Global Patterns of Healthy Life Expectancy for Older Women

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SUMMARY. This paper focuses on patterns of healthy life expectancy for older women around the globe in the year 2000, and on the determinants of differences in disease and injury for older ages. Our study uses data from the World Health Organization for women and men in 191 countries. These data include a summary measure of population health, healthy life expectancy (HALE), which measures the number of years of life expected to be lived in good health, and a complementary measure of the loss of health (disability-adjusted life years or DALYs) due to a comprehensive set of

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disease and injury causes. We examine two topics in detail: (1) cross-national patterns of female-male differences in healthy life expectancy at age 60; and (2) identification of the major injury and disability causes of disability in women at older ages. Globally, the male-female gap is lower for HALE than for total life expectancy. The sex gap is highest for Russia (10.0 years) and lowest in North Africa and the Middle East, where males and females have similar levels of healthy life expectancy, and in some cases, females have lower levels of healthy life expectancy. We discuss the implications of the findings for international health policy.

KEYWORDS. Older women, HALE, healthy life expectancy, health-adjusted life expectancy, DALE, compression of morbidity

INTRODUCTION

For the first time ever in its World Health Report 2000, the World Health Organization (WHO) reported on the average levels of population health for its 191 member countries using a summary measure that combines information on mortality and disability (WHO, 2000). The primary summary measure of population health used was Disability-Adjusted Life Expectancy, or DALE, which measures the equivalent number of years of life expected to be lived in full health (Mathers, Sadana et al., 2001). In the following year, updated estimates of healthy life expectancy for the year 2000 were published in the World Health Report 2001 (WHO, 2001) using improved methods and incorporating cross-population comparable survey data from 63 surveys in 55 countries. To better reflect the inclusion of all states of health in the calculation of healthy life expectancy, the name of the indicator used to measure healthy life expectancy was changed from disability-adjusted life expectancy (DALE) to healthy life expectancy (HALE).

In the last two decades, considerable international effort has been put into the development of summary measures of population health that integrate information of mortality and non-fatal health outcomes (Murray et al., 2001) and this special volume is another indication of the growing international policy interest in such indicators. There are two main classes

of summary measures: health gaps and health expectancies. The Disability-Adjusted Life Year (DALY) is the best known health gap measure and quantifies the gap between a population's actual health and some defined goal (Murray & Lopez, 1996). HALE belongs to the family of health expectancies, summarizing the total life expectancy into equivalent years of "full health" by taking into account the distribution of health states (disability) in the population. WHO has chosen to use HALE as a summary measure of level of population health because it is relatively easy to explain the concept of an equivalent "healthy" life expectancy and because it is measured in units (years of life) that are meaningful to non-technical audiences (unlike other indicators, such as mortality rates or incidence rates).

HALE is also preferable as a summary measure of population to indicators such as Disability-Free Life Expectancy (DFLE) which incorporate a dichotomous weighting scheme. Because time spent in any health state categorized as disabled is assigned arbitrarily a weight of zero (equivalent to death), DFLE is not sensitive to differences in the severity distribution of disability in populations. In contrast, HALE adds up expectation of life for different health states with adjustment for severity distribution.

DFLE estimates based on self-reported health status information are not comparable across countries due to differences in survey instruments and cultural differences in reporting of health (Robine, Mathers, & Brouard, 1996). Analyses of over 50 national health surveys for the calculation of healthy life expectancy in the World Health Report 2000 identified severe limitations in the comparability of self-report health status data from different populations, even when identical survey instruments and methods were used (Sadana et al., 2000). We have demonstrated how these comparability problems relate not only to differences in survey design and methods, but much more fundamentally to unmeasured differences in expectations and norms for health. For example, the cutpoints of scales for a given domain such as mobility may have very different meanings across different cultures, across socio-economic groups within a society, across age groups or between men and women (Sadana et al., 2000; Murray et al., 2000). During the last two years, WHO has embarked on large-scale efforts to improve the methodological and empirical basis for the measurement of population health, and has initiated a data collection strategy consisting of household and/or postal or telephone surveys in representative samples of the general populations using a standardized instrument together with new statistical methods for correcting biases in self-reported health (Ustun et al., 2001).

In constructing estimates of healthy life expectancy for 191 countries for the year 2000, we have sought to address some of the methodological challenges regarding comparability of health status data across populations and cultures. This paper briefly describes methods and data sources used to prepare the DALE estimates for the 191 member countries of WHO, and then examines the implications of the results for our understanding of global patterns of female-male differences in healthy life expectancy at age 60, and their proximate disease and injury causes.

