Health Indicators for Japan

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Second Mexico-Japan Meeting on Health Ageing

June 20-21, Mexico City, Mexico

MHLW's Life Expectancy and Active Life Expectancy: 2010 and 2001

	Males		Females	
Year	2001	2010	2001	2010
Life Expectancy	78.1	79.6	84.9	86.3
Active Life Expectancy	69.4	70.4	72.6	73.6
% Active	88.9	88.5	85.5	88.9

Life Expectancy and Healthy Life Expectancy: 1990 and 2010, Japan

	Males		Females	
Year	1990	2010	1990	2010
Life Expectancy	76.0	79.3	82.0	85.9
Active Life Expectancy	66.6	68.8	70.0	71.7
% Active	87.6	86.8	85.4	83.5

Source: Salomon et al., 2012, *Lancet*

Comparison of Estimated Health Expectancy for Japan

Publication	Year Published	Names of Summary Measures	Estimated Year	Estimated Value	
				M	F
World Health Report	2000	Disability-adjusted life expectancy	1999	71.9	77.2
World Health Report	2001	Healthy life expectancy	2000	71.2	76.3
World Health Statistics	2009	Healthy life expectancy	2007	73.0	78.0
Lancet	2012	Healthy life expectancy	1990	66.6	70.0
			2010	68.8	71.7

LE, DFLE and DLE

Table 5. Estimates of Life, Disability, and Disability-Free Life Expectancy Estimates for Men and Women Across Several Covariate Scenarios and Select Ages

		Men			Women		
Scenarios	Age	Years without disability	Years with disability	Total life expectancy	Years without disability	Years with disability	Total life expectancy
Medium level	65	16.76	1.69	18.45	19.20	3.20	22.40
Top level	65	24.28	1.45	25.73	29.89	3.01	32.89
Bottom level	65	11.46	1.80	13.26	12.99	3.29	16.29

Factors considered in the study are: age, sex education (high/low) occupation (while/others), income (high/low), life threatening diseases (yes/no), debilitating diseases (yes/no)

Source: Chan, Zimmer and Saito, 2010, *Journal of Aging and Health*

Outline of talk

- Concept of health expectancy and health
- Measures of health expectancy
- Methods of computing health expectancy
- Discussion

Health Expectancy: Definition

Life Expectancy = Healthy Life Expectancy
+ Unhealthy Life Expectancy
(Health Expectancy)

86 Years of Life = 82 Years of Healthy Years
+ 4 Years of Unhealthy Years

4 years of unhealthy years do not mean the last 4 consecutive years of life.

The World Health Report 1997

Conquering suffering
Enriching humanity

Report of the Director-General

World Health Organization
Geneva
1997

Message from the Director-General

Increased longevity without quality of life is an empty prize. Health expectancy is more important than life expectancy.

In today's rapidly changing world, some traditional attitudes towards human health, suffering and disability need to be urgently reviewed.

For example, infectious diseases can no longer be regarded as restricted to developing countries. This is clear from the evidence of their international resurgence and the intercontinental spread of AIDS. Nor can chronic noncommunicable diseases continue to be judged only as problems of the richer nations. They are emerging at an alarming rate in poorer regions, unwelcome additions to the infections which still flourish there.

Until now, the term for this phenomenon – the "double burden" of disease – has usually been applied only to developing countries. But it can no longer be confined to these countries alone; it has expanded into a double threat to global health. In the battle for health in the 21st century, infectious diseases and chronic diseases are twin enemies that have to be fought simultaneously on a global scale.

We dare not turn our back on infectious diseases, for they will return with a vengeance if we do. The lessons of AIDS, tuberculosis, malaria, cholera and *Escherichia coli* food-poisoning outbreaks must not be forgotten. In addition to the many millions of people a year who are killed by infectious diseases, hundreds of millions of others are afflicted by them. This was the theme of *The World Health Report 1996*.

But neither can we ignore the growing burden in suffering and disability represented by noncommunicable diseases and conditions – cancer, circulatory disease, metabolic and hormonal imbalances, mental disorders, musculoskeletal conditions – most of which are chronic; they invariably afflict the sufferer with pain and disability, for years and even decades. This, too, is the plight of hundreds of millions. Confronting these chronic conditions, and the crisis of suffering that goes with them, is the theme of *The World Health Report 1997*.

Health is being increasingly affected by a number of factors over which the individual has little control, and over which the conventional health sector also has little sway: social and economic circumstances, labour-saving technologies, and the information and communication revolutions. People in poorer countries are now acquiring many of the unhealthy lifestyles and behaviours of the industrialized world: sedentary occupations, inadequate physical activity, unsatisfactory diets, tobacco, alcohol and drugs. Populations in richer countries continue to live with all these risks. Problems are aggravated by the international spread of misleading information about consumer products. All these factors together will lead to a global increase in premature ill-health from chronic diseases.

