally, collaborative links between teaching facilities around the world, supported by modern telecommunications can help to support medical education in poorer countries[12].

Health Application Software

Health care software is not always readily portable across national boundaries. Health care software applications can be characterized according to three axes, which help to characterize their applicability to the developing world. These are:

- Basic ↔ advanced
- Generally applicable ↔ location specific
- Easily deployable ↔ infrastructure demanding

Thus, complex service-based contract modelling software available is the US is unlikely to be of much value in rural Tanzania. However, basic record keeping/inventory and reference software may be of great value. The current US fashion for remote application processing, through application service providers (ASPs), is unlikely to be applicable in poorer countries until a dramatic improvement in telecommunications infrastructure has been effected.

Ideally, pending deployment of sufficient infrastructure, and the skills/financial resources to operate it, some inexpensive and simpler-to-operate solutions are called for - ideally ones that will not become bottlenecks to progress once (presumably) the financial and resource picture improves. There "is, then, "seemingly an *application gap:* an easily deployable system of technology, that is not dependent on a large degree of local infrastructure, but which meets the specific needs of the developing world.

There are parallels to the pharmaceutical industry in this realm, since the market incentives to develop such applications are not strong.

Health Knowledge Management Software

Decision support applications that help health care professionals (e.g. doctors and nurses) with diagnosis and treatment protocols could help to support the quality of care provided in developing countries. Similar applications may also be used to directly assist patients. Such applications may be made available over the Internet, or distributed on CDs, according to the technical infrastructure of the location of intended use. Also, tools to help patients (consumers) may be deployed in a similar fashion, e.g. providing information to assist in managing their own health (sanitation, diet, contraception, etc.).

Barriers to Deployment of Health Care Information Technology and Approaches to Overcoming them.

In Africa, the health sector is even further behind other sectors in the use "of information technology. This is consistent with history in Europe and the US. The barriers to improved

In Africa, the health sector is even further behind other sectors in the use "of information technology. This is consistent with history in Europe and the US. The barriers to improved use of modern information management techniques and technologies in the developing world could be summarized as:

- Awareness of the potential
- Financial resources
- Skills
- Telecommunications infrastructure
- Relevant applications
- Each of these is discussed in more detail below.

Awareness of potential

Awareness of the potential of modern health care information technology has been slow to reach even the most technologically advanced parts of the world. Use of health care information technology in primary care in the United States is at approximately the same level of adoption as in Croatia. Awareness is growing, however, and this should continue. Increasing the exposure of health care professionals to information technology and its benefits is a key component of this. Thus, continued increases in the uses of technology in medical education, and the expansion of medical informatics programs in Universities will help to ensure continued progress.

Financial resources

By definition, poor countries have fewer financial resources. Technology is expensive, especially in areas where there is not sufficient demand or capacity to absorb to facilitate 'economies of scale'/volume-based cost reductions. Deregulation of telecommunications industries would help, by providing more affordable access to remotely-managed resources (static or dynamic information), and by creating the infrastructure that facilitates skills development and retention in more remote areas.

Skills

Increasing the level of skills in the technology sector is of great importance. This is one of the many areas where infrastructure improvements should occur as part of general capacity building programs organized by World Bank and other bodies.

Telecommunications Infrastructure

While the telecommunications infrastructure has improved dramatically over recent years, improvements still leave a huge gap between rich and poor countries. Moreover, distribution of telecommunications access within poor countries is extremely uneven[13].

Relevant applications

As outlined earlier, there may be a significant applications gap. However, the skills to develop the application are typically not available in those areas that could benefit from it. Moreover, underestimation of the cost and complexity of software development is almost a universal error (the fact that access to the US Space Shuttle is perhaps expensive would not usually prompt a poor country to seek to build a cheaper version of its own).

The goal should be to use structures that are already established in the US or Europe as templates, and extend or supplant their contents with material more directly relevant to the developing world.

Collaborative projects could readily be established between NGOs, universities [students are always looking for meaningful projects] and industry [to provide guidance on applications development and other supervision]. Additionally, market guarantee schemes akin to those being considered in the pharmaceutical sector could potentially be applied.

How can the industry help?

Contributions to the development of health care information technology could be considered to be in the spirit of Kofi Annan's term 'responsible globality.' Additionally, such efforts could be considered to be 'market making.'

It is important that aid provided by the industry be targeted wisely. There are many examples of destructive aid programs, however well intentioned [14]. Industry bodies (World Congress of Medical Informatics, American Medical Informatics Association) should continue their efforts to increase the awareness of the potential offered by modern clinical information management products and services[15].
The Industry (via bodies cited above) should consider creating an industry group to work with WHO & World Bank, specifically to bring medical informatics expertise to bear on the global health & development problems they are seeking to address.

Many US companies, for purely economic reasons, are exploring extending 'overseas' some aspects of their services. The Internet facilitates this, and may also assist in skills-building [e.g. simple - transcription services, complex - programming services.]

How can governments help?

"Currently, the international system fails to meet the scientific and technical needs of the world's poorest. Even when the right institutions exist - say, the World Health Organisation to deal with pressing public health disasters facing the poorest countries - they are generally starved for funds, authority and even access to the key negotiations between poor-country governments and the [International Monetary] Fund at which important development strategies get hammered out."
Jeffrey Sachs, Director, Center for International
Development Professor of international trade, Harvard
University

Governments of richer countries can help by considering measures that are similar to those applied to other capital intensive industries such as the defense industry. Such export guarantees could assist in the creation of new products and services adapted specifically for the needs of poorer countries. Additionally, they should ensure that any "e-business law" includes consideration of any special needs for health information management, such as adequate (but not disruptive) security provisions.

Governments of poorer countries can help by aggressive deregulation of telecommunications industries, and by cooperating in collaborative programs in conjunction with the educational sector.

It is also important to ensure that scarce resources are not spent on very high risk software development projects. That health care information technology may be expensive to buy is not
an argument for seeking to building ones own.

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GLOBALISATION SHOULD BE ON EVERY HEALTH AGENDA

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Introduction

Globalisation is a concept familiar to economists, the media and information technologists, but only recently coming to the attention of health professionals. Not that the international trade of goods, services, money and people along with various diseases is new, but the accelerated speed of human interactions has alarming implications for health and society as well as potentially some great benefits in the new millennium. AIDS is a good example of an illness where the natural history and epidemiology have largely been determined by global travel and other influences such as the inequitable distribution of condoms and retroviral drug treatments because of cost. While many of the movements and forces that create globalisation are transnational, the impact is all too often felt most keenly at local level as individuals and communities become clear winners or losers from globalisation. Conversely, local factors can have both negative and positive effects on globalisation. The latter has not been so extensively studied, but may have some interesting lessons about the changing governance of health in a "global village." This paper explores why globalisation is a local issue and therefore why it is the business of health professionals in the UK.

Health Impact Assessment

London is used to assess the possible impact of globalisation on the health of a population, and conversely, the impact of London on globalisation. London is used because it is large city and so lessons learned should br relevant not only to metropolitan conurbations elsewhere in the UK such as Edinburgh, Cardiff, Liverpool, Birmingham etc, but also to capitals elsewhere in the world. The London Regional Office of the National Health Service (LRO), established in 1999, is committed to the wider health agenda and is developing a health strategy for London with a wide range of strategic partnerships. This is an opportunity to explore the links between local and global issues, and identify programmes of action that will impact positively on globalisation, or at least minimise harmful effects and implement them through local health strategies.

London is a city of 7 million people in 33 boroughs and 16 health districts covered by the LRO, largely lying geographically within the M25 motorway. Other defining features of London are its political, financial and historical institutions; offices and workplaces for over 670,000 commuters each day; ethnic diversity; marked health inequalities; centre for music, culture, communication, entertainment and the arts; and an international centre for medical knowledge and research. But above all, for those who live there, London is divided into "villages" and communities which vary in their degree of cohesion arid social inclusion.

Using Lee's definitions (Lee 1998) the remit of this paper is to consider how globalisation of social and cultural factors effect health. The social/cultural sphere concerns characteristics of human communities or societies including collective activities, shared identities and traditions (e.g. values, beliefs, ideas) and support structures.(Lee 1999) A health impact assessment was the most appropriate method to explore the relationships between local and global, using rapid

appraisal techniques to identify the main health problems associated with globalisation that affect London from the published and grey literature, and from practitioner's experiences. A framework was constructed looking at the impact of globalisation on London and the impact of London on globalisation. The assumption that there are associations between the cultural and social factors and health outcomes is based on the model developed by Dahlgren and Whitehead^ 1991) Fourteen socio-cultural factors were found that fitted these criteria. (Table 1) The framework aims to bring together the local and the global to test whether globalisation is a local issue for public health, planners, practitioners and politicians.

Table 1. Health Impact of Globalisation on **London** and **Impact of** London on Globalisation **of Health: Cultural** and **Social Factors**

Impact of Globalisation on London			**Impact of London on Globalisation**	
Cultural and Social factors	**Health Outcomes**		**Cultural and Social factors**	**Health Outcomes**
250,000 Refugees and Asylum Seekers in London.	Mental ill-health, use of health services, social exclusion.		Migration to rest of UK and overseas.	Isolation of elderly relatives.
25% of London's population are black and ethnic minority communities.	Use of health services, premature mortality from CHD etc, for 1.7 million people.		London's health services are centres of excellence in teaching and research.	Setting and monitoring standards, innovation in medicine and technology.
Travel Health and infectious diseases for 50 million travellers.	eg Diarrhoea, Malaria, TB, STDsandHTV.		Export of health knowledge and skills overseas.	Contributes to eliminating world poverty.
Poverty and inequalities in health. 33% of children live in families with incomes below the "poverty line"	Women and children, ethnic communities and the elderly are disproportionately affected by poverty.		Globalisation of financial institutions and other services.	Re-distribution of wealth may contribute to low life expectancy in developing countries.
Changes in patterns of family size, structure and parenting skills. Loss of "social capital."	Unwanted teenage pregnancies Deliberate self-harm Smoking Substance misuse.		HealthyCities'initiatives, HAZ areas, community development, urban regeneration, all build social capital.	Associated with reduced morbidity, mortality and more appropriate use of health services.
Smoking and the tobacco industry.	Tobacco is estimated to kill 8,000 Londoners per year.		Offices and workplaces concentrated in cities and towns.	Opportunity for effective healthy workplace initiatives.
Globalisation of media but loss of local knowledge of health services.	Unwanted teenage pregnancies. Poor use of GP services.		London's contribution to the media, entertainments' industry, and culture.	Positive and negative effects on mental health eg substance misuse.

Health Impact of Globalisation on London

Of the world's refugee population, a small minority reaches the UK. Of those, the overwhelming majority (85%) come to London. In 1997, there were 32,500 applications for asylum. Only a minority of applications (13%) resulted in a person being granted refugee status or exceptional leave to remain (20%.) It is estimated that within London there are around

240,000-280,000 people who have been through the process of applying for asylum in the last 15 years.

A recent Health Needs Assessment for Refugees and Asylum Seekers (Health of Londoners Project 1999.) includes the following recommendations: developing better systems for identifying the numbers of refugees, and background information to help planning services; targeting Research and Development programmes on the health needs of refugees, especially into the effectiveness of interventions; improving access to primary care; engaging participation of local refugee communities in service planning and delivery; and co-ordinated action at regional and national levels to improve the accessibility and quality of interpreting and advocacy services, information, and health promotion.

In 1999 25% of the total population of London was made up of people from black or minority ethnic groups - 1.78 out of 7.14 million people in all. This proportion is expected to rise to 27% (1.93 million) by 2011. The 33 language groups of over 10,000 people (over 250 different language groups altogether) bring a richness and diversity to London, and contribute significantly to our economic and cultural life. Despite this, integration has not always easy, and indeed not always desired by all ethnic groups or all generations. Services are provided separately by some communities such as Jewish Old People's homes and schools for the Chassidic community of Hackney and North London, but still licensed and regulated by the health and local authorities. However, there are other examples of complementary practitioners not accountable to statutory authorities where breech of minimum safety standards have raised important issues about governance of the private health sector.(Sharma and Meltzer 1999)

Where services are integrated in the mainstream, advocates or interpreters and the choice of women staff, close attention to the provision of appropriate food, cultural sensitivity by all staff, and above all challenging racism, (Black and Minority Ethnic Representatives 1999) are a prerequisite for equitable and effective use of health services by all communities in London.

Ethnic minority communities have some different disease patterns: partly because of genetics e.g. sickle cell disease, thalassaemia and other haemoglobinopatbies; partly because of lifestyle eg high smoking rates, stress and lack of exercise in Asian, Turkish and other minority ethnic men all contribute to high rates of diabetes and heart disease; partly because of access to health services eg mental ill-health in Asian women; but mainly because of poverty. London's ethnic minority communities often live in the most overcrowded conditions, with high unemployment or jobs outside the regulated sectors.

Travel, health and infectious diseases are tangible examples of the effect of globalisation on health in London. It has been estimated that 1 million people cross borders every day, 50,000 of these are through Heathrow airport, which is the largest international airport in the world. 17 million tourists a year come to London, a figure that is projected to rise to 23 million over the next 5 years.(Habib and Behrens 1999) Tourism provides jobs and is a major industry for the UK economy and therefore has positive health benefits for local people as well as the risks of importing infectious diseases.

The success of these programmes to modernise London's health in a global world will depend on systems of surveillance that accurately record relevant ethnic data.

While Globalisation has its winners, it also has its losers. Studies over the last 20 years have repeatedly shown the growing gap between rich and poor, and the resulting health divide.(Acheson 1999) Poverty and inequalities in health disproportionately affect women and children, young people, the elderly and ethnic minority communities. Globally, it is estimated

that 70% of the 1.3 billion people living in extreme poverty are women. (SoS International Development 1997) In some areas of London, 33% of children grow up in families whose income is below the "poverty line." If the extent of these inequalities in London were identified, resources could be targeted on the most vulnerable to improve health and reduce th& gap-

The changes in family size and structures is at least partly a result of changing economic circumstances, expectations and working patterns globally. Britain has the longest working hours and the highest divorce rate in Europe with a concomitant rise in the number of one parent families, or two family parents i.e. step-parents. The loss of social cohesion and parenting skills appears to be associated with the rise in teenage pregnancies, increases in smoking, especially amongst women and. young people, suicide and deliberate self harm, low self-esteem and an obsessive concern with body image. London has the highest underage pregnancy rates in Europe. Compared to their continental counterparts, young people in Britain also do worse in terms of education, poverty, smoking and parental working hours. An interconnected approach to these problems led by the social exclusion unit is welcome. (McKee 1999)

The global nature of the tobacco industry is one of the best examples of the negative impact of globalisation on health. Sadly, the example of the deadly effect of a global industry on health is not new, but the global leadership of WHO in 1998 with the "Tobacco Free Initiative" is very welcome as a contribution to targeting the single largest cause of chronic diseases and premature death around the world. The UK government's Tobacco white paper " Smoking Kills" (DoH 1999) has also been welcomed as it lays out a comprehensive programme of action at a number of different levels, targeting young people, pregnant women and low income groups.

The globalisation of the media has many implications for health, many of them positive. The effectiveness of the telecommunications industry, especially satellite TV, in penetrating to the remotest regions of the world is a health promotion tool that we have not yet begun to exploit. Kids in the Okavango Delta, Botswana, know all about the Arsenal football team, while kids in Greenwich explore complex moral and ethical dilemmas through soap operas, often from Australia. This dislocation of local and global knowledge is illustrated by a recent survey of school children where we found that 54% of 14-15 year old boys in Greenwich did not know where to go for advice on sexual health and contraception, specifically free condoms.(Whiteman 1998)

Impact of London on Globalisation

London has been described as a city of migrants. Turning the coin around, London has an impact on globalisation through the large numbers of people and families who migrate out to the home counties, the rest of the UK and overseas. The perennial search for jobs, better housing and schools leaves relatives and friends behind in the city , contributing to the social isolation of elderly people, often lone female pensioners. The most common health consequences are mental ill-health and poor use of services by the socially excluded.

A positive contribution that London makes to globalisation is spelled out in Frank Dobson's introduction to "The modernisation plan for the NHS in London 1999-2002" (NHS Exec. LR0 1999):

"London's health services make a major contribution to the local economy. They also make a major contribution to our international reputation - major centres of excellence in teaching and

training. Research work involves world leaders and contributes to new and better ways of treating people, new technology and new pharmaceutical products, new and more effective ways of working. All this will be advanced and encouraged by our new plans for London."

In addition to teaching, training and research, the Royal Colleges, Faculties, GMC, NICE and other bodies set and monitor standards through examinations and shortly through re-accreditation. They also promote good practice globally through postgraduate education, audit and by encouraging publication of original research and reflection. These significant contributions of London to the globalisation of health and the western practice of medicine cannot be underestimated, and are now being further facilitated by enhanced forms of distance learning and other tools of the telecommunications revolution. A responsibility lies with these bodies in the UK to make sure that the medical learning they disseminate is appropriate for other populations. (WHO 1999)

London has a number of centres of excellence and leadership that export knowledge and skills in both the short term and the long term, and contribute collectively to eliminating world poverty. Historically, however, London's financial and other institutions have also contributed to creating poverty overseas. The British East India Company in the 19th century has been associated with asset stripping the country now known as Bangladesh. Similar claims have been made of other Multi-national Corporations, both historically and more recently. In the past 15 years, there has been considerable overseas interest in the UK model of health services reform, often linked to Economic Structural Adjustment Programmes. Some have argued (Sanders 1999) that the internal market is not appropriate in developing countries, and that user charges reduce use of services and exacerbate poverty.

Healthy Cities' initiatives,(Kickbusch 1999) Health Action Zones (HAZ) and Health Improvement Programmes (HiMPs) could contribute positively to globalisation by creating health at a local level through citizen participation, community development, and urban regeneration.(Jacobson 1998) All of these policy initiatives aim to build community capacity and social capital through sustainable development while aiming to reduce health inequalities. Social Capital has been defined by Putnam (1993) as consisting of trust, networks of co-operation and reciprocity, civic engagement and strong community identity. Social capital is associated with reduced morbidity, mortality and use of health services.(Kawachi et al 1997) Healthy Cities', therefore, potentially give us a model to positively improve health and impact local on global.

One of the significant features of London is the number of offices and other workplaces, and the vast number of people who commute in and out of the city. It is estimated that 670,000 people commute to London each day, 50,000 people to one single office block, Canary Wharf in London's Docklands. Healthy Workplace programmes could have a significant impact on the health of populations much wider than London especially if linked to corporate incentives to promote healthy workplaces. The NHS should set the standards with sustained programmes of health promotion for all the NHS workforce and within healthy workplace programmes. Education and training (life long learning) for all NHS staff in appropriate skills should also be provided. Regional Director of the London Region, Nigel Crisp, said:

"We should look at ourselves as major employers and investors in London. There are 130,000 people working in the NHS in London. We have a great opportunity to work with them to move forward the agenda." (NHS Exec. LRO 1999)

Another feature of London is the media, entertainment's industry, art, music, fashion, and culture, and the influence London has always had in determining youth culture both in the UK and globally. The impact on health is both positive and negative. Jobs and economic prosperity, entertainment, enjoyment, humour and lack of boredom all contribute to positive mental health. Substance misuse and other unhealthy lifestyles contribute to poor mental and physical health. The effects, especially of youth culture, are felt globally.

Global Problems: Local Solutions

Globalisation is no longer an academic concept familiar only to economists, the media and information technologists. It is having an impact on the health of populations in Britain and therefore becoming a local public health issue that is the responsibility of practitioners, planners and politicians to address. Also, it is clear that some of the solutions to globalisation are local.

This health impact assessment identifies health issues where local action in London will have a global impact. It suggests priorities for a programme of policy, action and research that will support the emerging health strategy for London as well as address some of the local implications of globalisation. (Table 2) Nine priorities for a programme of policy, action and research to reduce the negative effects of globalisation are given in the columns "Acting locally." They have been selected from the health impact assessment by using the criteria for "thinking globally" in Bruntland's introduction to the 1999 World Health Report.(WHO 1999) Possible targets have been suggested for discussion and adoption by local stakeholders, and the implications for monitoring, surveillance and governance are highlighted.

Table 2. Global Problems, Local Solutions: An example from the London Health Strategy.

Thinking Globally	Acting Locally	Possible Targets	Governance
"We need to step up our ability to deal with the rising toll of non-communicable diseases. Special attention will be given to cancer and cardiovascular diseases."	Develop and implement a CHD strategy for etiinic minority communities in London including diabetes and stroke.	Reduction in risk factors, complications and premature mortality from CHD, stroke and diabetes in black and minority ethnic populations.	Ethnic monitoring required.
"We need to be better at responding to increasingly diverse kinds of emergencies and humanitarian crises."	Implement the recommendations in HoLP health needs assessment for refugees and asylum seekers.	Co-ordinated action to improve access to services including health advocacy, responsive information systems, partnerships and community participation in service planning.	Better systems for monitoring the numbers, background, needs and use of services. Improved screening and surveillance systems for new entrants (Port Health.)
"We will pay more attention to the delivery of high quality health care for children, adolescents and women."	Co-ordinate policies and strategies to promote the health of children young people and women.	Reduction in rates of: underage conceptions, suicide and deliberate self-harm, child poverty, exclusions and "looked after children," accidents, smoking and substance misuse.	Co-ordinated surveillance systems to monitor trends of women and children in poverty.

"We are committed to reducing the burden of sickness and suffering from communicable diseases."	Improve quality of TB services. Support TB research worldwide. Develop multi-tiered systems of governance.	Reduction in the prevalence of TB, halting the increase in incidence of TB, and preventing resistance to drug therapies.	Global and Clinical governance for TB services. Validated notification and surveillance systems for TB.
"A global commitment to tobacco control can potentially avert scores of millions of premature deaths over the next half century, and its success can point the way for effective control of other threats."	Implement and evaluate the London wide Tobacco Control Action Plan.	Reduction in rates of smoking, particularly in the target groups of young people, pregnant women and low income groups. Reduction in tobacco advertising and marketing.	Monitor progress by developing city-wide audit and surveys.
"Our first priority must be to reduce-then eliminate- the debilitating excess burden of disease among the poor."	Racism in the NHS must be acknowledged as a pre-requisite for change. Access to new services for minority ethnic users such as NHS direct should be evaluated.	Reduction in excess inequalities in morbidity and mortality from CHD, stroke, diabetes for black and minority ethnic populations.	Monitoring health outcomes and access to services for black and minority ethnic people will require ethnic monitoring.
The tasks (for WHO) include "setting norms and standards, and generating and disseminating an evidence and information base...."	Supporting and encouraging the development of health promoting settings such as healthy schools and healthy workplaces would be particularly effective in London.	Setting norms and standards, disseminating good practice for health promoting settings, especially the NHS.	Health Impact assessments.
"There is a need to invest in expanding the knowledge base that made the 20* century revolution in health possible."	Linking SRB, WHO healthy city initiatives, HAZ and HImPs to launch London as a WHO Healthy City.	Partnership with ALG and others to launch London as a WHO healthy city.	Health Inequalities Impact Assessment.
"The tasks (for WHO) include ensuring that critical research and development for the poor receives finance."	Ensure that the health needs of the poor both in London and globally are included in the research agenda. Include the health impact of globalisation on R&D agendas.		

Discussion

This is the first published health impact assessment of globalisation on the health of a defined population such as London.

The strength of the framework is that it clearly demonstrates why globalisation is a local issue and therefore why we must work with a range of other partners, including the private sector, industry and big business to tackle the impact of globalisation on health. The framework also considers how local action can have an impact on globalisation for perhaps the first time in the literature. The framework illustrates positive as well as negative effects from globalisation i.e. "winners as well as losers" for population and individuals. We are also in the unique position to make recommendations about priorities for action to minimise the harmful impact of globalisation and put them into action through the London Health Strategy.

The weakness of the framework is that the methodology for health impact assessment is only just evolving. The framework is not, and never can be complete, and so it is not possible to quantify the overall effect of globalisation. The remit of this study was restricted to social and cultural factors, so the impact of globalisation on many important environmental, political economic determinants of health such as housing, transport and the built environment are not considered.

In the section on Global Problems, Local solutions, a research and policy agenda identifies populations most at risk (i.e. the "losers" from globalisation) so mat appropriate interventions can be targeted We have also tried to demonstrate not only that globalisation is a local issue, but also that local action will make a difference.

We would like to propose that globalisation should be included in every health impact assessment and health inequalities impact assessment so that local solutions such as new forms of health governance that reduce the adverse consequences of uncontrolled globalisation can be given priority in health strategies.

Globalisation should be on every health agenda.

Lee (1998) has described the polarisation of debate between liberal theory which "hails globalisation as a process of market forces triumphing on a world scale" and the critical theorists who " warn of its destructive and destabilising impact." Through this process of including globalisation in a health impact assessment for the population of London, we think there is a "third way." Local solutions can be found if the right to health is linked to the responsibility for good governance of health at all levels.