METHODS

Calculation of healthy life expectancy requires three inputs. First, life expectancy at each age is calculated in the standard way. Second, estimates of the prevalence of various states of health at each age are required. Finally, a method of valuing this time compared to full health must be developed. Data and methods for each of these components is briefly described below. Because comparable health status prevalence data are not yet available for all countries, a three-stage strategy was used to estimate severity-weighted health state prevalences for countries:

- first, data from the Global Burden of Disease 2000 study (GBD2000) were used to estimate severity-adjusted disability prevalences by age and sex for all 191 countries;
- second, data on health state prevalences and health state valuations from the WHO survey program was used to make independent estimates of severity-adjusted disability prevalences by age and sex for 55 countries;
- finally, for the survey countries, "posterior" prevalences were calculated as weighted averages of the GBD2000-based prevalences and the survey prevalences. The relationship between the GBD 2000-based prevalences and the survey prevalence among the survey countries was then used to adjust the GBD2000-based prevalences for the non-survey countries.

Life Tables and Cause of Death Distributions for Countries

New life tables and detailed cause of death distributions were developed for all 191 WHO Member States for the year 2000, starting with a systematic review of all available evidence from surveys, censuses, sample registration systems, population laboratories, and national vital regis-

tration systems on levels and trends of child and adult mortality (Lopez et al., 2000). In countries with a substantial HIV epidemic, separate estimates were made of the numbers and distributions of deaths due to HIV/AIDS and these deaths incorporated into the life table estimates (Salomon et al., 2000). Causes of death for the 191 WHO member states were estimated based on data from national vital registration systems that capture about 17 million deaths annually. In addition, information from sample registration systems, population laboratories, and epidemiological analyses of specific conditions have been used to improve estimates of the cause of death patterns. Cause of death patterns were carefully analyzed to take into account incomplete coverage of vital registration in countries and the likely differences in cause of death patterns that would be expected in the low coverage areas of countries with incomplete data (Salomon & Murray, 2000).

GBD2000 Estimates of Severity-Weighted Disability for Countries

WHO is currently updating and revising estimates of the Global Burden of Disease for the year 2000. The burden of disease methodology provides a way to link information at the population level on disease causes and occurrence to information on both short-term and long-term health outcomes, including impairments, disability, and death (Murray & Lopez, 1996). These revisions draw on a wide range of data sources, and various methods have been developed to reconcile often fragmented and partial estimates of epidemiological parameters that are available from different studies (Mathers, Lopez et al., 2001). These data, together with the new and revised estimates of deaths by cause, age, and sex for all member states, were used to develop internally consistent estimates of incidence, prevalence, duration, and YLD (years lived with disability), for over 130 major causes, for 17 sub-regions of the 6 WHO regions of the world. As well as the usual incidence-based YLD, prevalence rates and prevalence-based YLD rates were also calculated by cause, age, and sex, giving direct estimates of the severity-weighted prevalence of health states attributable to each cause (Mathers, Murray et al., 2000). These estimates are used here to examine the patterns of causes of disability in older women in different regions of the world, and to contrast them with the causes of disability in older men.

The regional YLD rates from the Global Burden of Disease 2000 project were also used to estimate country-specific YLD rates by age and sex for the calculation of HALE. Where feasible, country-specific prevalence estimates were made for a number of causes (including childhood

immunizable diseases, malnutrition, HIV/AIDS, cancers, and diabetes). For other causes, regional disability estimates were used, together with country-specific cause of death information, to develop country-specific estimates of severity-weighted prevalence of health states of less than good health (Mathers, Murray et al., 2000).

Summation of prevalence YLD over all causes would result in overestimation of disability prevalence because of comorbidity between conditions. We corrected for independent comorbidity between major cause groups as follows:

$$D_{s,x} = 1 - \prod_{g}(1 - PYLD_{s,x,g})$$

where $PYLD_{s,x,g}$ is the prevalence YLD per 1000 population for sex *s,* age *x* and cause *g* and $D_{s,x}$ gives the overall severity-weighted prevalence of disability by age and sex.

Health Survey Data

In order to gather population health data in a truly comparable manner across all member states, WHO launched a survey study in 1999 through a series of carefully designed steps (Ustun et al., 2001). The health module was based on selected domains of the International Classification of Functioning, Disability, and Health (ICF). It was developed after a rigorous scientific review of various existing assessment instruments, international consultations with experts, and with representatives of national and international statistical agencies, and has been informed by the scientific literature and pilot studies in 10 countries.

