

The Significance of Age and Duration of Effect in Social
Evaluation of
Health Care

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ABSTRACT

To give priority to the young over the elderly has been labelled 'ageism'. People who express "ageist" preferences may feel that, all else equal, an individual has a greater right to enjoy additional life years the fewer life years he or she has already had. We shall refer to this as egalitarian ageism. They may also emphasise the greater expected duration of health benefits in young people that derives from their greater life expectancy. We may call this utilitarian ageism. Both these forms of ageism were observed in an empirical study of social preferences in Australia. The study lends some support to the assumptions in the QALY approach that duration of benefits, and hence also age, should count in prioritising at the budget level in health care.

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Introduction

Severity of illness, and the potential effects of treatment on life expectancy and quality of life, are widely regarded as relevant criteria for prioritising between patient groups (Nord 1993c; Patrick, Bush & Chen 1973; Rosser & Kind 1978). There is less agreement about the role of patients' age. In the QALY algorithm, while age is not included as a relevant factor in itself, it has significance through the association with life expectancy. Empirical studies of public preferences in Wales, Sweden and Holland have shown support for according priority to children and young adults over elderly people (Bjork & Rosen 1993; Brakenhielm & Vard pa lika vilkar 1990; Busschbach, Hessing & de Charro 1993; Charny, Lewis & Farrow 1989), while studies in Norway and Australia have not (Nord 1993a; Nord, Richardson & Street 1995).

To give priority to the young over the elderly has been labelled 'ageism' (Harris 1987). Respondents who express 'ageist' preferences may have various reasons for doing so. Here we focus on two possible interpretations. First, they may feel that, all else equal, an individual has a greater right to enjoy additional life years the fewer life years he or she has already had. In other words, people may have a preference for equity between patients with respect to total life outcome. We shall refer to this as egalitarian ageism. Second, they may emphasize the greater expected duration of health benefits in young people that derives from their greater life expectancy. We shall call this position utilitarian ageism. It is akin to the emphasis on duration of benefit reflected in the counting of affected life years in the QALY valuation model.

To our knowledge, no attempt has been made hitherto to separate these two possible rationales for ageism in preference studies in health care. There has also been very little research aimed at measuring the strength of preferences based on these rationales (with the notable exception of Olsen (1994), see below).

This paper is concerned with both of these rationales. It draws on a study conducted recently in Australia with a view to examining the assumptions of the QALY procedure in the light of public values (Nord, Richardson, Street, et al 1995).

Egalitarian ageism was addressed by asking a group of subjects to value projects that would provide the same benefit - in terms of both quality of life improvement and duration of benefits - to different age groups. An attempt was made at measuring the strength of the age factor by means of the person trade-off technique (Nord 1992; Nord 1995). The technique consists in

asking people to consider pairs of projects that differ with respect to some characteristic of the patients involved (in this case age) and to indicate how many patients there would have to be in the first project relative to the second for the two projects to be considered equivalent in social value (details below).

Our study of utilitarian ageism is a follow up of a study by Olsen (1994). Olsen found that 10 years of benefit gained by 100 people was considered equivalent in social value to 20 years of benefit received by 80 people. In other words, 1000 life years gained in the first case was considered equivalent to 1600 life years gained in the second case. This judgement probably reflects some degree of discounting of effects that appear in the distant future (positive time preference). However, it could also reflect diminishing returns to quantity, ie that a QALY is valued less the more QALYs the individual has already received. Our study provides some further data on this issue, again employing the person trade-off technique.

In addressing the latter issue, we hypothesized that people's inclination to discriminate on the basis of duration of benefit might depend on the decision context. An emphasis on duration implies concern with outcome size and may be seen as a 'rational economic' way of thinking. An alternative way of thinking could emphasize people's equal entitlement to treatment when ill. A previous study suggests that the former way of thinking may be stimulated when people are placed in the role of planners distributing resources among groups of other people, while the latter way of thinking may be stimulated when people are asked to choose between rules for resource allocation that may affect themselves one day (Nord 1995). We therefore hypothesized that the willingness to discriminate between patients on the basis of the duration of the benefits they receive would be stronger when a planner's perspective is adopted than when there is a patient's perspective (for a similar hypothesis on 'split preferences', see Clark and Olsen (1994).