For Britain, perhaps this "third way" will tackle the impact of globalisation on health by expecting good governance for health at all levels: personal, community, district, regional, national and international. Rights and resources should follow the demonstration of good governance as well as health need.

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TRAVEL HEALTH AND INFECTIOUS DISEASE

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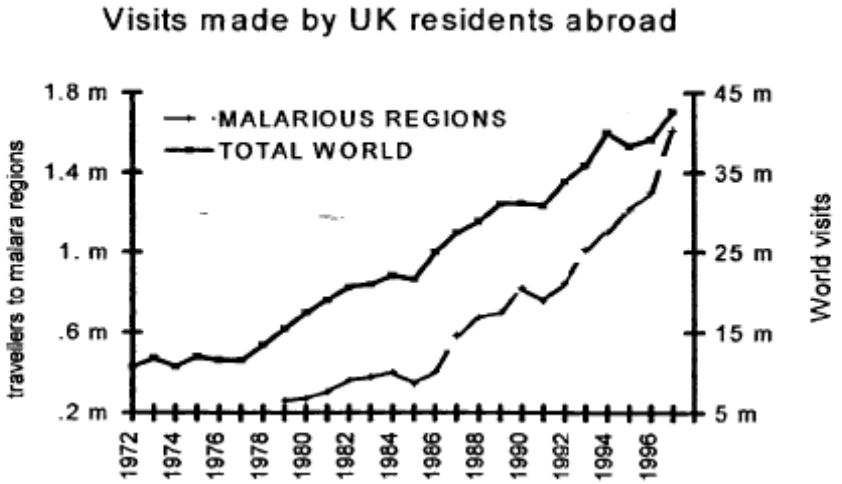
Summary

Travelling, be it for business or pleasure, has been increasing on an unprecedented scale, with more UK travellers of diverse backgrounds visiting exotic locales only rarely encountered before. Travellers are facing many health hazards that are uncommon to their country of origin that can result in considerable discomfort and illness, in addition to increasing the risk of spread of infectious disease to the home population. The consequences of increased travel and tourism are posing a challenge to health practitioners and policy makers to address the needs for prevention of illness and raise the publics' consciousness of global health issues.

Trends in Travel Health

The Impact of Travel

Table 1: Trends in Visits made by UK residents abroad



It is now widely recognised that travel has played a prominent role in the spread and emergence of disease among populations in different countries. Throughout humankind's never-ending migrations, microorganisms were unwittingly introduced into new ecological niches and into human populations who were susceptible to infection. Smallpox was introduced to the Americas by Columbus in the early 1500's, which lead to the deaths of two million Indians just thirty years later, no doubt helping the eventual conquest of almost the entire South American continent by the Spanish (Berlinguer 1992). Along with the rapid growth of tourism came the realisation that disease knew no national boundaries and an awareness grew that imported infection poses unique challenges to health-care practitioners. Almost any destination in the world can be reached within 36 hours, less than the incubation period for most infectious diseases. Sudden changes in climate, environment, time zone, and the related physical and psychological stress associated with long-distance travel may also pose health risks other than exposure to endemic infectious diseases.

The profile of UK citizens visiting foreign shores is becoming increasingly diverse, "with travel being no longer the pursuit of only the young, healthy and financially well off. Cheaper flights, rises in disposable income, convenient package holidays, international business travel, promotion of tours to previously unexplored destinations (e.g. eco-tourism, adventure travel) and other factors have encouraged greater numbers to visit exotic overseas destinations. Other migrating groups include technical experts, pilgrims, migrant workers, students, refugees, immigrants and military personnel. Future demographic trends predict a rise in the number of retirees, single adults and couples with children, visiting multiple destinations throughout the year, rather than staying at any one particular place for an extended duration of time (Clift and Page 1996).

The increase in travellers at the extremes of age, and those with serious chronic illnesses and complex treatment regimens (e.g. HIV infected travellers, travellers with heart ailments) pose new challenges to health care professionals who deal with the well being of the traveller (Behrens 1997). Activities such as identifying risk factors, infectious disease surveillance and planning health interventions become increasingly complex and require innovative approaches to establishing guidelines in travellers' health. Illnesses related to travel can become an increasing burden on the National Health Service (NHS) and a challenge to General Practitioners (GP) who may not suspect an exotic imported illness in a recently returned traveller.

Tourism and Health: the Global Dimension

Tourism has become one of the largest economic forces in the world with the consumer demand for travel steadily increasing since the documentation of travel statistics began. It has grown at an average of over 7 % per annum from 1950-1980, denoting an additional 11 million tourists each year. Over the past decade visits abroad by UK residents have increased by around 18% annually. The industry of international tourism is now estimated to account for up to 8% of the total world exports, and at least 34% of the world trade in services, accounting for over £280 billion pounds in revenue, almost one-third the value of world trade in the service sector. It is responsible for earning more revenue than the oil industry, clothing industry, motor vehicle industry, or the trade in electronic equipment, and is projected to be the worlds largest industry by the year 2010 (World Tourism Organisation 1997). By 1997, 625 million tourists, equal to 8% of the world's population, arrived in different countries around the world, with the United Kingdom maintaining its position as the fifth largest tourism market for the last 10 years. British citizens also rank as the fourth largest tourism spenders in the world, spending more than £17.3 billion pounds a year.

Europe has been the leading destination of international tourism for the past 30 years, receiving 60% of the worlds tourists, followed by North and South America with about 20% of the total. The United Kingdom receives up to 24 million visitors a year, the vast majority from the European community (58%), followed by North America (16%). In 1997 alone, there were 46 million visits abroad made by UK travellers, with nearly a million visits to Africa, half a million to the Indian subcontinent, and a quarter of a million to South America. Each year, up to 23 million visitors travel to the United Kingdom (Office of National Statistics 1998).

Illnesses occurring in travellers depend on a multitude of factors. The few studies on the rates of travellers acquiring illness have varying results, ranging from 15% in Swiss surveys, to 58% in Scottish studies (Habib 1997). In the largest survey series of 14,227 UK resident travellers published in 1985, up to a third of all travellers became ill, with the highest rates of illness reported among young people (20-29 years old), package holiday makers and travellers to the tropics (Cossar, Reid, Fallon et al., 1990). Taking destination into account, those travelling to the United States, Western Europe and Australia were least at risk, those visiting Eastern

Europe, the Mediterranean countries and North Africa were at intermediate risk, and those at highest risk had travelled to Africa, South Asia and the Far East (Habib 1997). There is still a lack of large, well-designed studies on the health status and specific illnesses acquired by travellers coming home from abroad. Such information is essential in providing care, improving pre-travel advice and planning effective disease surveillance methodologies in order to protect both the traveller and the population at large.

The success of the industry depends on the ability of retail travel agents to sell the product as quickly and efficiently as possible, providing some agents little motivation to draw the customers attention to any health hazards present at their destination. In studies on UK holiday makers, up to two-thirds of travellers express a willingness for receiving health advice before travelling from a GP, but in practice they are twice as likely to consult only the travel agent (Shickle et al 1998). Travel brochures recently assessed for health information in high street travel agents showed only 11 % carried health information in a prominent location, 64% placed health information at the end, and 25% carried no information at all. There is debate on how much medical advice is appropriate for the travel agent to provide as health risks vary according to area visited, season, type of accommodation and age and state of health of the traveller. There is a continuing need for health professionals and the travel industry to work together to improve travellers health

Surveillance and Control of Imported Infections

Table 2: Infections Imported to the United Kingdom, *1978-88*

AIDS	Diptheria	Lassa fever	Rabies	Trypanosomiasis
Amoebiasis	Dysentery	Leishmaniasis	Salmonellosis	Tuberculosis
Brucellosis	Giardiasis	Leptospirosis	Rabies	Typhoid
Cholera	Helminths	Malaria	Schistosomiasis	Paratyphoid
Cytomegalovirus	Hepatitis	Poliomyelitis	Shigellosis	

Source: Cossar,1996.

The phenomenal increase in world travel and tourism is taking place simultaneously with other factors that promote the spread of imported infections. Adaptable and antibiotic resistant microbes, increasing urban migration, movements of displaced populations and other events favour the emergence of infectious diseases. Early detection and immediate intervention can curb incidences of illnesses due to communicable disease and lessen the negative impact on national and international travel and trade. Due to its unique ethnic diversity, large tourist influx and long established links to developing countries, the United Kingdom is particularly susceptible to imported infections. During 1996, 10,000 cases of malaria were reported in the European Union, one fourth of them from the UK (Heymann and Rodier 1998).

In recent outbreaks of communicable diseases with global public health significance (avian flu in Hong Kong, Nipah virus in Malaysia), international collaboration co-ordinated by the World Health Organisation lead to swift investigation to prevent international spread of the illnesses. A framework for future collaboration developed by a multilateral organisation such as the WHO can be an important tool to develop an appropriate response to outbreaks of diseases of international importance. The effective implementation of existing surveillance procedures, orderly compilation of data, and continuing research by health bodies and academic institutions on travel related illness will be of great benefit in maintaining vigilance for imported infections

and reducing the burden on the NHS, but at a cost to taxpayers. Though data on many categories of travel-related illnesses are available (gastro-intestinal diseases, hepatitis, malaria) no integrated database specifically on travel-related illness exists in the UK [personal communication]. These points underscore the need to improve and maintain surveillance systems locally and internationally.

Overview of Common Illnesses Affecting Travellers

The steadily rising numbers of travellers to developing countries from the industrialised countries will expose a greater number of vulnerable hosts to hostile environments and climates. Between 15 to 50 % of these people will experience medical problems while travelling, though most of them will not be serious, about 5% will require a doctors' attention and only 1% will be admitted to a hospital (Reid and Cossar 1993) (Steffen 1989). The most common cases of death while abroad are injuries and accidents, or exacerbation of chronic illness, not infectious diseases. Though the majority of travel-related illnesses are preventable, health risks for the individual will depend on his or her mode of travel, lifestyle and budget. Vaccination, commonly thought of as the primary protection against illness abroad, can only prevent 5% of all diseases travellers commonly face (Cossar 1996). The following paragraphs will highlight some important travel related diseases and health hazards.

Gastro-intestinal Illnesses

Travellers' diarrhoea is by far the most common infection acquired by travellers across the world. The course of the illness is very seldom serious and is only considered a nuisance, but 1 in 3 persons with travellers diarrhoea is confined to bed and it can quickly spoil a vacation or business trip (Steffen, Van der Linde, Gyr et al., 1983). For those who have spent considerable time and money on their trip, days spent in bed ill with diarrhoea represents a real economic loss. Days spent off work due to prolonged illness can adversely affect family income. Drug resistant strains of microbes causing travellers' diarrhoea, such as *E. coli, Campylobacter* and *Shigella,* are more difficult to treat and take longer to cure. During the height of the recent seventh pandemic of cholera in Central and South America, 119 cases of travel-associated cholera was observed between 1991-1992, most of which resulted from an outbreak aboard a plane flight from Peru to Los Angeles (Tornieporth and Warren, 1996).

Malaria

WHO has confirmed that there has been a resurgence of malaria worldwide due to the increasing resistance of the parasite to drugs, and a range of other factors. Between 1987 and 1992, 8355 cases of malaria were reported to the Malaria References Laboratory in the UK, with underreporting possibly as high as 40% (Behrens 1995). Malaria is found throughout tropical countries and is one of the most important causes of fever in the returning traveller. Malaria can be difficult to distinguish from many common causes of fever affecting UK citizens, and delayed treatment can lead to severe illness or death. Attacks depend on season of travel, duration, type of accommodation and the use of protective measures against mosquitoes (Tornieporth and Warren 1996).

Tuberculosis

In 1993, the WHO declared tuberculosis (TB) a 'global emergency'. Eight million people worldwide were estimated to acquire the disease annually, resulting in over 3 million deaths per year (Ustianowski and Zumla 1998). The risk for travellers is limited because infection usually requires close contact over a long period of time, but groups with suppressed immunity, such as those with chrome illnesses or HIV sufferers, are much more susceptible to infection. Multiple drug resistant TB is particularly dangerous, as it does not respond to standard drug regimes, and takes much longer

cure, or may not be treatable at all. The families of immigrants returning to visit their relatives' abroad, especially from the TB endemic countries are particularly at risk. Studies analysing TB trends in Europe and North America show how travel-acquired infections may infect communities who have contact with infected travellers with most cases occurring in young adults from ethnic minority groups (Behrens and Grabowski 1995). Health promotion and tuberculosis prevention programs could be directed at groups at higher risk for acquiring the illness, with a need for better screening and follow-up of immigrants and closer links with community leaders to help combat the disease.

Vaccine Preventable Diseases

The incidence of hepatitis A for travellers in a developing country is 2-20 cases per 1,000 persons per month of travel, which makes it one of the most common immunisable diseases encountered by travellers (Tornieporth and Warren 1996). Recovery from illness may take weeks spent convalescing at home, affecting livelihood and mobility. Though many travellers assume that the only health precaution one needs for travel are vaccinations, they only prevent a small minority of infections. Cost of provision of vaccinations by national health systems should be weighed against the chance of preventing cases, but lack of research into the epidemiology of vaccine preventable illnesses make it difficult.

*Sexually Transmitted Diseases **and** HIV*

Travelling is widely recognised as a risk factor for contracting sexually transmitted disease (Cossar 1996). Tourists seek adventure and relax inhibitions while on holiday, increasing chances of engaging in unprotected sex with high-risk partners. Travellers' risk of contracting STD's or HIV varies widely in different parts of the world and depends mainly on their behaviour. In a study of 757 patients attending the Hospital for Tropical Diseases, London, 19% reported one or more new sexual partners abroad. Factors associated in engaging in sexual activity abroad included young age (median: 30 years old), males, going on overland tours, likely to have had paid for sex in the past 5 years, and to have been treated for an STD in the last 5 years (Hawkes and Hart 1998). The same factors apply for infection with HIV. The risk of sexual-transmission of HTV can be virtually eliminated by avoiding penetrative sexual intercourse with intravenous drug users, persons with multiple sex partners (such as prostitutes) and using condoms.

Other Health Hazards

Accidents and injuries are the leading cause of mortality among travellers (Cossar 1996). Most of these deaths were due to motor-vehicle accidents and drowning, but comprehensive data on risk and cause of deaths are yet to be collected. In a study of Peace Corps Volunteers (Hargarten, Barker and Guptil 1991) from 1962 to 1983, 36% of deaths were attributed to motor vehicle crashes, and 18 % were due to drowning, with the 20-29 age group at highest risk. In a review of deaths abroad by Paixao et al, (1991) most deaths occurred in the 60-69 age range, 34 % dying from cardiovascular problems, and 32% dying from accidents and injuries in the 20-29 age group. There are economic implications to the government and private sector if travellers, employees or dependents, become disabled while abroad and are unable to lead a productive life back home. Illness related to how people behave while abroad (sexually transmitted disease, accidents and injuries due to excessive alcohol consumption, and excessive exposure to the sun) has yet to receive proper attention from researchers.

Current Issues in Travellers Health

Importation of Antibiotic Resistant Infections

Strains of microbes that are resistant to standard treatment by antibiotics are endemic in some developing countries. Pathogens such as *Salmonella, E coli,* and *N. gonorrhoeae* resistant to multiple antibiotics have been responsible for numerous outbreaks in countries in the Indian subcontinent, Southeast Asia and Africa. Travellers acquiring such illnesses while abroad have to be hospitalised longer and treated with more expensive drugs, which incurs greater cost for the for treatment. Migrants coming from countries where illnesses of public health importance are endemic can be unwitting carriers of diseases that can be difficult to cure, and spread them at their destination. Diseases such as multiple drug resistant tuberculosis (MDR-TB) are particularly important for patients who are susceptible to illness, such as those living in long term care facilities, intravenous drug users and those infected with HIV. MDR-TB was recently implicated in a London teaching hospital when a patient was mistakenly put in a ward with HIV positive patients, causing an outbreak and multiple deaths despite treatment in HIV positive patients (Breathnach et al 1998). There is evidence to suggest MDR-TB can be spread within aircraft, which has serious implications for susceptible groups who may be at risk (Kenyon, Valway et al 1996).

Cost-effectiveness of Health Interventions

National health budgets are limited, and health problems affecting the general public are given greater attention. Economic tools such as cost-benefit analysis of health risks are universally used among policy-making bodies as devices to prioritise health care spending. In a study by Behrens and Roberts ((1994) cost-benefit analysis was done for preventive therapy against malaria, typhoid fever and hepatitis A in UK residents. General Practitioners used to give these prophylaxes free to travellers according to their judgement as part of the National Health Service (NHS) coverage. The cost per avoided case of typhoid fever for a single journey using oral typhoid vaccine was £202, 207, and for hepatitis A £187,137. Though hepatitis A is the most frequently encountered vaccine-preventable risk for travellers, incidences of travel related hepatitis A and typhoid occurred in less than 0.05% of visits by British residents in 1991. Only malaria prophylaxis was considered to be economically sound, with cost per avoided case of £1,360. The costs to the NHS of providing typhoid and hepatitis prophylaxis were calculated by the authors to be £25.8 million compared to costs of treating cases prevented by the use of vaccine of £1.03 million. The study illustrates the importance of providing useful health interventions that are cost-effective in addressing public health needs

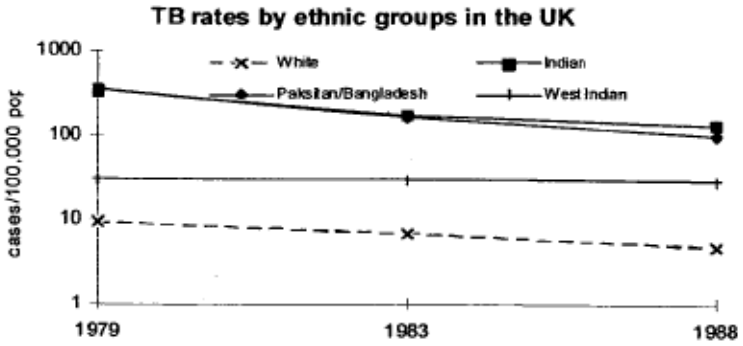
The Impact of Media on Public Perception of Risk

Whether or not a traveller seeks pre-travel health advice depends on his or her perception of risk of acquiring illness. The media is recognised to have an important effect on the publics' perception of what constitutes a risk when abroad. The 1994 outbreak of plague in India was of practically no risk to short-term travellers to India, though it escalated into a global panic lead by overzealous reporting by media. Such occurrences can be highly destructive to the tourist industry of the country concerned and can have unwanted social impacts such as the unfair discrimination of nationals travelling to other countries. At the same time of the plague outbreak, which caused 62 deaths, an epidemic of malaria was ravaging the state of Rajasthan, wherein 4,000 people had died (Clift and Page 1996). Malaria was a far greater potential danger to travellers in Rajasthan than the plague though the media at the time had not deemed to report on it in equal measure.

Public and individual's health concerns can have a major influence on tourism and can affect the transfer of wealth from tourist donor to tourist recipient regions. In this context, loss of tourism can result in significant economic hardship for developing regions. The vulnerability of the tourist dollar was highlighted following the single death of a

British tourist from malaria contracted in Kenya. The subsequent media attention in Britain lead to an estimated loss of 101,000 visits by UK tourists to Kenya over the following 2 years and a calculated loss of foreign earnings of £69m; which was equivalent to 18% of Kenya's foreign earnings or 33% of Kenya's health budget Behrens and Grabowski 1995). Efforts to prevent diseases, both in travellers and the home population will provide benefits by enhancing the economic advance of tourist dependent countries, providing economic stability and reducing the spread of infectious diseases.

Table 3: TB rates by ethnic groups in the UK



Travel Related Illness in Ethnic Minorities and Refugees

The United Kingdom is one of the most ethnically diverse countries in Europe, with a long history of contact with developing countries. There is currently a net inflow of 92,000 immigrants from various countries entering the UK every year (Office of National Statistics 1998). Many health problems of recent immigrants and refugees from developing countries frequently relate to illnesses endemic in their native countries. Recent findings suggest that ethnic minority travellers who were originally immigrants from developing countries are at increased risk for endemic diseases from their place of origin when they go back for visits (Behrens 1990). Such illnesses include infectious diseases of global public health importance such as drug resistant tuberculosis, malaria and hepatitis A. Between 1987 and 1992, half of the 8,355 cases of malaria in the UK occurred in immigrants (who have settled in the country for a decade or more) and visitors to the UK. This may be due differences in perceived risks of immigrant groups. Since having resided previously in the country, there may be a belief that they have immunity and therefore not seek pre-travel health advice. Ethnic minorities may have different patterns in susceptibility to infectious diseases than the native population, and as they do not constitute the majority of the population, little research has been carried out on the reasons behind the differences in rates of illness between them and the native population (Behrens 1995).

Conclusions

- Travel contributes to the spread of diseases. With increasing speed and convenience of travel, it is likely that the travellers may be infected with a communicable illness whose symptoms may not manifest themselves until he or she has come home.
- International travel and migration is increasing at an unprecedented rate, with 24 million visitors travelling to the United Kingdom each year, while nearly twice that number make overseas trips from the UK. It is predicted this trend will continue well into the next millennium.
- The profiles of travellers are changing, with more retirees, couples with young children and persons with chronic illnesses going abroad. Specialist tours such as

'adventure travel' will expose more people to exotic ecosystems and microbes, which may in turn be imported to their home country.

- Government bodies do infectious disease surveillance but there is a lack of research on illnesses and risks faced specifically by travellers. Such data is necessary for planning proper preventive health interventions and effective pre-travel advice.
- Travellers' diarrhoea, malaria, viral hepatitis, and sexually transmitted diseases are important illnesses for travellers to endemic countries to be made aware of. All of them are reducible with proper pre-travel counselling and prophylaxis.
- Injuries and cardiovascular disease are the most common causes of travellers' mortality while abroad. Disability and serious injury acquired abroad has economic implications for the national health budget, and can be prevented by proper counselling of at risk groups.
- Particular health interventions, such as vaccinations for hepatitis A and typhoid before travel may not be cost-effective for the national health budget. Use of tools such as cost-effectiveness analysis could be used to determine whether health interventions are economically sound and practically useful.
- Mass media may adversely influence the publics' perception of risk of travel to particular areas and can negatively impact the economies of countries dependant on tourism for revenue
- Importation of multiple drug resistant microbes acquired abroad are more difficult to cure, expensive to treat and have serious consequences to susceptible groups who may be unwittingly put at risk of infection.
- Ethnic minority travellers and refugees may be at significant risk of illness due to different patterns in their health-seeking behaviour when returning from visits to their native countries.

Recommendations

1. Creation of a national policy on preventive strategies raising the public profile of travel related health risk and addressing travellers health, based on evidence-based risk assessment and hazards by:

A. Identifying how much illness is occurring in and during travel:

- Non-infectious diseases (e.g. trauma) and exacerbation of pre-existing illness
- Behaviour related illnesses (e.g. sexually transmitted diseases), alcohol, and sun-related illnesses
- Infectious diseases of public health importance e.g. drug resistant TB, Salmonella, HIV
- Research on health interventions and validating their effectiveness in reducing morbidity

B. Devising clinical guidelines for 'best practice' for health professionals on the front line who advise travellers, including those who go on adventure tours or long overland treks.

2. Improved surveillance of travellers' illnesses, with expansion of public health databases to include travel-related illness as a distinct category. Reliable information on imported infection

is essential to improve advice and individual risk assessment to all travellers, especially those with pre-existing medical conditions.

3. Collaboration with the travel industry, health organisations with specialist expertise, and
mass media to advise on appropriate prevention and control measures. Centres where liaison
groups already exist and which are actively involved in travel health include: the PHLS Communicable Disease Surveillance Centre, the Hospital for Tropical Diseases, London and
the London School of Hygiene and Tropical Medicine.

4. Evaluation of new technology used by travellers to determine usefulness:

- Protective devices e.g. insect repellents and water purification instruments
- Computerised health risk self-assessment stations in travel agencies and GP clinics to help identify travellers at risk and encourage consultation at specialist travel clinics

5. More research on the cost versus benefits of new or altered vaccines, and use of economic tools, such as cost-effective analysis, to better allocate resources and evaluate preventive strategies.

6. Determination of factors contributing to high travel associated morbidity in ethnic minority travellers and provision of culturally appropriate health interventions.

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GLOBAL AND LOCAL GOVERNANCE FOR TUBERCULOSIS

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Introduction

A Health Impact assessment of globalisation on London (Parsons and Atkinson 1999) showed that globalisation has positive as well as negative effects; local activities can impact on global forces as well as vice versa; and therefore "globalisation should be on every health agenda."