Comparability is fundamental to the use of survey results for calculating summary measures of population health but has been underemphasized in instrument development. The WHO survey program has at its first objective the assessment of health in different domains for nationally representative adult population samples in a way that is comparable across populations. To do this, the survey includes case vignettes and some measured tests on selected domains that are intended to calibrate the description that respondents provide of their own health. WHO has developed statistical methods for correcting biases in self-reported health using these data, based on the hierarchical ordered probit (HOPIT) model (Murray et al., 2000). The calibrated responses for 63 surveys in 55 countries were

used to estimate the true prevalence of different states of health by age and sex for the HALE estimates reported here (Mathers, Murray et al., 2000).

Just over one half (34) of the surveys were household interview surveys, two were telephone surveys, and the remainder postal surveys. Thirty-five of the surveys were carried out in 31 European countries, 22 surveys in 19 developing countries, and the remainder in Canada, USA, Australia, and New Zealand.

Valuing Health States

A related objective of the WHO survey is to measure the value that individuals assign to descriptions of health states derived from decrements in major domains of body functions and activities. This allows the weighting of health states in calculating summary measures such as HALE. The WHO survey program uses a two-tiered data collection strategy involving the general population surveys described above, combined with more detailed surveys among respondents with high levels of educational attainment in the same sites.

In the household surveys, individuals provide descriptions for a series of hypothetical health states along seven core domains of health, listed in Table 1, followed by valuations of these states using a simple thermometer-type (visual analog) scale. The more detailed surveys include more abstract and cognitively demanding valuation tasks (standard gamble, time trade-off, and person trade-off) that have limited reliability in general population surveys but have been applied widely in industrialized countries among convenience samples of educated respondents.

Statistical methods have been used to estimate the relationships between valuations elicited using visual analog scale and those elicited with other valuation techniques in order to measure the underlying health state severities that inform responses on each of the different measurement methods. A valuation function based on estimation of the relationships between levels on the core domains of health for a particular health state and

TABLE 1. Core Domains of Health Used in WHO Health Status Survey Module for Measurement and Valuation of Health States

Health Domains	
1. Mobility	4. Pain and discomfort
2. Self-care	5. Affect (anxiety/depression)
3. Usual activities	6. Cognition

the valuation of that health state has then been used together with the calibrated prevalences of health states to estimate the overall severity-weighted prevalence of health states for the 61 surveys in 55 countries (Mathers, Murray et al., 2000).

Posterior Health State Prevalences for the Calculation of HALE

The prevalence estimates for all 191 countries based on the GBD-based prior estimates (described above) and the prevalence estimates for the countries with health surveys were combined using Bayesian methods to obtain posterior health state prevalences for all Member States. Bayesian statistical analysis techniques use evidence (the health surveys) together with prior probability distributions (the GBD-based prevalence estimates) to calculate new posterior probability distributions. Both the evidence (survey mean severity-weighted prevalences by age and sex) and the prior means were assumed to be normally distributed, allowing the posterior mean severity-weighted prevalence to be calculated as the weighted sum of the survey mean and the prior mean, where the weights are inversely proportional to the standard errors of the uncertainties for each (Mathers, Murray et al., 2000).

Evidence from the surveys was also used to update the prior estimates for non-survey countries. Least squares ordinary regression was used to model the relationship between the posterior prevalences and the prior prevalences for the survey countries. The fitted model was then used to estimate posterior severity-weighted prevalences for all non-survey countries, in order to (1) ensure that the use of the survey data did not introduce a prevalence differential between survey and non-survey countries, and (2) to take the survey evidence into account in making the best possible prevalence estimates for non-survey countries.

Calculation of HALE

HALE was calculated using Sullivan's method based on abridged country life tables and the posterior estimates of severity-weighted prevalence of disability (Mathers, Murray et al., 2000). Uncertainty distributions for the HALE estimates for each country were also calculated to take into account uncertainty in the life table quantities and in the posterior prevalence estimates (Salomon et al., 2001).

