paper for HESG, City
September 2001
work in progress
not for citation/quotation

Public preferences over reducing inequalities in health: A postal survey

Neill Booth and Aki Tsuchiya[†]

School of Health and Related Research, University of Sheffield

Abstract

The maximisation of population health and the reduction of inequalities in health are two of the main objectives of any publicly funded health care system. However, there are likely to be occasions when these twin objectives of efficiency and equity come into conflict with one another. The study reported here looks at the extent to which 800 members of the UK general public are willing to sacrifice health gain in order to reduce inequalities that exist between people of different groups. Using a postal survey, respondents were presented with variations in health (as represented by differences in average life expectancy and long-term illness) that exist between the highest and lowest social classes. The results suggest that many people are willing to trade gains in health for a more equitable distribution of health. However, the respondents to this postal survey were less willing to trade efficiency for equity than were an earlier group of respondents who received the same questionnaire but in the context of an individual interview. These results suggest that there is a general preference for an efficiency-equity trade-off in health. However, they have important implications for research methodology, suggesting that different policy measures might be implied from the results of postal questionnaires as compared to individual interviews.

† corresponding author: a.tsuchiya@sheffield.ac.uk

INTRODUCTION

The maximisation of population health and the minimisation of health inequalities are the two main objectives of a publicly funded health care system. Often these two objectives will be at conflict with each other, making a trade-off between them necessary. The ESRC funded project "The measurement of public preferences over inequalities in health" has been an effort to examine how the public view this trade-off. The project team has presented at two past HESG meetings (Dolan et al., Nottingham July 00, and Oxford January 01) the results of a series of interview studies. This paper reports on a postal questionnaire that explored the extents to which the same kinds of questions are amenable to such administration, and to which extent the results are comparable across the two different elicitation settings.

METHODS

The questionnaire

For the purposes of this paper, the postal questionnaire involved binary choice questions between an "untargeted" and a "targeted" programme, Programme A and Programme B, respectively. Each respondent was given three questions involving choices where the two Programmes affected two groups of people of equal size to

(1) increase life expectancy at birth,
(2) decrease rates of long-term illness, and
(3) save life.

For example, the first question will mention the existing inequality in life expectancy at birth between those in social class 1 and those in social class 5. The question will then ask the respondent to choose between the untargeted Programme A that will increase the life expectancy of both parties by 2 years, and the targeted Programme B that will increase the life expectancy of those in social class 5 by 4 years and will not change the life expectancy of those in social class 1. Which Programme would they prefer?

Another variant asked the same question, not in terms of social class, but in terms of life-style differences. Life-style is defined (for the purposes of the postal questionnaire) in terms of whether or not one has taken care of one's health as in eating healthily, exercising, and not smoking. There is also a social class variant and a life-style variant for the second question for decreasing the prevalence of long-term illness. Further, the order of the life expectancy question and the long-term illness question was changed in some variants of the questionnaire.

For the third question, the two groups of people are identical (and there is no inequality in health) except in the respect that those in one group have not taken care of their health while those in the other group have. Respondents are told that those in the two groups are all about to die within a few days, if they do not receive the intervention. Programme A will save the lives of those who have not taken care of their health and Programme B will save (the same number of) those who have taken

care of their health. Which Programme would they choose? There are three variants to this question: one specifies that the people in the two groups are all 20-year olds, and the second and third variants specify them as 35-year olds and 50-year olds.

In all, there were three variants regarding the first two questions, and each of these was further broken down and given the three different variants of the third question, so that the number of questionnaire versions totalled nine. See Table 1 for the combinations of questions used and a list of the nine versions. Also see Appendix 1 for an example of the wording and layout of the questions asked.

Respondents have been classed as 'non-targeters' if they chose Programme A and 'targeters' if they chose Programme B. For the targeters, there was a series of subsequent binary choices to quantify the efficiency-equality trade-off, where the efficiency of the targeted Programme B decreased while the untargeted Programme A stayed the same. However, this paper will only look into whether or not a respondent will choose to target in the first place.

The questions analysed here are the first three of the questionnaire, and there were two more questions on prioritising between patients of different age, which are not covered in this paper. Background information collected from the respondents and used in this paper are: age, sex, smoker or not, school leaving age, has degree (or equivalent qualification) or not, has children or not, has private health insurance or not, employment status, housing tenure, has long-term illness or not, and ACORN (See Appendix 2 for further details on the meaning of this and other variables used in this paper).

The sample

All postcodes in England, Wales and Scotland were extracted and stratified by Government Standard Region, and within that, by ACORN. Thus the postcodes were ordered in such a way that they were spread geographically, in proportion to the number of households in each Standard Region and socio-economically representative. The Electoral Register was then extracted for each of the postcodes selected and one name and address picked out at random. In total, a version of the questionnaire and a covering letter were sent to 3,000 names and addresses.

