

Research report December 2020

Understanding the impact of Brexit on health in the UK

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Overview

On 31 January 2020, the UK officially left the European Union (EU), although it remains a de facto member and beneficiary of its constituent structures until the end of the agreed transition period on 31 December 2020. From this date, the impacts of exiting European frameworks in practice will be momentous. Nowhere is this more relevant than health and the NHS, which is concurrently battling with the largest public health crisis in a century – the Covid-19 pandemic. Tracking these impacts, positive or negative, will be a vital task.

This report, commissioned by The Health Foundation, maps out the health areas that will be affected by exiting the EU, identifies both well-known and often overlooked policy issues and dilemmas, lays out their possible impacts, and describes how they could be tracked over time.

The project's aim, both in this pilot phase and in the future, is to track, monitor, clarify and, where possible, anticipate impacts on health, and to help inform decision-making.

In this first phase of the project, we held roundtables and interviewed key stakeholders to gather perspectives and intelligence, and analysed a range of data sources.

We examined existing and potential health impacts in the following nine areas:

- health systems delivery
- health systems workforce
- health systems financing
- information systems
- medical supplies
- leadership and governance
- communicable diseases
- non-communicable diseases
- public health capacity and governance.

We aim to look not only at the UK's departure from the EU, but also, more widely, at resulting changes in trade and international relations, migration, scientific and regulatory frameworks, and political, economic and social indicators.

Key points

Our research confirms the well-known issues Brexit raises in many areas, from medicine supplies to data flows. Most, though not all, are relevant whether or not an agreement on a future relationship is reached between the UK and EU at this late stage. It has also uncovered the following less widely discussed impacts, which deserve urgent attention:

- The short-term supply of medicines and medical devices to the UK after the transition period is a serious concern, with levels of uncertainty very high. The UK government is preparing for disruption, but it is not clear which scenarios it is and is not ready for. Border closures in December due to coronavirus have introduced an unpredictable new element. Flows of data will also face blockages.
- Beyond this short-term picture, our interviewees and roundtable participants believed the UK will face a lack of competitiveness in terms of investment in health-related industries, a permanent increase in the cost of supplies for health and social care, and difficulties in accessing them. Yet there seems to be no detailed plan for how the UK will regulate medicines and medical devices after we leave the single market and EU institutions.
- The end of the free movement of labour is likely to make it more difficult for the NHS and social care to access the growing number of workers they need. Our data analysis shows that the Covid-19 pandemic has also slowed migration dramatically – from the EU and the rest of the world – even before Brexit changes take effect, with a 70% drop in migrants entering the labour market. The pandemic has therefore raised the bar still higher: the UK now needs to dramatically accelerate migration from 2021 to meet government commitments on nursing and on providing more social care.
- Industry representatives and government officials described uncertainty around how medicines, supplies and staff will enter Northern Ireland after the transition period, and what this would mean for access to health services and medical products in the future. While the recent decision of the joint committee has set out short-term allowances, longer-term

decisions have yet to be taken and there is an expectation of widespread accidental failure to comply with the law.

- While food safety issues such as chlorinated chicken have received significant media attention, the most important question for public health will be how the UK government regulates causes of ill-health such as poor air quality, tobacco and unhealthy food. There has been little discussion of plans for this after Brexit.
- Slower economic growth and decreasing spending capacity following Brexit may worsen wider determinants of health, such as unemployment and access to health services. It will be possible to track indicators of these changes – such as healthy life expectancy or child poverty – over the long term. However, there will be a challenge in disentangling the impact of Brexit from the effects of the recession brought about by the Covid-19 pandemic.
- There was significant uncertainty regarding powers returned and redistributed through the Internal Market Bill (IMB), with respect to the UK's four constituent nations. Officials in Scotland, Wales and Northern Ireland are concerned the Act could curtail their ability to regulate in the future to improve public health, tying them to unclear Westminster plans, and depriving the UK the opportunity to learn from regulatory experimentation, such as Scottish measures on smoking in public places and alcohol pricing. The Internal Market Act, approved on 17 December, partly addresses these fears, by including amendments that permit regulatory divergence from UK-wide rules, where the four constituent governments have agreed on a common approach. This mechanism has been set out in principle, but remains to be monitored in practice.

1 Our approach

Scope of our report

The frameworks underpinning the UK's international trade and cooperation agreements will undergo fundamental change in the next few years, and health will be affected. The effects we investigate in this report will largely begin with, and be triggered by, the UK leaving the EU's single market and customs union on 31 December 2020, bringing back to the UK powers to sign trade agreements with other countries. The report focuses on the direct impacts of exiting the EU and sets out a structure for a future project looking further into the changes to come.

We examine how domestic policy parameters might change as powers are added to or subtracted from the UK, such as the ability to limit migration after the end of the transition period, or any conflict between Westminster and the devolved nations/administrations over the allocation of returning powers. We also aim to set a baseline to examine the potential and actual impact of the trade, migration, scientific and regulatory agreements that the UK now intends to seek with states including the United States, India and the Trans-Pacific Partnership countries.¹

We also consider economic and social changes brought about by changing international agreements. In doing so, we are informed by considerable evidence showing that these factors affect population health, as much if not even more so than health delivery factors such as medicines and the NHS.

Our project is centred on health. As a result, there is a risk that changes in other sectors – from agriculture to cybersecurity – might have an effect on health that we, and the sources we look at and speak to, did not anticipate. However, we will seek to expand and evolve the project wherever effects on health become significant.

The areas we looked at

To make sure that we could identify all the ways in which exiting the EU would affect health, we mapped out nine areas of possible impact. These cover two broad segments: ‘health systems’, which looks at the services and industries that provide care and treatment (such as the NHS and medicines industries); and ‘public health’, which looks at the direct impact of economic, political and social change on the health of populations. We considered all areas of health service provision – from pharmacy to mental health – to be in scope for this report, as exiting the EU will have an impact on them. Our stakeholders accordingly cut across these areas.

We used the World Health Organization’s ‘building blocks of health systems’ to structure our coverage of health systems.² There are six of these:

- health systems delivery – the international aspects of which include cross-border care and reciprocal health care initiatives such as the European Health Insurance Card (EHIC)
- health systems workforce – where both migration and the rights of workers and employers are tied to international agreements
- health systems financing – this may include impacts on public finances, and the loss or creation of international funding mechanisms
- information systems – which involve the exchange and compatibility of data between countries and global bodies
- medical supplies – in a UK context, branded and generic medicines, medical devices, equipment, consumables and even substances of human origin such as blood, which are frequently traded and moved on terms governed by international agreements
- leadership and governance – this covers how policy, legislation and decisions are made at the highest level, who holds these powers and how they are scrutinised and limited, but it also covers the UK’s ‘soft power’ and informal connections and perceptions.

For public health, we divided the possible range of categories into three building blocks:

- communicable diseases – the impact on infectious illnesses within the UK
- non-communicable diseases – covering long-term, non-infectious illnesses such as diabetes and most cancers, which often have environmental and social causes
- public health capacity and governance.

Methodology and approach

We conducted the research for this report in 2020. The overall project fulfils two purposes:

- to assess the feasibility and form the basis of a larger and longer-term function to monitor the impacts of the UK's changing international and trade relations on health governance, delivery and outcomes
- to present a report of our preliminary findings on these existing and potential impacts and highlight priorities for analysis and action now.

We faced two major challenges and limitations in undertaking this task. First, disaggregating the effect of the Covid-19 pandemic and the effect of Brexit will be difficult in some areas, such as economic growth, migration and fluctuations in the supply of medicines and medical devices. Second, the impact of economic and regulatory changes on people's health may only be detected several years after the developments that trigger them.

We therefore took an approach that allowed us to both analyse existing data and knowledge, and identify gaps in our knowledge, as comprehensively as could be achieved within the short timeframe of this initial project phase.

Initial policy analysis

The project team conducted an initial research and analysis exercise. First, team members examined key documents on the process of negotiating the UK's exit from the EU, such as the draft texts of the EU Withdrawal Agreement and Future Relationship documents, the Northern Ireland Protocol and the IMB. Second, drawing on this analysis and their own areas of expertise,³ further desk research and an exploratory roundtable, the team created a mapping of issues, questions and data against the nine building blocks described above. This exercise formed the framework for the qualitative and quantitative input.

Qualitative data

We sought qualitative input from stakeholders across the health care sector, including industry, government, the third sector and representative bodies, with the aim of covering as broad a range of expertise as possible.

- We conducted a first roundtable with UK-wide stakeholders on 29 September 2020, exploring public health, medicinal products and supply chains, and workforce.
- We conducted a second roundtable with representatives from Scotland, Wales and Northern Ireland on 7 October 2020, looking at supply and workforce, public health implications, the IMB and the Northern Ireland Protocol.
- We carried out in-depth interviews, narrowing down on themes identified in the roundtables, or where individuals lacked the time or opportunity to speak in a plenary setting, with representatives from:
 - Cancer Research UK
 - NHS England
 - Public Health England
 - the Department for Business, Energy and Industrial Strategy
 - the NHS Confederation

- the Scottish Government
- the University of Edinburgh
- University College London Hospitals NHS Foundation Trust.

