Full title:

The cost-effectiveness of public health interventions examined by NICE from 2011 to 2016

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Abstract

Background

A review of economic evaluations of public health interventions assessed by NICE between 2005 and 2010 found 85% were cost-effective.[1] With significant pressure on budgets the role of economics in securing funding remains important. This study updates the earlier analysis.

Methods

Economic evaluations carried out between 2011 and 2016 were categorised: cost utility analysis (CUA, cost-effectiveness analysis(CEA), cost benefit analysis(CBA) and cost consequences analysis(CCA). Cost-effectiveness estimates were analysed and compared with Owen et al 2011.[1]

Results

Of forty-three guidelines examined, 23 used CUA for specific interventions yielding 138 base-case ICER estimates, 11 used CUA for a threshold or 'what if' analysis, 1 used CEA, 3 used CCA, 1 used CBA and CUA and 1 used CEA and CUA, 5 did not require economic modelling. Compared with the earlier period, the median ICER for the 138 estimates was substantially higher (£7,843 versus £1,053) and there was greater variability (a higher proportion in the later period was cost saving, but a higher proportion was also over £20,000 per QALY).

Conclusions

Nearly two-thirds (63%) of public health interventions assessed were cost-effective. However, increased variability in estimates highlights the importance of assessing cost-effectiveness to ensure good use of scarce resources.

Background

In 2011, Owen et al analysed 200 base-case cost-effectiveness estimates of public health interventions considered in 21 public health guidelines developed by the National Institute for Health and Care Excellence (NICE).[1] They concluded that the majority of public health interventions assessed by NICE were estimated to be cost-effective and a significant minority (15%) were cost saving. It is timely to update the analysis now that 61 public health guidelines have been produced at the time of writing.

The funding for public health interventions has changed since the original Owen et al paper, particularly because of the Health and Social Care Act 2012. Local authorities are now responsible for improving public health and reducing health inequalities.[2] The role of economics in securing funding remains important, with Directors of Public Health requiring evidence on cost-effectiveness.[3] The budget available for local authorities for improving public health in England is notably less than that for treating ill-health – the 2016/17 allocation for public health is £3.38billion[4], compared with the £106.8billion budget for the National Health Service (NHS).[5]

Potential topics for NICE guidelines are first considered by the NICE topic oversight group, taking into account the existence of NICE-accredited guidance and the priority of the topic according to commissioners, professional organisations and service users. NICE then discusses identified topics with the Department of Health and Public Health England (for public health guidelines) and NHS England (for clinical guidelines) and a prioritised list is agreed. [6]

NICE's approach to assessing the cost-effectiveness of public health interventions remains relatively unchanged, although the guidance on public health guideline development has been superseded by a unified guidelines manual.[6] This manual sets out the reference case for economic evaluation and advises on the use of economic evidence in guideline development. For interventions with costs and health outcomes in NHS settings, the reference case stipulates that the type of economic evaluation must be a cost-utility analysis (CUA). Despite much discussion in the literature[7,8], the "threshold" below which interventions are generally considered to be cost-effective remains at £20,000 per quality adjusted life year (QALY). For interventions with health and non-health outcomes in public sector and other settings, the reference case additionally lists cost-effectiveness analysis (CEA), cost-consequences

analysis (CCA) and cost-benefit analysis (CBA) as potential types of economic evaluation.[6] The budget available to Local Government would appear to be insufficient to accommodate all interventions identified as cost-effective.

This study updates the original analysis (Owen 2011)[1] for interventions where the incremental cost-effectiveness ratio (ICER) estimates were available. In addition, it aimed to explore the different types of economic evaluation used in NICE Public Health guidelines.

Methods

Economic evaluations undertaken for every NICE public health guideline published between 2011 and 2016 were examined. Each economic evaluation was categorised by type: CUA, CEA, CBA and CCA. It was noted that some guidelines may use more than one type of analysis. CUAs were further categorised by those with base-case estimates, and those that only used threshold or "what if" analysis, where the specific cost and/or effectiveness of an intervention is not known.