The analyses

Correlation between questionnaire variants and respondents background characteristics is examined by χ^2-tests. The distribution of targeters and non-targeters across different questions and questionnaire variants are tested using 2-sided *Z*-tests of equality of distributions. These are further studied by use of binomial logistic regressions with the question type and respondent background characteristics as independent variables. The independent variables are narrowed down using the backward regression procedure in SPSS, which removes an explanatory variable when its statistical significance exceeds the cut-off point (a cut-off point/removal probability of 0.05 is used in all regressions reported here).

There are three hypotheses to be tested.

(H1): Given that social class is something people are born into and thus have no control over, while on the other hand life-style is largely a question of choice, respondents will be concerned more for inequalities in health by social class than by life-style. In other words, in both life expectancy questions and long-term illness questions, the social class variants will have more targeters than the corresponding life-style variants.

(H2): The presence of an interviewer is more likely to induce so-called 'Sunday best' responses, wherein respondents are affected by how the interviewer may perceive their responses/personality, thus leading them to be more concerned for inequalities in health than they otherwise may be. In other words, the postal questionnaire will have less targeters than the interview survey for comparable questions.

(H3): The extent to which respondents may wish to praise those who take care of their health may be a function of the age of those people: it is not unusual for somebody aged 50 to have a sensible life-style, but it is worth more if a 20-year old has one. In other words, there will be more targeters in the 20-year old variant of the third question than in the 50-year old variant.

In each case, the null hypothesis is that no such difference exists. These hypotheses will be tested by examining the corresponding coefficients of the logistic regressions. All comparisons are across-sample comparisons.

RESULTS

The respondents

From the 3,000 questionnaires sent, 833 were returned, resulting in a 28% response rate following a reminder. Prior to this reminding letter the response rate was just below 20%. The distribution of the background characteristics of these respondents and those for the British population are summarised in Table 2. There is no statistically significant difference between the ACORN classification (the only background characteristic available for the entire initial 3,000 sample) of those households to which the questionnaires were sent, and of those who responded. Nor was there any statistically significant difference in the response rate across questionnaire versions. There was, however, a correspondence between the geographical regions and the versions (χ^2-test: $p < 0.001$). This is due to specific versions often being sent largely to specific geographical regions.

Only one respondent was excluded from the entire analysis due to giving no coherent responses to the binary choice questions. Out of the remaining 832 respondents 36 (i.e. less than 5%) failed to respond appropriately to at least one question from the whole questionnaire. These respondents were not excluded, although they are dropped from some of the analyses where they do not have analysable data. 20 respondents had failed to complete some question or questions, while 9 respondents had responses which were inconsistent with other answers they had given. There were 7 respondents who refused to answer one or more questions. There were no

discernable patterns in the group of respondents who returned inappropriate responses, except that only one of these 37 'inappropriate respondents' reported being a non-smoker.

There are many more missing values for questions such as time taken, how and why were the questions difficult, etc. However, these questions were not used as a basis to exclude respondents, these response variables were not used in this paper for any statistical analyses.

A further investigation of the distribution of background characteristics found that none of them is distributed evenly across the 9 questionnaire variants (details not shown). For example, versions 3 and 8 have more males than the rest of the versions (χ^2 tests; $p < 0.001$), while versions 6 and 7 have less ($p = 0.006$ and $p < 0.001$ respectively). This means that simple comparison of the distribution of targeters and non-targeters across the questionnaire versions will not be enough, since these may be affected by respondent characteristics, which are not evenly distributed amongst the respondents of different questionnaire variants.

The responses

The results suggest that many people are willing to trade gains in health for a more equitable distribution of health. Table 3 summarises the distribution of targeters and non-targeters across the questions. For example, the first set is for the life expectancy question, and gives the distribution to this question depending on whether the question is by social class or by life-style, followed by the pooled sample across these two variants. The next set of columns offers the results of the corresponding questions in the interview survey.

The basic binomial logistic regression model used is

$$\text{P(Target = 1 | RESPONSE\_VARIABLES)} = \mathbf{F}(\text{Constant} + \beta_1 \text{ DEGREE} + \beta_2 \text{ PRIVATE} + \beta_3 \text{ EMPSTAT}_i + \beta_4 \text{ HOUSE} + \beta_5 \text{ SMOKE} + \beta_6 \text{ AGEGRP}_j + \beta_7 \text{ SEX} + \beta_8 \text{ CHILDREN} + \beta_9 \text{ SCHOOL} + \beta_{10} \text{ HEALTH} + \beta_{11} \text{ VERSION}_k + \beta_{12} \text{ ACORN}_l)$$

Tables 4 to 6 report the results by the questions asked. For example, in the question for life expectancy by social class (Table 4a), the odds of targeting as opposed to non-targeting for respondents who reported themselves as having a degree or equivalent qualification (i.e. those with DEGREE = 1) is just over twice the odds for those who reported themselves as not having a degree or equivalent qualification (i.e. those with DEGREE = 0, the reference). Thus respondents who report themselves as having a degree or equivalent qualification are, statistically, twice as likely to target (odds ratio = 2.126), which is a statistically significant coefficient using a 1% standard.

