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Nuffield Trust Risk Adjustment conference

Key messages

Event report

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The Nuffield Trust held a one-day conference in June 2011 on the development and application of risk adjustment tools. These tools are finding a variety of uses in the NHS, and have recently started being used to set budgets for GP practices and could be used by commissioning groups. Speakers included a number of world experts in this field from the US, UK and continental Europe. The conference began with an overview of risk adjustment methods and was followed by sessions on the new funding formula for the NHS in England, controversies in the field, and international perspectives on applying risk adjustment in practice.

Introduction to risk adjustment basics

Nuffield Trust Director, **Dr Jennifer Dixon,** opened the day with an overview of the different uses of risk adjustment, including:

- **resource allocation** (e.g. the Person-based Resource Allocation [PBRA] formula, which will allocate commissioning budgets to GP practices and clinical commissioning groups in England)
- **case finding** (e.g. Patients at Risk of Re-hospitalisation [PARR] and the combined model, which are used to identify patients who are high risk of an unplanned hospital admission in the next 12 months)
- **evaluation** (e.g. evaluation of the integrated care pilots and selected Partnerships for Older People pilots).

Professor Ian Duncan (University of California, Santa Barbara) then took on the unenviable task of providing a concise introduction to risk adjustment. In essence, risk adjustment allows researchers, actuaries and analysts to compare like with like. The most basic form of risk adjustment is to group people according to age and sex bands. In recent decades, however, risk adjustment has become far more sophisticated. Modern risk adjusters take account not only of age and sex, but also a range of other factors including medical diagnoses, socioeconomic deprivation and patterns of hospital use. Individuals allocated to the same risk-adjusted group are expected to make similar use of health care resources, allowing fairer allocation of resources and fairer comparisons to be made.

Professor Duncan presented a number of different risk adjustment models that are used in the United States (US) and other countries, and explained how the Society of Actuaries compares the predictive accuracy of the different models every few years using a test dataset.

He described the principal applications of risk models in the US, including:

- **reimbursement**, where the payment received by a health care providers is adjusted to reflect the complexity of the patient seen (*ex post* adjustment)

- **capitation**, where a health plan is given a fixed budget with which to provide health care to a population, such as a Medicare Advantage (*ex ante* adjustment)

- **case-finding**, where a disease management organisation provides preventive care to patients who are predicted to be costly to the insurer.

Person-based Resource Allocation (PBRA)

In the next presentation, **Professor Peter Smith** (Imperial College London) introduced the PBRA. This risk adjustment formula is being used to allocate funds to each general practice in England based on the expected needs of the practice population. This work was developed by a group led by the Nuffield Trust including people from the Universities of York, Manchester, New York, The London School of Hygiene and Tropical Medicine and a US company, Health Dialog. PBRA uses electronic data routinely collected at an individual level by NHS organisations, as well as some characteristics of the area in which the individual lives, to predict the expected cost of each individual's hospital care in the next financial year. Whilst relatively inaccurate at the individual level, when aggregated to the GP practice level, the latest version of PBRA is able to explain about 77 per cent of the variance in costs between practices.

Robert Shaw (Department of Health, England) then explained how the PBRA model is applied in practice, describing the practice-based commissioning toolkit (available at http://lpbcc.files.wordpress.com/2011/03/pbc-budget-guidance-1112.pdf) which enables PCTs to allocate their commissioning budget fairly across all general practices.

Between them, Professor Smith and Robert Shaw raised a number of considerations in respect to the use of PBRA in England:

- There is a need to ensure transparency of the methods used to develop and refine the formula, and for careful consideration of which variables to include in the final model. For example, a balance needs to be struck between including variables that may improve the model's accuracy and those which could potentially create perverse incentives – for example, including hospital attendance does improve the model's accuracy but might reward areas with inappropriately high historical rates of readmission.