The NICE guideline manual states that the comparator for public health interventions should be "interventions routinely delivered in the public sector, including those regarded as best practice." [6] In practice, the evidence base for public health interventions is often limited, and trials that report "best practice" as a comparator may have different interpretations of what this is. Furthermore, "best practice" is not necessarily consistent across England since public health is funded at the local rather than national level. To compare an intervention against all possible comparators would require network meta-analyses which is frequently not possible because of a paucity of information and heterogeneity in the study population, comparators and outcomes. The economic evaluations considered in NICE public health guidelines and in this study are therefore pairwise comparisons between one intervention and comparator, usually based on a single study or meta-analysis. Each evaluation represents a specific case study and is not necessarily generalizable to all populations and settings, so for some guidelines there are multiple interventions which seem similar.

Cost utility analyses

For interventions with base-case estimates, the analysis performed by Owen et al (2011)[1] was repeated. The incremental cost-effective ratios (ICERs) reported for each intervention were

extracted from the model reports and summarised by topic and according to one of five categories: cost saving (costs less and produces more benefits than the comparator); between £0 and less than £20,000 per QALY; between £20,000 and less than £30,000 per QALY; £30,000 per QALY and above; and dominated (costs more and produces less benefit than the comparator). The number of ICERs that were cost saving or dominated were counted. The median ICER for interventions in each of the remaining three categories was calculated. This approach provided consistency with the original paper and enabled an updated comprehensive list of the cost-effectiveness of public health interventions to be produced. The overall median was also calculated and compared with that of the earlier period. The findings from the updated analysis were compared with those from the 2011 analysis using comparisons between median ICERs and proportion of interventions cost-saving and cost-effective. The reasons for differences in results, and the implications of these were explored.

Other types of economic evaluation

We reviewed how guidelines were developed where specific CUA evidence of interventions was unavailable. We examined interventions where CEA, CCA and CBA have been used, to understand scenarios in which these types of economic evaluation are appropriate and how NICE committees consider this evidence in developing guidelines.

Results

Forty-three guidelines were published between the publication of Owen et al (2011)[1], and September 2016. Twenty-three of these guidelines used CUA for specific interventions and provided 138 base-case ICER estimates. A further 11 guidelines used CUA only for a threshold or 'what if' analysis. One guideline used a CEA, and three guidelines used CCA. One guideline used CBA in addition to CUA and one used CEA in addition to CUA. Five guidelines did not require economic modelling.

CUA base-case ICERs

The 2011-16 ICERs are compared to those from the original analysis (Owen 2011)[1] in Table 1. The proportion of interventions which are cost-effective at £20,000/QALY has decreased from 85.5% to 63%, but the proportion which are cost-saving has increased. The proportion which are dominated has decreased, but the proportion which are not cost-effective at £20,000/QALY or £30,000/QALY has increased. The median ICERs for interventions with

ICERs ranging from £0-£20,000/QALY, £20,000-£30,000/QALY and over £30,000/QALY have all increased. A summary of the ICERs by guideline is presented in Table 2.

"What if" analysis

Eleven guidelines used cost-utility analysis, but used a "threshold" or "what-if" scenario analysis framework alone and therefore do not report specific ICERs. This approach considers at what cost and effectiveness interventions would be cost-effective rather than calculating base-case ICERs for specific interventions. It is similar to a sensitivity analysis, but where there is no base-case ICER. It is used when the value of one or more of the parameters is unknown - several likely possible values of the parameters are chosen, and the cost-effectiveness is worked out. The idea is to find out how big the effect or how low the cost would have to be for the intervention to be borderline cost-effective.