Comparing responses to the life expectancy questions by social class and by life-style, while DEGREE, EMPSTAT, HOUSE, AGEGRP and VERSION (and thus the ordering of the question) affects responses to the social class variant, they do not affect the life-style variant. Note that DEGREE, EMPSTAT and HOUSE are to some extent background characteristics related to the social class position of the respondent. On the other hand, SEX and SCHOOL affects the life-style question but not the life expectancy

question. Of interest is that SMOKE, which can be considered as a life-style variable, has a much larger coefficient in the life-style variant.

Continuing the comparison between the social class variant and life-style variant, but this time for the long-term illness question, now it is the life-style variant that is affected by AGEGRP and EMPSTAT, not the social class variant. HOUSE and DEGREE however continue to affect the social class variant only, and not the life-style variant. SMOKE is now dropped from the social class variant, while it remains for the life-style variant with a weakened effect.

Moving to the life-style questions, SMOKE, a life-style choice detrimental to the health of the respondent, has an effect for all three variants. It is interesting to see how different variables survive the stepwise elimination procedure according to how old the people in the two groups are. Regarding life-style of 20-year olds, EMPSTAT of the respondent influences whether or not a respondent targets or not. But when life-style of 35-year olds is considered, then it is largely the CHILDREN factor of the respondents that matters, in addition to AGEGRP. And finally, concerning the life-style of 50-year olds, DEGREE enters the picture.

Alternative models starting from different sets of independent variables are also run to see the robustness of the set of variables that survive the stepwise elimination procedure. There are four alternative models which alter those variables not reported by the respondent (either VERSION or ACORN was dropped, or VERSION was replaced by clusters of variants). For most questions, starting from a different set of independent variables results in different set of residual variables (results not shown), thus suggesting the possible unstable nature of these regression coefficients. However, for life expectancy by life-style, life-style of 20-year olds, and life-style of 35-year olds, the results were robust in the sense that all four alternative models resulted in the same results as those reported here. In other words, these are not affected by questionnaire versions or by how their neighbourhood is ranked by ACORN.

Regarding the three hypotheses, it can be seen from Table 3 that the distributions observed supports H1 for both the life expectancy questions (2-sided *Z*-tests; $p < 0.001$) and the long-term illness questions ($p < 0.001$); lends support to H2 for all three questions ($p < 0.02$ for the life expectancy question, $p < 0.001$ for the long-term illness question, and $p < 0.001$ for the life-style question); and does not consistently support H3 for the life-style question ($p < 0.002$ for 20-year olds vs. 35-year olds, $p < 0.5$ for 20-year olds vs. 50-year olds, and $p < 0.001$ for 35-year olds vs. 50-year olds).

In addition, H1 can be explored by estimating two logistic regressions: one for the life expectancy question and another for the long-term illness question. The social class variants and the life-style variants are pooled, and the effect of these by including a dummy representing these different variants is tested. This approach has the advantage over the *Z*-tests above, since it controls for the effects of the difference in background characteristics of the respondents. The coefficient for this dummy has the expected sign (i.e. suggesting that respondents are more likely to target in the social class variant) with $p < 0.001$ for the life expectancy question and $p < 0.001$ for the long-term illness question (full results not shown). Thus the null hypothesis, "that the

responses are the same for the social class variant and the life-style variant", is rejected.

To do the same for H2 will require the individual level dataset for the interviews, and is left for a later study.

Testing for H3 can be accomplished by pooling all the results for the life-style question, and by including two dummies representing the 35-year old variant and the 50-year old variant. While the 50-year old dummy is dropped, the 35-year old dummy survives and is significant at the 1% level (full results not shown). Therefore, the null hypothesis, "that the responses for the three different age variants are the same", is rejected. The claim "that the responses for the 20-year old variant and the 50-year old variant are the same", however, cannot be rejected.

DISCUSSION

This study has demonstrated that it is possible to engage members of the public in carefully designed postal questionnaires concerning efficiency-equality trade-offs in life expectancy, illness, and life saving. Some of the questions asked involve difficult and sensitive issues, but the 28% response rate is not appallingly low, and the rate of unusable responses is very low.

Overall, the observed results are in line with the earlier interview results. People are concerned about inequalities in health; different population groupings (by social class or by life-style) have an effect on the degree by which people are concerned; different measures of inequality (in life expectancy or in long-term illness) also have an effect; and whether one has taken care of one's own health is seen as a relevant component.

