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Estimating spending on health promotion and public health in Wales

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June 2009

Introduction

Preventive activities have over time produced significant improvements in the health of populations¹ and secured impressive rates of return for investment.^{2,3,4} However, the question that tends to be focused on is whether prevention is more efficient than cure and the extent to which preventive schemes can exert downward pressure on the utilisation of other health care facilities and on subsequent costs. It has been estimated, for example, that preventable illness constitutes approximately 70% of the burden of illness and associated costs⁵ and therefore the incentives to utilise health promotion and preventive measures for such a purpose are obviously attractive. Health care systems can be likened to the course of a river, from the relative simplicity of its structure and form at source to the complexity, magnitude and power at its confluence with the sea. Along its course of its journey, it is influenced by many factors, while the river itself also has an effect on the communities and areas through which it flows. The same is true of health care systems. As patients enter the system and present with their health care problems, their interaction with health care professionals is relatively straightforward and simple to comprehend. However, the further they journey through the system the degree of complexity intensifies, with many obstacles and problems to negotiate. As the patient reaches the hospital the patient is subjected to an entirely different environment, just as the river is subjected to the tidal flows and other effects as it joins the sea.

What is also evident is that there is a direct correlation between the costs of dealing with health care problems and the location of the patient in the health care system – in simple terms hospital costs are significantly greater than primary care costs, which means that it is much cheaper to ‘fish patients out of the NHS river’ nearer its source than when it enters the sea. To extend the analogy further, it is probably more efficient to prevent the patient from falling into the river in the first place. However, health systems like lifeboats are geared up to rescue those who succumb, not attend to those at risk of drowning on dry land.

The question to address therefore is whether allocating resources to preventive activities will generate a return to society in terms of improved health and reductions in disabilities and premature deaths. As with all areas, there will be some schemes that prove to be a waste of scarce resources, while others are highly efficient in securing large scale benefits from the resources invested. The evidence base for the cost-effectiveness of preventive measures is not

¹ CDC (Centers for Disease Control and Prevention). Ten great public health achievements – United States, 1900-1999. *Morb Moral Wkly Rep* 1999; 48: 241-43.

² Phillips CJ, Prowle M. Economics of a reduction in smoking: case study from Heartbeat Wales. *J Epidemiol Community Health*, 1993; 47: 215-23.

³ Culter D, Miller G. The role of public health improvements in health advances: the 20th century United States. National Bureau for Economic Research (NEBR), 2004. Available at: <http://www.nber.org/papers/w10511>

⁴ Access Economics for Department of Health and Aged Care. Returns on investment in public health — an epidemiological and economic analysis. Canberra: Department of Health and Aged Care, 2001. Available at: <http://www.applieconomics.com.au/pubs/reports/health/ph00.htm>.

⁵ Fries, JF et al. Reducing health care costs by reducing the need and demand for medical services. *New England Journal of Medicine*, 1993; 329: 321-325.

extensive⁶ with a wide range of estimates being offered for various schemes,⁷ which highlight the need for further work and research in these areas.

There is growing interest in the potential for preventive interventions to improve the average health status of people in countries and to tackle health inequalities that exist within and across countries. The interest is in a wide range of interventions that span not only health services, but also measures to influence behaviour and lifestyles and action to improve the contribution of the social, economic and physical environments to health. These interventions have been referred to as examples of a government's 'population health investment' effort.⁸

However, in order to establish the degree to which returns are secured on investment it is necessary to establish exactly what the level of investment is. Recent events such as emerging and re-emerging infectious diseases associated with increased globalization; breakdowns in the infrastructure that protect the food, water, and blood supplies; and increased awareness of the downstream effects of unhealthy lifestyle choices have focused attention on the investments made by governments and government agencies on public health. Policy makers and researchers who need to track the level and change in investments in public health often look to a country's health accounts as a source of this information. With the emergence of public health, and more specifically, of prevention, as an increasingly important function of healthcare, national health expenditure accountants have been faced with the challenge of updating the definition of public health to reflect current concepts and develop data sources that support them. Although public health professionals may understand the concept of public health in its broader sense, the concept is not necessarily recognised used by those responsible for the accounting and funding of public health programmes. In some countries, e.g Canada⁹ and the US¹⁰, this issue is being addressed through the re-definition of 'public health' and the reclassification of expenditure data in the National Health Accounts that is broad enough to encompass the revised definitions and provide meaningful insights into the trends of expenditure on public health.

The three related projects that are the subject of this investigation have been developed with the aim of moving towards a clear estimate of prevention spending within Wales that can be used for comparative purposes by exploring methodological and conceptual issues that can assist in the process.

⁶ de Bekker-Grob EW, Polder JJ, Mackenbach JP, Meerding WJ. Towards a comprehensive estimate of national spending on prevention. *BMC Public Health*. 2007; 7: 252.

⁷ Tengs TO, Adams ME, Pliskin JS, Safran DG, Siegel JE, Weinstein MC, Graham JD. Five-hundred life-saving interventions and their cost-effectiveness. *Risk Anal*, 1995;15: 369-90.

⁸ Bennett J. Investment in population health in five OECD countries. *OECD Health Working Papers No.2*. Paris: OECD, 2003.

⁹ Ballinger G. Refining estimates of public health spending as measured in National Health Expenditure Accounts: The Canadian experience. *Journal of Public Health Management Practice*, 2007; 13: 115-20.

¹⁰ Sensenig AL. Refining estimates of public health spending as measured in National Health Expenditure Accounts: The United States experience. *Journal of Public Health Management Practice*, 2007; 13: 103-14.

Study 1: developing an estimate of prevention expenditure in Wales for comparative purposes

Introduction

Preparatory work has already been undertaken to assess the extent of prevention spend in Wales, which estimated that the total spend from WAG DHSS budgets on prevention and public health for 2008 -09 was £103,118,550, which is 1.92% of the total DHSS budget¹¹. However, this was acknowledged to be an initial attempt at producing such an estimate and was to be treated with considerable caution.

This project has its origin in the recommendations made in the WAG internal report, where it was suggested that a methodology be developed to generate a more accurate estimate that can be used to compare expenditure trends over time.

Aim

The aim of this study is therefore to develop an estimate of prevention expenditure in Wales that can be used for comparative purposes.

Approach

Following discussions with relevant WAG staff, a review of the literature was undertaken and internet searches conducted to identify approaches used to determine levels of expenditure on prevention and public health. Search terms included prevention, health promotion, public health, expenditure, spending, financing mechanisms and funding.

A general internet search via Google was conducted using the same terms and specific web sites were trawled and subsequent links explored to identify relevant studies, reports and materials that contained evidence of useful classifications of health expenditure that include prevention, health promotion and public health.

Discussions with key WAG staff have also been undertaken to discuss methodological and conceptual issues relating to the study and how best these can be dealt with. Such methodologies and approaches will then be applied to relevant financial records from WAG, NHS Wales, LHBs and other agencies' to arrive at a provisional estimate that will then be used for comparison with other healthcare systems.

Results

The literature search and internet search produced useable references from a number of different countries – which were read to establish definitions of what prevention encompassed and expenditure classifications that were included within estimates of prevention spending. In addition, the studies were further investigated to identify potential methodologies to be considered for developing an estimate of prevention spend within Wales. The classifications of expenditure headings included within public health/prevention schemes were noted and were passed to relevant staff at WAG/NHS Wales to determine whether appropriate data and information was available for Wales.

¹¹ WAG Personal communication

Definitions of prevention

The notion of prevention is inextricably linked with public health, and is often viewed as a specific component of public health, which in itself has an array of definitions associated with it. For example, it has been defined as “the science and art of *preventing* disease, *prolonging* life and *promoting* health through the organised efforts of society,”¹² while Wanless defines public health as “the science and art of *preventing* disease, *prolonging* life and *promoting* health through the organised efforts and informed choices of society, organisations, public and private, communities and individuals.”¹³ The three ‘Ps’ of preventing, prolonging and promoting are writ large in the above definitions, but it is evident that the Wanless approach is relatively far reaching than conventional textbook approaches, in being explicit that efforts of individuals and communities and of private and public bodies should be included.

