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Health expectancy in the Netherlands 1983–1990

HARRY P.A. VAN DE WATER, HENDRIEK C. BOSHUIZEN, ROM J.M. PERENBOOM *

Health expectancy is a relatively new indicator for population health, taking account of both mortality and morbidity and/or disability. This integral measure, introduced by Sullivan in the 1970s, is based on the simple idea of subtracting the number of years that may be expected to be spent in poor health from life expectancy. This article presents results of calculations from the Netherlands based on 2 approaches: firstly, disability-free life expectancy and, secondly, healthy life expectancy. In the latter, health is based on a health interview question about self-perceived health. Although the life expectancy at birth of females exceeds that of males by rather more than 6 years, this lead is almost entirely cancelled out by the greater number of years which females spend in poor health. The trend study 1983–1990 revealed some indication of a rise in the healthy life percentage of males albeit that this development was only statistically significant for age 45 years. For females the healthy life percentage appears to be declining. This is in concordance with the results of some trend studies from other countries. They give support to the expansion of morbidity. Recent studies, however, suggest a relative compression of morbidity for severe disability. The analysis of health expectancies by socioeconomic class revealed that in the Netherlands an impressive difference of more than 10% between high and low socioeconomic status also exists, which tallies with findings in Great Britain.

Key words: health expectancy, disability free life expectancy, trends, compression of morbidity, socioeconomic differences

As in other developed countries, life expectancy in the Netherlands has increased considerably in recent decades. Whereas around the turn of the century the average life expectancy was approximately 50 years, it now stands at 75 years. The average Dutch person thus lives longer and longer. Initially seen as favourable, this development very soon turned out to have drawbacks, in that only part of the gain in years of life consisted of healthy years. Ageing of the population went hand in hand with an increase in chronic diseases and disabilities. This observation has led to a debate on the question as to what consequences further increases in life expectancy will have for the scale of health problems in the population.

Some consider an increase in chronic diseases and disabilities to be the inevitable price to be paid for the extra years of life which we have managed to achieve with our modern society.[1–3] They assume that higher life expectancy will lead to an increase in the number of (chronically) ill people who need long-term, costly health care and whose quality of life is seriously impaired. If this so-called 'expansion of morbidity' is the case, then is not the price of longer life too high for both society and for many individuals? Others, however, think that it must be possible to postpone chronic diseases and disabilities and to push them back to the 'twilight of human life',[4,5] then talking about 'compression of morbidity'. And then there are others, like Manton,[6] who work from a theory of equilibrium which postulates that although increasing life expectancy does indeed lead to more diseases and disabilities, these will gradually become less serious in nature as each successive generation becomes healthier.

Whatever the outcome of this debate, it is clear that the present-day health policy will not only have to take account of disease and mortality individually, but also in particular of their joint results. To do this it will be necessary to have a combined indicator representing not only the length of life but also its quality. 'Health expectancy' is one such indicator. This paper explains the structure of this health indicator and presents results available for the Netherlands.

SCOPE OF THE INDICATOR AND ITS RELEVANCE FOR POLICY

The indicator 'health expectancy' (HE) provides summarizing information on both mortality and morbidity and/or disabilities. This integral measure of health is achieved by reducing total life expectancy with the number of years that will be spent in poor health. The indicator can be used to express the health of populations in a single figure, making it possible in principle, for example, to compare the health of various countries with each other. As HE is a fairly new health indicator and one that is still in the process of development, an international network of researchers (REVES) has been set up which is concerned, amongst other things, with the harmonization of

* H.P.A. van de Water, H.C. Boshuizen, R.J.M. Perenboom, TNO Prevention and Health, Leiden, The Netherlands
Correspondence: H.P.A. van de Water, TNO Prevention and Health, P.O. Box 2215, 2301 CE Leiden, The Netherlands, tel. +31 71 5181778, fax +31 71 5181920

concepts and methods of calculation.[7–9] One of the aims of this network is to subdivide HE further into components which are of relevance for policy, such as disability-free life expectancy, handicap-free life expectancy and dementia-free life expectancy.[10]

