Impact case study (REF3b)

Institution: Newcastle University
Unit of Assessment: 19
Title of case study: Addressing inequalities in health: Shaping the allocation of resources in the National Health Service

1. Summary of the impact

Findings from research at Newcastle on health inequalities and the basis on which economic decisions are made have informed the recommendations made to and adopted by the Secretary of State of Health. These recommendations influenced two specific areas of the National Health Service (NHS) budget allocation. Formulae developed by Wildman and his colleagues are of key importance in determining the allocation of the NHS's £8 billion prescribing budget and the £10.4 billion mental health services budget.

2. Underpinning research

Health inequalities and the allocation of resources

Professor John Wildman has played a leading role in research into the economics of healthcare provision since his appointment to Newcastle in 2002. His expertise is in the area of inequalities in health: how these inequalities might be explained and what might be done to address them through appropriate resource allocation. Reducing health inequality remains a priority for the Department of Health (e.g. Equality Objectives 2012 to 2016). Whilst overall levels of health in the UK are improving, this improvement has not been accompanied by reductions in the disparity between the levels experienced by different socio-economic groups. The allocation of NHS resources can play a large part in addressing this issue.

Addressing the 'aggregation problem'

The importance of Wildman's work lies in its having found a way of overcoming what economists refer to as the 'aggregation problem'. This refers to the fact that while individual level factors are important in determining an individual's health outcomes, their impact can be distorted if data is used from a higher level of aggregation (say, average health and average income at the regional level). Policy based on such calculations can also thus be misdirected. Additionally, the most recent research at Newcastle has developed a model which takes account of public opinion on the allocation of NHS resources **(1)**.

The research at Newcastle highlighted the issues with the data and calculations used to understand the relationship between individual health inequality and income (Grants 1-3). By testing a model based on the relationship between health and income using contemporary data, Wildman and colleagues showed that the results do not hold over time and that aggregation problems seem to persist despite the attempt to remove them **(2)**. In looking for the most appropriate method for testing the relative income hypothesis about the effect of income distribution on individual health, the research established the superiority of individual level studies over aggregate ones **(2)**.

Wildman's model provides a framework for the assessment of the effects of absolute income and income inequality on individual health, average societal health and health inequality. This is in response to deficiencies in existing measures which do not take income inequality into account in examining individual-level health **(3)**.

Developing new models

The research at Newcastle has shown that the causes of inequality are more complex than had been assumed **(4)**. Evidence of the complexity of the relationship between income and health inequality was demonstrated through the analysis of data from the British Household Panel Survey (BHPS). This provided robust evidence for the impact of income on self-reported measures of health for men and women, with the results also being resilient to the inclusion of measures of relative deprivation **(5)**.

The disaggregation method was further applied to the area of mental health. It was found that subjective financial status is a major determinant of ill-health and makes a major contribution to income-related inequalities. Relative deprivation is an important factor for women but not for men. Wildman's measurements have also shown that men still suffer from more income-related mental health inequalities than women and women suffer a higher absolute level of mental ill-health **(4)**.

3. References to the research

1. Baker, R., Wildman, J., Mason, H., Donaldson, C. (2013). 'Q-ing for health – A new approach to eliciting the public's views on health care resource allocation'. *Health Economics* DOI: http://dx.doi.org/.1002/hec.2914. (ABS List 2010 2*).

2. Wildman, J., Gravelle, H., Sutton, M. (2003). 'Health and income inequality: Attempting to avoid the aggregation problem'. *Applied Economics*, 35(9), 999-1004. DOI: http://dx.doi.org/10.1080/0003684032000056805 (ABS List 2010 2*).

3. Wildman, J. (2003). 'Modelling health, income and income inequality: The impact of income inequality on health and health inequality'. *Journal of Health Economics*, 22(4), 521-538. DOI: http://dx.doi.org/10.1016/S0167-6296(03)00003-1 (ABS List 2010 3*).

4. Wildman, J. (2003). 'Income related inequalities in mental health in Great Britain: Analysing the causes of health inequality over time'. *Journal of Health Economics*, 22(2), 295-312. DOI: http://dx.doi.org/10.1016/S0167-6296(02)00101-7 (ABS List 2010 3*).