We emphasize that our study should be seen as explorative. Our samples are small, and it is known that responses to preference questions may be highly sensitive to how the questions are framed (Schoemaker 1982). Person trade-off questions are no exception (Nord 1995). We shall return to this issue in the discussion.

Methods

Our report is based on a survey which used a self administered questionnaire and on interviews in two different groups of people. The survey, conducted first, addressed a number of fairly general prioritisation issues. From the large number of subjects a more limited number were recruited for personal more detailed interviews. The survey questionnaire was sent to a total of 2000 Australians living in Melbourne (1600) and four country towns (400). 551 questionnaires were returned, including 435 in Melbourne. 60% of those in Melbourne who completed the postal survey expressed willingness to participate in a follow up personal interview. 84 of these subsequently changed their minds or could not be contacted. The remaining 176 respondents were split into four randomly selected groups of 44 people each. To limit the length of the follow up interviews different questions were put to different groups. Two of the groups were asked to express their views on the role of patient age and/or the duration of benefits in prioritising. Results from these two groups are reported here.

Interviews took place approximately three months after completion of the postal survey. Interviewees were encouraged to think carefully and take their time before responding.

To facilitate reading, the exact wordings of questions in the survey and the interviews are presented together with the results later on.

The number of completed interviews in the two groups were 44 and 42 respectively. Table 1 shows the distribution of respondents in the postal survey and the interviews by age, sex and education. Compared with the Australian population, there is a strong overrepresentation of people with tertiary education and a slight overrepresentation of women.

TABLE 1
Descriptive Data

Sample	N	Male %	% < 40	% > 60	Tertiary education %
Postal survey	551	43	44	25	49
Interview Group 1	44	39	30	39	58
Interview Group 2	42	36	50	32	57

Since person trade-off responses are bounded at one end (1:1) and not at the other, the median is used as the measure of central tendency throughout the study. The 25 and 75 percentiles are provided as an indication of the variability of responses.

Questions and Results

Age per se

In the postal survey, the subjects were faced, inter alia, with the following options:

- 1 Among people with life threatening illnesses, younger patients should have some priority over older people.
- 2 People should have the same priority with respect to life saving treatment, unless they are very old.
- 3 People should have the same priority with respect to life saving treatment, no matter what their age is.

The subjects were presented with similar options regarding treatments that improve quality of life rather than saving lives. They were asked to tick the view that came closest to their own, given the assumption that the groups being compared differed in age only.

Only 17,6 % chose to discriminate in favour of the young in the context of life saving (option 1). 41,9 % would extend priority irrespective of age (option 3), and yet another 40,5 % would discriminate only against the 'very old' (option 2). Similarly, in the context of improving quality of life, only 21,6 % would give priority to the young, while 75,6 % would extend priority irrespective of age (for more details, see (9). 95 percent confidence intervals for these percentages are in the order of +/-4 per cent.

In stage 2, the first group of interviewees were asked questions about the role of age in a context which did not involve themselves. To create this 'arms length' perspective, subjects were asked to imagine that they were members of a State Health Board. They were asked to choose

between equally costly projects that differed with respect to the age and the number of patients involved and to express a trade-off between these two factors. Life expectancy after treatment was described as being the same in all projects (ten years). For example, the following scenario was presented:

Project A:

‘Imagine an illness A from which patients die within a few months if they are not treated. The patients are typically around 20 years old. Treatment will enable the patients to continue to live in normal health for 10 years, whereafter they die. A project is proposed that will allow treating an additional 10 patients with illness A in the next year.’

Project B:

‘Now, imagine another illness B from which patients also die within a few months if not treated. The patients are typically around 10 years old. Treatment will enable the patients to continue to live in normal health for 10 years, whereafter they die. A project is proposed that will allow treating an additional x patients with illness B in the next year.’ (x varied during the course of the interview).