Of the three hypotheses tested, the first null hypothesis is rejected. The interpretation of this is that a given inequality matters more if it occurs across people of different social classes than when it occurs across people of different life-styles. Relatively speaking, social class is something one has little choice over, while whether or not one eats sensibly, exercises, or smokes, is to a larger extent up to one's own choice. It is reassuring that the expected outcome, that a given inequality matters more (less) if it is imposed (self-selected), is observed in an across-sample context.

Statistically rejecting the second null hypothesis requires a more detailed comparison with the interview survey results, which is beyond the scope of this paper. However, the *Z*-tests (which do not take into account the effect of respondent background characteristics) suggest that there is scope for this to be rejected. This would imply that the presence of an interviewer systematically affects a respondent's reply so as to appear more concerned for inequality than is the case when the questionnaire is completed in privacy with no personal contact with an interviewer or a researcher. There are arguments that support the use of interviews over postal questionnaires, but should the effect found here be confirmed, this will offer an interesting countervailing argument.

A related point is the relevance of personal interests. The number of respondents in the earlier interview survey was not large enough to carry out statistical tests, but to the extent that these were done, effect of background characteristics were not picked up. However, in the regressions on the seven types of questions indicated, not only do background characteristics affect the probability of a given respondent targeting, it is also related to the particular question asked so that for example DEGREE and EMPSTAT were related to social class variants when they were not related to the corresponding life-style variants of the same question, and SMOKE was present or more prominent in the life-style variants than in the corresponding social class variants. The implication seems to be that a person from the professional class is more likely than others to target in social class variants (which is to negate self-interest), and a smoker is more likely than others to target in life-style variants (which is to promote self-interest). The effect of personal interests on a question concerning social values and public decision making, as opposed to questions in individual values and consumer choices, is an important issue that requires further analysis and careful discussion.

The third null hypothesis is rejected. This means that the data support the claim that the age of people matter when the relative merits of having taken care of one's health are considered. However, since the difference between the 20-year old variant and the 50-year old variant is not indicated, the interpretation of this is not as simple as suggested earlier. A possible line of argument to single out 35-year olds from the others is to appeal to the likelihood of people at this age being responsible for a young family. This however is likely to lead to 35-year olds being expected to take better care of their health, and not (as observed) allowed to take less care. Thus, the finding here is puzzling. One explanation could be that they are showing deference to the value of human capital. This 'rule of thumb' could be that, at age 35, people may well be making an economic (or other) contribution to society. Therefore there may well be less distinction drawn between living a healthy or unhealthy life-style, as long as you are 'paying your way'.

There are several more issues that can be explored with this data. One such issue is the extent to which ordering of questions affects the responses. Since the same set of questions are asked in different orders, this is testable, and is planned for the next stage of analysis. Another is to examine the extent of the trade-off targeters make, to quantify this in terms of "weights", and to compare these across respondent backgrounds. Further, there are two more questions on patient age, that we have not reported on.

References

Dolan, P., Shaw, R., Tsuchiya, A., To reduce inequalities in health or to maximise health? Determining the social welfare function using stated preference data, HESG, Nottingham, July, 2000

Dolan, P., Shaw, R., Tsuchiya, A., Some methodological issues in the measurement of people's preferences regarding age weighting in health, HESG, Oxford, January, 2001

Acknowledgements

This study is part of an ESRC funded project on the measurement of public preferences over inequalities in health (Award No: L128251050). Paul Dolan and Rebecca Shaw have offered much help. Neill Booth is a Health Economics MSc student at the University of York, presently based at the University of Sheffield as a placement student, and would like to express gratitude for support received in the form of an ESRC studentship. We are grateful to all the respondents who agreed to take part. The usual disclaimers apply.

Table 1: The study design

(a) Questions 1 and 2

Life expectancy (by life-style)	Life expectancy (by social class)
Ill-health (by life-style)	Ill-health (by social class)

Of the eight possible combinations, the following were used:-

Life expectancy (by social class) followed by Ill-health (by life-style)
Life expectancy (by life-style) followed by Ill-health (by social class)
Ill-health (by life-style) followed by Life expectancy (by social class)

(b) Question 3

Life-style 20-year-olds	Life-style 35-year-olds	Life-style 50-year-olds

(c) The nine variants

Version	N	Question 1	Question 2	Question 3
A	90	Life expectancy (by social class)	Ill-health (by life-style)	Life-style 20-year-olds
B	90	Ill-health (by life-style)	Life expectancy (by social class)	Life-style 20-year-olds
C	91	Life expectancy (by life-style)	Ill-health (by social class)	Life-style 20-year-olds
D	93	Life expectancy (by social class)	Ill-health (by life-style)	Life-style 35-year-olds
E	93	Ill-health (by life-style)	Life expectancy (by social class)	Life-style 35-year-olds
F	95	Life expectancy (by life-style)	Ill-health (by social class)	Life-style 35-year-olds
G	91	Life expectancy (by social class)	Ill-health (by life-style)	Life-style 50-year-olds
H	93	Ill-health (by life-style)	Life expectancy (by social class)	Life-style 50-year-olds
I	97	Life expectancy (by life-style)	Ill-health (by social class)	Life-style 50-year-olds
	833			