Our data were accordingly limited by which of our stakeholders were able to attend, what information they shared and what we were able to complete through desk research before and after these events.

Quantitative data

Our quantitative data relate primarily to medicines and the health workforce. We sought to identify trends in these data since June 2016 and, where relevant, 2010.

- We made Freedom of Information requests for the latest workforce data (leavers, joiners and staff in post by nationality and country of training) to NHS Digital, the Nursing and Midwifery Council (NMC) and the General Medical Council (GMC). On this basis, we compiled time series and identified any visible trends over the past two years in the numbers of EU and non-EU staff working in the UK, arriving, and leaving.
- We analysed UK Trade Info data on medicines and medical devices to derive trends in EU imports and exports of these products, between March 2016 and August 2020.
- We looked for trends in how many medicines the Department of Health and Social Care (DHSC) had awarded pricing concessions to as a potential result of shortage, between July 2012 and July 2020.
- We considered any changes in the rate of insulin and epilepsy-control prescriptions at general practice level, between January 2018 and August 2020.
- We also considered, more widely, any changes in the proportion of EU and non-EU population inflows through data related to National Insurance number applications and visa applications and outcomes.

Because the NHS staffing data are counted by nationality, they do not take into account the country of training, and could represent an undercount of staff who were originally from abroad and acquired UK nationality over time (EU and non-EU). The data cover only NHS trusts in England, and not the private sector. Data from the NMC and GMC cover all nursing and medical professionals licensed to work in the UK according to the country in which they trained. Accordingly, they may include UK nationals who trained abroad.

2 Overview of issues

Our interviews, data analysis and roundtables provided rich information on the well-known probable impacts of Brexit on different aspects and enablers of health. These issues, which we have described in earlier publications^{4,5} and are widely recognised by key NHS stakeholders⁶ and to some extent the government, include:

- challenges to the supply of medicines and medical devices in the UK after the transition period
- a probable economic slowdown, which would affect public health as living standards fall or improve more slowly than they would otherwise, and growth in government spending would be slower
- the potential for the UK's unilateral new migration policy to block the recruitment of key staff in areas of shortage, particularly social care
- possible scope for UK regulatory divergence in working time and in procurement, where senior officials in the English NHS have expressed hope that the end of EU rules will allow them to put fewer contracts out to market⁷
- UK departure from key institutions regulating, funding and connecting health and life sciences institutions, including the European Medicines Agency (EMA), the European Centre for Disease Prevention and Control (ECDC), European Reference Networks and, possibly, Horizon Europe depending on the shape of any future agreement.

Table 1 summarises the possible impacts for which we found evidence on different timescales.

Table 1: Possible impacts of Brexit on health

Area	Immediate (1 January 2021)	Medium term (within one year)	Longer term (five or more years)
Medical supplies, life sciences and standards	Immediate disruption of supplies due to new haulier and customs requirements. Interim measures mean UK keeps accepting EU-approved products. Suppliers try to shift to new routes and air freight.	UK medicine and medical device exporters face loss of competitiveness, incentivising less investment. UK institutions find it more difficult to take part in cross-Europe clinical trials due to divergent processes, and possibly ineligibility for the flagship Horizon Europe funding programme.	UK implements its own regulatory system, trying to minimise barriers to imports while remaining competitive. Becoming a separate market is likely to mean UK accesses new products later. Potential for higher-quality regulation of medical devices. 2023: UK's legacy participation in the Horizon 2020 programme ends.
Information networks	End of inclusion in ECDC, Eurostat and the data they produce; limited or no participation in the Early Warning and Response System (EWRS) of the EU. UK bodies will require specific agreements to transfer EU data, with no immediate exemption expected. These agreements will be in place with, for example, some public health bodies in EU member states.	UK may seek agreements for ongoing participation (for example in Eurostat). Loss of shared and comparable data may make understanding Covid-19 and other infectious diseases more difficult.	Loss of the data sharing network may exacerbate a loss of UK competitiveness for clinical trials and life sciences. Less comparable and shared data may make it harder to benchmark and study the NHS and health outcomes.
Workforce	Newly immigrating non-Irish European Economic Area (EEA) health and care staff will be subject to the same process and fees as other overseas applicants. The new system will block most non-UK social care staff. Doctors and nurses will clear requirements, but will face fees and bureaucracy.	Impact on overseas recruitment drives. Gaps in social care workforce now larger than they would otherwise have been. New system may deter nurses, medical specialists in shortage and junior life science researchers.	New trade deals with large developing countries may expand rights for their citizens to move to the UK and work in health and social care. Slower overseas recruitment due to the Covid-19 pandemic and Brexit may result in a failure to close staffing gaps.

Area	Immediate (1 January 2021)	Medium term (within one year)	Longer term (five or more years)
Public and population health	<p>UK leaves ECDC, which shares information on infectious diseases.</p> <p>UK leaves the European Food Standards Agency (EFSA). Minimum standards for food are no longer set by the EU but by the UK Food Standards Agency (FSA). EU legislation rolls over with minor amendments (for example in terms of labelling).</p> <p>The UK is likely to leave the Rapid Alert System for Food and Feed (RASFF).</p> <p>EU environmental regulation no longer directly extends to the UK: non-regression rules under any agreement are applied.</p>	<p>Economic slowdown probable, increasing unemployment and deprivation with an impact on public health.</p> <p>Ongoing trade negotiations may lower regulatory standards or dilute food protection provisions.</p> <p>UK Trade and Agriculture Commission becomes a permanent body and vets future food standards in free trade agreements, with high levels of representation from farming lobbies.</p>	<p>Weaker tax revenues will decrease spending on services important for health, including housing, welfare, health and social care and prevention.</p> <p>UK may change environmental or product regulations, with an impact on health.</p>
Northern Ireland	<p>Structures in place: Withdrawal Agreement (goods), Common Travel Area (CTA) (people), Northern Ireland Protocol (goods).</p> <p>Uncertainty as to the impact of the new customs and regulatory requirements. Widespread unintended illegality possible.</p>	<p>Northern Ireland may be effectively part of the Irish market for supplies, having a different mix of products from Great Britain.</p> <p>Peace Plus cross-border programme continues, even in case of a no deal.</p> <p>Presumable withdrawal of allowances made by EU and UK for medicine supplies, potentially leading to a second regulatory shock.</p>	<p>Votes every 5 years on the Northern Ireland Protocol will cause continued uncertainty for supplies.</p> <p>Northern Ireland will be excluded from new regulatory systems in Great Britain, disadvantaged by any competitive edge they generate.</p> <p>Structural funds expire in 2023. Future of joint structures such as Cooperation And Working Together (CAWT) unclear.</p>

Area	Immediate (1 January 2021)	Medium term (within one year)	Longer term (five or more years)
Devolution and returning powers	<p>Medicines and devices:</p> <ul style="list-style-type: none"> • Republic of Ireland/Northern Ireland goods travel freely • Cost and legal risk potentially prevents travel of goods between rest of the EU and Northern Ireland. <p>Life sciences: legal repatriation of European funding to Westminster.</p>	<p>Finalisation of IMB and provisions currently blocked out by the House of Lords. Clarification of practical implications for supplies and devolved settlements.</p>	<p>Potential reluctance to regulate proactively in areas such as tobacco control or environmental protection – infringement of IMB non-discrimination or mutual recognition principles.</p> <p>Repatriation of EU funding programmes to Westminster, leading to potential disputes over the devolved settlement.</p>
Health governance	<p>UK leaves key health governance structures: EMA, ECDC, EWRS, Eurostat, European Reference Networks and standards-setting committees.</p> <p>Some or all EU structures and processes for reciprocal health care (EHIC, S1) no longer cover new travellers or retirees moving between EEA and UK. Only EHIC appears possible within an agreement.</p>	<p>UK negotiates trade deals with the United States and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), potentially introducing new international law governing medicine pricing, private health companies, life sciences and product standards.</p> <p>UK may try to negotiate regulatory cooperation, such as mutual recognition, outside formal trade negotiations.</p>	<p>Positioning as a health power</p> <ul style="list-style-type: none"> • (re)joining collaboration and information networks, in Europe and beyond • increasing internal funding and the attractiveness of the UK health and social care and life sciences sector. <p>Internal health policy and governance shifts (see Public Health, IMB).</p>

3 Issues needing investigation and action

As well as highlighting the well-known probable impacts of Brexit, our research also threw up a set of issues that have been examined and understood relatively poorly to date. Many of these will have an immediate impact at the end of the transition period on 31 December 2020 – in most cases, with or without a deal in place. In this chapter we look in greater depth at how they should be understood in order to frame debates and decisions in the months after the UK’s exit from the single market and all that goes with it. In line with our project goals, our overview of these issues aims to be relevant not only to future researchers, but also to policy-makers and those holding them to account.

Using the World Health Organization’s building blocks of health systems, which we outlined in Chapter 1, enabled us to analyse existing and anticipated issues systematically. However, several areas – such as public health and Northern Ireland – cut across individual building blocks. We begin with issues falling more neatly under specific building blocks, and continue with issues illustrating the cross-cutting nature of health issues.