RESULTS

Japanese older women lead the world with an estimated average healthy life expectancy of 21.4 years at age 60 in 2000 (Table 2). HALE for Japanese males aged 60 years is 3.8 years lower at 17.6 years. This a narrower gap than for total life expectancy at age 65 years of 5.4 years. After Japan, in second to fifth places, are Monaco, San Marino, Switzerland, Australia, and France with healthy life expectancies of older women in the range 19.4 to 20.2 years, followed by a number of other industrialized countries of Western Europe. Full details of male and female HALE and total life expectancy at age 60, together with 95% uncertainty ranges, are available by country in the World Health Report 2001 (WHO 2001).

Overall, global healthy life expectancy for women at age 60 in 2000 is 14.1 years, just over 2 years greater than that for men (Table 3). In comparison, total life expectancy at age 60 is 20.2 years, almost 4 years higher than that for men. HALE at age 60 ranges from a low of 6.3 years for African women to a high of just over 24 years in the low mortality countries of mainly Western Europe and North America. This is a 4-fold difference in healthy life expectancy between major regional populations of the world. The difference between HALE and total life expectancy is HLE (healthy life expectancy "lost" due to disability). HLE for women aged 60 ranges from 47% (of total life expectancy at birth) in Africa to 22% in the European region.

Apart from Afghanistan (where female healthy life expectancy at age 60 is just 5.8 years), the bottom 10 countries are all in sub-Saharan Africa, where the HIV-AIDS epidemic is rampant and there is a high disability burden due to chronic diseases and injury, as well as to other communicable diseases and childhood and maternal causes earlier in life.

Figure 1 shows HALE at birth for women versus men for the 191 countries in the year 2000. In the countries with HALE at birth of 46 years or lower, male and female HALE are almost the same. These countries are almost entirely African countries, but include the Lao People's Republic, Haiti, and Nepal. There are a number of countries with HALE around 50 years, where female HALE at birth is actually lower than male HALE. These countries are mostly in North Africa or the Eastern Mediterranean region, but also include Afghanistan, Pakistan, and Bangladesh. For other countries with HALE at birth of greater than 50 years, female HALE is generally higher than male HALE, though the gap is lower than for total life expectancy. In many countries of Eastern Europe, female HALE at birth is substantially higher than male, reflecting very high levels of adult mortality in men in the 1990s.

TABLE 2. Healthy Life Expectancy for Women Aged 60 years, WHO Member States, 2000

Rank	Member State	HALE (years)	Rank	Member State	HALE (years)	Rank	Member State	HALE (years)
1	Japan	21.4	65	Cyprus	14.1	129	Nauru	10.5
2	Monaco	20.2	66	Saint Vincent and Grenadines	14.1	130	Papua New Guinea	10.5
3	San Marino	19.9	67	Slovakia	14.0	131	South Africa	10.4
4	Switzerland	19.7	68	Paraguay	14.0	132	Tajikistan	10.3
5	Australia	19.5	69	Colombia	14.0	133	Cambodia	10.1
6	France	19.4	70	Saint Lucia	13.9	134	Egypt	10.0
7	Andorra	19.3	71	Hungary	13.8	135	Morocco	10.0
8	Sweden	18.9	72	Niue	13.8	136	Bolivia	10.0
9	Italy	18.8	73	Poland	13.8	137	Myanmar	9.8
10	New Zealand	18.6	74	Belize	13.6	138	Zimbabwe	9.7
11	Iceland	18.6	75	Tonga	13.6	139	Swaziland	9.6
12	Austria	18.4	76	Philippines	13.6	140	Nepal	9.6
13	Luxembourg	18.4	77	Peru	13.6	141	Iraq	9.5
14	Spain	18.3	78	Turkey	13.4	142	Turkmenistan	9.5
15	Norway	18.2	79	Trinidad and Tobago	13.3	143	Gabon	9.3
16	Belgium	18.0	80	United Arab Emirates	13.3	144	Sao Tome and Principe	9.2
17	Finland	17.9	81	Suriname	13.3	145	Namibia	9.1
18	Netherlands	17.8	82	El Salvador	13.3	146	Kenya	9.1
19	Canada	17.8	83	Cook Islands	13.0	147	Ghana	9.0
20	Malta	17.7	84	Dominican Republic	13.0	148	Botswana	8.9
21	Greece	17.6	85	Kuwait	13.0	149	Congo	8.9
22	Germany	17.6	86	Mongolia	12.7	150	Lesotho	8.8
23	United Kingdom	17.4	87	Malaysia	12.7	151	Yemen	8.8
24	Israel	17.1	88	Honduras	12.7	152	Pakistan	8.7
25	USA	16.9	89	Fiji	12.7	153	Maldives	8.6
26	Ireland	16.9	90	Tunisia	12.6	154	Togo	8.6
27	Slovenia	16.7	91	Saint Kitts and Nevis	12.6	155	Haiti	8.5
28	Denmark	16.5	92	Bahamas	12.6	156	Bhutan	8.5
29	Dominica	16.4	93	Brazil	12.6	157	Cote d'Ivoire	8.5
30	Singapore	16.2	94	Nicaragua	12.5	158	Zambia	8.5
31	Barbados	16.1	95	Republic of Moldova	12.5	159	Equatorial Guinea	8.3
32	Portugal	16.0	96	Indonesia	12.5	160	Nigeria	8.2