- Considerable variations exist across practices in terms of their 'Distance From Target', i.e. how far their current budget differs from the budget determined by PBRA. Much of this variation is due to small practices (smaller practices have volatile costs) and highly specialised services (certain treatments, such as haemodialysis, can be very costly).

- We are moving away from the 'soft' budgets in the days of GP fundholding – where no financial risk was borne by the GP fundholder – towards 'hard' budgets, where clinical commissioning groups will have responsibility for overspends.

- However, too much exposure to risk may have untoward consequences: these include patients being treated inequitably, changes in clinical management over the course of the financial year, and 'cherry picking' patients who are likely to be low-cost.

Strategies will be needed to safeguard these hazards, including the pooling of small practices, excluding (or 'carving out') certain expensive conditions and making sanctions and rewards proportionate.

Topical issues in risk adjustment

After lunch, **Professor Randall Ellis** (Boston University) joined the conference via a live video link from Australia to present his experience of using risk adjustment for primary care provider payments. In the US, healthcare providers are often paid on a fee-for-service basis. This payment structure tends to reward the volume of services delivered rather than the overall quality of care, and may therefore encourage the over-use of services. Professor Ellis and colleagues have developed a new method for

calculating payments to non-hospital based providers that attempts to address this issue by setting:

(i) a capitated sum, called a Primary Care Activity Level (PCAL), based on an approximate level of resources needed to deliver high-quality care

(ii) a linked reward if results on certain criteria are better than expected.

The risk adjustment model developed by Professor Ellis and colleagues includes age, sex, Hierarchical Condition Categories, and the cost of laboratory tests and specialist services. When applied on a concurrent basis, i.e. to explain that year's cost profiles, the accuracy (r^2) of the model was 67 per cent at the individual level and 72 per cent at the practice level.

Next, **Professor Ian Duncan** (University of California, Santa Barbara) considered a number of controversies in applying risk adjustment in practice:

- Without adequate risk adjustment, health care providers may select patients based on their profitability, which manifests itself as three linked phenomena known as 'creaming, skimping and dumping'.[1] One example of creaming is the story, presumably apocryphal, of a health insurer only allowing prospective patients to register if they signed on in-person at a third-floor office in a building with no lift. In reality, such practices are constrained in the US through regulation and other approaches including reinsurance, pooling, gain-sharing and patient–provider management

- Health care providers are almost invariably concerned about under-funding, believing that the risk adjustment formula does not reflect their population sufficiently accurately. Known as the Lake Wobegon effect (where "all the women are strong, all the men are good-looking and all the children are above average"), this is the tendency to think that "my population is more risky" than that of my peers. Professor Duncan advised that reaction will be inevitable and should be expected, but keeping the risk adjustment formula simple and transparent can help with gaining trust in the methods used to determine allocations.

Simon Moody (Milliman UK Ltd) then gave a presentation on the challenges of introducing risk adjustment in a health system. Drawing on issues raised in some earlier discussions, he emphasised the need to address practitioners' concerns about the appropriateness of the model design, the variables included in the model, the need to prevent unintended consequences on patient care, and the importance of risk management in the implementation of risk adjusted resource allocation. He also

[1]Ellis RP (1998) 'Creaming, skimping and dumping: provider competition on the intensive and extensive margins', *Journal of Health Economics* 17(5): 537–555.

speculated about the intriguing possibility that health care organisations might look to external private insurance schemes to handle risk.

International perspectives

The final session of the conference was an opportunity to hear about how risk adjustment is being used in practice internationally.