5. Jones, A., Wildman, J. (2008). 'Health, income and relative deprivation: Evidence from the BHPS'. *Journal of Health Economics,* 27(2), 308-324. REF2 Output: 76784. DOI: http://dx.doi.org/10.1016/j.jhealeco.2007.05.007 (ABS List 2010 3*).

Health Economics and *Journal of Health Economics* are the top two ranked policy journals in the area of health economics (http://www.degruyter.com/view/j/bejeap.2005.5.issue-1/bejeap.2006.5.1.1520/bejeap.2006.5.1.1520.xml).

Table of Relevant Grants

	Principal Investigator(s)	Grant Title	Sponsor / Funder	Period of Grant	Value to Newcastle
1.	John Wildman	A new approach to measuring and decomposing health inequalities in Great Britain	British Academy	10/04-10/05	£3,300
2.	John Wildman	Investigating health inequalities in the UK	Leverhulme Research Fellowship	09/06-08/08	£21,127
3.	Steve Morris / John Wildman	Research on health inequalities	Department of Health	03/09–08/09	£5,241
4.	Matthew Sutton / John Wildman	Developing the NHS resource allocation formulae for mental health services and prescribing	Department of Health	01/10-06/10	£9,500
5.	Matthew Sutton / John Wildman	Developing the mental health funding formula for allocations to general practices	Department of Health	01/11–09/12	£18,000

4. Details of the impact

The quality and focus of the underpinning research at Newcastle has led to Wildman taking a prominent role in three commissioned projects with direct implications for government policy. The £95.6 billion NHS budget is split into four areas, namely acute care, health inequalities, prescribing and mental health services. It is distributed to bodies that provide health services across the country. Deriving the formulae for the allocation of these resources is highly significant in terms of reducing inequalities. In England, the Advisory Committee on Resource Allocation (ACRA) provides independent advice to the Department of Health on how central resources should be allocated. The Economic Advisor, Resource Allocation Team, Department of Health and NHS England commented as follows: *"Professor Wildman was a member of the research teams who undertook three studies funded by the Department of Health developing formulae for determining NHS funding allocations between local areas based on the relative need for health services…All*

three research projects were extremely useful" **(IMP1)**. Wildman's role in the impact of each of the three projects is now looked at in detail.

Health Inequalities Resource Allocation Formula
In 2010, ACRA commissioned research from a consortium of leading health economists to help the Department of Health deliver its strategic priorities of ensuring equal opportunity of access to health care and contributing to a reduction in health inequalities. According to the Chair of ACRA, Wildman made a *"distinctive and substantial"* contribution to the work of the consortium **(IMP2)**. This research was published in the form of a report to the Department of Health **(IMP3)** which informed policy debate and associated practice. The research contained in the report was subject to a process of refereeing undertaken by a Technical Advisory Group (TAG) comprising leading academic and policy-focussed economists.

A series of four adjustments were proposed to the health inequalities formula: 1) An adjustment to equalise use for people with equal needs; 2) An adjustment to achieve funding capacity for appropriately unequal use for people with unequal needs; 3) An adjustment for differences in input quantities across population groups; and 4) An adjustment based on the relationship between funding and health outcomes **(IMP3p148)**. These adjustments thus proposed a fairer distribution of resources, taking into account the needs and supply variables, and based on better population data. The Economic Advisor, Resource Allocation Team, Department of Health and NHS England commented: *"[This] project was welcomed by ACRA and is being used to consider longer term work by ACRA on how the formulae address health inequalities"* **(IMP1).**

Resource Allocation for Mental Health and Prescribing (RAMP)
Building on the health inequalities resource allocation formula, a further project was commissioned (Grant 4). The TAG and ACRA accepted the recommendations of the project team regarding both the resource allocation model for mental health services and the formula for prescribing **(IMP4).** Wildman and his colleague developed the prescribing formula, established the methods, organised the data and conducted the data analysis. Wildman developed a suitable model for use *"that contains plausible needs and supply variables… is robust to a variety of tests and has good explanatory power"* **(IMP4p30)**. The Economic Advisor, Resource Allocation Team, Department of Health and NHS England commented: *"[This project] was fully endorsed by ACRA and used for calculating part of the Primary Care funding allocations for 2011-12"* **(IMP1).**

The recommendations contained in the report were communicated by ACRA to the Secretary of State for Health, Andrew Lansley, in September 2010: *"ACRA recommends a new approach to the mental health component of the weighted capitation formula. The approach is a major step forward in how funding is allocated for mental health services"* **(IMP5p5)**. This letter recommended changes to the resource allocation formula in, among other things, health inequalities.

