List of references on health expectancy
Update n°7
Dec2007

New references with keywords and abstracts

2008

Bronnum-Hansen, H., Baadsgaard, M. **Increase in social inequality in health expectancy in Denmark**. *Scandinavian Journal of Public Health* 2008;36:44-51.   CB18/02
(http://sjp.sagepub.com/cgi/content/abstract/36/1/44)

HEALTH EXPECTANCY / LIFE EXPECTANCY / SOCIAL INEQUALITY / TRENDS / EDUCATION / DENMARK / ORIGINAL CALCULATION / SULLIVAN METHOD / PERCEIVED HEALTH / LONG-STANDING ILLNESS / ACTIVITY RESTRICTION / 1994-2005

Health expectancy represents the average lifetime in various states of health and differs among social groups. The purpose of the study was to determine trends in social inequality in health expectancy since 1994 between groups with high, medium and low educational levels in Denmark.
Methods: The study was based on data from nationwide registers on educational level and mortality during the period 1994–2005 and data on health status derived from the Danish Health Interview Surveys carried out in 1994, 2000 and 2005. Expected lifetime in self-rated good and poor health, lifetime without and with longstanding illness and expected lifetime without and with long-lasting difficulties or restrictions were estimated by Sullivan's method.
Results: Between 1994 and 2005, life expectancy at age 30 years increased by 1.9 years for men and 1.5 years for women with a low educational level. For people with a high educational level, the increase was 2.7 years for men and 2.2 years for women. The difference between people with low and high educational level in expected lifetime in self-rated good health increased by 2.0 and 1.3 years for 30-year-old men and women, respectively. The social gap also increased for other indicators. Conclusions: During the past 12 years, social inequality in life expectancy and health expectancy has increased in Denmark, but the proportion of the population with a low educational level has decreased.

2007

Cai, L., Lubitz, J. **Was there compression of disability for older Americans from 1992 to 2003?** *Demography* 2007;44(3):479-495.   CB17/166
(http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=17913007)

DISABILITY-FREE LIFE EXPECTANCY / AGED / INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADL) / ACTIVITIES OF DAILY LIVING (ADL) / ORIGINAL CALCULATION / MULTI-STATE LIFE TABLE METHOD / TRENDS / USA / 1992-2002

Medical advances and the growth of the elderly population have focused interest on trends in the health of the elderly. Three theories have been advanced to describe these trends: compression of morbidity, expansion of morbidity, and dynamic equilibrium. We applied multistate life table methods to the Medicare Current Beneficiary Survey to estimate active and disabled life expectancy from 1992 to 2003, defining disability as having difficulty with instrumental activities of daily living or activities of daily living. We found increases in active life expectancy past age 65 and decreases in life expectancy with severe disability. These trends are consistent with elements of both the theory of compression of morbidity and the theory of dynamic equilibrium.

Cruz, G. T., Saito, Y., Natividad, J. N. **Active life expectancy and functional health transition among Filipino older people**. *Canadian Studies in Population* 2007;34(1):29-47.　　　　　CB18/03
(http://www.canpopsoc.org/journal/CSPv34n1p29.pdf)

HEALTH EXPECTANCY / EDUCATION / SOCIAL INEQUALITY / ORIGINAL CALCULATION /
SULLIVAN METHOD / MULTI-STATE LIFE TABLE (Imach) / PHILIPPINES / 1996
1996-2000

The authors estimate Active Life Expectancy (ALE) based on ADLs and IADLs to separate the population aged 50 and over into healthy or active, and unhealthy or disabled. The paper presents the ALE estimates from the multistate life table method (IMaCH). Results are presented by sex, education and place of residence (urban or rural).
Findings on ALE demonstrate that females and urban residents live longer and have a greater proportion of their remaining life in active state compared to their counterparts. Health transition analysis indicates a significant proportion experiencing recovery. Age, sex, place of residence and health status/behavior indicators (self-assessed health, drinking and exercise) display a significant influence on future health and mortality trajectories although surprisingly, education did not show any significant effect.

Franco, O. H., Steyerberg, E. W., Hu, F. B., Mackenbach, J., Nusselder, W. **Associations of diabetes mellitus with total life expectancy and life expectancy with and without cardiovascular disease**.
Archives of Internal Medicine 2007;167(11):1145-1151.　　　　　　　　　CB17/163
(http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=17563022)

HEALTH EXPECTANCY / DISEASE-FREE LIFE EXPECTANCY / CARDIOVASCULAR DISEASE
/ DIABETES / ORIGINAL CALCULATION

BACKGROUND: Diabetes mellitus is a recognized risk factor for cardiovascular disease (CVD) and mortality. However, limited information exists on the association of diabetes with life expectancy with and without CVD. We aimed to calculate the association of diabetes after age 50 years with life expectancy and the number of years lived with and without CVD.
METHODS: Using data from the Framingham Heart Study, we built life tables to calculate the associations of having diabetes with life expectancy and years lived with and without CVD among populations 50 years and older. For the life table calculations, we used hazard ratios for 3 transitions (healthy to death, healthy to CVD, and CVD to death), stratifying by the presence of diabetes at baseline and adjusting for age and confounders.
RESULTS: Having diabetes significantly increased the risk of developing CVD (hazard ratio, 2.5 for women and 2.4 for men) and of dying when CVD was present (hazard ratio, 2.2 for women and 1.7 for men). Diabetic men and women 50 years and older lived on average 7.5 (95% confidence interval, 5.5-9.5) and 8.2 (95% confidence interval, 6.1-10.4) years less than their nondiabetic equivalents. The

differences in life expectancy free of CVD were 7.8 and 8.4 years, respectively.
CONCLUSIONS: The increase in the risk of CVD and mortality from diabetes represents an important decrease in life expectancy and life expectancy free of CVD. Prevention of diabetes is a fundamental task facing today's society in the pursuit of healthy aging.

Gómez Redondo, R., Génova, R., Robles, E. ***Envejecimiento, Longevidad y Salud. Bases demográficas en España***. In: Ballesteros, S., editor. Envejecimiento Saludable: Aspectos Biológicos, Psicológicos y Sociales. Madrid: UNED-Editorial Universitas; 2007. p. 41-76   CB17/165
(http://www.axon.es/axon/LibroFicha.asp?Libro=63492&T=ENVEJECIMIENTO+SALUDABLE%3A+ASPECTOS+BIOLOGICOS+PSICOLOGICOS+Y+SOCIALES)

HEALTH EXPECTANCY / HEALTHY LIFE EXPECTANCY / PERCEIVED HEALTH / DISABILITY-FREE LIFE EXPECTANCY / CALCULATION / CHRONOLOGICAL SERIES / SPAIN / 1995-2003

The authors calculate healthy life expectancy at birth and at age 65 for the Spanish population, using data from the national health surveys of 1987, 1993, 1995, 1997, and 2003. They also calculate a series of disability-free life expectancies using date from the 1999 survey on handicaps and disabilities and health.