Table 2: Background characteristics of the respondents

Category	Respondents	Britain*
Sex:		
Male	45%	47%
Female	55%	53%
Age:		
<44 years	47%	49%
>45 years	53%	51%
Dependants:		
Children	30%	66%
No-children	70%	34%
Smoking status:		
Smoker	17%	27%
Ex-smoker	23%	
Non-smoker	60%	73%
Economic status:		
Employed	60%	56%
Other	40%	44%
Tenure		
Owner	82%	67%
Social sector	8%	24%
Private renters	10%	9%
School leaving age:		
Minimum	65%	68%
Stayed on	35%	32%
Limiting long-term illness		
Yes	21%	19%
No	79%	81%
N	**832****	**38509**

***** The Annual Survey of English Housing 1997/1998 and The British Household Panel Survey 1997.

** There are only 832 sets of background variables, as one respondent neglected to provide any such data.

Table 3: Distribution of targeters and non-targeters by question

	Average life expectancy question by **social class** (from **postal**)		Average life expectancy question by **life-style** (from **postal**)		Average life expectancy question (using **all**) (from **postal**)		Average life expectancy question by **social class** (from **interview**)		Average life expectancy question (using **all**) (from **interview**)	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Non-target	274	50.3	227	80.2	501	60.5	24	36.4	56	43.1
Target	271	49.7	56	19.8	327	39.5	42	63.6	74	56.9
Total	545	100.0	283	100.0	828	100.0	66	100.0	130	100.0

NB. The interview-based questionnaires (Dolan et al, 2000) did not differ greatly from the postal questionnaires, in that the same basic question was asked. However, in the interviews, some questions were also asked with reference to gender and in relation to the healthiest and unhealthiest quintiles, rather than social class. Differing ages of people for the life-expectancy choices were used, with more alternative classes in interview.

	Long-term illness question by **social class** (from **postal**)		Long-term illness question by **life-style** (from **postal**)		Long-term illness question (using **all**) (from **postal**)		Long-term illness question by **social class** (from **interview**)		Long-term illness question by **'life-style'** (from **interview**)		Long-term illness question (using **'all'**) (from **interview**)	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Non-target	168	59.4	397	72.7	565	68.2	14	21.2	9	27.3	23	23.2
Target	115	40.6	149	27.3	264	31.8	52	78.8	24	72.7	76	76.8
Total	283	100.0	546	100.0	829	100.0	66	100.0	33	100.0	99	100.0

NB. The interview-based questionnaires differed in that the life-style questions were couched in terms of smoking/non-smoking, rather than the healthy eating, exercising and non-smoking in the postal questionnaires. Differing percentages of decreased rates of long-term illness were used, with more alternative classes in the interviews.

	life-style question (using **age = 20**) (from **postal**)		life-style question (using **age = 35**) (from **postal**)		life-style question (using **age = 50**) (from **postal**)		life-style question (using **all**) (from **postal**)		life-style question (using **all**) (from **interview**)	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Non-target	60	22.3	92	33.5	61	21.9	213	25.9	1	1.7
Target	209	77.7	183	66.5	218	78.1	610	74.1	55	98.2
Total	269	100.0	275	100.0	279	100.0	823	100.0	56	100.0

NB. The interview-based questionnaires did not differ greatly from the postal questionnaires, in that the same basic question was asked, but without reference to age. Differing numbers of people who had cared for their health were used for the trade-offs.

Table 4: The life expectancy question

(a) by social class

Variables in the Equation		B	Exp(B)	Sig.
DEGREE		0.754	2.126	0
PRIVATE		-1.008	0.365	0
EMPSTAT				0.005
	EMPSTAT(1)	0.265	1.304	0.353
	EMPSTAT(2)	-0.586	0.556	0.097
HOUSE		-0.742	0.476	0.007
SMOKE		0.495	1.64	0.05
AGEGRP				0.013
	AGEGRP(1)	-0.602	0.548	0.035
	AGEGRP(2)	0.204	1.226	0.394
VERSION				0
	VERSION(1)	0.59	1.804	0.073
	VERSION(2)	0.173	1.189	0.603
	VERSION(3)	0.079	1.082	0.81
	VERSION(4)	-0.713	0.49	0.043
	VERSION(5)	0.839	2.313	0.014
Constant		0.294	1.342	0.511