Worldwide, life expectancy has increased dramatically during the last decades of the 20th century. But in celebrating our extra years, we must recognize that increased longevity without quality of life is an empty prize, i.e. *health* expectancy is more important than *life* expectancy.

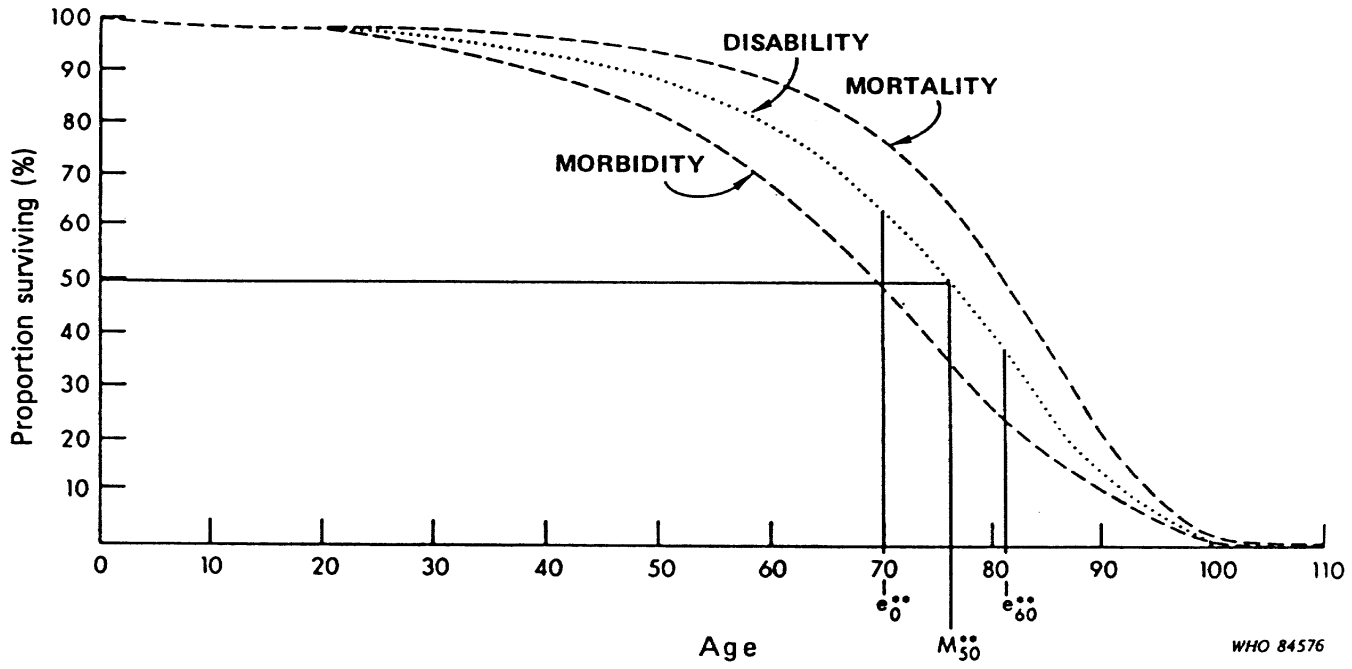
Unlike many infectious diseases, the majority of chronic diseases are preventable but cannot as yet be cured. The emphasis must therefore be on preventing their onset, delaying their develop-

Message

Increased longevity without quality of life is an empty prize. Health expectancy is more important than life expectancy.

Health Expectancy

Figure 1: **General model of health transitions [WHO, 1984]:** The observed mortality and hypothetical morbidity and disability survival curves for females in the United States of America in 1980.



e_0^{**} and e_{60}^{**} are the number of years of autonomous life expected at birth and at age 60, respectively.
M_{50}^{**} is the age to which 50% of females could expect to survive without loss of autonomy.