33	Argentina	16.0	97	Solomon Islands	12.4	161	Eritrea	8.1
34	Republic of Korea	16.0	98	Viet Nam	12.3	162	Gambia	8.1
35	Costa Rica	15.9	99	Marshall Islands	12.3	163	Bangladesh	8.0
36	Uruguay	15.8	100	Mauritius	12.3	164	Cameroon	8.0
37	Czech Republic	15.8	101	Russian Federation	12.2	165	Senegal	8.0
38	Chile	15.7	102	Lebanon	12.2	166	Central African Republic	7.9
39	Jamaica	15.7	103	Saudi Arabia	12.1	167	Malawi	7.8
40	Cuba	15.5	104	DPR Korea (b)	12.1	168	Sudan	7.8
41	Antigua and Barbuda	15.4	105	Oman	12.1	169	Comoros	7.7
42	Panama	15.3	106	Armenia	12.0	170	Burundi	7.7
43	Bulgaria	15.2	107	Micronesia (Fed. States of)	12.0	171	United Rep. of Tanzania	7.7
44	Croatia	15.2	108	Cape Verde	12.0	172	Ethiopia	7.5
45	Mexico	15.1	109	Ukraine	11.8	173	Madagascar	7.5
46	Brunei Darussalam	15.1	110	Kyrgyzstan	11.8	174	Chad	7.5
47	Estonia	14.8	111	Bahrain	11.8	175	Uganda	7.4
48	Venezuela	14.7	112	Guatemala	11.7	176	Burkina Faso	7.4
49	Sri Lanka	14.6	113	Vanuatu	11.7	177	Benin	7.4
50	Azerbaijan	14.6	114	Uzbekistan	11.6	178	Dem. Republic of the Congo	7.4
51	Kazakhstan	14.6	115	Qatar	11.6	179	Mozambique	7.3
52	Yugoslavia	14.6	116	Tuvalu	11.5	180	Angola	7.3
53	Albania	14.4	117	Iran (Islamic Republic of)	11.4	181	Rwanda	7.2
54	Latvia	14.4	118	Kiribati	11.4	182	Mali	7.2
55	Ecuador	14.4	119	Syrian Arab Republic	11.3	183	Guinea-Bissau	7.1
56	Belarus	14.4	120	Libyan Arab Jamahiriya	11.3	184	Mauritania	7.1
57	Thailand	14.4	121	Jordan	11.3	185	Guinea	7.0
58	Romania	14.4	122	Guyana	11.1	186	Djibouti	7.0
59	China	14.3	123	Georgia	11.1	187	Liberia	6.9
60	Samoa	14.3	124	Algeria	11.0	188	Somalia	6.4
61	Bosnia and Herzegovina	14.3	125	India	10.9	189	Sierra Leone	6.0
62	TFYR Macedonia (a)	14.3	126	Seychelles	10.7	190	Afghanistan	5.8
63	Lithuania	14.2	127	Palau	10.7	191	Niger	5.8
64	Grenada	14.1	128	Lao People's Dem. Republic	10.6			

(a) The Former Yugoslav Republic of Macedonia (b) Democratic People’s Republic of Korea

TABLE 3. Life Expectancy (LE), Healthy Life Expectancy (HALE), and Lost Healthy Years as Percent of Total LE (LHE%), at Birth and at Age 60, by Sex and Region, 2000