Lack of clarity on the regulation of medical products

Interviewees and roundtable attendees unanimously recognised a set of problems for the medicines and life sciences sector after the end of the transition period. Industry and researchers will face diminished global competitiveness due to trade barriers, while the NHS in Great Britain risks permanently complicating its access to many existing and new products.

In the short term, the plan is to address the access problem by simply continuing to accept many EU regulatory processes.⁸ However, interviewees warned that this might further decrease competitiveness, as products tested, approved and certified in the EU would be eligible for sale on both the EU side and the UK side, whereas those tested, approved and certified in the UK would be eligible for sale only on the UK side, even if they objectively met EU standards. One interviewee said it was likely that “you’ll just see investment decline fairly sharply, at least for two years”, with the possible “death of certain sub-sectors”.

Many officials and industry representatives were considering or expecting solutions that involved continuing to accept EU decisions and potentially those of other countries, while running a parallel UK system that would use streamlined approval to stay competitive. They said that there would be a “carefully managed divergence” from the status quo, with asymmetric competitiveness to some degree. The UK system could be targeted to particular cutting-edge sectors.

These ideas involve difficult trade-offs. If the UK focuses on more advantageous regulation for certain favoured areas, this implies a loss of competitiveness being accepted for others. Meanwhile, any policy that could be seen as lowering standards to compete could risk trust in the system at a time when a troublingly large minority of the public doubts the safety of vital medical products.⁹

But these details were either undecided or being held in close secrecy when we carried out our research. It was unclear what the exact changes to the UK system would be, whether similar ideas applied to medical devices as well as medicines, when the changes might take effect, and even who was responsible for this policy area across the DHSC, the Department for Business, Energy and Industrial Strategy (BEIS), the Office for Life Sciences and the Medicines and Healthcare products Regulatory Agency (MHRA). For areas such as batch testing and certification, this may be in part because they are still being negotiated as part of the agreement with the EU, with little communication or clarity about draft text during the process. However, for medicines approval and clinical trials, it has been clear for more than a year that continued alignment or mutual recognition has not been on the table.

The lack of clarity, expressed even before it was clear how late in 2020 any UK-EU agreement would be finalised, was a source of serious concern among our research participants. One said that: “It’s the uncertainty that is the challenge ... the more detail the better.” There was no settled expectation about what a deal would bring, and even how final this would be: “We’re going to be negotiating forever”, one official told us.

The situation for medical devices

The dependence of UK health care on medical devices and the long, complex supply chains that are involved across the world have been highlighted during the Covid-19 pandemic, for a wide range of technologies from surgical masks to ventilators. Yet while medicines have played a central role in the media, policy and political debates around Brexit, medical devices have tended to be overlooked.

The regulatory structure for medical devices we are leaving is in many ways more complicated than for medicines. Rather than being licensed centrally, medical devices are assessed for conformity with EU standards by third-party organisations known as ‘notified bodies’ designated by regulators in each country. Products that conform to the standards can then display the CE mark, and access the EU market with that certification.

Compared with the market for pharmaceuticals, the medical device sector is more fragmented and its regulatory structures less resilient. Both manufacturers and the conformity assessment bodies are usually smaller than for medicines, with a consequently reduced capacity to contribute to a changing regulatory structure (for example, updating standards), adapt to policy changes and ride out fluctuations in the market.

The UK is leaving the EU at a time when the demand for medical devices is high due to the Covid-19 pandemic and the policy environment is uncertain. The EU’s medical device regulatory regime is in a transitional period following revisions made in 2017. Implementation has been delayed due to uncertainties relating to Covid-19 as well as a pre-existing lack of capacity among some actors within the industry.¹⁰

Government messaging has not brought clarity. Draft guidance from the UK government issued in September 2020 states that the new Regulations ‘will not be transposed into law in Great Britain and will not be implemented in Great Britain’.¹¹ This marks a reversal from previous guidance,¹² which said that the new EU regime would be transposed into UK law. The new information merely says that the MHRA will ‘take into consideration international standards and global harmonisation’ in the development of a future UK system and will consult with stakeholders.¹³

However, the UK will continue to accept EU conformity assessments for several years after the transition period,¹⁴ and indefinitely in Northern Ireland. Northern Ireland may have parallel EU and UK certifications well into the future. Whether there will be scope for continued EU recognition of assessments carried out in the UK under a future agreement remains entirely unclear, even in the closing days of negotiations.

Medical device regulation is one area where the UK has scope to make different policy choices than the EU. The two major global jurisdictions of the EU and the United States take contrasting approaches to regulating medical devices, with the United States being stricter in some areas. Potentially, the UK has the opportunity to design a better system, given an often poor record of patient safety under the EU regime.¹⁵ But the capacity of industry to weather and comply with regulatory changes raises important questions. This makes monitoring the likely impacts and changes in this sector especially important as negotiations progress.

Transparency of planning for supply disruption

The DHSC and NHS England have extensive plans and monitoring systems in place to respond to the disruption they expect in supply routes for medicines and medical devices after 1 January 2021, with or without an agreement in place. These include surveys of suppliers, red/amber/green ratings of risk by product, and Brexit situation reports to be filed by NHS trusts. The authors of this paper are grateful for the DHSC and NHS England's help in outlining these measures.

However, the sense of uncertainty we heard during our research is not helped by the fact that none of this appears set to be published. There are very legitimate concerns around total transparency, relating to encouraging patient stockpiling and breaching commercial confidentiality. But openness about processes and reported facts in aggregate would help demonstrate what is being done and allow industry, parliament and independent bodies to consider and debate it.

The same is true of the operational response. Few details about the medical devices and clinical consumables stockpile have been published, which will be particularly crucial in the context of Covid-19, either in England or any of the devolved nations/administrations, some of which built their own in 2019. The DHSC made an important change in stockpiling policy, from the six weeks in addition to normal stocks in 2019 to six weeks in total in 2020. The data supporting this change have not been publicly shared. This may lead to more aggressive scrutiny if it is perceived to be inadequate. The same is true of the uptake of new routes into the UK.

This situation is mirrored in an already limited level of data collection and publication about NHS stocks and the pharmacy supply chain. An attendee at one of our roundtables remarked that the health service might be required to undertake a paradigm shift away from ‘just in time’ inventories of key supplies following the experiences of coronavirus and exit from the single market. Building up inventories would carry permanent cost and be scrutinised by the Treasury and National Audit Office, and clear data and monitoring would be required.

Most significantly, there is very little clarity over the evolving border projections that inform the policies of stockpiling, new routes, and regulatory relaxation planned for 2021.

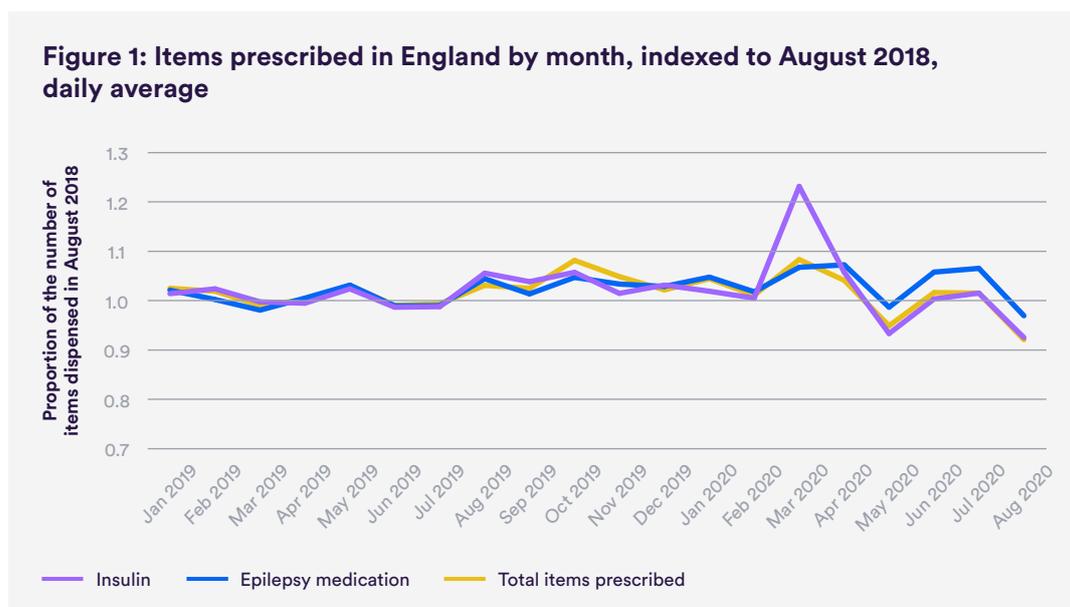
Disruptions relating to freight, customs and logistics are expected to cause the majority of delays. These are something of a black box to many in the health sector: “even the big companies ... don’t really know, we just give it to UPS or whoever and they magic it to wherever it goes”, one individual from industry told us.

Policy and decisions in the health sector are based on cross-government scenarios that use survey data from the logistics industry and analysis of EU member state processes and facilities. These have not been made public. The ‘reasonable worst-case scenario’ around which most plans are built has been outlined to industry in a letter from Steve Oldfield of the DHSC and one from Michael Gove MP – the latter not published by government, but by the Road Hauliers Association.^{16,17} However, it is unclear, for example, what it is based on in terms of actions by the EU and France, which may be determined by negotiations and decisions at a late stage.