Health Expectancy

can be considered as

A family of
summary measures of
population health

What are summary measures of population health?

measures that combine information on mortality and morbidity to indicate the health of a particular population

Two Families of Summary Measures

1 Health Expectancy (Healthy Life Years)

- REVES (Réseau Espérance de Vie en Santé)
- Theories of Predicting Future Population Health

*Quality Adjusted Life Years (QALYs)

2 Health Gap (Healthy Life Expectancy)

- Disability-Adjusted Life Years (DALYs)
- The Global Burden of Disease Project

Healthy Life Years

Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis

Carol Jagger, Clare Gillies, Francesco Moscone, Emmanuelle Cambois, Herman Van Oyen, Wilma Nusselder, Jean-Marie Robine, and the EHLEIS team

Lancet 2008; 372: 2124–31

Published Online November 17, 2008

DOI:10.1016/S0140-6736(08)61594-9

See Editorial page 2088

Summary

Background Although life expectancy in the European Union (EU) is increasing, whether most of these extra years are spent in good health is unclear. This information would be crucial to both contain health-care costs and increase labour-force participation for older people. We investigated inequalities in life expectancies and healthy life years (HLYs) at 50 years of age for the 25 countries in the EU in 2005 and the potential for increasing the proportion of older people in the labour force.

Healthy Life Expectancy

Healthy life expectancy for 187 countries, 1990–2010: a systematic analysis for the Global Burden Disease Study 2010

Joshua A Salomon, Haidong Wang, Michael K Freeman, Theo Vos, Abraham D Flaxman, Alan D Lopez, Christopher J L Murray*

Lancet 2012; 380: 2144–62

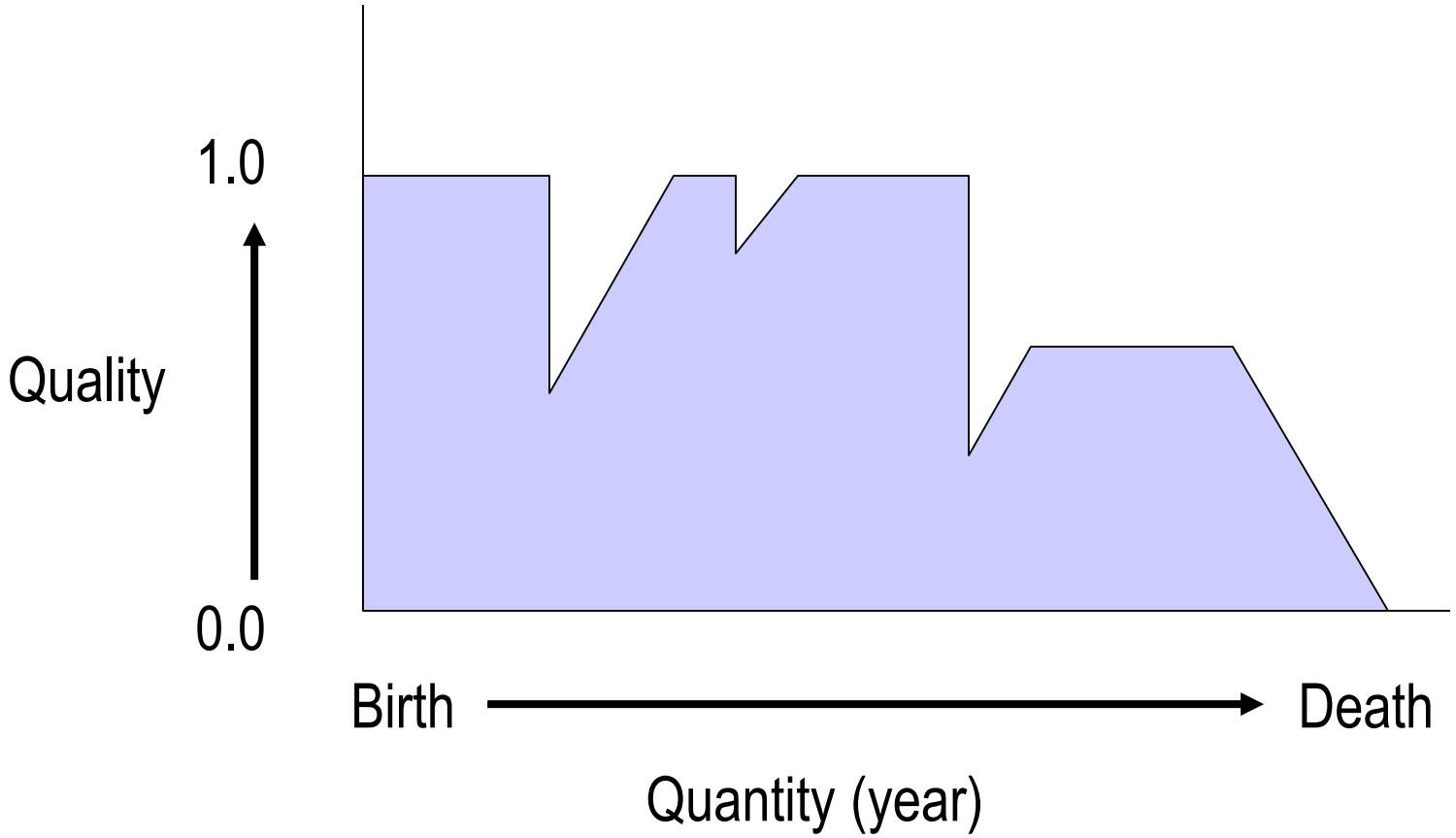
See Comment pages 2053, 2054, 2055, 2058, 2060, 2062, and 2063