The OECD has developed a System of Health Accounts (SHA)¹⁴, which provides a standard framework for producing a set of comprehensive, consistent and internationally comparable accounts to meet the needs of health analysts and policymakers. Here, “prevention and public health” is defined as:

“services designed to enhance the health status of the population as distinct from the curative services, which repair health dysfunction. Typical services are vaccination campaigns and programmes.” The definition also includes “activities of health care comprising the sum of activities performed either by institutions or individuals pursuing, through the application of medical, paramedical and nursing knowledge and technology the goal of promoting health and preventing disease (p.121)”.

This definition is broad in the sense that it includes work done by individuals as well as public and private institutions. However, it focuses on “services” and “activities of health care” and does not include other aspects of prevention such as government taxation and regulatory policies e.g. tobacco, environment, housing, education, etc. Some of the areas that are not included are included under “health-related functions” and could be added to the data on prevention, including food, hygiene and drinking water control and environmental health.

Another OECD report¹⁵ categorises “prevention” into three main areas:

- Public health – “the systematic and organised responses of society to protecting the health of its population including disease surveillance systems, workforce development of public health officers, legislation and regulation, taxation and pricing policies, intelligence and research activities to monitor and identify emerging issues and potential health threats and patterns and trends in health status and

¹² Nutbeam D. Effective health promotion programmes. In Pencheon D, Guest C, Melzer D et al. Oxford Handbook of Public Health Practice. Oxford: OUP, 2007.

¹³ Wanless D. Securing our future health: Taking a long-term view. HM Treasury, 2002.

¹⁴ OECD. A system of health accounts. OECD, 2000

¹⁵ Bennett J. Investment in population health in five OECD countries. OECD Health Working Papers No.2. OECD, 2003

interventions such as organised population wide prevention and early detection services.”

- Population health – “looks at and acts upon the broad range of factors and conditions that determine health....explicit acknowledgement that socioeconomic conditions and the social and physical environment are key in determining people’s health and wellbeing action across many sectors such as education and social support are necessary...”
- Health promotion – “broad range of interventions and programs designed to promote health and well being. While these may focus on behaviours and lifestyle and individual change, the approach goes much further than this....includes advocacy for change, community development and support, and acknowledgement of the benefits of working in settings such as schools and workplaces and in collaboration across sectors. acknowledges the social, economic and political context in which people make lifestyle choices.”

The report also discusses the range of measures that are effective in “promoting wellbeing and good health and preventing illness and injury” which include:

- health education
- community participation
- policy development and co-ordination
- taxation and pricing policies
- regulation and mandating activities
- finance
- information and education
- research

and provides a much more comprehensive definition of prevention than in its System of Health Accounts. However, although the report set out to investigate spend in these areas it was unable to measure spend in any of the five countries looked at, even when focussing down on specific problems such as alcohol and falls in the elderly. This suggests that the definition may be too broad to be practical in measuring spend.

However, it does highlight the fundamental issues that must be included in any definition relating to ‘prevention:’

- Health promotion activities that target major risk factors of disease at a population level through efforts to change behaviour e.g. smoking, nutrition, physical activity, sexual behaviour, etc.
- Preventive care such as vaccination, screening and prenatal care (organised population-directed services)
- Primary health care such as blood pressure checks, counselling re smoking cessation, etc (services offered to individuals for prevention)

Health promotion has also been used as an umbrella term for three spheres of activity, namely health education, health protection and prevention. This stresses that education and

regulatory/protective roles are as important in promoting health and wellbeing as activities that are specifically defined as “prevention” such as immunisation and screening¹⁶. Although, the above definitions are helpful in that they are comprehensive and indicate the breadth of areas that should or could be included in this work, they are not very detailed or specific and hence present difficulties in helping to clearly define areas for data collection with respect to spend on prevention.

Specific definitions relating to prevention offer greater specificity in this regard. For example, prevention has been defined as the process of “reducing the risk of disease, premature death, illness or disability or any other undesirable health event.”¹⁷ Furthermore, it includes primary, secondary and tertiary prevention as described below:

- Primary prevention
 - Aims to prevent the onset of disease by altering some factor e.g. in the environment, behaviour, etc. which covers, for example, immunisation programmes.
- Secondary prevention
 - Aims to halt the progression of disease once established by early detection followed by prompt effective treatment. This covers, for example, screening programmes.
- Tertiary prevention
 - Aims to rehabilitate people with established disease to minimize residual disabilities and complications and improve quality of life.

This is a well-known and accepted definition of prevention. Whilst being broad, it is more detailed and is useful in ensuring that the different aspects of prevention are included in this work – a feature that will occupy the third study of this report.

One of the most detailed structures available for the type of analysis required to estimate prevention spend is that provided by Health England¹⁸, where the OECD Health Accounts have been elaborated upon to provide a potentially useful framework for conducting the exercise. This is shown below:

- Maternal and child health; family planning and counselling
 - Maternity services
 - Family Planning Clinics
 - Contraceptives
 - Neonatal audiological screening
 - Quality and Outcomes Framework
- School health services
 - Healthy Schools Programme
- Prevention of communicable diseases
 - Immunisation

¹⁶ Downie R, Fyfe C, Tannahill A. Health promotion – models and values. Oxford: OUP, 1990.

¹⁷ Donaldson RJ, Donaldson LJ. Essential public health medicine. Oxford: Petroc Press, 2003.

¹⁸ Health England. Prevention and preventative spending. Health England Report No. 2, 2009.

- Other infectious diseases
- Quality and Outcomes Framework
- Reducing MRSA incidence
- Prevention of non-communicable diseases
 - Pharmaceuticals
 - Quality and Outcomes Framework
 - Dental check-ups
 - Screening programmes
 - Sight tests
 - Obesity/diet/lifestyle
 - NHS Stop Smoking Services
 - NICE Public Health Guidelines
 - CJD surveillance
- Occupational health care
 - Occupational Health for Dentists
 - Quality and Outcomes Framework
- Other miscellaneous public health services
 - Health Protection Authority
 - NHS Blood & Transplant administration
 - Publicity for prevention activities
 - National Biological Standards Board
 - Public Health in Prisons
- Health-related functions
 - Environmental Health Services (by LAs)
 - Food safety measures (by LAs)
 - Food Standards Agency
 - Healthy Start / Welfare Foods

This would appear to represent a useful point of departure for assessing the extent of prevention spend in Wales. However, the current configuration of expenditure reporting in Wales has made it difficult to populate the above framework, while some of the categories are not pertinent to Wales, which has different programmes and organisations.

Therefore, the subsequent section poses an estimate of the prevention spend in Wales, with a view to being comparable with that of other countries.

Towards an estimate of prevention spend in Wales

While there are many similarities in the budget headings of the Health England framework, there are also a number of differences and irrelevant categories. It is therefore recommended that an appropriate framework be developed for Wales and that current budget heads – such as those, for example, presented under the Programme Expenditure by Division - be re-classified to correspond with the agreed framework for Wales.

Previous work had estimated that the total spend from WAG DHSS budgets on prevention and public health for 2008 -09 was over £103 million, which is 1.92% of the total DHSS

budget. Although this was acknowledged to be an initial attempt at producing such an estimate and was to be treated with considerable caution, it was based on figures obtained from WAG and which have also been made available to the researchers. However, in the WAG Consultation Paper on the Unification of Public Health Services in Wales¹⁹, an estimate of the total budgets of the five organisations that are likely to comprise the new Unified Public Health Organisation – Wales Centre for Health, National Public Health Service for Wales (NPHS), Welsh Cancer Intelligence and Surveillance Unit, Screening Services Wales, Congenital Anomaly Register and Information Service and Welsh Blood Service – amounted to an estimated £105 million per year. Some aspects of the expenditure incurred by the above bodies were included in the original estimate of £103 million, but it has not been possible to ‘validate’ the levels of expenditure between WAG provided data and the information in the relevant NHS accounts. For example, the NPHS is hosted by Velindre NHS Trust and for which an income figure of £43.4 million is indicated in the Velindre NHS Trust Annual Report²⁰ to reflect the service level agreement with WAG, whereas in the original estimate²¹ a sum of £19 million was derived from DHSS budget to reflect NPHS core funding – a difference of £24 million. Four of the six bodies identified as comprising the new Unified Public Health Service are hosted by Velindre NHS Trust – which received the sum of over £141 million from long-term agreements and service level agreements with WAG, Health Commission Wales and LHBs. It is acknowledged that not all of these funds are specifically for prevention or indeed public health per se, but the implication is that the original estimate based on WAG figures, is likely to represent a significant underestimate.