Overall, the failure to publicly share the cross-governmental evidence base for crucial decisions makes it more difficult to offer reassurance before the end of the transition period, and risks creating mistrust, confusion and recriminations.

Covid-19 and the demand for medicines

We analysed prescribing data covering general practices across England from the start of 2019, to see if any anomalies were associated with possible no-deal Brexit dates or with the Covid-19 pandemic. Figure 1 shows the number of items dispensed each month. It is important to note that ‘items’ may vary greatly in terms of the number of tablets or volume of liquid that they include.



We looked at total items dispensed and also at insulin and epilepsy-control medications – two areas where patient stockpiling may be plausible because a constant supply is crucial and they are typically repeat prescriptions. The results show little change around possible no-deal exit dates in 2019, nor in total items during the coronavirus pandemic. However, insulin items spiked in March 2020, around the first wave of the disease and resulting lockdown. Around a quarter again as many insulin prescriptions were dispensed as usual. This may be consistent with doctors and patients pulling prescriptions forwards to make sure vulnerable patients had medication.

It is concerning to consider a scenario in which a similar spike (perhaps if doctors and patients pull prescriptions forwards against the uncertainty of 1 January 2021) coincides with a reduction in supply due to disruption at the border, or firms attempting to build buffer stocks before the end of the transition period. Recent closures of the UK border with EU countries following the emergence of a new strain of coronavirus raise the prospect that supply may also have been affected even before December 31st, interfering with the building of stockpiles.

Health powers and the Internal Market Bill

Brexit is raising important concerns about the allocation of authority within the UK as it relates to health policy. Health is currently a shared competence between the EU and member states, but all those powers at EU level will be repatriated to the UK at the end of the transition period, when EU law ceases to apply.

In the UK's constitutional settlement, most health matters are devolved to Northern Ireland, Scotland and Wales. At the time of the devolution settlement, the dimensions of 'health' were fairly simple: they were the things the Welsh, Northern Irish and Scottish territorial offices did in relation to health and the things the UK health department did in relation to health in England. Public health powers did not receive much consideration, even as decisions such as bans on smoking in public places and minimum unit pricing for alcohol slowly expanded in devolved public health powers.

An initial approach identified the DHSC as a ministry in which 'common frameworks' – a common approach to a policy area applying to the whole of the UK and negotiated among the UK, Scottish, Welsh and Northern Irish governments – would be needed.¹⁹ The UK and devolved governments

agreed common principles to guide these discussions, including enabling a continued UK internal market, ensuring compliance with international obligations and making sure that the UK can negotiate and enter into new trade agreements and treaties.²⁰

But the UK government has more recently argued that these common frameworks are not enough to secure the functioning of the UK internal market after the end of the transition period.

On 9 September 2020, it introduced the IMB to ‘guarantee the seamless functioning’ of the market, ‘avoiding the creation of new barriers ... for our brilliant manufacturers, producers and service providers’.²¹ The Bill includes provisions that will secure access to markets in England, Scotland and Wales through legal principles of mutual recognition and non-discrimination applicable to goods and services. It passed through the House of Commons on 29 September 2020.²²

Roundtable and interview participants raised several concerns about the Bill.

We heard concerns that, because of the relative size of the English market and the Bill’s principle that any good that can be legally sold in one part of the UK can be sold in the other parts,²³ the Bill would mean de facto that English regulatory standards would apply to the whole of the UK. We also heard concerns about the lack of clarity as to how the law would be enforced.

Several interviewees and roundtable participants raised concerns about future plans to implement public health protections in Scotland and Wales, including further pricing measures for alcohol, tobacco packaging and calorie labelling in Scotland, and banning hormone-injected beef in Wales. The Bill, once in force, might result in a reluctance to introduce new measures that are likely to be subject to costly legal challenge by companies, delays in redrafting measures, and uncertainty around whether the health protection measures would be protected in future trade deals and how dispute resolution mechanisms might apply to them. Participants also raised concerns about *existing* divergences that are permitted under EU law, particularly Scottish minimum unit pricing rules for alcohol.²⁴

On 26 October 2020, the Bill reached Committee Stage in the House of Lords, with scrutiny scheduled to continue into November. But members have voiced concerns about the impact of the Bill on public health, consumer, labour, animal welfare and environmental protections.^{25,26} Scottish Liberal Democrats in the House of Lords proposed an amendment that would freeze implementation of the Bill until agreement on the common frameworks was reached.²⁷

On 16 December the government and House of Lords agreed to amendments which exclude the application of the powers of non-discrimination and mutual recognition (at the centre of concerns about the potential to stop progressive regulation) “to any statutory provision or requirement that gives effect to a decision to diverge from harmonised rules that has been agreed through the common frameworks process”. These were subsequently included in the Bill as “further exclusions from market access principles”.

Devolved administrations enjoy a more reduced consulting role in the publication of further statutory guidance, on periodic reviews of the Office for the Internal Market – which would have an oversight role and sit within the Competition and Markets Authority – and on state subsidies. The Internal Market Act was passed on 17 December.

In order to measure the impact of these changes, we will need to assess the extent to which the common frameworks process – which has been agreed in principle – will enable Scottish and Welsh policy preferences to be adopted in practice going forward.

Drivers of public and population health

When talking about the potential effects of Brexit on public and population health, much of the public debate has focused on issues of food safety and measures against infectious disease. From 1 January 2021, powers in these areas, and the right to negotiate trade deals about their use, will be largely repatriated, although initially EU rules will transfer to the UK’s statute books. The UK Food Standards Agency (FSA) will replace the EU Food Standards Agency (EFSA) as primary standards regulator. EU food law and labelling will continue to apply in Northern Ireland.

The potential export of chlorine-washed chicken (which is banned in the EU) to the UK from the United States is often discussed in the media as an example of how Brexit could impact food safety through changes in standards.²⁸ The new Trade and Agriculture Commission, launched in July 2020 and put on a statutory basis on 1 November 2020,²⁹ will examine trade deals from this point of view, and is to be welcomed in that regard. But it is set up primarily to represent farmers and producers in the UK, who may not have goals that are aligned with public health.

Impact on the burden of non-communicable disease

Participants in our roundtable discussions emphasised issues that are getting less attention than others but may be far more important, particularly the potential impact of Brexit on the burden of non-communicable disease in the UK – including obesity, illnesses caused by smoking, and harm from air pollution.

In recent years, the UK and its nations/devolved administrations have implemented important public health regulations targeting the prices, advertising and labelling of products that can harm health. In other areas, EU regulations have held the UK to high standards despite industry objections. Specifically, participants mentioned:

- policies designed to lower the consumption of foods that can cause obesity (for example, the Soft Drinks Industry Levy at the UK level)
- minimum alcohol pricing in Scotland
- water and air quality regulation, largely at the EU level
- plain packaging of tobacco products, done by the UK unilaterally with specific EU permission.

Participants raised concerns that the loss of minimum standards at the EU level, the creation of new regulatory structures under conditions of low scrutiny and ongoing trade negotiations could lead to renewed demands from domestic and foreign industry actors to reverse these regulations and subsequent policy changes. Examples in environmental legislation might include vehicle emission and industrial carbon emission regulations, both of which are important for health in the long term but also have industry interests opposed to tight controls.³⁰ It appears probable that an agreement

with the EU will significantly restrict the UK in lowering environmental standards, but may allow it to fall back from strengthening standards over time at the price of some penalties.³¹

In external trade negotiations and arbitration and in the context of the IMB, these regulations could be framed in ways that are detrimental to public health: as ‘trade restrictions’ in the context of external trade relations and as breaching non-discrimination and mutual recognition principles in the IMB. These concerns are not unfounded, given recent legal action by the tobacco industry against packaging regulations and flavour restrictions designed to protect health.³²

The Brexit negotiations have proceeded with little public transparency. Trade negotiations have tended to take place behind closed doors and sometimes without much engagement with public interest groups.³³ For these reasons, our research participants considered it important to track changes in policy and negotiating positions, as well as public statements from industry.

Indirect impacts on population health

Even with a trade agreement in place, independent studies of the economic impact of leaving the single market and customs union anticipate lower economic growth or a compounding of the recession associated with the Covid-19 pandemic.³⁴ Should funding for the NHS, local authorities or civil society groups be negatively affected, access to a range of important preventative services could be reduced.

The UK has long prided itself on the quality and accessibility of health care that the NHS systems provide at low cost when measured as a percentage of Gross Domestic Product (GDP). The phenomenon known as ‘Baumol’s cost disease’, however, tends to mean constant upward pressure on health budgets, something NHS plans and governments across the UK have recently recognised.³⁵ As a matter of arithmetic, lower GDP growth will confront the governments with a choice: dedicating more of their economy to health care every year or seeing NHS services deteriorate. Brexit creates a serious risk that the NHS systems will find themselves caught in a vice of slower overall economic growth and steadily increasing labour costs. Long-term low funding growth in the 1990s was associated with a rise in the number of people buying

private health insurance, shifting the UK to a less equitable model of funding and coverage.³⁶

This budgetary pressure will also face fields such as welfare and housing, which have been shown to drive population health outcomes,³⁷ and which in many cases have already fared worse than the NHS during the recent period of austerity.