See Special Report page 2067

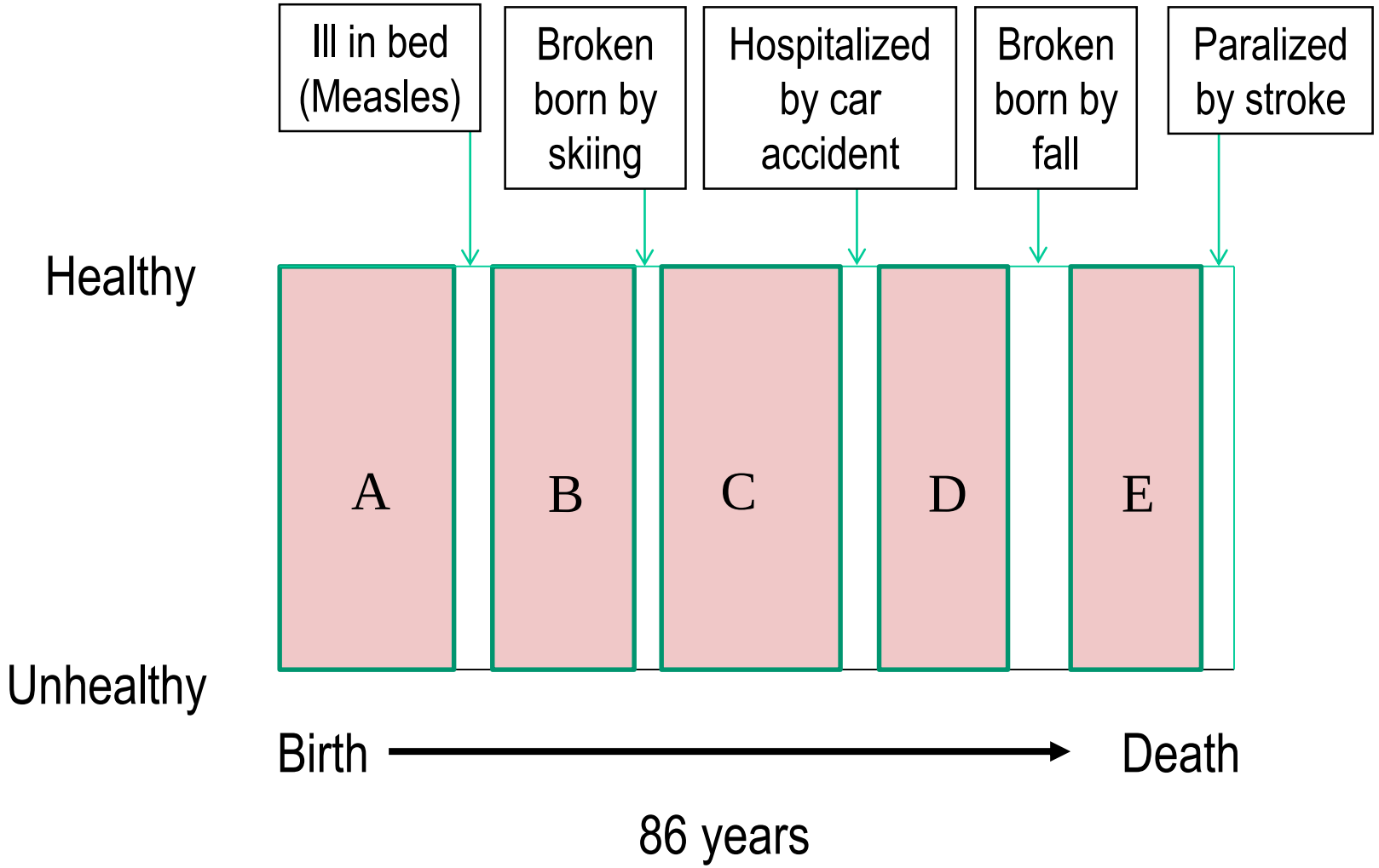
Summary

Background Healthy life expectancy (HALE) summarises mortality and non-fatal outcomes in a single measure of average population health. It has been used to compare health between countries, or to measure changes over time. These comparisons can inform policy questions that depend on how morbidity changes as mortality decreases. We characterise current HALE and changes over the past two decades in 187 countries.