Globalisation is defined in this paper as a process that is changing the nature of human interaction across a range of social spheres including the economic, political, social, technological and environmental. This process is globalising in the sense that many boundaries hitherto separating human interaction are being increasingly eroded. These boundaries - spatial, temporal and cognitive - can be described as the dimensions of globalisation. (Lee 1998)

Other papers in the Nuffield programme (Lister 1999) have demonstrated the complexity and diversity of the effects globalisation has on health and the delivery of health services. There is a growing consensus of opinion in the UK that global governance to protect and promote health is needed. However, it is also clear from the Nuffield seminars that no single approach to governance will effectively minimise the harmful impact of globalisation on health and also the health risks of globalisation are constantly evolving and changing.

Lee (1998) has described the polarisation of debate between liberal theory "which hails globalisation as a process of market forces triumphing on a world scale" and the critical theorists who " warn of its destructive and destabilising impact." Through the process of including globalisation in *n* health impact assessment for the population of London, we proposed a "third way." Local solutions can be found if the right to health is linked to the responsibility for good governance of health at all levels.(Parsons and Atkinson 1999)

For Britain, perhaps this "third way" will tackle the impact of globalisation on health by expecting good governance for health at all levels: personal, community, district, regional, national and international. Rights and resources should follow the demonstration of good governance as well as health need.

Alongside globalisation, governance is emerging as a vital determinant of good health. Governance has been defined as being "the process whereby an organisation or society steers itself." (Rosenau 1995:14). Systems and structures of governance exist on all spatial levels: local, regional, national and global.(Buse and Dodgson 1999.)

To test the hypothesis that globalisation needs good governance, we have taken one public health problem, Tuberculosis, (TB) and reconstructed what needs to be in place at all levels to link local and global governance for an effective programme to prevent and manage TB.

We have linked "Rights" to "Responsibilities" to demonstrate that there are incentives that might drive such a global programme in addition to the "moral imperative" and "enlightened self interest" that are the usual reasons given for good governance in health.

The analysis is restricted to Tuberculosis in adults.

Why Tuberculosis?

Among adults, tuberculosis is the leading cause of death due to a single infectious agent. In the developing world it causes more than 25% of avoidable adult deaths.

On the basis of notification data and the ARTI, global TB incidence in 1995 was estimated at 8.8 million cases (154 per 100,000.) Most cases, in both men and women, were in the 20-49 years age group. Projections published in 1994 suggest that TB incidence might increase to 10.2 million cases in the year 2000 and 11.9 million by 2005. Currently, the global prevalence of all forms of TB is estimated at 20 million. The projected prevalence is 23.2 million cases by the year 2000 and 28 million by 2005.(WHO 1998)

It is of local concern to Public Health practitioners and others in London because TB notifications continue to rise (Hayward 1998.) This contrasts with rates in the UK as a whole which have increased since 1987 butnot as much as in London. Tuberculosis rates in London have increased considerably over the last 10 years (rates have doubled in many boroughs) and mortality rates are high. A number of explanations have been given for the higher rates of TB in people from Black and Minority Ethnic Groups (BMEGs):

- Infection recently acquired abroad becomes clinically manifest after arrival in the UK.
- Latent infection, acquired abroad either recently or in the more distant past, is reactivated due to the stresses and/or circumstances of immigration.
- People coming to the UK arrive healthy but become infected or re-infected in the UK because of bad housing, overcrowding or poor working conditions.
- A few people come to the UK seeking treatment. These numbers do not contribute statistically significantly to the increased numbers seen.

Comparisons with New York show that the overall level of tuberculosis in London and the extent of the increase is similar to that seen in New York 10 years ago.(New York State Department Tuberculosis Notification Data) There is also a concentration of TB in the same vulnerable groups as in New York (eg the homeless and people with HIV.) New York experienced a major epidemic of TB in the 1980's and 1990's. In the 15 years prior to 1992 the rates trebled and multidrug resistance increased to 20% of all isolates. There were many outbreaks of multidrug resistant disease in hospitals and prisons. Massive re-investment in TB control (in particular, greatly increased use of Directly Observed Therapy - DOT - and improved hospital infection control) was needed to reverse the trend in New York.

Like many public health interventions, TB control depends on technologically relatively simple and largely standardised procedures, but also requires the managerial capacity to implement them on a large scale in order to be truly effective. However, with these aspects of "good governance" in place, control of TB would be possible in many parts of the world.

Recognising that TB is one of the most neglected health crises and out of control in many parts of the world, WHO declared the TB epidemic a global emergency in April 1993. A Handbook (WHO 1998) was produced to promote effective control of TB by synthesising the general principles and practical approaches for TB control that have been developed by the WHO Global TB Programme (GTB). Many of the elements of "global and local governance for TB" in this paper are drawn from this handbook.

In the UK, tuberculosis control services should comply with the recommendations for prevention and control of TB developed by the Department of Health and Welsh Office Interdepartmental Working Group on Tuberculosis. (Interdepartmental Working Group on Tuberculosis. 1996)

Framework for Management of TB

The framework for the global and local governance of TB has been constructed largely from the sources already referred to in discussion with a wide range of experts as part of the Nuffield programme on globalisation.

Table 1. Global and Local Governance for Tuberculosis in Adults.

Who?	Rights	Responsibilities
Individuals	Facilitated access to understandable services including information, education and screening. Effective diagnosis and treatment. Effective and safe protection from infection and re-infection. (BCG and prophylaxis)	Complete treatment Community benefit from appropriate take up of BCG immunisation.
New arrivals, BMEGs, special and socially excluded population groups eg HIV+, homeless, prisoners and refugees.	Equal rights for best treatment. Appropriate and sensitive screening.	Early presentation with symptoms. Protection of others. Completion of treatment.
Families and other community contacts	Screening and prophylaxis. Appropriate treatment.	Co-operation and adherence
Healthcare workers in primary and secondary care.	Training. Appropriate and feasible safety measures. Systematic risk assessment. Guidelines for safe collection, handling and processing of patient samples. Access to robust occupational health services.	Effective case management. Notification of cases. Support patients to maximise completion of treatment. Proper implementation of existing guidelines for control. Prevent MDRTB. Present early if ill. Adherence to infection control, health and safety at work .
Health authorities, PCGs/PCTs and other donor or commissioning agencies that allocate resources in UK.	Effective system of screening "new arrivals." Consistent policy on free treatment. Regular supply of drugs and BCG vaccine. Accurate and timely information from patients and services.	Needs assessment. Accurate local surveillance system and participation in national surveillance. Monitoring services and disease outcomes against key indicators. Locally agreed and audited guidelines for treatment, prevention and control. Equitable funding mechanisms that reflect local prevalence and populations at risk (BMEGs.) Commissioning safe workplaces

		and appropriate care pathways.
Hospitals world wide and Trusts in the UK.	Equitable funding mechanisms that reflect local prevalence and populations at risk (BMEGs.)	Deliver cost effective treatment programmes such as DOTs. Well managed clinical networks. Quality control of laboratories. Active audit. Training healthcare workers. Effective implementation of workplace health and safety policies, occupational health and infection control guidance.
Department of Health in UK.	Political commitment. Adequate funding for TB related activities.	National communicable disease strategy that includes TB. Minimisation of MDRTB.
National TB programmes (NTPs) in developing countries.	Political commitment. Adequate handing for TB programmes (may have to be subsidised by overseas aid). Affordable drugs and vaccines.	Implement programmes in line with the internationally recommended TB control strategy. Case detection by microscopy. Implementation of DOTs. Regular supply of all essential anti-TB drugs. Monitor case detection and treatment outcomes.
Pharmaceutical Industry.	Patent protection. Guaranteed markets.	Develop tests, drugs and vaccines that are affordable.
Research Community.	Research strategy with clear priorities and direction. Funding for TB research in UK and developing countries.	Portfolio of research that addresses strategy. Affordable new drugs and vaccines. Evidence of prevention of MDRTB and new drugs. Delivery of co-ordinated and ethical research.
UN Agencies and international Community.	Mechanisms for encouraging TB control by rewarding good practice and sanctions against countries that are not striving to achieve good practice	Develop and agree a global strategy for the control of TB. Set and monitor standards of treatment and effectiveness of national TB programmes.

Putting Good Governance into Practice: Locally

The framework is unashamedly simplistic and reductionist, and at first sight it may appear that all the elements are in place. However, a recent review of Tuberculosis Control in London (Hayward 1998) showed this was not the case either at a local or a Regional level within the

UK. The conclusions of this process of review of Tuberculosis control in London was a shared vision of working in geographical sectors with a clear service model of managed clinical networks following consistent protocols and care pathways to meet national and internationally agreed standards with centralisation of treatment for children, Multi-Drug Resistant TB, HTV+ patients, and those needing isolation or secure facilities. The service would aim to become nurse led. Interestingly, there is widespread agreement that these changes can be achieved within existing budgets.

However, certain issues to address were consistently identified:

- Agreeing consistent service priorities for London in the context of resource constraints, for example by agreeing which activities should no longer be carried out because they only have a limited impact on TB control in London, eg Screening new entrants in its' current form, and neonatal BCG in certain boroughs.

- Developing a consistent approach to improving clinical quality through: diagnostic testing; use of DOT; prevention (including BCG, prophylaxis and occupational health screening); surveillance including notifications.

- Raising the issue of free treatment, as a component of encouraging the completion of treatment and identifying a common approach by all health authorities.

- Raising concerns about the availability of supplies of drugs and vaccine.

- Agreeing shared outcome goals for TB services in London.

- Co-ordinating the production of a newspaper for staff working in TB control in London.

- Ensuring that information is produced for patients in a range of languages and formats.

- Taking a strategic view of those elements of service which could be provided across sectors, such as secure facilities.

Not only did this review of TB control in London achieve a remarkable degree of consensus and commitment to what amounts to a multi-layered system of governance of TB in London, but it also established good practice in agreeing good governance by doing it democratically and involving a wide range of partners, including the public. This is an example of reviewing services and commissioning to link good governance at all levels within one health region within the UK.

Putting Good Governance into Practice: Globally

While the conditions for global good governance of TB are far from being met, there are other examples of good practice from around the world. In a leader in the BMJ (1999) timed to influence the 1999 Commonwealth heads of Government meeting in Durban, Nicholl and Godfrey-Faussett identify that though Commonwealth countries represent only 29.5% of the global population, they account for 60.5% of cases of HTV and 42.3% of those of tuberculosis. The total numbers involved are massive and reflect significant health burdens requiring substantial investments if their impact on health and development are to be mitigated. Yet some Commonwealth countries have shown important successes in controlling these diseases, and there is much that countries could learn from each other if some effort was put into organising

the transfer of information and experience from one country to another. Uganda, for example, has shown remarkable openness and vigour in tackling AIDS from the start, though it remains heavily burdened, it is showing success in reducing transmission among young people in urban areas at least. The United Kingdom and Australia have done far better than most comparable industrialised countries in limiting the penetration of HTV after it first appeared in the early 1980s. Equally, tuberculosis control programmes in several Commonwealth countries (Malawi, Kenya and Tanzania) are model programmes which, at least until the advent of HTV were achieving high population coverage and good cure rates.

Proposed Action Plan

l.Link systems of governance at all levels from individual to global by each level considering its' rights and responsibilities in relation to adjacent levels.

2.Identify and make explicit, or build incentives into systems of disease control.

3.Good governance is more than just clinical governance.

4.Within a national communicable disease control strategy there should be a clear approach to addressing TB and MDRTB reflecting the approach to rights and responsibilities in this paper.

5.At highest level of surveillance, the UN agencies and international community needs mechanisms such as rewards and sanctions to really "Stop TB!"

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THE UNITED KINGDOM'S VITAL INTEREST IN HEALTH AND SYSTEMS OF GOVERNANCE

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In recent years, governance has emerged as an important issue in the field of health. This paper discusses the process and mechanisms of health governance that exist on all spatial levels and the implication of these systems for the vital health interests of the United Kingdom's (UK) government. As means of an introduction to the subject, the chapter begins with a conceptual discussion of governance and vital health interests of the UK government. This discussion shows that UK's health policy is deficient in its recognition of the globalisation of health and the implications of this process for governance. The paper moves on to discuss the systems of health governance that exist on a multilateral, regional (European Union), bilateral and local level. It is apparent that there is little connection or co-ordination between systems of governance. Nevertheless, these different systems influence the ability of the UK government to fulfil its vital health interests. The chapter concludes that the government has to decide upon its future policy towards these systems of health governance. In particular, it must decide whether its health interests will be best served by supporting the emergence of a single cohesive system of global health governance or not.

Governance and Health

Governance is defined as "the process whereby an organisation or society steers itself." (Rosenau 1995:14) Mechanisms and systems of governance exist on all spatial levels. Generalising about governance at a national level is difficult, as each national system is based upon a different set of institutions, decision-making norms and principles. However, in the case of the West, it is possible to identify the common features of liberal democratic governance. This system of liberal democratic governance is becoming more global as it is exported to Eastern Europe, Asia, Africa and Latin America in the form of World Bank/IMF programmes of'good governance' (Leflwich 1993: 605-612).

The European Union is the leading example of regional governance as it has established forms of governance "that stretch above the nation-state and reach down to the individual." (Giddens 1998:142) These forms of governance include a model of social governance that promotes social justice and spans the policy areas of education, welfare, safety at work and health (Fh/nn 1999:7). There are many additional examples of emerging mechanisms of regional governance, including trading blocks (e.g., NAFTA) and more encompassing associations (e.g., ASEAN), yet these do not represent the development of supra-national government as is the case with the EU.

On a global level, one purpose of governance is the establishment of order. Within the context of global governance, order equates to "those routinized arrangements through which world politics gets from one moment in time to the next." (Rosenau 1992:3). These arrangements are constantly evolving and are diffuse and diverse: diffuse in the way that they do not respect existing boundaries; and diverse in the way they are composed of states, inter-governmental organisations, non-state actors, regimes, norms and principles (Rosenau 1992:5, 13-18). Scholars agree that the emergence of global governance signals a change in the sovereign authority of states. The sovereign state is not dead, but it has lost or ceded some authority to supranational or sub-national entities (including private). While recognising that the emergence and future need for

global governance can be linked to globalisation, there is agreement that global governance is constructed through human actions (Falk 1997:20-24)

Governance and health are becoming increasingly interlinked. For example, in the UK the idea of 'clinical governance' has recently entered the health lexicon; referring to "...a system through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish." (Scally and Donaldson 1998:61) Outside the UK, the arena of international health has changed dramatically. Although the nation state retains primary responsibility for health, increasingly, health determinants and the means to address them transcend national boundaries. In response to these changes, there has been a general recognition of the need to establish mechanisms of health governance that connect all spatial levels and actors to form a system of integrated global health governance (Kickbusch 1997)

The UK Government's Vital Interests in Health

The government of the UK considers the health of its people to be central to its vital interests. This view is supported by the governments' health strategy *Saving Lives, Our Healthier Nation,* in particular it's opening paragraph; "Good health is fundamental to all our lives. We all treasure our own health, and the health of our families and friends. Good health is the bedrock on which we build strong families, strong communities and a strong country." (DoH 1999:4) *Saving Lives, Our Healthier Nation* is centred upon two broad objectives and four specific priority areas. In seeking to close the health/poverty gap and improve the health of the nation, the objectives of *Saving Lives, Our Healthier Nation* reflects the ethos of the 'third way' (Giddens 1998:69). In the area of health, the 'third way' is described as " striking a new balance -a third way - linking individual and wider action is at the heart of our new approach." (DoH 1999:5) The balancing of rights and responsibilities is a central aspect of 'third way' politics and policy (Giddens 1998:65). Individuals and society have a right to good health. Through policies and programmes, the government is primarily responsible for ensuring that this right to good "health is fulfilled. However, the ideology of the 'third way' demands that the individual is also responsible for his/her health. Thus, it is up to the individual to ensure that his/her health is not jeopardised by practices (e.g. smoking) which may place this health at risk (DoH 1998:1).

Partnerships are an essential feature of *Saving Lives, Our Healthier Nation* and further evidence of how the government's approach to health is shaped by the principles of the 'third way'. The government calls for partnerships between itself, health authorities, local authorities, businesses, voluntary bodies and individuals (DoH 1999:8). Working together, these partners can reduce ill health, promote good health and fulfil the government's objective of national social renewal and development.

Transnational systems of governance are an aspect of the 'third way' that receives little attention within *Saving Lives, Our Healthier Nation.* The document pays no explicit attention to the threat posed by globalisation to health and gives only cursory treatment of transnational systems of health governance (DoH 1999:33). Although the role of the UK government in transnational systems of health governance is discussed in other government publications, in a globalising world, the failure of *Saving Lives, Our Healthier Nation* to broach this topic, may undermine the ability of the UK government to meet its domestic health objectives. For example, if the UK government does not recognise the global nature of infectious diseases or how these infectious diseases may be controlled on a transnational level, its ability to respond to outbreaks of infectious diseases will be undermined. While the recent action of the EU to stop the import into the UK of contaminated food products from Belgium demonstrated the utility of transnational systems of health governance.

In contrast to *Our Healthier Nation,* the UK government's white paper *Eliminating World Poverty* emphasises the link between the government's domestic objectives and the global context that conditions how and whether they are met. The white paper believes that the UK's own vital health interests can be met by supporting multilateral agreements and targets on the promotion of sustainable development in developing countries. These targets include a number which are health-related, for example, a reduction by two-thirds in the mortality rates for infants and children under age 5 and a reduction by three-fourths in maternal mortality by 2015. The pursuit of poverty elimination through the achievement of health goals is sought by both the international community and the UK government because health in increasingly viewed as a critical determinant of sustainable development. Hence, the UK government's position with respect to the pursuit of global health through the aid regime is linked to the contribution of good health to the elimination of poverty which in turn is seen to be a *sin qua non* of the well-being of UK citizens.

DAD takes the position that "only governments can create the right political and economic framework within which the march out of poverty [and ill health] can gather momentum" (DflD 1997:12). However, given the manifestations of globalisation and the global nature of the determinants of health (both at home and abroad), the UK government is faced with a range of options with respect to promoting global health governance. In particular, it can work to strengthen mechanisms of governance on a multilateral, regional, bilateral and societal/local level.

Meeting UK Health Interests on the Global Multilateral Level

As global integration progresses, domestic policy objectives - such as public health - are increasingly subject to international forces (Frenk et. al 1997). Consequently, to attain national policy objectives, governments must increasingly turn to international co-operation. However inadequate, the present major source of such co-operation is vested in the inter-governmental system. There has been significant debate on the effectiveness of the UN and other multilateral organisations. Despite this debate, however, there is still recognition of the value of multilateral organisations in international health governance (Drager et. al. 1994). Indeed, a review of the WHO concluded that national governments continue to support the WHO because of its ability to bring together "a critical mass of finance and expertise under a global strategy, offering a common approach and representing a collective effort by the international community."(Vaughan et. al. 1995)

The multilateral development system is complex, containing several major groupings and a great many individual organisations. To begin with, it is possible to highlight a grouping of 'social' multilateral organisations that are making a significant contribution to the formation of global health governance (See Table 1).

Table 1 : Perceived comparative advantages and disadvantages of select multilateral organisations involved in health

Organisation	**Perceived Advantages**	**Perceived Disadvantages**
WHO	* in-house scientific & technical medical knowledge and network of experts * legitimacy to set global norms and standards (neutrality) * close links with ministries of health	* bureaucratic and top heavy * staff too medically oriented * weak capacity and few resources at country-level * weak accountability and transparency * stagnant financial situation * agency priorities follow donor preferences
UN1CEF	* large measure of public support * strong implementation capacity * resources and personnel at country level * effective procurement * powerful advocacy	* driven by narrow set of corporate goals * vertical approach to health through parallel infrastructures limits sustainability * too independent of other organisations * interest in health waning
UNFPA	* powerful advocacy in family planning * effective, if narrow, technical capacity * effective procurement services	* major re-orientation from family planning to reproductive health incomplete * limited country-level health expertise * subject to changes in political climate
World Bank	* significant, increasing and sustainable financing (given 're-flows') * strong links with central ministries permit upstream advocacy and cross-sector linkages * skills in economic, sector and institutional analyses as required for health, sector reform * the Bank has successfully raised salience of health on domestic policy agendas	* weight of decision-making in hands of a small number of creditor countries * dominated by neo-liberal values and economic approach to health * central, corporate strategy dominates over country-specific approaches * 'mission culture' as opposed to country-based technical health capacity * emphasis on disbursement of loans at expense of quality of interventions * low Bank stafl7workload coefficients constrains quality of lending * lack of technical expertise across wide range of health issues
European Commission as a development agency	* significant amount of funds * access to technical expertise from member states	* poor internal co-ordination or co ordination with member states * limited in-house technical health capacity - particularly at the country-level * nascent involvement with social sectors * complex bureaucracy * spending not targeted at poor * unable to disburse funds

Source: adapted from Buse (1998).

Recently, a number of International Financial Institutions (IFI) have joined these 'social' multilateral organisations in the field of global health. The most prominent of these IFIs is the World Bank, which from a modest start has become the largest external financier of health activities in developing countries and a major voice in health policy debates (Buse and Gwin 1998). The Regional Development Banks are also becoming major players in health - both in absolute terms and in relation to other international actors (Frenk et. al. 1997). Whereas other multilateral organisations in the health sector provide grant assistance, the IFIs give out loans, primarily to governments, which the governments guarantee to repay. For all borrower countries except the poorest, IFI loans are made on non-concessional terms. Within the IFIs the weight of decision-making is in the hands of a small number of creditor member governments (i.e., voting power is related to capital subscriptions).

The World Trade Organisation (WTO) is the most contentious of the multilaterals to become involved in global health. A number of treaties that seek to harmonise and reduce barriers to free trade are annexed to the WTO Convention. Most of these carry implications for health. For example, the Trade-Related Aspects of Intellectually Property Rights Agreement (TRIPS) establishes minimum standards in the field of intellectual property - in effect protecting patents. Concern has been expressed that the enforcement of TRIPS will erode access to essential drugs in low-income countries (Velasquez and Boulet 1999). Recent rulings by the WTO on the illegality of the EU ban on the importation of American hormone-enhanced beef, demonstrates how the organisation can impact on British health directly. In that the establishment of the WTO, and systems of trading rules that it supports and fosters, will have far-reaching implications for health, the WTO is poised to become a central actor in global health governance. Some public health advocates argue that the WTO can be used to foster better health. In particular, Labonte (1998) suggests that the social clauses and agreements of the multilateral conferences, such as the Convention on the Rights of the Child (which are currently unenforceable), should be appended to the free-trade agreements which would then be monitored and enforced by the WTO.

Table 1 demonstrates that-multilateral organisations differ significantly and make diverse contributions to the governance of global health. However, the current configuration of multilateral health governance leaves much to be desired. First, the issue of co-ordination remains problematic (Buse and Walt 1997). The health-related organisations are independent of one another and, consequently, they find it difficult to agree to a strategic division of responsibility. This failure can, in part, be attributed to the second challenge; namely how to distribute authority within the system. WHO leadership was progressively eroded under the management of its former Director-General, while the World Bank became to assume certain leadership responsibilities (e.g., agenda setting, resource mobilisation) (Buse and Gwin 1998). With the election of a more widely respected Director-General, WHO may find itself in a position to re-claim a limited amount of authority. Nonetheless, more thoughtful consideration needs to be given to a formal delineation of leadership, mandates, functions and co-ordination; the articulation of a global health system. The third challenge relates to funding. Funding for UN organisations has declined in real terms during the 1990s, with increased multilateral health spending reflecting the increased commitment of the MDBs and EC to this sector. Prospects for growth in the WHO budget seem poor given, for example, the World Health Assembly's failure in May 1999 to maintain even a zero real growth budget (McGregor 1999).

Multilaterals and the UK's vital health interests

Processes related to globalisation will reinforce the unique and irreplaceable functions in global health governance performed by multilateral organisations of the UN, such as WHO (Jamison

et.al. 1998). Through its support, the UK can contribute to enabling these organisations to perform these tasks which are critical to the protection and promotion of global health.

About 50% of the UK's development programme is spent through multilateral channels. Currently, the main share is provided to the European Union (56%), with the IFIs second (24%) the UN third (12%) with the remainder going to the Regional Development Banks (DfiD 1999b). In 1997, the UK's share of the UN Regular Budget was 5.3%; agreement was reached that the contribution would be reduced to 5.1% in 1998 (FCO 1998:13). There may be a political role for the UK to mobilise financial support from other OECD countries or in finding alternate means to finance these organisations (e.g., Tobin-type taxation). There is certainly an argument to be made that the UK should consider how to get better value for money from its multilateral investment in the EC. Should, for example, some of this be re-channelled into United Nations agencies?

One of the notable features of the financing of the multilateral regime is the rise in the portion of budgets financed by supplementary funds. The UK is a major provider of supplementary funding to many multilateral organisations, including the WHO. Providing such support to multilateral organisations enhances the UK's influence and leverage over the manner in which these organisations operate. In particular, voluntary support enables donors to assume a greater voice in the choice of policies, priorities, programmes and staffing of multilateral organisations as well as in their organisational reform (Vaughan et. al., 1995). Depending on how responsibly this influence is exercised, the UK could play a leading role in enabling organisations such as the WHO to meet the growing challenges to global health governance.