The question of which concept of health to use when determining the number of healthy and unhealthy years is essential when it comes to the comparability of HE calculations. In this connection, Minaire[11] distinguishes between 4 different points of view, a biomedical view, an approach via impairments, disabilities and handicaps, a situational point of view (looking at people in relation to their environment) and a quality-of-life approach. These points of view partly overlap. With an integral measure like HE it is important to do justice to the complete concept of 'health' as far as possible. Internationally, it has now been agreed that the model from the International Classification of Impairments, Disabilities and Handicaps should be taken as the point of departure[12]:

disease or disorder → impairment → disability → handicap

Impairments, disabilities and handicaps are seen as the consequences of diseases or disorders. Most of the studies carried out so far in various countries have been based on (elements of) the above model.[10,13]

Despite HE's status as 'indicator in the making', policy makers and politicians have recognized its potential importance and the promotion of HE has been included in various policy proposals in our country. Mention can be made of the 'Health through Policy Document' and the World Health Organization's health objectives, to which the Netherlands has also subscribed.[14–17]

The increased value of HE compared with traditional measures of public health lies in the integral nature of this indicator. HE incorporates information on both mortality and (the consequences of) disease. This ties in well with the present-day policy issues mentioned in the Introduction, such as the increase in the burden of disease associated with increased life expectancy and the greater attention that is consequently paid to the quality of life. It looks as if HE will be able to play an important part in the setting and evaluation of overall health targets. By considering what measures for combatting disease can contribute most to maintaining healthy years, it is possible to specify priorities in health policy. A quantitative basis for the highly topical issue of 'choice in health care' could also be established in this way.[18] HE may also prove useful in connection with the problem of competing diseases and death risks which is increasingly coming to the fore, i.e. the phenomenon that gains achieved through the successful combatting of 1 disease are being replaced by an increase in another disease. With this indicator as a measure it should after all be possible to try and promote solutions leading to more healthy years of life.

METHODS OF CALCULATING HEALTH EXPECTANCY

Various methods are available for calculating health expectancy (HE). For a description of the advantages and disadvantages of these methods, see previous publications.[19–22]

For the calculations which are to be presented here, the procedure followed was the same as the one introduced for the Netherlands by Van Ginneken et al.[19] in 1989. This way of calculation, based on a method developed by Sullivan,[23,24] makes use of transversal data files: mortality figures and figures on the prevalence of poor health for a given population in a given year. Although this method gives some idea of the state of public health, it does not give any information on the underlying dynamics (the changes from health to poor health and back and also the factors influencing these). For the dynamics – which are in fact just as interesting for health policy, since they can highlight points of action for effective health policy – longitudinal data files (data on the same individuals over several years) are needed. Not enough data files of this kind are available yet for the Netherlands. The shortcomings of the Sullivan method are very well-known. Robine and Mathers[25] demonstrated, however, that with moderate and long-term changes in incidence and mortality rates the Sullivan method is acceptable for monitoring trends in health expectancies for populations.

For the results presented here the calculation goes as follows. First of all, the life expectancy for an artificial cohort is calculated for a particular year on the basis of the age-specific mortality figures for that year (Survival Tables of the Central Bureau of Statistics). For each age interval this leads to a number of years that the cohort will spend in that interval. The number of years lived in an age interval is then divided into healthy and unhealthy years with the help of the prevalence of poor health in that age interval.

For the prevalence of poor health in the population, one could in principle examine (objectively) a random sample from that population. From the point of view of practicality and cost control, however, most calculations make use of data from health surveys (self-rated, therefore subjective). This has also been done with the calculations presented here, 2 different approaches being used with respect to poor health.

It has to be stressed that HE, like life expectancy, is calculated using an artificial cohort. This means that the health expectancies for a given year for the various age groups only become real expectancies in the case where age-specific mortality and poor health remain constant during the rest of the lifetime. Because age-specific figures alter over time, the results are of limited significance for the actual life span of birth cohorts. Thanks to this standard method though, it is possible to compile indices which allow comparisons to be made between the health of different populations over the same period and between the health of the same population over different periods. The life expectancy in poor health, for example, gives an indication of the average burden of disease in a population. The absolute size of this burden of disease cannot be read off from that index, however, as this would necessitate taking account of the age and sex structure of the population.