Hidajat, M. M., Hayward, M. D., Saito, Y. **Indonesia's social capacity for population health: the educational gap in active life expectancy**. *Population Research and Policy Review* 2007;26(2):219-234.
                                                                                    CB18/04
(http://www.springerlink.com/content/a04r973k33711l00/)

HEALTH EXPECTANCY / ACTIVE LIFE EXPECTANCY (ALE) / ORIGINAL CALCULATION / MULTI-STATE LIFE TABLE METHOD / EDUCATION / DISABILITY / INDONESIA

In this paper, we lay the initial groundwork for anticipating Indonesia's future burden of disease by developing a demographic model of population health. We develop this model within the analytic framework of a Markov-based multistate life table model to calculate an important indicator of the burden of disease, the expected years of active life of elderly Indonesians. The magnitude of the gap points to the potential consequences of improvements in the nation's educational level for the future burden of disease. The results show that having some education increases life expectancy but it also expands the expected years with a major functional problem. Overall educational attainment levels, however, are very low, indicating that Indonesia's elderly are at the leading edge of improvements in the nation's social capacity for health. The life tables suggest that at the early stages of development, longer life is accompanied by an expansion of morbidity.

Imai, K., Soneji, S. **On the estimation of disability-free life expectancy: Sullivan's method and its extension**. *Journal of the American Statistical Association* 2007;102(480):1199-1211.   CB18/01

HEALTH EXPECTANCY / MORTALITY / MORBIDITY / DISABILITY / TRENDS / CALCULATION METHOD / SULLIVAN METHOD / USA

A rapidly aging population, such as the United States today, is characterized by the increased prevalence of chronic impairment. Robust estimation of disability-free life expectancy (DFLE), or healthy life expectancy, is essential for examining whether additional years of life are spent in good health and whether life expectancy is increasing faster than the decline of disability rates. Over 30 years since its

publication, Sullivan's method remains the most widely used method to estimate DFLE. Therefore, it is surprising to note that Sullivan did not provide any formal justification of his method. Debates in the literature have centered around the properties of Sullivan's method and
have yielded conflicting results regarding the assumptions required for Sullivan's method. In this article we establish a statistical foundation of Sullivan's method. We prove that, under stationarity assumptions, Sullivan's estimator is unbiased and consistent. This resolves the debate in the literature, which has generally concluded that additional assumptions are necessary. We also show that the standard variance estimator is consistent and approximately unbiased. Finally, we demonstrate that Sullivan's method can be extended to estimate DFLE without stationarity assumptions. Such an extension is possible whenever a cohort life table and either consecutive cross-sectional disability surveys or a longitudinal survey are available. Our empirical analysis of the 1907 and 1912 U.S. birth cohorts suggests that while mortality rates remain approximately stationary, disability rates decline during this time period.

Lievre, A., Jusot, F., Barnay, T., Sermet, C., Brouard, N., Robine, J.-M., Brieu, A.-M., Forette, F. **Healthy working life expectancies at age 50 in Europe: a new indicator**. *The Journal of Nutrition, Health & Aging* 2007;11(6):508-514.   CB17/158
(http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=17985068&ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum)

HEALTH EXPECTANCY / HEALTHY WORKING LIFE EXPECTANCY / ELDERLY / HEALTH CARE SYSTEM / WORKING ABILITY / ORIGINAL CALCULATION / MULTI-STATE LIFE TABLE (Imach) / AUSTRIA / BELGIUM / DENMARK / FINLAND / FRANCE / GERMANY / UNITED KINGDOM / GREECE / ITALY / THE NETHERLANDS / PORTUGAL / SPAIN / EUROPEAN UNION / 1995-2001

Objectives: The absence of disease or disability and active involvement in society are considered as essential dimensions of successful ageing. To assess these concepts, we propose a new indicator the Healthy Working Life Expectancy (HWLE) that associates health status and productive engagement, in order to compare various situations in Europe.
Design: The study population is drawn from the European Community Household Panel (ECHP) which is the unique source of longitudinal data, providing comparable information between 1995 and 2001 on health and work statuses for a sample of some 60,000 household's representative of the population of: Austria, Belgium, Denmark, Finland, France, Germany, the United Kingdom, Greece, Italy, the Netherlands, Portugal, and Spain. Based on the multi-state life table approach conventionally used for calculating healthy life expectancies, the HWLE corresponds to the number of years spent between the ages of 50 and 70 both in good health and at work.
Results: In average, among the 20 years available between age 50 and age 70, the HWLE is 7.5 years for men and 4.8 years for women, ie, one half and one third respectively of the number of years spent in good health (14.1 and 13.5 years). The countries where the healthy working life expectancy of seniors is the highest are also the countries where the levels of employment of seniors are higher. Conversely, health status has only a weak influence on the HWLE indicator.
Conclusion: These findings suggest the existence of a reservoir of healthy years which can be used to increase the length of the working life expectancy. They underline also the essential role that employment maintenance and retirement policies should have to increase the number of healthy years spent at work, and therefore guaranty a successful ageing for the seniors in Europe.

Meszaros, J. **Ako dlho žije populácia Slovenskej republiky v zdraví? [For how long the population of the Slovak Republic live in health?]**. *Slovenská štatistika a demografia* 2007(1-2):133-140.   CB17/157

HEALTH EXPECTANCY / PERCEIVED HEALTH / CALCULATION / SOCIAL INEQUALITY / SLOVAK REPUBLIK / 2005

Based on EU-SILC 2005, the article analyses feeling of Slovak population about health. In the part "data on persons" this survey contains the questions on health status of the respondents. One of the questions - In general, you can say that your health is: very good, good, fair, bad, very bad" is in accordance with recommendations for measuring perceived health, elaborated by the group EURO-REVES within the project EHEMU on measuring health status of European population.
In the first part, the author analyses the frequency of answers and shows that men evaluate their health more positively than women. With aging, perceived health is weakening, except for men in age groups 65 - 69 and 70 - 74, where the old men perceive their health as good as the younger men.
In the second part, the author calculates average healthy life expectancy by health categories. 16-years old male should live healthy for 29 years out of his 55 years life expectancy, 16-years old female 28 years out of her 63 years life expectancy. 50-years old male have only 5 more years of good health out of the 24 years life expectancy; 50-years old woman even only 4 years out of 30 years of life expectancy.
In the last part of the article, the author searches the relation between perceived health and age, education, marital status, and dwelling, using nominal logistic regression. The results show that the advanced age makes the perception of good health weaker, whereas higher education makes it stronger. There is a higher chance to perceive health as good in the region of Bratislava; on the other hand in Central Slovakia there is higher chance to perceive health as bad. Married persons perceive their health as fair. Single women perceive their health equally good and bad, on the other hand single men more often perceive their health as bad.

HEALTH EXPECTANCY / DISABILITY-FREE LIFE EXPECTANCY / HEALTH INEQUALITY / ACTIVITY LIMITATION / QUEBEC / CANADA

Background: The most common way of accounting for the countryside in health studies has been to compare it, as a whole, to the city. Furthermore, most of the work on small area health inequalities has been confined to major urban centres. To counter this trend, in this paper, we explore small area health inequalities in the predominantly rural county of Portneuf (population = 44,545), Quebec. Such information can be of interest for local health planning.
Methods: Three sources of data were used to define neighbourhood units: historical data, socio-economic data and perceptions of local stakeholders. Demographic, socioeconomic and general health status indicators were calculated by neighbourhood unit. For health status indicators, data came from mortality files (1998 to 2002), hospitalization files (2001/02) and the 2001 census for disability (individuals who reported being often limited in their daily activities) and the reference population.
Results: The county of Portneuf was subdivided into 8 neighbourhoods. Differences between neighbourhoods were noticeable for demographic, socio-economic and all health status indicators. The greatest differences were found between the town of Pont-Rouge (population = 4,975) and the hinterland of the towns of Donnacona (population 6,125) and Saint-Marc-des-Carrières (population = 3,160). The most striking was a difference of 6 to 8 years of disability-free life expectancy between the two groups, to the advantage of Pont-Rouge.
Conclusion: Although measuring rural health inequalities at a local level has some methodological limitations, true health inequalities exist in the county of Portneuf. These now need to be examined

further.