The Secretary of State replied in October, accepting the report's recommendations: *"I am pleased to inform you that I accept all of ACRA's recent recommendations"* **(IMP6p1)**. The calculations were put into practice in two Department of Health guidance documents **(IMP7p24, IMP8p6)** which included the statement that *"the 2011/12 toolkit introduces new methodologies for the Prescribing and Mental Health parts of the toolkit. This is based upon the results of the Resource Allocation for Mental Health and Prescribing (RAMP) project, which was developed as part of the methodology for PCT allocations"* **(IMP8p6).** The changes introduced in 2011/12 continue to provide the basis for resource allocation in these areas **(IMP2)**. Thus, as the Chair of ACRA confirmed, *"The work of Professor Wildman has had a significant and far-reaching effect on the allocation of resources in the NHS in the areas of mental health services and prescribing"* **(IMP2)**.

Person-based Resource Allocation Model for Mental Health (PRAM)
The third project involved the development a new method of resource allocation based on individual level data – PRAM (Person-based Resource Allocation Model for Mental Health) (Grant 5). The need for a new formula followed the continuing development of Practice Based Commissioning, where *"larger volumes of services are expected to be commissioned by organisations that serve larger populations, older populations, and populations with worse health and more socioeconomic deprivation"*, thus requiring more up to date equations for the basis of calculations **(IMP9p4)**. The recommendations were reported to ACRA in 2012 **(IMP9)**, and they in turn recommended to the Minister that the model be used **(IMP2)**.

The Economic Advisor, Resource Allocation Team, Department of Health and NHS England commented as follows: *"The third research project was also fully endorsed by ACRA and used to calculate components of the options for Clinical Commissioning Group (CCGs – the successors to PCTs) funding allocations … [The] research and formula are the starting point of NHS England's fundamental review of allocations"* **(IMP1)**. The Chair of ACRA confirmed the continuing impact of Wildman's work: *"In response to important social and demographic changes, PRAM has developed a new model on the basis of individual level data … Wildman is currently playing a key role in the development of a new method of resource allocation in mental health services"* **(IMP2)**.

5. Sources to corroborate the impact

IMP1) Testimonial from Economic Advisor, Resource Allocation Team, Department of Health and NHS England

IMP2) Testimonial from Chair of ACRA

IMP3) Department of Health (2010) Research on the health inequalities elements of the NHS weighted capitation formula, commissioned by ACRA, Resource Allocation Research Paper (RARP) 36. Available at: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122620.pdf (accessed 07/08/13).

IMP4) Department of Health (2010) Report of the Resource Allocation for Mental Health and Prescribing, commissioned by ACRA, RARP 35. Available at: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122619.pdf (accessed 06/08/13).

IMP5) Letter from Chair of ACRA (David Fillingham) to Secretary of State for Health (Andrew Lansley), September 27 2010

IMP6) Letter from Secretary of State for Health to Chair of ACRA, October 11 2010.

IMP7) Department of Health (2011) Resource Allocation: Weighted Capitation Formula (Seventh Edition). Available at: https://www.gov.uk/government/publications/resource-allocation-weighted-capitation-formula (accessed 07/08/13).

IMP8) Department of Health (2011) Practice-based commissioning: budget guidance for 2011/12 Methodological changes and toolkit guide. Available at: https://www.gov.uk/government/publications/practice-based-commissioning-budget-guidance-for-2011-12-methodological-changes-and-toolkit-guide (accessed 07/08/13).

IMP9) Sutton, M., Kristensen, S., Lau, Y-S., Glover, G., Whittaker, W., Wildman, J., Gravelle, H., and Smith, P. (2012). 'Developing the Mental Health Funding Formula for Allocations to General Practices Phase 3: Estimation of a formula based on person-level data'. Commissioned by ACRA. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213333/ACRA201218A-Developing-the-Mental-Health-Funding-Formula-For-Allocations-to-General-Practices.pdf (accessed 07/08/13).