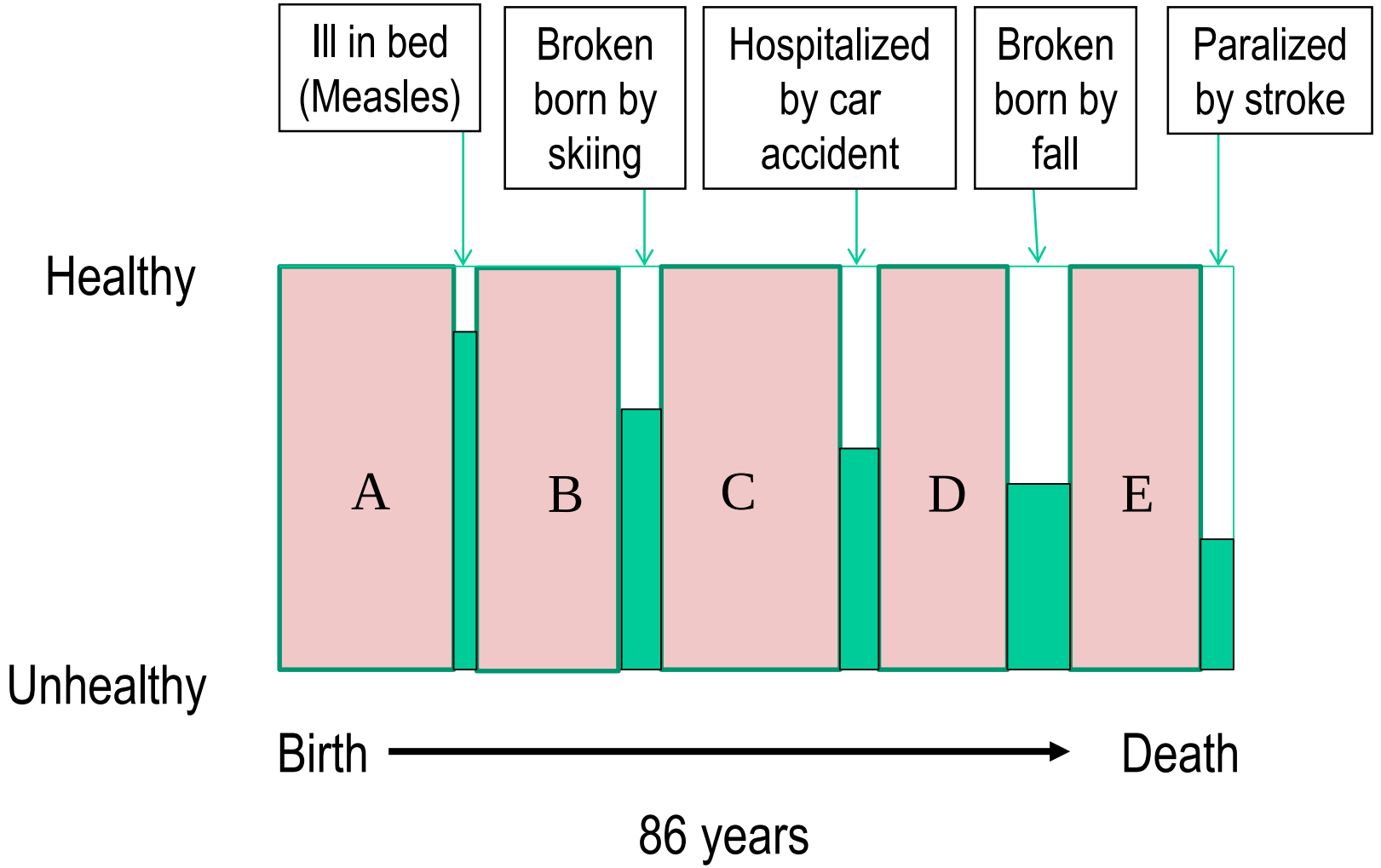
Quality Adjusted Life Years



Life Expectancy: 86 years
Health Expectancy: A+B+C+D+E



Healthy Life Expectancy / Weighted Health Expectancy:
A+B+C+D+E+green area



Pioneers of Health Expectancy Research

- Sanders, B. (1964): "Measuring Community Health Level," American Journal of Public Health, 54:1063-1970
- Sullivan, D.F. (1966): Conceptual Problems in Developing an Index of Health. Vital and Health Statistics, Series 2 (17), Washington, DC: National Center for Health Statistics.
- Sullivan, D.F. (1971) "A Single Index of Mortality and Morbidity," HSMHA Health Reports, 86, pp. 347-354.