CEA

One guideline covering contraceptive services for under 25s (PH51) used CEA, reporting outcomes in natural units (pregnancy or abortion averted).[9] The use of QALYs was not appropriate for this guideline because the interventions aimed to delay or prevent conception and NICE does not attempt to place a value on potential life in the future. The analysis considered several interventions, some of which resulted in net cost savings and which provided a clear economic case for recommending contraceptive services for young people.[10]

CCA

Three guidelines used CCA alone, reporting the costs and outcomes for intervention and comparator without quantifying a comparison: NG44 for community engagement programmes[11], NG48 for oral health promotion programmes in nursing homes[12] and PH56 for interventions to increase the uptake of vitamin D supplements.[13] In each case, this analysis was chosen because there was a lack of evidence linking the outcomes included in the effectiveness studies with health related quality of life, and there were other important dimensions to take into account.

CBA

One guideline, for unintentional injuries on the road, used CBA, in addition to cost-utility analysis. CBA was included because the interventions under consideration would be funded

by the transport sector, whose preferred form of economic evaluation is cost benefit analysis.[14]

Discussion

Main finding of this study

This study found that a smaller proportion of interventions were estimated to be cost-effective at £20,000/QALY in this analysis than in 2011. This should not be interpreted as public health interventions becoming less cost-effective, but more an indication of differences between the two time-periods in the types of interventions and topic areas assessed - the topics that were chosen earlier may have been those that were (on average) more cost-effective. When we consider the broad remit of public health interventions that could be funded, we see that there is wide variation in their cost-effectiveness. Decision makers need to be aware of this variation in order to maximise health gain within a limited budget. It is imperative that decision makers carefully consider the costs and benefits of public health interventions when making funding decisions.

Clinical interventions often have high incremental costs as a result of new technologies, whereas public health interventions tend to have incremental lower costs per person. This may be because the interventions are delivered on a population level and so the cost is shared between a large group and the benefit only applies to a few individual, or may be because the interventions have relatively low costs. With relatively low incremental costs and QALYs, the ICERs of public health interventions are very sensitive to small changes in intervention costs or effectiveness, which is why seemingly similar interventions can have very different results. Decision makers and funders therefore need to carefully consider the costs and benefits of interventions they commission, either by comparing the interventions to those with published ICERs (such as these here) or by evaluating the new programme.

In June 2015 the Government announced a cut of £200 million in the 2015/16 public health grant to local authorities. Further cuts of £77 million and £84 million are planned for 2016/17 and 2017/18.[15] There is growing evidence that these significant financial pressures are leading local authorities to disinvest in highly cost-effective non-statutory public health services such as local stop smoking services.[16] The likely knock-on effect is that other public services, particularly the NHS, will experience increased pressure and higher costs, though this may not occur immediately or even within a couple of years of the reduction in services.

Cost effectiveness in public health optimises over the long term whereas commissioning cycles operate over very short time periods. The benefits of a healthy lifestyle may not be seen for decades, but will add many additional years to the lives of individuals and give higher health related quality of life. This raises a difficult but important question about the link between affordability and cost-effectiveness. Our current analysis found that nearly two-thirds of the public health interventions studied in cost-utility analyses were cost-effective or cost-saving according at a threshold of £20,000 and as such provide excellent value for money. However, for Local Authorities with limited budgets, funding all these interventions may not be affordable. Research is needed to understand whether current disinvestment in non-statutory public health services reduces population net health benefit long-term.

The present analysis identified eleven guidelines informed by 'what if' (or so-called 'threshold') analyses. Although not reported by Owen and colleagues, there were only three guidelines in the time period up to 2011 that necessitated such an approach. This finding suggests that over time, NICE has received an increasing number of referrals for interventions and behaviours for which there are significant gaps in the evidence base. Threshold analyses are also useful where costs and effects vary widely between interventions and settings (but are known locally to decision makers).

We provide cases where methods other than CUA have been used. The decision to use the results of a cost benefit analysis in transport-related interventions was justified, even though the conclusions from cost utility analysis were different due to a difference in perspective. The CUA took a public sector perspective and accounted for all QALYs and medical, police, local authority and department for transport costs invested or saved. The cost-benefit analysis was from a broader societal perspective and accounted for medical and human costs saved and lost output saved.