Any effect on poverty and health inequality might be compounded by the direct effect on jobs and prices. There is some evidence that worse economic performance and living standards are associated directly with poorer health outcomes. Recessions tend to increase rates of mental health problems. The impact on other risk factors can be complicated. A worsening of economic outlook for some groups and regions has been linked to ‘deaths of despair’ from causes such as alcohol. However, more generally, negative income shocks seem to reduce these behaviours.³⁸

The impact from Brexit on the economy is likely to affect some areas of the UK more than others, often those that already have lower average incomes and worse health outcomes. Papers published by the UK in a Changing Europe have suggested that regions more dependent on manufacturing and where workers have fewer qualifications have been harder hit by the changes in investment and expectations that the EU referendum has caused.³⁹

A Health Impact Assessment conducted by Public Health Wales identified potential indirect effects from Brexit that could have significant negative impacts, including inflation on basic necessities such as food, loss of jobs in sectors sensitive to imports and exports and loss of EU funding for addressing inequalities at the community level.⁴⁰ The Scottish government’s Local Level Brexit Vulnerabilities report⁴¹ identified rural and remote areas as the most likely to be affected. Our roundtable participants echoed both sets of concerns.

Disruption to information and networks

Sharing health information across borders is essential in order to contain the spread of communicable disease, monitor and assess non-communicable

disease, facilitate comparison and benchmarking, and promote scientific collaboration. Scientific networks have seen UK-based researchers often become prominent and influential in European science.⁴²

In recent months, the Covid-19 pandemic has illustrated the importance of sharing health-related information and the risks of not doing so. During early attempts at local lockdowns, local authorities experienced difficulties in accessing key epidemiological data about their own areas due to a lack of transparent communications with central government and appropriate data-sharing agreements.⁴³

Our research participants raised concerns that Brexit would have an impact on access to relevant data at the level of the UK as a whole. As a non-EU/EEA state, the UK will no longer be part of the ECDC, which shares more specific and in-depth reporting on threats such as pandemics, or the Early Warning and Response System (EWRS) which connects it to member states. Some form of cooperation is under discussion, but details are unclear.⁴⁴ It also appears that from January 1st the UK will not immediately be considered to be “adequate” by the EU in protecting personal data, meaning any flow not supported by special contractual clauses must stop.

The UK will no longer be covered by Eurostat, which creates comparable data and information, including through surveys, essential to enable benchmarking and comparison between health systems.

It is striking how little clarity there has been about establishing the terms of UK participation in data-sharing networks and scientific organisations after Brexit. There are a variety of ways, for example, that the UK could participate in or coordinate with the ECDC, but we do not know if any such coordination is planned or how it might work.⁴⁵ Switzerland’s access to the EWRS during the pandemic has been difficult to negotiate;⁴⁶ it cannot be assumed that these relationships can be easily or quickly constructed.

There are specific issues related to Northern Ireland, which will have a unique degree of integration into both the UK and EU internal markets. The EU internal market has developed a wide range of mechanisms to ensure that relevant information is shared, with the aim of avoiding unsafe products in one part of the market passing unknown to another part. For many of the

movements of patients, staff and products across the Northern Irish border, no effective data collection and comparison structures yet exist.

Apart from the sharing and aligning of hard data, interviewees were concerned that Brexit would disrupt personal networks with researchers and officials in other countries, who they used to learn from and through them stay abreast of sometimes confidential developments. Although they believed many of these relationships could be rebuilt over time, they also saw the potential for a dynamic much less conducive to mutual support. “They will see Brexit as an opportunity to boost their pharmaceutical sector, their research sector”, one told us.

Covid-19, labour migration and Brexit

Our research confirmed the widely debated problems that the end of the free movement of labour poses for health and social care in the UK. Interviewees and roundtable participants were particularly concerned with difficulties in filling shortages in nursing and social care, which rely heavily on international staff.

Future operational and policy requirements will increase this need for migrant staff. To meet the target of 50,000 more nurses in England in the next five years, official NHS plans assume inward migration of at least 2,500 nurses a year.⁴⁷ However, the Nuffield Trust, The King’s Fund and The Health Foundation carried out an independent assessment, which suggested that a similar overall increase in the number of nurses would in fact require inward migration of at least 5,000 nurses a year.⁴⁸

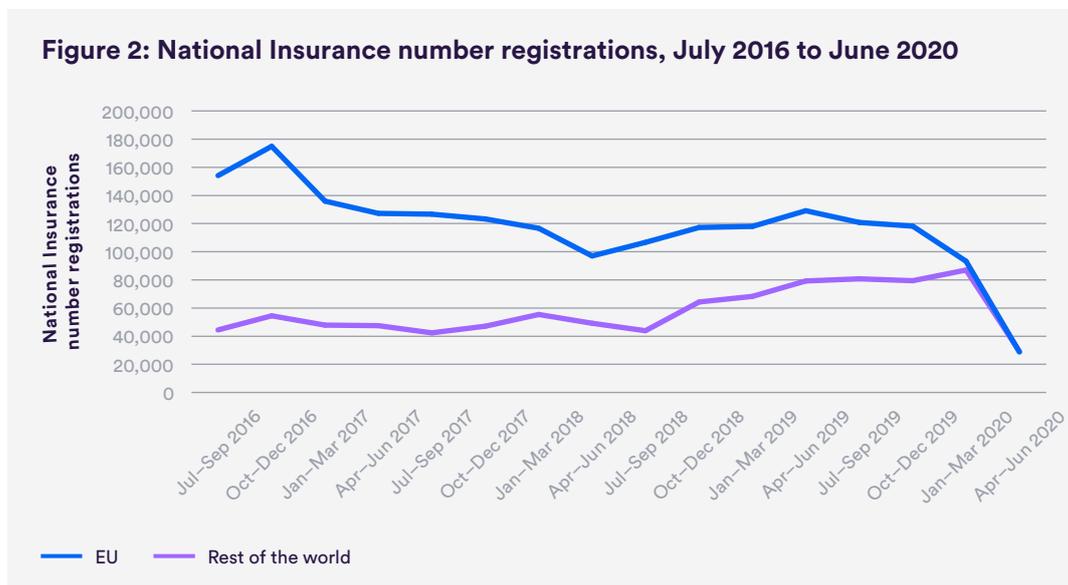
In social care, the government has pledged ‘to give every older person the dignity and security they deserve’,⁴⁹ but this would require at least 50,000 additional workers if they are to provide even basic support to those in England currently going without the care they need.⁵⁰

Our data work has highlighted the potential for the impact of the coronavirus pandemic to intensify these demands.

Migration and the Covid-19 pandemic

Our data show that over the second quarter of 2020, visa applications decreased significantly. Study visas fell by 97.5%, from 52,803 in the fourth quarter of 2019 to 1,276 in the second quarter of 2020. Meanwhile, work visas fell by 86.2% over the same period, from 45,253 to 6,223, with positive visa outcomes decreasing at a slightly slower rate.

Similarly, National Insurance number registrations, for both EU and non-EU applicants, decreased by 70.1% over the same period, from 190,509 to 55,428 (see Figure 2). This appears to reflect the restriction of travel to the UK during the first wave of Covid-19. It suggests that around 135,000 fewer workers migrated to the UK than might otherwise have been expected. It is highly probable that the gap has continued to grow since. A recent report from the Office for National Statistics confirms that the number of EU employees (by country of birth) saw a record decrease, by 364,000 to 1.87 million (16.3%), over the quarter from July to September 2016, after remaining relatively flat from 2010 to 2016, with a slight increase from 2017. The number of other overseas employees fell only slightly, by 65,000 to 1.29 million (4.8%).⁵¹



The general labour pool is of particular significance for social care, which draws recruits from those without particular qualifications or who may have come to the UK for other reasons. Among social care staff, even with vacancy rates falling from 8.65% to 7% from the start of the Covid-19 pandemic in March to September 2020, supply falls short of the demand necessary for the

social care sector to function at its current level,⁵² let alone in the expanded system that all major UK political parties accept is needed.

These figures suggest that the UK has come close to losing an entire year's worth of vital inflow of migrant staff, while underlying need has continued to increase. This creates an urgent need to address catch-up recruitment, without which care services will be unable to deliver the improvements in access and quality that the government and *The NHS Long Term Plan* promised.⁵³ Given the already destabilising levels of vacancies, some services may become unsustainable due to staff shortages.