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

(b) by life-style

Variables in the Equation	B	Exp(B)	Sig.
SEX	1.009	2.743	0.003
SMOKE	1.284	3.611	0.004
SCHOOL	1.115	3.049	0.002
PRIVATE	1.367	3.925	0
Constant	-2.981	0.051	0

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

Table 5: The long-term illness question

(a) by social class

Variables in the Equation		B	Exp(B)	Sig.
SEX		0.54	1.716	0.041
DEGREE		0.873	2.394	0.003
HOUSE		-1.217	0.296	0.001
VERSION				0.016
	VERSION(1)	-0.335	0.716	0.281
	VERSION(2)	-0.929	0.395	0.004
Constant		0.58	1.786	0.161

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

(b) by life-style

Variables in the Equation		B	Exp(B)	Sig.
SEX		0.474	1.607	0.047
SMOKE		0.807	2.241	0.005
SCHOOL		-1.215	0.297	0
PRIVATE		-0.75	0.472	0.011
AGEGRP				0
	AGEGRP(1)	-1.759	0.172	0
	AGEGRP(2)	-0.954	0.385	0
EMPSTAT				0.01
	EMPSTAT(1)	0.612	1.844	0.082
	EMPSTAT(2)	-0.281	0.755	0.528
ACORN				0.043
	ACORN(1)	0.82	2.271	0.118
	ACORN(2)	-0.343	0.71	0.552
	ACORN(3)	1.411	4.102	0.012
	ACORN(4)	0.729	2.073	0.169
	ACORN(5)	0.021	1.021	0.968
	ACORN(6)	0.468	1.597	0.393
	ACORN(7)	0.037	1.038	0.947
	ACORN(8)	0.231	1.26	0.712
	ACORN(9)	0.35	1.419	0.515
VERSION				0.001
	VERSION(1)	0.074	1.076	0.84
	VERSION(2)	-1.455	0.233	0.001
	VERSION(3)	-0.099	0.906	0.803
	VERSION(4)	-0.226	0.798	0.561
	VERSION(5)	-0.92	0.399	0.023
Constant		-0.5	0.607	0.446

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

Table 6: The life-style question

(a) of 20-year-olds

Variables in the Equation		B	Exp(B)	Sig.
SMOKE		-1.346	0.26	0
EMPSTAT				0.041
	EMPSTAT(1)	-1.183	0.306	0.015
	EMPSTAT(2)	-0.804	0.448	0.151
Constant		2.426	11.315	0

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

(b) of 35-year-.olds

Variables in the Equation		B	Exp(B)	Sig.
SMOKE		-1.634	0.195	0
CHILDREN		1.512	4.535	0
AGEGRP				0.008
	AGEGRP(1)	1.124	3.078	0.003
	AGEGRP(2)	0.558	1.746	0.109
Constant		0.099	1.104	0.64

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

(c) of 50-year-olds

Variables in the Equation		B	Exp(B)	Sig.
DEGREE		0.988	2.686	0.01
SMOKE		-1.375	0.253	0
AGEGRP				0.019
	AGEGRP(1)	0.908	2.479	0.065
	AGEGRP(2)	-0.377	0.686	0.32
CHILDREN		-0.729	0.482	0.028
VERSION				0.01
	VERSION(1)	0.634	1.885	0.093
	VERSION(2)	1.236	3.441	0.003
Constant		1.05	2.857	0.006

Variable(s) entered on step 1: DEGREE, PRIVATE, EMPSTAT, HOUSE, SMOKE, AGEGRP, SEX, CHILDREN, SCHOOL, HEALTH, VERSION, ACORN.

Appendix 1: Examples of the three questions addressed in this paper

The life expectancy question, by social class

As you might know, average life expectancy differs by social class. There are differences between people in social class 1 (for example, doctors and lawyers) and people in social class 5 (for example, road-sweepers and cleaners). These two groups are more or less equal in size (they each make up about 7% of the population).

Whilst actual life expectancy varies between individuals, on average, people in social class 1 live to be **78** and in social class 5 they live to be **73**.

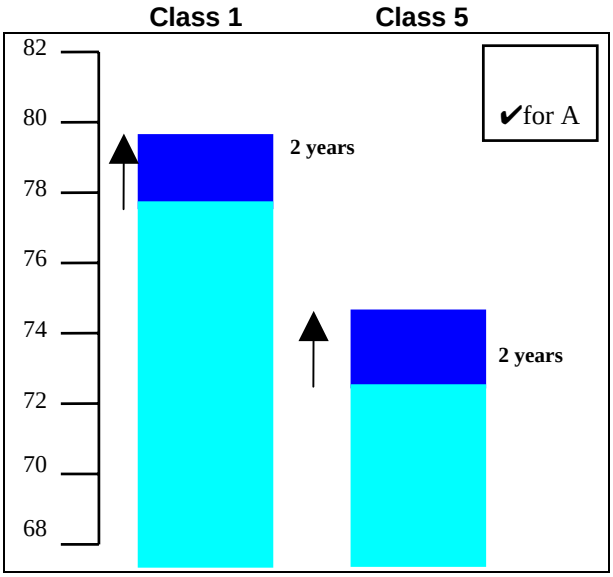
Imagine that you are asked to choose between two programmes which will increase average life expectancy. Both programmes cost the same.