Financing and supporting multilaterals, however, also provides the UK government opportunities to pursue distinctly bilateral objectives through the apparatus of the neutral multilateral institution. The multilateral machinery can be utilised to increase the leverage with which the UK pursues a particular objective, to enhance the legitimacy of a policy or value, to provide distance from a contentious policy (e.g., HIV/AIDS control in the mid-1980s), or to increase the reach of Britistt policies to nations states which are not covered by the bilateral assistance programmes.

Meeting UK Health Interests on the Regional Level

Health issues were added to the policy remit of the European Union with the signing of the Maastricht Treaty on European Union in 1992. Articles 3 and 129 of this treaty gave the institutions of the EU competence in the area of health. Article 3 sets out the broad aim of the EU in this area, "...to make a contribution to the attainment of a high level of health protection." (European Commission 1997:18) Article 129 gives the EU competence in health, although it does not seek to harmonise the public health policies of member states or open up a space for the EU in health care service provision (EPHA 1999:3).

The EU's involvement in health expanded with Article 152 of the Treaty of Amsterdam (1997). Article 152 states "that a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities." (European Commission 1998:10) Despite this extension to the scope of EU activity in the area of public health, Article 152 reaffirmed the right of member states to be the sole provider and administrator of health care services within their own territory (European Parliament 1998:3).

The European Commission has driven the involvement of the EU in health. The European Commission is composed of bureaucrats and Commissioners that are appointed by the governments of EU member states. The role of the Commission is to initiate policy, implement

the measures adopted by the Council of Ministers and ensure that the member states fulfil then-obligations under the Treaties. The Commission is organised into Director-Generalates that deal with different aspects of EU policy. The issues of health and public health have traditionally, although not exclusively, fallen within the remit of the Director-General for Employment, Industrial Relations and Social Affairs. Since the adoption of Article 152 the number of Director-Generalates with an interest in the EU's system of health governance has expanded. The Commission Interservice Group on Health seeks to co-ordinate the activities of these different Director-Generalates.

In light of Article 152, The European Commission is currently in the process of redrafting its policies on health. These represent a 'new policy orientation' (European Commission 1998:i). A three-point model for future public health policy on a EU level is proposed (See Table 2).

Table 2 : Principles and proposed actions of the 'new policy orientation'.

Principle	Summary of Proposed Future Action
Better information exchange for the development of public health	Building on the 'community action programme on health monitoring', a health information and infrastructure for policy analysis and development is proposed. Topics on which information could be exchanged include health financing, health inequalities and major health determinants.
Rapid reaction to emerging infectious diseases	In response to outbreaks of infectious diseases, the European Commission proposes the creation of a EU wide surveillance, early warning and rapid reaction capability.
Better disease prevention and health promotion	Policy in this area should aim at improving health determinants through healm promotion as well as disease prevention.

Source: European Commission (1998:11-16).

This three-point model is based upon two broad approaches to policy and action:

- horizontal actions concerned mainly with health promotion and health monitoring; and
- programmes covering priority issue areas - cancer, drug dependence, ATDs and other communicable diseases.

Although the 'new policy orientation' is a direct response to Article 152, its origins can be found in changes to the wider health, socio-economic and political context[1] of the EU (European Commission 1998:1). These changes have made the EU more aware of the need to co-operate with different actors on a regional and global level. On a regional level, co-operation with NGOs, consumer groups and professional organisations has played an important part in the development of the EU's policy on public health (Ludvigsen and Roberts 1996:55). Recently, the EU's Social Affairs Commissioner has proposed the idea of a European Health Forum. This forum would include health professionals, NGOs, health authorities and would help develop the health agenda to best meet the needs of the EU's citizens (European

[1] With reference to health, the member states of the EU have to deal with challenges of rising health care costs, ageing populations, new medical and health care technologies, the need to be economical and efficient, the increased demands of citizens and consumers, and employment (European Commission 1998:3-4). With reference to socio-economic and political issues, the member states of the EU have to deal with the health and public health consequences of a single European market, enlargement and globalisation.

Information Service 1998:33). Although the EU is attempting to develop its links with a range of actors, problems remain, as the majority of EU citizens are said to be unaware and uninterested in what the EU does in the area public health (Richards and Smith 1994:121). That such disinterest also characterises the attitude of the General Practitioners within the UK may be significant for the future development of EU public health policy and the role of the UK government within it.

The extent of co-operation between the EU and multilateral institutions that form the emerging system of global health governance is deemed to be unsatisfactory. The EU maintains co-operative links with many of these organisations, including WHO. EU/WHO co-operation is based upon an exchange of letters between the two organisations in 1972 and 1982. Working relations have been established between the EU and WHO in a number of different operational areas. Of particular importance is the technical expertise provided by WHO to the European Commission. Co-operation in the cancer field with the International Agency for Research on Cancer (IARC) is also very extensive. Other multilateral institutions with which the EU is co-operating with in the area of public health include the World Bank, OECD, UNFPA and G-7 (European Commission 1998:6). The Commission resolved to seek closer co-operation with multilateral institutions along the following strands (European Commission 1997:127):

- In matters of Community competence, the Commission could ask international organisations to carry out specific tasks for the Commission in areas where these organisations have a mandate and proven expertise (joint projects).

- In areas reserved for co-operation between member states, the Commission can enlist the help of such organisations, in conducting joint programmes and actions that benefit some or all of the member states.

- In areas where the international organisations conduct their own programmes or actions, which are not-priority matters for the Commission or member states, the Commission may provide assistance, if such programmes and actions are of interest to the Community.

The future of the EU centred system of regional health governance is secure, a view that is supported by recent proposals for a EU Public Health Commission (Watson 1999:893). Moreover, through the establishment of the European Medicines Evaluation Agency and participation in a series of international conferences, the EU has became a key actor in the global regulation of pharmaceuticals (Vogel 1998). Moreover, rulings by the European Court of Justice on the cross-border provision of health care (Kanavos, McKee and Richards 1999:1157) and proposals for a EU health decade starting in the year 2000 (Watson 1999:893) can be seen as routes towards a system of governance that deals with all aspects of health. The extents to which this system of health governance develops and links with global systems is dependent upon the willingness of the EU's member states to give-up or at least pool more of their sovereignty in the area health.

The EU **and the** UK's **vital health interests**

The UK government has been supportive of the development of the EU system of health governance in the area of public health (DoH 1998b:6). This support is based upon a mixture of altruism and national interest Altruism in the sense that the UK government seeks to improve the health and quality of life of all people within Europe (DoH 1998:6). National interest, in the sense that the UK believes it can use the EU system of health governance to fulfil its own vital interests in health (DoH 1999:33).

The pledge of the UK government to support the development of the EU's system of health governance is consistent with its desire 'to be at the heart of Europe' and the principles of the 'third way'. The UK and the EU share common interests (e.g. the monitoring of infectious diseases) within the area of health. These common interests represent ready-made areas in which co-operation can occur. Tobacco control is one area in which co-operation is already working to the benefit of the EU and UK (DoH 1998:75-77). Given the transborder nature of a number of health issues, the UK government may not be able to fulfil its vital interests in health without active support and involvement of a region-wide system of health governance.

The nature of the debate on Europe in the UK may result in significant opposition to the government's support for the EU's system of health governance, on the grounds that it represents a further erosion to the sovereignty of the UK. This argument ignores the fact that by supporting and playing an active role in the EU's system of health governance, the sovereignty of the UK will be enhanced, as the government will be better equipped to protect itself against transborder health threats. The apathy of the general public and sections of the health/medical professions (e.g. GPs) towards the EU and the UK's involvement in its system of health governance, is a further problem the government must face. Working in partnership, NGOs, consumer organisations and professional bodies can help the government overcome both of these problems by disseminating information on the advantages to the UK of a regional system of health governance.

Meeting UK Health Interests through Bilateral Action

Bilateral assistance plays an important role in many low-income countries as it makes a contribution to meagre public expenditure programmes (including the health budget) and can be the source of innovative ideas and essential commodities. Efforts to enhance recipient government capacity through aid projects are particularly relevant to improving health governance. Approximately half of the UK's development budget is disbursed on a bilateral basis. Least Developed Countries (LDCs) received approximately 31% of this assistance in 1997/98, which was down from approximately 39% in 1994/95 *(DSD* 1999a).

The UK is attempting to refocus and increase the effectiveness of its bilateral assistance through an emphasis on building partnerships with recipient countries (DfID 1997:39). In the health sector, DfID is seeking to give priority to achieving five inter-related outcomes in recipient countries: (1) health policies and systems which serve the needs of the poor; (2) poor people suffering less from major causes of illness and disability; (3) all women and men able to demand, access and benefit from effective sexual and reproductive health care; (4) children surviving infancy and having good health throughout childhood; and (5) better health and reduced poverty through healthier environments. DAD, therefore, has an explicit health agenda for countries that wish to avail themselves of British assistance.

Whether or not DfID will be successful in implementing a more selective approach to aid allocation is a moot point. A great many factors influence bilateral spending practices including historical relationships as well as the pursuit of a range of non-developmental objectives. Reviews of OECD bilateral health assistance have been unable to demonstrate any correlation between the per capita receipt of aid and health need - as defined by a number of indicators (Drager et. al. 1994; Michaud and Murray 1994). These analyses suggest that political, diplomatic and economic priorities often prevail in the allocation of bilateral health assistance.

Bilateral assistance and the UK's vital health interests

The provision of direct bilateral aid to recipient countries provides the UK government with a greater measure of control over the allocation and management of assistance than if these resources are disbursed through multilateral organisations. In terms of allocation, the benefits of direct assistance include control over: which countries to support; types of activity or programme financed; proportion of support to be ear-marked as tied to the purchase of UK goods and services; and direct access to senior national decision-makers within the public and private sectors.

These are important considerations given the stated aims DflD has set for its aid programme. In the broadest terms, the UK hopes that its aid will promote poverty elimination in recipient countries, which will, among other things, improve health status in those countries, which will in turn, it is argued, reduce a range of threats to the health of UK citizens. DflD's health sector assistance is increasingly targeted and leveraged to ensure that recipients make adequate budgetary allocations to the health sector and that reforms are enacted that make the health system for responsive and efficient in meeting the health needs of the poor.

Lessons from past experience with development co-operation suggest that; aid is more likely to be effective in meeting its objectives if the recipient government is committed to the programme's aims; but that recipient commitment and ownership of programmes can not be bought with aid. These lessons are reflected in DflD's new partnership approach. Where recipient governments are perceived by DUD to be insufficiently committed to the international poverty targets (or appropriate health sector policies and priorities), DflD proposes to work through, and provide financial and other support to, the institutions of civil society so as to re-orient the development strategy in the recipient country (DAD 1997: 40). It is to civil society that we now turn.

Meeting UK Health Interests on a Societal Level

Civil society is defined as "a sphere of social interaction between economy and state, composed above all of the intimate sphere, the sphere of associations, and forms of public communication." (Jareg and Kaseje 1998:819). Civil society is composed of a wide range of actors. In the area of health, the most prominent of these actors have been global social movements, the private sector, epistemic communities, the media and NGOs.

While **global social movements** (GSM) exist on a global level, they also have strong links to the regional, national and local levels. GSMs typically seek to transform society, or at least to make it more open and supportive of the issues and values on which they campaign. In pursuit of this aim, GSMs use the tools of political negotiation, supported by mass mobilisation and advocacy. GSMs have a loose organisational structure and a large membership. The membership of GSMs interact via networks and NGOs[2]. The membership of a GSM are aware of their 'global' existence and their transcendence of territorial borders. (Dodgson 1999:95). Examples of GSMs in the field of health are the gay/homosexual movement and the women's health movement. The first of these movements had a significant influence upon the direction and nature of multilateral action to combat HTV/AIDs. At the International Conference on Population and Development (ICPD), the women's health movement brought about a major shift in global policy and thinking on population and women.

[2] Although GSMs are partially composed of NGOs, GSMs and NGOs are not the same thing. In comparison to GSMs, NGOs are more formal and more organised phenomena. NGOs also tend to be much smaller than most GSMs, in the sense diat they tend to campaign on a single political issue and draw their support from a smaller constituency.

Epistemic communities are much smaller than GSMs, however, they are also global in scope. Epistemic communities are a source of expert knowledge to both governments and multilateral organisations. These communities of experts influence the actions and policies of national governments and multilateral organisations through quiet persuasion and the weight of their academic argument (Haas 1989). The area of AIDS is one case in which epistemic communities played an important role in the emergence of a global system of health governance. Indeed, multinational co-operation on AIDS was not possible until expert knowledge on the subject had been formed and presented to the appropriate decision making bodies (Gordenker et. al. 1995:145).

In partnership with public institutions, the **private sector** has came to play a role in systems of health governance. The latter half of the 1990s has witnessed a burgeoning number of initiatives in which the corporate and public sectors sought collaboration to overcome both market and public failures in international health through global public private partnerships for health development These range from drug donation programmes (e.g., the Albendazole Donation Programme), to product development partnerships (e.g., the Medicines for Malaria Venture) to issue specific partnerships (e.g., the International AIDS Vaccine Initiative — IAVI). These partnerships typically include the participation of multilateral and bilateral organisations, charitable foundations, private firms (and/or industry associations) and non-governmental organisations. The LAVI, for example, includes the World Bank and UNAIDS, DUD, the Rockefeller and Marcel Merieux Foundations (among others) and private sector collaborators such as Glaxo-Wellcome and Levi-Strauss Int. These partnerships bring significant (and usually much needed) resources to highly visible health interventions which promise rapid results and which could potentially benefit large populations. For example, as part of one recently launched partnership (The International Trachoma Initiative), Pfizer Inc. donated its antibiotic 'Zithromax' worth an estimated US $ 60 million over two years to trachoma control programmes in five high prevalence countries.

As these partnerships begin-to blur traditional distinctions between public and private sector responsibilities and aims, they raise a number of important questions (Buse and Walt, forthcoming). For example, where is leadership vested among and within this diverse range of organisations and who is setting the agenda? How are they governed and to whom are they accountable? Whose interests do they represent? What will be their long-term effect on the values, priorities, strategies, capabilities, and resources of the public sector institutions (both national and international) with a mandate to protect the public's health? Will the more 'profitable' activities be hived off to special partnerships leaving the public organisations with the 'runt' of more difficult issues (i.e., supporting health systems and training personnel)? Are partnership initiatives sustainable and replicable or do they depend on the confluence of a number of extraordinary circumstances?

Although there has not yet been much scrutiny of these partnerships, there is cause for concern. Carol Bellamy, the Executive Director of UNICEF, for example, warned that "it is dangerous to assume **that** the goals of the private sector are somehow synonymous with those of the United Nations, because they most emphatically are not." (UN Wire 1999a). After the recent launch of Secure the Future™ (a partnership between Bristol-Myers Squibb, UNALDS, five southern African countries, and a number of academic institutions), the governments of both Namibia and South Africa rejected the partnership as they claimed they had not been consulted in its design (UN Wire 1999b). It is important that as these partnerships develop, they do not create unnecessary duplication, exacerbate existing health inequalities, further fragment the global health scene, detract from the legitimacy, authority and neutrality of the UN multilateral

organisations nor further undermine the ability of the these organisations to be pulled together into one system.

It is clear that the role of NGOs in relation to health policy agenda setting and service delivery at the national, regional and global levels has expanded enormously in recent years. The most publicised campaigns of NGOs in the field of health (e.g., the campaigns against land mines and breast milk substitutes in developing countries) have been conducted on a transnational level by global networks of NGOs. The fact that both of these campaigns led to global legislation that prohibited the use of land-mines and restricted the marketing of breast milk substitutes, demonstrates that if they act collectively, NGOs can have a significant influence upon systems of health governance (Jareg and Kaseje 1998:820).

In addition to their emerging global role, NGOs have traditionally had strong links with the local level. The existence of such linkages enable NGOs to offer governments and health agencies on a regional/multilateral level expert advice on local health issues and how local conditions may effect the successful implementation of a global health programme. For example, in drawing up its Alma Ata declaration on 'Health for All' in 1978, WHO consulted with the Bangladeshi NGO Gonoshasthaya Kendra (Ekins 1992:172). Since the early 1980s, NGOs have worked with WHO and donors to establish community-based primary health care programmes and thereby ensure that the marginalised majority in low-income countries gained access to health workers and clinics. Supporters of this local level approach to health governance advocate that it empowers local people by making them less dependent upon outsiders and inaccessible technologies for the fulfilment of their basic health needs.

Civil society and the UK's vital health interests

The UK government recognises that civil society has a vital role to play in the fulfilment of its vital health interests. On a general level, this role includes holding governments and international institutions to account, acting as a catalyst for change, advocating new ideas and developing new perspectives'for looking at the world (Short 1999). With specific reference to health, the UK government believes that partnership with UK based and local NGOs is integral to its ability to meet the basic health needs of the poor in the developing world (DffD 1997:22-23). As regional and global civil society develops, the frequency with which they intersect with the UK's vital interests in health will increase. For example, a campaign by the World Development Movement (a British NGO) succeeded in forcing the UK government to add an international dimension to its white paper *Smoking Kills* (Must 1999). This is a positive example of civil society impacting upon the UK's vital health interests, as it resulted in the UK's tobacco control legislation being strengthened and the UK being seen as a key actor in the WHO's Tobacco Free Initiative. In short, through co-operation with civil society, the UK enhanced its position in the emerging global system of health governance.

The UK government's future approach to civil society appears to be based upon a belief that partnerships between government, civil society and the private sector are an essential feature of the national system of health governance (El Ansari 1998:18). It is thought that partnerships can help the formulation and implementation of government policy in health and also ensure that there are open lines of communication between the government and other stakeholders in the health sector. Partnerships of a more critical orientation can ensure that the government keeps to its promises and point out where improvements can be made in the future (Moore 1999:8). As globalisation makes the area of health more complex, partnerships between the government and civil society are considered essential if the UK government is to stay informed of the latest developments. To this end, the UK government should consider taking action to codify the involvement of civil society within national, regional and global systems of health

governance. Action to ensure that NGOs and global social movements are involved in the implementation as well as consultation stages of policy-making is particularly important, as is the need to ensure that the publics' need and interests are not obscured by powerful interests (i.e., the private-for-profit sector) in the partnering process.

Conclusion

This paper has reviewed four distinct systems of health governance which operate on different spatial and political levels. The review found significant accomplishments and barriers to improved governance within each of these systems and also significant disjunctures between them. Thus, we cannot yet speak of the existence of a single, homogenous system of global health governance. The UK's historical involvement in public health and its membership in major multilateral and regional organisations means that it could play a significant role in deciding whether a system of global health governance will exist in the future - and what shape this might take. However, whether this support should be directed towards establishing a single system of global health governance and/or maintaining (and strengthening) the disparate systems of health governance that currently exist is unlcear. Ultimately, the existence of a integrated global system of health governance will be decided upon by the UK acting in co-operation with other states. Historically, such co-operation has been difficult to achieve and maintain. Globalisation, will not make the task of achieving or maintaining co-operation any easier. The homogeneity/heterogeneity aspect of globalisation is likely to remain a contested phenomena for some time, given this situation, the current systems of health governance may be all that can be achieved.

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LOCAL PERSPECTIVES ON GLOBAL HEALTH: HOW NGOs CAN HELP

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International Agencies and Global Health

This century has seen dramatic gains in health for the world's population. However, at the end of the century, these gains are being lost by the very poorest, who now make up about one fifth of the population. Their health is declining. Their control over the use of limited resources is weakening, and their poverty, which is at the heart of ill health, is deepening. The gap between rich and poor is widening, and this is true both within rich and poor countries and between rich and poor countries. The number of people living in absolute poverty is greater today than ever before. The need for better representation of the people to have control over their own health has never been greater. Non Governmental Organisations (NGOs) as a part of civil society, have a vital role to play.

The availability of health care is a key determinant of health, and investment in health systems development is considered to be a vital component of poverty alleviation programmes. However, when we think of the health resources needed for the development of health systems, we think of medicines, doctors, nurses, clinics and hospitals. These are of course important, but in a poor country these are likely to be less important for health than personal and community resources, such as food security, safe water and adequate waste disposal, disposable assets and relevant knowledge about disease risks and prevention. The first set of resources is usually controlled through international and state organisations, which may or may not be democratic, efficient and corruption free. The second is controlled by individuals, families and villages and here too power and community structures are important and not necessarily equitable or efficient. In this paper we discuss the role of Non Government Organisations (NGOs) in relation to both.

We first examine how international organisations respond to the challenges of globalisation and health, then we discuss state, village and individual responses. This is not intended to suggest that a local or community perspective has any greater validity than state or international views but rather to suggest that these are different perspectives which should be respected. This leads us to examine how NGOs can play a role in relation to the health needs, viewed from these different perspectives. We then discuss how NGOs can be strengthened and helped to fulfil these roles and work in partnership with international, state and private sector players.

Our conclusions are that we need to find new ways of connecting individual, family and village views to the decision makers of international and state governments and that we must seek ways to support local solutions to local health problems which together comprise global health issues. NGOs can help in finding new solutions but they are neither magic wands nor paragons of efficiency or good governance. We all

[1] In discussion with Graham Lister

need to find new ways of working together. A very similar point is made by Inge Kaul, Isabelle Gruneberg and Marc Stern in their introduction to "Global Public Goods". As Edwards points out in his book "Future Positive" this requires that rich countries recognise that the long term cost of not co-operating to tackle global problems out-weigh the short term benefits of selfish behaviour.

International Agencies and Global Health

In seeking new solutions we do not reject the role of international agreements, even those on which the rich world has failed to deliver, such as Alma Ata. Nor do we dismiss the role of international organisations, even those that have increased disadvantage, such as the World Trade Organisation. We simply seek to redress the balance, giving greater recognition to perspectives such as those expressed by Gandhi in his call to respect the village as the true centre of society, and Ivan Mich who noted, "The level of public health corresponds to the degree to which the means and responsibility for coping with illness are distributed among the total population."

While promoting the democratic principal within countries we have, as Mwalimu Julius Nyere pointed out, yet to establish it between them. We vote democratically for common agreement to high sounding ideals such as the United Nations Declaration of Human Rights and the World Health Organisation Alma-Ata declaration of the goal of "Health for All by the year 2000". But democracy in declaration is not matched by democratic control of funding to implement them. International organisations are dependent upon the financial and practical support of rich countries. The failure of the US to pay its contribution to UN agencies and its contribution of ofiry 0.1 % of GNP to aid speaks louder than its words.

Failure to meet the aspirations of the 1978 Alma-Ata declaration was due to several factors. First and foremost it was due to lack of financial support. Though no calculation of resource requirement was made at the time, in 1993, the World Bank estimate it would cost $12 per capita per year to provide essential services. To meet the needs of the poorest 20% of the world population, then 1 billion people, given the fact these countries spent some $5 per capita would therefore have required funding of $5-15 billion per year. This would have required an increase in aid and loans of 10-25%. In 1978 such an increase might have seemed feasible, but 1979 saw a steep rise in oil prices and in 1982 Mexico declared it could no longer service its debts. The myth of risk free development lending (because surely countries could not go bankrupt) was destroyed and Governments switched attention from solving world problems to coping with domestic economic downturn.

It also appears that the requirement for preventive health and primary care measures, to support Health for All offered neither the economic benefits to donor countries of say large scale building contracts, nor the political benefits of easy short term evidence of impact In practice much multi-lateral and bi-lateral aid was and still is motivated by the interests of the rich nations that support them.

Even where co-operation is for the common good, for example, the Poliomyelitis eradication programme, to which the UK has recently pledge increased funding, bringing the UK contribution to £109 million, pay back can be seen. It is estimated that this programme will save the UK £40milUon per year when immunisation is no longer required and reductions in the long term care costs of polio victims will be

considerable and international travel will be safer. For the very poor countries like Somalia, however, they will be required to devote considerable health resources to tracking down the last pockets of this disease, while their saving will be negligible, as they have virtually no money to provide long term care. In relation to their other health problems polio is not a significant burden. This is not to suggest that the Poliomyelitis eradication programme is not honourable or worthwhile, merely that the self interest of the rich countries that support it should be recognised.

When rich nation interests are directly threatened, response can be swift. For example John Wyn Owen recounts that when avian flu was detected in Hong Kong, a rapid reaction force from the US military Control of Diseases Center, moved in to Hong Kong under US flags. They took medical samples, which were then flown back to the States for analysis, the results of which were released some six months later.

