Towards a better health expectancy

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Explanation of symbols

.	= data not available
*	= provisional figure
**	= revised provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2010–2011	= 2010 to 2011 inclusive
2010/2011	= average of 2010 up to and including 2011
2010/'11	= crop year, financial year, school year etc. beginning in 2010 and ending in 2011
2008/'09–2010/'11	= crop year, financial year, etc. 2008/'09 to 2010/'11 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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Evaluation of existing statistics on health expectancy

Jan-Willem Bruggink [1)]

Statistics Netherlands (SN) has been publishing figures on health expectancy (HE) for several years. So far we have published about various variants of health expectancy, broken down by various subpopulations. These figures meet a need in society as is shown by the frequent use policymakers, scientists and the media make of the data.
However, the way to determine health expectancy and the way to publish about it are subject to discussion. We have made choices, but these could and perhaps should have been somewhat different.
SN is convinced that supplying proper information on health expectancy is very useful. In the future we want to be leading in this area. Therefore it is important to evaluate the work of recent years to see where improvement can be made.

The evaluation took place in 2010 within framework of the SN theme Health and welfare. This is the evaluation report, structured as follows:
- Outline of the evaluation
- Description of the existing figures on health expectancy
- Description of the calculation and operationalisation.
- The operationalisation of socio-economic status. This status is for breaking down the figures on health expectancy into different subpopulations.
- Publication of the figures
- Subjects of discussion and options for change
- Conclusions and decisions

This document is mainly intended for professional users of the health expectancy statistics, such as policymakers and scientists. However, it may also be of interest to anybody who is generally interested in health expectancy figures.

[1)] Many people contributed to this evaluation. Without their suggestions and remarks this kind of evaluation would not have been possible. Therefore a word of gratitude goes out to the Dutch experts and users who responded to the request from SN to participate in this evaluation. To the participants of the REVES meeting who came up with suggestions as a result of our presentation about this evaluation. And within SN especially to Jaap van den Berg, Kim Knoops, Marion van den Brakel-Hofmans, Robert de Vries and the Department of Demography.

1. Outline of the evaluation

The publication of SN figures on health expectancy has led to various reactions. These followed the direct publication of figures and papers on our website and the presentations at congresses and other meetings. The reactions were generally positive and the figures are widely used by scientists, policymakers and media. However, the reactions also provided some pointers for the evaluation, while at SN we also developed our own ideas about improving the figures.

External users of the data and other specialists in the field of health expectancy were involved in the evaluation. They were asked to reflect critically on SN's work in the field of health expectancy. People from the following institutes agreed to this request: RIVM (National Institute for Public Health and the Environment), Erasmus Medical Centre, University of Amsterdam/Amsterdam medical Centre and TNO (Dutch Organisation for applied scientific research). Partly based on their reactions we gave a presentation about the evaluation at the yearly international REVES congress (http://reves.site.ined.fr/en/) in May 2010. Suggestions in response to this presentation have been included in this evaluation report.

2. Description of the existing figures on health expectancy

SN publishes four variants of health expectancy:

- The life expectancy in perceived good health: since 1981. Based on the survey question about how people evaluate their health in general.
- The life expectancy without physical limitations: since 1983. This is about limitations in hearing, seeing and moving (mobility).
- The life expectancy without chronic morbidity: since 1981. The diseases are selected based on their influence on the quality of life and on mortality.
- The life expectancy in good mental health: since 2001. Based on the survey questions included in the Mental Health Inventory 5.

These figures are updated yearly and are broken down by age and sex. Health expectancies are calculated for the ages 0, 1, 5, 10, 15, …, 75 and 80.
Furthermore figures are available about health expectancy for different socio-economic groups. We used education and income levels as indicators for socio-economic status. The time series of these figures are still short. Health expectancies by education level are available since 1997–2000 and by income class since 2004–2007.
Health expectancies for 2001–2005 are also available by region (north, west, south and east).

3. Calculation and operationalisation

To calculate health expectancy, we combine population and mortality data with data on the prevalence of ill-health. Life expectancy is divided into a healthy and an unhealthy part using the method of Sullivan (Jagger et al., 2006). The age-specific mortality probability is based on the population and mortality figures from the municipal population registers (GBA).
Age-specific population figures come from the StatLine [2)] table 'population; sex, age and marital status, 1 January'. Short title 'population; age, marital status'.
Age-specific mortality figures come from the Dutch StatLine table on 'death; sex, age (on the last birthday) and marital status' (not yet available in English).[3)]
Data about age-specific prevalence of ill-health come from the Health Survey of SN.

The four health indicators are operationalised as follows:

– *Perceived health*: Someone is classified as healthy if he/she answers 'good' or 'very good' to the question 'How is your health in general?' The answers 'fair', 'poor' or 'very poor' are classified as unhealthy.

– *Chronic morbidity*: Respondents are asked about a number of chronic conditions. Respondents are classified as unhealthy if they indicated they have at least one of them. The selection of the diseases is based on their effect on the quality of life and on mortality. The following diseases are included:
– Asthma, chronic bronchitis, pulmonary emphysema, or COPD
– Hypertension
– Migraine or regular serious headaches
– Diabetes
– Cancer
– Stoke, haemorrhage or CVA
– Serious or persistent disorder of the back
– Serious or persistent disorder of the intestines, longer than three months
– Chronic arthritis
– Arthrosis of hips or knees
– Myocardial infarction
– Other serious heart diseases

The question is whether the respondent has or has had at least one of these diseases in the past 12 months. However with stroke, myocardial infarction and cancer, the question is whether they have ever had the disease. For diabetes no reference period is involved. The exact phrasing of the survey questions can be found in appendix 1.
The Health Survey does not ask children aged under 12 years all these questions about diseases. It is assumed that the prevalence of arthritis, hypertension, myocardial infarction, other serious heart diseases and strokes is 0 for these age groups.

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2) Statline is the online database of SN, http://statline.cbs.nl/statweb/?LA=en

3) Within the method of Sullivan a 'normal' life expectancy is determined before dividing the figure up into healthy and an unhealthy. This normal life expectancy is based on the population and mortality data from the Statline tables meant above. However it differs from the official SN figure about life expectancy for several reasons. One major reason is the use of a highest age group of 80 years and over in the former whereas the highest age group of 99 years and older is used in the calculation of the official life expectancy figure.
The SN departments 'population' and 'health' agreed to optimize the calculation of life expectancy and minimize the differences. The calculation of life expectancy will be adapted towards the method used by SN 'population' from the statistical year 2010 onwards. For more details, see paragraph 6.15.

– *Physical limitations*: respondents are classified as physically limited if they state they are unable to carry out at least one of the following activities or have serious difficulty doing so:
– Can you follow a conversation in a group of 3 or more people (using a hearing aid if necessary)?
– Can you have a conversation with one other person (using hearing aid if necessary)?
– Can you see newspaper print (using glasses or lenses if necessary)?
– Can you recognize someone's face from a distance of 4 metres (using glasses or lenses if necessary)?
– Can you carry an object of 5 kilos (e.g. a full shopping bag) over a distance of 10 metres?
– Can you, when standing, bend down and pick something off the floor?
– Can you walk 400 metres without resting (using a walking stick if necessary)?

Respondents who state they have no, or some difficulty performing these activities are classified as not being limited.
The Health Survey does not ask children aged under 12 years these questions about physical limitations. It is assumed that the prevalence of physical limitations is 0 for these age groups.

– *Mental health:* the Mental Health Inventory (MHI-5) is used to measure mental health. The MHI-5 measures the general psychological health situation in a population. This is determined by the balance between the degree of positive and negative feelings. The MHI-5 includes the following questions:
– Have you been very nervous?
– Have you felt depressed?
– Have you felt calm and peaceful?
– Have you felt downhearted and blue?
– Have you felt happy?

We use a reference period of four weeks for these questions.
The possible answers to these questions are: 'all of the time', 'most of the time', 'often', 'sometimes', 'rarely' and 'never'. Positively phrased questions (question 3 and 5) are assigned scores of 5,4,3,2,1 and 0 respectively. Negatively phrased questions (question 1, 2 and 4) are scored reversely. A sum score is calculated for every respondent and multiplied by 4, so the minimum score is 0 (very unhealthy) and the maximum score is 100 (perfectly healthy). Every respondent with a score of 60 or more is considered healthy. Scores under 60 are classified as unhealthy.
The Health Survey does not ask children aged under 12 years these questions about mental health. It is assumed that the prevalence of mental health problems for these age groups is similar to that in the age group of 12-14.