The role of cost consequences analysis in developing recommendations is, arguably, less straightforward. When there is more than one outcome of interest, the relative importance of the outcomes is unclear and may differ from one person to another. There are other difficulties too, for example, the committee for community engagement found it difficult to make a general statement about whether community engagement provides good value for money based on the very specific and small number of case studies used in the analysis. However, others take the view that cost consequences analysis is easier to understand for the

purposes of decision making and resource allocation because decision makers are able to select the components most relevant to their perspective.[17,18]

What is already known on this topic

In 2011, Owen et al estimated that most public health interventions considered in NICE guidelines were cost-effective. Others too have found that public health interventions are cost-effective, and that investing in prevention saves money in the future.[19]

The challenges of economic modelling in public health are well known.[20] The suitability of the QALY outcome is widely discussed, and its limitations recognised. The role of other forms of economic analysis, in particular cost consequences analysis is much debated, and its application in decision making warrants further investigation.[18, 21-23]

What this study adds

This paper provides an updated comprehensive source of the cost-effectiveness of public health interventions considered in NICE guidance and can be used by decision makers to inform funding decisions. While the general tenor of the results follows a similar path covered by the 2005 to 2011 paper, the later results show a greater spread of the distribution of the ICERs, and quite a substantial increase in the overall median ICER. This leads into discussion about why ICERs vary, and the importance of decision makers carefully considering the costs and benefits of public health interventions. The use of CEA and CCA demonstrate the challenges that still remain in applying CUA analysis to the assessment of public health interventions. We hope that this contributes to wider discussions about the cost-effectiveness of public health interventions generally, and the methods used for economic evaluation in public health.

Limitations of this study

Although this study represents a comprehensive list of the cost-effectiveness of public health interventions studied in NICE guidelines, it represents a subset of all public health interventions. This is because the interventions assessed by NICE are determined by a topic referral process which was described earlier, the number of topics that can be assessed by NICE is limited by the resources available, and the broad scope of public health makes for a substantial number of potential interventions.

Table 2 shows that the topics referred to NICE between 2011-2016 covered a diverse range from interventions targeting individual lifestyle behaviours such as smoking, alcohol misuse and physical inactivity to those 'targeting' overall population wellbeing such as looked after children, cold homes and community engagement. We have been unable to carry out any form of regression analysis to isolate the determinants of cost-effectiveness because of the enormous range of possible determinants and the fragmentary nature of the cost-effectiveness analyses in the literature.

This study includes multiple similar interventions within several guidelines, such as those for smoking cessation in secondary care (PH48) and smoking harm reduction (PH45). Including multiple interventions with similar ICERs may have skewed the distribution of the data - in these examples all interventions have relatively low or dominant ICERs. In contrast, cold homes (NG6) and skin cancer prevention (PH32) have multiple interventions with very high ICERs. This is a feature of the availability of data to inform analyses for the guidelines and should be noted as a limitation. By calculating the median rather than the mean ICER we hoped to mitigate the impact of this skew.

It was not possible for us to compare the cost-effectiveness of all NICE public health interventions in all guidelines, as not all include QALYs as an outcome. Even where QALYs were reported, care must be taken in making direct comparisons. It is likely that economic analyses will vary in the extent to which they have been able to fully capture the costs and consequences arising from complex, multi-faceted public health interventions.

A further limitation involves the comparator. In some cases, such as in smoking cessation, a number of interventions have in the past all been compared with a background quit rate ("doing nothing"), and most were cost saving. A new intervention might well be cost-effective compared with no intervention, but may be dominated by an existing intervention. It is therefore imperative that decision makers ensure that they consider economic analysis that is similar to their decision problem in terms of population, intervention and comparator.