The point X at which the subjects were indifferent between selecting projects A and B was ascertained using a slide board to visualize the person trade-off issue.

Two scenarios presented subsequently were identical to the one described above, except that the patients affected were 60 year olds versus 20 years olds and 80 year olds versus 20 year olds. Then followed a similar set of three paired comparisons involving health improving treatments (rather than life extending interventions). The patients in each comparison were described as ‘partly bedridden and in slight pain’. Respondents were told that, with treatment, the patients in both age groups would live in normal health for ten years.

Results are given in tables 2 and 3. For both life saving and health improving treatments, subjects gave higher preference to projects directed at younger patients. For example, extending the lives of four 20-year olds was considered equivalent to extending the lives of ten 60-year olds by the same amount (table 2, second line). The preference for the young is more pronounced the greater the disparity in the two age groups. These results contrast markedly with the results from the survey (stage 1) reported above.

TABLE 2
Life Extending Interventions (for Other People)

Age of recipient		Equivalent numbers of people helped			
Group A	Group B	A	=	B (median)	IQR (B)
20-yr-old	10-yr-old	10	=	9.5	9.0-10.0
60-yr-old	20-yr-old	10	=	4.0	2.0-5.5
80-yr-old	20-yr-old	10	=	1.0	0.02-2.4

Duration of Benefit

Interviewees in the second group were asked about duration of benefit. The context described to them was one implying that they themselves could be affected one day by the prioritising

principle they opted for. They were, in effect, placed behind a Rawlsian ‘veil of ignorance’. More specifically, subjects were asked to consider proposals to establish two highly specialised hospital units. They were told that there were sufficient resources for one of these only. Subjects were presented with eight scenarios in each of which the money spent on unit A would allow more people to receive treatment while the alternative unit B promised a lesser number of people the same benefit but for a greater number of years. Subjects were asked to assume that they themselves had a 1 in 100 chance of contracting either illness.

In the first paired comparison, unit A would save the life of ten people per year and allow them to live in normal health for one year, after which they would die. With unit B, X patients would be saved per year and allowed to live in normal health for 5 years, after which they would die. An indifference point ($X < 10$) was established with the aid of the slide board. There were three other paired comparisons of life saving units, with life expectancies of the patients concerned being 5 versus 10 years, 10 versus 20 years and 20 versus 30 years respectively. There were four similar paired comparisons of units providing health improvements rather than life saving. The patients were described as being ‘partly bedridden and in slight pain’, with the possibility of being restored to full health for the same lengths of time as in the life saving cases (1/5, 5/10, 10/20, 20/30).

TABLE 3
Health Improving Interventions (for Other People)

Age of recipient		Equivalent numbers of people helped			
Group A	Group B	A	=	B (median)	IQR (B)
20-yr-old	10-yr-old	10	=	9.0	4.5-9.5
60-yr-old	20-yr-old	10	=	4.0	1.0-6.0
80-yr-old	20-yr-old	10	=	1.0	0.02-2.5

With the duration questions, an extra effort was made to ensure reflective responses by presenting the subjects with arguments in favour of either project. In the life saving case, the arguments were as follows:

‘You could argue that people have an equally strong desire for treatment whichever of the two illnesses they happen to get. You might therefore prefer unit A, since this would treat more people and give you a better chance of benefiting one day.

On the other hand you could argue that it would be more important for yourself and others to have a chance of treatment if it resulted in twenty extra life years rather than ten. You might for this reason prefer unit B even though it would treat fewer patients.’ (Italised numbers were changed according to the context).

Similar arguments were presented in the cases relating to health improvement.