Rasulo, D., Bajekal, M., Yar, M. **Inequalities in health expectancies in England and Wales - small area analysis from the 2001 Census**. *Health Statistics Quarterly* 2007(34):35-45.   CB17/148
(http://www.statistics.gov.uk/cci/article.asp?id=1807)

HEALTH EXPECTANCY / HEALTHY LIFE EXPECTANCY / DISABILITY-FREE LIFE EXPECTANCY / ORIGINAL CALCULATION / SULLIVAN METHOD / SOCIAL INEQUALITY / ENGLAND / WALES / UNITED KINGDOM / 2001

This study investigates inequalities in healthy life expectancy (HLE) and disability-free life expectancy (DFLE) using 2001 Census data at small area (ward) level for England and Wales. Both measures were calculated using the Sullivan method and results are reported at birth and at age 65. For the calculation of HLE, age and sex-specific prevalence rates of self-assessed 'good' or 'fairly good' health were used to partition the number of expected years lived in each age band into those lived healthy and those lived in poor health. Similarly, DFLE was based on the age and sex specific prevalence of no limitation in daily activities. As both indicators make allowance for the age structure of populations, they can be used, for example, to make comparisons between areas or sexes. Inequalities were examined both nationally and within regions by computing life expectancies and health expectancies in groups of wards (twentieths) aggregated according to the Carstairs deprivation score. The results showed that the inequality gaps were significantly larger for health expectancies compared with life expectancy; they were wider for disability-free life expectancy than for healthy life expectancy; and, for all measures, were wider for males. Within regions, the gradient in health inequalities with increasing deprivation varied. Those living in the least deprived wards had similar levels of health expectations across all regions. There was more geographical variation in the most deprived areas with lowest health expectations in the northern regions.

Rodriguez-Abrego, G., de la Pena, J. E., Zurita, B., Ramirez, T. D. **Premature death and disability profile in the population affiliated to the Mexican Institute of Social Security (IMSS)**. *Salud Publica De Mexico* 2007;49(2):132-143.   CB17/156
(http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S0036-36342007000200009&lng=es&nrm=iso)

DISABILITY-ADJUSTED LIFE YEARS (DALYs) / DISABILITY-ADJUSTED LIFE EXPECTANCY (DALE) / TRENDS / MEXICO

Objective: To carry out estimations of the burden of disease for 129 causes in order to identify health priorities in the different geographic regions of the country and to present comparative data between 1995 and 2000.
Material and Methods: Indicators such as disability-adjusted life years (DALYs) and disability adjusted life expectancy (DALE) were analyzed for the population covered by IMSS in 1995 and 2000; for both years, the methodology proposed by the Burden of Disease Worldwide Study was applied. Data corresponding to 1995 were analyzed in 1997, while data corresponding to 2000 were analyzed in 2001. The comparative study was carried out in 2006 by IMSS, Mexico.
Results: The higher proportion of DALYs was due to chronic diseases, although the 2000 rate is 1.5 times higher than that of 1995. Priorities that were identified were diabetes mellitus, ischemic cardiopathy, and cerebrovascular disease, with a loss that is mainly accounted for by premature death, as well as by diseases related to disability with an important burden of disease, such as AIDS or depression. Epidemiological backlogs can still be observed.
Conclusion: The population covered by IMSS is still in a phase of epidemiologic transition, favoring

polarization in health conditions. Health policies need to be directed toward bringing about an improved response and reversing the trend in diseases that represent an institutional risk for the financing of health care.

Takeda, S. **[Healthy life expectancy and the standardized mortality ratio for the elderly in Japan's 47 Prefectures]**. *Nippon Koshu Eisei Zasshi - Japanese Journal of Public Health* 2007;54(1):25-31.
CB17/152
(http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=pubmed&dopt=AbstractPlus&list_uids=17338191)

HEALTHY LIFE EXPECTANCY / ELDERLY / LONG-TERM CARE / ORIGINAL CALCULATION / SULLIVAN METHOD / JAPAN / 2004

OBJECTIVE: To derive values for life expectancy and healthy life expectancy (number of years people are expected to live without certification as being in need of long-term care) for Japanese at 65 years of age across 47 Prefectures in Japan, based on both national death statistics and long-term care insurance data, and to analyze their relationships with the standardized mortality ratio (SMR) for the elderly aged 65 years and more.
METHOD: Life expectancy was calculated using Chiang's method and healthy life expectancy using Sullivan's method. The number of years of living with long-term care needed (duration of care need) was determined by subtracting the healthy life expectancy from life expectancy. The SMR was calculated in comparison with that for the nation set at 1. The relationships between the indices were analyzed based on the Spearman rank-order correlation coefficient.
RESULTS: (1) Among the 47 prefectures, healthy life expectancy at 65 years of age in 2004 for males was the longest in Nagano Prefecture (16.72 years) and the shortest in Aomori Prefecture (14.32 years). For females, it was the longest in Yamanashi Prefecture (19.18 years) and the shortest in Osaka Prefecture (16.47 years). (2) Healthy life expectancy for males and females positively correlated with life expectancy, and negatively correlated with the duration of care need and SMR. Life expectancy negatively correlated with SMR for males and females, and, for females, it positively correlated with the duration of care need as well.
CONCLUSION: (1) Among the 47 prefectures, healthy life expectancy at 65 years of age in 2004 was the longest in Nagano Prefecture and the shortest in Aomori Prefecture. For females, it was the longest in Yamanashi Prefecture and the shortest in Osaka Prefecture. (2) For males and females, lowering the mortality rate as well as the prevalence of ill health with long-term care need is important for extending healthy life expectancy. For females, long life expectancy is associated with a long duration of care needed.

United Nations, Department of Economic and Social Affairs. ***World Economic and Social Survey 2007: Development in an ageing world***. New York: United Nations; 2007.
CB17/153
(http://www.un-ngls.org/site/article.php3?id_article=296)

AGING / ELDERLY / DISABILITY / HEALTH STATUS / LONG-TERM CARE / HEALTH CARE SYSTEM / MORBIDITY COMPRESSION / HEALTH-ADJUSTED LIFE EXPECTANCY (HALE) / WORLD POPULATION

Several health expectancy indicators designed to examine whether a compression of morbidity and related changes are taking place in various populations have been proposed. The lack of comparability of these indicators only allows a few general conclusions to be drawn. (See pages 119-121)

2006

Gomez Redondo, R., Genova Maleras, R., Robles, E. *Mortality compression and equilibrium trend in health: the Spanish case*. In: Institut des Sciences de la Santé, editor. Living longer but healthier lives: how to achieve health gains in the elderly in the European Union. Europe Blanche XXVI, Budapest, 25-26 November 2005. Paris: ISS; 2006. p. 65-82.   CB17/149

HEALTH EXPECTANCY / HEALTHY LIFE EXPECTANCY / DISABILITY-FREE LIFE EXPECTANCY / CALCULATION / TRENDS / SPAIN / 1987-2003

The authors use healthy life expectancy and disability-free life expectancy indicators to study the trends in the health status of the Spanish population from 1989 to 2003.