Finally, we note the limitation that adjustment for costs and standard of living adjustments for the real-money value of QALYs have not been made.

Conclusion

Although many public health interventions are cost-effective or even cost-saving, there is a large variation in the cost-effectiveness of public health interventions, and some do not represent good value for money. In order to maximise health gain within a limited budget, it is imperative that decision makers and those funding public health understand the costs and benefits associated with different interventions.

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Table 1 Number (%) and median values of ranges of the estimated incremental cost per QALY for public health interventions assessed and published by NICE between 2006 and 2016

	Cost saving	£0-<£20,000	£20,000-£30,000	>£30,000	Intervention was dominated		
Published 2011-2016						Median*	Interquartile range of medians
Number (%)	35 (25)	53 (38)	4 (3)	43 (31)	3 (2)		
Median	N/A	£4,830	£25,306	£188,301	N/A	£7,843	£75 - £61,814
Published 2006-2010						Median*	Interquartile range of medians
Number (%)	30 (15)	141 (70.5)	7 (3.5)	11 (5.5)	11 (5.5)		
Median	N/A	£1,030	£25,150	£90,786	N/A	£1,053	£149 - £6587

*The median of the whole sample consists of the middle observation for that time-period, where the dominating (cost-saving) ICERs are counted at the low end and the dominated ICERs are counted at the high end of the ICER distribution.

Table 2 Value of incremental cost-effectiveness estimates for public health interventions assessed and published by NICE between 2011-2016

Guidance topic & interventions	Comparator	cost/QALY (£)
NG30: Oral health promotion: general dental practice		
one-to-one counselling to parents of children aged 5 years at average risk caries in socio-economically deprived areas in Northwest England	usual care	£163,558
One-to-one counselling to parents of children aged 5 years at high risk caries in socio-economically deprived areas in Northwest England		dominant
Dental hygienists OH prog for children aged 12 years at average risk	usual care	£14,408
Dental hygienists OH prog for children aged 12 years at high risk		dominant
NG32: Older people: independence and mental wellbeing		
internet and computer training	usual care	£15,962
Friendship programme		dominant
PH27: Weight management in pregnancy		
weight management interventions	conventional postnatal care	£9,096
PH30: Unintentional injuries in the home		
Free smoke alarms programme	no intervention	£23,046
PH35: Type 2 diabetes: pop and comm		
broad dietary education/cooking skills	no intervention	£878
new food retail outlet	no intervention	dominated
multicomponent small scale	no intervention	£562
large scale region-wide multi component	no intervention	dominant
PH38:Type 2 diabetes: high risk		
LPDS ≥ 4.75, HbA1c ≥ 5.85% (+ intensive intervention)	Vascular Checks (without intervention)	£12,042
LPDS ≥ 5.0, HbA1c ≥ 5.85% (+ intensive intervention)	Vascular Checks (without intervention)	£11,169
LPDS ≥ 5.25, HbA1c ≥ 6.0% (+ intensive intervention)	Vascular Checks (without intervention)	£11,376
LPDS ≥ 5.25, FPG ≥ 5.5mmol/L (+ intensive intervention)	Vascular Checks (without intervention)	£7,057
LPDS ≥ 4.75, HbA1c ≥ 5.85% (+ intensive intervention)	Vascular Checks (with intervention)	£14,154
LPDS ≥ 5.0, HbA1c ≥ 5.85% (+ intensive intervention)	Vascular Checks (with intervention)	£15,192
LPDS ≥ 5.25, HbA1c ≥ 6.0% (+ intensive intervention)	Vascular Checks (with intervention)	£19,259
LPDS ≥ 5.25, FPG ≥ 5.5mmol/L (+ intensive intervention)	Vascular Checks (without intervention)	£13,440
PH38:Type 2 diabetes: South Asians age 25-39 years		
LPDS ≥ 5.25, HbA1c ≥ 6.0% (+ intensive intervention)	Vascular Checks (without intervention)	dominant
PH40: Social emotional wellbeing early years		