Able to Answer the Question:

Are we living longer healthy lives
as well as longer lives?

What is the evidence
to answer to this question?

Longer HE and Higher % of HE

Definition of Health

- WHO: Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

- Many measures of health expectancy

Health Related Classifications

- ICD: International Classification of Disease
  - 10th edition
- ICIDH: International Classification of Impairments, Disabilities, and Handicaps
  - Second edition of ICIDH was endorsed at the 54th World Health Assembly with the title International Classification of Functioning, Disability and Health (in short ICF) in May 2001

ICF

- The ICF puts the notions of ‘health’ and ‘disability’ in a new light. It acknowledges that every human being can experience a decrement in health and thereby experience some degree of disability. Disability is not something that only happens to a minority of humanity. The ICF thus ‘mainstreams’ the experience of disability and recognizes it as a universal human experience. By shifting the focus from cause to impact it places all health conditions on an equal footing allowing them to be compared using a common metric – the ruler of health and disability. Furthermore ICF takes into account the social aspects of disability and does not see disability only as a 'medical' or 'biological' dysfunction. By including Contextual Factors, in which environmental factors are listed ICF allows to records the impact of the environment on the person's functioning.

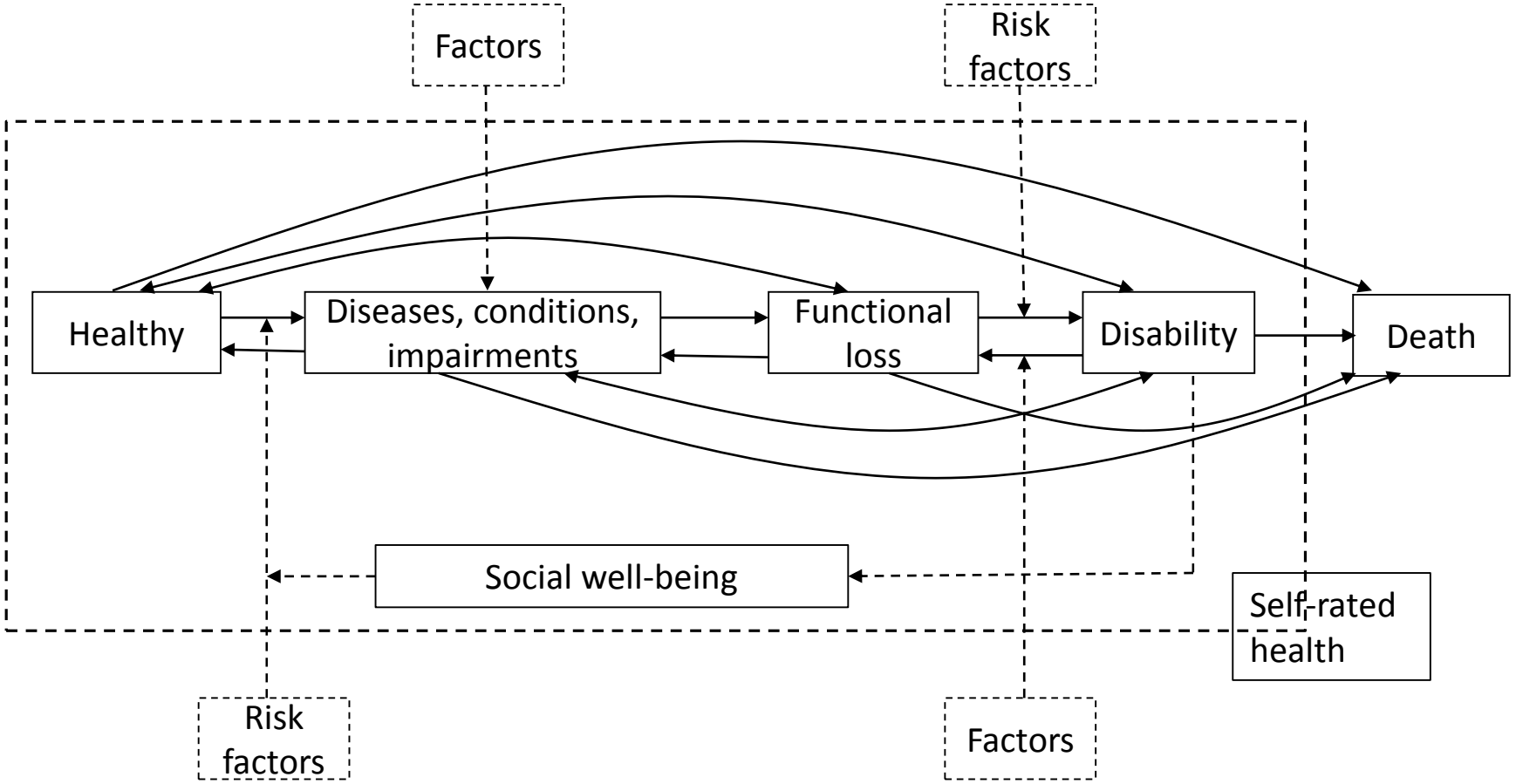
Components of ICF

- Body Functions: Mental, Sensory etc.
- Body Structure: Nervous System etc.
- Activities and Participation:
  - General Tasks and Demand (ADL, IADL)
  - Major Life Areas (economic life, religion and spirituality, community, social and civic life)
- Environmental Factors:
  - Products and technologies

5 Dimensions of Physical/Mental Health

- Healthy
- Diseases, Conditions, and Impairments:
  - stroke, dementia, depression, pain, amputated leg
- Functioning loss:
  - walking, hearing, vision
- Disability:
  - ability to perform personal activities, independent living, work
- Death

Health States and Health Transitions



Measures of Health Expectancy

- disease prevalence
- bed-disability
- self-rated health
- Activity of Daily Living (ADL)
- Instrumental Activity of Daily Living (IADL)
- limitation of activities (disability)
- Global Activity Limitation Index (GALI)
- Washington Group's Disability Questions

Self-Rated Health

- self reported subjective measure
- age range: 20+ ?
- Question wording: "Would you say your health in general is"
- "excellent, very good, good, fair or poor" (English speaking countries and Nordic European countries)
