Public Health Review of a Ministerial National Health Improvement Programme: A Programme Budgeting and Marginal Analysis (PBMA) Methodology, Wales U.K.

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SUBMITTED FOR HESG, WINTER 2013, EXETER – WORK IN PROGRESS - PLEASE DO NOT QUOTE WITHOUT THE AUTHORS PERMISSION

ABSTRACT

Background: Wales faces serious public health challenges with some of the widest inequalities in life expectancy and quality adjusted life expectancy in the U.K., relatively high smoking and obesity rates and associated pressures on the NHS. Health improvement or prevention activities are across a range of Welsh Government, NHS, local government and voluntary sector agencies. No clear mapping of these exists. Beginning with the Minister for Health and Social Care's budget for health improvement this paper describes an initiative to rationalise investment in prevention.

Objective: To review the Ministerial budget of 2012, and the current various health improvement interventions being funded through Welsh Government and through Public Health Wales with a view to some degree of re-distribution in line with Government priorities for health improvement and in particular the need to address widening inequalities in health.

Setting: Wales U.K., with a population of 3 million, an NHS with seven health boards, and a single Public Health service.

Methods: The Minister commissioned Public Health Wales to establish a Health Improvement Advisory Board (HIAG), to oversee a Programme Budgeting and Marginal Analysis (PBMA) expert panel, who drew on evidence review groups, stake holder consultation groups and a primary care advisory group to explore potential alternative modes of health improvement initiative delivery in the community. Our PBMA group met 3 times, with representation from Public Health Wales, Welsh Government, Local government, academic health economics, Primary Care and NHS finance.

Results: The PBMA multi-disciplinary panel identified a budget of £17.2 million (with £15.1 million accounting for 25 identifiable health improvement interventions and £2.1 million supporting health improvement networks), spanning 10 Welsh Government priority areas, and

6 life course stages. Using electronic voting the PBMA group agreed an appropriate time horizon for health improvement programme outcomes in Wales, main objective of the health improvement review and criteria for evaluating candidate services for disinvestment and investment. The PBMA panel recommended total disinvestment in 7 out of 25 initiatives at a total cost of £1.5 million, and partial disinvestment in a further 3 interventions at a total cost of £7.3 million. The panel did not recommend increasing investment in any of the 25 initiatives under review.

Conclusions: The PBMA provided a platform to discuss what public health initiatives are currently being delivered in Wales. The panel gave clear candidates for disinvestment, and plan next year to make recommendations for investment. The evidence sub-groups were also able to suggest what we are not currently doing, but could be doing in Wales using NICE guidance, which could provide a next step for Public Health Wales to take this health improvement review further. The theme of environmental change is becoming more prominent in NICE guidance in its focus on 'whole setting' approaches to health improvement e.g., through schools and workplaces. Overall, Wales spends a very small proportion of its NHS budget on health improvement. A recent document by Directors of Public Health in England advocates £1 billion uplift in Public Health expenditure in England. We argue here, that if anything, more should be spent on health improvement. However, by demonstrating that the PBMA process can reach decisions about potential candidates for disinvestment, next steps would be an evidence review of the relative benefits of spending released or additional funds for health improvement in Wales.

INTRODUCTION

Public health challenges in Wales

Circulatory disease causes a third of all age deaths and a quarter of deaths under 75 years in the Welsh population, although cancers cause essentially 28% of deaths in all ages they do account for 40% of the deaths in the under 75 year old group. Mortality has been steadily increasing. In the last decade the number of deaths in Wales has decreased by about 7% and during the same period the population has increased by 3% and got older. Circulatory disease shows the most dramatic drop with a 40% fall in the age standardised rate of deaths among under 65s. In line with the falling death rate, life expectancy has been increasing amongst both males and females and across socioeconomic groups. Life expectancy among males has increased from 75.9 years to 77 years. There have been increases also in healthy

life expectancy from 62.8 years to 63.5 years. There remains a large gap between the most and least deprived in our communities. In life expectancies this is a gap of 8.6 years, which has increased to 9.2 years more recently. Although the gap is smaller in females it is also increasing. The gap in healthy life expectancy is particularly large between the most and least deprived, around 18 years. When we look at the conditions contributing to this gap, coronary heart disease has the largest role to play contributing a 13 month gap in life expectancy under the age of 75 years in males, and a 6 year gap in females (Public Health Wales Observatory, 2012).

Smoking causes about 1 in 5 deaths in Wales. Prevalence has been slowly falling and is now at around 23%. It is the highest in young Males, the 25-34 year old age group, at 38%, and whereas it has fallen at most ages it has remained unchanged over the last 5 or 6 years in this age group. About 45% of the population drink above guideline amounts of alcohol, over 1000 people a year die from alcohol in Wales, and there are over 55,000 hospital admissions due to alcohol in Wales per year. Admissions due to alcohol peak during adulthood between 35 and 65 years. Around a third of adults eat 5 fruit and vegetables a day, under a third meet physical activity guidelines whereas 57% of the Welsh adult population is overweight and obese. Looking at physical activity, about 30% of the adult population take no exercise in a typical week (defined as 30 minutes of moderate or vigorous physical activity). Thirty seven percent take the recommended 5 or more days of exercise per week, the remainder (fairly evenly spread) taking 1, 2, 3 or 4 days of physical activity per week. Sixty-three percent of young adults aged 16-24 are of a healthy weight, falling to 32% by age 45 years. Similarly the proportion of obese people increases from around 9% in the younger age group up to 28% in the 45 year old age group (Public Health Wales Observatory, 2012). The health challenges above have historically been addressed through public health improvement interventions focused on the individual.