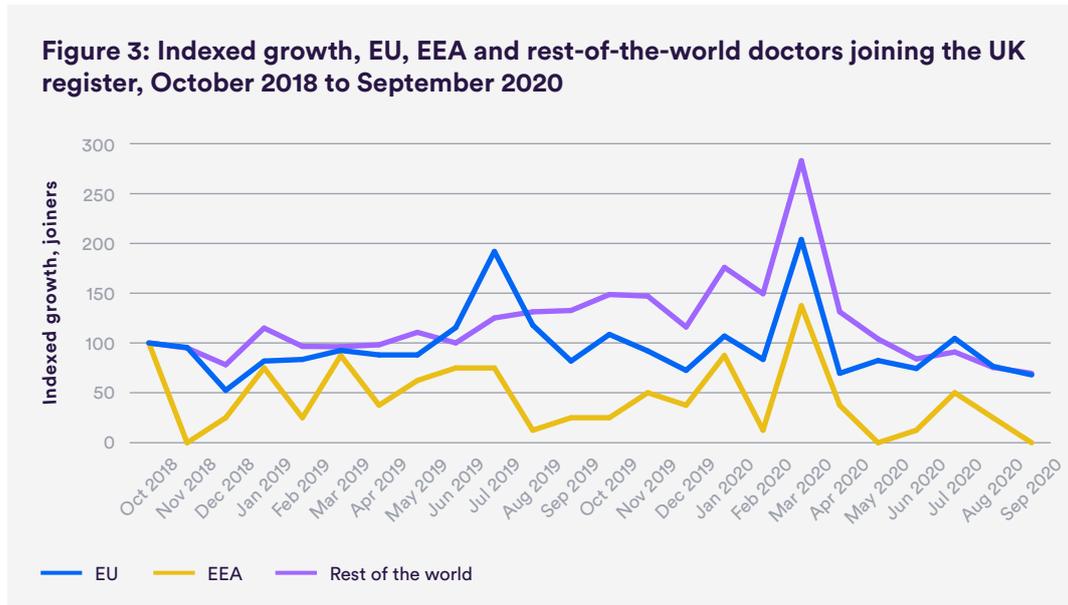
Conversely, national retention rates appear to have improved over this period, with the number of doctors leaving NHS trusts in England stabilising by April 2020. EU-trained doctors leaving the register in March and April 2020 were numbered at 251 and 181 respectively. These figures were slightly lower than in March 2019 (307) and April 2019 (181).

Over this period, the number of nurses and health visitors leaving NHS trusts in England decreased slightly, from 559 in March 2019 and 392 in April 2019 to 439 in March 2020 and 392 in April 2020. From March to November 2020, fewer people had left the permanent nursing and midwifery register than during the same period in the previous year – 11,615 compared with 13,479. We can infer that these trends might be due to reduced mobility and uncertainty in the labour market. Our roundtable participants confirmed these trends in their own areas, noting that they were subject to regional variation, with London faring better.

The number of new doctors, nurses and health visitors joining NHS trusts in England appears to have remained stable over the period, with recurring peaks in August followed by troughs for EU and rest-of-the-world doctors every year, and in September every year for EU and other overseas nurses and health visitors. Other overseas doctors were consistently more numerous than EU doctors, while numbers of EU and rest-of-the-world nurses and health visitors were often similar.

However, it appears that the numbers of doctors joining the register in all four nations of the UK decreased following a peak in March 2020, below the level of joiners in October 2019 (see Figure 3). This suggests that a loss of migrant staff

has potentially also occurred for NHS roles, but may not have yet translated to those at the stage of joining trusts or may have been balanced out by the exceptional recruitment efforts during the acute phase of the pandemic.



Leaving the EU

The introduction of strict controls on migration from the EU may make existing or expanding gaps in the health and social care workforce harder to fill.

Our roundtable and interview participants unanimously reported high levels of uncertainty, citing the absence of clear plans on areas directly related to workforce – such as the future mutual recognition of professional qualifications and restricted mobility – and areas indirectly affecting the provision of health services and the attractiveness of the UK – such as medicine supplies, data adequacy and access to care. One representative with an affiliation to the NHS noted a decline in the ‘robustness of forecasts’, leading to instability in labour supply markets.

Some specialist staffing is particularly reliant on a predictable international intake. One example is proton beam therapy for sarcoma, which requires staff from a range of specialties working seamlessly. Identifying workforce needs, locating the best candidates from all over the world and completing the recruitment process takes up to four years of careful planning, which in turn is highly dependent on a stable recruitment market.

Government and academic representatives from Northern Ireland highlighted uncertainty over workforce on the Northern Irish border, despite the continuation of the Common Travel Area (CTA) after the UK leaves the EU. The daily movement of Irish or EU-26 staff residing in the Republic of Ireland to Northern Ireland is poorly tracked, and could be affected if the UK no longer recognises the qualifications or social security rights of staff from the EEA.

Meanwhile around half of PhD students and three quarters of postdoctoral researchers working in the field of cancer in the UK are international, and early-career science researchers from the UK habitually spend several years abroad. A recent report estimated that, in areas such as cancer research and treatment, the necessary growth in the cancer workforce to meet diagnostic and treatment needs is 45% by 2029.⁵⁴ It is unclear how this sustained growth might be met outside the EU framework.

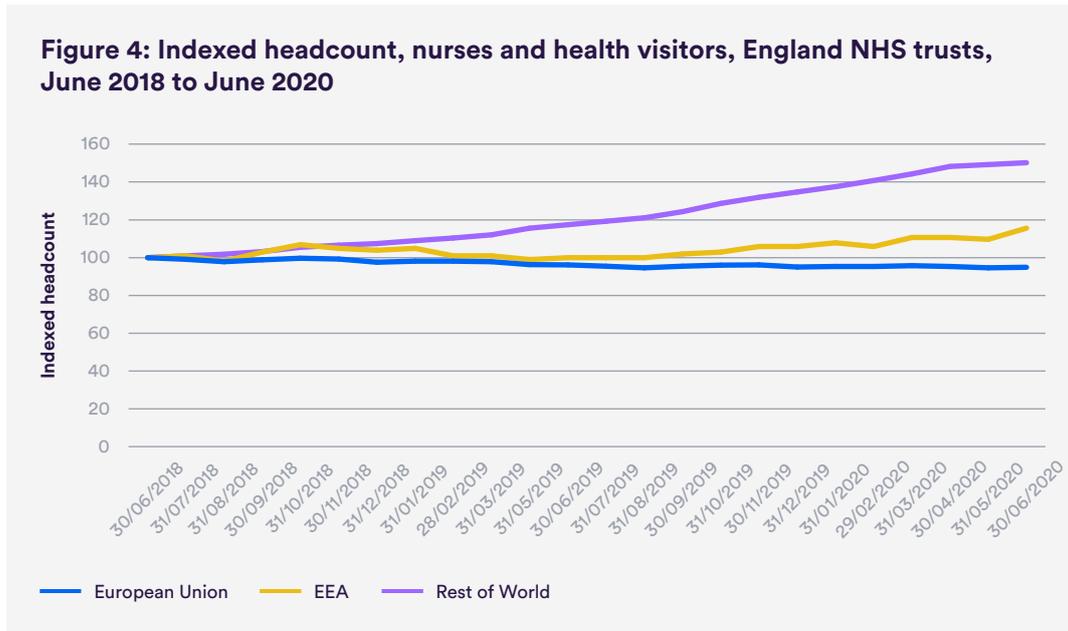
Several participants noted the need to track more qualitative phenomena such as the rise in hate incidents and the declining perception among EU and other overseas staff of being welcome.

NHS Digital and GMC workforce data suggest that the decision to leave the EU has already had some effect. EU staff growth in doctors and clinically skilled staff has levelled out and decreased as a proportion of overseas employees over the past two years, while growth from the rest of the world has accelerated and increased in proportion.

The increase in the number of EU doctors in England appears to have remained stable: headcount stood at 10,686 in June 2018, increasing by 1.2% to 10,814 in June 2019, and by 3.5% to 11,196 in June 2020; in contrast, doctors from the rest of the world saw their numbers increase from 18,979 in June 2018 by 14.6% to 21,757 in June 2019 and by 14.8% to 24,975 in June 2020. These developments are in line with the decreasing proportion of EU National Insurance number registrations.

The pattern is most dramatic in nursing and midwifery, where numbers of EU staff have actually fallen after rapidly increasing ahead of the EU referendum vote in June 2016. The number of nurses and midwives from the EEA confirmed this trend, with a reduction from 31,385 to 30,895 (490 or 1.6%)

between 1 April and 30 September 2020. In contrast, the numbers of nurses and midwives from outside the EEA increased by 1,557 to 85,873 (1.1%), although still more slowly than during the same period the previous year. The same pattern exists within NHS trusts, as shown below.



A concerning picture emerges of Covid-19 slowing down migration from all sources, at a time when we need it to accelerate, and when uncertainty from Brexit and new controls are already making this more difficult.

Brexit and health in Northern Ireland

The situation of Northern Ireland’s health and care system with regard to Brexit is profoundly different from the rest of the UK in ways that are not well understood, for which policy is still opaque and data are largely lacking.

Cross-border health care has been specifically supported as part of the peace process, and the geography of the island of Ireland is such that many areas of the health and care system essentially function on an all-Ireland basis.

The workforce is not demarcated effectively on either side of the border, with a significant number of people living on one side and working on the other, or indeed on both sides, without any effective means of monitoring the extent

to which this is the case. Patients likewise flow in both directions, and the structure of care provision reflects this. Key facilities in both Northern Ireland and the Republic of Ireland, such as the joint cancer centre at Altnagelvin, get enough patients to make them clinically and financially viable by drawing on populations from both sides of the border.