Jonker, J., De Laet, C., Franco, O., Peeters, A., Mackenbach, J., Nusselder, W. **Physical activity and life expectancy with and without diabetes: life table analysis of the Framingham Heart Study**. *Diabetes Care* 2006;29(1):38-43.   CB17/160
(http://care.diabetesjournals.org/cgi/reprint/29/1/38)

HEALTH EXPECTANCY / DISEASE-FREE LIFE EXPECTANCY / DIABETES-FREE LIFE EXPECTANCY / PHYSICAL ACTIVITY / DIABETES / ORIGINAL CALCULATION / MULTI-STATE LIFE TABLE METHOD / USA

OBJECTIVE: Physical activity is associated with a reduced risk of developing diabetes and with reduced mortality among diabetic patients. However, the effects of physical activity on the number of years lived with and without diabetes are unclear. Our aim is to calculate the differences in life expectancy with and without type 2 diabetes associated with different levels of physical activity.
RESEARCH DESIGN AND METHODS: Using data from the Framingham Heart Study, we constructed multistate life tables starting at age 50 years for men and women. Transition rates by level of physical activity were derived for three transitions: nondiabetic to death, nondiabetic to diabetes, and diabetes to death. We used hazard ratios associated with different physical activity levels after adjustment for age, sex, and potential confounders. RESULTS: For men and women with moderate physical activity, life expectancy without diabetes at age 50 years was 2.3 (95% CI 1.2-3.4) years longer than for subjects in the low physical activity group. For men and women with high physical activity, these differences were 4.2 (2.9-5.5) and 4.0 (2.8-5.1) years, respectively. Life expectancy with diabetes was 0.5 (-1.0 to 0.0) and 0.6 (-1.1 to -0.1) years less for moderately active men and women compared with their sedentary counterparts. For high activity, these differences were 0.1 (-0.7 to 0.5) and 0.2 (-0.8 to 0.3) years, respectively.
CONCLUSIONS: Moderately and highly active people have a longer total life expectancy and live more years free of diabetes than their sedentary counterparts but do not spend more years with diabetes.

Okuma, K. **[Estimates of active life expectancy based on the data of the public nursing-care insurance in Mie prefecture]**. *Nippon Koshu Eisei Zasshi - Japanese Journal of Public Health* 2006;53(6):437-447.   CB18/08
(http://www.ncbi.nlm.nih.gov/pubmed/16881532?ordinalpos=6&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum)

Pardo Silva, M., De Laet, C., Nusselder, W., Mamun, A., Peeters, A. **Adult obesity and number of

years lived with and without cardiovascular disease. *Obesity* 2006;14(7):1264-1273.   CB17/159
(http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=16899
808&ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum)

HEALTH EXPECTANCY / DISEASE-FREE LIFE EXPECTANCY / OBESITY / SMOKING /
DIABETES / EDUCATION / CARDIOVASCULAR DISEASE / ORIGINAL CALCULATION /
MULTI-STATE LIFE TABLE METHOD / USA

OBJECTIVE: To determine the differences in number of years lived free of cardiovascular disease (CVD)
and number of years lived with CVD between men and women who were obese, pre-obese, or normal
weight at 45 years of age.
RESEARCH METHODS AND PROCEDURES: We constructed multistate life tables for CVD,
myocardial infarction, and stroke, using data from 2551 enrollees (1130 men) in the Framingham Heart
Study who were 45 years of age.
RESULTS: Obesity and pre-obesity were associated with fewer number of years free of CVD, myocardial
infarction, and stroke and an increase in the number of years lived with these diseases. Forty-five-year-old
obese men with no CVD survived 6.0 years [95% confidence interval (CI), 4.1; 8.1] fewer than their
normal weight counterparts, whereas, for women, the difference between obese and normal weight
subjects was 8.4 years (95% CI: 6.2; 10.8). Obese men and women lived with CVD 2.7 (95% CI: 1.0; 4.4)
and 1.4 years (95% CI: -0.3; 3.2) longer, respectively, than normal weight individuals.
DISCUSSION: In addition to reducing life expectancy, obesity before middle age is associated with a
reduction in the number of years lived free of CVD and an increase in the number of years lived with
CVD. Such information is paramount for preventive and therapeutic decision-making by individuals and
practitioners alike

2005

Aijsanseppa, S., Notkola, I.-L., Tijhuis, M., Van Staveren, W., Kromhout, D., Nissinen, A. **Physical
functioning in elderly Europeans: 10 year changes in the north and south: the HALE project**.
Journal of   Epidemiology and Community Health 2005;59:413-419.   CB17/147
(http://jech.bmj.com/cgi/content/abstract/59/5/413)

DISABILITY / FUNCTIONING / TRENDS / ELDERLY / NORTHERN EUROPE / SOUTHERN
EUROPE

Objectives: To examine age related changes in physical functioning in elderly men and women.
Design: Prospective, population based study.
Setting: Population of 15 rural and urban centres in 10 European countries.
Participants: Altogether 3496 men and women born between 1900 and 1920 who participated in the
baseline survey of the HALE project in 1988–1991. The study population was examined again about five
(in 1993–1995) and 10 (in 1999–2001) years after the baseline examination.
Main outcome measures: Physical functioning was measured by means of a self administered
questionnaire of activities of daily living (ADL). Dichotomised prevalence of disability and need for help
in self care and mobility ADL were used as dependent variables in the analyses.
Results: Prevalence of disability and need for help tended to be higher in women than in men and in
mobility abilities than in self care activities. Disability and need for help increased with advancing age but
ameliorated over time from one birth cohort to another. In longitudinal analyses this beneficial time trend
was independent of the effect of age, study, and region in self care disability in men and women (OR
0.85, 95% CI 0.75 to 0.97 and OR 0.64, 95% CI 0.43 to 0.97, respectively) and self care need for help in
men (OR 0.83, 95% CI 0.70 to 0.96). Mobility disability among men and self care disability among

women decreased more in the south than in the north.

Conclusion: While European populations are aging, the proportions of elderly people with disability are decreasing. These results suggest that dynamics of functioning may differ across cultures. Future studies are needed to clarify which potentially modifiable and culturally determined factors protect against functional decline.