- "very good, good, fair, bad or very bad" (EU following WHO recommendation

ADLs and IADLs

- self reported but little more objective
- age range: 50+ ?
- Activities of Daily Living
  - bathing, eating, dressing, walking, toileting
- Instrumental Activities of Daily Living
  - using telephone, managing money, shopping
- response categories: yes/no, some/lot/unable
- Wording: do you have difficulty, can you do, do you need help (vary by culture: eating)

Limitation of Activities

- self reported measure
- age range: ?
- activities can vary by age
  - playing, go to school, work, taking care of oneself
- question used to compute HE in the US and Japan

Global Activity Limitation Index (GALI)

- self reported measure
- based on ICF and measures participation
- age range: 15+ ? (working for younger ages)
- Wording: "For the past 6 months at least, to what extent have you been limited because of a health problem in activities people usually do?"
- Response categories: "not limited" "limited but not severely" "severely limited"

EUROPEAN JOURNAL OF PUBLIC HEALTH 2003; 13 (3 SUPPLEMENT): 6–14

Creating a coherent set of indicators to monitor health across Europe

The Euro-REVES 2 project

JEAN-MARIE ROBINE, CAROL JAGGER AND THE EURO-REVES GROUP *

Washington Group's Disability Questions

- self reported measure
- based on ICF and measures functioning
- age range: 5+ ? (working on younger ages)
- short set: 6 questions for census
  - seeing, hearing, walking, cognition, self-care, communication
- long set: for health interview survey, etc.

Washington Group's -- continued

- Wording: "The next question ask about difficulties you may have doing certain activities because of a health problem." "Do you have difficulty seeing even if wearing glasses?"
- Response categories:
  - "no difficulty"
  - "some difficulty"
  - "a lot of difficulty"
  - "cannot do it at all"

Madans *et al. BMC Public Health* 2011, **11**(Suppl 4):S4
http://www.biomedcentral.com/1471-2458/11/S4/S4

BMC Public Health

PROCEEDINGS Open Access

Measuring disability and monitoring the UN Convention on the Rights of Persons with Disabilities: the work of the Washington Group on Disability Statistics

Jennifer H Madans*, Mitchell E Loeb, Barbara M Altman

From What is disability? UN convention on the rights of persons with disability, eligibility criteria and the International Classification of Functioning Disability and Health
Rome, Italy. 19-20 April 2010

Health Expectancy & Measures Used

"health states in question"

- self-rated health → healthy life expectancy
- specific disease → stroke-free life expectancy
- impairments → impairments-free life expectancy
- functional limitation→ disability-free life expectancy
- ADL limitation → active life expectancy
- dementia → dementia-free life expectancy