The legal situation from 1 January 2021 will be highly complex and unclear, with overlapping legal arrangements. These will include:

- the Withdrawal Agreement, covering the rights of cross-border citizens, including those from the EU
- the CTA rules, which allow British or Irish (but not other EEA) citizens to live and work in either country
- the Northern Ireland Protocol, which will keep the region inside the single market for goods and the customs union in many respects
- potentially a UK–EU trade agreement, which might cover the co-ordination of social security, including cross-border health care.

The specific legal status of Northern Ireland will hinder its ability to be part of supply chains that emerge for the rest of the UK, because there will be new customs requirements for shipments from Great Britain⁵⁵ and regulations may increasingly diverge. Yet at the same time, because key regulatory checks, such as batch testing of medicines, carried out in Northern Ireland will no longer be valid for the rest of the EEA,⁵⁶ it may become less well integrated into this market too. In the short term, a unilateral declaration by the UK and EU together will avert some requirements, notably for a marketing authorisation holder to be in Northern Ireland rather than elsewhere in the UK. This is welcome, but underlines the breadth of the long-term shifts required.⁵⁷

While it may be legally possible for a full range of products to be supplied to Northern Ireland, the complexity may in practice mean that the availability of health-related products in Northern Ireland becomes limited due to the costs and legal risks involved, in a similar way to other small jurisdictions within the EU, such as Malta and Cyprus.⁵⁸ Attendees at our roundtables suggested that industry may treat Northern Ireland as part of the Republic of Ireland

market, without all medicines offered in Great Britain necessarily being available there.

Those we spoke to tended to agree that preparations for these changes were at a very early stage as of autumn 2020, with government and industry often blaming one another for this. One predicted that adaptation would proceed so slowly that the UK and EU “may find ways to live with persistent non-compliance”.

Roundtable attendees also had long-term concerns about the Northern Ireland Protocol’s provision for votes in the Northern Ireland Assembly every five years on the continuation of its measures. This would potentially mean a rapid and complete regulatory overhaul for medicines, medical devices and life sciences.

The UK as a peripheral European health power

Many of these issues come back to one fundamental problem: there is still no clear strategy for how the UK will position itself in the medium term. The UK’s policy options and choices remain substantially unclear. Can it and will it cleave closely to the EU? Can it and will it influence EU decision-making in the interests of a shared market? Can it and will it pursue a more distinctive strategy in an increasingly fragmented world economy? Nor is the EU static: just how different will EU decision-making look like as it confronts challenges in the absence of the UK and its influence?⁵⁹

In terms of relations with the EU, the shared problem of the UK and the EU is that the UK is far larger and more economically important than non-member states such as Iceland, Norway and Switzerland, and far more integrated with the European economy than trading partners on the other side of the world such as Australia, Canada and the United States.⁶⁰ Regulatory or other policy decisions made in London and Brussels will have consequences for both parties. There is no ready model for such a relationship, and the process of negotiation has not produced a sense of what models the parties might develop. So far, the UK has focused on a public narrative of maximising its

autonomy and the EU has focused on constraining the UK's ability to cause problems in its internal market. But over time, it is likely that both parties will need to develop an approach to policy coordination that serves their broader interests. There is no reason to expect that a model of EU-UK relations built out of the accumulation of *ad hoc* decisions on specific topics will serve any party well.

Health is a sector characterised by high degrees of innovation and change, especially in medicinal and other health-related products, and by a high dependence on a specialist workforce requiring long periods of training. This puts health at the forefront of strategic choices about trade and international relations, with potential impacts on the availability of health goods and services that are likely to be highly visible. The UK plays a relatively distinctive role in these areas, with a particular strength in the nexus of academia, industry and government around life sciences invention, and a particularly high proportion of staff from other countries in its health and care system.

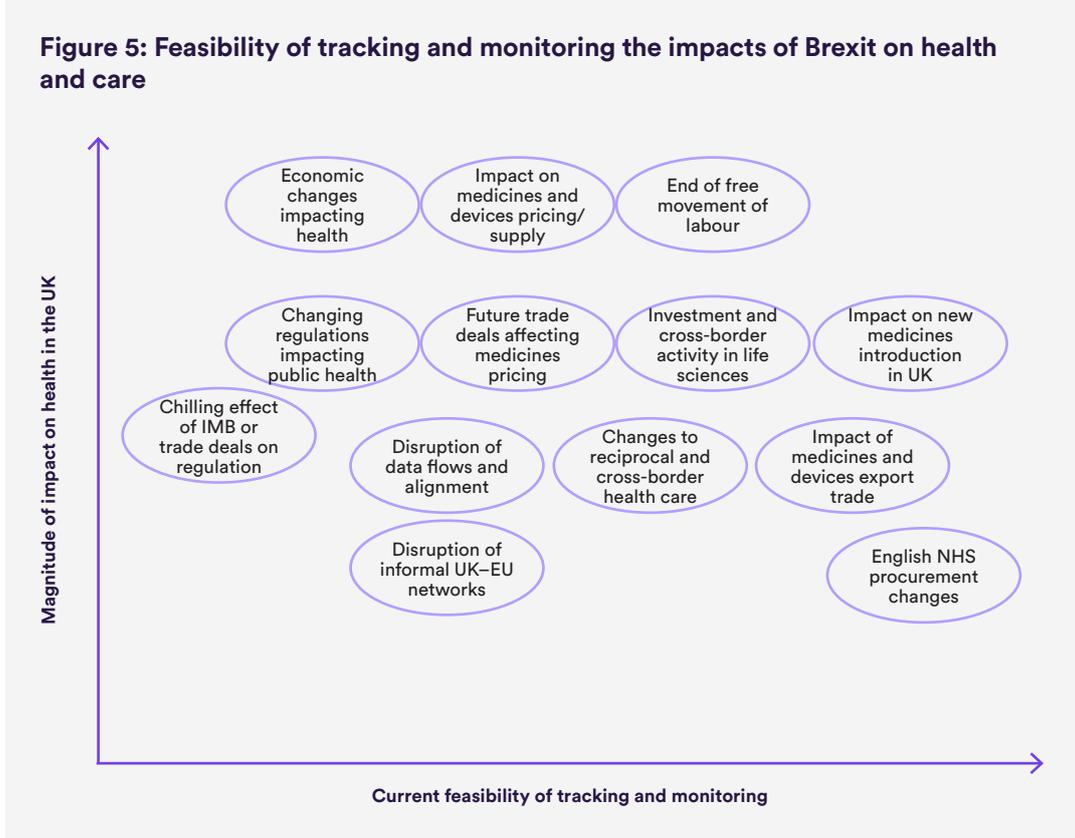
This suggests a need for an overall strategy for how to position the UK in relation to the other major blocs that goes beyond the relatively simple issue of tariffs to engage with wider links and investments. For example, will the UK wish to continue to be part of EU research collaborations even when it no longer has a voice in shaping those programmes? Or will the UK attempt to maintain its international position through greater domestic funding that would replace European funding and networks? Will the UK choose to invest in its health and care workforce sufficiently to reduce the current levels of staff from elsewhere? Or will the UK seek to establish more strategic partnerships with other countries, in order to enable more structured mobility – at the risk of exacerbating international health workforce inequalities?

There is a risk that obscure decisions on details (for example, data protection and transfer, clinical trials regulation, visas and cross-border working) will have unexpected effects on some on health and life sciences, which are among the UK's strongest economic sectors. There is also a risk of too much focus on distant partners, whether for trade agreements, research collaborations or workforce, at the expense of the enormous nearby EU market.

4 What would be needed for a sustainable impact tracking and monitoring mechanism beyond Brexit?

This report has identified a wide range of impacts from Brexit on the health and care system in the UK, and underlines the importance and relevance of tracking and monitoring them. The coming years will see a once-in-a-generation reset and reshaping of the international relations and trade context for health and care, in ways that are not yet well understood. The UK will attempt new trade agreements with the world's largest economies, and reshape migration, devolution and regulation policy using powers returned from the EU.

Figure 5 shows our initial assessment of the magnitude of impacts that different changes are likely to have, and how feasible it currently is to track and monitor them. Where an area is more feasible to track and monitor – towards the right of the Figure – there might be at least some reliable data (as there is for medicines authorisation or export volumes) or legal or policy changes would be visible (as is the case for changes in procurement law). The least feasible areas are those either without sources of information or, as with economic changes, where disentangling any effect from other causes will be very difficult.



A mechanism for tracking and monitoring these impacts on health and social care in the coming years would make a vital contribution to ensuring that we have an accurate and informed understanding of them as we seek to respond to them.

Overall approach

The variety of potential impacts due to Brexit that this report has identified and the mechanisms involved suggests that a wide range of methods will be required to successfully track them. Four principles should underpin any tracking project that covers this breadth of issues:

- 1 Look beyond Brexit and the UK-EU relationship to track the broad impact of the UK’s shifting external relations and trade agreements on health and care in the UK.

- 2 Track changes in processes before an impact on health outcomes is necessarily visible. This will help ensure that information is available for action in a timely manner, given the long timescales for both impact and potential policy action in areas such as workforce and environmental protection.
- 3 Be ready to analyse policy and key documents well in advance of their taking effect, in order to provide timely information for decisions in trade negotiations and domestic legal and policy decisions at UK and devolved levels.
- 4 Draw on different types of data to provide, and if necessary create, reliable and valid indicators.