Growing evidence of the cost-effectiveness of public health interventions

Owen et al., 2011 have published a paper synthesising data of cost-effectiveness evidence of public health interventions, as no comprehensive list of estimates was previously available. Reviewing cost-effectiveness evidence underpinning National Institute for Health and Clinical Excellence (NICE) Public Health Guidance from 2006-2010; Owen et al. (2010) analysed 200 base-case cost-effectiveness estimates. Findings showed the majority of public health interventions assessed were highly cost-effective, 85% were cost-effective at the threshold of £20,000 per Quality Adjusted Life Year (QALY) and 89% were cost-effective at

the higher threshold of £30,000 per QALY. The authors conclude that the next step would be to develop a framework that allows the combination of economic analysis and other criteria to support local decision makers to make better investments. Although there is a need for quality evidence from RCTs as recommended by Kelly et al. (2005), and McDaid & Needle, (2008) that pay particular attention to the challenges of conducting economic evaluations of complex (as defined by the Medical Research Council (MRC), 2008) public health interventions (Weatherly et al., 2009), there is also a need for expert opinion and common sense.

Programme Budgeting and Marginal Analysis (PBMA)

Programme Budgeting and Marginal Analysis (PBMA) is a process that helps decision-makers maximise the impact of healthcare resources on the health needs of a local population. Programme budgeting is an appraisal of past resource allocation in specified programmes, with a view to tracking future resource allocation in those same programmes. Marginal analysis is the appraisal of the added benefits and added costs of a proposed investment (or the lost benefits and lower costs of a proposed disinvestment) (Brambleby and Fordham, 2003a, 2003b). This is at the margin of current provision and hence the relative costs and benefits of a programme with scale of provision. Some programmes can absorb an amount of contraction, whilst still continuing e.g. through better targeting. We need to be aware of the links across programmes and therefore, how changes in expenditure on one programme may impact on others. The PBMA process requires information on spend by programme for example by an annual budget and/or numbers of full time equivalent posts (WTE). The stages of PBMA can be found in Figure 1 below.

Figure 1. PBMA Stages (Brambleby and Fordham, 2003a, 2003b)

PBMA Stages (Brambleby and Fordham, 2003b)

1. Choose a set of meaningful programmes.
2. Identify current activity and expenditure in those programmes.
3. Think of improvements.
4. Weigh up incremental costs and incremental benefits and prioritise a list.
5. Consult widely.
6. Decide on changes.
7. Effect the changes.
8. Evaluate progress.

A recent review considered factors that may explain the success or otherwise of PBMA exercises (Tsourapas & Frew, 2011). Tsourapas & Frew (2011) found 28 applications of PBMA spread across the UK, Australia, New Zealand and Canada. Findings showed PBMA was successful in 52% of cases where success was defined in terms of the participants gaining a better understanding of the area under interest. PBMA was successful in 65% of cases where success was defined as 'implementation of all or some of the advisory panel's recommendations'. Forty-eight percent of the studies were successful where success was defined in terms of disinvesting or resource reallocation; and in 22% where success was defined in terms of adopting the framework for future use. The authors concluded that the definition of success influenced the rate of successful PBMA applications. They argue for a broadly accepted definition of success to allow greater comparability within the field.

There has also been more recent use of PBMA as a framework for disinvestment (Donaldson et al, 2010). When conducting a rapid review of applied PBMA exercises, we found papers describing PBMA exercises of maternity services (Ratcliffe et al., 1996), Canadian Surgical Department (Mitton et al., 2003), gynaecology services in Glasgow (Twaddle & Walker, 1995) and GP led community hospital care for stoke patients (Henderson et al., 2001). We are not aware of a previous published description of a PBMA exercise at a national level, of a whole public health programme (Edwards et al., 2012).

METHOD

Perspective of Health Improvement Review

This PBMA took an NHS, Public Health Wales (payer) perspective, in light of WG published health and social care policy direction. However, we also took into account the role of outside private and public partners in improving health and wellbeing e.g. environmental partners to build cycle paths. Health improvement was defined under the Ottawa Charter (1986) definition of health improvement which highlights the importance of reorienting health services, creating supportive environments, improving personal skills, community action, and healthy public policy.

Development of a PBMA panel

Invitations were sent to representatives from Public Health Wales, Welsh Government, Local government and Primary Care to develop a PBMA panel. The expert panel drew on evidence collected by review sub-groups, stake holder consultation groups and a primary care advisory group to explore potential alternative modes of health improvement

initiative delivery in the community. The PBMA panel met three times, with representation from Public Health Wales, Welsh Government, Local government, academic health economics, Primary Care and NHS finance and facilitated by a session leader.