Tables 4 and 5 show that the valuation of benefits was a positive function of duration, as treating fewer people with a longer life expectancy was regarded as equally valuable as treating more people with shorter life expectancy. However, valuations increased less than proportionately with duration. For example, the first line in table 4 indicates that 10 (10x1) life years provided by unit A were considered equivalent to 17.5 (5x3.5) secured by unit B. In Table 6 this result is expressed as a ratio in which each life year gained at unit B on average is worth 0.57 (10/17.5) of the life year gained at unit A (column 3). The other results shown in table 6 may be interpreted

correspondingly. In all cases, there is a marked discounting of additional life years gained in unit B, both in the context of life saving and health improvement.

TABLE 4
Life Extending Interventions (Including Self Interest)

Years extended		Equivalent numbers of people helped			
Group A	Group B	A	=	B (median)	IQR (B)
1 yr	5 yrs	10	=	3.5	1.5-6.6
5 yrs	10 yrs	10	=	6.5	5.0-9.1
10 yrs	20 yrs	10	=	7.0	5.5-9.0
20 yrs	30 yrs	10	=	8.5	7.5-9.5

TABLE 5
Health Improving Interventions (Including Self Interest)

Years enhanced		Equivalent numbers of people helped			
Group A	Group B	A	=	B (median)	IQR (B)
1 yr	5 yrs	10	=	2.5	1.5-6.0
5 yrs	10 yrs	10	=	6.8	4.9-9.1
10 yrs	20 yrs	10	=	6.5	5.5-9.0
20 yrs	30 yrs	10	=	7.5	6.4-9.1

Finally, the interviewees in the first group were also asked to consider the role of duration of benefit, but this was in an 'arms length' perspective as members of a State Health Board. They were presented with two pairs of projects in which the money spent on project A would save the life of ten people and allow them to live in normal health for ten years, after which they would die. In project B, X patients would be saved and allowed to live in normal health for 20 years, after which they would die. An indifference point ($X < 10$) was established with the aid of the slide board. The second pair of projects was identical to the pair above, except that it related to health improvements. As with the questions used in interview group 2, patients were described as being 'partly bedridden and in slight pain'. Projects A and B would allow them to live in normal health for ten and twenty years respectively, after which they would die. An indifference point in terms of person trade-off was again established.

TABLE 6
Ratios Derived from Tables 4 & 5

Comparison		Life saving	Health improving
Unit A	Unit B	Life years A/B	Life years A/B
1 yr	5 yrs	0.57	0.80
5 yrs	10 yrs	0.77	0.74
10 yrs	20 yrs	0.71	0.77
20 yrs	30 yrs	0.78	0.89

Again, subjects were presented with arguments for preferring either unit to ensure that reflective responses were elicited. In the cases relating to life saving, the arguments were as follows:

‘On the one hand you could argue that the illnesses in question are both life threatening and that both projects would save the lives of the patients and restore them to full health for a substantial number of years. You could argue that for these reasons, people would have an equally strong right to treatment whichever of the two illnesses they happened to have. You might therefore prefer project A, since it would treat more people.

On the other hand you could argue that project B is better because it gives patients the opportunity to enjoy normal health for a longer period of time. You might for this reason prefer project B, even if it would treat fewer patients.

Similar arguments were presented with the pair of projects involving health improving treatments.

TABLE 7
Life Extending Interventions (for Other People)

Years extended		Equivalent numbers of people helped			
Group A	Group B	A	=	B (median)	IQR (B)
10 yrs	20 yrs	10	=	5.5	4.0-8.0

TABLE 8
Health Improving Interventions (for Other People)

Years enhanced		Equivalent numbers of people helped			
Group A	Group B	A	=	B (median)	IQR (B)
10 yrs	20 yrs	10	=	5.5	3.5-8.0

Tables 7 and 8 show the results in the first group of interviewees. The 10 patients given 10 years of extended life at unit A were considered equivalent to 5.5 patients having 20 years of extended life offered by unit B. Results are similar for health improving treatments. Both these medians are lower than the ones obtained when 10 and 20 years of duration were compared in the context of the second group of interviewees (tables 4 & 5), where the subjects' own interests as potential future patients were involved. In other words, subjects seemed to place greater emphasis on the duration of benefit when choosing between projects directed at other people than when choosing between units that might be of use to the subjects themselves one day. This is in accordance with our initial hypothesis. However, the difference is significant at the 5 per cent level only in the case of life extension.