The World Trade Organisation (WTO) also provides a model of an international agency, which appears to vote democratically for resolutions but can implement only those supported by the rich and powerful. The 1999 Seattle meeting of WTO promised to be its most democratic, with representatives of 135 countries able to vote and 30 more waiting to join. This meeting was disrupted by a "swarm" of protesters representing a broad range of disquiet about global capital and its impacts. We would do well to listen to these concerns even if their expression may be misguided. We must promote greater understanding of trade and aid issues.

The complexity of health and trade issues is illustrated by the jeans worn by many of the protestors. Sold for £55 in London as a fashionable "Global Brand" item they may have been sewn by women in Cambodia with a labour cost of 25p. This itsound global economics, to manufacture where costs are lowest and sell at the price the market will bear. It may mean that the women employed are exploited, they may not enjoy the health and safety legislation of richer countries, but they have a job and income. What is the alternative, to demand better conditions for labour and thus risk manufacturing being transferred elsewhere, or to boycott the goods with a similar effect? In both cases the women may lose their job and move into work that is even more hazardous to health, such as prostitution.

One answer would be to encourage countries to form producer alliances, thereby enabling them to impose conditions on their trade. This is essentially what the EU and NAFTA do to control agricultural trade and of course it applies to oil producers but for poor countries this would be seen as a cartel to impose unwarranted costs. The alternative, which has been proposed, would be to introduce an international trade tax for the benefit of poor countries.

International agencies wield great power and influence at the behest of rich countries. They are mostly staffed from these countries and bring their view of the world to bear, albeit with the best of intentions. Power and humility seldom go hand in hand, and this is certainly true of most such agencies. To deal efficiently with myriad problems they categorise them and offer standard solutions. Programmes of reform sweep across the world, offering solutions such as privatisation and managed care to every problem they might conceivably fit. Humility only comes when you live with the consequences of actions so that it is necessary to listen and learn as well as teach. Most agencies are full of highly intelligent, well meaning, successful people who move on from problem to problem. Winston Churchill defined success as the ability to move on from failure to failure with confidence.

International agencies and bilateral agencies deliver about $5 billion in health aid each year. Most is provided through state institutions in poor countries. Health for All (HFA) strategies require involvement of users and providers of primary care and political commitment over the long term. Perhaps for this reason NGOs have been particularly appropriate to the delivery of such programmes to local villages and communities.

State Resources for Health

National health systems in poor countries usually comprise the Ministry and regional health management organisations controlling national specialist hospitals and district general hospitals with local clinics and pharmacies and outreach workers including midwives and other health workers. For many poor countries the resources available are pitiful, for example, Rwanda has just $1.4 per person per year to spend on health, of this $0.4 is provided from government resources and $1.0 is provided from international aid. This means that governments are dependent upon aid, which can be withdrawn for political or other reasons. The communist coup in Cambodia in 1997 resulted in massive withdrawal of health aid, almost halving the resources available. More recently one European donor country that provided virtually 100% of the cost of a public health programme in Mozambique decided to withdraw giving 18 months notice.

Salary costs for national health system staff are usually met from local sources. This has the unfortunate effect of reducing the formal pay of doctors and nurses to unrealistic levels. In these circumstances it is often accepted that they accept money from patients and undertake private work when they can. This undermines the integrity of the health service and public confidence and it makes it very difficult to post staff away from towns to rural areas where the cash economy is not strong enough to sustain them. It also makes it difficult to divert resources away from hospitals to prevention and primary care services as required for Health for All programmes.

Corruption plays a significant part in undennining the integrity of health systems. It has been evident in some drug supply systems, though with some exceptions. UNICEF has achieved remarkable improvements in recent years. The availability of good quality, affordable, essential drugs, properly prescribed by well trained health staff and taken by people who trust the service, makes the difference between an effective service and a useless one. But the financial value of drugs makes them prime candidates for corrupt manufacture, sale and abuse. The quality of care under such a corrupt system is compromised. It is often very poor and, at worst, dangerous.

Reform of health systems management and financing has been the focus of WHO and WB attempts to switch more local resources into HFA programmes. It also reflects the lack of additional funds. Affordable health strategies have succeeded in middle income countries but have almost all failed in the poorest countries. Despite all the difficulties reform and strengthening of national health systems, particularly strengthening their planning and control of resources for preventive and primary care must remain the central focus of health development efforts. But in terms of the delivery of effective health measures it must be recognised that the poorest countries are dependent upon aid and will require support to deliver basic health measures for the foreseeable future.

Today 1.4 billion people live on less than $1 per day in 44 of the least developed countries. These countries do not have the $10-20 to fund basic essential health services. These are the people Dr Gro Brundtland has described as the forgotten billion. Of these about 75% are women and children.

Health conditions in these countries are appalling. Infant mortality rates are expected to rise, immunisation rates have fallen and rates of other diseases including Tuberculosis, HIV infection and Malaria have risen. In many countries outside the major towns the health systems have largely collapsed. A few separately funded services such as the Expanded Programme on Immunisation are still able to deliver vaccines to some children but in many cases these services are also deteriorating. Maternal mortality rates remain at levels which constitute an international disgrace.

Family and Village Resources for Health

One would be forgiven for assuming that these appalling health conditions lead people to live in a constant state of degradation and misery. This is not so, poor people are just the same as anyone else, they live with dignity and fortitude, they are cheerful and often content with very little. They are remarkably well informed often gathering round radios or television sets and what is not broadcast gets round even faster. Poverty reveals the spiritual strength of village people that Gandhi referred to as Ramanama, it is clearly an essential resource for health. How else can we explain how a mother living in a mud hut miles from clean water with virtually no money can emerge well groomed and tidily dressed with her children equally scrubbed ready for church or temple or health centre or any local festival.

Where the state health system isJiinded at $5 or less per person per year it is likely to offer very few effective services for villagers, other than perhaps immunisatioa Personal and family expenditures on health, are often, but not always far higher than $5 per person per year. A family may need to pool its resources to obtain medicines for a sick child or to provide informal payment to the doctor. An illness is often the cause of the failure of family finances (as it is in the USA, where it is the most common reason given for bankruptcy). The availability of credit at non usurious rates may therefore be an important health resource. Other health related expenses including the cost of obtaining and maintaining clean water, food, sanitation, and housing have to be included.

All the resources referred to above require two further components. The first is knowledge of health and healthy living, and practical skills such as cooking, and managing childhood illnesses. The second is supportive communities to share skills and resources. These are sometimes referred to as knowledge capital and social capital see inset 1.

Inset 1 "The limits of my language are the limits of my world" — Wittgenstein

In a remote village in Western Sudan, the water supply and sanitation is inadequate and variable in quality. Household economies are fragile. Food supply depends on the rain. The school and health facility are run down and of poor quality. There is no electricity. But the village committee has invested in a generator and a satellite dish. Each evening the villagers gather to watch CNN. Their local perspective has changed and become more "global". Even this one way communication has great potential, for information and for manipulation through disinformation. Which will we chose and who will decide? Source Peter Poore

Local perspectives are a measure of local circumstances. This includes knowledge, understanding, the capacity to use either and the limits to choice and action. The way we live and the actions we take to survive and prosper is a measure of our resources. This applies to people of all ages, whatever sex, culture or wealth. It is the most important resource we have for health. Since women care for our children and are the most important conduits for culture they are also the most important custodians of the local perspective. We should not idealise indigenous cultures, they can be repressive of women and restrictive, but globalisation can unsettle cultures and relationships without offering an alternative.

The NGO as a resource for health

There is a wide range of types of NGO. By definition they are not, or should not be, directly controlled by governments and they reflect a wide diversity of opinions, needs and resources. They offer opportunities for people to address common concerns and problems, by the direct action, of staff and volunteers, by donation and by political action. Their strengths and their weaknesses lie in this diversity. They can be very effective in mobilising people with common ideals and can respond to needs rapidly and flexibly. They may lack the stability and resource base of international government agencies but they are also relatively free of bureaucracy and political control - and must remain so.

The main source of legitimacy for many NGOs concerned with global health is that they directly respond to health needs by providing resources and working with those in need. About 40% of all care is delivered by the private and voluntary sectors in Africa. Many "mission hospitals" provide very good quality care with local medical staff receiving adequate wages but often this is only possible because of overseas donation and support. Such support is in decline, and the non government sector is also under financial threat. NGOs work in situations in which other agencies are unable to respond, for example, working in war zones, or providing rapid response to crisis situations. To be effective in such circumstances NGOs need to stress their independence and impartiality, they must be able to deploy resources and competent people quickly without fear or favour. Ideally they should be able to continue to provide direct assistance to people and communities whatever the political context, for example, in Cambodia NGOs stayed when UN agencies pulled out. Other examples include: Southern Sudan, Israel occupied Palestine, Eritrea (until 1991) and Iraq. Funding for NGOs in these circumstances may not always reflect need. The recent example

of resources being much harder to come by for the victims of abuse in Sierra Leone rather than for those in Kosovo reflects political interests rather than humanitarian need.

However, it is also part of most NGOs' remit to bear witness on behalf of the people they help, in order to mobilise resources and political attention to the wider issues, which often underlie a crisis situation NGOs must be prepared and able to adopt an adversarial role, highlighting issues and problems which governments and /or external agencies are not prepared to address. It is in the nature of agencies that they need to show success and to promote optimism in order to maintain morale and to secure further funding. It is often left to NGOs to show a fuller reality of the lives of poor people. This may not be so uncritically optimistic. The truth may be complex and complexity is not attractive to those looking for simple solutions. Most NGOs. nevertheless attempt to convey the dignity and cheerfulness of poor people, but this may or may not be good for fund raising.

NGOs can provide a wide range of specific expertise and resources. Typically, and especially in emergencies, there may be many NGOs working in a locality. For example, there are now some 350 agencies in Kosovo. These may swamp local resources and the capacity of local agencies. NGOs and international agencies often have offices in the capitals of poor countries, their visitor books show how many contacts there are between these agencies, they may not be bureaucracies but they generate a very large workload for one another and for local Ministry staff Co-ordination of agencies, including NGOs, has improved in recent years. However, as the number of agencies increases, their willingness and capacity to coordinate activities may be compromised by (i) their failure to appreciate the need, (ii) their fear of competition for funds from donor agencies, or (iii) by their inexperience.

NGOs can also play a wider role as local coordinators and advisors on aid and assistance or even bankers, as in the Grameen Bank in Bangladesh. In theses circumstances NGOs must consider their long term impact on the institutions of poor countries, to ensure they are not undermining them.

International NGOs have an important role to play encouraging local NGO activity. The building of a strong local civil society is crucial to more equitable development. However, this role is not without its contradictions. Many international NGOs depend to a considerable extent on donor funding, and the diversion of funds to local agencies, even though this may be preferable, could be a threat to international agencies.

Working with NGOs

International NGOs bring their own agenda to poor countries, reflecting the issues of concern to the community they represent. This may or may not correspond to local priorities. The example of The Aids Support Organisation (TASO) in Uganda, illustrates this. In the beginning it was a small local NGO with no outside help, it provided an excellent model of care, support and education for people with HTV/AIDS. Its success has attracted well deserved praise and support. It has expanded to provide many more local support centres. It attempts to provide basic health and support services for those with HIV/ADDS. And yet, in Uganda today, the country is still unable to provide these basic services to the majority of its people,

with or without infection with HTV. Many of the services provided by TASO could not be sustained without the outside support it now receives.

In recent years International Agencies such as the WHO, UNICEF, UNHCR, the European Union and the World Bank have often used NGOs as contractors to plan, develop or provide services in very poor countries. The advantages are that NGOs can deliver a flexible service responding to local needs, they avoid some of the problems of the rigidity and poor pay of national systems and may be less prone to corruption. There are, however, disadvantages to this form of "contractorisation". Diverting resources from the national system to NGOs may mean that more care is delivered but it does not address the long term structural problem of the state system. The NGO may be happy to accept such funding but in doing so it risks becoming an agent, subordinating its goals and working methods to those of the international funding agency and losing some of its independence and ability to innovate.

It is dangerous to assume that NGOs are necessarily a "good thing". NGOs can be as inefficient, corrupt and misguided as any other organisation, and it is important to note that international NGOs may have very little local accountability for their decisions. They require monitoring, *udit and to be held to account but it is difficult to define an appropriate regime for this without cutting across the very qualities of flexibility, innovation and commitment that make NGOs effective. Most NGOs recognise the importance of establishing an agreed regime for accountability and co-ordination.

One response to this dilemma has been to develop Sector Wide Action Programmes (SWAPs) to establish general agreement on sector priorities and strategies with government and NGO support. This can be an important tool for collaboration.^ The development of SWAPs and the governance framework for their implementation requires an understanding of how NGO, international agency, local government and others can work in partnership, coupled with the ability to listen to local voices and concerns. It must combine local health needs planning with a broad view of civic society and the wider determinants of health. A realistic view of achievable targets within the available resources and an understanding of programme management and financial control are essential. These are some of the same concerns and skills required for Health Improvement plans in the UK. For this reason it may be a field in which the UK Partnership for Global Health could help.

Helping NGOs to help others

Our suggestions for assisting NGOs in global health are tentative and will require a good deal of consultation and refinement, thus our first proposal is simply that the UK Partnership for Global Health should provide a forum for discussion with NGOs. We suggest that resources should be provided to facilitate this, recognising that NGOs rightly devote as many resources as possible to front line services and that as an aftermath of debt relief there is likely to be a great demand for NGO support.

We suggest that there will be considerable benefit from learning from best practice in expressing and responding to local community views in Sector Wide Action Programmes and in national and international agency policies and plans. Local and international NGOs have shown great innovation and are having a real impact on civic society in many countries. The lessons from such experience are often best communicated not simply by statistical measures but by anecdote and story telling. A facility to capture

lessons in a learning knowledge base accessible to ordinary people through Internet, digital television films and books, as well as experts could be of great value.

The main aim should be to improve understanding of local perspectives and to let the people speak. Journalists could contribute a great deal to this development, where their objectivity and skills would be particularly valuable. We are used to 24 hour news coverage from everywhere but have been slow to capture its potential for constructive (or destructive) criticism. It is sometimes forgotten that the news we see and read in rich countries also appears in poor countries and can be a powerful force for change.

We also suggest that more could be done to help national governments or UNHCR to co-ordinate the efforts of NGOs on the ground. In particular an international clearing-house would be useful so that NGOs can co-ordinate efforts even before getting involved locally so as to avoid the swarm effect of Kosovo and perhaps avoid the neglect of other problem areas. Such a clearing-house could also help to co-ordinate local agencies and resources and international NGOs and even deal with mundane problems, for example, booking vehicles and accommodation, clearing customs and health requirements.

NGOs could also use this facility to address problems of continuity. Often NGO projects are funded for perhaps 3-5 years in the hope that local resources will be forthcoming or the need will have been met. In practice very few developmental problems can be addressed in such short time scales and the progress achieved can disappear a few years after the "project". A clearing-house could enable NGOs to seek partners for projects to extend their scope and duration.

We note that elsewhere in the Global Health a local issue programme it has been suggested that an Internet based charity and information network should be established for Global Health. While similar developments exist we believe this would be helpful and could be linked to the proposals put forward in this paper.

RAISING AWARENESS OF GLOBAL HEALTH

Graham Lister
The Nuffield Trust

Introduction

This discussion paper considers the current state of debate on global health issues, the audience for such messages and the means by which the message can best be communicated. It is a further step in the year-long policy review programme, Global Health: a local issue in preparation for the final Conference at the Royal College of Physicians on 31 January 2000.

The Debate on Globalisation and Health

The BBC Reith Lectures "Runaway World" given by Professor Anthony Giddens, both extend public understanding of globalisation and invite us to move on, from discussion of the definitions and mechanisms of globalisation, to acceptance of a world in which global economic, political, social and cultural influences are pervasive. This requires us to respond to such influences at personal, community and institutional levels and to learn to live in an emerging world society. Professor Giddens may therefore be seen as echoing United Nations Secretary General Kofi Annan's call for "responsible globalhy", which has been a theme of our discussions.

Major conferences on globalisation and global health have served to extend our understanding of how we may interpret responsible globally in health care. These meetings included a one-day conference at the London School of Hygiene and Tropical Medicine; Rockefeller Foundation/WHO/Society for International Development Roundtable on Globalisation and Health Equity in Geneva; and a planned symposium on global governance and health by Yale University to be organised by Professor Ilona Kickbusch. Dr Kelley Lee, who organised the London conference, has kept us in touch with the emerging ideas from these meetings. And in turn we have contributed ideas emerging from this policy review. At the Geneva roundtable we proposed an award for an organisation, either from the private sector, public sector or civil society, that demonstrates responsible globality in health. This idea (see later discussion) is being put forth as a means of encouraging positive attitudes and actions in relation to global health.

The World Health Organisation has recently initiated a new programme of work, within its Department of Health in Sustainable Development (HSD), as well as a working group on globalisation and health. The two main themes the programme is initially taking forward are global trade and health, and global governance for health. Both areas of work will yield much needed discussion papers, review articles and guidebooks on aspects of global health. The work of the programme will be supported by a WHO External Advisory Group who will advise and comment on a variety of activities related to globalisation.

In May the *World Health Report 1999, Making a Difference* was published by WHO. The report asserts the goal of reducing the burden of excess mortality and morbidity suffered by the poor, stating that one billion people are entering the 21st century without benefiting from the health revolution that can transform life and health in many parts of the world. It pledges to actively counter potential threats to health, in

particular malaria and tobacco. It points out the importance of unipolar depression as the leading cause of disability in 1990 and ischaemic heart disease as the leading cause of disease burden by 2020. The report notes the importance of developing more effective health systems addressing the needs of the poor and expanding the knowledge base particularly in relation to those diseases that afflict the poor.

Introducing the report, WHO Director General Dr Gro Harlem Brundtland welcomed greater collaboration between UN agencies, the World Bank and IMF to address health and poverty, noting: "A five year difference in life expectancy may yield an extra annual growth of 0.5%. It is a powerful boost to economic growth." She stressed that "Health is a fundamental human right" and that the WHO would "speak out for all those denied their human rights to health". While it is difficult to prove the relationship between crude life expectancy (which is heavily dependent upon infant mortality) and economic growth extending the healthy economic life of the population has clear benefits.

The keynote address of Professor Amartya Sen, the Nobel Laureate in Economics, to the World Health Assembly pointed out that, good health is an integral part of good development and not simply a result of increased GNP. Health and economic prosperity support one another because healthy people can more easily earn an income and those with an improved income will seek medical care better nutrition and have the freedom to lead healthier lives. Policies which improve the income of the poor and provide better more appropriate health services can improve health even in the absence of economic growth and equally inappropriate policies will fail to achieve health improvement even if economic growth is achieved This can be seen as a major restatement of health and economic policy in which health is not simply an outcome of economic development but a goal and integral element of good human development.

The Verona Initiative supported by the WHO Regional Office for Europe also reflects this approach by examining how Investment for Health in a wide range of related spheres such as housing, employment generation and community development can both build social and economic strength and bring about health improvement. To support this, it is developing benchmarking to examine and learn from national or local capacity to invest for health. The WHO Regional Office for Europe also organised the Third Ministerial Conference on Environment and Health held in London in June. The conference set renewed priorities for the Environmental Action Plan for Europe, based on national environmental health plans and experience over the past two years. It stressed the importance of appropriate methods for assessing environment and health risk and understanding the link between economics and health, for example, setting taxes and tariffs to discourage inappropriate use of private transport and to reflect the true cost to health.

Other United Nations organisations have also taken up the theme of globalisation in recognition of its importance to key aspects of their activities. The UN Development Programme (UNDP) has published its *Human Development Report 1999* on globalisation. The UN Children's Fund (UNICEF) is continuing to pursue a programme of work entitled "Children in a globalising world". And the World Bank has contributed policy research to themes related to global health such as the economics of tobacco.

European Council meetings have been concerned with issues of food safety and trade. The detection of dioxins in the food chain of Belgium producers, had countries such as Myanmar (Burma) imposing an embargo on European food imports and created a major health scare. Food safety has been a prominent issue over the past four months due to the dispute with the US over hormone treated beef imports. The

World Trade Organisation upheld the US right to impose sanctions in response to European objections to the import of hormone treated beef, this seems to give priority to global trade interests over local health concerns. It has recently been proposed that a European Agency on food safety should be established. Commission President Prodi has announced that he intends to create a Directorate General with a focus on health and Consumer Affairs

We are currently pursuing a UK led initiative based on Global Health view of health and trade to be proposed by the Prime Minister at next year's Davos Economic summit. We are also collaborating with the Foresight International Health Group supported by the Office of Science and Technology. This group is considering how to build on UK strengths to achieve significant gains in international health. We hope to share and take forward their findings which can be found at www.fbresight. gov.uk.

Meanwhile in the UK public debate on health and the environment has continued to focus on the testing of genetically modified crops. Government attempts to promote understanding of the issues involved have shown just how difficult it is to engender informed debate on environmental and health issues where MNCs and environmental interest groups have entrenched positions. Events did, however, demonstrate the power of consumer choice in insisting on food labelling. It is interesting to note that in this debate and in relation to the aftermath of the Kosovo war, concern has focused on "environmental impacts", it seems that these concerns are much better represented than health concerns.

This indicates the need for a better articulation of global health concerns and the development of international perspectives in the health consumer movement. The first meeting of a European group of patient representative bodies took-place in Bournemouth last year, see insetl. Though it is also notable that such a meeting could only take place with the support of the pharmaceutical industry. It seems strange that despite continued references to the importance of involving patients in health policy the UK Government has done little to improve the funding or organisation of the UK Patient/Consumer movement.

In May the vulnerability of countries such as the UK to terrorists using biological and/or chemical weapons was underlined by the report of the International Institute for Strategic Studies. The Ministry of Defence report on "Defending Against the Threat from Biological and Chemical Weapons", however, states that the current threat of attack by terrorists using biological or chemical weapons is classified as "low". Their report focuses largely on the potential military uses of such weapons. The Home Office, which is responsible for integrating civil responses to such contingencies, has recently reviewed the arrangements for managing the consequences of biological or chemical incidents. These developments may or may not be reassuring, but it is far from clear that the public is aware of or prepared for such threats.

Box 1 UK Patient Associations

While UK patient /consumer interests are increasingly said to be important to the NHS and health policy, little constructive support has been given to the fragmented and diverse groups that make up the UK health consumer movement. With such fragmentation within the UK it is little wonder that they are not yet capable of presenting a coherent view of global health issues.
CHCs and the Association of CHCs play an important role representing the interests of patients but their scope and quality is very variable depending to a large extent on the support provided by their Local Health Authority.
Patients Forum. Probably the nearest we've got to a national network organisation for patient /consumer groups but it has no formal remit and currently no funding.
The College of Health the only patient organisation to monitor all national waiting times from referral to treatment until its funding for this vital service runs out in November 1999.
Users and Carers Group An ad hoc grouping of organisations representing patients, carers, minority ethnic groups and generalist consumer organisations which meets the Chief Executive of the NHS Executive twice a year.
National self-help and voluntary organisations 3,000, some with hundreds of thousands of members and hundreds of paid staff and themselves fund research and provide services on a large scale; some are tiny.
Alliances of self-help associations and groups, such as the Long Term Medical Conditions Alliance, the Genetic Interest Group and the Neurological Alliance.
Patient Association A national representative body but lacking funding.
National Consumers Council Funded by Government and active in health.
In 1998 a new global association of health consumer groups was formed. They met for the first time in Bournemouth as the International Alliance of Patient Organizations. One of their aims is to establish a global voice for patients.

Source M Rigge and G Lister Going Dutch article in the Guardian May 1999

Getting the Message Across

The people whose awareness must be raised include:

- Individual citizens, patients and Patient / Consumer Groups,
- Non Government Organisations and the NHS,
- The pharmaceutical and health information industry and the corporate sector, and
- Government and international institutions.

The messages of global health are not simple, we cannot say that globalisation is bad for health, nor can we say that it is good for health. We must recognise that globalisation poses threats and opportunities and that we must take responsibility as individuals for addressing these threats and taking opportunities to improve health in our global society. This implies being a good citizen of the world community, being informed of global issues and taking personal and collective action. It is what Kofi Annan called "responsible globality".

The Environmental movement captures the feeling of global responsibility and enables people to express concern, gain information and take action to reduce pollution and protect endangered species. However, it

seems that when it comes to direct human health concerns we expect some other agency to take care of the problem. A greater understanding of the dependence of health on individual resources and knowledge would be helpful, there is a danger that we rely too much on health agencies. Only when such agencies are clearly failing and death and starvation are imminent do we find compassion is roused on a global scale. For example, it is claimed that the Netaid concert of 9 October 1999 attracted 1 billion users to log on through their computers. This phenomenon suggests the potential for an Internet based charity providing direct contact on global health issues. It is proposed that the UK Partnership for Global Health should convene a group of health related Non Government Organisations and relevant Internet Companies to examine this possibility.