Disability-free life expectancy

The first of the 2 approaches mentioned above involves 'disability-free life expectancy' (DFLE), which distinguishes 3 different types of disabilities. Firstly, disabilities as a result of long-term stays in institutions. To calculate these, use has been made of records relating to stays in psychiatric hospitals, institutions for the mentally and physically handicapped, nursing homes and old-people's homes (the last with a correction for healthy residents). A special methodological report gives support to the idea that the institutionalized population is fairly well represented by the sources used.[22] The 2 other types of disabilities relate exclusively to the non-institutionalized population. Long-term disabilities have been calculated on the basis of the age-specific answers to 10 items from the Organization for Economic Cooperation and Development (OECD) questionnaire in the Central Bureau of Statistics (CBS) Health Interview Survey (ability to follow a conversation in a group, ability to hold a conversation with one other person, ability to read small print in newspapers, ability to recognize another person's face, ability to carry a 5 kg object 10 m, ability to bend over and pick something up from the floor, ability to walk 400 m in one go, ability to dress and undress oneself, ability to get in and out of bed and ability to move from one room to another). People are deemed to have a long-term disability if they cannot carry out one or more of these activities or if they can do so only with great difficulty. Short-term disabilities have been derived from other questions in the CBS Health Interview Survey, namely ones concerning impairments of activity during the fortnight preceding the interview. The Netherlands Central Bureau of Statistics started its Health Interview Survey in January 1981. It includes over 5,000 households yearly (over 10,000 people). The response rate has decreased from 68% in 1981 to 57% in 1991, but non-response studies showed that the respondents remain a reasonable reflection of the population.[26]

Healthy life expectancy

The HE approach via 'healthy life expectancy' (HLE) is based on 2 kinds of phenomena. Stays in institutions have been calculated in the same way as for DFLE, while poor health in the non-institutionalized population has been determined using the answers to one question about 'self-perceived health status' in the CBS Health Interview Survey. People whose answer to the question 'How is your state of health in general?' was 'fair', 'sometimes good, sometimes bad' and 'poor' were considered to be unhealthy.

RESULTS

Health expectancy in 1990

The results for the total life expectancy and health expectancy in 1990, calculated as DFLE, are presented for both sexes and for different ages in *table 1*. The same type of results, but calculated as HLE, are given in *table 2*.

Table 1 Health expectancy in the Netherlands in 1990 calculated as disability-free life expectancy (DFLE), by age and sex (in years, rounded to 1 decimal place)

		Unhealthy life expectancy				
Age	Total life expectancy	In institutions	With long-term disabilities	With short-term disabilities	Total	Health expectancy
Males						
0	73.9	1.0	7.8	4.7	13.4	60.4
15	59.7	1.0	7.4	4.2	12.7	47.0
25	50.0	1.0	7.3	3.7	12.0	38.1
45	31.0	0.9	6.7	1.9	9.4	21.5
65	14.4	0.9	3.8	0.8	5.4	9.0
75	8.6	1.1	2.9	0.5	4.5	4.1
Females						
0	80.1	2.7	12.4	5.1	20.2	59.9
15	65.8	2.7	12.2	4.8	19.6	46.2
25	56.0	2.6	12.1	3.9	18.6	37.4
45	36.7	2.6	10.9	2.1	15.6	21.1
65	19.0	2.7	7.6	0.7	11.0	8.0
75	11.4	2.9	5.4	0.3	8.6	2.9

Table 2 Health expectancy in the Netherlands in 1990 calculated as healthy life expectancy (HLE), by age and sex (in years, rounded to 1 decimal place)