Franco, O. H., Peeters, A., Bonneux, L., de Laet, C. **Blood pressure in adulthood and life expectancy with cardiovascular disease in men and women: life course analysis**. *Hypertension* 2005;46(2):280-286.   CB17/164
(http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15983235)

HEALTH EXPECTANCY / DISEASE-FREE LIFE EXPECTANCY / BLOOD PRESSURE / CARDIOVASCULAR DISEASE / ORIGINAL CALCULATION / MULTI-STATE LIFE TABLE METHOD

Limited information exists about the consequences of hypertension during adulthood on residual life expectancy with cardiovascular disease. We aimed to analyze the life course of people with high blood pressure levels at age 50 in terms of total life expectancy and life expectancy with and without cardiovascular disease compared with normotensives. We constructed multistate life tables for cardiovascular disease, myocardial infarction, and stroke using data from 3128 participants of the Framingham Heart Study who had their 50th birthday while enrolled in the study. For the life table calculations, we used hazard ratios for 3 transitions (healthy to death, healthy to disease, and disease to death) by categories of blood pressure level and adjusted by age, sex, and confounders. Irrespective of sex, 50-year-old hypertensives compared with normotensives had a shorter life expectancy, a shorter life expectancy free of cardiovascular disease, myocardial infarction, and stroke, and a longer life expectancy lived with these diseases. Normotensive men (22% of men) survived 7.2 years (95% confidence interval, 5.6 to 9.0) longer without cardiovascular disease compared with hypertensives and spent 2.1 (0.9 to 3.4) fewer years of life with cardiovascular disease. Similar differences were observed in women. Compared with hypertensives, total life expectancy was 5.1 and 4.9 years longer for normotensive men and women, respectively. Increased blood pressure in adulthood is associated with large reductions in life expectancy and more years lived with cardiovascular disease. This effect is larger than estimated previously and affects both sexes similarly. Our findings underline the tremendous importance of preventing high blood pressure and its consequences in the population.

Kassai, B., Boissel, J. P., Cucherat, M., Boutitie, F., Gueyffier, F. **Treatment of high blood pressure and gain in event-free life expectancy**. *Vascular Health and Risk Management* 2005;1(2):163-9.
                                                                                                     CB18/06
(http://dovepress.com/articles.php?content_id=355)

DISEASE-FREE LIFE EXPECTANCY / CARDIOVASCULAR DISEASE

OBJECTIVE: Consideration of absolute risk has been recommended for making decisions concerning preventive treatment in hypertension. We performed simulations to estimate the benefit of antihypertensive therapy over a life-time.

METHODOLOGY: The rate of nonfatal and fatal events of untreated hypertensives in the US population were estimated using data from Individual Data ANalysis of Antihypertensive drug intervention trials (INDANA; a meta-analysis on individual data in hypertension) and specific cause of death from national statistics. Disease-free survival curves until all patients have died were built using the "life-table" method.

The treatment effect estimated from INDANA was applied to this curve to obtain the disease-free survival curve of the life-long treated population. Gains in event-free life expectancy (GLE) were estimated from survival curves. A sensitivity analysis was performed to assess the impact of possible death misclassifications.

RESULTS: For a 40-year-old man, the gain in life expectancy without stroke and major cardiovascular events were 27 and 32 months, respectively, and were more substantial than those without coronary disease (19 months). The GLE decreased slowly with increasing age at the beginning of treatment, whereas short-term absolute risk reductions increase sharply with age.

CONCLUSIONS: Policies based on the selection of patients to treat according to absolute benefit do not maximize the GLE compared with strategies that treat low-risk patients.

Kondo, N., Mizutani, T., Minai, J., Kazama, M., Imai, H., Takeda, Y., Yamagata, Z. **Factors explaining disability-free life expectancy in Japan: the proportion of older workers, self-reported health status, and the number of public health nurses**. *Journal of Epidemiology* 2005;15(6):219-227.   CB17/150 (http://www.jstage.jst.go.jp/article/jea/15/6/219/_pdf)

DISABILITY-FREE LIFE EXPECTANCY / PERCEIVED HEALTH / ORIGINAL CALCULATION / SULLIVAN METHOD / HEALTH INEQUALITY / JAPAN

BACKGROUND: Disability-free life expectancy (DFLE) data for 47 prefectures in Japan were reported in 1999; however, few studies have identified the factors associated with the length of the DFLE. The objective of this study was to elucidate the primary factors that explain differences in DFLEs in Japan.

METHODS: In our ecological study, 47 prefectures in Japan were used as units of analysis. The DFLEs for men and women at 65 years of age (DFLE65), calculated by Hashimoto et al using Sullivan's method, were set as dependent variables. From various national surveys, 181 factors associated with demographics, socioeconomic status, health status and health behaviors, medical environment, social relationships, climate, and other areas were gathered as independent variables. Pearson's or Spearman's correlation coefficients were calculated to screen independent variables potentially associated with the DFLE65s. Then, multivariate linear regression analyses were conducted for the selected 24 independent variables after adjusting for the proportion of older people (65 years or more) and population density.

RESULTS: Multivariate linear regression analyses revealed that the large number of public health nurses per 100,000 population, a good self-reported health status, and a high proportion of older workers were significantly associated with long DFLE65s for both genders.

CONCLUSIONS: These three factors could potentially explain the differences in DFLE of the older population in Japan.

Spiers, N. A., Matthews, R. J., Jagger, C., Matthews, F. E., Boult, C., Robinson, T. G., Brayne, C. **Diseases and impairments as risk factors for onset of disability in the older population in England and Wales: findings from the Medical Research Council Cognitive Function and Ageing Study**. *Journal of Gerontology: Medical Sciences* 2005;60(2):248-54.   CB17/155 (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15814870)

DISABILITY / ACTIVITIES OF DAILY LIVING (ADL) / DEPENDENCE / DISEASE / ELDERLY / ENGLAND / WALES / UNITED KINGDOM

BACKGROUND: This paper reports the association between self-reported diseases and impairments and 2-year onset of disability in a prospective study of people aged 65 years or older in five urban and rural centres in England and Wales (Medical Research Council Cognitive Function and Ageing Study;

MRC-CFAS).

METHODS: We initially reviewed risk factors for onset of disability in 35 prospective studies of functional decline in older people published in 1998-2001. In the present study, disability was defined as requiring help from another person at least several times a week and was assessed by dependency in activities of daily living. Polytomous and bivariate logistic regression models were fitted for onset of disability and mortality among those nondisabled at baseline (n=7913), adjusting for age, sex, and sociodemography.

RESULTS: Among prevalent conditions, arthritis (population-attributable risk 11.4%) and cognitive impairment indicated by a Mini-Mental State Examination score of <or=21 (population-attributable risk 6.8%) were powerful predictors of incident disability. Baseline cognitive impairment, stroke, treated diabetes, chronic airways obstruction, coronary heart disease, and treated hypertension were significantly associated with both incident disability and mortality, whereas Parkinson's disease, eyesight problems, and arthritis were statistically significant disabling conditions not associated with mortality. Stroke, heart attack, cognitive impairment, eyesight problems, and hearing problems were newly occurring conditions significantly associated with onset of disability.

CONCLUSIONS: Cognitive impairment, arthritis, followed by stroke, and problems with vision have major impact on population disability at older ages. Both prevalent and incident conditions must be considered as risk factors to accurately assess potential benefits from prevention.

Treurniet, H. F., Hoeymans, N., Gijsen, R., Poos, M. J. **[Health and disease in the Netherlands: the Dutch National Public Health Compass as a source of information]**. *Nederlands Tijdschrift voor Geneeskunde* 2005;149(5):226-31.   CB17/154 (http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=pubmed&dopt=AbstractPlus&list_uids=15 719832)

HEALTH EXPECTANCY
PUBLIC HEALTH
THE NETHERLANDS

--The Dutch National Public Health Compass has been available on the Internet (www.nationaalkompas.nl) since 2001. This website, developed and managed by the National Institute for Public Health and the Environment, contains data and information on the population's health status, its determinants, prevention and care. The Compass brings together information from various data sources, research and expert opinions. --On the basis of this Compass, an overview has been made of the health of the Dutch population. --Both the life expectancy and the healthy life expectancy in the Netherlands increased after 1980. --Mortality from coronary heart disease, cerebrovascular accidents and lung cancer decreased, but they are still the most important causes of death. --Especially psychological disorders (alcohol dependence, anxiety disorders and depression), coronary heart disease and COPD are associated with a significant decrease in quality of life. --There are important health differences in the Netherlands between rich and poor, urban and rural areas, natives and immigrants. --The difference in life expectancy between men and women will decrease from more than 5 years in 2000 to less than 4 years in 2020. --A permanent facility for the provision of accurate public-health information is of great importance. The collaboration of registration holders and experts in maintaining the Compass is and will remain essential so that an integral overview of the health of the Dutch population can also be made in the future.