Community to community contacts have the potential to build a better understanding of shared health problems. We propose that the UK Partnership for Global Health should initiate a series of programmes run by Non Government Organisations, possibly with industry sponsorship to build community to community health links. This could involve patients, nurses and doctors in this country forming links with an overseas community. This might involve twinning UK community hospitals or Primary Care Groups with overseas groups with finance to support visits and exchange of knowledge probably using Internet connectioa The community base for such groups could either be ethnic groups those with particular health problems or simply local communities with an interest in health.

Corporate awareness of global health issues should be reinforced by the proposed Nuffield Trust award for contribution to global health see inset 2. In this sphere health supply companies (including pharmaceutical companies) could exercise a very valuable leadership role. Their understanding of health issues could provide a bridge for other companies who may find it hard to understand how they can contribute to global health. For this reason the UK Partnership for Global Health should sponsor cross industry groups led by health supply companies to consider how they can contribute to global health.

Government and International Agencies can be addressed directly by the UK Partnership for Global Health. Currently the Nuffield Trust is developing proposals for the June 2000 G8 Meeting in Okinawa and the Davos conference of 2001. We hope that the UK will take a lead on global health issues at these meetings.

Box 2 Nuffield Trust proposal for a Global Health Award

To raise awareness of the importance of the global dimensions of health, and to encourage what UN Secretary General Kofi Annan has called "responsible globality", it is proposed that an annual award be established to recognise a public or private organisation, or group of organisations, that demonstrate global citizenship and responsibility through a significant contribution to global health. The benefits of the award would be the following:

- To raise public awareness and understanding of the important and wide-ranging impacts of globalisation on health;
- To raise the profile of global health issues among health policy makers at the national and international levels;
- To put health higher on the agendas of policy makers and organisations in other sectors such as trade, communication and environment;
- To stimulate organisations to think innovatively about how they might contribute to the promotion and protection of global health;
- To encourage new forms of collaboration and partnerships between public and private sector individuals and organisations that are needed to address global health issues effectively; and
- To motivate individuals and organisations in both the public and private sectors to devote increased resources to addressing global health challenges.

The potential criteria for the award might include the following:

- Development of a health intervention that addresses an important global health issue (e.g. Merck's development and donation of Ivermectin; creation of the Global Alliance for Vaccination and Immunisation GAVT)
- The financial support of research on a global health issue (e.g. Bill and Melinda Gates Foundation, Soroos Foundation, Turner Fund, Rotary International contribution to polio eradication);
- The creation of an innovative way of working collaboratively across the public-private sectors, health and non-health fields, or global-local levels on a global health issue;
- The promotion of public awareness of global health issues
- The development and marketing of a product or service that protects the global environment and human health (e.g. Salisbury's City Petrol).

Eligibility - —

The award could be open to a wide range of organisations from either the public or private sectors including NGOs, civic bodies and research institutions. A collaborative effort among different types of organisations could be particularly encouraged.

Award

The Global Health Award should be limited to a small sum of money and/or a medal or trophy. However, substantial efforts should be made to publicise it internationally so that it has strong recognition as a high-profile and prestigious award (e.g. Nobel Prize). The prize may be awarded annually at the WHO World Health Assembly.

Selection Process

The selection process could be carried out by representatives of the sponsors of the award and/or a designated body (e.g. WHO External Advisory Group on Globalisation and Health) with particular knowledge of global health. There would need to be an agreed process of nomination,

Funding

The Global Health Award could be sponsored by a number of organisations, such as The Nuffield Trust (UK), Rockerfeller Foundation and other charitable foundations, and administered through the World Health Organisation (WHO). One or more sponsors from the developing world should be encouraged. A small fund would be needed to establish the award and administer it (e.g. publicity, selection process, award ceremony).

Dr Kelley Lee, London School of Hygiene and Tropical Medicine

PROGRAMME REPORT AND ACTION PLAN

Graham Lister
The Nuffield Trust

Introduction

This report presents the conclusions of a 12 month policy review programme, supported by the Nuffield Trust, to raise awareness and mobilise national policy in response to global health issues. It was initiated at a seminar hosted by The Nuffield Trust and Templeton College, Oxford University on February 17th 1999. It will conclude with a national conference on January 31st 2000, hosted jointly with the Royal College of Physicians. This will mark the start of the UK Partnership for Global Health.

Introducing the programme, John Wyn Owen, Secretary of the Nuffield Trust, noted that the UK delegation to the Trilateral Meeting on the Globalisation of Healthcare, held in Washington in October 1998, had been convinced of the imperative for concerted action at national and international level (1). Kofi Annan speaking to the World Economic Forum held in Davos on January 31st 1999, recognised that globalisation is a fact of life and called on the World's leading businessmen to initiate a global compact of shared values, which he defined as "responsible globality" (2). This programme is a contribution to such a compact.

The Steering Group (see annex A) is grateful to all those who took part in the review. Seminars and papers were produced as follows:

1. Introductory Seminar chaired by Professor Rosemary Stewart
- Global Dimensions of Health, Dr Kelley Lee (3)
- Global Health Implications for Policy, Dr Graham Lister (4)

2. Health and Environment chaired by Professor Michael Adler
- An Overview of Health and Environmental Risks, Dr Kelley Lee (5)

3. Economic Trade and Aid Issues chaired by Professor Morton Warner
- Globalisation of Pharmaceutical Business: A Comparative Approach, Dr Panos Kanavos, Monique Mrazek and Dr Elias Mossialos (6)

4. Information and Technology chaired for Dame Fiona Caldicott by G. Lister
- Changing Medical Technology: Complexity or Chaos, Dr Fiona Murray and Dr Sue Dopson (7)

5. Social and Cultural Factors chaired by Dr Sue Atkinson
- Social and Cultural Factors in London, Dr Luise Parsons and Dr Sue Atkinson (8)
- Travel Health and Infectious Disease, Dr Najib Habib and Dr Ron Behrens (9)

6. Institutional and Political Issues chaired by Sir Graham Hart
- The UK's Vital Interests in Health and Systems of Health Governance, Dr Kent Buse and Dr Richard Dodgson (10)

7. The Action Agenda chaired by Dr Graham Lister
- Raising Awareness of Global Health, Dr Graham Lister (11)

8. Uncertainty and Global Health Risks, chaired by Dr Graham Lister
- The Precautionary Approach to Global Health, Professor Anthony McMichael (12)

9. Local Perspectives on Global Health Chaired by Dr Graham Lister
- How NGOs Can Help, Dr Peter Poore (13)

10. Working with Industry for Global Health chaired by Professor Morton Warner
- Global Health: The Role of the Information Technology Industry, Dr Nick Beard of IDX (14)
- Globalisation and health - perspectives from the pharmaceutical industry, Dr David Webber of Glaxo Wellcome and Simon Gentry of Smithkline Beecham (15)

11 .Local Responses to Global Health chaired by Dr Sue Atkinson
- A case study of TB in London, Dr Luise Parsons (16).

12. Steering Group Meetings chaired by John Wyn Owen
- Framework Report (17) and this Programme Report, Dr Graham Lister.

The Frame of Reference for the Review

Dr Kelley Lee (3) points out that there are many definitions of globalisation. She refers to a process that is changing the nature of human interaction, across a wide range of spheres, by reducing the barriers of time, space and ideas that have separated individuals and societies. This understanding is also reflected in Professor Anthony Giddens' 1999 Reith lectures (18) on globalisation. He suggests that it is a political, technological and cultural, as well as economic phenomenon, influenced above all by developments in communications.

The analytical framework for the review was taken from a previous paper by Dr Lee (19). She suggests that an understanding of the spatial, temporal and conceptual dimensions of change provides insight into the factors influencing global health. An analysis of the spheres of activity in which change is taking place provides a basis for developing policy responses. The spheres of activity she identifies were used as the basis for the analysis of policy choices and are described in this report under the following headings:

- Global Health and Environmental Risks
- Economic Trade and Aid
- Technology and Knowledge
- Cultural and Social Factors
- Political and Institutional Context

A policy review must be set in a clear moral and practical context; that is "why should we act?" and "what can be done?". The UK perspective will be different from that of the USA, as set out in the Institute of Medicine's paper (20), reflecting our moral commitment to human rights and equity and the intellectual, trade and aid resources we bring to this issue. Our concluding sections consider:

- The Moral and Practical Case for UK Leadership in Global Health
- The Agenda for Action.

Global Health and Environmental Risks

Global health refers to widespread health impacts that affect populations across geographic boundaries between countries and continents. It is fundamentally influenced by economic, cultural, technological and political globalisation. Because such issues cross national borders international co-operation is required to address them, but as health is determined locally by national health systems and local communities it also requires local awareness and response.

The impacts of globalisation on health are likely to be long term and sometimes irreversible in their effects on future generations. It may not be clear how, or indeed whether, a certain action or lack of action may impact on health. For this reason extreme caution is required, particularly when non-renewable resources are utilised or threatened.

These global health risks often increase disadvantage, because poor people may be unable to protect themselves against health risks and because those creating the risk do not bear its consequences.

Global health risks that are widespread and affect large numbers of people, identified by Dr Lee (5), include current pandemic diseases such as influenza (see inset 1) which are now transmitted faster due to the increase in the speed and volume of international travel. Global warming is leading to the wider spread of diseases such as Malaria, Yellow fever and Dengue Haemorragic fever. Communicable diseases such as HIV/AIDS and Tuberculosis, and foodborne and diet related diseases, such as Diabetes, are becoming more widespread as a result of global trends in human behaviour- sexual behaviour, urbanisation and global trends in food production and consumption. Failure to control the effective use of antibiotics (75% of antibiotic use in humans and animals is of questionable value) has also given rise to changes in infective agents such as multi drug resistant Tuberculosis, types of cholera and hospital infections. Global trade in blood products in the 1970s resulted in the global spread of Viral Hepatitis B.

Box 1: Some Examples of Global Health Risks

Influenza
Global epidemic (pandemic) in 1918-19 resulted in 30 million deaths.

Tuberculosis
2 billion people carry TB bacilli. 2 million die of this disease each year.

HIV/AIDs
40 million people are infected. 16 million have died of this condition.

Viral hepatitis
450 m are chronic carriers of Hepatitis B or C. 1/4 of these will die as a result.

Malaria
500 million people affected annually. 1-2 million die each year as a result.

Cardiovascular disease
Major cause of death in rich countries, increasing world-wide 13 m deaths p.a.

Diabetes
Affected adults increasing from 135m to 300 m by 2025, 13m deaths in 1990.

Lung Cancer
Tobacco causes 90% of cases, currently 1 billion smokers, half will die of smoking related diseases, by 2030 10 million will die each year as a result.

Source: An Ov erview of Health and Environmental Risks, Dr Kelley Lee

Large scale risks to the natural environment are identified by Professor McMichael (12). Many of these risks are very long term in their impacts on population health. They may also be described as risks to the health of the planet and its eco-systems. They include global warming and damage to the ozone layer, destruction of natural habitat and biodiversity, over consumption of resources and contamination of air, water and soils.

Health risks also arise from the changing social environment due to global trends towards: violence, forced migration of populations, urbanisation, loss of traditional social structures, tourism and growth of illicit drugs trade (inset 2).

Box 2: Some Examples of Global Environmental Risks
Global Warming
Temperatures will rise between 1 and 3.5 degrees Celsius over the next century.
Natural World
More than 30% of the natural world has been destroyed since 1970.
Resource Consumption
Population increased 400% since 1990 consumption rates, 25% since 1975.
Contamination
200-400 major chemicals contaminate the world's rivers.
Refugees
Annual flow of refugees 10-15 million people.
Tourism
Approximately 100 million people cross borders by plane every year.
Illegal drug traffic
US and Europe spend about $122 billion per year on illegal drugs.

Source: An Ov erview of Health and Environmental Risks, Dr Kelley Lee

Bio-diversity is an environmental resource for health, increasingly valued by pharmaceutical companies seeking to patent the genetic codes of plants and animals. Biodiversity is being lost, species and eco-systems such as the coral reefs and rain forests are being destroyed by the global spread of tourism and the increase it brings in fishing, hunting and pollution. While there are many reasons for preserving animals and eco systems the impact on health is an important factor, which is not given prominence in public awareness (inset 3).

Box 3: Throwing away the key to AIDs
The recent discovery of the link between the HIV-1 virus strain and the Pan troglodytes troglodytes chimpanzee provides a vivid illustration of the complex relationship between globalisation and global health risks.

It is now believed that the HIV-1 virus probably passed from chimpanzee to humans as a result of commercial hunting for chimpanzee meat in West Africa. This was the product of increased demand arising from logging activities attracted by the hardwoods of the rain forest and the European demand for these woods. This species of chimpanzee, which shares 98% of its genetic make up with humans has now been hunted to the point of extinction. Yet the Pan troglodytes troglodytes has developed an immunity to HIV-1 and may hold they key to the development of human vaccines (24.)

Source: Paul Brown "Chimp Close to Being Wiped Out" Guardian 1 Feb 1999

The Chief Medical Officer's Report of 1997 (22) dedicates a chapter to environment and health. It deals with, amongst other things: global warming, environmental chemicals, genetically modified organisms and the possible link between oestrogenic chemicals in food and the fall in human sperm counts. Actions have been set in hand at UK level and in consultation with European Partners (see for example the Declaration of the Third Ministerial Conference on Environment and Health (23)). The UK has also signed the Kyoto Treaty on climate control and has a good record of achievement in health and environmental protection and research. However, it appears that research in this field is currently fragmented between many different agencies. There is a need for co-ordination of research and monitoring effort both at a national level and internationally.

The basis for international co-ordination of research and control is suggested by the 1992 Rio "Earth Summit" Declaration, that sets out the "Precautionary Principle."

This says that if a practice seems likely to harm the environment, even if proof is not definitive, action should be taken to control it. This principle is difficult to apply in practice, for example, the US is taking action through the World Trade Organisation to prevent the EU from banning or even the labelling meat containing growth-promoting hormones, even though there are concerns that one of these hormones could be linked to child cancers. The crisis regarding CJD and UK beef sales in France also shows how emotive such issues may become.

Debates concerning: genetically modified food, use of hormone and chemical additives and the fears raised by the detection of dioxins in Belgium food, have led to proposals to establish a European Food Safety Agency. They also illustrate the importance of properly informed public debate. There is a danger that discussions and agreements between government and industry experts in national and international meetings will preclude informed consumer debate. It is reassuring to note that a number of relevant UK committees have been broadened in membership to provide greater consumer representation, however, it is still necessary to improve public awareness and access to information in this field.

The proposals for UK action stemming from our discussion of these issues are:

- The UK Government should seek greater international recognition of the Precautionary Principle and should seek to develop a scientific basis for its application, in research, monitoring and control actions.
- This should lead to steps to identify potential and actual health risks according to agreed criteria, supported by international surveillance and research.
- A clear set of priorities should be set for UK research institutions in the field of global health risk assessment and surveillance.
- Measures should be taken to improve public access to and understanding of information concerning global health risks, including, as examples; better representation of consumer interests, access through the NHS Electronic Library, better education about health risks and steps to support responsible media coverage.

Economic, Trade and Aid Issues

About $70 billion per year is provided in aid and loans from official OECD sources, about $7 billion of which is directed towards health provision (see inset 4). In the past aid has focussed on support for economic development through large scale agriculture, infrastructure and industrial development often with aid tied to contractors from the donor country. Such large-scale programmes often proved ineffective. Now greater attention is given to micro economic development through small-scale loans and local informal sector employment schemes. In the light of this change there is also a realisation that investment in health is essential for economic development, since people must be healthy to be able to contribute. Dr Gro Bruntland of the WHO (25) stated that a five year increase in life expectancy may lead to 0.5% improvement in economic growth (see also the World Bank report of 1993 (26) which makes a similar estimate).

The net inflow of funds arising from private sector trade is about $250 billion per year. These trade flows are dependent upon trade terms and conditions agreed through the bilateral trade agreements and the World Trade Organisation (WTO). In general poor countries have gained short term economic benefit from the globalisation of trade. Exports from poor countries have grown by about 6% per year in the past ten years, which is why many are seeking WTO membership.

Box 5: Economies and Health in Rich and Poor Countries a Rough Guide

The richest 20%

1.2 billion people receive 84% of world income, growth rate 3 %. GDP per head $17,500, Health expenditure 8% of GDP $1,400 per person. Aid expenditure 0.28% of GDP, (UK.'0.29%, US 0.1%), S50 pci head, 10% of aid is directed towards health. Population growth rate 1% falling, life expectancy 72 years rising.

The poorest 20%

1.2 billion receive 1.2 % of world income, growth rate 2%. GDP per head $250, Health expenditure 2-4% of GDP, $3-15 per person per year (44 countiies spend less than S5) 20% of health expenditure is aid supported (higher in some countries). Population growth rate 3%, not falling, life expectancy 45-55 years, falling in several sub Saharan countries.

The future

If trends continue within 20 years the richest 20% will be 120 times as rich as the poorest 20%. but it is doubtful whether the poor in poor countries could continue to survive on the below subsistence income levels this implies.

Source: Global Health a local issue Framework Report G Lister (figures rounded).

However, there are significant disadvantages to poor countries from current trade arrangements. Rich countries and blocks such as the European Union and the North American Free Trade Agreement support massive subsidies to their farmers, annual agricultural subsidies in industrialised countries have been estimated at $353 billion. Because such subsidies are often paid through price support mechanisms, rather than as income support, this distorts and undermines the agriculture of poor countries, which cannot compete with subsidised prices. Tariff barriers are also used to protect agriculture sectors of rich countries where they may face competing imports. While this issue was recognised in the 1999 Seattle meeting the problem remains to be addressed by the WTO.

Poor countries face a number of specific health disadvantages from the trend towards global life styles. They have become targets for some multi national companies (MNCs) selling lifestyle products that have serious health consequences. Sales of sugared drinks, powdered baby milk, alcohol and tobacco all have negative health consequences. In South Asia the growth of Diabetes as a result of diet and lifestyle changes has been described as being of epidemic proportions; in ten years it is estimated that 300 million people will suffer from Type 2 Diabetes, most will be in poor countries. The problems of associated with powdered milk baby have been apparent in Africa for 30 year. Alcohol is the fourth most important cause of disability world-wide affecting 5-10% of the population. The effects of the tobacco industry are illustrated in inset 5.

The White Paper on International Development "Eliminating World Poverty" (26) notes the importance of the globalisation of lifestyles and trade. It makes proposals for working with the United Nations Conference on Trade and Aid to improve trade procedures and reform agricultural trade, linking this to reform of the EU's Common Agricultural Policy and environmental standards. In particular the paper states the Government's intention to ensure that the advertising of items such as tobacco, baby milk and pharmaceuticals are conducted in a responsible way. The white paper calls for partnership between the public and private sectors to support health and economic development in poor countries.

Stephen Byers the Trade and Industry Secretary announced UK proposals to the failed World Trade Organisation (WTO) Seattle Conference of 1999 to eliminate trade tariffs for the world's poorest 48 countries. We believe these actions together with the stand taken on debt reduction, underline the UK's moral commitment to address the global issue of the gap between rich and poor.

Box 5: The Global Death Industry

The tobacco industry is a US$400 billion industry dominated by a small number of transnational corporations led by British American Tobacco (BAT) and Philip Morris. In a few countries, such as China, tobacco production is controlled by a state monopoly. The industry is both global and local, with complex linkages between MNCs, inland revenue agencies, retailers and farmers. As a consequence, many economies around the world are heavily dependent on tobacco.

There are over one billion smokers world-wide. Half of persistent smokers will die from their habit. Tobacco currently causes 3.5 million deaths annually, expected to rise to 10 million by 2030. The biggest growth market is in the developing world where 85% of the world's smokers will be located by 2025 and seven million smoking related deaths will occur per year.

Smoking will kill a third of all young men in China. Of 300 million males now aged 0-29 about 200 million will become smokers. If they continue to smoke throughout their lives, 100 million will die of smoking related diseases, half of these deaths will occur before the age of 70. Current research indicates that every day 2000 Chinese people die of smoking related diseases.

Source: Tobacco Free Initiativem WHO and World Conference on Tobacco, Beijing 1997
"Smoking epidemic: a fire in the global village"

Health care is the world's largest industry absorbing 8% world product. Services are largely provided by local and national organisations, but a few Non Government Organisations (NGOs) such as Medicin Sans Frontieres are global. Medicine has some characteristics of a global profession, with a common language and technology. Staff move from one country to another, 28% of NHS Dental and Medical staff gained their primary qualification outside the EU, most from South East Asia and Caribbean countries. NHS Trusts have been asked to take care when recruiting not to denude poor countries of their trained staff.

Economic globalisation is a feature of health supply companies. The pharmaceutical sector (which accounts for some 15% of global health costs) is highly globalised. Pharmaceutical wholesaling (accounting for about 1% of total costs) is also concentrated in a limited number of regional operators. Medical equipment (about 4% of costs) is becoming more globalised and health information systems and technology supply (1.5% of costs) is dominated by a decreasing number of international companies, mostly focussed on the US.

Kanavos et al (13), remind us that when considered within therapeutic categories the market is far less fragmented. Pharmaceutical multinationals focus on the three major markets for branded prescription products - USA ($100 billion), Europe ($ 70billion) and Japan ($50 billion). This excludes low cost generic drugs that account for about 40% of prescriptions but only 10% of the market value in high-income countries.

The market for drugs in low-income countries is estimated at $44 billion. Essential pharmaceuticals defined in national formularies are almost entirely drawn from generic drugs (with 4-5 exceptions). These may be manufactured locally or imported from regional and global producers. No low-income country, except China, is self sufficient in essential pharmaceuticals. The EU provides about 75% of all drugs imported to low-income countries through UNICEF at prices below those applied in high-income countries. Lack of money, inefficiencies and corruption in the supply system and lack of an effective cold chain mean that some 2.5 billion people living in rural areas have little or no access to essential drugs through local health systems. However, branded pharmaceuticals can often be obtained from local pharmacies.

High research and development costs and the low prices affordable in poor countries lead to "orphan drugs" that are not developed because they have little prospects of profitability. For example, there has been very little research by pharmaceutical companies into anti malarial vaccines (inset 6). The European Commission proposes to designate orphan drugs and provide incentives to bring them to market. Fear of litigation and the US anti abortion lobby has also restricted research into contraceptive technology.

Intellectual property rights are one key to this issue, since they enables pharmaceutical companies to make returns on investment. When patents lapse the price of a drug as a generic will often reduce to perhaps 30% or less of it's former price. Joining the WTO may mean that some poor countries are required to apply patent protection more strictly to pharmaceuticals and other products. South Africa has reacted by proposing the compulsory licensing of certain products (AIDS related drug therapies).

Even when drugs are donated, this does not ensure that they can be provided cost effectively. In poor countries it is essential to consider the total cost and impact of delivering medicines. Neither compulsory licensing, nor donation, answer the wider question of how to make these markets attractive for the continued development and supply of cost effective medicines.

Box 6: The War against Malaria

Malaria kills 1-2 million people per year, mostly children and pregnant women, 90% of the 500 million cases per year occur in Africa.

After the second world war considerable progress was achieved in combating the disease through programmes of DDT spraying and the development of a quinine based drug cholraquine. But the parasite of the mosquito, which carries the disease, developed resistance to insecticides and to chloraquine and other quinine based drugs. Environmental controls on mosquito breeding fell into neglect. Various drugs were developed each with increasing cost and side effects. By the late 1980s there was very little research by pharmaceutical MNCs into Malaria.

In the lae 1960s Chinese scientists discover a herb based treatment for malaria based on the Artemisinin plant. However, due to fears of exploitation by western companies by the Chinese government and a disregard of herb based approaches by western scientists, the development was not followed up until the early 1990s. Since that time drug trials have been carried out and the WHO launched a campaign in 1998 using the drug with a target to halve the rate of deaths from malaria.

Meanwhole the US Centers for Disease Control and Prevention and the National Institute of Immunology in New Delhi have been collaborating to develop and test a new malaria vaccine based on an artificially created gene.

Source: BBC News October 15 1998 and February 16 1999

Professor Sachs (27) has suggested that rich countries could provide market guarantees to support pharmaceutical markets that would otherwise simply not be attractive for pharmaceutical research. David Webber and Simon Gentry (15) suggest it would also be possible to build upon the current structure of market prices, which effectively segregates the market according to ability to pay. This in turn requires strict control of the distribution of the drugs and prevention of patent infringements and counterfeiting. It would also be essential to control the export and import of drugs so that products could not be recycled from low price markets to higher priced markets.

Following discussion of these issues we make the following proposals for action:

- Co-ordination of health aid and trade to establish clear and coherent strategies to support health improvement in the poorest countries. This should include the assessment of total trade and aid impacts on health.
- National support for investment in drugs and other remedies for diseases affecting low income countries particularly where diseases can be shown to pose a global health risk, including a UK policy on orphan drugs.
- Partnership with the pharmaceutical industry and pharmaceutical supply industry and with poor countries to consider the incentives and support required to ensure investment in the appropriate provision of pharmaceuticals and health knowledge at local levels in poor countries. This should include the provision of market guarantees.