		Unhealthy life expectancy			
Age	Total life expectancy	In institutions	In poor perceived health	Total	Health expectancy
Males					
0	73.9	1.0	12.9	13.9	60.0
15	59.7	1.0	12.0	13.0	46.7
25	50.0	1.0	11.6	12.5	37.5
45	31.0	0.9	9.4	10.3	20.7
65	14.4	0.9	4.2	5.1	9.3
75	8.6	1.1	2.6	3.6	4.9
Females					
0	80.1	2.7	17.3	19.9	60.2
15	65.8	2.7	16.4	19.1	46.8
25	56.0	2.6	15.3	17.9	38.0
45	36.7	2.6	12.2	14.8	21.8
65	19.0	2.7	7.2	9.9	9.1
75	11.4	2.9	3.9	6.8	4.6

If the results of DFLE and HLE are compared, it can be seen that, for males, the numbers of both healthy and unhealthy years correspond fairly well at different ages. For females, the HLE is higher than the DFLE for all ages. It also turns out that, at birth, males and females can expect to have approximately the same number of healthy years (approximately 60 years). This means that, at birth, females can expect to spend approximately 75% of their lives in good health and males rather more than 81%. We will call this derived indicator the 'healthy life percentage' (HLP).

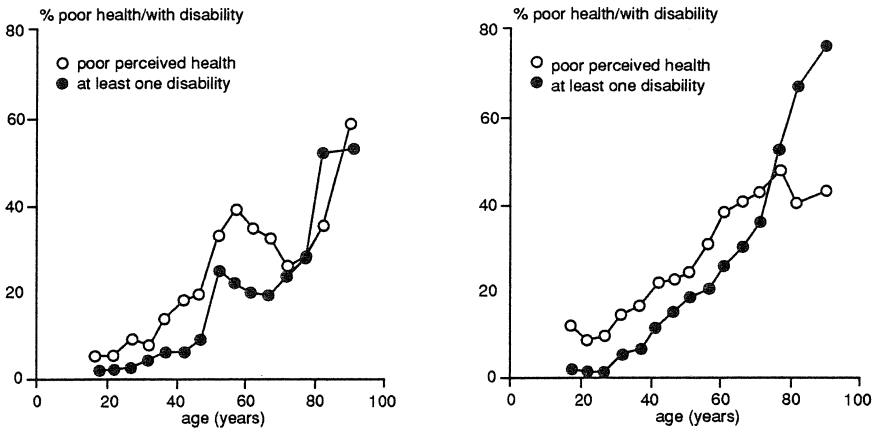

Figure 1 Prevalence of poor perceived health and the presence of at least 1 disability from the OECD list in the Netherlands in 1990, by age for males (left) and females (right)
Source: 1990 CBS Health Interview Survey

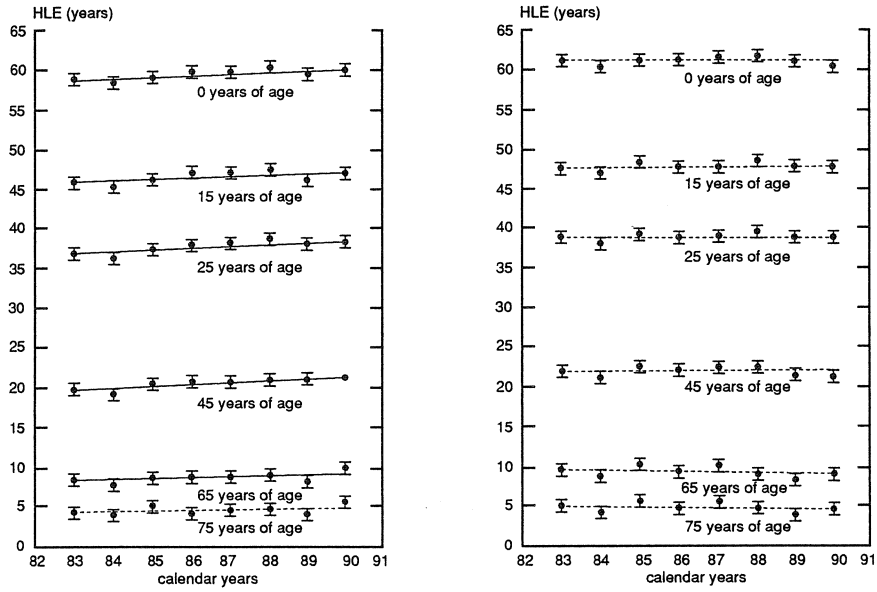

Figure 2 Trends in healthy life expectancy (HLE) in the Netherlands in the period 1983–1990 for males (left) and females (right)