In the period since 1981 several changes have been made in the phrasing of the questions and answer categories. This has caused breaks in the series of figures (Stam and Knoops, 2009). These have been repaired to get to a series of figures that is comparable over time. For an elaborate description of this correction, see Lodder and Kardal (2009). Since 2001 the Health Survey has remained unchanged as far as the questions that are relevant here are concerned.

4. Socio-economic status

Different indicators of socio-economic status can be used to calculate health expectancy by socio-economic status (SES). SN publishes health expectancies by education level and by income. To get to the breakdown of health expectancy we need both mortality and health prevalence figures by SES.

– Education: Data from the Labour force survey (LFS), in which also data about education level are collected, were linked with population and mortality data from the population register. This was done from 1997. This made it possible to determine the education level of the LFS respondents who have died since 1997, which led to age-specific mortality rates by education level. The LFS was used because it has the largest number of respondents of any SN survey. The highest *completed* education level determines the education level. For respondents up to the age of 25 we used the highest education level completed within the household.
  The prevalence of ill-health by education level is also determined. The Health Survey includes questions on education. The highest *completed* education level is used. For respondents up to the age of 12 we used the education level of the first carer (usually a parent). For respondents aged 12–25 we used the highest education level *attended*. Education level is divided into four categories: low (primary education), lower secondary, higher secondary and high (college, university).
  We merged some survey years in order to reduce the confidence interval around the figures. In first instance these were nine years (1997–2005). Later on we also calculated figures for four-years periods, 1997–2000, 2001–2004 and 2005–2008. This was done to gain some insight into developments in health expectancy over time.
– Income: Here we used the standardised disposable household income, attributed to a person, as an indicator of socio-economic status. This is the disposable income adjusted for differences in household size and composition. We used mortality data by income class (by age and sex) from SN's Social Statistics database (SSB) to calculate the life expectancy. Complete fiscal data on income in a certain year (mainly from the tax authorities) are enriched through the SSB with personal data about age and sex on 1 January of the following year and the mortality data of that following year. These data come from the population register.
  Subsequently we calculated the health expectancy taking the prevalence of the different ill-health indicators into account. These data come from the Health Survey. Since this survey is also enriched with fiscal income data from the SSB, the figures about health can also be broken down by income. And this makes it possible to calculate health expectancy by income.
  Income is divided into five classes, based on quintile limits, which are determined in the Income Panel Survey (IPO) of SN. The highest income of the first quintile is the 20%-percentile of the IPO. The lowest income class consists of people with an income within the first 20%-percentile.
  We opted to merge four survey years (2004–2007) in order to reduce the confidence interval around the figures.

Besides the health expectancy also the normal life expectancy is broken down by SES (both education level and income).

5. Publication

The figures about health expectancy are published in StatLine (http://statline.cbs.nl/statweb), the online database of SN. Furthermore, both short and more extensive papers appear regularly at www.cbs.nl and in journals and books, both internally (SN) and externally.

In StatLine the tables about health expectancy can be found via the (Dutch) theme structure: 'gezondheid en welzijn' > 'gezonde levensverwachting'. This sub directory contains the following tables (19-07-2010):

- Gezonde levensverwachting vanaf 1981 → yearly figures. This table is also available in English: Health expectancy; since 1981 (English theme structure: 'health and welfare')
- Gezonde levensverw.; opleidingsniveau (HE by education level) → four-year and nine-year averages
- Gezonde levensverwachting; inkomen (HE by income) → four-year averages
- Gezonde levensverwachting → three-year averages

In the StatLine-archive (sub directory 'gezondheid en welzijn') another table can be found:

- Gezonde levensverwachting 2001/2005 → five-year averages, broken down by region (north, west, south and east)
- A selection of the articles:
- Rijke mensen leven lang en gezond
- Ontwikkelingen in (gezonde) levensverwachting naar opleidingsniveau
- Trends in gezonde levensverwachting
- Hoogopgeleiden leven lang en gezond
- Langer leven, maar ook langer gezond?

6. Subjects of discussion and options for change

Our request for a critical review by external health expectancy experts has led to many suggestions for improvement and refinement. Appendix 2 provides an overview of the comments made by the external HE experts. Together with our own ideas about further optimalisation of the HE statistics, they pointed the way for this improvement operation.
This section deals with each of the improvement options. We have indicated whether or not these can be fitted in our procedures and methods, and if so how.

6.1 The list of diseases used to calculate life expectancy without chronic diseases

In the current calculation of the life expectancy without chronic morbidity the following diseases are included:
– Asthma, chronic bronchitis, pulmonary emphysema, or COPD
– Hypertension
– Migraine or regularly serious headache
– Diabetes
– Cancer
– Stoke, haemorrhage or CVA
– Serious or persistent disorder of the back
– Serious or persistent disorder of the intestines, longer than three months
– Chronic Arthritis
– Arthrosis of hips or knees
– Myocardial infarction
– Other serious heart disorder

This selection of diseases was based on a choice of the RIVM (Dotinga & Picavet, 2006). Discussions about this list of diseases mainly focus on hypertension. The frequently used argument is that hypertension is not a ‘real’ disorder but a risk factor for other diseases. And since hypertension is very prevalent, whether or not to include it has a substantial impact. To illustrate this, the figures for 2008 using the ‘classic’ list and excluding one of the diseases are presented in table 1.

Not including hypertension would lead to more than 3 extra years without chronic morbidity. So hypertension has a substantial influence on health expectancy. There is no other disorder of which the exclusion would lead to a bigger ‘gain’ in health expectancy among men. Among women only migraine is more influential. Migraine is the most prevalent disease among women and moreover it is prevalent at ages at which other diseases do not occur frequently (Bruggink, 2009).

Table 1
Life expectancy without chronic diseases, 2008

	Males	Females	Difference males	Difference females
Taken all into account	48.4	42.4		
Without hypertension	52.0	45.5	3.6	3.1
Without asthma	51.6	45.0	3.2	2.6
Without cancer	49.6	43.5	1.2	1.1
Without stroke	48.8	42.5	0.4	0.1
Without diabetes	49.2	42.8	0.8	0.4
Without disorder of the back	50.9	43.9	2.5	1.5
Without disorder of the intestines	48.9	43.4	0.5	1.0
Wihtout migraine	50.9	48.8	2.5	6.4
Without arthritis	48.6	43.0	0.2	0.6
Without arthrosis	49.9	45.3	1.5	2.9
Without myocardial infarction	48.7	42.5	0.3	0.1
Without other heart diseases	48.8	42.8	0.4	0.4

The Health Survey does not only collect information about the diseases mentioned. It also collects information about other diseases. However, the prevalence information about these diseases is not included in the calculation of the health expectancy. These other diseases are:

- Constriction of the blood vessels in abdomen or legs
- Psoriasis
- Chronic eczema
- Dizziness with falling
- Incontinence
- Serious or persistent disorder of the neck or shoulder
- Serious or persistent disorder of the elbow, wrist or hand
- Other chronic disease or disorder

These diseases/disorders may well lead to considerable health problems. This is the case, for example, for constriction of the blood vessels, according to one of the external referents.

The total list of diseases observed in the Health survey was constructed during the revision of the survey in 2001. http://www.cbs.nl/NR/rdonlyres/C3A60CA3-2FAC-4F2E-8A19-39088CFEF552/0/revisiepols1999.pdf
This was done after a discussion in an expert group. Criteria were:

- Diagnostic approach; preferably relatable to a ICD code (group)
- Measurable in survey (understandable for respondents)
- Prevalence of at least 1 percent
- Sufficient severity

In 2003 a somewhat different survey list of diseases was recommended (Eurohis, Barutta et al., 2003). Almost all the diseases in that list are also part of the Health Survey.

The present list of chronic diseases and disorders focuses on physical diseases. However, psychological disorders also cause many unhealthy years. Anxiety disorders top the top 10 of diseases causing the highest burden. Depression/dysthymia is number three and dementia ranks ninth (alcohol dependence ranks seventh) (VTV, http://www.RIVM.nl/vtv/object_document/o1672n18840.html). Therefore it might be better to call our HE measure 'life expectancy without *physical* chronic diseases'.