Boundaries of the Programme Budget

This programme was really a historically determined programme budget of Ministerial resources currently devoted specifically to health improvement at an All Wales level. There are other resources known to be used for health improvement purposes, sometimes matched with Local Government or voluntary sector spending. However, these were considered outside the remit of this analysis.

Protocol for review of clinical effectiveness evidence

An 'Initiative Assessment Log' was completed for each initiative. Information from any evaluation or other reports about the initiative in Wales was considered for relevance and pertinent information summarised into the log along with a traffic light based Summary Evidence Grade and other information. A final 'Initiative Grade' was then. taking into account both the research evidence of potential effectiveness and evidence of actual effectiveness in Wales, where available. Initiative grades were checked for consistency by comparison and discussion amongst the review team.

Protocol for review of cost-effectiveness evidence

Relevant articles identified from an evidence search (2002-2012) of NICE, Pub-Med and the Centre for Reviews and Dissemination (CRD) Database using key terms from each of the 25 initiatives were sourced and then appraised. Evidence was defined as; directly relevant i.e. an economic evaluation of a specific intervention delivered through the programme/initiative stated in the list of included programmes or indirectly relevant (where directly relevant evidence is unavailable) i.e. evaluation of related intervention similar to the one delivered through the programme/initiative or as part of the intended aims of the programme/initiative stated in the list of included programmes by either method of delivery (school-based smoking cessation) or target population (pregnant women). The Drummond et al. (2005) checklist for a sound economic evaluation was used to appraise evidence found in the electronic searches. A subjective judgement of the overall balance of economic evidence was made by the economic evidence sub-group and a traffic light system of grading was used.

Stakeholder Consultation Process

Public Health Wales made significant attempts to consult at a national level on this Health Improvement Review. This was done via (1), visits to the seven health board's local public health teams, often involved with the delivery of health improvement programmes, (2), Beaufort Research were commissioned to undertake a public survey and to conduct six focus groups and six in-depth family interviews, (3), An online feedback form was hosted on the bilingual review web pages on the Public Health Wales website. Responses were assigned a traffic light system based upon the overall majority of positive, negative and mixed feedback from each of the groups.

Equity Review

A traffic light categorisation system was developed to grade the degree of equality/equity focus of each initiative under review. Some of these programmes have a degree of complexity which required explanation in addition to the traffic light grading. These include some where there has been a change of focus since inception and others where programme employees act as intermediaries and local areas are largely autonomous in the way programmes are delivered. It should be noted that the categories apply to the intention of the programme rather the supporting evidence, effectiveness or cost effectiveness, which have been reviewed separately.

Primary Care consideration

Options for alternative modes of delivery of the initiatives under review were considered and the mechanism of delivery was summarised with consideration given to alternates where appropriate.

Information from the above five sub-groups was summarised into booklets for each initiative. These booklets were distributed to the PBMA panel (Appendix 1).

RESULTS

The Programme Budget

We were able to identify 25 specific health improvement initiatives for which it was possible to identify an annual budget, and review evidence of effectiveness and cost-effectiveness. There were a number of initiatives where no or little evidence was available.

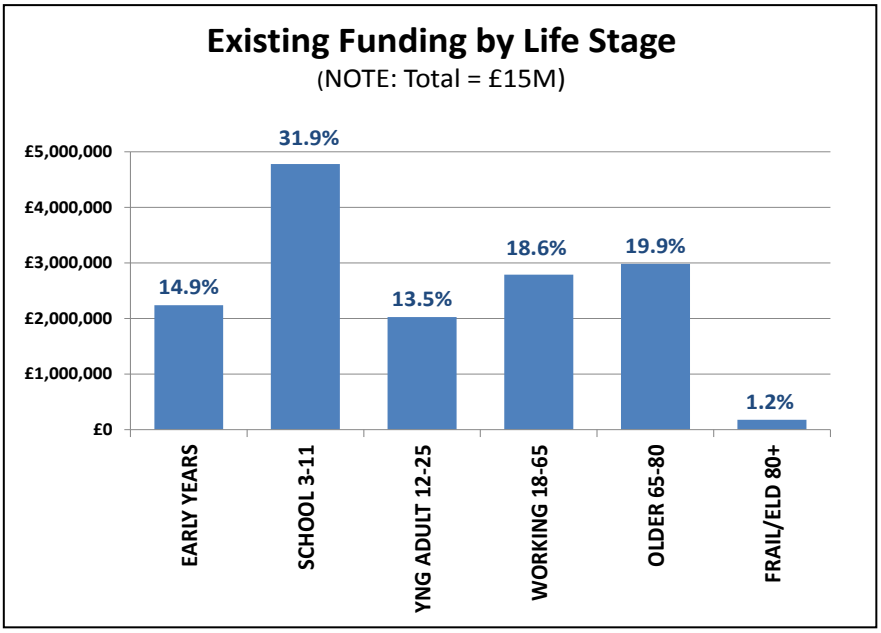
Economic evidence was sparse for the initiatives, with 11 of the 25 initiatives having no available evidence of cost-effectiveness, cost-utility or cost-benefit.