In the two graphs below the light grey part shows average life expectancy, and the dark grey part shows the increase in life expectancy. There is a separate graph for each of the programmes.

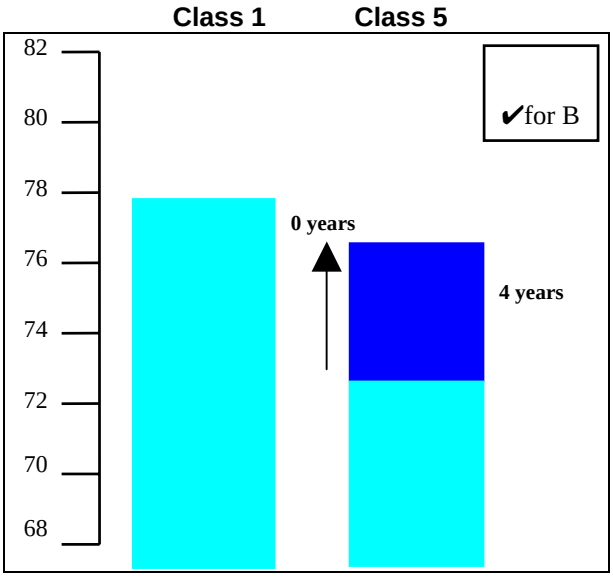
As you can see, Programme A is aimed at both social classes and Programme B is aimed only at social class 5 .

Please indicate whether you would choose A or B by ticking one box.

Programme A



Programme B



The long-term illness question, by life-style

The number of men aged 45 to 64 who report having a long-term illness differs between those who have taken care of their health and those who haven't.

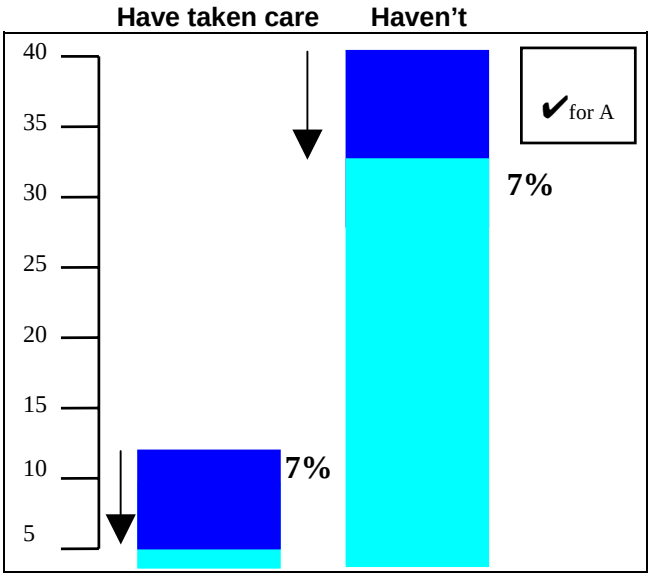
Of men aged 45 to 64 who **have** taken care of their health (have eaten healthily, exercised, not smoked), **12%** report long-term illness. Of men aged 45 to 64 who **haven't** taken care of their health, **40%** report long-term illness.

Imagine that you are asked to choose between two programmes which will decrease rates of long-term illness. Both programmes cost the same.

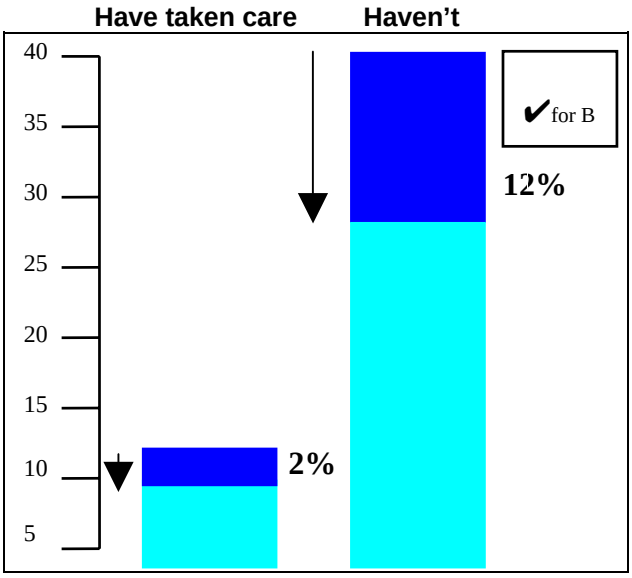
The graphs below show rates of long-term illness. The dark grey parts show the reduction in illness brought about by each of the programmes.