Cultural and Social Factors

Cultural and social factors are central to health. Even in rich countries 90% of incidence of ill health are self treated and health outcomes depend upon local knowledge and resources, for example knowing how to stay healthy and have a healthy diet. Globalisation of communications provides the opportunity to share knowledge, but it also brings threats to traditional knowledge and cultures. Globalisation of our cultures risks undermining traditional healers and social structures with no adequate replacement. For example the use of powdered baby milk in Africa is popularly believed to be associated with "developed lifestyles" and good health yet its use decreases health and often results in sickness as mothers do not have access to clean, boiled water.

In countries with expenditure on health systems below $5 per person per year cultural and social factors such as knowledge and support for self-treatment are the most important resources for health. Lack of these resources not only creates greater cost for the local health system but also has wider consequences for global health, as shown in inset 7, which illustrates how lack of knowledge leads to misuse of drugs and builds resistant strains of diseases.

Box 7: Health Resources and Drug Resistance in Cambodia

The health status of the 11 million people of Cambodia is amongst the lowest in Asia. Average life expectancy at birth is 52.4 years, infant mortality is 115/1,000 and child mortality is 181/1,000 live births, the highest in Asia. The very low level of child health may be attributed to the impact of 30 years of war and poverty and the virtual collapse of a once effective health system. The major causes of child deaths are diarrhoea diseases, acute respiratory infections (often pneumonia), malaria, tuberculosis, measles and dengue fever. Tuberculosis (estimated prevalence of 8%) greatly increased under the Pol Pot regime due to forced communal living and HIV-1 was introduced during the Vietname war. In some areas the goitre rate is over 20% and the vitamin A deficiency rate is 6.4%.

The Pol Pot regime also effectively removed the intellectual leaders. Most doctors, pharmacists and other trained people were eliminated, village leaders and killed and village social structures were destroyed.

Government expenditure on health care is estimated as $2.8 per person per year. A similar amount is spent by some 90 NGOs and international aid organisations. This results in unrealistically low salaries for health workers, it is therefore understood that patients often buy their own medicines and make unofficial payments to doctors and nurses. Personal expenditure on health is estimated at $20 per person per year. A full range of modern medicines can be bought from wayside shanty pharmacies in many towns. Refgulation is ineffective and medicines such as rocephine and ofloxacine can be bought in single doses. It is therefore unsurprising to find that resistance to drugs develops rapidly. There is over 90% resistance of Salmonellae to ampicillion, bactrim and chloramphenicol and over 80% resistance of Escherichia to augmentine and bactrim. Within 18 months of its introduction resistance of Esherichia to olfoxacine tose to 28%,

Source: Report by Graham Lister on a review of Kantha Bopha Children's Hospital in Phnom Penh for the Swiss Development Agency 1997

London is one of the most ethnically, socially and culturally diverse cities in the World; 33 languages are spoken by groups of 10,000 or more people. Over the years it has seen the immigration of many people with distinctive cultures and genetic factors that give rise to specific health needs. For example recent refugees from Somalia, Sudan, Ethiopia and the former Yugoslavia and immigrants from Cyprus and Turkey have distinctive health needs as well as a common need for effective contact and communication with the NHS. Refugees also share many mental health needs arising from their experience. At the same time these communities are important resources which can help to develop understanding and responses to global health needs.

Dr Luise Parsons and Dr Sue Atkinson (8) demonstrate how a health impact assessment can show the impact of globalisation of social and cultural factors on London and conversely the impact of London on global health (see inset 8).

Box 8: Health Impact of Globalisation on London and London on Global Health

Impact of Globalisation on London			**Impact of London on Globalisation** [i]	
Cultural and Social factors	**Health Outcomes**		**Cultural and Social factors**	**Health Outcomes**
250,000 refugees and asylum seekers in London	Mental ill health, use of health services, social exclusion		Migration to rest of UK and overseas	Isolation of elderly relatives
25% of London's population are ethnic minority communities	Use of health services, premature mortality from CHD etc, for 1.7 million people		London's health services are centres of excellence in teaching and research	Setting and monitoring standards, innovation in medicine and technology
Travel health and infectious diseases for 50 million travellers	Eg Diarrhoea, Malaria, TB, STDs and HIV		Export of health knowledge and skills overseas	Contributes to eliminating world poverty
Poverty and inequalities in health	Women and children, ethnic communities and the elderly are disproportionately affected by poverty		Globalisation of financial institutions and other services. Contribution of London to creating poverty	High mortality rates and low life expectancy in developing countries
Changes in patterns of family size, structure and parenting skills. Loss of "social capital"	Teenage pregnancies Deliberate self-harm Smoking Eating disorders Substance misuse		Healthy Cities initiatives, HAZ areas, community development, urban regeneration, all build social capital	Associated with reduced morbidity, mortality and use of health services
Smoking and the tobacco industry	Tobacco is estimated to kill 8,000 Londoners per year		Offices and workplaces concentrated in cities and towns	Opportunity for effective healthy workplace initiatives
Globalisation of media but loss of local knowledge of health services	Unwanted teenage pregnancies Poor use of GP services		London's contribution to the media, entertainment industry and culture	Positive and negative effects on mental health eg susbstance misuse

Travel for business and pleasure is a further global social and cultural trend which has shown enormous increase over the past 30 years, as discussed by Dr Habib and Professor Behrens (9). Total numbers of international tourists grew from 200 million in 1970 to 430 million in 1990. The UK, which is the world's fourth largest spender on tourism saw a very rapid increase in residents visits abroad from 12 million in 1970 to 45 million in 1990, with a very steep growth in travel to malarious regions from less than 200,000 to 1.5 million. The UK is also a very popular destination for overseas tourists, with some 24 million visitors. Since it is now possible to travel from virtually any destination within hours there is very limited ability to control the importation of infections (see inset 9).

Box 9: Infections Imported to the United Kingdom. 1978-88

AIDS	Diptheria	Lassa fever	Rabies	Trypanosomiasis
Amoebiasis	Dysentery	Leishmaniasis	Salmonellosis	Tuberculosis
Brucellosis	Giardiasis	Leptospirosis	Rabies	Typhoid
Cholera	Helminths	Malaria	Schistosomiasis	Paratyphoid
Cytomegalovirus	Hepatitis A & B	Poliomyelitis	Shigellosis	

Source Cossar 1996

To date the transfer of diseases to the UK has not been a major problem. Most illness results from UK travellers falling ill with quite common conditions or suffering accidents. People returning to visit their country of origin are more likely to suffer from tropical diseases partly because they tend to assume they have some immunity. It appears that the response does not always match these problems. This is in part due to a lack of a clear national strategy for travel health and in part due to the conflict of interests apparent in the travel industry, which is expected both to promote travel and warn travellers of potential health hazards.

The global rise of fundamentalist religions and other extreme cults can be seen partly as a response to the hegemony of western culture and the growing disparity between the rich and powerful and the poor and powerless of the world. Extremist groups together with the odd psychopath, whether leading a country, an army of the aggrieved or fanaticising alone, are described by the report of the International Institute for Strategic Studies (28) as one of the main threats to this country. The Ministry of Defence report (29) focuses attention on the military threat of biological and chemical weapons, (see also inset 10).

With the availability of the information from the Internet and the materials required to develop them, biological and chemical weapons are now seen to pose a very significant threat. The BMA has called for international action to outlaw such weapons. President Clinton recently proposed to double the budget to $2.8 billion to prepare for terrorist acts by creating preparedness offices in 120 cities and increasing research into vaccines. Since the UK is, perhaps, second in line as a target for terrorist attack it is relevant to ask what action is required here.

Box 10: Mail Order Anthrax

Anthrax is one of the most deadly of the potential biological weapons. According to one study, if its spores were distributed appropriately a single gram would be sufficient to kill more than one third of the population of the US. While it may not be possible to distribute the spores across America, a small-scale attack is possible. The US Law Enforcement Assistance Report of March 1997 estimated that a single ounce of anthrax spores introduced into the air conditioning system of a domed stadium could infect 70-80,000 spectators within an hour. A study by the Advanced Concepts Research Corporation of Santa Barbara in 1972 suggested that an aerosol attack with anthrax spores on the New York City area could result in more than 600,000 deaths.

The UNSCOM inspectors found that Iraq produced 8,4000 litres of anthrax spores. The anthrax culture brought into Iraq was believed to have been ordered from a mail order company in the USA and shipped to Iraq by overnight mail.

Source: H.E.Harvey, Biological Weapons FAQ 1998 at http://www.ocean.ic.net and Canadian Security Intelligence Service at http://www.csis-scrs.gc.ca

In response to the issues raised by the globalisation of cultural and social factors the following actions were proposed:

- Through the Healthy Cities programme, links between rich and poor countries should be extended. In the case of London there are special resources of knowledge from institutions specialising in global health. There is also special knowledge amongst local immigrant communities and contact with health professionals from former countries, which should be utilised to improve health both in the UK and in countries of origin.
- Local Health Improvement Plans should both consider the potential and actual impact of global health influences and poverty on the health of local communities and how local resources can contribute to the alleviation of global health risks.
- Specific local action in relation to global health risks such as Tuberculosis should also reflect and support a global response to such issues as part of a local, national and international concerted programme of action (16).

In relation to travel health and infectious diseases and biological or chemical terrorism our agenda for action includes:

- A national policy on travel related diseases, including: the identification of risks for travellers and visited communities, development of best practice guidelines for all those advising travellers, improved surveillance of traveller illness, research into the cost effectiveness and funding of preventive measures and improvements to the way advice and preventive services are provided to travellers returning to countries of family origin.
- The creation of a high level committee to improve the collation and sharing of intelligence information on potential terrorist groups and individuals.

Technology and Knowledge

Marshall McLuhan described the Global Village created by radio and television; the Internet now allows the villagers to chat to one another across their walls. Health is the second most common use of the Internet, most frequently by patients seeking information relevant to their condition. They will find plenty of sites, enter a term like "cancer" in a web search engine, which typically search 10% of the web, and some 600,000 world-wide sites will register. Some information will be useful, some may be misleading or even dangerous. A study to examine 41 sites providing guidance on treating child fever showed all but a few contained errors and omissions (30). Several countries including Canada, USA and now the UK are attempting to provide a form of quality evaluation for approved sites.

Health is a knowledge-based industry, doctors in this country spend almost as long dealing with information (25% of their time) as they do in contact with patients. However, as Murray and Dopson (7) point out, health knowledge must be seen as a continuum (see inset 11). Moreover health knowledge must be seen within the culture to which it relates and in the context of local needs and resources.

Box 11 The Continuum of Medical Knowledge

Proven & generally acceptcd knowledge of long standing	Knowledge in rapidly changing fields	Knowledge of diseases of limited prevalence	Medical mythology- diseases that do not exist; totally unsupported claims to knowledge
Knowledge acquired by RCTs, or widely accepted statistical knowledge	Rules of thumb- clinical experience & judgement	Unsupported'everyday" knowledge: tradition folklore	

Source: Learning and knowledge and new information technology. Pritchard P 1993 in Learning and Medicine Coles C and Holm H OUP Oxford

This means that although it is possible to codify and give electronic access to some technical elements of health knowledge it is essential to provide access to a whole range of contextual information. This is probably best achieved by enabling personal and community to community contact, particularly if the communities have a shared understanding of one another's cultures.

In examining the potential role of the health information technology industry in relation to global health, Beard (14) acknowledges the need for any "technology fix" to be set in the context of supporting actions and contacts. He notes that Internet based knowledge systems would need local support through "Information Waystations" and "Staging Posts". However, there is potential to develop Internet based health knowledge systems with local experts, reflecting local culture and resources. The announcement of a $250 million investment by Microsoft in the Web.MD system and the merger of Healtheon with Web.MD to produce the world's largest on-line health provider signals the potential.

The 1998 World Bank Report, "Knowledge for Development" (31) stresses the importance of the power of knowledge to support development and in particular to assist in health improvement. At a personal level the education of women was the single greatest potential contributor to health and family wellbeing. The development of information and systems standards for health is very relevant to poor countries and to the former socialist states of Eastern Europe. In many cases they have been encouraged to invest in information systems to control health cost and provision. At present health information suppliers will often offer tailored versions of systems developed for the US market. A global approach to the specification of systems suitable for low- income countries may help.

Many hospitals and local health dispensaries in poor countries lack basic resources such a dependable water supply, electricity and basic drugs. It is nevertheless relevant to consider the use of Internet based telemedicine advice which can be run from solar powered batteries and use satellite links even in remote locations. The Committee on Development Information of the Economic Commission for Africa has noted (32) that while there are less than 50,000 dialup Internet accounts for 700 million people in Africa access is growing rapidly, 50 of the 53 African nations have direct Internet access. President Clinton has recently stated that providing access to the Internet can be a powerful force for development. Community based Internet services could provide continued education and training of medical staff and patients.

Internet based systems are applied to the task of disease surveillance. Existing surveillance networks and centres in 191 countries are linked by a "network of networks" established by WHO. Surveillance will only work if there are effective local health system, including hospitals and laboratories. This suggests one basis for the development of knowledge based health systems and emphasises the importance of

ensuring that technical developments are matched to local needs.

Our proposals for action arising from this review of technology and knowledge are as follows:

International standard setting, accreditation and quality marking of reliable medical knowledge on the Internet, which should include contextual information and personal contacts.

The current proposal by the London Region of the NHS, to create a health knowledge network for London could both improve health in the capital and provide a valuable resource for global health.

International effort should be mobilised to support the development of specific web based health knowledge systems relevant to poor countries. Systems such as Web.MD and the systems used to support NHS Direct show the potential for such applications in rich countries. We believe that there is even greater potential for health benefit in poor countries.

Such developments must be matched by wider understanding of the cultural and practical context in which medicine is practised. This requires dialogue on a community to community level, between health professionals and with experts from the countries involved. It is important to ensure that technical solutions represent the best investment of time and resources for the country concerned and could be sustained by them.

Political and Institutional Framework

The report by the US Institute of Medicine "Vital Interests in Global Health" (20) concludes that "Distinctions between domestic and international health problems are losing their usefulness and often are misleading". The European Union has accepted health as an area for convergence in the Maastrict Treaty and an accord has been signed by Clinton and Santerre to work together on global health issues; this has produced a joint EU-USA Task Force on Communicable Diseases. —•

Due to its history, there has not been a clear focus on health within the European Commission (33). Perhaps partly for this reason co-ordination with the European Office of the WHO was poor and there may also have been some lack of co-ordination on health issues with the OECD. For whatever reason it appears that these powerful and resourceful bodies achieve less than they might. The proposal to establish a European Commission Directorate General for Health is therefore very welcome. The UK should play a leading role in working with the DG on health issues within Europe and in respect of global health.

Within the UK, many issues concerning global health cross departmental boundaries, and it is not clear to how the interests and concerns of the home countries will be managed. One issue raised by the review in the paper of David Webber and Simon Gentry (15) concerns the role of the Department of Health as both the principal customer and the sponsor of the pharmaceutical industry, facing global competition for investment. We suggest that these issues should be re-examined. Since global health requires concerted action within government, with other countries and agencies and partnership with the private and NGO sectors we propose that it should be led at the highest level of government.

While government ministers seem to be prepared to see health as a leading element of aid and trade policy, when the Foreign Office took responsibility for the budget of the British Council recently they redefined its targets areas. Health is still covered but it is no longer a specific focus for British Council support. The creation of a powerful new organisation to promote Britain overseas "British Trade International" replacing the former Overseas Trade Services should provide a focus for health related sales and aid.

One way of demonstrating an ethical foreign policy would be to provide the sort of trade support and funding currently devoted to the arms industry for health related trade and aid (see box 12). There are clear parallels between the support and organisation provided for the arms trade and the support and organisation lacking for health aid and trade.

It is not yet clear what form of organisation is required to provide UK aid and trade leadership in global health; it could be that a strengthening of existing institutions, a network organisation or a new agency is required. We should learn from the successes and failures of the former United Medical Enterprise and NHS Overseas Enterprises. Whatever organisational form emerges should encompass trade in pharmaceuticals, medical devices and equipment, health aid including technical support, medical and advisory services, research and training links, plus NGO and community to community links in health.

Box 12: UK Support for its Arms Trade

The UK is the third largest exporter of conventional weapons with sales of some £2.4 billion in 1997. This compares with exports of £5.5 billion for pharmaceuticals.

UK success in arm sales is strongly backed by the Government. The Defence Export Sales Organisation (DESO) is supported by the Ministry of Defence with a world wide marketing and sales presence from Riyadh to Jakarta and liaison with UK military forces for demonsration of various products. Sales are assisted by training and support contracts and backed by Department of Trade Export Credit Guaranteees, arms sales take up 25% of ECGs but are less than 3% of total exports. (The Mark Thomas Product Channel 4 October 19th reported that over 50% of recent guarantees were in support of arms sales. It was also pointed out that the International Monetary Fund has suggested that export guarantees are inappropriate for arms sales.

The Government also funds research and development expenditure on arms. Total national research funding accounts for 2.2% of GDP, (high by European standards but less than the USA of Japan), 33% of research expenditure is provided by public funds and 45% of this is spent on defence research compared with 54% on health research.

Source: Addicted to the Arms Trade, The Economist, 18 Sept 1999, UNESCO Statistical Year Book 1993 and 1997, The Mark Thomas Product, Channel 4, 19 October 1999

As a first step we propose the establishment of a UK Partnership for Global Health. It should bring together the relevant functions of the Department of Health, the Department of Trade, British Trade International, the British Council, DFID, the Medical Research Council, the Royal Colleges, the NHS, NGOs and patient organisations and the health supply industry. Its main purpose should be to provide UK leadership in global health.

Governance of global health is complex, multi layered and multi dimensional(lO). While one view of health governance would see the international institutions as leading, with regional and national institutions following their direction; we suggest a different perspective. Most aspects of health are determined by family and community health resources, knowledge and values (13). Local communities form the front line for global health. Local agencies and NGOs can support and respond to community leadership with national and regional systems of governance to direct resources, research and share knowledge. Our agenda for action balances support for national health planning and provision with a community perspective:

- Listen to local community voices and empower local action. NGOs may be the most appropriate way of supporting community action in fields such as women and children's health, housing, clean water and employment creation.
- Support the development of the European Commission Directorate General for Health.
- Bind together the local, regional and international patchwork of health governance by supporting the development and application of community based health planning.

- Create the UK Partnership for Global Health to provide leadership.

The Moral and Practical Case for UK Leadership in Global Health

The moral case rests on considerations of equity:

- between rich and poor countries and people,
- between those consuming and those dependent on non renewable resources,
- between generations.

This is not simply a question of relative equity of well being or economic wealth but concerns fundamental values of the right to life and health.

Throughout this paper we have referred to rich and poor, since it is misleading to distinguish between "developed" and "developing" countries. Many of the poorest countries are simply not developing in terms of income per capita or in health. Furthermore it is presumptuous to suggest that "developed" countries somehow represent advanced social, moral and economic positions in relation to "developing" countries. If poor countries did follow the same path in terms of health and use of resources it would be disastrous.

It is clear that the marginal benefit of an additional expenditure of $15 per head in the poorest countries could bring immense gains in health from the adoption of the WHO basic health programme (costing some $15-20 per head). This is equivalent to the increase in health expenditure experienced in rich countries every four months, where it would be extremely difficult to show any significant improvement in health resulting from the increase.

A Government currently spending less than $5 per head on health will take many years to expand formal provision for health to meet the WHO basic health programme, at a cost of $15-20 per head. In such countries personal expenditure on health (e.g. purchasing drugs from wayside pharmacies, informal payments to health workers and traditional healers) and health related expenditures and effort (e.g. fetching clean water, cleaning homes, maintaining pit latrines) are likely to be more significant than formal health system expenditures. Provision of health knowledge and support to local communities through NGOs can make a very significant^contribution to health by bearing on these elements of health provision. A co-ordinated approach to the support of both government and voluntary sector provision of basic health services coupled with support for self-care is required.

During the next 20 years the poorest countries will experience increasing levels of non-communicable diseases that are much more expensive to treat than most infectious diseases. 95% of HTV cases will occur in poor countries with a devastating effect on health, economic activity and society, since HTV is particularly prevalent amongst educated, urban people. Many of the current generation of low cost antibiotics may become ineffective. A high percentage of the population of Africa and several Asian countries will have incomes below that necessary for basic nutrition. It will surely be impossible to find feasible health solutions for poor countries let alone "affordable" ones.

The 12 October 1999 was designated as the date the global population reaches 6 billion. It is clear that despite increases in agricultural productivity, continued population growth will become unsustainable unless halted in the next century. Some point to the experience of rich industrialised countries to suggest that the population growth of poor countries will follow a similar path and decline as living standards increase.

Others note that the poorest 1.2 billion people with the highest population growth rate are actually getting poorer at about 1% per annum. Organisations such as the International Planned Parenthood Federation have long recognise that it is morally and

practically essential to provide support for a range of maternal and child health programmes, as well as contraception, if family sizes are to be reduced. This is because decisions on family size depend upon life and health chances and security and not just the availability of contraception.

Moreover, it is important to question whether it is morally defensible for rich countries to ask poor countries to curb population increase, while they are not prepared to limit growth in consumption.(34).

The consequence of pollution, created largely by over consumption in rich countries threatens health now and for future generations. Global warming will result in countless deaths over the next century, most in poor countries. While in the USA contingency plans have been drawn up to bring elderly people at risk into air conditioned areas in the event of heat waves, no such solution is available to the vast majority of people living in equatorial regions.

Many other global health threats pose immeasurable risks for future generations, some could be the cause of deaths and others will be extremely expensive to resolve. For example, failure to contain the development of multi drug resistant forms of Tuberculosis is already estimated to cost the USA $1 billion per year.

The Right to "Health for All"

We live in an unequal world, but we must at least accept an equal right to life. The right to the highest attainable standard of physical and mental health is embodied in the UN Declaration of Human Rights. The Alma-Ata declaration signed in 1978 reflects a strong belief in the need to address the gross inequalities in health. It calls for international acceptance of the social target of achieving levels of health for all by the year 2000 to enable all people to lead socially and economically productive lives.

Faced with the reality that aid for health did not increase to match the rhetoric of Alma -Ata, the WHO and the World Bank, together with other aid agencies have focussed on affordable health strategies. These are based on ill-health prevention (water supply, health education, immunisation) and basic primary care provision (including malnutrition, maternal and child health and basic drugs provision). The cost of basic health provision is estimated at $15-20 per person. This is still 3,-4 times the level of resources available to the poorest countries. And in most cases a high proportion of current resources are devoted to hospital provision, which though an essential element of health infra structure, has less impact on health than basic primary care.

Dr Gro Brundtland, the WHO Director General, has recently reaffirmed the World Health Organisation's commitment to human rights to health for the people of the world's poorest countries. She has committed the WHO to challenge abuses of this right and to seek a solution to basic health needs for all in the 21st century.

Failure to meet the aspirations of the Alma-Ata declaration is not only morally insupportable, it also poses a threat to world order, stability and prosperity. In an historic context, since the Second World War the west has experienced a period of great prosperity. If we do not use this prosperity now to secure basic health rights global health threats will develop at greater long-term cost in money and lives.

The EconomicRationale for Investing in Health.

In the past health improvement (and reduced family size) has been seen as an eventual consequence of economic development. "Diversion of resources" to health has therefore been seen as an economic cost that could delay growth and hence reduce long term health gains. This view is changing, first because the poorest people are not achieving increased personal wealth. Second, because health depends upon the quality of health policies and investments and not simply the level of expenditure. This is a point made by Professor Amartya Sen the Nobel Laureate in Economics (35). Third, views of economic activity have changed, we used to focus on the cash economy and

export earning potential of poor countries, we are now more aware of the importance of rural and informal sector activity. This micro economic development depends not on large-scale investment, but upon healthy, active people able to generate incomes with local support and micro loans. And finally increased economic prosperity without regard to other aspects of well being or quality of life, such as the sustainability of the natural and social environment is increasingly seen as meaningless.

The case for increased health aid was clearly stated in the article "Helping the World's Poorest" by Professor Jeffrey Sachs (27). He commented that the G8 Cologne Summit meeting of June 1999 demonstrated a real determination to address this moral and practical issue. We hope this is so.

There are No Simple Solutions

Globalisation poses complex questions, to which there are no simple answers, except that we must find new solutions. We cannot accept that increases in global trade, tourism communication and cultural exchange are "bad". Trade and tourism are essential to the economies of poor countries, without it they would certainly be poorer and as a consequence health would probably be worse. Countries which have attempted to withdraw from globalisation to some extent, such as Malaysia, have found that in practice they have little choice but to participate in the global economy. Improved communications and cultural exchange promote mutual learning and respect and also are essential for peace and development. Thus we agree with Kofi Annan when he says that globalisation is a fact of life, which demands that we find new moral solutions. He was not directly referring to health, but it is certainly apposite

The pace of globalisation is increasing but we still lack ways to respond to its impact on health. In some ways this mirrors the development of awareness and action to address environmental threats, which are of course also threats to human health. In this field too questions such as the use of gene technology in food production, present complex choices, balancing potential benefits against global risks. Continued research and measurement are essential to guide thoughfand action in both fields, and we have been impressed by the academic presentations made during the programme, but we believe that it is also essential to mobilise awareness and action on a wider scale to address this complex issue now.