weekly home visits	no intervention	£85,097
sure start - 1 year	no intervention	dominant
sure start - 3 year	no intervention	£15,148
sure start - 5 year	no intervention	dominant
PH41: Physical activity: walking and cycling		
multi-component cycling demonstration	no intervention	£4,830
multicomponent sustainable travel towns	no intervention	£997
travelsmart (continuous risk)	no intervention	£300
travel smart (step risk)	no intervention	£2,500
pedometer 4 week baker (continuous risk)	no intervention	£2,903
pedometer 4 week baker (step risk)	no intervention	£9,448
pedometer sustained Baker (continuous risk)	no intervention	£1,731
pedometer sustained Baker (step risk)	no intervention	£7,817
pedometer Merom (continuous risk function)	no intervention	£1,530
pedometer Merom (step risk function)	no intervention	£1,995
PH43: Hep C testing		
dried blood spot testing in addiction services	not offering DBS	£14,632
PH43: Hep B & C testing		
DBS in prison	not offering DBS	£59,418
GP education and paid targeted testing of ex IDUs	no intervention	£13,877
PH44: physical activity: brief advice for adults in primary care		
brief advice for one year	no brief advice	£1,730
PH45: Smoking: Harm reduction		
CDTQ + NCP + generic support	no treatment	£668
CDTQ + NCP + specialist support	no treatment	£2,294
CDTQ + NCP	no treatment	£544
CDTQ + generic support	no treatment	dominant
CDTQ + specialist support	no treatment	£437
CDTQ	no treatment	dominant
Abrupt + NCP substitute + generic support	no treatment	£2,836
Abrupt + NCP substitute + specialist support	no treatment	£4,280
Abrupt + NCP substitute	no treatment	£7,388
Temporary abstinence + NCP + generic support	no treatment	£765
Temporary abstinence + NCP + specialist support	no treatment	£2,458
Temporary abstinence + NCP	no treatment	£7,843
Temporary abstinence + generic support	no treatment	£706
Temporary abstinence + specialist support	no treatment	£8,464
Temporary abstinence	no treatment	no benefit, no cost
Reduce + NCP + generic support	no treatment	£765
Reduce + NCP + specialist support	no treatment	£2,458
Reduce + NCP	no treatment	£7,843
Reduce + generic support	no treatment	£706
Reduce + specialist support	no treatment	£8,464

Reduce	no treatment	dominant
PH48: Smoking cessation secondary care		
high intensity behavioural intervention for pregnant women Hartman	low intensity behavioural	dominant
high intensity behavioural intervention for pregnant women Domelas	usual care	£634
high intensity behavioural intervention for pregnant women Hegaard	usual care	£15,281
high intensity behavioural intervention for pregnant women Ershoff	usual care	dominant
conditional incentives for pregnant women Higgins	unconditional incentives	£3,076
conditional incentives for pregnant women Donatelle	unconditional incentives	£5,149
conditional incentives for pregnant women Heil	unconditional incentives	£3,306
behavioural + pharmacological for PTSD patients	usual care	dominant
behavioural + pharmacological for PTSD patients	usual care	£6,407
high intensity behaviouraL + pharmacological for pre-operative patients Moller	low intensity behavioural	dominant
high intensity behaviouraL + pharmacological for pre-operative patients Lindstrom	low intensity behavioural	dominant
high intensity behavioural for COPD BTS	brief advice	dominant
high intensity behavioural + pharmacological for COPD Tonnesen	low intensity behavioural	dominant
pharmacological for COPD Borglykke	usual care	dominant
High intensity behavioural + pharmacological for cardiac de Busk	brief advice	dominant
high intensity behavioural for cardiac Quist	low intensity behavioural	dominant
Behavioural + pharmacological for cardac Taylor	usual care	dominant
High intensity behavioural for cardiac Henrrikus	brief advice	dominant
pharmacological for general inpatients Miller	low intensity behavioural	dominant
pharmacological for hospital employees Dalsgaro	placebo + low intensity behavioural	dominant
Total smoke free policy -indoor and outdoor Gadomski	Indoor smokefree policy	dominant
PH50: Domestic violence and abuse: multi-agency working		
incidence reduction - independent domestic violence advisors	no IDVA	dominant
harm reduction - cognitive trauma therapy - battered women	CTT-BW	dominant
PH54: Physical activity exercise referral schemes		
ERS	usual care	£88,742
PH31: Unintentional injuries on the road		
mixed priority routes	no intervention	£304,823
mandatory 20mph zones LOW CASUALTIES	no intervention	£457,762
mandatory 20mph zones HIGH CASUALTIES	no intervention	£89,700
advisory 20mph zones	no intervention	£22,952
NG34: sunlight exposure: risks and benefits		
living with the sun'	do nothing	£312,744
photo-aging		£316,968
tailored message		£16,859
mass media		dominant