Table 1. The 25 initiatives identified in the PBMA exercise with an overall summary statement from the five evidence sub-group categories (total of £15 million expenditure)

Initiative	Approx. Spend 2012/13	Assessment Category
Cooking Bus	£655k	Red – Based on published evidence and consultation, this intervention is unlikely to bring a population health benefit and alternatives should be explored to achieve these health goals.
MEND	£480k	
Mental Health First Aid	£143k	
Smokebugs	£131k	
National Breastfeeding Programme – Breastfeeding Peer Support Programme (BPSP)	£31k	
National Breastfeeding Programme – Breast-feeding Welcome Scheme (BFWS)	£11k	
Health Challenge Wales website Cost	£38k	
Smokers Helpline	£30k	
Smoking Resources	£30k	
Skin Cancer Awareness	£15k	
Designed to Smile	£3.75M	Amber - Greater evidence needs to be found for the impact of this initiative at a population level. and/or There are elements of the programme that need substantial revision or There is insufficient evidence available to make a judgment
Welsh Network of Healthy Schools Schemes	£2.3M	
Stop Smoking Wales – Pre Surgery	£2.2M (NB total spend on SSW over 5 programmes)	
Stop Smoking Wales – Pregnancy		
Stop Smoking Wales – Vulnerable Groups		
Stop Smoking Wales – Brief Intervention Training		
Fresh Start Wales	£700k	
Alcohol Brief Interventions in Primary Care Training	£100k	
HIV Prevention	£56k	
National Exercise Referral Scheme	£3.5M	Green - This is a sound programme with a reasonable evidence base however we need to ensure that reach is maximised and it is cost effective.
Stop Smoking Wales – Adults	£2.2M (NB spend over 5 programmes)	
ASSIST	£300k	
National Breastfeeding Programme - Baby Friendly initiative (BFI)	£110k	
No Smoking Day	£27k	
Teenage Pregnancy Pilot	£150k	White – a Pilot
Steroids and Image Enhancing Drugs	£50k	White – insufficient information to make an assessment.
Champions for Health	£30k	White – It is not clear what theoretical or evidence base has been used in planning this intervention. Without an evaluation (which specifies and measures primary outcomes) wider implementation cannot be recommended.

Spending by life course stage

Figure 2. Spending by the life course stage



Establishment of criteria for evaluating the programme and candidate interventions for investment and disinvestment

The PBMA panel were asked, using electronic voting to come up with criteria with which to judge the relative merit of candidate interventions for investment and disinvestment.

Table 2. Results of the electronic vote for the preferred objective of the Health Improvement Review

Objective	Percentage Vote	n
A housekeeping exercise of current patterns of spending	8%	1
A means of bringing a culture of evidence based decision making into routine policy	42%	5
An academic exercise to explore the degree of success achieved in applying PBMA	8%	1
A means of bringing evidence of cost-effectiveness into resource planning	42%	5

Table 3. Results of the electronic vote for the top four criteria for the health improvement review from 12 PBMA panel members.

Criteria	Percentage Vote	n
Stakeholder views	20%	2
Presence and robustness of evidence of effectiveness	34%	4
Presence and robustness of evidence of cost-effectiveness	27%	3
Impact or potential impact on reducing inequalities in health	19%	2

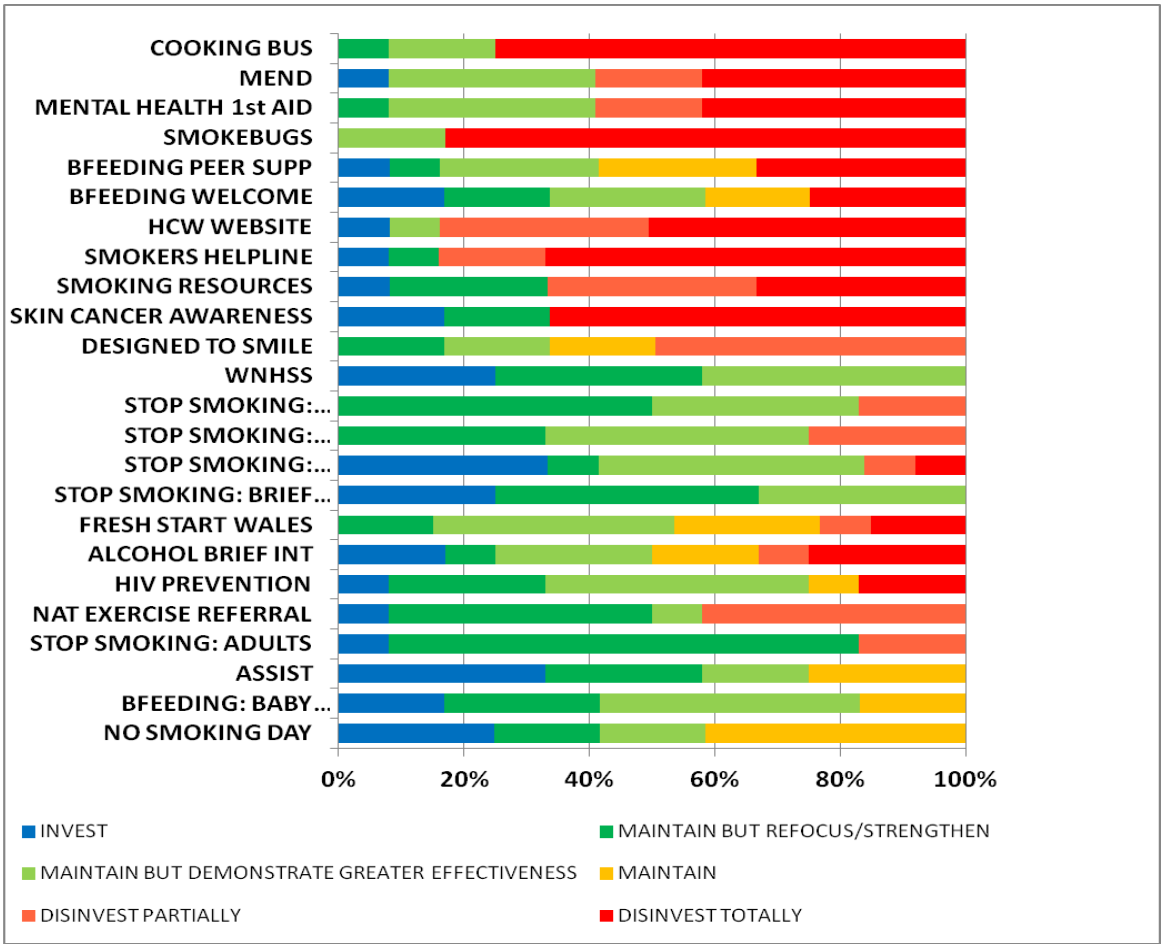
Table 4. Results of the electronic vote for the most relevant time horizon that should be used in this PBMA based review of health improvement programmes in Wales – it was stated to the panel in the session that this time horizon related to outcomes rather than the process of the review