The prevention of non-communicable diseases represents the largest category of expenditure in the Health England report²², representing 64% of the total, with the next highest category being maternal and child health. This latter category was not included within the original estimate for Wales, but with expenditure of £178.4 million in 2006-07²³, further work is recommended to ascertain the extent to which this expenditure falls within the categories outlined above.

The prevention of non-communicable diseases category is also difficult to populate given current accounting structures. The largest component of this category is that of pharmaceutical expenditure. The issue of whether pharmaceuticals should be considered as part of prevention spend has been debated in the Health England report²⁴, since OECD accounts do not include pharmaceuticals, and therefore estimates including and excluding pharmaceuticals have been presented. In the original estimate a figure of nearly £17 million was included for drugs, but more recent data provided by WAG for expenditure relating to aspirin, thiazides and related diuretics, angiotensin-converting enzyme inhibitors, calcium-channel blockers, beta-adrenoceptor blocking drugs and lipid regulating drugs amounted to £79.6 million²⁵.

¹⁹ WAG. Unification of Public Health Services in Wales: Consultation Paper, January 2009

²⁰ Velindre NHS Trust Annual Report 2007-08.

²¹ WAG Personal Communication

²² Health England op cit

²³ WAG stats

²⁴ Health England op cit

²⁵ WAG stats

Another significant component is that accounted for by the Quality and Outcomes Framework (QOF). In Wales, expenditure relating to QOF was £64 million, with the average payment for each QOF point being £124.60²⁶. Assuming a similar proportion of 'preventative points' as in England (as agreed by NPHS/WAG staff) would result in a spend of £29 million in Wales.

Taking into consideration some of the additional data and amendments provided by WAG results in a provisional revised estimate of prevention spend in Wales as shown in Table 1. The extent to which these additional amounts can be allocated to prevention spend is subject to many factors, not least of which is the degree of spend on services as opposed to administration etc. The proportions allocated are therefore based on assumptions that have been given a limited amount of validation by 'experts' but further validation is recommended. Therefore, the same caveats as presented in the original estimate remain and this revised estimate should also be treated with considerable caution.

²⁶ WAG stats

TABLE 1: Revised Estimate of Prevention Spend

Programme name	Original Estimate (£'000)	Revised Estimate (£000)
Wales Centre for Health	1,308	1,308
FSA Programme	3,502	3,502
Health Protection Agency	488	488
Disease Control and Prevention (a)	475	475
Immunisation Cover (b)	4,012	4,012
Pandemic Flu	1,800	1,800
Public Health Special Initiatives	76	76
Family Health Services Publications	1	1
Cancer Registry	755	
Implementing Vaccination HPV	4,501	4,501
Central Information (CMO)	51	51
Inequalities in Health Fund	6,247	6,247
Health Challenge Wales	9,525	9,525
Marketing Budget for Health Challenge Wales	459	459
Welsh Health Survey	572	572
Health Promotion Programme	3,095	3,095
Tobacco Control White Paper	1,698	1,698
Food in Schools	1,541	1,541
Breast Feeding Co-ordinator	36	36
Total	40,142	39,387
DRC budgets		
Total DRC budget	6300	6300
Less Health Professionals not prevention/public health	1200	1200
Total	5100	5100
DHSS budgets		
NPHS Core funding	19000	32577
Vaccination programmes	0	0
Primary Care	639	639
Dental Contract	3891	3891
GMS contract	13278	29000
Ophthalmology	785	785
Pharmacy	3343	3343
Drugs	16942	59700
Total	57877	129934

Revisions

Screening services		18907
Cancer intelligence and surveillance		31777
Maternal and child health		55000
Total prevention/public health spend	103119	312682
Total prevention/public health spend per capita	34.77	105.43
Percentage of DHSS budget spent	1.92	5.84
Percentage of DHSS budget spent (exc pharmaceuticals)	1.61	4.72

The estimated amount spent on prevention in Wales therefore amounts to £105 per head in Wales. The percentage bears comparison with those produced by Health England, where just over 5% of health expenditure was directed towards prevention – 3.6% when pharmaceuticals are excluded.

Conclusion

In order to more accurately reflect expenditure on prevention the system of accounts needs to be amended where that the basic framework of the OECD Health Accounts are used as the basis of a system applicable for Wales. Until this system is in place it would be extremely difficult to establish any pattern that could be used for comparative purposes either over time or against proportions devoted to prevention spending in other countries and systems. This should be considered alongside developments in relation to the DPHHP Dashboard model that is currently being developed within WAG and also as moves are put in place towards establishing and operationalising the Unified Public Health NHS Trust in Wales.

Study 2: establishing a mechanism for establishing expenditure on public health from the wider WAG budgets

Introduction

The preparatory work undertaken to assess the extent of prevention spend in Wales was limited to expenditure from within the WAG DHSS budget and the revised estimate undertaken as Study 1 above did not consider prevention spend from other areas. This might be termed indirect prevention spend, since the primary purpose of the expenditure might not be for prevention or the role of the organisation is separate from the health service.

A study from the Netherlands²⁷ has clearly demonstrated the differential between what could be considered as direct prevention spend and indirect prevention spend, with an estimate of €139 (in 2003) for direct prevention spend generated from health accounts and an estimate of €769 (in 2003) for total prevention spend – including indirect spend generated from assessing relevant expenditure in other areas/agencies relating to prevention of health problems. The classification employed in the Netherlands study was:

- Health protection
- Disease prevention
- Health promotion

which does not differ from some of the classifications highlighted in Study 1 but which has embraced spend from other sectors and organisations.

Aim

The aim of this study is therefore to establish a mechanism for establishing expenditure on public health from the wider WAG budgets and other agencies whose activities might impinge on prevention of health problems.

In order to arrive at such a mechanism it is necessary to distinguish between what might be termed direct expenditure on prevention and public health and indirect expenditure – which arises where public expenditure schemes have a ‘health factor’ attached to them and contribute towards enhancement of health, e.g in relation to programmes in economic development, education, environment and housing, injury prevention, poverty and social exclusion and sport and exercise, but which do not have public health as their primary objective.

Approach

Discussions with officials from relevant WAG departments were carried out to identify budget heads and expenditure streams that clearly have health promotion and public health as the aim – the direct expenditure component. It was also intended to engage with a panel of public health experts (drawn from academia, voluntary sector and the profession) to identify public expenditure schemes that might have a ‘health factor’ attached to them – the indirect component. Discussions were held with NPHS, WAG and Welsh Local Government Association (WLGA) staff to ascertain the extent of public health spend from other budgets.

²⁷ De Bekker-Grob EW, Polder JJ, Machenbach JP, Meerding WJ. Towards a comprehensive estimate of national spending on prevention. *BMC Public Health*, 2007; 7: 252.

A review of local authority budget returns was conducted and areas of revenue expenditure that contained a possible 'health factor' were identified and the magnitude of the 'health factor' for each identified area classified and the proportion of the total expenditure that could be attributed to the 'health factor' for each of the groups arrived at. Furthermore, published documents arising out of joint initiatives developed by local authorities, local health boards and other agencies, e.g local Health and Wellbeing Strategies, were scrutinised to ascertain the extent of expenditure that could be apportioned to the public health arena.

Much of the analysis in this section was based on work undertaken by WLGA – entitled Valuing our Activity²⁸ - “to fully understand and quantify local government’s contribution to health” - defined as “activity that has as its primary purpose, the prevention or management of accidents, injury, chronic or acute ill health, death or the transmission of disease.”