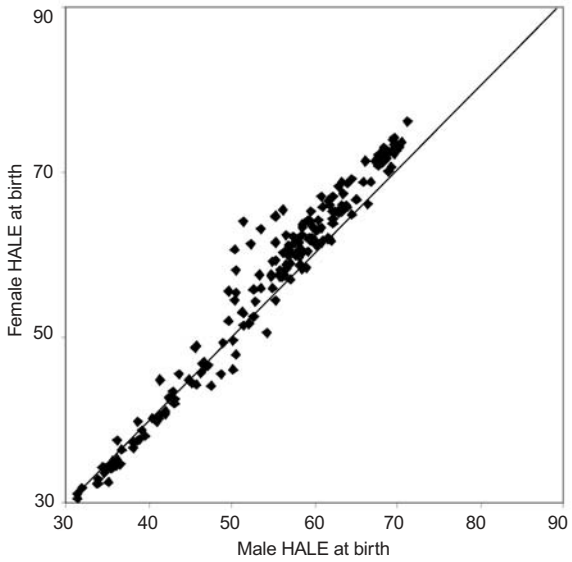
Region[a]	Females			Males			Female-Male Difference		
	HALE (years)	LE (years)	LHE% (%)	HALE (years)	LE (years)	LHE% (%)	HALE (years)	LE (years)	LHE% (%)
At birth									
Low mortality countries	72.0	81.2	11.4	68.0	75.1	9.5	4.0	6.1	1.9
Eastern Europe	61.0	72.2	15.5	54.0	62.9	14.2	7.0	9.3	1.3
Latin America	61.8	73.7	16.1	58.0	67.0	13.4	3.8	6.7	2.7
Eastern Mediterranean	55.9	69.4	19.5	56.4	66.1	14.7	−0.6	3.3	4.8
Asia/Pacific	57.5	67.6	15.0	56.2	63.9	12.2	1.3	3.6	2.8
Africa	38.9	48.8	20.3	39.5	47.0	15.9	−0.6	1.9	4.4
World	57.0	67.2	15.1	54.9	62.7	12.5	2.1	4.5	2.7
At age 60									
Low mortality countries	18.8	24.2	22.4	15.9	19.9	19.8	2.9	4.4	2.6
Eastern Europe	13.0	18.9	31.5	9.6	14.6	34.2	3.3	4.3	−2.7
Latin America	14.1	20.8	32.2	12.3	17.5	29.9	1.8	3.3	2.2
Eastern Mediterranean	10.3	18.0	42.4	10.4	16.1	35.5	0.0	1.9	6.9
Asia/Pacific	12.9	19.0	32.2	11.1	15.9	29.8	1.7	3.1	2.4
Africa	8.3	15.8	47.3	8.3	13.9	40.2	0.0	1.9	7.1
World	14.1	20.2	30.3	11.9	16.7	28.3	2.2	3.6	2.0

[a]*Low mortality countries* include Western Europe, North America, Japan, Australia, New Zealand, Singapore, and Brunei Darussalam; *Eastern Europe* includes Turkey and the former socialist countries of Eastern Europe and Central Asia; *Asia/Pacific* includes India, China, and other Asian and Pacific countries apart from the four included in *Low mortality countries*; *Africa* includes the countries of sub-Saharan Africa; North African countries are included in *Eastern Mediterranean*.

In Russia in the year 2000, healthy life expectancy is estimated to be 60.6 years for females, 4 years below the European average, but just 50.3 years for males, 9 years below the European average. This is one of the widest sex gaps in the world and reflects the sharp increase in adult male mortality in the early 1990s. Similar rates exist for other countries of the former Soviet Union.

Similar patterns are apparent for the male-female gap in healthy life expectancy at age 60 (Figure 2), although the male-female reversal in Eastern Mediterranean countries no longer occurs. In the countries with the longest healthy life expectancies, there is a trend to increasing female-male gap with increasing HALE, reflecting the greater proportion of years of life lived at older ages by women aged 60 and over, where there are higher prevalences of disabling conditions such as dementia and musculoskeletal disorders.

FIGURE 1. Healthy Life Expectancy at Birth for Females versus Males, 191 Countries, 2000



As shown in Figure 3, the gap between female HALE at age 60 and total life expectancy at age 60 decreases with increasing life expectancy in the developing countries, reflecting declining prevalence of disability due to communicable, maternal, perinatal, and nutritional causes. Among countries with higher life expectancies, the gap stabilizes and there is some indication that it may start to widen in the countries with the highest life expectancies. This may reflect the increasing burden of disability at older ages from non-fatal conditions such as musculoskeletal disorders, neuropsychiatric conditions, and sense organ disorders, as well as the increasing disability associated with the major causes of mortality (cardiovascular diseases and respiratory diseases in particular).