2004

Konno, K., Katsumata, Y., Arai, A., Tamashiro, H. **Functional status and active life expectancy among senior citizens in a small town in Japan**. *Archives of Gerontology and Geriatrics* 2004;38(2):153-166.

ACTIVE LIFE EXPECTANCY (ALE) / DISABILITY / ACTIVITIES OF DAILY LIVING (ADL) /
INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADL) / ORIGINAL CALCULATION /
DOUBLE DECREMENT TABLES METHOD / JAPAN / 1998-2002

The objectives of this study were to understand transition patterns and mechanisms of functional status,
and to estimate active life expectancy (ALE) among senior citizens in a small town in Japan. With data
drawn from surveys conducted annually from 1998 to 2002 (n=638 at baseline), prevalence and incidence
of functional disability in activities of daily living (ADL) and instrumental activities of daily living
(IADL) were described and compared between the sexes. Then relationships between potential predictors
and functional decline through a 4-year follow-up were examined using logistic regression. Finally, active
and disabled life expectancy was estimated by Katz's method. At baseline, 9 and 12% of subjects were
dependent in performing ADL and IADL, respectively. Prevalence and incidence rates increased with
age. The risk of mortality increased by 2.2-5.0-fold when the subject was functionally dependent at the
previous year. Advanced age, difficulty in walking and poor interest were shown to be significant
predictors of loss of independence in ADL. Mean durations with disability in ADL and IADL among
women were longer than among men by around 1 year. Population-specific preventive care programs
considering physical, cognitive and social aspects are needed not only to maximize ALE but also to
improve quality of life during survival period with disability especially in old women.

Mamun, A., Peeters, A., Barendregt, J., Willekens, F., Nusselder, W., Bonneux, L. **Smoking decreases
the duration of life lived with and without cardiovascular disease: a life course analysis of the
Framingham Heart Study**. *European Heart Journal* 2004;25(5):409-415.   CB17/162

HEALTH EXPECTANCY / DISEASE-FREE LIFE EXPECTANCY / CALCULATION /
CARDIOVASCULAR DISEASE / SMOKING / ORIGINAL CALCULATION / MULTI-STATE LIFE
TABLE METHOD / USA

AIMS: To compare the burden of cardiovascular disease in terms of lifetime risk and life years lived with
disease between smokers and non-smokers.
METHODS AND RESULTS: We constructed multi-state life tables describing transitions through
various cardiovascular diseases for 4723 smokers and non-smokers observed during 20 biannual
observations in the Original Framingham Heart Study. Non-smokers live 8.66 (95% CI 7.61-9.63) (men)
and 7.59 (95% CI 6.33-8.92) (women) years longer than smokers and more years free of cardiovascular
disease: 6.22 (95% CI 5.09-7.30) years for males and 4.93 (95% CI 3.54-6.29) for females. But
non-smokers spend more years with cardiovascular disease over the life course: 2.43 (95% CI 1.72-3.16)
years for males and 2.66 (95% CI 1.87-3.38) years for females. The risk of cardiovascular disease before
age 70 is higher among smokers, but over the entire lifecourse male non-smokers have higher risks of
coronary heart disease, myocardial infarction, stroke and congestive heart failure, and female
non-smokers have higher risks of coronary heart disease and congestive heart failure.
CONCLUSION: Smoking, by shortening life, decreases both the probability and duration of
cardiovascular disease throughout the life course. Non-smokers live many years longer and longer free of
cardiovascular disease than smokers, but at the end of their life non-smokers will have lived longer with
cardiovascular disease.

Ostbye, T., Taylor, D. H. **The effect of smoking on years of healthy life (YHL) lost among**

middle-aged and older Americans. *Health Services Research* 2004;39(3):531-52.   CB18/07
(http://www.ncbi.nlm.nih.gov/pubmed/15149477)

HEALTHY YEARS OF LIFE LOST / SMOKING / USA

OBJECTIVE: To estimate the effects of smoking on quality of life over time, using the Years of Healthy Life (YHL) construct.
DATA SOURCES/STUDY SETTING: The Health and Retirement Study (HRS) survey (N=12,652) of persons 50 to 60 years old and the Asset and Health Dynamics Among the Oldest Old (AHEAD) survey (N=8,124) of persons > or =70 years old, plus spouses regardless of age, followed from 1992/1993 to 2000.
STUDY DESIGN: Years of healthy life from baseline to death were estimated. Regression models were developed with smoking as the main explanatory variable and with both YHL and years of life remaining as the outcome variables.
PRINCIPAL FINDINGS: Smoking was strongly and consistently related to YHL lost. In HRS, individuals who had quit smoking at least 15 years prior to baseline had a similar number of YHL left as never smokers.
CONCLUSIONS: Efforts to encourage smoking cessation should emphasize the impact of these factors on quality of life.

Peeters, A., Bonneux, L., Nusselder, W., De Laet, C., Barendregt, J. **Adult obesity and the burden of disability throughout life**. *Obesity Research* 2004;12(7):1145-1151.   CB17/161
(http://www.obesityresearch.org/cgi/reprint/12/7/1145)

HEALTH EXPECTANCY / DISABILITY-FREE LIFE EXPECTANCY / FUNCTIONAL LIMITATION / ACTIVITIES OF DAILY LIVING (ADL) / OBESITY / ORIGINAL CALCULATION / SULLIVAN METHOD / USA

OBJECTIVE: To analyze the prevalence of disability throughout life and life expectancy free of disability associated with obesity at ages 30 to 49 years.
RESEARCH METHODS AND PROCEDURES: We used 46 and 20 years of mortality follow-up, respectively, for 3521 Original and 3013 Offspring Framingham Heart Study participants 30 to 49 years and classified as normal weight, overweight, or obese at baseline. Disability measures were available between 36 and 46 years of follow-up for 1352 Original participants and at 20 years of follow-up for 2268 Offspring participants. We measured the odds of disability in the Original cohort after 46 years follow-up, and we estimated life expectancy with and without disability from age 50. Two disability measures were used, one representing limitations with mobility only and the second representing limitations with activities of daily living (ADL).
RESULTS: Obesity at ages 30 to 49 years was associated with a 2.01-fold increase in the odds of ADL limitations 46 years later. Nonsmoking adults who were obese between 30 and 49 years lived 5.70 (95% confidence interval, 4.11 to 7.35) (men) and 5.02 (95% confidence interval, 3.36 to 6.61) (women) fewer years free of ADL limitations from age 50 than their normal-weight counterparts. There was no significant difference in the total number of years lived with disability throughout life between those obese or normal weight, due to both higher disability prevalence and higher mortality in the obese population. DISCUSSION: Obesity in adulthood is associated with an increased risk of disability throughout life and a reduction in the length of time spent free of disability, but no substantial change in the length of time spent with disability. (Copyright 2004 NAASO)

Takeda, S., Tamura, K. **[Evaluation of indices indicating elderly long-term care need in**

municipalities]. *Nippon Koshu Eisei Zasshi - Japanese Journal of Public Health* 2004;51(5):335-46.