Discussions with WAG related to the development of the DPHHP Dashboard²⁹ – linked into the strategic objectives of WAG and the relationship between expenditure and outcomes. It was suggested that the Public Expenditure Statistical Analysis³⁰ might also provide a useful structure for analysis. While the concept was relevant and would offer an appropriate methodology for generating an estimate of prevention spend across budgetary and departmental heads, in its current form it was not sufficiently specific in the health area to enable anything other than generic health spend to be identified. The same problem was evident in relation to the DPHHP dashboard and until expenditure data is available at a 'lower' level in terms of prevention, public health, etc. it does not offer a way forward in its current iteration, but with further developments has considerable potential in developing an indicator of spend on prevention and other healthcare areas.

The Health England report³¹ also included an estimate of charitable spend on prevention and public health. The methodology employed is highlighted in the report where expenditure from 36 UK charities identified as being involved in preventive activities was allocated to England on a proportionate basis linked to relative population. In this report, the charitable spend from these charities will be allocated according to the Welsh proportion of the total UK population.

Results

Review of Local Authority Budgets

The WLGA report (dated 2004)³² suggested that from data gathered by 16 of the 22 local authorities in Wales (and a population of 2.2 million) the amount of spend on “the prevention or management of accidents, injury, chronic or acute ill health, death or the transmission of disease” amounted to £934 million – and represented 38% of total

²⁸ WLGA Valuing our Activity. Unpublished – personal communication with WLGA

²⁹ WAG personal communication

³⁰ http://www.hm-treasury.gov.uk/pespub_pesa08.htm

³¹ Health England op cit

³² WLGA op cit

expenditure. The proportion of total expenditure that was reported as being on health activity for each domain was:

- Social Care – 52%
- Corporate – 1%
- Education – 11%
- Environment – 13%
- Housing – 16%
- Leisure – 5%
- Public Protection – 2%

In addition, the study reported on the extent to which health activity spend was delivered through partnership working, which included involvement with LHBs and NHS Trusts. Therefore, to avoid any notion of ‘double-counting’ the proportion of spend has been adjusted to exclude the proportion spent as part of partnership working with these health organisations. The results are as below:

- Social Care – 45%
- Corporate – 0.7%
- Education – 8%
- Environment – 12%
- Housing – 13%
- Leisure – 4%
- Public Protection – 2%

The proportion of total spend that involved no partnership working in each of the domains was:

- Social Care – 7%
- Corporate – 0.03%
- Education – 2%
- Environment – 5%
- Housing – 1.5%
- Leisure – 0.15%
- Public Protection – 1%

Applying the above proportions to the net expenditure of local authorities in Wales results in spend of £1.1 billion (£381 per head) when the attribution factor was not adjusted, which is 18% of total net expenditure by LAs in Wales; £940 million (£318 per head) when the attribution factor excluded any partnership working with health organisations; and £185 million (£62 per head) when the attribution factor was based only on actual local authority spend with no involvement with other organisations.

There is obviously some way to go in developing such an approach – the LA report indicates that 38% of total spend related to health (as specified) – but the greater need is for data and information to be made available to inform the methodology. It is known that further work is being conducted in this area related to the unification of the national public health service in Wales and it is recommended that this be integrated with the developments taking place aiming to relate expenditure streams to WAG strategic goals and objectives.

Charity giving

The Health England report³³ estimated that £33.6 million was spent by charities on prevention in England. If the same methodology was applied to Wales the amount of spend by charities would amount to £1.98 million.

In addition, consideration should also be given to individual and household expenditure on prevention and health promotion – for example, membership of gyms and sports clubs, expenditure on exercise equipment and outdoor activities, etc. This has not been possible within this study but, in order to determine the actual amount of expenditure on prevention within Wales, such expenditure would need to be included.

Conclusion

If the estimates from Study 1 and Study 2 were merged the total expenditure on prevention in Wales would be somewhere between £440 million (roughly 8% of total WAG health expenditure) and £1.5 billion (roughly 25% of total WAG health expenditure) – which emphasises the lack of precision and the need for further developments in accounting and reporting procedures, as highlighted in Study 1.

Interestingly, the percentages bear comparison with those reported in the Netherlands study, where the percentage that was directly incurred by healthcare was 4.3% whereas total prevention spend represented 23% of total health spending.³⁴

The message from this exercise is that these remain estimates, with considerable uncertainty attached to them. They represent an initial attempt at producing a percentage of total expenditure that can be attributed to prevention, but the attribution rates that are attached to budget heads are subject to high degrees of subjectivity and should be treated with considerable caution.

³³ Health England op cit

³⁴ De Bekker-Grob EW, Polder jj, Machenbach JP, Meerding WJ. Towards a comprehensive estimate of national spending on prevention. BMC Public Health, 2007; 7: 252.

Study 3: develop a health programme approach by identifying relevant expenditure streams and attributing them to each stage of the health-production cycle in a particular area of healthcare

Introduction

This study suggests ways in which programme budgeting could be developed to support strategic decision making and priority setting for health and care in Wales. It uses as an example the prevention, diagnosis, management and treatment of Type 2 Diabetes and its complications. It is based on consultation with senior Welsh Assembly Government staff, a rapid review (5 days) and consultation with colleagues. A National Service Framework for Diabetes³⁵ and a delivery strategy for adults³⁶ and children have been developed for Wales. NHS expenditure has been analysed by broad programme budgets³⁷ including expenditure on direct provision of Diabetes treatment in the acute sector. This review builds on these foundations to show how programme budgeting could be developed to address broad health programme objectives as well as specific issues of priority setting for interventions in relation to Type 2 Diabetes.

In the language of Diabetes planning, the review attempts to show how programme budgeting analysis could support decisions about the planning and design of diabetes services at each level of care³⁸ including national decisions about the service framework and local decisions about priorities and implementation. The review suggests a development route for programme budgeting from current Expenditure Programme Budgets (EPB) and National Service Frameworks (NSFs) recognising that programme budgeting is not an end in itself but a tool to support decision making. Since it will be complex and perhaps costly to develop such a tool it is important to demonstrate the costs and benefits in relation to a practical example.

Programme budgeting is described and where possible illustrated at four levels: first as a system wide assessment of the balance of investment in major fields of health in relation to common goals and objectives. This approach uses research sources and analysis to assess programmes of prevention, diagnosis, management and treatment and their impact on and costs to the NHS and co-producers of health over the long term. This is illustrated for Type 2 Diabetes, please see Annex 1 for limitations on estimates.

Second; programme budgeting is described as a support for national and generic decisions about the design of services. This requires an assessment of costs and outcomes for each element in the patient care pathway, which might be developed from studies of patient experience. In relation to type 2 Diabetes this concerns the design of the service model and the balance within this model, for example, between prevention, management and treatment.

³⁵ Welsh Assembly Government (2003) "National Service Framework for Diabetes in Wales" Cardiff

³⁶ Welsh Assembly Government October (2008) "Designed for the Management of Adults with Diabetes Mellitus across Wales: Consensus Guidelines" Cardiff

³⁷ Statistics Directorate (2009) "NHS Expenditure Programme Budgets: 2007 - 08" Welsh Assembly Government April Cardiff

³⁸ NHS Clinical Governance Support Team October (2006) "Levels of Care: A New Language for Service Planning and Design" National Diabetes Support Team. Leeds

Third; detailed costing could be supported by ongoing monitoring of activity outcomes and costs, this would support local decisions about the balance of services to be commissioned within a particular field. Thus for example it would help to determine targets for investment to improve service outcomes and possibly disinvestment to improve cost effectiveness. This could be used to examine the cost of the investment required to meet the consensus target standards.

Fourth; programme budgeting can be used to examine detailed propositions for investment and disinvestment to improve service effectiveness. This requires an analysis of the marginal cost of practical options for increasing or reducing service levels. This would support local decisions about the redesign and rebalancing of services. In the case of Type 2 Diabetes for example it might be possible to examine options for improving self care and providing more generic home support while reducing specialist acute care.