Time Horizon	Percentage Vote	n
1 year	8%	1
5 years	50%	6
10 years	17%	2
15 years	8%	1
20 years	17%	2
Other (please specify)	0%	0

Generation of Candidate Initiatives for Investment and Disinvestment

Figure 3 illustrates that the PBMA panel was able to reach a majority vote to recommend disinvestment in 7 out of 25 initiatives at a total cost of £1.5 million, (The Cooking Bus, Smoke Bugs, Skin Cancer Awareness, Health Challenge Wales Website, MEND, Mental Health First Aid and Smokers Helpline). It was stressed that this was on the basis of a lack of evidence of effectiveness, cost-effectiveness or support from local public health teams, or any evidence of impact on inequality.

Figure 3. Candidates for investment and disinvestment recommendations from votes made by the PBMA panel (n=12) for the 25 initiatives under review. Please note the initiatives considered as pilots (Teenage Pregnancy Pilot, Steroids and Image Enhancing Drugs and Champions for Health) were not included in the voting.



It did not mean that the target stages of the life course e.g. primary school children, or the goal of limiting health harming behaviours were less important than other goals, rather that such goals should be addressed in other, evidence based ways. The PBMA panel also recommended partial disinvestment in a further 3 interventions at a total cost of £7.3 million, including some big spend areas such as Designed to Smile and National Exercise Referral Scheme. The PBMA group did not vote in any majority fashion to invest further in any of the 25 interventions under review, based upon lack of evidence effectiveness, cost-effectiveness and impact on inequalities

What does NICE recommend that we are currently not doing in Wales

The PBMA process generated a list of interventions recommended by NICE that we are not currently delivering in Wales. There is limited information on the extent of implementation of NICE public health guidance in Wales. There is potential for the introduction of systematic implementation and monitoring of NICE recommendations in Wales. There are a number of existing programmes where greater impact could be achieved through more systematic implementation; more robust monitoring and greater reach. There a number of interventions with evidence of effectiveness not currently being implemented;

Smoking cessation

- Electronic Health Record Interventions
- The provision of smoking cessation in the workplace.
- Nursing interventions (dedicated rather than routine interventions more effective)
- Telephone counselling, there is potential to extend the existing smokers helpline and offer pro-active counselling as well as reactive
- Mass media interventions for smoking cessation in adults
- Targeted programmes at disadvantaged groups

Smoking Prevention

- Mass media interventions for smoking prevention with young people

Physical Activity

- NICE guidance recommends training health professionals (and other health and fitness advisors) to give advice to pregnant women about physical activity.
- Whole-setting approach to physical activity in child-care settings
- There is some evidence to suggest that brief interventions about physical activity in primary care can be effective, particularly when intensive, followed-up and targeted at the highest risk individuals.
- NICE guidance about the importance of planning and development of infrastructure (roads, towns, schools, public places etc) to promote active travel, active play and provision of safe, welcoming, acceptable and appropriate facilities for physical activity
- Whole setting approaches in Workplaces

Nutrition

- Intensive dietary counselling in primary care for high risk individuals
- Workplace approaches

Obesity

- Worksite behaviour modification programmes, that include health screening with counselling/education can result in short-term weight loss although weight loss may be regained post intervention.
- Sustained health-professional-led interventions in primary care or community settings, focusing on diet and physical activity or general health counselling can support maintenance of a healthy weight.
- Interactive computer-based interventions can be an effective intervention for weight loss and weight maintenance but are less effective than in-person interventions.