One alternative for using a list of diseases is HE by disease, for example life expectancy without diabetes. (Crimmins, chapter 4.3: in WHO Summary Measures of Population Health 2002). This approach is relevant for policy aims since these are often pointed at one disease.
Egidi and Crialesi advise to also calculate 'disease specific free life expectancy' , based on the Eurohis-list, and not the life expectancy without all of the diseases of that list. Besides this a life expectancy without multimorbidity could be calculated. Therefore a minimum of three diseases is suggested.

The participants of the REVES-conference suggested analysing clusters of diseases. Diseases should be grouped on medical grounds. For example the clusters cardio-vascular diseases and psychological disorders.

To be able to calculate life expectancies without specific physical chronic diseases, we must select diseases for which this could be relevant. In principle this can be done for each disease included in the current calculation, or even for each disease and disorder included in the Health Survey. An alternative would be to calculate the disease specific health expectancies for high burden diseases (combination of lost life years and disease equivalents), as determined by the RIVM. According to the '*Volksgezondheid Toekomst Verkenning (VTV) 2010'* the ten diseases with the highest burden of disease are:

– Coronary heart diseases
– Stroke
– Anxiety disorders
– Depression
– Diabetes mellitus
– Lung cancer
– COPD
– Arthrosis
– Injuries due to accidents
– Dementia

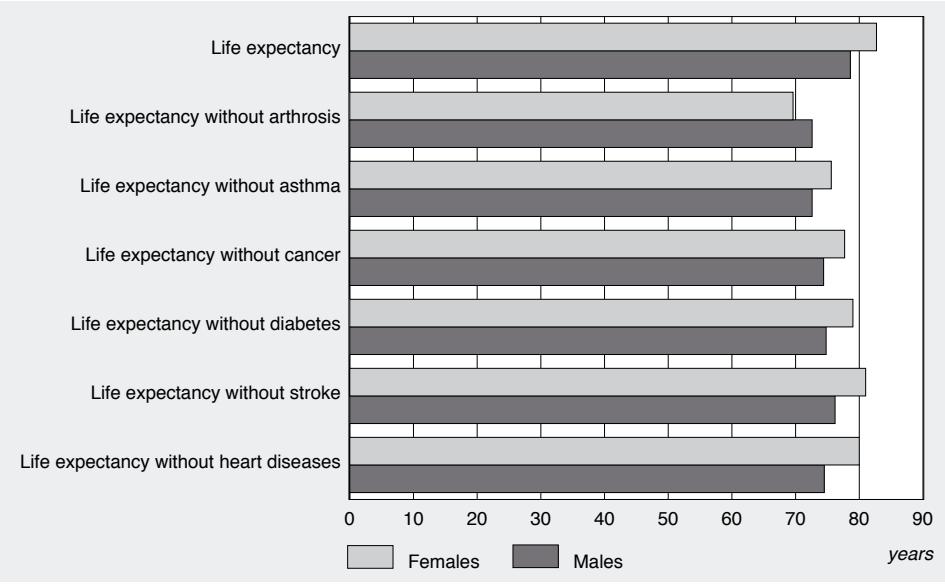
(RIVM)

Not all these diseases are physical. Therefore anxiety disorders, depression and dementia are excluded here. Life expectancy in good mental health can roughly be seen as a depression free life expectancy. Questions about anxiety are asked in the survey, so it might be possible to calculate this. Questions about dementia are not included. It is difficult to get information about this disease by means of surveys. Besides this, dementia will be concentrated among people living in institutional households. No survey data are available about injuries due to accidents.

Six diseases remain. The survey questions do not literally address all of them. So an approximation has to be made for some.

– Coronary heart diseases. We used the survey questions about myocardial infarction and other severe heart diseases. The lifetime prevalence is used.
– Stroke is literally asked. The lifetime prevalence is used.
– Diabetes mellitus. This disease is included without a reference period.
– Lung cancer mostly leads to lost life years (mortality) and less to disease years. Therefore this disease is hard to measure through surveys. Although other forms of cancer are also characterised by the loss of many life years, there tends to be a relatively substantial number of disease years. Therefore we opted not to look specifically at lung cancer, but at the total category 'cancer'. The lifetime prevalence is used here.

1. Disease specific health expectancy, at birth, 2008



– COPD. The survey question about asthma, chronic bronchitis, pulmonary emphysema, or COPD is used as an approximation of COPD.
– Arthrosis. The question about arthrosis of hips or knees is used.

These approximations would lead to the following disease free life expectancies (survey year 2008) (figure 1).

The expectation is that arthrosis is the disease with which people have to live the longest. Among women life expectancy without this disease is especially short. Men can expect to live fewer disease free years of the other diseases.

Decisions

In publications it will be made clear that chronic diseases in this case are *physical* disorders.
In response to remarks made by the external experts we will also calculate life expectancy without chronic disease, using the current list of diseases but excluding hypertension. These figures will also be published in StatLine. The 'old' list, however, will remain for reasons of continuity.
Disease specific health expectancies will also be calculated. Possibly based on the burden of disease top 10 of RIVM/VTV. Life expectancy without certain mental chronic disorders could also be included, where we have to take into account the existing measure of life expectancy in good mental health. Within publications about disease specific health expectancies we could also pay attention to clusters of diseases. Disease specific health expectancies will not be published regularly, but incidentally.

6.2 The reference period of the diseases for the life expectancy without chronic diseases

Most survey questions about chronic diseases make use of a 12 month reference period. For example: respondents are asked whether or not they have, or have had chronic arthritis in the last 12 months. However, for stroke, myocardial infarction and cancer the question is used whether or not the respondent has ever had the disease. In other words, the lifetime prevalence is used for these three diseases. This is not fully correct within the Sullivan method. However, the choice for lifetime prevalence is deliberate. The assumption is that these three diseases have a lasting influence on health even if the disease or disorder occurred more than a year previously. For these disorders the low year prevalence does not do justice to their severity. The year prevalences for these diseases are still not high (table 2). If we opt for year prevalence, the health expectancies would be somewhat higher. For men the disease free life expectancy (in 2008) would be 50.2 instead of 48.4 years, for women it would be 43.6 instead of 42.4 years.

Table 2
Year prevalence or lifetime prevalence, 2008

	Year prevalence	Lifetime prevalence
	%	
Stroke	0.2	1.9
Myocardial infarction	0.2	1.9
Cancer	1.0	4.7

Decision

Make no changes to the current situation. Year prevalence might be slightly more correct in terms of methodology, but does not do justice to the severity and the long-lasting consequences of these diseases.

6.3 Which indicator for physical limitations?

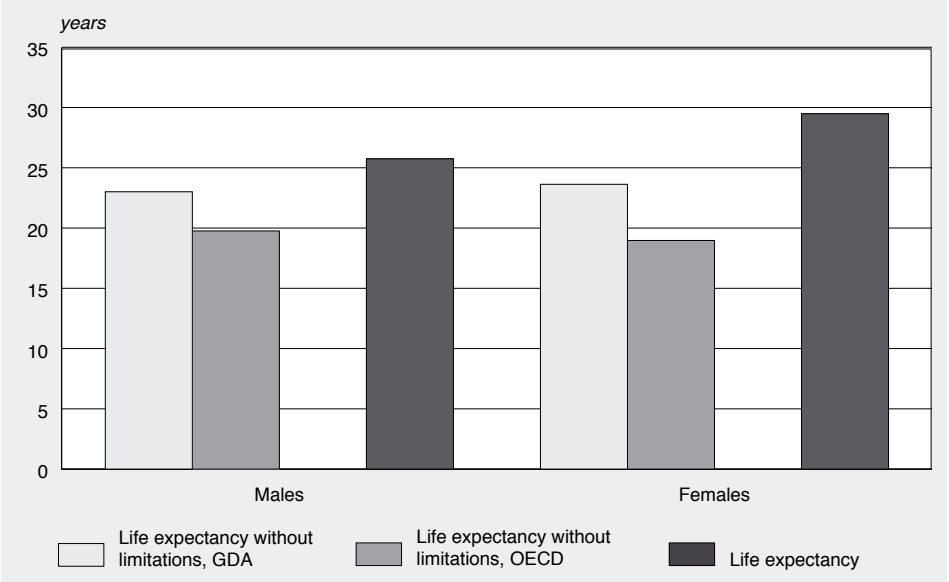
The OECD [4] questions about physical limitations in the fields of hearing, seeing and moving are used to calculate life expectancy without physical limitations. In total there are seven questions. A respondent who responds to at least one question with 'yes, with serious difficulty' or 'no, I cannot do that' is classified as being physically limited. The questions about limitations in speaking are not included in the analysis. The prevalence of speech limitations is less than 1 percent.
An alternative for calculating limitation free life expectancy is the use of questions about general daily activities (GDA). Some HE users and specialists we consulted indicated that they would like to have figures on life expectancy without limitations in GDA.