HEALTHY LIFE EXPECTANCY / LONG-TERM CARE / ELDERLY / JAPAN / 2000-2002

OBJECTIVE: To establish a way to evaluate preventive care programs using indices that indicate the status of long-term care need for elderly in municipalities.
METHOD: Based on the number of people certified as subject to long-term care need and the number of deaths in Taihaku Ward in Sendai City, 3 indices in 14 junior high school districts in the ward were derived; Healthy Life Expectancy for 65 year old men and women (the period in which certification for long-term care need is not made), Hours of Care Need (age-adjusted standard hours for care need) and the Odds Ratio (age-adjusted relative risk) for the elderly aged 65 years or older. Yearly comparisons of the indices were made for 2000 vs 2001, 2001 vs 2002 and 2000 vs 2002. The relationships between the three indices were further analyzed for 2000, 2001 and 2002. Care Compensation by district (age-adjusted care compensation by district was derived for 2001) and its relationships to Healthy Life Expectancy, Hours of Care Need and the Odds Ratio were analyzed by school district for 2001.
RESULTS: 1) The Hours of Care Need by district significantly correlated with the Odds Ratios by district for 2000, 2001 and 2002. Both the Hours of Care Need and the Odds Ratio by district also significantly correlated between 2000 and 2001, between 2001 and 2002 and between 2000 and 2002. Healthy Life Expectancy did not show a significant correlation between 2000 and 2001, between 2001 and 2002 and between 2000 and 2002, for men and women. 2) The 2001 Care Compensation by district was obviously proportional to both Hours of Care Need by district and the Odds Ratio by district but did not correlate with Healthy Life Expectancy by district for men and women. 3) Using the co-relationship of the Hours of Care Need between the years, the percentage of applications for certification for care need by people needing care was estimated at 65% for 2000, 87.5% for 2001 and 101% for 2002. This implies that in 2002 almost all the people who needed care applied for the certification. The 2001 Odds Ratio by district was significantly low in district D and significantly high in district H.
CONCLUSIONS: Hours of Care Need correlate well with the Odds Ratio and also with Care Compensation which represents long-term care insurance service expenses. The results clearly indicate that the 3 indices represent the status of care need of the elderly in these districts, even with conservative estimates, after 2002. It is suggested that Hours of Care Need and the Odds Ratio are appropriate as indices to evaluate preventive care programs in municipalities.

2003

Iburg, K.M., Kamper-Jorgensen, F. **Nyere mål for en nations sundhedstilstand – en oversigt / [More recent measures for a nation's state of health--a review]**. *Ugeskrift for Laeger*

HEALTH EXPECTANCY / HEALTH INDICATOR

The objective of this article was to give a conceptual survey of old and new measures for a nation's state of health with special focus on new measures seeking to combine mortality with morbidity, functional, and quality of life dimensions. Internationally, the development has given rise to two different movements. One (represented by Denmark and the rest of the EU) aims to develop a large number of standardized indicators, whereas the other (represented by the WHO and the World Bank) builds on the idea that it must be possible to combine the many indicators into a single summary measure for a nation's

state of health. In the summary measures, distinction is made between health expectancy and health gap measures. Attention is given to reviewing DALY (disability-adjusted life years), disability weighting, and the social value choices applied in WHO's World Health Report 2000.

Kassai, B., Gueyffier, F., Boissel, J. P., Boutitie, F., Cucherat, M. **Absolute benefit, number needed to treat and gain in life expectancy: which efficacy indices for measuring the treatment benefit?** *Journal of Clinical Epidemiology* 2003;56(10):977-982. CB18/10
(http://www.jclinepi.com/article/S0895-4356(03)00159-8/abstract?issue_key=S0895-4356%2800%29X0196-5&issue_preview=no&search_preview=no&select2=no&select2=no&start=&startPage=)

DISEASE-FREE LIFE EXPECTANCY / CARDIOVASCULAR DISEASE

The absolute benefit (AB) is extensively used to summarize the results of clinical trials. As the AB depends directly on the patient's baseline risk, therapeutic decisions based on AB tend to favor patients at high risk. To evaluate the consequences of this decision's procedure for life-long therapy, we compare the AB with the gain in event-free life expectancy in a simulated hypertensive population. Our results show that the AB goes through a maximum and then declines as the duration of treatment increases. The amplitude of the variation of AB is independent of the baseline risks but the maximum is reached more quickly in the high-risk patients. Considering the gain in event-free life expectancy, low-risk patients benefit more than high-risk patients do, at the expense of a longer treatment exposure. The interpretation of the AB changes depending on follow-up.

Law, C. K., Yip, P. S. F. **Healthy life expectancy in Hong Kong Special Administrative Region of China**. *Bulletin of the World Health Organization* 2003;81(1):43-47. CB18/11
(http://www.who.int/bulletin/Law0103.pdf)

HEALTH-ADJUSTED LIFE EXPECTANCY (HALE) / CALCULATION METHOD / HONG KONG / CHINA

Sullivan's method and a regression model were used to calculate healthy life expectancy (HALE) for men and women in Hong Kong Special Administrative Region (Hong Kong SAR) of China. These methods need estimates of the prevalence and information on disability distributions of 109 diseases and HALE for 191 countries by age, sex and region of the world from the WHO's health assessment of 2000. The population of Hong Kong SAR has one of the highest healthy life expectancies in the world. Sullivan's method gives higher estimates than the classic linear regression method. Although Sullivan's method accurately calculates the influence of disease prevalence within small areas and regions, the regression method can approximate HALE for all economies for which information on life expectancy is available. This paper identifies some problems of the two methods and discusses the accuracy of estimates of HALE that rely on data from the WHO assessment.

Manuel, D. G., Leung, M., Nguyen, K., Tanuseputro, P., Johansen, H., Canadian Cardiovascular Outcomes Research Team. **Burden of cardiovascular disease in Canada**. *Canadian Journal of Cardiology* 2003;19(9):997-1004. CB18/12
(http://www.pulsus.com/journals/abstract.jsp?sCurrPg=journal&jnlKy=1&atlKy=3813&isuKy=104&spage=1&isArt=t)

BACKGROUND: This report updates the death estimates for cardiovascular disease (CVD) in Canada and introduces a population-based perspective on disease prevalence and health-related quality of life

(HRQOL) burden.