In suggesting that we attempt to build responses from a community base we are aware that this also poses issues of accountability, financing and control. We do not believe that these are insurmountable problems, as the women's health movement and environmental groups have shown. But neither do we suggest that action is only taken at this level. What is required is a balance of actions in support of national and local systems, responding to their capabilities and needs.

The need to take action on many different levels is illustrated by The House of Lords Select Committee report on "Resistance to Antibiotics and other Antimicrobial agents" (36) and the Government response (37). The actions identified to respond to this single issue of global health include: setting national priorities, developing an action plan, surveying current arrangements and performance and strengthening where required, establishing an interdisciplinary steering group, and multi-disciplinary expert group, funding basic and applied research, raising public awareness, providing guidelines for doctors and veterinarians, extending information systems to provide relevant information, improving the education and training of clinical staff in this field, developing new drugs to combat resistance (particularly low cost treatments for tuberculosis and malaria) in partnership with the pharmaceutical industry, support for international agencies engaged in surveillance and joining in recommendations to the World Health Assembly.

The Case for UK leadership

Claire Short, the Secretary of State for International Development, speaking on the Today Programme of 30 September, said that the gross disparity in wealth between the richest countries and the poorest was the "Greatest moral challenge we now face". She referred to countries with appalling levels of infant mortality and life expectancy for women of 37 years. She noted that this situation was simply not sustainable and noted the UK's leading role in the field of debt reduction and support for basic education and health.

The UK has many resources to bring to this moral challenge. The importance of health related exports, including pharmaceuticals, to the economy was noted during the speech of the Secretary of State for Health, Frank Dobson, to the Association of the British Pharmaceutical Industry in April 1999. Pharmaceuticals are the UK's second largest source of overseas earnings after North Sea Oil, and we are the world's second largest exporter of pharmaceuticals, after Germany. Our medical devices and technology industry is also world class.

The NHS is the largest single health organisation in the western world, it can command immense intellectual resources, and it is respected throughout the world for its innovation and cost effectiveness. It includes leading centres for the study of many tropical diseases and health solutions for poor countries and it is the largest single source of overseas training for doctors and other health professionals from poor countries. We also have well developed public health services and the Public Health Laboratory Services and National Institute for Biological Standards, which are important in global health surveillance.

The NHS embodies the values noted by the Ljubljana Charter of the WHO Regional Office for Europe (38). The NHS aspires to be:

- Driven by values of human dignity, equity, solidarity and ethics.
- Targeted on protecting and promoting health.
- Centred on people's choices and responsibility for health.
- Focused on quality, including cost effectiveness.
- Based on sound financing to allow universal coverage.
- Primary care led.

We do not seek to impose our health system on poor countries but believe these values provide an important basis for dialogue, which is more relevant than the profit oriented approach exemplified by healthcare in the USA.

While our health and social systems are quite different, we have a history of co-operation and understanding with the USA in science and medicine. Note for example, the leading role of the Wellcome Trust Sanger Centre laboratories in the "Human Genome" project. This will be important in building an international understanding of the scientific basis for the Precautionary Principle and its application to global health issues. This requires scenario-based risk assessment, using our current knowledge, and acknowledging where we lack knowledge, coupled with mathematical modelling to project potential outcomes.

The UK is home to many of the world's leading Non Government Organisations. These include: Oxfam, Save the Children Fund and the International Planned Parenthood Federation and Marie Stopes International who would find it harder to operate from the USA given the vehemence of their "right to life" movement. While the UK is not the largest aid donor as a proportion of GDP, we contribute at a rate 3 times that of the USA. We are amongst the highest personal aid donors and one of the largest sources for aid staff.

These resources coupled with our own multi ethnic people and our historic and

practical links to the Commonwealth give us an immense advantage and a moral obligation to lead in this field. With proper organisation and support, it is clear that the UK could play a leading role in global health aid and trade.

The case for UK leadership in Global Health is multifaceted:

- We are the world's second largest exporter of pharmaceuticals (exports are estimated at £5.5 billion in 1999 with a trade surplus of £2.3 billion)
- The NHS with its associated medical schools, the Royal Colleges, the Public Health Laboratories and the National Institute for Biological Standards is the largest source of relevant knowledge, research and training in health for poor countries (particularly the Schools of Hygiene and Tropical Medicine in Liverpool and London).
- We are home to many of the world leading charities and research organisations in this field (e.g., Oxfam, Save the Children, International Planned Parenthood Federation and The Wellcome Trust)
- We have the most diverse ethnic communities of any European country, which means we have much to learn from other countries as well as much to contribute.
- The Commonwealth links us with many of the world's poorest countries, we also have a central role in European health and ties with the USA.
- We have most to lose from the spread of global health threats as one of the most visited countries, particularly from tropical regions.
- We would also suffer significant damage to our economy and lives if growing inequality in health, made more obvious by global communications, leads to instability and fanaticism.
- Investment in health provides the opportunity for people to live healthy productive lives and contribute to economic self-sufficiency.

The Agenda for Action

In this section we bring together the agenda for action identified throughout the report. The first step in this agenda js to form the UK Partnership for Global Health and to raise awareness of the issue for individuals, communities, corporations, NGOs and Government.

The Environmental movement captures the feeling of global responsibility and enables people to express concern, gain information and take action to reduce pollution and protect endangered species. However, it seems that when it comes to direct human health concerns we expect some other agency to take care of the problem. Only when such agencies are clearly failing and death and starvation are imminent do we find compassion is roused on a global scale. For example, it is claimed that the Netaid concert of 9 October 1999 attracted 1 billion users to log on through their computers. This phenomenon suggests the potential for an Internet based charity providing direct contact on global health issues. It is proposed that the UK Partnership for Global Health should convene a group of health related Non Government Organisations and relevant Internet Companies to examine this possibility.

Community to community contacts have the potential to build a better understanding of shared health problems. We propose that the UK Partnership for Global Health should support programmes run by NGOs, the NHS and others, to build community to community health links. There are of course a great many schemes of this nature already in existence involving patients, nurses and doctors in this country forming links with overseas communities. We are aware that there are difficulties with such schemes and stress that we do not see them as replace or divert resources from other forms of aid. The UK Partnership for Global Health could support training, co-ordination and information sharing for such groups.

In order to promote greater corporate awareness of these factors it is proposed to sponsor an international award for private sectors firms, civic organisations and NGOs showing awareness of and taking steps to improve global health (inset 13). The UK Partnership for Global Health should also sponsor cross industry groups led by health supply companies to consider how they can contribute to global health.

Governments and international agencies should be addressed directly by the UK Partnership for Global Health. Currently papers are being prepared for the June 2000 G8 Meeting in Okinawa focused on the AIDS issue. We hope that the UK will take a lead on global health issues at the Davos conference of 2001. The creation of a Health Directorate General for the European commission will provide a further opportunity to contribute to the global health debate.

Raising Awareness

- The UK Partnership for Global Health should study the potential for an Internet based charity focused on global health.
- Community to community health global links should be supported.
- An international award for global health should be established.
- The UK should seek to develop an international consensus for action on global health.

Box 13: Nuffield Trust Proposal for a Global Health Award

To raise awareness of the importance of the global dimensions of health, and to encourage what UN Secretary General Kofi Annan has called "responsible globality", it is proposed that an annual award be established to recognise a public or private organisation, or group of organisations, that demonstrate global citizenship and responsibility through a significant contribution to global health. The benefits of this award would be the following:

- To raise public awareness and understanding of the important and wide-ranging impacts of globalisation on public health;
- To raise the profile of global health issues among policy makers and organisations in other sectors such as trade, communication and environment;
- To put health higher on the agendas ot policy makers and organisations in other sectors such as trade, communication and environment;
- To stimulate organisations to think innovatively about how they might contribute to the promotion and protection of global health;
- To encourage new forms of collaboration and partnerships between public and private sector individuals and organisations that are needed to address global health issues effectively; and
- To motivate individuals and organisations in both the public and private sectors to devote increased resources to addressing global health challenges.

The potential criteria for the award might include the following:

- Development of a health intervention that addresses an important global health issue (e.g. Merck's development and donation of Ivermectin; creation of the Global Alliance for Vaccination and Immunisation GAVI);
- The financial support of research on a global health issue (e.g. Bill and Melinda Gates Foundation, Soroos Foundation, Turner Fund, Rotary International contribution to polio eradication);
- Iht creation of an innovative way of working collaboratively across the public- private sectors, health and non health fields, or global-local levels on a global health issue;
- The piomotion of public awareness on global health issues;
- The development and marketing of a product or service that protects the global environment and human health (e.g. Sainsbury's City Petrol).

Eligibility

Ihe award could be open to a wide range of organisations from either the public or private sectors including NGOs, civic bodies and research institutions. A collaborative effort among different types of organisations could be particularly encouraged.

Award

The Global Health Award should be limited to s small sum of money and/or a medal or trophy. However, substantial efforts should be made to publicise it internationally so that it has strong

recognition as a high-profile and prestigious award (e.g. Nobel Prize). The prize may be awarded annually at the WHO World Health Assembly.

Selection Process

The selection process could be carried out by representatives of the sponsors of the award and/or a designated body (e.g. WHO External Advisory Group on Globalisation and Health) with particular knowledge of global health. There would need to be an agreed process of nomination.

Funding

The Global Health Award could be sponsored by a number of organisations, such as The Nuffield Trust (UK), Rockefeller Foundation and other charitable foundations, and administered through the World Health Organisation (WHO). One or more sponsors from the developing world should be encouraged. A small fund would be needed to establish the award and administer it (e.g, publicity, selection process, award ceremony).

Dr Kelley Lee, London School of Hygiene and Tropical Medicine

Understanding Global Health Risks

- The UK Government should seek greater international recognition of the Precautionary Principle and should seek to develop a scientific basis for its application, in research, monitoring and control actions.
- This should lead to steps to identify potential and actual health risks according to agreed criteria, supported by international surveillance and research.
- A clear set of priorities should be set for UK research institutions in the field of global health risk assessment and surveillance.
- Measures should be taken to improve public access to and understanding of global health risks, including, as examples; better representation of consumer interests, access through the NHS Electronic Library, better education about health risks and steps to support responsible media coverage.

Supporting Trade and Aid for Global Health

- Co-ordination of health aid and trade to establish clear and coherent strategies to support health improvement in the poorest countries. This should include the assessment of total trade and aid impacts on health.
- National support for investment in drugs and other remedies for diseases affecting low income countries particularly where diseases can be shown to pose a global health risk, including a UK policy on orphan drugs.
- Partnership within the pharmaceutical industry and pharmaceutical supply industry and the governments of poor countries to consider the incentives and support required to ensure investment in the appropriate provision of pharmaceuticals and health knowledge at local levels in poor countries this should include the provision of market guarantees.

Developing Knowledge Resources for Global health

- International standard setting, accreditation and quality marking of reliable medical knowledge on the Internet, which should include contextual information and personal contacts.
- The current proposal by the London Region of the NHS, to create a health knowledge network for London could both improve health in the capital and provide a valuable resource for global health.
- International effort should be mobilised to support the development of specific web based health knowledge systems relevant to poor countries. Systems such as Web.MD and the systems used to support NHS Direct show the potential for such applications in rich countries. We believe that there is even greater potential for health benefit in poor countries.

- Such developments must be matched by wider understanding of the cultural and practical
  context in which medicine is practised. This requires dialogue on a community to community level, between health professionals and with experts from the countries involved. It is important to ensure that technical solutions represent the best investment of
  time and resources for the country concerned and could be sustained by them.

Local Responses to Global Health

- Through the Healthy Cities programme, links between rich and poor countries should be extended. In the case of London there are special resources of knowledge from institutions specialising in global health. There is also special knowledge amongst local immigrant communities and contact with health professionals from former countries, which should be utilised to improve health both in the UK and in countries of origin.
- Local Health Improvement Plans should both consider the potential and actual impact of global health influences and poverty on the health of local communities and how local resources can contribute to the alleviation of global health risks.
- Specific local action in relation to global health risks such as Tuberculosis should also reflect and support a global response to such issues as part of a local, national and international concerted programme of action.

Travel Health and Health Threats

- A national policy on travel related diseases, including: the identification of risks for travellers and visited communities, development of best practice guidelines for all those advising travellers, improved surveillance of traveller illness, research into the cost effectiveness and funding of preventive measures and improvements to the way advice and preventive services are provided to travellers returning to countries of family origin.
- The creation of a high level committee to improve the collation and sharing of intelligence information on potential terrorist groups and individuals.

Building Health Governance from Community

- Listen to local community voices and empower local action. NGOs may be the most appropriate way of supporting community action in fields such as women and children's health, housing, clean water and employment creation.
- Support the development of the European Commission Directorate General for Health
- Bind together the local, regional and international patchwork of health governance by supporting the development and application of community based health planning.
- Create the UK Partnership for Global Health to give leadership in global health.

For further information and to contribute to the debate consult the Nuffield Trust Web site at www.nuffieldtrust.org.uk . Your comments will be welcomed.

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Annex A Global health: a local issue. Steering Group

Sir Maurice Shock Mr	Chairman Nuffield Trust
John Wyn Owen	Secretary Nuffield Trust
Professor George Alberti	President Royal College of Physicians
Professor Morton Warner	Director Welsh Institute for Health and Social Care University of Glamorgan
Professor Michael Adler	Professor of Sexually Transmitted Diseases University College London Medical School
Mr Nigel Crisp Professor	Chief Executive NHS Executive South Thames
John Kay Sir Graham	Said Business School University of Oxford
Hart Dame Fiona	Retired Permanent Secretary Department of Health
Caldicott Mr Nicholas	Principal Somerville College University of Oxford
Timmins	Financial Times

BIOGRAPHIES

Dr Sue Atkinson

Sue Atkinson is Regional Director of Public Health and Medical Director for London . Her remit covers improving the health of Londoners, protecting their health and improving the outcome of and clinical quality of health services. To accomplish this she works with the Directors of Public Health for Health Authorities and with Medical Directors of Trusts, clinicians and general practitioners, as well as health service managers. Her responsibilities entail her linking ever more closely with partners whose work has a major impact on the determinants of health, such as environment, employment, crime etc.

Prior to her current appointment, Sue was Regional Director of Public Health and Medical Director, (RDPH) of South Thames Region and previously RDPH of South and West Region. Sue developed public health and health purchasing functions as Director of Public Health and acting Chief Executive of South East London Health Authority. Besides extensive experience in public health and health service management, Sue has practiced clinically in paediatrics and in general practice after qualifying in medicine and sciences from Cambridge University. Sue has also undertaken research in both scientific fields, medicine and epidemiology , with a special continuing interest in early vision screening. She has a broad knowledge of health status and services of other countries, especially European urban health through Project Megapoles and USA, Australia and USSR.

Dr Nick Beard

Nick Beard is Vice President of Product Marketing at IDX Systems Corporation, where he is responsible for products fer integrated delivery networks, including management of the company's flagship clinical products. He qualified in medicine in London in 1984, and practiced medicine in London and Australia. He worked as a consultant with Coopers & Lybrand and Price Waterhouse, in the UK & US, where he specialized in the application of information technology to health care. He was Director of Information Systems at HCI International Medical Centre in Scotland, where he lead the team that implemented the first completely 'paperless' medical record in the World. He also holds an MSc in software engineering from Imperial College, London, where he focussed on 'artificial intelligence,' and researched the application of neural networks to ECG interpretation. He has published a wide variety of articles in numerous magazine and newspapers.

Dr Ron H Behrens

Consultant Physician in Tropical and Travel Medicine, Hospital for Tropical Diseases and Senior Lecturer, Dept of Infectious and Tropical diseases, London School of Hygiene and Tropical Medicine.

Dr Behrens appointment is at the Hospital for Tropical Diseases as a consultant in Travel Medicine, the only full time NHS post in the UK. He contributes to national committees relating to vaccines and malaria and runs a short course in travel medicine at the London School of Hygiene and Tropical Medicine. He directs the HTD's Travel Clinic, acts as a national reference centre on travel medicine issues. His current research interest is focused on malaria and its prevention particularly on clinical studies on the efficacy and toxicity of new

malaria prophylactic drugs. Other research includes studies on diseases of ethnic travellers, traveller's compliance to advice and their prophylaxis. Publications include the first academic book on travel medicine; a book on expatriates working abroad and many of papers covering malaria and hepatitis the economics of disease prevention imported and emerging infectious diseases.

Professor Kent Buse

Professor Kent Buse (BA, MSc, PhD) is a political-economist with interests in health policy. His research focuses on policy and institutional analyses of the health sector at the global, international and national levels, including: the global architecture for health governance; globalisation and its influence on health policy and health governance; international co-operation in health development; inter-agency donor co-ordination and frameworks for aid management and co-ordination at the country level (e.g., sector-wide approaches); global public-private partnerships for health development.

Dr Richard Dodgson

Richard Dodgson is an independent researcher in international politics. He obtained his PhD from the University of Newcastle and has taught international politics at Durham and Sunderland universities. He was for nine months a research fellow in the Health Policy Unit at the London School of Hygiene and Tropical Medicine, were he worked on a number of projects relating to globalisation, governance and health. His work has been published in such journals as *New Political Economy, Review of International Political Economy* and *The Journal of Contemporary Health.*

Dr Sue Dopson

Sue teaches elements of the University's degree programme in management, is a tutor for post-graduates of the College and teaches on management development programmes for various companies. As a member of the Oxford Health Care Management Institute she is involved in the development of courses for the NHS and a number of research projects, including the evaluation of projects aimed at improving clinical effectiveness, exploring issues of getting the results of medical research evidence into clinical practice and more general research in the area of NHS management.

She has published on the changes in the management of the NHS, the changing nature of middle management, management careers and developments in public sector management.

Sue formerly worked as personnel manager in the NHS before pursuing a research and academic career at the College. She is currently University Lecturer in Management Studies; Senior Tutor and Fellow in Organisational Behaviour Templeton College, Templeton College.

DrNajibHabib

Dr Habib has a special interest in Travel Medicine and is currently doing a PhD at the London School of Hygiene and Tropical Medicine.

Dr Panos Kanavos

Panos Kanavos is Lecturer in International Health Policy at the London School of Economics and is the course convenor for the MSc in International Health Policy. His research interests are Pharmaceutical Economics and the Industrial Economics of High Technology industries. He is adviser to OECD, WHO, the World Bank, the European Commission and many other international organisations.

Dr Kelley Lee

Kelley Lee is Senior Lecturer in Global Health Policy at the London School of Hygiene and Tropical Medicine where she is co-ordinator of an informal working group on globalisation, environmental change and health. She is also Honorary Lecturer at the Division of International Health, Yale University where she is contributing to the development of a new programme of work on global health governance. She is currently the chair of the WHO External Advisory Group on Globalisation and Health. She is working on a number of projects concerned with globalisation including analysis of tobacco control policies in lower-income countries, a review of UK public health measures concerned with transborder health risks, and a study of the impact of globalisation on selected infectious diseases.

Dr Graham Lister

Graham is an expert on international health and care systems, health information and health reforms. He is a Senior Associate of the Nuffield Trust an Associate of the Oxford Health Care Management Institute and Acting Chairman of the College of Health.

In 1973 he was awarded a doctorate in the faculty of Economics of London University for his work with the Industrial Sociology Unit of Imperial College on public sector management, after obtaining a master's degree in management science and operational research and a first degree in engineering. Since then he has followed his interest in improving public sector management, believing that this the key to a better society.

He joined Coopers and Lybrand in 1975 as an economist and institution development specialist in the Public Sector Consulting Group. His main field of work was institutional and economic development in relation to urban, water and health programmes. He has lived in Africa and South East Asia and worked in more than 20 countries. From 1982 to 1997 he set up and led the C&L Health Consulting Group, which played a major role in UK health reforms and he was the director of the European Health Group.

Since retiring from Coopers & Lybrand, after 15 years as a partner, his work has included: the national study for the Development of NHS Direct, with the College of Health a study of the management of Primary Care Groups, a review of the major children's hospital of Phnom Pen an EC project to develop standards for measuring behaviour change for diabetes patients, and review of the health reform programme for the Czech Republic.

Professor Tony McMichael

Tony McMichael is Professor of Epidemiology at the London School of Hygiene and Tropical Medicine, London, UK. *After graduating in medicine (University of Adelaide) he gained a doctorate in epidemiology (Monash University). He has subsequently worked in a variety of research positions and fields: in occupational disease research, studies of diet and

disease,environmental epidemiologic studies of lead exposure and early childhood intellectual development, studies of air pollution and health, and more recently in relation to global environmental changes and their potential health impacts.

During 1990-92 he chaired the Scientific Council of the International Agency for Research on Cancer (WHO). He has been a frequent advisor to WHO, the World Meteorological Organisation and the World Bank. During 1994-96 he chaired the health impacts assessment *task group for the UN's Intergovernmental Panel on Climate Change (Second Assessment Report) - and is currently doing likewise for the IPCC's Third Assessment Report.

He has written widely on aspects of global environmental change and health, including climate change, stratospheric ozone depletion and biodiversity loss, His book "Planetary Overload: Global Environmental Change and the Health of the Human Species" (Cambridge University Press/ Canto, 1995) explored these and other issues.

Dr Elias Mossialos

Elias Mossialos is Senior Lecturer in European Health Policy at the london School of Economics and Director of LSE Health. His research interests in which he has published extensively include Health financing, Pharmaceutical policies, priority setting, and Public Health. He is adviser to international organisations including the OECD, WHO, World Bank and the European Commission.

Monique Mrazek

Monique is research assisstant at LSE Health and is currently finalising a PhD dissertation in Pharmaceutical Economics.

Dr Luise Parsons

Twenty years experience as a doctor in Public Health in the United Kingdom and developing countries have been characterised by a commitment to making a difference in a rigorous way. Achievements include health improvement in the fields of: inequalities; black and minority ethnic communities; women's health; the health of children and young people; coronary heart disease; and most recently research on the impact of globalisation on health.

Developing country experience includes 2 years in Papua New Guinea, 3 years in Peru, extensive knowledge of Southern Africa (4 field visits with WHO public health staff in the last 5 years) experience in East and West Africa, South East Asia and North America. She also participated in the 4th International Health Promotion Conference in Jakarta in 1997.

Working in the voluntary sector and as a freelance consultant as well as the National Health Service, she has learned a range of strategies to manage change effectively. Luise has extensive experience of health needs assessment, strategic development, planning and co-ordinating multi-disciplinary programmes in challenging circumstances such as the deprived East End of London

As Director of Public Health for Bexley and Greenwich Health Authority, Luise led the development of a health strategy based on intersectoral partnerships, contributed actively to the board's corporate responsibilities and successfully implemented our Public Health responsibilities. Luise has developed corporate strategies and policies on Primary Care

development and Health Promotion while maintaining statutory functions and developing a Research and Training capability.

Luise's interest in globalisation and health grew from observation of the health problems of Londoners and the symbolism of Greenwich at the start of a new Millennium.

Dr Peter Poore

Peter Poore qualified at St Bartholomew's Hospital, London in 1964. After some 7 years in hospital practice and 5 years in general practice in the UK, Peter spent 6 years overseas, working in Ghana, Tanzania and Papua New Guinea. He returned to the UK in 1983 and has been health adviser for Save the Children fund until now.

Peter's interests lie in the problems of health care delivery in the poorest parts of the world, with a special interest in immunisation services and other components of Primary Health Care.

Dr David Webber

David Webber is Senior Public Policy Manager, Corporate Policy and Public Affairs (CPPA) Department, within Glaxo Wellcome pic. The mission of the department is to enhance the Company's business success by maximising Glaxo Wellcome's influence on its political, regulatory, legal, and economic environment, on a global basis.

David took a degree in Biology, and a PhD in animal physiology from London University, subsequently undertaking post-doctoral research at the Royal Veterinary College, publishing scientific papers on stomach function.

David joined Glaxo in 1982"," and for some years managed a variety of marketing support roles in the UK Operating Company. He moved on to take up a competitive intelligence role at Group level, before being seconded to the Corporate Strategy Unit in 1994 to help with the work which led ultimately to the acquisition of Wellcome in 1995. In January 1999 the CPPA department was formed, to improve the Company's orientation towards the external environment. Current responsibilities include development of policies for incentivising pharmaceutical industry research in 'neglected' diseases, the public policy implications of genetics, and the Rock Carling Fellowship for 2000.

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