In the GDA questions respondents have to indicate whether or not they are able to do the following activities.
– eating and drinking
– sitting down in and getting up from a chair
– getting in and out of bed
– dressing and undressing
– going to another room on the same floor
– walking up and down the stairs
– leaving and entering the house
– moving outdoors
– washing one's face and hands
– washing one's whole body

The answer categories are 'without difficulty', 'with some difficulty', 'with serious difficulty' and 'only with the help of others'.
These questions are for respondents aged over 54, although questions 2, 3 and 6 are also included for people aged between 12 and 55. Therefore a health expectancy cannot be calculated for the under 55 year-olds.

There are 10 GDA questions. Seven of them directed at people over 54. The other three at people aged over 11. In this comparison between the GDA results and the OECD outcomes only people over 54 are taken into account. 'Limited' according to the GDA variant means a respondent has indicated that he or she has serious difficulty performing at least one of the activities or is unable to do at least one of the activities without the help of others. For 2008 this leads to the following results (figure 2).

2. Life expectancy without limitations, GDA and OECD, at age 55, 2008



[4] The OECD is the Organisation for Economic Cooperation and Development

The life expectancy without GDA limitations at 55 is higher than the life expectancy without OECD limitations. This is true for men and women. In relation to the total life expectancy, women are confronted with GDA limitations for longer than men. The outcomes for life expectancy without GDA limitations are more or less the same as the outcomes for life expectancy without *severe* (OECD) limitations. See section 6.4.

About 84 percent of people with a GDA limitation also have an OECD limitation, whereas only 38 percent of those with an OECD limitation also have a GDA limitation. This may well be because the OECD indicator is broader. It focuses on limitations in hearing, seeing and moving, while the GDA indicator mainly focuses on mobility. The prevalence would only be slightly higher If the GDA indicator were used to complement the OECD indicator.

Decision

We elaborated on life expectancy without GDA limitations in *Bevolkingstrends*, 3rd quarter 2010. However, this will not become regular (StatLine) output. One variant of limitation free life expectancy is enough, and we would prefer a variant that can be calculated for younger ages.

6.4 Which cut off points, severity levels?

Physical limitations

The line between limited and not limited is drawn between the answer categories 'yes, with some difficulty' and 'yes, with serious difficulty' (OECD questions). A refinement would be possible if the information about mild limitations was used, i.e. people who indicated they have 'some difficulty' with a certain activity. The separate treatment of the category 'no, I cannot do that' could also enrich the data

Table 3 shows clearly what the consequences would be of taking into account the different severity levels of physical limitations. The following breakdown is made: no limitations, slight limitations, moderate limitations and severe limitations.

The table shows that the influence of the position of the cut-off point is substantial. For men the life expectancy without physical limitations was 70.9 years at birth in 2008. This is the figure that is published in StatLine and in this case the answer category 'with some difficulty' is classified as 'not limited'.

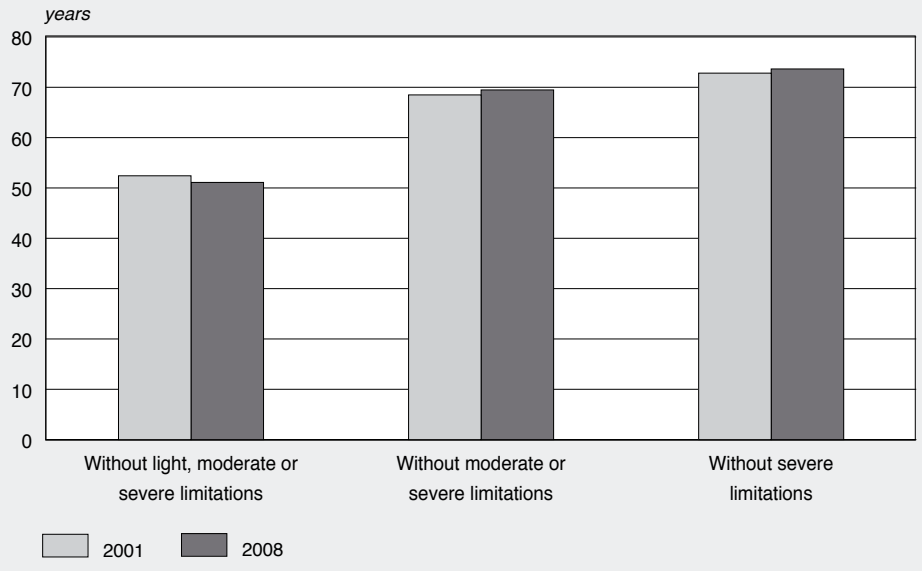
Table 3
Life expectancy without physical limitations, 2008

	Males			Females		
	without light, moderate or severe limitations	without moderate or severe limitations	without severe limitations	without light, moderate or severe limitations	without moderate or severe limitations	without severe limitations
Age						
0	55.3	70.9	75.0	51.1	69.5	73.6
1	54.5	70.1	74.3	50.3	68.7	72.9
5	50.5	66.2	70.4	46.3	64.8	69.0
10	45.5	61.3	65.4	41.3	59.8	64.0
15	41.3	56.4	60.5	37.2	55.0	59.1
20	36.9	51.6	55.6	33.5	50.1	54.2
25	32.6	46.8	50.8	29.7	45.4	49.4
30	28.2	42.0	46.0	26.1	40.6	44.5
35	23.9	37.2	41.1	22.3	36.0	39.8
40	19.9	32.6	36.4	18.6	31.3	35.0
45	16.3	28.1	31.7	15.0	26.9	30.3
50	13.4	23.9	27.3	12.1	22.7	25.9
55	11.2	19.8	23.0	9.5	19.0	21.9
60	8.9	16.0	18.9	7.0	15.1	17.7
65	6.5	12.4	15.0	4.6	11.4	13.9
70	4.3	9.0	11.3	2.6	8.0	10.1
75	2.6	6.2	8.3	1.2	5.3	7.0
80	1.6	3.8	5.7	0.5	3.1	4.5

If these slight limitations had been classified as ‘with limitations’, male life expectancy without limitations would have dropped to 55.3 years. If, on the other hand, only the answer category ‘no, I cannot do that’ had been classified as ‘with limitations’, life expectancy without limitations would have risen to 75.0 years.

For women, health expectancy drops from 69.5 years to 51.1 years if all severity levels of limitations are included. And it rises to 73.6 years if only the ‘heavy cases’ are included.
The addition of severity levels to the figures on life expectancy without physical limitations can contribute to the better interpretation of the figures. Especially to make clear how serious a situation is. By including severity levels in the time series of health expectancy, we can show separate developments. For example, life expectancy without slight limitations may decrease, while life expectancy without moderate limitations increases. See figure 3, for example. In that figure different severity levels of health expectancy for women seem to develop in different directions. This contrast seems to confirm the trend found by Perenboom (2004) for the period 1989–2000. However, the differences between 2001 and 2008 lie within the 95 percent confidence intervals.

3. Life expectancy without physical limitations, females



Severity levels can also be broken down in different ways. RIVM, for example, uses the following classification:
For life expectancy without limitations, the number of healthy years is based on the percentage of people who indicate they can perform all seven activities with no difficulty or with some difficulty. Not being able to do, or having a lot of difficulty doing at least one of the seven activities means that a person is ‘slightly unhealthy’. People who cannot do, or who have serious difficulty with two or more of the seven activities are considered ‘unhealthy’.
In his dissertation Perenboom uses weights to determine severity levels. Not all limitation variants are assigned the same weight. The weighing factor depends on the impact a limitation has on how someone can function. The impact is determined by an expert panel.

Decisions

Severity levels will be published regularly for life expectancy without physical limitations, from statistical year 2001 onwards. The figures about ‘moderate or severe’ limitations will correspond with the current figures.
We will focus on limitations in hearing, seeing and moving in *Bevolkingstrends*, 3rd quarter 2010. This will not become a regular publication.