The most striking finding from *tables 1 and 2* is that although the life expectancy at birth of females exceeds that of males by rather more than 6 years, this lead is almost entirely cancelled out by the greater number of years which females spend in poor health. This finding is based on the fact that women of practically all ages report a higher prevalence of self-perceived poor health and the presence of at least 1 disability than do men *(figure 1)*.

Trends in HLE in the period 1983–1990

Knowing whether there is a particular trend is of even greater interest than the health expectancy (HE) in a given year. The possibility of carrying out a trend analysis using the material collected via the CBS Health Interview Surveys in the years 1981–1990 was therefore looked at.[21,22] The questions from the OECD disability indicator needed for calculating the DFLE were asked only in 5 different years; in each of the years looked at, however, the questionnaire asked about self-perceived health. Because questions from the OECD disability indicator were worded differently in most years, as was the introductory text, the trend study had to be confined to 1 approach to HE, namely HLE and to the years 1983–1990.

Figure 2 shows the outcome of the trend analysis for HLE, giving the results for various age groups and the 95% confidence intervals. A weighted linear regression method (weighting based on standard errors) was used to calculate the trends. A solid-drawn trend line means that the change in the HLE is statistically significant (5% level; bilateral check). Dotted lines indicate non-significant developments.

For males, except for 75 year olds, a significant increase in the HLE occurred in the period 1983–1990. For females, the HLE for all ages remained approximately the same. Since total life expectancy increased significantly for both sexes in the period looked at, which could partly explain an increase in the HLE, life expectancy should also be taken into account. To this end, *figure 3* shows the developments in the HLP.

From this figure it turns out that, for males, the HLP does indeed increase for all the ages presented, but that only

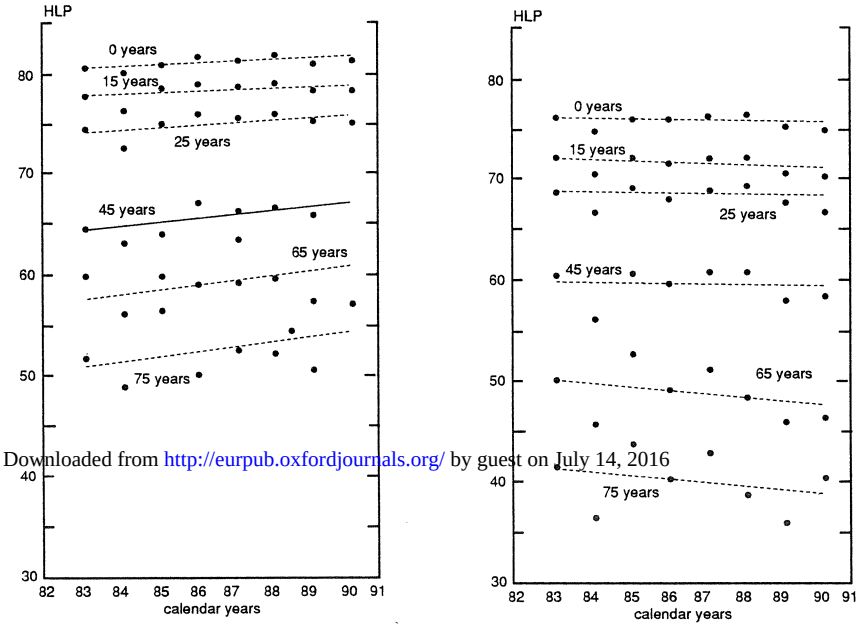

Figure 3 Trends in healthy life percentage (HLP) in the Netherlands in the period 1983–1990 for males (left) and females (right). Confidence intervals were omitted for reasons of readability of the graph

for 45 year olds is there a significant improvement. Only in this age group does the increase in the HLP point to a relative compression of morbidity. The HLP for females appears to decline slightly, except in the case of 25 and 45 year olds, though the reduction involved is not significant. A quantitative overview of the results of the trend study – indicating the size of the increase or decrease which has taken place – is given in *table 3*.