Sources of data

This report has drawn on two principal sources: experts within the system and a review of relevant documents. A future tracking mechanism could build on these and expand on them in three ways: by making better use of existing data, by commissioning surveys or other processes to gather new data, and by recommending new datasets for the health and care system itself.

Drawing on experts

This report has shown the enormous potential of existing health and care stakeholders to provide timely insights into impacts. Expert opinion from within the system will always remain vital. But monitoring a wider range of issues might require a wider network of contacts, with the aim of ensuring that multiple informed perspectives on each of the major areas of impact are sought from across the four nations of the UK. Our stakeholder events and interviews have shown Brexit's potentially dramatic ramifications for the UK's devolved nations and this warrants more sustained engagement with the devolved administrations.

Sectors adjacent to health – such as logistics and chemicals – are also expected to experience major impacts from Brexit and face particular dynamics and

issues, and it would therefore be desirable to build sources of intelligence on these sectors too.

Analysis of documents

Following Brexit and the end of the transition period, large volumes of new or revised policy and law can be expected in areas previously covered by EU legislation, ranging from specific trade agreements to domestic medicines and alcohol regulation policy. Analysis of these documents – including primary and secondary legislation, draft and final trade agreements, and trade negotiating mandates – will provide information about changes in policy and their likely impact.

This will be a substantial means of tracking the likely impact of changes on the health and care system. Given the likely volume of changes and the relative lack of capacity of many stakeholders for engaging with and understanding these changes, a future tracking mechanism would provide a vital resource for the health and care system as a whole in understanding and responding to the evolving situation.

Making better use of existing datasets

This report has identified some existing datasets that could help track different areas of the impact of Brexit, many of which are currently under-used.

These include:

- the NHS Electronic Staff Record and GP workforce data for the health workforce in England, and nationality records in Wales
- the professional registers of the General Medical Council (GMC), the Nursing and Midwifery Council (NMC) and the Health and Care Professions Council (HCPC) for the health workforce across the UK
- trade data held by HM Revenue and Customs (HMRC)
- data on the risk and reality of medicine shortages, currently being collected by the Department of Health and Social Care (DHSC) in preparation for the end of the transition period

- patient-level prescribing data for medicines and medical devices
- data held by regulators on the number of medicines and medical devices authorised for sale in the UK.

Making use of these existing datasets would require investment in securing the required permissions and the establishment of a technical platform and expertise to assemble and analyse the data. But the datasets offer a rapid and relatively low-cost way of substantially improving on existing available understanding. Many would be well suited to examining the changes likely to occur immediately following the end of the transition period.

Commissioning surveys to gather new data

Additional surveys of stakeholders on key issues would enable specific new data to be collected in a structured and repeatable way. This would be most useful in areas where stakeholders within the health and care system are likely to have relevant information that is not currently collected and shared, such as on staff or product shortages.

Recommending new datasets for routine collection

In some areas, the potential impact on health related to future external relations and trade may be sufficiently significant as to warrant new routine datasets to be established within the health and care system.

For example, in Northern Ireland there will be a unique regulatory situation, with the potential to have substantial impacts on many of the building blocks of the health and care system, yet routine data that would be needed to accurately monitor flows of either staff or patients are not currently collected. Similarly, the Covid-19 pandemic has highlighted the relative lack of vital data for the social care sector, in particular workforce data. Rather than the future tracking mechanism collecting such data directly, we could engage with the relevant stakeholders to help seek agreement on new datasets for collection by the health and care system itself.

Methods of analysis

We created a refined framework for the analysis in our initial phase of the project. This could provide the analytical structure for future monitoring.

Future tracking could continue to gather data through at least a combination of information from experts (from workshops and individual contacts) and documentary analysis, as well as from the other data sources described in the previous section, as resources allow. For interviews, a schedule of questions similar to the one we used for this report could be repeatedly put to key contacts at intervals to track how their perceptions and priorities change over time.

The model we used was one of iterative data sharing and comparative analysis. A future monitoring project could use a similar approach on a permanent basis, with constant updating of shared analysis documents combined with collective review by the research team on at least a quarterly basis. This should ensure key changes and trends are identified and debated and key emerging issues are flagged for further investigation and reporting.

While a core research team has been appropriate for this report to cover the issues raised, as discussed in the previous section, a future project should include partners across the UK.

Outputs

The exact outputs of a tracking and monitoring mechanism would depend on the remit and funding requirements. However, in view of the complexity and permanently changing nature of this field, we would recommend a combination of publications to combine both timeliness and depth:

- **Overview reports** – providing comprehensive up-to-date analysis of the impact of international relations and trade on health, which would be a reference publication for policy-makers across the sector. These might be annual, or perhaps biannual in the first year.

- **Policy briefs on specific impacts** – shorter and more accessible online publications on specific topics, which provide detail while remaining short enough to be absorbed by policy-makers and other stakeholders. The volume and breadth of changes taking place after the transition period would justify six to eight policy briefs a year. But our work suggests that changes will be most intense at the start of the post-Brexit period, requiring more work.

Overview reports and policy briefs could be accompanied by academic, peer-reviewed publications to generate impact within the research community, and by short and accessible audio or video presentations to build public understanding of the issues.

5 Conclusion

Leaving the single market and the customs union will mean a sharp break in historic trends that have shaped the health of people in the UK – from migration, to scientific research, to the medicines industry and to the rules governing food and pollution. It will be all the more important yet difficult to understand because it follows the extraordinary events of the Covid-19 pandemic. We will probably be debating the impact of this moment for decades, and its effects will keep expanding further as rules diverge and different agreements are shaped and reshaped around the world.

Three overall issues seem likely to stand out as we look back on this moment, and acknowledging them honestly should inform how leaders and policy-makers act over the coming months and years.

The first is our lack of understanding in the UK not just of the risks ahead, but even of the reality we began with inside the single market. The data on supply chains, workforce and life sciences are very far from giving us a full understanding of exactly how health in the UK has been dependent on and integrated with the rest of the EU. We hope that this report, through the generosity and insight of people we spoke to, has contributed at least to surveying which areas will be affected. The task for future work will be to actually monitor the readings from this dramatic national experiment, so that decisions in future are based on a better appreciation of how international relations affect health and the NHS.

Second, partly as a consequence of the lack of understanding, there is a lack of preparedness. Extensive national plans to tackle immediate disruption do exist but their assumptions and performance are difficult to ascertain. At a strategic level, there is no clear policy for what the UK intends to do with returning powers over medicines, products or environmental regulation; there is no workforce strategy that addresses the changing picture of migration; and there is no clear agenda for health in trade deals beyond the EU, even as they are being signed.

Third, many of the people we spoke to felt a sense of perilous uncertainty as a result of the limited picture of either what is happening or what is supposed to be happening. Policy-makers in Scotland and Wales are unclear what changes through the Internal Market Bill will actually mean for their powers over public health. The pharmaceutical and medical devices industries, hoping for a deal at the very last moment, do not know what will constitute a legal supply chain. Scientists do not know whether they will be eligible to bid for funding.

Even if the legal position becomes clearer, very important questions will remain:

- What kind of economic slowdown might be seen, with what sorts of effects on health?
- What UK governmental responses, and policies in the devolved nations/ administrations, might alleviate negative effects?
- Can the UK still compete as a global science and biotech power?
- What will governments not yet elected do with their powers to change regulation quickly and, potentially, unilaterally?
- How will new UK institutions interact with their various constituencies and stakeholders?

There are no reliable answers, in part because this process of legal secession has no real parallel among developed, interdependent countries. Our changing international relations will mean that protecting and improving health in the UK remains an unpredictable task long after the Covid-19 pandemic fades.

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We are grateful to the following people for their input to the various roundtables and interviews that were carried out during the research phase of this report.

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Acknowledgements

The authors would like to thank Dr Eleanor Brooks, Lecturer in Global Health Policy at the University of Edinburgh, and Nicholas Timmins, senior fellow at the Institute for Government and The King's Fund, for their time and their insights as external reviewers of this paper.

Glossary

BEIS	Department for Business, Energy and Industrial Strategy	UK
CAWT	Cooperation And Working Together	Northern Ireland/ Republic of Ireland
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership	Asian and South American countries, Australia
CTA	Common Travel Area	Republic of Ireland/ UK
DHSC	Department of Health and Social Care	UK
ECDC	European Centre for Disease Prevention and Control	EU
EFSA	European Food Standards Agency	EU
EHIC	European Health Insurance Card	EU
EMA	European Medicines Agency	EU
Eurostat	European Statistical Office	EU
EWRS	Early Warning and Response System	EU
FSA	Food Standards Agency	UK
GMC	General Medical Council	UK
HCPC	Health and Care Professions Council	UK
HMRC	HM Revenue and Customs	UK
IMB	Internal Market Bill	UK
MHRA	Medicines and Healthcare products Regulatory Authority	UK
NMC	Nursing and Midwifery Council	UK
RASFF	Rapid Alert System for Food and Feed	EU

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Published by the Nuffield Trust.
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ISBN: 978-1-910953-84-6

Design by Soapbox: soapbox.co.uk

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