Figure 4 summarize the changing patterns of causes of disability in older females across the world, as assessed by the Global Burden of Disease 2000 project. The figure shows the major causes of prevalence YLD per 1000 population for 6 groups of countries. Prevalence YLD measure

FIGURE 2. Healthy Life Expectancy (HALE) at Age 60 for Females versus Males, 191 Countries, 2000

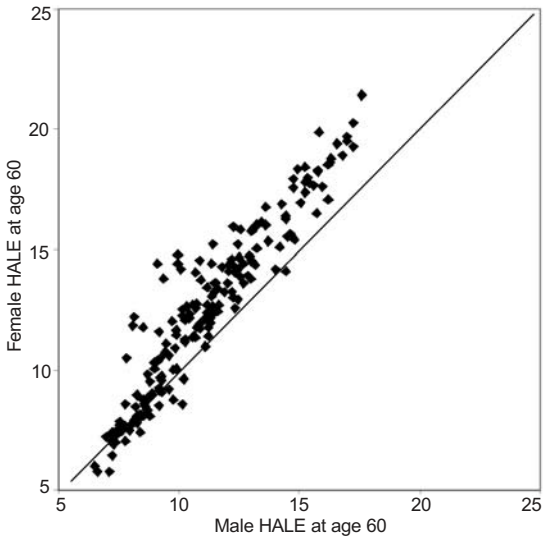
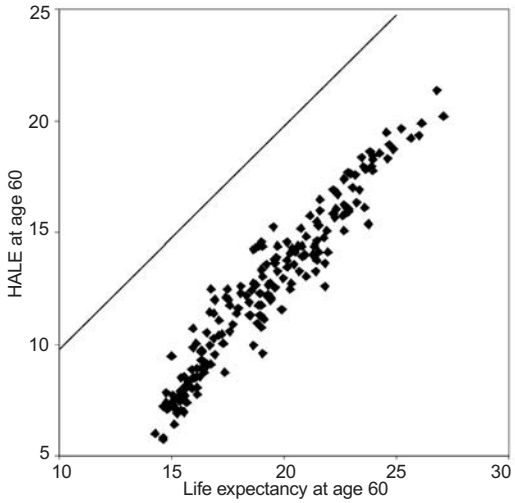


FIGURE 3. Healthy Life Expectancy (HALE) at Age 60 versus Total Life Expectancy at Age 60, Females, 191 Countries, 2000



the equivalent healthy years of life lost due to disability resulting from diseases and injuries. Group 1 conditions (communicable, maternal, perinatal, and nutritional causes) are an important cause of disability for older women in Africa and the Middle East. Among the low mortality populations of Eastern and Western Europe, North America, Japan, Australia, and New Zealand, neuropsychiatric conditions and other non-communicable diseases are the dominant causes of disability at older ages.

Table 4 shows the top 15 disease and injury causes of disability (prevalence YLD) for older women in developed countries (the low mortality countries plus Eastern Europe) and in developing countries (the rest of the world). In developed countries, senile dementias are responsible for over 20% of loss of healthy life, and YLD rates are 40% higher for females than males. Osteoarthritis is the second leading cause of YLD, again with a female excess compared to males, followed by hearing loss, where the female rate is 14% lower than the male rate.

In developing countries, in contrast, chronic obstructive lung disease is the leading cause of disability burden in older women, responsible for around 10% of the total. This reflects the impact of both smoking and indoor air pollution. Cataracts are the second leading cause, reflecting the high burden of blindness in the developing world due to unoperated cataracts in older people. Perinatal and maternal conditions also cause significant disability in older women, unlike in developed countries.

FIGURE 4. YLD per 1,000 Population by Major Cause Group, Females Aged 60 Years and Over, by Region, 2000. Group 1 Conditions Include Communicable, Maternal, Perinatal, and Nutritional Conditions

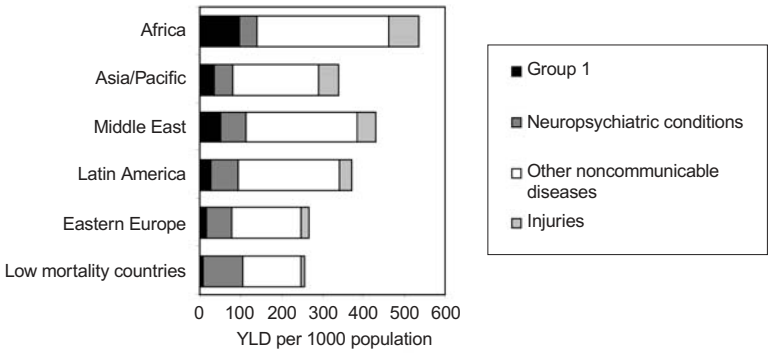


TABLE 4. Top 15 Causes of Disability (YLD), for Women Aged 60 Years and Over, Developed and Developing Countries,[a] 2000