DISCUSSION

The budget presented for this PBMA exercise was a historical budget within the behest of the Minister for Health and Social Care for Wales. It was split in terms of 70 percent allocated via Public Health Wales and 30 percent directly allocated by Welsh Government. What became clear through the PBMA process was the importance of a programme having a logical and comprehensive boundary. We were made well aware that our £15.1 million is by no means representative of total spending on health improvement across Wales. We believe there may be many examples of matched funds, through arrangements between Welsh Government and local Government, the voluntary sector and other agencies. It became very hard for the members of the PBMA group to comprehend the task of reallocating the £15.1 million without full knowledge of what resources and what interventions were being devoted to tackling health improvement issues out with the programme budget under review. The same argument could be made for previous published PBMA exercises. For example, Twaddle and Walker, (1995) reviewed gynaecological services in Glasgow. They may have needed to consider a wider context of spending e.g. across primary care, other hospitals and other related agencies.

QALYs in Public Health

Despite a growing view that QALYs are an insufficient outcome measure to capture the benefits of public health interventions (Kelly et al., 2005; Weatherly et al., 2009; Payne et al., 2012), the publication of a list of 200 cost per QALY estimates relating to NICE public Health Guidance (Owen et al., 2010), delivered a powerful message that over 80 percent delivered a cost-per QALY of under the NICE threshold of £20,000 per QALY. We found

that in reviewing evidence of cost-effectiveness in the PBMA exercise described in this report, it was necessary to try to find common units of benefit, with which to compare across a whole range of health improvement interventions. QALYs, DALYs, and life years gained were most useful. We found it far more difficult to use information on cost -effectiveness studies which used natural units of effect directly relevant to the public health intervention concerned (e.g., point change on a child behaviour index, minutes of exercise per week, numbers of smokers quitting). This PBMA exercise reinforced the argument for common units of benefit for the purpose of comparing across a whole programme of interventions, even in a public health setting.

We found few return on investment studies, or cost-benefit studies of public health improvement interventions. The fact remains that it is very difficult to place monetary values on health outcomes, whether these be clinical outcomes or public health outcomes.

Public Health – Invest to Save

There is a growing interest amongst health care commissioners and local government in the concept of "invest to save", which is not applied, and has not historically been applied to commissioning decisions over primary and secondary care clinical services in the NHS, but is being demanded of public health today. Within the research time frames of most public health trials and studies of about five years, it is difficult to show in any robust manner evidence of longer term savings for every £1 invested. It is almost as if we need to take a two stage look at the cost-effectiveness of public health interventions. First, what is their respective cost-effectiveness in terms of producing QALYs, or achieving behaviour change in relation to the consumption of health harming products or health harming behaviours, and secondly, an acknowledgement of their longer term likely implications for the NHS and wider economy. If a programme is cost-effective in terms of the first hurdle, then it deserves consideration for funding when up against more clinical interventions in funding rounds. It is arguably disingenuous to demand public health interventions demonstrate an "invest to save" benefit when we do not expect this of new drugs and surgical interventions in the NHS (Woolf et al 2009).

Environmental versus person centred interventions

Chokshi et al (2012), argue that it is potentially much more cost-effective to alter physical or social environments rather than to interact with specific individuals. Environmental changes lead to small individual effects that add up to a large impact at a

population level. Historically most NHS health improvement programmes have been person centred. Perhaps the best example of where health improvement resources have been directed to try to influence environments has been through something like the Healthy Schools programme (Department of Education, 2012), which aimed to change environmental choice sets (school dinners) and cultures, via healthy packed lunches and focus on exercise. However, demonstrating effect has proved difficult.

Limitations of the PBMA exercise

This exercise was the result of a direct request from the Minister for Health and Social Care in Wales to review her specific health improvement budget of £15.1 million. It was recognised that across Welsh Government there were other diverse budgets that could be linked with health improvement activities e.g. through matched funding with local government and the voluntary sector. This meant that we were, at best, undertaking a partial analysis, and needed to keep in mind wider patterns of spending, as far as these could be identified in the time allowed, when considering what was essentially a historically determined boundary to the specific health improvement budget. Common themes and concerns highlighted by the authors that emerged from the three PBMA sessions are summarised in Figure 4.

Figure 4. Key themes and concerns emerging from the PBMA sessions as noted by the authors.

1. There is no source of information on wider spending in Welsh Government and Public Health Wales on health improvement to provide the big picture context to the exercise.
2. It is very difficult to find evidence of effectiveness and cost-effectiveness relating specifically to different time horizons or national versus local provision.
3. The panel may need the information to take into account proportion of the population who may take up a service when thinking about budget share.
4. What is the role of the pot of money under consideration? What makes it different from other pots of money?
5. Should the panel be thinking about potential for treatment savings in the NHS when prioritising?
6. Government priorities can sometimes be based upon serial decision making rather than parallel decision making.

Strengths

This PBMA exercise offered the first detailed breakdown of spending on 25 health improvement initiatives, within the minister's budget 2012/13. This budget provided a starting point for Welsh Government and Public Health Wales to take the scope wider if required and gain a greater understanding of what is spent on health improvement in Wales. The review of initiatives allowed the panel to see what programmes are currently being rolled-out in Wales and suggest further improvements for initiatives, alternate delivery systems or new initiatives based upon NICE guidance. The PBMA process generated a list of interventions recommended by NICE that we are not currently delivering in Wales. A next step would be to generate evidence booklets for these, estimating what could be achieved with e.g. £1 million invested in any one of these new interventions. There would be a need to see how they would dove-tail with existing interventions and goals.