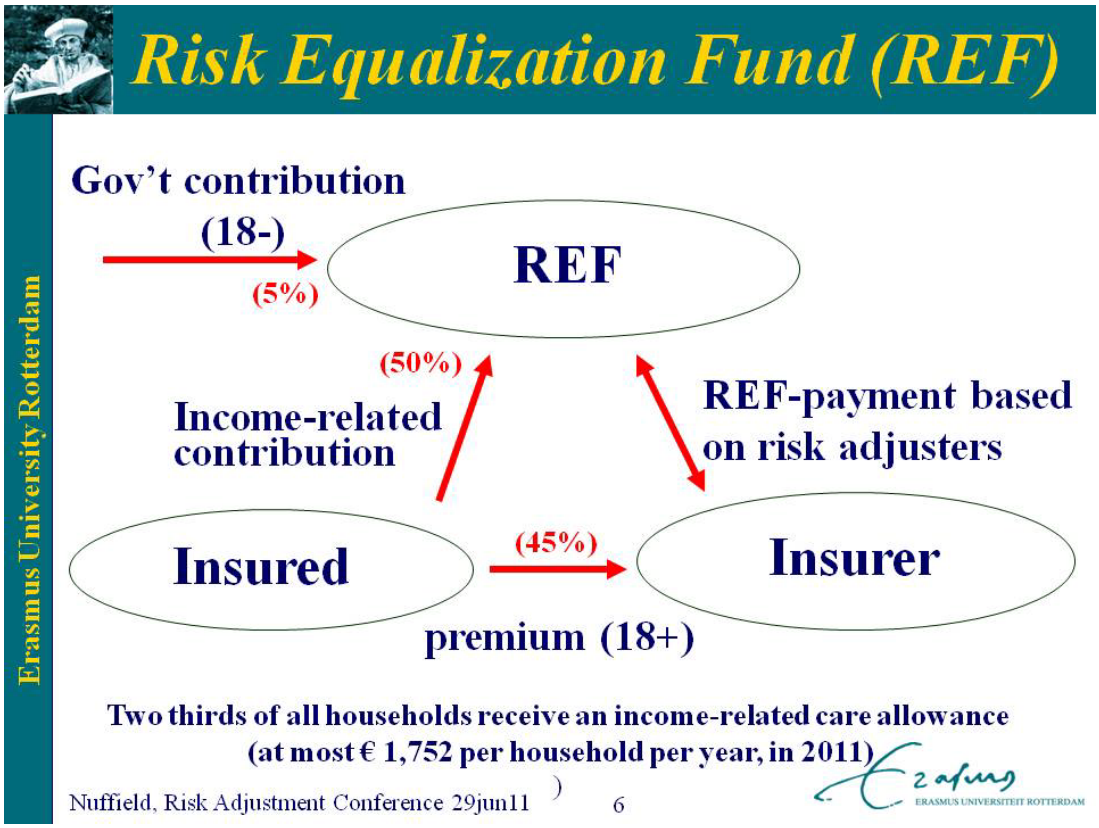
England

Professor Jonathan Weiner (Johns Hopkins University, Baltimore) discussed how risk adjustment models are improving efficiency in the UK and US. He presented an example of 'efficiency profiling', where primary care trusts (PCTs) in England who are using the Adjusted Clinical Groups (ACG) risk adjustment model are able to compare observed practice-level costs with the costs that would be expected by the model, based on the risk profile of the practice population. This method can be used to identify outlying practices, where additional discussions may be needed to understand why a particular practice appears to be significantly over or under budget, and any issues addressed.

The Netherlands

In the Netherlands, as in the US, risk adjustment methods are being used to remunerate insurers for the costs incurred by their patients. **Professor Wynand van de Ven** (Erasmus University, Rotterdam) began with an overview of the health system in the Netherlands, and explained the 2006 reforms that made it mandatory for individuals to have health insurance. These reforms, which amount to a form of regulated competition, depend centrally on risk adjustment to ensure affordability, with a community rating for each insurer so that health insurance costs the same to each patient regardless of their health status.