In all cases it is important to stress that programme budgeting is simply an analytical aid to decision making, it should be part of an approach to inform such decisions that is open and engaging for the public, professionals and politicians. For this reason it is important to keep the analysis as clear, simple and objective as possible. It should support and bring together current work on setting goals, objectives and standards and improving the design and delivery of services and the effort required to analyse costs and outcomes should be cost effective.

Programme Budgeting

Programme budgeting is the preparation of budgets to support programme objectives. This has been called Programme Planning and Budgeting, Zero Based Budgeting, Priority Based Budgeting, and Programme Budgeting and Marginal Analysis. Each of these titles emphasises a different function of programme budgeting: it should support planning as well as costing, it should support the re-evaluation of plans and budgets, it should support decisions about priorities and should allow comparisons of investments or disinvestment in different fields of activity. Essentially programme budgeting can meet all these requirements but how it is developed will vary according to the purpose. Programme budgeting can be applied to system or organisation wide programmes of activity to inform major organisational objectives or to sub programmes which support elements of these objectives within a broad programme area, at national or local levels. Programme budgets often cut across conventional cost control budget boundaries.

Thus a programme budget is not simply a restatement of current costs, it requires a programmes structure related to the goals of the system, a projection of demand (in this case health needs) plans for the development of services and projections and monitoring of activity, outcomes and patient based costs. All must support a decision making process that links national goals to local plans and involves local partners.

Applying this approach to health is particularly useful and at the same time difficult because achievement of health goals depend upon different parts of the health and care systems operated by different agencies. Further it requires co-production with many other partners beyond the formal health and care system. Many of the decisions to be made in this field are difficult because they require priorities to be set for interventions with different types of outcomes, some of which are uncertain and long term with complex and sometimes

contradictory evidence. Programme budgeting can provide useful tools to support this difficult task but it cannot solve the problems. It is also important to note that programme budgeting relies on sound cost accounting and therefore any development in this field must start by improving this discipline.

Current Expenditure Programme Budgets

The NHS Expenditure Programme Budgets: 2003-04 to 2007-08 (EPB) produced by the Statistical Directorate are designed to explain what NHS expenditure is spent on. It analyses expenditure on 23 main programmes defined in terms of disease categories addressed in primary and secondary care and broad fields of expenditure such as healthy individuals, social care and General Medical Services. This analysis of total NHS expenditure by Health Commission Wales (HCW) and by each Local Health Board (LHB) shows trends in expenditure and provides a comparison of expenditure per capita for each disease and in each LHB area. Within the disease categories sub programmes are identified relating to diseases (though these data may be less reliable). These data support comparisons between different disease and different LHB budgets, they also provide control totals for any subsequent analysis.

Expenditures relating to Diabetes as a primary condition are identified in the EPB, which shows LHBs spent £48m on primary care and £18m for secondary care, while HCW spent £2m on Diabetes in 2007/8. This could be further developed to support the National Service Framework and Designed for Life for Diabetes. It would be helpful to distinguish between Type 1 and Type 2 Diabetes (identified as sub programmes) since patient requirements are very different for these medically similar conditions. Relevant costs of prevention and General Medical Services and costs arising from complications and co-morbidity could be allocated to these sub programmes. This would produce an estimate of current activity and costs relating to Type 2 Diabetes. This could help in assessing the balance of expenditure required between different disease based programmes corresponding to National Service Frameworks now and in the future as trends in the determinants of health change the balance of needs and as service development strategies are implemented. It could be developed further to support decisions about the balance of elements within the programme, monitoring of plans and expenditures and to assist local investment and disinvestment decisions.

This is, of course, easier to say than to do but elements of such a programme budget already exist. The National Service Framework for Diabetes sets out ten year objectives and a plan of actions. It notes the estimate made by Currie et al³⁹ that the cost of Diabetes and its complications plus the impact of extended lengths of stay for co-morbidities could amount to 9% of acute care costs. While it does not provide estimates of costs of prevention or General Medical Service costs it does include these elements in the planning framework. Moreover the reporting template provided by the Design for Life Consensus Guidelines, provides a basis for setting out the costs of current services including social care and proposed service improvements against the 12 standards and 20 action points in this reporting template. For primary care the Quality and Outcomes Framework provides incentives for patient

³⁹ CJ Currie, D Kraus, CI Morgan, I Gill, NCH Scott, J Peters (1997) "NHS acute sector expenditure for diabetes: the present future, and excess cost of care" *Diabetic Medicine*: 14: 686-692

management that reflect NSF standards of good practice. These elements provide the core of a system of programme budgeting to link system wide goals for to local plans and action by all relevant partners in health.

Developing Health Programme Budgets for Wales

1 System Wide Health Programme Budgets

System wide level programme plans and budgets could be developed to support strategic decision making and priority setting across major service improvement strategies, for example, in relation to Diabetes, Cancer, Chronic Illness, Heart Disease, Mental Illness as well as cross cutting strategies such as Food and Fitness and Palliative Care. Inevitably there will be areas of overlap between the plans and budgets, for example, strategies to address the determinants of Type 2 Diabetes will also address many other programme areas and equally Diabetes increases the costs of each of the other conditions. This does not matter, provided the EPB is used to control the totals of NHS expenditure in each area and overlaps are explained.

National Service Frameworks for Wales note that health is a co-production of many partners, including Local Health Boards and NHS Trusts, Local Authorities, Voluntary Sector Bodies, employers, retailers, health workers, the public, patients and carers. The NSFs and Consensus guidelines set out objectives for each service which recognise this. At system wide level it may be useful to express the common goals and objectives of NSFs for Wales in a common format along the lines of the following example:

Table 1. An Illustration of the Goals and Objectives of Health Programmes for Wales based on Designed for Life and National Service Frameworks

Improved Health and Wellbeing	Equity and Community Enhancement	Excellent Health and Care Services	Sustainable and Affordable for All Partners in Health
Mortality and morbidity (QALYs) Burden of disease (DALYs) Reported Wellbeing Support for carers Societal impacts	Local access Engagement of Communities, patients and carers Health needs based Reduce/ eliminate disadvantage Intergenerational impacts	Safety Effectiveness based on evidence Patient Focus Timeliness Efficiency High quality integrated care Clinical leadership and innovation	Cost impacts for NHS - prevention, primary, - community, secondary - short and long term Other public sector costs Voluntary sector costs Employer/retailer costs Personal/household costs Economic impacts

These goals are of differing significance: improved health, well being and equity are fundamental goals, while excellent care services at sustainable costs are enabling. Specific objectives may vary between programmes and in some cases elements of such objectives may be irrelevant or impossible to assess. However, in most cases it should be possible to describe the performance of current services and the impact of NSFs in such terms and perhaps to use these as “dashboard indicators” to support the assessment of system wide priorities and in subsequent implementation and monitoring.

Assessing Current Performance and Expenditure

The NSF for Diabetes in Wales provides assessments of virtually all the objectives noted above, for example, noting the particular impacts of Type 2 Diabetes on low income and minority groups, recognising the role that employers and retailers can play, focussing on self management and designing integrated care services with patients and communities. Setting cost management objectives within this framework introduces financial and cost considerations as creative influences at the assessment planning and design stages rather than as a subsequent evaluation. It also recognises that in many cases poor health and health improvement have financial and economic consequences for all partners.

At this system wide level of health programme budgeting, broad estimates of the likely levels of cost can be obtained by allocating the costs identified by the EPB to health programmes defined by National Service Frameworks and other programme plans.

Rates of Diabetes in Wales have increased rapidly both because of causal factors such as overweight and due to the success of strategies to encourage early diagnosis. The aging population, itself a signal of successful healthcare, also means more people are more likely to have Type 2 Diabetes and, living longer with the condition, they are also more likely to experience complications and co-morbidity. On the other hand better management and self care will tend to reduce complications. The current prevalence of Diabetes in Wales is estimated from the Quality and Outcomes Framework at 4.4%⁴⁰, prevalence of Type 2 Diabetes now amounts to some 90% of this at 4%.