text messages		£65,945
NG6: Cold homes		
energy efficiency COPD	none	£28,324
energy efficiency HD	none	£157,137
energy efficiency CMD	none	£394,556
energy efficiency age 65+	none	£157,661
energy efficiency low income	none	£275,896
fuel subsidy COPD	none	£39,437
fuel subsidy HD	none	£188,301
fuel subsidy CMD	none	£509,205
fuel subsidy age 65+	none	£204,076
fuel subsidy low income	none	£358,089
energy efficiency+ fuel subsidy COPD	none	£33,771
energy efficiency+ fuel subsidy HD	none	£174,467
energy efficiency+ fuel subsidy CMD	none	£452,154
energy efficiency+ fuel subsidy age 65+	none	£180,456
energy efficiency+ fuel subsidy low income	none	£317,927
PH28: Looked after children - Transition support services		
Georgiades (2005) men	usual care/ no intervention	dominant
Georgiades (2005) women	usual care/ no intervention	dominant
Lemon et al (2005) men	usual care/ no intervention	£2,573,542
Lemon et al (2005) women	usual care/ no intervention	dominated
Lindsey & Ahmed (1999) men	usual care/ no intervention	dominant
Lindsey & Ahmed (1999) women	usual care/ no intervention	dominant
Scannapieco (1996) men	usual care/ no intervention	dominant
Scannapieco (1996) women	usual care/ no intervention	dominant
PH32: Skin cancer prevention		
verbal advice & print to parents-children at home (Turissi)	no intervention (current practice)	£6,700
verbal advice - in school and at home activities children at school & newsletter (School) Buller	no intervention (current practice)	£260,000
verbal advice group session- uni students	no intervention (current practice)	£42,000
construction of shade sail	no built shade	£2,394,901
multicomponent beach and pool	none	£10,621,954
multicomponent community	none	£1,069,469
multicomponent community		£207,339
multicomponent education 2-7 years(Bauer)	3 hour education	£32,498,835
multicomponent education 13-15 year olds	3 hour education	£50,940,170
multi-component healthcare - 13-15 year olds	PA & diet	£82,264,556
multicomponent work setting 21065 year olds	Delayed	£1,298,476

PH33: HIV testing: increasing uptake in black africans		
Choice of rapid or standard testing	do nothing	£31,333
Music	do nothing	£32,357
Sport	do nothing	£30,509
Mass media	do nothing	£27,566
PH34: HIV testing: increasing uptake in MSM		
Choice or rapid, oral or standard testing	no testing	£42,632
Opt-out intervention	no testing	£42,145
Retreat intervention	no testing	£56,285
Peer referral intervention	no testing	£50,358
Multi-component mass media	no testing	£62,613
NG55: Harmful sexual behaviour		
Multi-systemic therapy for problem sexual behaviours	Cognitive behavioural therapy	dominant
Cognitive behavioural therapy	Play therapy	£2,685