Discussion

In our original postal survey we found that the majority of respondents did not prioritise between patients on the basis of their age. The results from interviews in group 1, on the other hand, suggest a very strong egalitarian ageism, that is a preference for the young over the elderly even

under the assumption of equal life expectancy. There are three possible explanations for this discrepancy. One is that participants in the interviews were self selected and hence may hold different views from participants in the general survey. While the possibility of such selection bias cannot be ruled out, it seems unlikely that it could explain the very drastic difference in results in the two stages of the study. We find explanations in terms of framing effects more plausible. Here there are at least two possibilities. First - and in our view the most plausible explanation - the framing of the questions may have created a difference in perspective. In the postal survey, the question was whether age should count when choosing between individuals at the 'admission level', that is when decisions regarding particular individuals are made. At this personal level, it is not surprising to find a strong reluctance to discriminate against certain individuals, or, in other words, a strong preference for treating all as equals. In the interviews, on the other hand, the question was how, in a budgeting context, to prioritise between different projects involving different numbers of patients. We have hypothesized elsewhere that it is easier for people to discriminate at this less personal budget level of decision making (Nord, Richardson, Street et al 1995). The results of the present study may be interpreted as lending support to this hypothesis.

A second possible explanation is that the different results may arise from the difference in factual information presented in the two stages of the study. While the postal survey simply asked people to compare broad age groups such as 'the young' and 'the elderly' in general terms, the interviews referred to specific numbers of people treated and specific age groups. This may have made the consequences of choosing different options clearer to the respondents and hence encouraged more reflective responses.

Thirdly, it is possible that our results are in part artifacts of the person trade-off technique. Particularly when a slide board is used as a visual aid, it is conceivable that the technique encourages people to engage in numerical trade-offs, rather than to keep in mind principles of equal entitlement to treatment (Nord 1995). Further research is needed to test this possibility.

In both interview groups, we found that respondents were prepared to take the duration of benefits into consideration when choosing between health care programs. This is consistent with the assumptions of cost-utility analysis and with the findings of Olsen (1994). The result may be interpreted as a preference for the 'greater outcome' (Olsen 1994). The ethical basis of such a preference has been questioned by Harris (1987), who argues that each patient helped should count equally, no matter how much they are helped (as long as the help is significant to them). Ethicists in New Zealand, Norway, Sweden and the US argue similarly (Callahan 1994; Campbell & Gillett 1993; Daniels 1993; Norwegian Commission for Prioritising in Health Care 1987; Swedish Health Care and Medical Priorities Commission 1993;). Later empirical studies have shown support for Harris' position (Nord 1993b; Nord, Richardson, Street et al 1995; Nord 1993c). For instance, in a study among 150 Norwegian politicians involved in health care decision making at the county level (Nord 1993b), the subjects were asked whether limited resources should be allocated to patients who would receive the greatest benefit or whether they should be divided equally between two groups of possible beneficiaries. 72% chose the second view (egalitarian), 24% chose the first one (utilitarian). The preference for the egalitarian view was particularly strong in women, older people, those with less than college education and members of parties to the left.

There is not necessarily a contradiction between these types of empirical results on the one hand and those of Olsen (Olsen 1994) and the present study on the other. The size of an outcome is defined both by the improvement in quality of life and the duration of the benefit. The empirical studies referred to above address differences in quality of life benefits. One of the reasons why

people may hesitate to discriminate on the basis of this factor is that quality of life is difficult to measure. Many people may feel that they should not pass judgement on how good or bad different states of illness will be for other people (Nord 1993c). With differences in duration, there is no such problem of judgement. Hence, people may also feel that there is a more legitimate basis for discriminating between different patient groups.