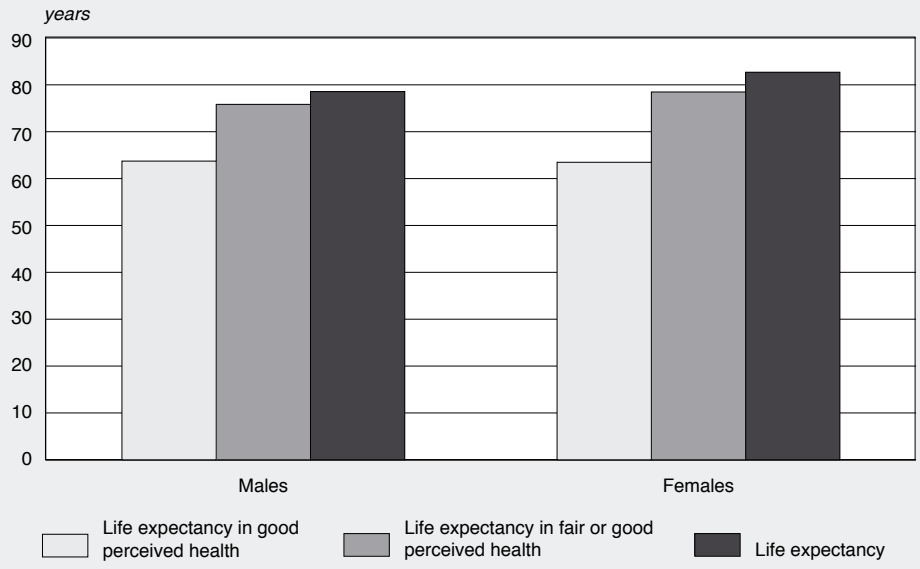
Participants of the REVES meeting 2010 suggested that we should separately analyse physical limitations for hearing, seeing and moving.

Chronic diseases and perceived health

The cut-off point for perceived health and chronic diseases seems undisputed. However, some finer points could be added. For example making a split between fair and bad/very bad perceived health (similar to the Nationaal Kompas Volksgezondheid 2010 of the RIVM). We could consider determining life expectancy without multimorbidity for chronic diseases by determining the age-specific prevalence of having two or more chronic diseases (similar to the Nationaal Kompas Volksgezondheid 2010 of the RIVM). We could also determine life expectancies without specific diseases.

Adding severity levels for perceived health leads to the following results, see figure 4:

4. Life expectancy by level of perceived health, at birth, 2008



The years people are expected to spend in less than good perceived health mainly consist of years with fair health. The number of years with bad or very bad health is limited, where:

– The number of years in health perceived as good = life expectancy in perceived good health.
– The number of years in health perceived as fair = life expectancy in perceived fair or good health – life expectancy in perceived good health.
– The number of years in health perceived as (very) bad = life expectancy – life expectancy in perceived fair or good health.

Women live more years in perceived fair health than men, and also a few more years with perceived bad health.

Decisions

No severity levels for perceived health.
No severity levels for chronic diseases.

Mental health

Often, the cut-off point for mental health is 60. However, it is not always clear whether the score of 60 belongs to 'healthy' or 'unhealthy'. Schoemaker and Hoeymans (2010) count the value of 60 as 'healthy'. Perenboom (2000) counts 60 as 'unhealthy'. The national and international literature also refer to other cut-off points.

Decision

The cut-off point remains unchanged. This means that someone with a sum score of less that 60 will be classified as 'unhealthy'. This way we join the method used by Schoemakers and Hoeymans (2010)

6.5 Prevalence of ill health at younger ages

Not all respondents are asked all questions in the Health survey. Many questions, relevant for calculating the health expectancy are only put to people aged 12 and older. This applies to questions about mental health, physical limitations and some questions about chronic diseases. This is why some assumptions have to be made about the prevalence of good or ill health amongst children up to the age of 12.

– Perceived health: prevalence known for ages 0 and older. No assumptions have to be made.
– Physical limitations: the prevalence up to the age of 12 years is assumed to be 0. This has been done because the prevalences within the next age bracket (12 to 15 years) are low. However, they are not 0. It would be possible to use these prevalences to estimate the prevalences among children aged 0 to 12 years. For example, similar to the way this was done for mental health. External experts have argued in favour of different approaches. Using the prevalence in the next age bracket is advised as well as the current approach. Most experts, however, did not make comments on this issue.
– Chronic diseases: the prevalence figures for children aged 0 to 12 are based on survey questions about some diseases in the list. Children up to the age of 12 are asked some questions about more specific children's diseases. We could use a selection of this list as a supplement in calculating child prevalences. The external experts do not comment much on this issue, however one stated that the prevalence of 'other heart diseases' is higher than the assumed 0.
– Mental health. The prevalences up to age 12 years are assumed to be similar to the prevalence in the age group 12-14 years. We chose this approach on the recommendation of the RIVM. However, an external expert stated that the assumptions are too strong and that a prevalence of 0 would be better.

Decisions

Perceived health: no changes.
Physical limitations: no changes. Assuming a prevalence of physical limitations of 0 for children is more logical than making this assumption for mental health. The prevalence figures for physical limitations rise sharply at older ages, while poor mental health can already be found in middle age and at younger ages.
Chronic diseases: no changes.
Mental health: no changes.

6.6 Indicators of socio-economic class

Grouping people into different categories can be based on many characteristics, such as their education level, income, occupational class, household composition or neighbourhood characteristics. Together these characteristics provide a strong indication of someone's socio-economic position. In practice, however, a single indicator is often used, mostly

education level, income or occupational class. These three are known as the core indicators of SES and they are complementary. Education is seen as determining cultural, intellectual and behavioural aspects, and income as determining the material aspects of life. The position of occupation is somewhere in the middle and it adds aspects of authority and prestige. Both income and education level are recommended for routine reporting by SN on socio-economic health differences (Kunst et al., 2005). Characteristics of geographical areas are generally not considered as core indicators of SES.

– Education level: the education level can be determined for every individual. It will hardly change from early adulthood onwards. Therefore this indicator is less sensitive to changes in health than income and occupation. However, determining the education level is difficult for children and adolescents, and therefore sometimes a bit artificial. After all, they are usually still working on their education and it is not yet known what level they will reach in the end. Making use of the education level of the parents/carers offers a solution because it is plausible that the education level in the household corresponds with the socio-economic circumstances in which the child grows up. A drawback for education level as an indicator is that it loses power in populations that become more highly educated. However, the opposite could also be argued, since education level gains importance in societies that become increasingly meritocratic. In such a situation a low education level can have more serious consequences for socio-economic status. In the past education had less importance, especially among women. Something that might be a problem is that the older people who are less well educated are not very comparable with less well educated people in their twenties precisely because of the increasing importance of a good education.
  To summarize: strengths: easy to measure in surveys, relevant for every individual irrespective of age or labour market situation.
  Limitations: cohort effect of the 'value' of education, especially among women. Education abroad is difficult to evaluate (Galobardes et al., 2006).
– Income: standardised disposable household income figures are available in full, so age-specific mortality by income does not have to be based on sample surveys and corresponds with real values. Moreover it is not necessary to make estimates about children. Household income also takes the income of other household members into account so it is less of an individual indicator than education. However, income has its limitations, for instance it can fluctuate greatly from one year to the next. So it would be better to use an average income over several years. The data make working with long-term income possible. Furthermore property is not included, although it is very well possible that people have a great deal of wealth together with a low income, because they own property. Reliable data are available about property, so it must be possible to create a 'wealth indicator' that combines property and long-term income.
  Students who do not live with their parents are likely to have low incomes. Maybe even lower than that of their less educated contemporaries with jobs. For this group income might not be the right SES indicator.
  To summarize: strengths: best indicator for material standard of living. Limitations: less reliable for young and old-aged, since income often follows a parabolic course over the lifetime (Galobardes et al., 2006).
  An external HE expert asked whether anything conspicuous happens around 65, since people's income often changes suddenly around that age. This turns out not to be the case. Probably because HE at age 60 is already largely based on the health and mortality probabilities of people over 65. The Sullivan method cannot tell whether the same people end up in a given income quintile at ages 60, 65 or 70.
– Occupation: data about occupation are poor, for example among the elderly. If anything is known, it usually is the most recent occupation. But people may have had other occupations. But it is even difficult to determine the right occupation for people who are currently working, since little is known about their working history. What was their main job? And what about the people who do not work at all or not yet? Occupation could be valuable if the active labour force is the sole target population (Kunst et al., 2005).
  Since 1 January 2010 the survey question about perceived health is part of the basic questionnaire that precedes both the Health and the Labour force survey. The LFS has more detailed questions about occupation. Moreover the LFS is much bigger than the Health survey. Perhaps we can calculate health expectancy by occupation, from 2010 onwards through the LFS. This would only be the variant of health expectancy dealing with perceived health.