Methods of Computing Health Expectancy

- Prevalence-Based (Sullivan) Method (1971)
- Double Decrement Life Table Method (1983)
- ✓ Multistate Life Table Method (1989)
- ✓ Grade of Membership (GoM) Approach (1993)
- ✓ The Global Burden of Disease Approach (1997)
  - DALY, DALE, HALE
- ✓ Microsimulation Method (1995)
- ✓ Bayesian Approach (2003)

Data Used to Calculated Health Expectancy

- Cross Section
  - Sullivan Method
- Longitudinal, Panel
  - Double Decrement Life Table Method
  - Multistate Life Table Method
  - GOM Method
  - Simulation Method

Sullivan Method

Daniel F. Sullivan

1966: "Conceptual Problems in Developing an Index of Health"

1971: "A Single Index of Mortality and Mobidity"

Data: Life Table, Prevalence Rates, Institutionalization Rates

- easy to calculate and collect data
- applied by many countries to compute health expectancy

Multistate Life Table Method

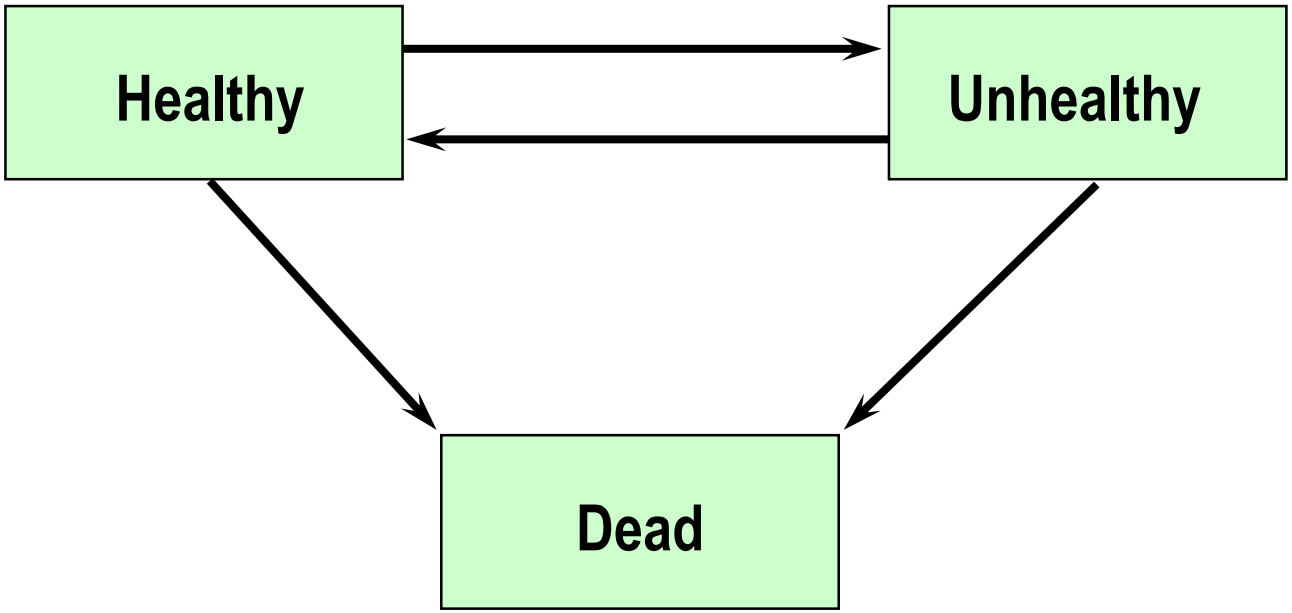
Method existed but applied to Health Expectancy Research by

Rogers A., Rogers R., Branch (1989)

Rogers R., Rogers A., Belanger (1989)

Rogers A., Rogers R., Belanger (1990)

Multistate Life Table Method



Multistate Life Table Method

- Population-Based Method
  - only age is a variable
  - only one radix but need to distribute it by healthy status at the beginning of the age range
- Status-Based Method
  - age and health status are variables
  - can compute life table as many as the number of health status employed

Discussion

- What can we do using concept of health expectancy?
  - By monitoring health expectancy over time and compare health expectancy across countries, we could help improve health status of a population
  - In doing so, we need common index for measuring health status across countries
- Mexico could lead Latin American countries and Japan could lead Asian countries to develop such index.

Caution

Increased longevity without quality of life is an empty prize. Health expectancy is more important than life expectancy.

Life is life, whatever the quality is . We have to respect for life.

Possibility of discrimination by health status if emphasizing healthiness too much.

More Caveat

- definition of words has to be considered
  - “disabled” does not mean not healthy
- not healthy is not equal to bad
  - (human gene project)