A paper by Bagust et al in 2002⁴¹ provides an estimate of the excess cost per patient of Type 2 Diabetes, plus complications and co-morbidity, updating from 1996 GB costs per head to the 2007/8 Wales EPB figure (£1610) and revising to reflect current prevalence suggests cost of some £200 m. It also provides a breakdown of caseloads for complications and co-morbidity that could be used to allocate EPB to Type 2 Diabetes.

A further source of evidence is provided by Jönsson⁴² who analysed total care costs for 7000 patients with Type 2 Diabetes across European countries. Updating the estimate of UK costs from this study from 1999 Euros to 2007/8 £ and applying this to costs and prevalence in Wales gives primary and community (ambulatory) costs of about £101 m, drug costs of £65 m and hospital costs of £89 m, a total of £255 m.

The Bagust and the Jönsson excess cost estimates suggest that Type 2 Diabetes patients give rise to over twice the average NHS cost per patient (£3200 - £3700 vs £1610).

Health prevention costs attributable to Type 2 Diabetes can be allocated from the £139 m EPB Healthy Individuals Programme budget according to the proportion of avoidable health loss attributable to Type 2 Diabetes and the extent to which disease prevention measures can contribute to the reduction of this disease. Evidence for this can be obtained from the

⁴⁰ Diabetes UK Reports and Statistics Diabetes prevalence Quality and Outcomes Framework (Note the 2008 figure is assumed to apply to 2007/08)

http://www.diabetes.org.uk/Professionals/Information_resources/Reports/Diabetes-prevalence-2008/
Access 01/05/2009

⁴¹ A Bagust, PK Hopkinson, L Maslove, and C.J. Currie (2002) The projected health care burden of Type 2 diabetes in the UK from 2000 to 2060" *Diabetic Medicine* 19 (Suppl.4) 1-5

⁴² B Jönsson (2002) "Revealing the cost of Type II diabetes in Europe" *Diabetologia* 45:S5-S12

WHO/World Bank, Global Burden of Disease Study⁴³. This provides estimates of the proportion of the burden of disease, as measured by loss of Disability Adjusted Life Years (DALYs), attributable to various diseases and the proportion of such diseases that are related to behavioural determinants of disease.

Table 2 shows some selected relevant health attributable fractions for High Income Countries from the Global Burden of Disease study. This suggests that Diabetes Mellitus contributes 2.8% of DALYs lost in high income countries which is almost 10% of major preventable diseases. The analysis shows that preventable Diabetes is largely attributable to overweight and obesity, smoking and lack of physical activity (multi causality means that it is not possible to add attributable fractions). But the analysis was based on 1997 and 1998 data and rates of diabetes in rich countries have almost doubled since that time Updating this from 1997 to 2007 and recognising that Wales has a particularly high rate of Type 2 Diabetes, it seems reasonable to allocate at least 7% of the cost of the Healthy Individual Programme to Type 2 Diabetes, that is £10 m. This estimate could be improved if a burden of disease estimate were developed for Wales.

Table 2 Comparable Quantification of the Burden of Diseases Attributable to Selected Risk Factors for Selected Diseases in High Income Countries in DALYs

Disease \ Risk Factor	Ischemic Heart disease	Stroke	Lung cancer trachea	COPD	Diabetes Mellitus	Alcohol use disorders	Osteoarthritis	Attributable disease burden
High Blood Pressure	48%	56%						6.6%
High Cholesterol	57%	25%						4.4%
Overweight Obesity	27%	20%			76%		20%	5.1%
Low fruit and Vegetables	19%	9%	9%					1.8%
Physical Inactivity	21%	8%			15%			2.2%
Smoking	23%	21%	84%	73%	4%		4%	9%
Population attributable fraction	8.3%	6.3%	3.6%	3.5%	2.8%	2.8%	2.7	29.1% \ 30%

Estimates of the impact of risk factors are based on comparison with what a comparison between morbidity and mortality with the risk factors and the level that would apply if there were the lowest possible risks applied i.e. the highest attainable level of health. More details are available from the Burden of Disease Study (op cit).

⁴³ Majid Ezzati, Stephen Vander Hoorn, Alan D. Lopez, Goodarz Danaei, Anthony Rodgers, Colin D. Mathers, and Christopher J. L. Murray, (2006) "Comparative Quantification of Mortality and Burden of Disease Attributable to Selected Risk Factors." . *Global Burden of Disease and Risk Factors,ed.* , 241-268. New York: Oxford University Press. DOI: 10.1596/978-0-8213-6262-4/Chpt-4.

Combining figures from EPB and Jönsson analyses suggests a distribution of costs as: prevention £10 m, ambulatory care £101 (about £63 GMS and £38 Community Services) drug costs £65 m, hospital care £89 m (of which about £14-16 m is for direct treatment of Type 2 Diabetes, about £72 is for treatment of complications and extra costs of treating people with co-morbidities and up to £2m for tertiary services and research).

Recognising the Contribution of and Impacts on Partners in Health

A major theme of “Designed for Life” is that health and wellbeing are co-productions of many partners including local authorities and other public sector agencies, communities, voluntary sector, employers, manufacturers and retailers, individuals and households. It is therefore important to include these partners in a system wide programme budget and to assess the contribution, costs incurred and impacts upon all partners. As a framework for this evaluation the following outline is suggested. Annex 2 provides an example of how such a matrix could be completed based on a series of rapid reviews. A consensus is needed on the form of a societal cost matrix for Wales in order to establish a common framework for evaluation of impacts and costs across all NSF's.

Table 3: Societal cost matrix for Health

Health Impacts	Population Attributable Fractions (PAF)	Disability / Quality Adjusted Life Years Lost (DALYS/QALYS)	Years lived with disability (YLDs)	Years of life lost (YLL) premature deaths and loss of economically active years
Costs to Individuals and Families	Addictive expenditure on products	Private sector costs and cost of using NHS	Informal and long term care + Incapacity benefits	Income loss from early death and reduced employment
Costs to NHS	NHS costs for treatment	Health Promotion and Disease Prevention	NHS care costs	+ Cost avoided as a result of early death
Costs and income to other public services	+ Income from taxes on products	Other local authority costs Criminal Justice System Fire Services	LA personal social care and residential costs	Benefit payments and Reduced income tax + Reduced retirement benefits
Costs to employers retailers and manufacturers	Health and safety expenditure	Presenteeism Productivity loss	Absenteeism	Labelling and other costs
Wider social costs and values	Household expenditure on health improvement	Willingness to pay to avoid illness	Costs to victims of crime and injury	Loss of social capital

Currently Diabetes UK is completing an analysis of the societal costs of Type 2 Diabetes for England and Wales. This will also provide an estimate of the cost of complications.