In the long run it would be interesting to construct an indicator of socio-economic status that combines wealth and education.

A selection effect is possible for income and education. Bad health (especially at younger ages) may lead to a low level education and/or a lower income. So relations between education/income on the one hand and health on the other hand do not necessarily have to be causal.

One of the external experts pointed out this selection effect with respect to income. He stated: A point of concern is that the relationship between income and mortality/morbidity can be caused by selection effects (health affects income, not the other way around). These selection effects could lead to exaggerated differences in life and health expectancy between rich and poor, assuming that many users will interpret these differences as 'less money, so a shorter healthy life'. Since users tend to be quick to make such causal interpretations, selection effects should be reduced to a minimum. This could be done by longitudinal measurements of the relationship, with an interval of at least 3 to 5 years between measuring income and measuring mortality/morbidity.

Decisions

Maintain both income and education level as SES indicators.
Try to use long-term income and try to incorporate property in the indicator. Then HE could be determined by 'prosperity' (the combination of income and property). This should be done in consultation with researchers of SN working with income and property as indicator for socio-economic status.
Mention (possible) selection effects when publishing about health expectancy by SES.
In the long run: try to make an indicator that combines prosperity and education. This should be done in consultation with SN researchers working with classifications of socio-economic status.
For the time being occupation cannot be used. If the questionnaire allows it in the future, analyses of occupation as a classification variable should target the active labour force and not the population (in private households) as a whole. What could be done, however, is to see if something can be said about the relationship between health and the level of occupation (included in the Health survey at least until 2008). Starting with statistical year 2010, life expectancy in good perceived health could be determined by level of occupation, based on the LFS.

6.7 Which classification of socio-economic class?

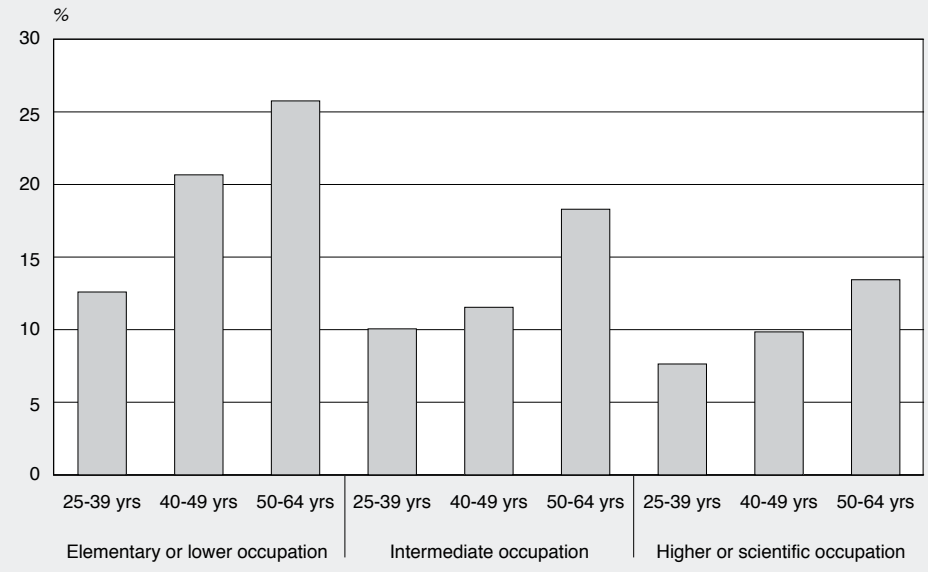
Once the choice is made for an indicator of socio-economic status, it has to be decided how to make the classification. There are different ways to do this for the indicators education, income and occupation.

– Education. The sizes of the four currently used classes are not constant over time. The group with the lowest education level is the smallest and is expected to get even smaller in the future. The highest category will probably grow. Does this have to lead to adjusting the current classification into primary/lower secondary education, higher secondary education, higher vocational and university education? Anyway, it seems wise to mention the relative size of the groups in publications.
– Income. Currently we use a quintile classification, and sometimes 'low' and 'not low' income. Self-employed people form a problem within the quintile classification as they end up in the lowest income group if they have a negative income. Some will only occasionally have a low income, and they need not to be comparable in the socio-economic and socio-cultural sense to other people with low but positive incomes, like people on social security benefits. Using long-term income can solve this problem for the most part. When using a classification based on scientific income limits or limits in accordance with policy, the use of long-term income might complicate matters. The number of people living long-term below the poverty line is limited. This complicates the calculation of age-specific prevalences for this

group. Therefore the use of quintiles seems to be most appropriate when long-term income is used.

– Occupation. Occupation can be classified in several ways. For example by using the occupation levels in the Standard Classification of Occupations constructed by SN where the level is based on the appropriate education level required to practice the occupation. There is a strong relationship with education level. Another classification can be made by distinguishing between very demanding and not so demanding occupations. Whether or not an occupation is demanding is subject to much political debate. But there is no definition of what a demanding job is. The first step should be to define this before we can use this classification. A third option for a classification of occupations is the EGP-classification (named after the people who came up with it: Erikson, Goldthorpe and Pontocarero). This classification distinguished manual labour, white collar work and agricultural labour of different levels. Furthermore the classification takes management into account and distinguishes self-employed people from employees. The classification contains 11 categories, some very small. In 2001–2008 the EGP was included in the analysis files of the Health survey. To be able to determine a healthy life expectancy by occupation based on this variable, some categories had to be merged. Some problems with low number per class might remain since only people who work more than 12 hours a week can be classified. Therefore several survey years will have to be combined, probably more than four. Subsequently analyses should be limited at the top end, because not many people continue to work after the age of 60. Possibly only a partial health expectancy is achievable for 20–59 year-olds. But are figures on mortality by occupation really necessary? Mortality at these ages is not very common. A drawback is that people with labour disabilities caused by their work/occupation are not observed. Figure 5 gives an impression of the relationships between occupation level and perceived health.

5. Health perceived as less than good by level of occupation, 2004/2008



Decisions

Keep the current classification of education. The publication about a relatively small group can be relevant as well. If the share of people with only ‘primary education’ becomes too small to calculate health expectancies, given the margins, we can opt for another classification. For example: primary/lower secondary education – higher secondary education – higher vocational/university education.
Mention the size of the different classes of education level in publications.
Income: maintain the classification with quintiles.

6.8 Why Sullivan?

We use the Sullivan method because it is a relative easy method with limited data requirements. A cross-sectional survey is enough besides data about the population and mortality. Subpopulations can easily be compared. International comparisons are possible since the method is not sensitive to differences in the size and age composition of populations. A drawback of the method is that period prevalences have to be estimated through observed cross-sectional prevalences.
The multi-state life table method could be an alternative. This method takes into account the possibility of recovering from an unhealthy state to a healthy one. This method needs longitudinal data, which is the major drawback. Longitudinal data of sufficient quality and quantity are only rarely available.

Decision

Continue to use the Sullivan method.

6.9 Highest age category

The age category of 80 years and older is used as the highest age category in the calculations. Elsewhere, for example in the Sullivan calculation guide, 85 and older is used. An external expert also expressed the wish to use this higher age category.
Adding an extra age category is impossible because there are few men over 85 in the survey. Table 4 shows the number of respondents by age category in survey year 2008.

Table 4
Number of respondents by age category, 2008

	Males	Females	Total
0	47	41	88
1– 4	243	222	465
5– 9	308	294	602
10–14	281	282	563
15–19	298	286	584
20–24	287	282	569
25–29	288	288	576
30–34	298	299	597
35–39	373	370	743
40–44	384	375	759
45–49	367	363	730
50–54	334	331	665
55–59	320	315	635
60–64	291	289	580
65–69	207	215	422
70–74	159	182	341
75–79	125	163	288
80–84	76	120	196
85 and older	24	72	96
Total	4,710	4,789	9,499

The number of men in the highest age category is so small that it is difficult to calculate reliable prevalences. The problem probably increases when a breakdown is made for ses. In that case we could combine four years, but that still leaves us with four or five ses categories, and these are unequal in size especially with respect to education.