Conclusions

The PBMA provided a platform to discuss what public health initiatives are currently being delivered in Wales, the annual budget for these initiatives, their evidence base (including clinical effectiveness, cost-effectiveness and equity considerations), stakeholder consultation and alternative options for delivery. The voting for candidates of investment and disinvestment showed a clear recommendation for total disinvestment in 4 initiatives and a recommendation for partial disinvestment in 6 further initiatives. The evidence sub-groups were also able to suggest what we could be doing in Wales using NICE guidance. This could provide a next step for Public Health Wales to take this health improvement review further. It was also clear during the PBMA sessions during the discussion that the panel were in favour of a Salutogenesis/ health stock model of public health improvement policy.

Wales spends a very small proportion of its NHS budget on health improvement. A recent document by Directors of Public Heath in England (Association of Directors of Public Health, 2012) advocates an uplift of £1 billion (an additional £19 per head) in Public Health expenditure in England, this would equate to £57 million in Wales, assuming comparability of population and current spending, which across Welsh Government in its broader sense is as yet unidentified. We argue here, that if anything, more should be spent on health improvement. However, by demonstrating that the PBMA process can reach decisions about potential candidates for disinvestment, next steps would be an evidence review of the relative benefits of spending released or additional funds on health improvement in Wales.

REFERENCES

Association of Directors of Public Health (2012). The Case for Additional Investment in Public Health (working document v.1, 28th August 2012) Retrieved from http://www.publications.parliament.uk/pa/cm201213/cmselect/cmcomloc/writev/694/m27.htm

Brambleby, P., & Fordham, R. (2003a) What is PBMA? Volume 4, Number 2. Hayward Medical Communications U.K.

Brambleby, P., & Fordham, R. (2003b) Implementing PBMA? Volume 4, Number 3. Hayward Medical Communications U.K.

Chokshi, D A., and. Farley, T A (2012) The Cost-Effectiveness of Environmental Approaches to Disease Prevention, New England Journal of Medicine, 367 (4), p. 295-297.

Department for Education (2012) Healthy Schools Retrieved from http://www.education.gov.uk/schools/pupilsupport/pastoralcare/a0075278/healthy-schools

Donaldson, C., Bate, A., Mitton, C., Dionne, F., & Ruta, D. (2010). Rational Disinvestment. QJM: An international Journal of Medicine, 103, 801-807.

Drummond, M.F., Sculpher, M.J., Torrance, G.W., O'Brien, B.J., & Stoddart, G.L. (2005). Methods for the economic evaluation of health care programmes (3rd Ed.). Oxford University Press: Oxford, U.K.

Edwards, R.T., Charles, J.M., Thomas, S., Howson, H & Bradley, P. (2012) Use of health economics and programme budgeting and marginal analysis at a national level to prioritise public health improvement programmes in Wales. The Lancet. Retrieved from http://download.thelancet.com/flatcontentassets/pdfs/public-health/Public_Health_Abstracts_ALL_Part73.pdf

Henderson LR, Scott A. (2001). The costs of caring for stroke patients in a GP-led community hospital: an application of programme budgeting and marginal analysis. Health and Social Care in the Community, 9, 244–254.

Kelly, M.P., McDaid, D., Ludbrook, A., & Powell, J. (2005). Economic appraisal of public health interventions. London: Health Development Agency. Retrieved from http://www.nice.org.uk/nicemedia/documents/Economic_appraisal_of_public_health_interventions.pdf

McDaid, D., & Needle, J. (2007). *What use has been made of economic evaluation in public health? A systematic review of the literature.* In Policy Futures for UK Health. Oxford: Radcliffe Medical Press, Forthcoming.

Medical Research Council. (2008). Guidance on the development, evaluation and implementation of complex interventions to improve health. Retrieved from http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC004871

Mitton C, Donaldson C, Shellian B, Pagenkopf C. (2003). Priority setting in a Canadian surgical department: a case study using program budgeting and marginal analysis. Canadian Journal of Surgery, 46, 23–29.

Owen, L., Morgan, A., Fischer, A., Ellis, S., Hoy, A., & Kelly, M.P. (2011). The cost-effectiveness of public health interventions. Journal of Public Health DOI:10.1093/pubmed/fdr075

Payne, K., McAllister, M., & Davies, L.M. (2012). Valuing the economic benefits of complex interventions: When maximising health is not sufficient. Health Economics DOI:10.1002/hec.2795.

Public Health Wales Observatory (2012) Retrieved from personal communication with Ciaran Humphreys from the Public Health Wales Observatory.

Ratcliffe J, Donaldson C, Macphee S. (1996). Programme budgeting and marginal analysis: a case study of maternity services. Journal of Public Health Medicine, 18, 175–182.