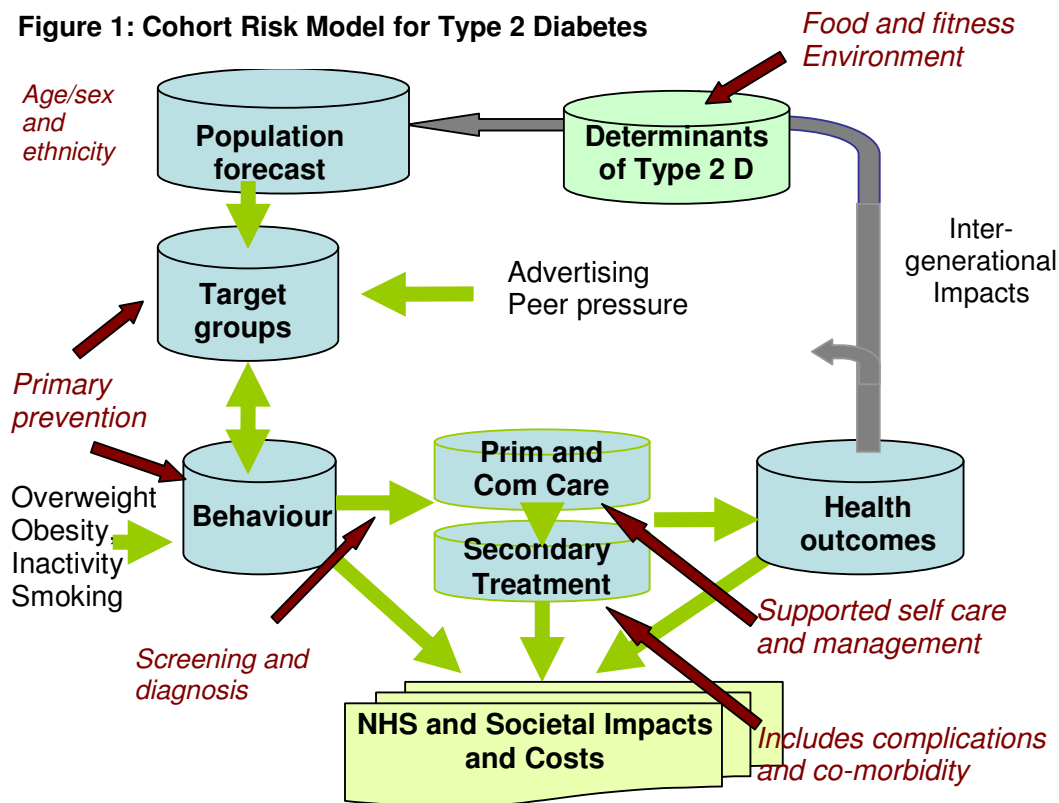
Evaluating Long Term Trends

National Service Frameworks provide a ten year term vision for the development of services, it is therefore important to develop programme budgets that support long term evaluation of plans, outcomes and costs. This requires projections of expected activity, outcomes and costs against which actual performance can be assessed.

There are different estimates of trends in Type 2 Diabetes and its complications. The Bagust article quoted previously estimated a 20% increase over the next 30 years due to the aging of the population. It estimated increases in complication rates for the same cause but trends in determining factors such as overweight were thought likely to be offset by changes in treatment regimes. Rennie and Jebb⁴⁴ note rates of obesity amongst adults in Wales almost trebled between 1980 and 2002 reaching over 23% for men and 25% for women. While it is difficult to estimate the impact of obesity, earlier detection, better management and other factors it would be useful to develop a comprehensive projection of the potential trends in Type 2 Diabetes linked to the implementation of Designed for Life. Bagust calls for an epidemiological and economic model to assess and monitor the potential trends over the long term of Type 2 Diabetes. Similar models could be developed for other NSF fields, to help to understand the dynamics of the system and to ensure projections could be shared and updated as the future unfolds. An example of a cohort risk model is shown for Type 2 Diabetes:

⁴⁴ K. L. Rennie, S. A. Jebb (2005) "Prevalence of obesity in Great Britain" Obesity Reviews Volume 6 No 1 Page 11-12

Figure 1: Cohort Risk Model for Type 2 Diabetes



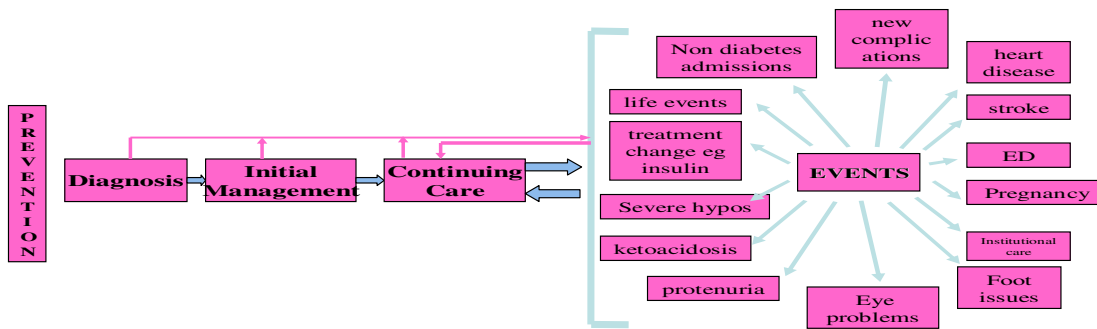
2 Health Programmes Budgets within National Service Frameworks

Programme budgeting can inform decision making within National Service Frameworks by demonstrating the cost effectiveness of each component of a redesigned delivery plan as well as the cost effectiveness of the overall system. The programme structure could be based on the main elements for NSF delivery. This could be supported by exercises to monitor patient activity for different care pathways through the system and evaluate their experience, outcomes and costs.

The 2002 Jönsson study (op cit) provides a useful model for such a review; since it examined different national health and care systems it provides a source of insight into the features required for excellence in delivery of treatment and care for Type 2 Diabetes. It builds upon the 1998 UKPDS study⁴⁵ that confirmed that managing the risk of complications is more complex than simply managing blood-glucose levels. The NHS Diabetes Support Team (NDST) could co-ordinate similar studies to monitor a significant sample of Welsh, English, Scottish and Northern Irish patients. This would ensure continuing learning from experience as Design for Life is introduced. The well known “tadpole” diagram from the New Language document (op cit) provides a map of the complex elements of Diabetes services and care pathways to be evaluated.

⁴⁵ United Kingdom Prospective Diabetes Study Group (1998) “Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes” (UKPDS 33). *Lancet* 352: 837-853

Figure 2 Level 1 Planning: Map of the Essential Elements of Diabetes Care



Broad estimates suggest at least £10 m of prevention spending is attributable, diagnosis initial management and continuing care up to £101 million, plus £65 m for drug costs (though some will be hospital prescribed) and other hospital costs will account for about £89 m of which £14 -16 m will be for primary treatment of Type 2 Diabetes and £70 – 75 m will relate to patients with complications and co-morbidities.

The NSDT facilitates shared learning and exchange between and within the countries and would allow studies and recommendations for individual elements of the system to be seen in context. For example there is a wealth of guidance from bodies such as the RCN and economic evaluations from NICE that would be of greater value if they could be set in the context of total system performance.

3 Ongoing Monitoring of NSF Programme Budgets

The development of common research programmes supporting Communities of Practice for each NSF provides the basis for a further step towards integrated management and monitoring of implementation across different NHS bodies and other partners. In such cases it is important to link research and development to ongoing monitoring of current activity and to ensure a balance between setting very specific targets and standards for activity and ensuring they reflect a common set of underlying goals.

The Reporting Template for the NSF for Diabetes⁴⁶ provides a good example of how standards derived from system wide goals can provide the basis for monitoring implementation. In support of such monitoring programme budgeting could be developed to provide budgets against which Local Health Boards could manage their own capital investment and revenue expenditure programmes in respect of Diabetes.

This will require the development of standard unit costs that can be applied to activity coded at local levels. Such standard costs are available in some cases - through DRG and HRG costing but require further research and development for other items. The extent to which it is helpful and cost effective to attempt to measure every element of costs requires more detailed review in each case. It may be that for certain elements it will be sufficient to rely on

⁴⁶ Welsh Assembly Government (2008) “Reporting Template for the National Service Framework for Diabetes in Wales 2003-2013 and implementation of the Diabetes Consensus Guidelines” Cardiff

allocating a proportion of costs within a field – remembering always that such costs must be reconciled to a control total ultimately reflecting the EPB.

Activity and consequent costs in the secondary and tertiary sectors could be measured and monitored by surveying the proportion of acute patients who have an ICD 10 Code for Diabetes as a primary cause of admission or co-morbidity and allocating the appropriate proportion of the EPB programme expenditures to Diabetes programme. Note that while ICD 9 coding would indicate that Diabetes was the cause of an admission for a complication, ICD 10 simply indicates a co-morbidity, but as Currie (op cit) has demonstrated both complications and co-morbidities give rise to higher costs.

Similarly Read code classifications can be used to monitor activity in primary and community care. The problem, that has often been noted, is that Read coding is applied in different ways or not at all in different practices. It may be counter productive to attempt to impose Read coding. Incentives may help but the Welsh Quality and Outcomes Framework already has more targets for Diabetes than any other clinical field.

The development of communities of practice to focus on practical research, development and implementation issues may provide the most effective answer to improving coding in both primary and secondary care. Emphasis upon the importance of Continuity of Care and ways of improving this for Type 2 Diabetes patients could lead to better practice in both recording and sharing information, using Read coding and ICD codes as a means to this end rather than as a method of collating central statistics.