As you can see, Programme A is aimed at both groups and Programme B is aimed more at those who haven't taken care of their health. Please indicate whether you would choose A or B by ticking one box.

Programme A



Programme B



The life-style question, of 20-year olds

Imagine that you are asked to choose between two programmes which could benefit two different groups of people. Both programmes cost the same.

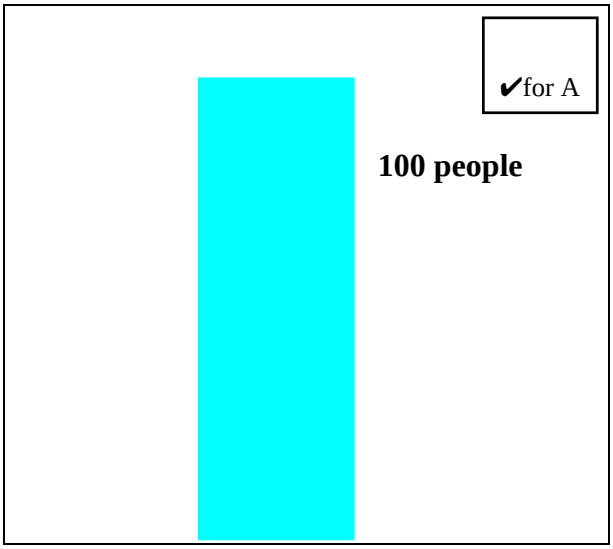
Without the intervention, patients will die within a few days but with the intervention they will live for another 10 years in good health and then die.

People in both groups are 20 years old. They are similar to one another except that those in Programme A **have not** taken care of their health, whilst those in Programme B **have**.

Please indicate whether you would choose A or B by ticking one box.

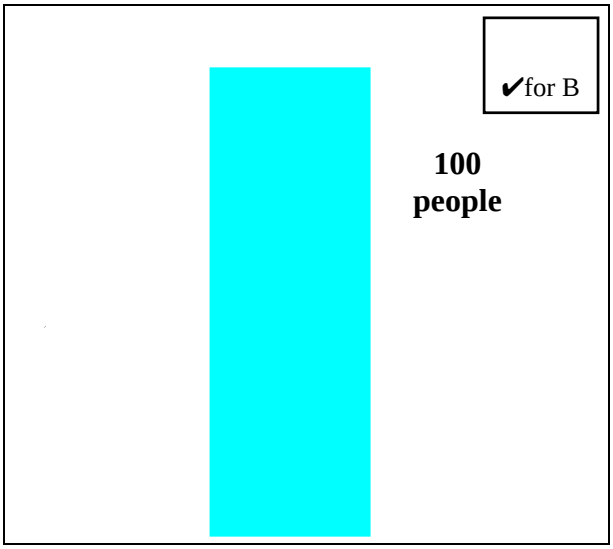
Programme A

Number of 20 year olds who **haven't** taken care their health, who will live for ten more rather than die in a few days.



Programme B

Number of 20 year olds who **have** taken of care of their health, who will live for years, ten more years, rather than die in a few days.



Appendix 2: Explanations of variables used in this paper.

VARIABLE	Description of variable	Classification of variables
Main response variables		
LIFEB	**Average life expectancy (at birth) question**	0 = "non-target", 1 = "target"
ILLNESSA	**Long-term illness (self-reported limiting) question**	0 = "non-target", 1 = "target"
PTOB	**PTO lifestyle question**	0 = "non-target", 1 = "target"
Main background variables		
SEX	**Gender**	1 = Male, 0 = Female
SMOKE	**RECODED smoking**	1 = smoker, 0 = current non-smoker
AGEGRP	**RECODED age**	1 = 16-34, 2 = 35-64, 3 = 65+
EMPSTAT	**RECODED econstat**	1 = employed, 2 = retired, 3 = ('looking after the house', unemployed, unable to work and in full-time education)
HOUSE	**RECODED tenure**	1 = own own home outright or with a mortgage, 0 = rent (either from local authority or privately)
DEGREE	**Degree or equivalent qualification obtained**	1 = Yes, 0 = No
CHILDREN	**Of school-age or younger**	1 = Yes, 0 = No
SCHOOL	**School leaving age**	1 = Stayed on, 0 = Minimum
PRIVATE	**Private health insurance**	1 = Yes, 0 = No
HEALTH	**"Health"**	Long term health illness or health problem affecting daily activities: 1 = No, 0 = Yes
ACORN	**Geodemographic classification**	an index of socio-economic status assigned to areas