The Ottawa Charter for Health Promotion (1986) Retrieved from http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index.html

Tsourapas, A & Frew, E (2011). Evaluating 'success' in programme budgeting and marginal analysis: a literature review. Journal of Health Service Research Policy, 16, 177-183.

Twaddle, S & Walker, A (1995). Programme budgeting and marginal analysis: application within programmes to assist purchasing in Greater Glasgow Health Board. Health Policy, 33, 91-105.

Weatherly, H., Drummond, M., Claxton, K., Cookson, R., Ferguson, B., Godfrey, C., Rice, N., Sculpher, M., & Sowden, A. (2009). Methods for assessing the cost-effectiveness of public health interventions: Key challenges and recommendations. Health Policy, 93, 85-92.

Woolf, S.H. et al (2009) The economic argument for disease prevention: distinguishing between value and savings. Prevention Policy Paper Commissioned by Partnership for Prevention. February 2009

APPENDICES

Appendix 1: Examples of evidence booklets presented to PBMA expert panel

Example of ASSIST evidence table

Description	A school based programme which trains peers to work with individuals through a central specialist team. It aims to delay adoption of regular smoking and prevent the uptake of those who have experimented with smoking aged 12-13 years.
Priority area	Tobacco Control – Smoking Prevention
Life course stage	School Children (Age 12 – 13 years)
Intervention	Social norms/peer influence programme in which influential peers are nominated by the year group and invited to attend a two day training session. The training encourages them to engage in discussions with peers to promote smoke free lifestyles. **Level of intervention:** Targeted Population
'total' cost 2012/13	c. £300k (PHW funded)
Evidence of effect GI	**GI** There is good evidence of the potential population impact of this intervention from effectiveness and cost effectiveness studies and it is recommended by NICE. There is evidence of the potential benefit at population level and in reducing inequities. The intervention has been successfully translated into routine delivery.
Cost effectiveness Green II	**Green II – Small number of good quality economic evaluations showing cost-effectiveness/cost-savings/ cost-benefits as appraised by Drummond et al's 2005 Checklist for a sound economic evaluation** In the only initiative specific economic evaluation found (Hollingworth et al. 2012) ASSIST was shown to be cost-effective using a reduction in smoking prevalence of the study population.
Reach	Funded to reach pupils aged 12-13 in 45-50 schools in each academic year (120 schools over a three year period); training a total of 1,250-1,400 pupils as trained peer leaders.
Inequalities	Targets schools by level of deprivation based on school meals eligibility and WIMD. Trial evidence suggests effect in most deprived communities (see Mercken et al 2012). The original evidence was based on testing the programme in Wales.
Mechanisms of delivery	**Delivery:** Peer Support **Setting:** Secondary school Peer support programme for 12-13yr old school children in the school setting based on a 'stopping starting' ethos. Run once every 3 years. WG decides school eligibility and produces list of schools to receive this intervention. Evaluation of the implementation of the programme has not been funded.
Wider views & suggestions for alternative delivery from stakeholders	**Engagements events** There are mixed views from the Health boards with 1 indicating support for the programme and 2 expressing reservations. It was also negatively viewed by LA Health Improvement Leads. There is a perception that the following are key issues: • Poor targeting and uptake of the programme. • Lack of local consultation. • Lack of integration with other services and programmes. *Online form findings:* Two out of the 51 responders said they were aware of ASSIST and one said they thought it worked well *Alternative Delivery:* There is a general consensus that the ASSIST programme could be improved if it were better integrated into other similar or complementary programmes and services in localities, the most obvious being the WNHSS. It is also evident that there needs to be closer co-operation between the national delivery team and the LPHT's. Pathways of risk and risk factors for alcohol, drugs and tobacco among the young are very similar therefore peer support programmes could also be broadened to have synergistic impacts.
Policy Link(s)	**Tobacco Control Action Plan (2011)** Identified Action: "Public Health Wales will provide the Assist programme to 40 to 50 schools per year, focussing on areas of deprivation (Action 2.2)." Also referenced in the Child poverty strategy.

Appendix 2: Summary of wider outputs from the PBMA exercise

The PBMA approach generated the following outputs which will collectively and independently have an important role in informing future health improvement policy in Wales;

- The first detailed breakdown of spending on health improvement initiatives, within the minister's budget 2011/12.
- A breakdown of spending across the 10 priority areas set out in 'Our Healthy Future' for this budget.
- A breakdown of spending across the life course stages set out in 'Our Healthy Future' for this budget.
- A systematic evidence review of the effectiveness and cost effectiveness of 25 health improvement initiatives.
- An equity audit of these 25 initiatives.
- A primary care review of potential for moving health improvement activities into primary care and the community.
- An awareness of the need for a high level mapping and programme budget of all health improvement activities across Welsh Government and partner stakeholders.
- A list of health improvement interventions recommended by NICE currently not delivered in Wales.
- A proposal to shift resources or redesign some current health improvement initiatives within the Minister's budget of £15.1 million.
- Feedback from PBMA expert panel members on taking part in this process.

ACKNOWLEDGMENTS
The authors would like to acknowledge all the members of the Health Improvement Review groups and sub-groups and Prof. Ceri Phillips for his assistance with planning and developing the scope of the PBMA exercise. The authors would also like to thank Alison Shaw for providing reader support to the first author.