From the column in this table headed 'unhealthy life expectancy' it can be seen that the number of unhealthy years for males decreased in all age groups in the period 1983–1990, whereas for females it increased. Neither development is significant, however. In absolute terms there was therefore neither compression nor expansion of morbidity.

Table 3 Trends in life expectancy, healthy life expectancy (HLE), unhealthy life expectancy (in years) and healthy life percentage in the Netherlands over the period 1983–1990, by age and sex (increase or fall in years or percentage given in brackets)

Age	Life expectancy	Healthy life expectancy	Unhealthy life expectancy	Healthy life percentage
Males				
0	↑↑ (1.1)	↑↑ (1.7)	↓ (–0.6)	↑ (1.1)
15	↑↑ (0.9)	↑↑ (1.4)	↓ (–0.5)	↑ (1.2)
25	↑↑ (0.8)	↑↑ (	↓ (–0.6)	↑ (1.6)
45	↑↑ (0.8)	↑↑ (1.3)	↓ (–0.5)	↑↑ (2.6)
65	↑↑ (0.4)	↑↑ (0.8)	↓ (–0.4)	↑ (3.5)
75	↑↑ (0.2)	↑ (0.4)	↓ (–0.3)	↑ (3.9)
Females				
0	↑↑ (0.7)	↑ (0.3)	↑ (0.4)	↓ (–0.2)
15	↑↑ (0.5)	↑ (0.1)	↑ (0.5)	↓ (–0.4)
25	↑↑ (0.5)	↑ (0.4)	↑ (0.1)	– (0.0)
45	↑↑ (0.5)	↑ (0.3)	↑ (0.3)	– (0.0)
65	↑↑ (0.4)	↓ (–0.3)	↑ (0.7)	↓ (–2.5)
75	↑↑ (0.3)	↓ (–0.2)	↑ (0.5)	↓ (–2.9)

↑↑: significant increase; ↑: non-significant increase; –: no change; ↓ = non-significant fall

INTERNATIONAL COMPARISON

Insofar as trend studies on the development of HE have been carried out in more or less comparable developed countries, these are presented in *figure 4*.[27–29] In this figure the changes in total life expectancy are plotted against changes in the HLP. An increase in the HLP – or, in other words, any upward movement on the graph – points to a relative compression of morbidity; a reduction in HLP – any downward movement – indicates relative expansion of morbidity. It is not possible to tell from this graph whether there has also been any absolute compression or absolute expansion of morbidity, i.e. an increase or decrease in unhealthy life expectancy.

In interpreting *figure 4* it has to be realized that differences between countries must be considered with reservation, since the methods used to calculate the HE vary from country to country.[10] The consistency of methods within countries does make it possible to draw conclusions as to the direction of developments. The trends in question are in any case gross trends, because confidence intervals and significances have not been included in this graph. For Australia the trend for both males and females was significant, in Great Britain the trend was not significant for either sex; in the USA a significant trend was found only for men. Furthermore, in *figure 4* no distinction has been made according to the seriousness of the poor health. Finally, the periods looked at differ slightly.

For males in Australia, Great Britain and the United States a relative expansion of

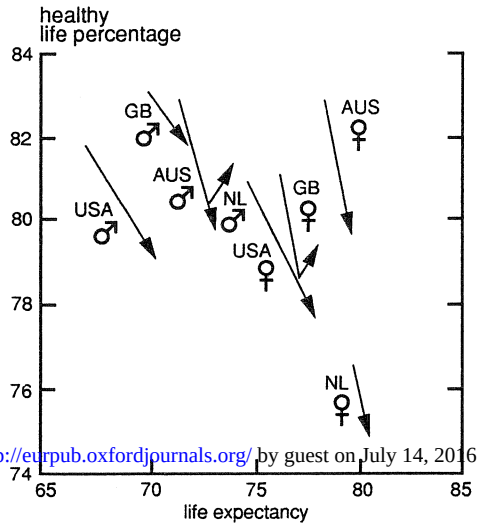

Figure 4 Results of trend studies on life expectancy and healthy life percentage (HLP) at birth from 4 countries
AUS: Australia 1981–1988; GB: Great Britain 1976–1981–1985; NL: the Netherlands 1983–1990; USA: United States 1970–1980