Decisions

Extending with the age category 80–84 is desirable, but impossible at the moment due to the size of the Health survey. From 2010 onwards a life expectancy in perceived good health might be determined for higher age groups based on the LFS.

As of 2010 life expectancy in perceived good health could also be based on the Labour Force Survey instead of the Health Survey. This is because the question about perceived health has also been asked in the LFS since 1 January 2010. Since the LFS is much bigger, we may be able to work with higher age categories for this variant of the health expectancy. There is a need for this extra age category, mainly among scientists. Policymakers and the media are usually satisfied with HE's at birth and at 65.

6.10 Lowest age category

Life expectancy is always presented from the age of 0 years onwards. Since not all survey data needed are available from age 0 years onwards, we have to use tricks and assumptions. These tend to overcomplicate the situation. For example, the prevalence of ill health among children. An alternative is to only present health expectancies on ages where we have information available about prevalences. A breakdown by education could start at age 25. By that age most people have finished their education, so we no longer require information about the education of the parents/carers or about their current enrolment in education.

Decisions

No changes. We continue to present figures from age 0 onwards. The external experts did not comment on this point. However, in publications we must clearly describe the assumptions that are made about young persons, their health prevalences and their education level.
An exception is made for incidental publications about the life expectancy without GDA limitations. In those cases 55 is the minimum age.

6.11 Research method: no separate weighing for paper questionnaire

The Health survey has to deal with selective non-response, like all surveys. By using a weighing factor the bias can be reduced. By applying a weighing factor, the answers of different types of respondents are assigned different weights based on different background characteristics. The Health survey consists of two parts. Only the question we use to determine prevalences about perceived health is in part one, the others are in part two. Between part one and part two of the survey there is some loss of respondents. In the period 2001-2008 approximately 80 percent of the people who responded to part one also responded to part two. The weighing factor, however, is based upon the first part so it does not take into account the additional selective loss of respondents between the two parts.
In the re-designed Health survey, starting in 2010, a transition is made from face-to-face data collection only to online, telephone and face-to-face data collection. The loss of respondents between the two parts is expected to increase, so it becomes less sound to work with one weighing factor.

Decision

From 2010 onwards: a separate weighing of part two of the survey. Figures about 2009 will be published in the old way.

6.12 Health survey only includes people in private households

The Health survey is conducted among those living in private households. People in institutional households are not included in the survey sample. The institutionalised population in the Netherlands is small, but it is a selective group. On 1 January 2009 the

population in institutional households consisted of 207 thousand people, of whom 119 thousand were living in nursing homes or homes for the elderly. Sixty percent of the institutionalised population was over 64 years old (CBS).
The age-specific prevalences of ill health are likely to be higher among this group than among the rest of the population. By not taking the institutional households into account the health expectancy will be somewhat overestimated. Excluding the institutional population leads to overestimating life expectancy in perceived good health by about 5 months among men, according to a study of Lodder and Kardal (2009). Among women it is around 10 months. For life expectancy without limitations it comes to 5 months both for men and women, according to Lodder and Kardal.
External experts indicate a need for more clarity about how we deal with the institutionalised population.

In a European context it is being considered whether or not the institutionalised population should be included in health surveys in the framework of the European Health Interview Survey (EHIS). Eurostat may make this EHIS obligatory for the member states. Within the EHIS framework a task force is looking at how the institutionalised population can be included in the EHIS. Its advice is to focus on the population in homes for the elderly and nursing homes (Eurostat, 2010). Final decisions had not been made by mid 2010.

Decision

In publications it has to be made clear that the Health survey involves the private households and that the higher age-specific health prevalences among the institutionalised population are not taken into account in the results. Estimates of the effect are based on the study by Lodder and Kardal.
Keep informed about de decision-making process at Eurostat about the inclusion of the institutionalised population in the EHIS.

6.13 Presentation: period under review

Health expectancy not broken down by socio-economic status is calculated per calendar year. For the breakdown by SES, four years are combined. This is done because of the larger margins of the yearly figures. These margins are mainly determined by the margins for the prevalence figures rather than the margins for the mortality rates. The margins for the health expectancies, not broken down by SES, are also mainly caused by prevalence figure margins.
The external experts did not comment on the different periods under review. The consulted ‘layman’ from within SN did comment on this issue.
It can easily be explained that we need several years for the breakdown by SES. However, it is more difficult to explain why we do not use the same grouping of years for the breakdown by income and education level .

Decisions

Make the grouping of years in the tables by SES uniform. The least labour intensive option is to replace the income table for the years 2004/2007 by a table for the years 2005/2008.
Leave the nine-year figures about HE by education as they are.

6.14 Presentation: show figures about total life expectancy?

The tables by socio-economic status also show the ‘normal’ life expectancy by SES. The other tables do not contain figures on ‘normal’ life expectancy. This is because the total

figures on life expectancy differ slightly from the figures of the Population department at SN, due to methodological differences. We do not want to publish two different figures about the same topic on StatLine. The tables by SES do not have this problem since the Population department does not publish life expectancies by SES.

From the user point of view it is illogical that some tables do and other tables do not contain 'normal' life expectancy. It would be quite user friendly to include life expectancy, so users can relate health expectancy and life expectancy in the same table. So we decided to include 'normal' life expectancy figures in all tables, starting from the statistical year 2010.
This decision should not lead to life expectancy figures in the tables about health expectancy that differ from the figures in the tables of SN's Population department. This can be achieved by slightly altering the method to calculate life expectancy within the Sullivan method. See section 6.15.

Decision

Add figures about 'normal' life expectancy to all tables about health expectancies. This will be done starting with the statistical year 2010.

6.15 Calculation of life expectancy

We consulted the Population department of SN about preventing the publication of different figures about life expectancy on StatLine. The decision was to change the calculation of life expectancy within the Sullivan method (used to determine health expectancy) in the direction of the method used by SN Population. This is possible because the data used as input for the calculation of health expectancy originate from SN's Population department.

The old situation (up to statistical year 2010):
The age groups about which prevalence figures about health can be determined are leading, also for the calculation of 'normal' life expectancy. That is why the calculation scheme of the Sullivan method is filled with summed population and mortality figures for the age-groups: 0, 1–4, 5–9, 10–14, 15–19, …, 70–74, 75–79, 80 and older.

The new situation (from statistical year 2010 onwards):
The 'normal' life expectancy will be based on population and mortality numbers for the ages: 0, 1, 2, 3, …, 87, 98, 99 and older.
The age-specific population numbers on year x are determined by taking the average of the numbers on 1 January of year x and the numbers on 1 January of the year x+1. This is a reasonable approach of the midyear population. The required data come from the StatLine table on population, age and marital status: *'Bevolking; leeftijd, burgerlijke staat'*.
The age-specific numbers of deaths are taken from the table on mortality and the age at 31 December: *'sterfte; leeftijd op 31 december*'.
In the new situation too the prevalences of health can only be determined for the age groups: 0, 1–4, 5–9, …, 75–79, 80 and older. The same prevalence will therefore be valid for every individual age within such an age group. For example: if the prevalence of physical limitations is 0.25 for males aged 65 to 69 then we will use the prevalence of 0.25 for each of the individual ages 65, 66, 67, 68 and 69. In the StatLine tables the concept 'age' will be explained: it is the age on 31 December. A (healthy) life expectancy in year x for age y therefore applies to everyone who has reached age y in year x. Because everyone of age y on 31 December of year x has reached this age in that year.

The new method almost matches the method of example 1 from *Health Expectancy Calculation by the Sullivan method: a practical guide* (Jagger et al., 2006). The difference is that the highest age category in this example is '85 years and older' instead of '99 years and older'.
Given the limitations (in size) of the Health survey, see section 6.9, the highest age category for which prevalences of (ill)health are determined remains unchanged, that is '80 years and older'. In the new method therefore the same prevalences are assumed for each of the ages 80, 81, 82, …, 98, 99 and older.

Decision

To avoid deviations from the figures about life expectancy published by SN's Population department, we adjust the calculation within the method of Sullivan as of statistical year 2010.