Subjects seemed to place greater emphasis on the duration of benefit when choosing between projects directed at other people than when choosing between units that might be of use to the subjects themselves one day. While the difference is statistically significant only in the life extension case, we note that the result is consistent with previous findings (Nord 1995). Of the two decision contexts in question, the one that involves self interest behind a veil of ignorance is arguably more relevant for policy makers, as it may serve to establish guidelines for the distribution of scarce health care resources in terms of Rawlsian justice (Rawls 1971). This was the reason why the questions about duration in the present study were mainly posed within this latter context.

The results reported above are based on a survey in which the response rate was only 28 per cent and on interviews in very small, self selected population samples. What does this mean for the generalisability and the usefulness of the results?

To answer this question, one must consider two potential sources of measurement error, namely random sample variation and bias due to self selection of responders.

In the general survey, standard errors of the percentage of subjects giving different answers were in the order of 2 percentage points, which suggests that random sampling variation is a minor concern (see results section on age). Bias due to self selection is a definite possibility. An indication of the risk of such bias may be obtained by comparing respondent characteristics with those of the general population and by considering how any differences might affect results (Essinck-Bot, Stouthard & Bonsel 1993). From table 1, the most significant difference is that respondents were more likely to have had tertiary education. There was little variation in the responses by age, sex, socio-economic status, previous health history or geographical location (Nord, Richardson, Street et al 1995). In particular, the percentage of respondents preferring equal priority for the young and the old in the life saving context was 39 for those with tertiary education and 49 for other educational groups. In the health improvement context, these percentages were 77 and 75 respectively. All things considered, we doubt that a survey based on a probability sample with a high response rate would have produced very different results.

In the interview samples, self selection was even stronger than in the survey respondents, producing a higher overrepresentation of women, elderly people and people with tertiary education. The samples are too small to allow subgroup analysis. As noted above, there are no indications in the survey data that these background variables affect responses significantly. On the other hand, random error could be a considerable problem, due to the small number of people interviewed. In general this means that it would be wrong to interpret the various medians in tables 2-5 as precise estimates of the person trade-offs that the general population would make between treating different age and duration categories. However, when the interquartile ranges are taken into account, tables 2 and 3 do suggest a fair degree of consensus that age should count quite heavily in priority setting. For instance, from the IQR data in table 2, 75 per cent of the respondents felt that helping less than six 20-year olds would be equivalent to helping ten 60-year olds, and helping less than three 20-year olds would be equivalent to helping ten 80-year olds. Conclusions regarding duration must be even more cautious. However, it is noteworthy that in all

eight comparisons in tables 4 and 5, 75 per cent of the respondents felt that it would be acceptable to treat fewer people if the benefit lasted longer. The standard error on this percentage is 6.5, yielding a 95 % confidence interval of 62-88 per cent. In sum, while the median values presented here are unreliable indicators of precise population values, our chief conclusions are robust.

Conclusion

In this paper, we have distinguished between an egalitarian and a utilitarian rationale for ageism in priority setting in health care. Empirical research on the degree to which different societies accept these rationales has been scarce. In particular, the assumption in the QALY procedure that societal appreciation of health outcomes is proportional to their duration - and hence indirectly linked to the age of the recipients - has largely remained untested. This study highlights some of the framing effects associated with preference measurement. It explores how the strength of social preferences for giving priority to the young and to those with long life expectancy may be measured quantitatively using the person trade-off technique. It also provides some popular support for the assumptions in the QALY approach that duration of benefits and age should count in prioritising in health care.

The status that should be assigned to popular preferences in health care decision making is a matter for debate. Our view is that as a minimum such preferences should be known to decision makers and not be entirely disregarded. We believe that a strong ethical argument could be made for decision makers accommodating, at least to some extent, the preferences expressed by the population as long as these preferences are not ethically unacceptable.

We recognise that the interview samples in this study are small and that possible methodological biases in this area of research have not been sufficiently explored. Further research is needed to establish the functional relationships between age and duration of benefit on the one hand, and social value on the other, in a manner precise enough to be useful in quantitative health economic analysis. It is our hope that the results of the present study will stimulate interest in such research and that the methods we have used may prove useful to other researchers.

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