morbidity is to be seen. For males in the Netherlands, the gross trend indicates a relative compression of morbidity, with a significant improvement being found only among 45 year olds. For females, all the trends are towards a relative expansion of morbidity, except for the last part of the trend line in Great Britain.

The general impression from *figure 4* is that there is a relative expansion rather than a relative compression of morbidity. Other international data pointing in this direction also exist. From comparisons it turns out that developed countries, which generally have a higher life expectancy, have lower HLP values than developing countries. Similarly, women, who as a rule have a higher life expectancy than men, are often found to have a lower HLP than men.[30,31] It therefore looks as if longer life expectancy goes hand in hand with an increasing loss of health. A recently published study, however, revealed that this is probably only true for total disability. When one distinguishes between severe disability and light/moderate disability, a relative compression of morbidity is found for the former, while the amount of light/moderate disability increases.[32] These findings are in favour of the dynamic equilibrium theory of Manton.[6]

HEALTH EXPECTANCY ACCORDING TO SOCIOECONOMIC STATUS

In the Netherlands, as elsewhere, considerable differences have been found in both mortality and the occurrence of diseases and their consequences, according to socioeconomic status (SES). Socioeconomic health differences of this kind will also be manifested in differences in the HE. To gain some idea of the extent of these differences a first approximate calculation of HE according to SES – in the form of HLE – has been carried out for 1990.[33]

The calculation relates solely to males because mortality risks according to SES are not available for females. To calculate life expectancy, we used mortality risks from a follow-up study carried out among 18–50 year olds. This study (N=78,505) started in 1950 with 19 year old males undergoing medical examination for military service. During the 32 years that the group was followed 3,456 died.[34] These risks were extrapolated to all ages. This probably means that the differences in mortality between SES groups are underestimated for younger men, while extrapolation of the relative risks towards older ages might have resulted in an overestimation of the differences. With regard to stays in institutions it was assumed that there were no differences according to SES. This probably leads to some underestimation of socioeconomic health differences. To average out chance fluctuations, the data on self-perceived health were taken from the CBS Health Interview Surveys for the years 1989–1991. Moreover, the analysis distinguished between two SES groups: a low SES group (those with primary education only) and a high SES group (those with intermediate/higher vocational training or higher general secondary education or beyond). The analysis was also confined to the situation for males aged 0 and 65 years, respectively. The results are shown in *table 4* except for the intermediate SES group. These results, however, fell between these of the two presented SES groups.

For males aged 0 years there is a difference of 4.5 years in life expectancy according to SES and of no less than 12.6 years in health expectancy. The HLP of the low SES group is somewhat more than 10% lower than that of the high SES group at both 0 and 65 years of age. The number of years spent in institutions is greater for the group with the higher SES because this group lives longer. The size of these differences in HE according to SES tallies with other results found in the Netherlands in an analysis based on

Table 4 Health expectancy in the Netherlands in 1990 according to socioeconomic status (SES) (calculated as healthy life expectancy; in years, rounded to 1 decimal place) and the healthy life percentage for males at ages 0 and 65 years

Type of life expectancy	0 years of age			65 years of age		
	Low SES	High SES	Difference	Low SES	High SES	Difference
Total life expectancy	72.2	76.7	4.5	13.3	16.4	3.1
Unhealthy life expectancy of which	20.6	12.6	8.0	6.1	5.8	0.3
In institutions	0.9	1.4	0.5	0.7	1.2	0.5
In poor perceived health	19.7	11.2	8.5	5.4	4.5	0.9
Health expectancy	51.6	64.2	12.6	7.2	10.6	3.4
Healthy life percentage (HLP)	71.5%	83.6%	12.1%	53.8%	64.7%	10.9%