4 Programme Budgeting to Support Local Investment

At local level LHBs, NHS Trusts, General Practitioners and other partners for health need to decide on investments and disinvestments to provide the right balance of each element of services meeting the requirements set out in the NSF. In order to do this they will examine options for investments to improve the level and quality of services and options for disinvestment from activities that are unsatisfactory or can meet the goals and objectives at lower costs. Priority setting in such cases may be supported by programme budgeting.

For Type 2 Diabetes NHS local investment decisions concern the design of each of the essential elements of Diabetes care: prevention, diagnosis, management (including self care education and support, community care provision, secondary care and treatment of complications and co-morbidities plus any social care needs and continuing care. It also requires investment in leadership, management and training for providers and information management. In practice the design of local services may give rise to less difficult choices than decisions about the level and quality of each element of such a programme.

It can be helpful to use the tools of programme budgeting and marginal analysis, as for example described by Mitton and Donaldson⁴⁷ to support such decisions. Essentially for each element of service options for cost reduction (that still meet basic standards) and options for extending or improving services are compared in terms of marginal costs and benefits corresponding to a local interpretation of the system wide goals. In the case of Diabetes these are set out as Standards in the Reporting Template.

⁴⁷ Mitton C, Donaldson C. Priority Setting Toolkit: A Guide to the Use of Economics in Healthcare Decision Making. London: BMJ Books, 2004

It is always difficult to get service providers to identify any possible level of service below that currently provided, so this exercise is more difficult than it sounds, but it is nevertheless important to examine disinvestment options alongside any new investment. It is also important to examine the longer term implications of any investment or disinvestment decisions, programme budgeting should provide the tools to support longer term projections of likely demand for services. Marginal analysis means that each increment for the improvement or cost reduction of services would be examined in relation to its ultimate impact. In the case of Type 2 Diabetes the risk of complications dominates other outcomes in terms of both health impact and costs thus each option would be examined in terms of its contribution to reducing this risk.

LHBs will also work with other partners in health to support local action relevant to Diabetes. This may include support for patient organisations providing social networking or actions by local shops to ensure that healthy food options are available for single people, measures to ensure people at work know how to care for a colleague experiencing a hypoglycaemic episode, steps to improve cycle ways and many other possible actions. Programme budgeting can support such investment decisions by developing local health goals, providing information about health risks and prevalence, recognising and linking contributions, showing the likely long term impacts on health and valuing the investments made by all partners for health.

Suggestions for further action

It would be presumptuous to attempt draw firm conclusions about how the Welsh Assembly Government and NHS Wales should take forward programme budgeting after a brief 5 day review. And it must be borne in mind that Type 2 Diabetes is only used as an illustration of the different potential applications of this approach.

The review found that many of the basic questions addressed by programme budgeting are addressed through National Service Frameworks and related planning mechanisms. Thus programme budgeting is a support for this approach rather than an alternative. There is certainly no point in developing programme budgeting as an end in itself. Programme budgeting depends on sound cost accounting which must be improved.

Suggestions for further discussion include:

- Programme budgeting could be seen as a support for national and local decisions about the development and implementation of NSF Programmes.
- Programme Budgeting at system wide level could be developed to support strategic decisions concerning the balance between NSF Programmes.
- It might be helpful to set out programme goals and objectives in a consistent format so that broad estimates of outcomes and costs can be compared.
- It should be possible to allocate costs from the Expenditure Programme Budget to the NSF Programmes but current estimates vary considerably.
- It might be helpful to recognise the contribution of all partners for health and the impact of health outcomes, which can create high costs for others.
- It would be helpful to develop a common epidemiological and economic model to ensure projections are consistent and can be used for monitoring.

- Programme budgeting could support NSFs, addressing economic and financial issues as a creative contribution to system design.
- It could also compliment other aspects of research and development by evaluating the costs and benefits of the system and its elements.
- Ongoing monitoring of demand, activity, outcomes and costs could be developed from research to continuing practice – but local ownership is key.
- Programme budgeting could support local decision making about priorities for investment/disinvestment to best meet NSF programme goals.

An outline expenditure allocation was prepared as an example, based on available evidence, it suggests total excess cost of Type 2 Diabetes of £210 m or £265 m (see Annex 1) : prevention (5%) primary and community care (35%) hospital care (35%) and drug costs (25%). Type 2 Diabetes incurs over twice the level of cost per patient of an average patient. Further review by an expert consensus group is suggested.

Annex 1 Limitations on Cost Estimates

The estimates given in this paper are only intended as broad examples of the nature of costs estimates that could be used to support National Service Framework planning.

Estimates can only be as good as the figures on which they are based. In this case two studies, one based on 1994 data other derived from English data applied to UK prevalence and costs in 1996. Errors arise first from the coding of events and episodes, codes for co-morbidities are particularly likely to have been omitted. Secondly the unit cost estimates applied to elements of care are subject to considerable error. Third the process of updating the incidence of complications and co-morbidity in line with changing age sex structures and overall prevalence rates for Wales is uncertain. Prevalence rates increase with newly diagnosed patients, complications and co-morbidities occur some time later and will therefore lag. Fourth the estimation of NHS costs in Wales in relation to UK estimates for specific conditions is uncertain and fifth the assumption that overall NHS cost inflation applies equally to all procedures is uncertain. Thus while these are reasonable starting points for broad estimates they are only indicative costs say with an error range in the region of + or - 15%.

The fact that the Bagust based estimate is lower than the Jönsson based estimate should not be taken to suggest that these represent a “range”. Because the latter is a more recent figure and most estimating errors tend to deflate the estimate, but perhaps assume a faster rise in complications and co-morbidities, the best guesstimate for the total cost of Type 2 Diabetes to the NHS in Wales is they likely to increase to some £300 m in £2007/8.

Such estimates will be much more useful if set alongside similar estimates for other NSFs and if used to consider long term trends and changes. More detailed costs could be developed for other aspects of programme budgeting alongside measures of activity, but even these costs are likely to have an error range of + or _ 5% due to the nature of the events being captured and costed.

Annex 2 Example of a Societal Cost Matrix

Total societal costs and values for risk factors, England 2006 £ billion

Risk Factor	Mental Illness	Smoking	Alcohol	Obesity	Other CVD	Illicit Drugs	Unsafe sex	Total
Cost to individuals and households	£11.4 b	£18.2 b	£12.7b	£3.2b	£2.9 b	£8.6 b	£0.1 b	£57.1 b
Cost to NHS less null hypothesis	£9.9 b	£ 1.6 b	£2.1 b	£1.1 b	£1.7 b	£1.0 b	£0.6 b	£18.0 b
Costs to other public services less tax and duty	£6.4 b	(£5.9 b)	£1.7 b	£1.4 b	£1.8 b	£3.5 b	£0.3 b	£9.2 b
Costs to employers	£3.2 b	£4.2 b	£3.2 b	£3.2 b	£1.6 b	£1.0 b	£0.3 b	£16.7 b
Total economic costs	£30.9 b	£18.1 b	£19.7 b	£ 8.9 b	£8.0 b	£14.1 b	£1.3 b	£101.0 b
Wider social costs and values	£18.1 b	£13.5 b	£23.0 b	£14.0 b	£10.8 b	£18.6 b	£1.4 b	£99.4 b
Total economic cost and social value	£49.0 b	£31.6 b	£ 42.7 b	£22.9 b	£18.8 b	£32.7 b	£2.7 b	£200.4 b

This analysis, taken from ongoing work by Graham Lister, Richard Fordham and Dominic McVey for the National Social Marketing Centre is based on a series of rapid 5 – 10 day reviews of each field and a consensus conference held with leading health economists to discuss the methodology and assumptions used. Publications are available for previous stages of this work - see Graham Lister; Dominic McVey; Jeff French; Clive Blair Stevens; Rowena Merritt “Measuring the Societal Impact of Behavior Choices” Social Marketing Quarterly Vol 14 Issue 1 March 2008