Figure 1: Risk equalization in the Netherlands

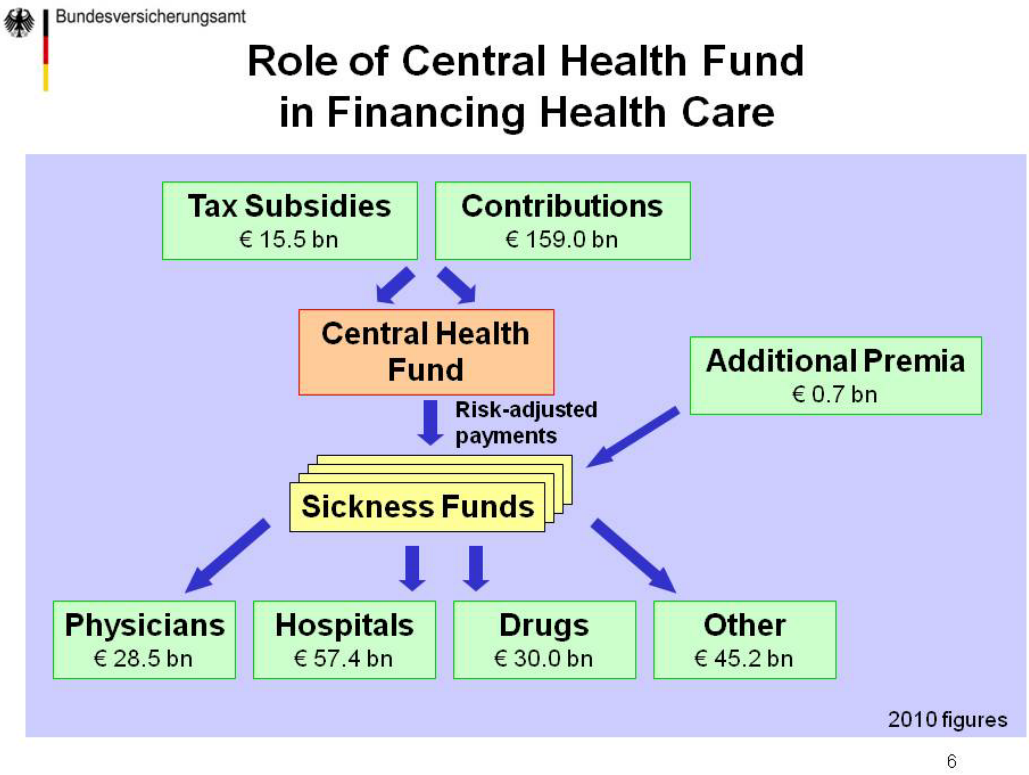


Financial risk for Dutch health insurers is held by a Risk Equalisation Fund (REF). This fund receives several sources of income, including contributions from individuals, and contributions from the Government for children (Figure 1). A risk adjustment model is then used to reimburse insurers from the REF, based on the characteristics of its patients including their age, sex, socioeconomic status, region, medications and diagnoses. As a result, if an insurer is more efficient than the national average then it should gain from this reimbursement system. In other words, the system is designed to reward insurers for greater efficiency. Professor van de Ven suggested that in England, clinical commissioning groups could be viewed as analogous to the health insurers in the Netherlands.

Germany

Risk adjustment methods have been used in Germany since 1996 to calculate payments to sickness funds. **Dr Dirk Göpffarth** (German Federal Insurance Agency) explained that there are two health insurance systems in Germany: a statutory system, which covers approximately 90 per cent of the population; and a private system for the remainder. German sickness funds operate under conditions of choice, open enrolment and community ratings. However, affluent patients may choose to take out private health insurance and opt out entirely of the national scheme.

Figure 2: The role of the Central Health Fund in Germany



Risk adjustment is used in Germany to calculate risk-adjusted monthly payments to insurers from a Central Health Fund (Figure 2). The formula is reviewed and adjusted each year and includes age, gender, disability to work and morbidity (limited to 80 disease states, for political reasons). The 2009 model had an r^2 (accuracy) of 25 per cent at the individual level.

For copies of the presentations and interviews visit:
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