Low SES = primary education
High SES = intermediate/higher vocational training or higher general secondary education or beyond

health in suburbs of Amsterdam and with findings in Great Britain.[35,36]

DISCUSSION AND CONCLUSIONS

Health expectancy (HE) appears to be a promising indicator for gaining some insight into the current problems of the burden of disease and quality of life. The concept of HE as a population health indicator should not be confused with the concept of quality-adjusted life years (QALY), which is a unit of measurement for adding years of life in different health status. QALYs have up to now typically been used to measure and compare the benefits of medical interventions.[37] HE as an integral measure for public health is still in the process of development, however, which is apparent, amongst other things, from the fact that some aspects of health are still receiving too little attention. This is particularly true where mental health is concerned. Further refinement in the representation of quality of life also appears desirable, in that differences in the severeness of ill health or disabilities ought to be expressed better. Both of these shortcomings are being worked on in the international and in the European network for health expectancy (REVES and Euro–REVES). In spite of the difficulties some people have already made the quality of life aspect more explicit by using a correction factor for quality – in our view a fairly arbitrary one – in their calculations.[38] The results of such calculations are referred to as 'health-adjusted life expectancies'.[37] We have deliberately decided against doing this in the calculations presented here.

Mindful of the above limitations, the 2 approaches to health adopted here – DFLE and HLE – give a reasonable reflection of health expectancy in the Dutch population, with women turning out to have a higher life expectancy, but spending so many more years in poor health that their health expectancy stands at the same level as that of men. As regards developments in the period 1983–1990, men again have the advantage. The percentage of life that they spend in good health shows a rising tendency which, apart from the trend for 45 year olds, is nevertheless not significant. The greater increase in life expectancy for males compared with females – partly as a result of the sharp fall in mortality from heart disease seen among males since the 1970s – makes an important contribution to that favourable development for men. For women, on the other hand, the healthy life percentage appears rather to be decreasing, though statistically the trend is not significant. If international trend results are compared for disability as a whole, one thing to emerge is that an increase in life expectancy is more likely to lead to a relative expansion than to a relative compression of morbidity. Apparently it is in the nature of things that longer life expectancy goes hand in hand with a relatively greater loss of health. This unfavourable development calls for an active and purposeful health policy in which it comes down to making choices and promoting actions which increase the number of healthy years of life. Recent studies suggest, however, that a relative expansion of morbidity is only taking place for light and moderate disabilities and that severe disability is in a process of compression. This implies that 'level of severity' should have a prominent place in the development of health policies.

Another area meriting further attention is that of socioeconomic differences in health expectancy. These differences are impressive and are of the same order of magnitude as those encountered in the UK. Initial investigations have shown that the healthy life percentage of people with a lower socioeconomic status is approximately 10% lower than that of people with a high socioeconomic status. Furthermore, high SES is a situation where longer life and better health concur, which may give us clues for the improvement of population health.

Finally, in order to determine trends in health expectancy, it is recommended that both methods of calculation (DFLE and HLE) be used. Because each of them shows a different aspect of health, it is desirable to be able to compare the results. DFLE only takes account of the number of physical disabilities which people report. The self-rated health constituting HLE, on the other hand, evaluates 3 dimensions of health: the presence of diseases, the presence of disabilities and general feelings about the state of health. Due to changes in the wordings of a number of questions in the CBS Health Interview Survey, DFLE is only usable for trend studies from 1989 onwards. It is therefore advisable that in the Health Interview Survey changes to questions are limited as far as possible, in order to avoid breaks in trends.

NOTE

Some of the results in this article were presented at and published in the Proceedings of the Sixth Meeting of the International Network on Health Expectancy (REVES) in Montpellier in 1992 (Perenboom RJM, Boshuizen HC, Van de Water HPA. Trends in health expectancies in The Netherlands, 1981–1990. In: Robine JM, Mathers CD, Bone MR, Romieu I, editors. Calculation of health expectancies: harmonization, consensus achieved and future perspectives. Paris: Colloque INSERM/John Libbey Eurotext Ltd. 1993;226:309-20.

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