6.16 Table structure StatLine

The table structure of the theme 'gezondheid en welzijn' (Dutch for 'health and welfare') on StatLine was changed on 1 July 2010 to improve access to the tables. There is a separate folder on health expectancy within the theme 'health and welfare' containing the four HE tables (the 2001/2005 table remains in the archive). The table on health expectancy since 1981 ('gezonde levensverwachting; vanaf 1981') is placed at the top with the highest weight for searching. This means that this table will be the first result when somebody uses 'health expectancy' ('gezonde levensverwachting') as a search term.
The table on health expectancy; since 1981 (in Dutch) and the table on health expectancy (in Dutch) show a lot of similarities. The main difference between the two is the period under review. One shows yearly figures, the other shows averages over three years. In the course of time it must be possible to integrate these tables into one table. The user can select the review period he or she wants figures about.
It will also be investigated whether or not it is possible to integrate the table about health expectancies by education level with the table about health expectancies by income. In such a table the user can choose the SES indicator.

Decision

Integrate the current table on health expectancy (in Dutch) with the table on health expectancy since 1981 (in Dutch).

6.17 Extensions of HE statistics not mentioned elsewhere

– Decomposition
Apply the decomposition method to find out which part of the differences in health expectancy is caused by differences in health and which part by differences in mortality (Nusselder, 2004). This is a project with the Erasmus University Rotterdam.

– More breakdowns
We are working on a breakdown by lifestyle and (ethnic) origin. The breakdown by GGD (=Area Health Authority) region is being done by RIVM (http://www.nationaalkompas.nl/gezondheid-en-ziekte/sterfte-levensverwachting-en-daly-s/gezonde-levensverwachting/zijn-er-in-nederland-verschillen-naar-regio/). SN does not publish health expectancy by GGD region, mainly due to the large margins around these figures.
SN only has a regional breakdown by part of the country available. This breakdown, however, does not provide much interesting information. So this StatLine table is no longer updated and has been moved to the archive. The data are not sufficient for a breakdown by municipality.

Decisions

Use the decomposition method.
Publish health expectancy by (ethnic) origin.
Publish health expectancy by lifestyle.
Do not extend or update the table with regional life expectancy. RIVM already makes HE's by GGD region. That is sufficient regional information.

7. Conclusions and decisions

The critical views of people inside and outside SN provided many new insights about the statistics about health expectancy. Based on this we could make many decisions about improving or extending the current statistics. These decisions are listed below.

All decisions leading to extensions or changes to the current method of working

- In publications it will be explained that chronic diseases refers to *physical* disorders
- Life expectancy without chronic disease will be calculated using the current list of diseases but excluding hypertension. These figures will also be published on StatLine (from statistical year 2001 onwards).
- Disease-specific health expectancies will also be calculated and an article about this subject will be written. Disease-specific health expectancies will not be published regularly.
- Severity levels will be published regularly for life expectancy without physical limitations, from statistical year 2001 onwards.
- An article will elaborate on life expectancy without GDA-limitations (Bevolkingstrends, 3rd quarter 2010). However, this will not become regular StatLine output.
- An article will focus on the limitations in hearing, seeing and moving (Bevolkingstrends, 3rd quarter 2010). This will not become a regular publication .
- We shall try to incorporate long-term income and property in the indicator to determine HE by 'wealth' (combination of income and property).
- We shall mention (possible) selection effects when publishing about health expectancy by SES.
- In the long run: we shall try to make an indicator that combines wealth and education.
- We are looking into the possibility to determine a life expectancy in perceived good health by occupation, based upon the LFS as of statistical year 2010. This is because the survey question about perceived health is also asked in the LFS. Given the size of the LFS it may become possible to use a highest age category of '85 years and older' for this variant.
- We shall choose another classification if the share of primary education only shrinks too much, making it difficult to calculate health expectancies with reference to margins.
- We shall mention the size of the different classes of educational level in publications.
- In publications, we shall describe clearly the assumptions made for young persons. Both in health prevalences and in education level .
- The incidental publications about the life expectancy without GDA-limitations will use a minimum age of 55 years.
- From 2010 onwards: we shall weigh part two of the Health survey separately. This is made necessary by the redesigned Health survey, with an increase in the loss of respondents between the two parts of the survey.
- In publications it has to be explained that the Health survey applies only to the private population. So the higher age-specific health prevalences among the institutionalised population are not taken into account in the results. Estimates of the effect can be given, based on the study by Lodder and Kardal.
- We shall replace the table about health expectancy by income 2004/2007 with a table dealing with the years 2005/2008. This will be in line with the other table about SES.
- We shall add figures about 'normal' life expectancy to all tables about health expectancies. To avoid deviations from the figures about life expectancy published by SN's Population department, the way of calculating within the method of Sullivan is adjusted as of statistical year 2010.
- The table structure in StatLine will be changed.
- We shall integrate the current table on health expectancies (in Dutch) with the table on health expectancies since 1981 (in Dutch).
- We shall use the decomposition method.
- We shall publish health expectancy by (ethnic) origin.
- We shall publish health expectancy by life style.

8. Literature

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Appendix 1

Phrasing of the questions about chronic diseases

- Do you suffer from diabetes?
- Have you ever suffered a stroke, a cerebral haemorrhage or a brain stroke?
- Have you ever suffered a heart attack?
- Have you suffered from another serious cardiac defect (like heart failure or angina pectoris) during the past 12 months?
- Have you ever suffered from a form of cancer (malignant affliction)?

With regard to the following diseases, could you please tick whether you have suffered from them during the past 12 months?

- migraine or periodical severe headache
- hypertension
- asthma, chronic bronchitis, pulmonary emphysema or COPD
- serious or persistent intestinal disorders for more than 3 months
- attrition of the joints (arthrosis, rheumatic attrition) of the hips or knees
- chronic arthritis (rheumatic arthritis, chronic rheumatism)
- serious or persistent affliction of the back (incl. slipped disc)

Appendix 2

Comments external experts gave on the HE activities (summarized)

	Perenboom TNO	Kunst AMC/UvA	Nusselder EMC/EUR	Mackenbach EMC/EUR	Van Gool/Hoeymans RIVM
List of chronic diseases disorders	Hypertension is a risk factor, not a disorder.	Hypertension does not have a big influence on the quality of life.	Hypertension is not a disease. Why are diseases like the constriction of the blood vessels not taken into account? These lead to many limitations.	Heterogeneous. What happens when some less obvious "disorders" like hypertension are excluded?	Don't include hypertension. It is not a disease, but a risk factor. And not qualitative measurable by self-report. Furthermore the list consists of physical diseases, while mental diseases do also cause a lot of ill-health. Therefore better: life expectancy without physical diseases.
Breakdown by other background variables		Country of origin. Would like to give advice on this.		Region, degree of urbanisation, ethnicity.	
Severity levels	It's possible and desirable to make distinctions within the unhealthy part. Stratification of the unhealthy years will be the result.	Make distinctions for the physical limitations.			Make distictions in ill-health by severity levels.
Child prevalences disorders/diseases	'Other severe heart disorders' could also occur amongst children.				Assumptions are good.
Child prevalences limitations	Using the same prevalences as the neighbouring age-group would be better.				Assumptions are good.
Child prevalences mental health			Strong assumptions. 0 would be better.		Assumptions are good.
Cut-off point MHI	'60' belongs to 'unhealthy'. See document attached. Severity levels possible.				
Determining education level	Why would you use the highest education level within the household up to the age of 25 years. Wouldn't the age of 18 years be better.		Why is sometimes the education level of the parents used and sometimes that of the carer?		
Income as indicator of SES	What does this mean at ages around 65? Something strange visible there?	Selection effect. Be careful with presentations without extensive clarification, like statline.			
Margins		Always show 95% BI's, especially for HE's of sub-populations.			
Age groups		HE for every 5 years age group are not necessary. 0, 15, 30, 50, 65 and 80 would be enough.	Add 85 at least. And preferably even higher ranges.		
Partial HE		Could be of added value.	For small groups (e.g. by ses) expectancies 0–80.		
Institutionalised population		Starting from the age of 75 the influence of the institutionalised population is strong. This should be taken into account.	Needs more clarification. Is it possible to determine health expectancy and life expectancy within this population?		Unclear how this has been dealt with. TNO used data of SCP. The assumption that institutionalised population is always unhealthy would be acceptable.
Life time prevalence		Not correct within Sullivan method.			
GDA			Calculate HE's without limitations based on GDA as well. From age 55 onwards.		Take GDA into account when operationizing limitations. Possibly in combination with severity levels.
Presentation			More attention for the unhealthy years.		