METHODS: The Canadian Mortality Database was used to estimate the mortality of men and women in different age groups for the 139 Canadian health regions from 1950 to 1999. Heart disease prevalence and its impact on HRQOL were estimated using the 2000-2001 Canadian Community Health Survey (CCHS). Life table techniques were used to estimate the impact of heart disease on life and health expectancy.
RESULTS: Although CVD remains the leading cause of death in Canada, between 1950 and 1999 the death rates from CVD dropped from 702 per 100,000 to 288 per 100,000 men, and from 562 per 100,000 to 175 per 100,000 women. Results from the CCHS indicated that 5.4% of men and 4.6% of women reported having heart disease as diagnosed by a medical professional. Of these individuals, 14% of men and 21% of women reported difficulty ambulating - about six times more than people without heart disease. In total, 4.5 years of life expectancy and 2.8 years of health expectancy were lost due to CVD. The study also found large differences in the burden of CVD among men and women and across the 139 Canadian health regions.
CONCLUSIONS: CVD is a major disease burden in terms of both mortality and HRQOL and is an important source of health inequalities between populations in Canada. Any attempt to improve the health of Canadians or to reduce health inequalities should include interventions to reduce CVD mortality and morbidity. Given the present impact of CVD on HRQOL, reducing or eliminating heart disease may potentially result in an increase in life expectancy that will be larger than the gains in health expectancy.

Manuel, D. G., Luo, W., Ugnat, A. M., Mao, Y. **Cause-deleted health-adjusted life expectancy of Canadians with selected chronic conditions**. *Chronic Diseases in Canada* 2003;24(4):108-115.

CB18/12

(http://www.phac-aspc.gc.ca/publicat/cdic-mcc/pdf/cdic244e.pdf)

HEALTH-ADJUSTED LIFE EXPECTANCY (HALE) / HEALTH EXPECTANCY / LIFE EXPECTANCY / QUALITY OF LIFE / MORTALITY / MORBIDITY / ORIGINAL CALCULATION / CANADA

Health-adjusted life expectancy (HALE) is life expectancy weighted or adjusted for the level of health-related quality of life (HRQOL). Cause-deleted probabilities of dying were derived using the cause-eliminated life table technique and death data from vital statistics for Canada in 1998/99. Life expectancy for men and women in Canada was 76.0 and 81.5 years respectively; HALE was 67.9 years for men and 71.1 years for women. Cancer represented the greatest burden of disease in the population, and eliminating it would increase men's life expectancy to 79.6 years and women's to 85.1 years. HALE would rise to 70.7 years for men and 73.6 for women. The gain in life expectancy would be very small if osteoarthritis were eliminated, but there would be an overall gain in HALE of approximately 1.0 years for men and 2.5 years for women. HALE estimated for chronic conditions using a utility-based measure of HRQOL from population health surveys should be regarded as a valuable component of population health surveillance.

Mathers, C. D., Salamon, J. A., Murray, C. J. L. **Infant mortality is not an adequate summary measure of population health**. *Journal of Epidemiology and Community Health* 2003;57:319.   CB18/17
(http://jech.bmj.com/cgi/content/extract/57/5/319)

DISABILITY-ADJUSTED LIFE EXPECTANCY (DALE) / HEALTH INDICATOR

Commentary on the paper by Reidpath on infant mortality rate proposed as a good proxy of disability-adjusted life expectancy when comparing the health status of different populations.

DISABILITY-ADJUSTED LIFE EXPECTANCY (DALE) / HEALTH INDICATOR / MORTALITY / MORBIDITY

OBJECTIVE: To assess whether and how the rankings of the world's health systems based on disability adjusted life expectancy as done in the 2000 World Health Report change when using the narrower concept of mortality amenable to health care, an outcome more closely linked to health system performance.
DESIGN: Analysis of mortality amenable to health care (including and excluding ischemic heart disease).
MAIN OUTCOME MEASURE: Age standardised mortality from causes amenable to health care
SETTING: 19 countries belonging to the Organisation for Economic Cooperation and Development.
RESULTS: Rankings based on mortality amenable to health care (excluding ischemic heart disease) differed substantially from rankings of health attainment given in the 2000 World Health Report. No country retained the same position. Rankings for southern European countries and Japan, which had performed well in the report, fell sharply, whereas those of the Nordic countries improved. Some middle ranking countries (United Kingdom, Netherlands) also fell considerably; New Zealand improved its position. Rankings changed when ischemic heart disease was included as amenable to health care.
CONCLUSION: The 2000 World Health Report has been cited widely to support claims for the merits of otherwise different health systems. High levels of health attainment in well performing countries may be a consequence of good fortune in geography, and thus dietary habits, and success in the health effects of policies in other sectors. When assessed in terms of achievements that are more explicitly linked to health care, their performance may not be as good.

DISABILITY-ADJUSTED LIFE EXPECTANCY (DALE) / HEALTH INDICATOR

BACKGROUND: The infant mortality rate (IMR) has been criticised as a measure of population health because it is narrowly based and likely to focus the attention of health policy on a small part of the population to the exclusion of the rest. More comprehensive measures such as disability adjusted life expectancy (DALE) have come into favour as alternatives. These more comprehensive measures of population health, however, are more complex, and for resource poor countries, this added burden could mean diverting funds from much needed programmes. Unfortunately, the conjecture, that DALE is a better measure of population health than IMR, has not been empirically tested.
METHODS: IMR and DALE data for 1997 were obtained from the World Bank and the World Health Organization, respectively, for 180 countries.
FINDINGS: There is a strong (generally) linear association between DALE and IMR (r=0.91). Countries with low DALE tend to have a high IMR. The countries with the lowest IMRs had DALEs above that predicted by the regression line.
INTERPRETATION: There is little evidence that the use of IMR as a measure of population health has a negative impact on older groups in the population. IMR remains an important indicator of health for whole populations, reflecting the intuition that structural factors affecting the health of entire populations have an impact on the mortality rate of infants. For countries with limited resources that require an easily calculated, pithy measure of population health, IMR may remain a suitable choice.

Reidpath, D. D., Allotey, P. A., Kouame, A., Cummins, R. A. **Measuring health in a vacuum: examining the disability weight of the DALY**. *Health Policy and Planning* 2003;18(4):351-6. CB18/18 (http://heapol.oxfordjournals.org/cgi/reprint/18/4/351)

DISABILITY-ADJUSTED LIFE YEARS (DALYs) / HEALTH INDICATOR

The Disability Adjusted Life Year (DALY) is a widely used summary measure of population health combining years of life lost due to mortality and years of healthy life lost due to disability. A feature of the DALY is that, in the assessment of morbidity, each health condition is associated with a disability weight. The disability weight lies on a scale between 0 (indicating the health condition is equivalent to full health) and 1 (indicating the health condition is equivalent to death). The disability weight associated with each health condition is currently fixed across all social, cultural and environmental contexts. Thus blindness in the United Kingdom has the same disability weight as blindness in Niger in spite of structural interventions in the UK that make the disability less severe than in Niger. Although the fixed disability weight is defended on grounds that it supports a strongly egalitarian flavour in the DALY, we argue that the lack of consideration of realistic contexts results in a measure that will underestimate the burden associated with morbidity in disadvantaged populations and overestimate the burden in advantaged populations. There is, consequently, a loss of information on possible non-clinical points of intervention. Disaggregated estimates of the burden of disease such as those in the World Health Report 2000 should be interpreted with caution.

Robine, J.-M. **The relevance of population health indicators**. *Journal of Epidemiology and Community Health* 2003;57:318.   CB18/16 (http://jech.bmj.com/cgi/content/extract/57/5/318)

DISABILITY-ADJUSTED LIFE EXPECTANCY (DALE) / LIFE EXPECTANCY / MORTALITY / HEALTH INDICATOR

Commentary on the paper by Reidpath on infant mortality rate proposed as a good proxy of disability-adjusted life expectancy when comparing the health status of different populations.