	% of total YLD	Female to male ratio[b]
Developed countries		
1 Alzheimer and other dementias*	21.3	1.41
2 Osteoarthritis	11.2	1.47
3 Hearing loss, adult onset	7.0	0.86
4 Cerebrovascular disease	5.8	1.15
5 Unipolar depressive disorders	3.6	1.80
6 Diabetes mellitus	3.4	1.07
7 Chronic obstructive pulmonary disease	2.9	0.44
8 Malignant neoplasms	2.3	0.58
9 Ischaemic heart disease	1.9	0.77
10 Falls	1.6	0.64
11 Maternal conditions	1.4	---
12 Parkinson's disease	1.5	0.88
13 Oral conditions	1.4	1.49
14 Migraine	1.4	2.42
15 Rheumatoid arthritis	1.3	2.15
Developing countries		
1 Chronic obstructive pulmonary disease	9.9	0.74
2 Cataracts	7.3	1.11
3 Osteoarthritis	7.2	1.36
4 Hearing loss, adult onset	7.0	0.75
5 Alzheimer and other dementias	4.7	1.03
6 Falls	3.2	0.75
7 Unipolar depressive disorders	2.9	1.79
8 Maternal conditions	2.8	---
9 Cerebrovascular disease	2.7	1.23
10 Ischaemic heart disease	2.2	1.06
11 Perinatal conditions*	2.2	0.94
12 Oral conditions	1.9	1.09
13 Diabetes mellitus	1.7	0.89
14 Iron-deficiency anaemia	1.5	0.99
15 Road traffic accidents	1.5	0.34

[a] Developed countries include European countries, Canada, USA, Japan, Australia, New Zealand.
[b] Ratio of total YLD per 1,000 population for females aged 60 years and over to those for males aged 60 years and over.

DISCUSSION

Despite the fact that women live longer in the richer, more developed countries, and have greater opportunity to acquire non-fatal disabilities in older age, disability has a greater absolute (and relative) impact on healthy life expectancy at age 60 in poorer countries. Separating life expectancy into equivalent years of good health and years of lost good health thus widens rather than narrows the difference in health status between the rich and the poor countries. Cross-sectionally, at the global level, higher life expectancy at age 60 is associated with a compression of mordidity in developing countries: fewer expected years of good health are lost due to the non-fatal consequences of diseases and injury as mortality rates decline. There is some indication in these data that there may be some expansion of morbidity cross-sectionally with increasing life expectancy at older ages in the low mortality countries.

At a global level, older women live on average 3.6 years longer than men, but lose the equivalent of 1.4 extra years of good health to the non-fatal consequences of diseases and injuries. In other words, although females live longer, they spend a greater amount of time with disability. However, this global average disguises enormous variations across the world in the sex difference in healthy life expectancy. The male-female gap in healthy life expectancy at age 60 varies from a high of 10 years in some former Soviet Union countries to a low of –1.5 years for some Middle Eastern countries.

Russia has one of the widest sex gaps in the world for healthy life expectancy of older people: 66.4 years for females at birth but just 56.1 years for males. The most common explanation is the high incidence of male alcohol abuse, which led to high rates of accidents, violence, and cardiovascular disease. From 1987 to 1994, the risk of premature death increased by 70% for Russian males. Between 1994 and 1998, life expectancy improved for males, but has gotten worse in the last few years.

In some countries of North Africa, the Middle East, and West Asia, the gap in healthy life expectancy at birth for males and females is reversed. Contributing to these sex differences are higher female infant and child mortality rates, and higher risks of maternal mortality than in other countries, reflecting the position of women in these societies.

As with any innovative approach, there are substantial limitations and gaps in the information base required for estimating healthy life expectancy for all countries of the world. We have attempted to maximize the comparability of the data derived from available, nationally representative health surveys, and have used additional cross-population comparable in-

formation on health status derived from analysis of epidemiological data sources to improve comparability.

The WHO instrument has been used to collect population health data in over 50 countries at the time of writing, and this experience will be used to improve the health status measurement methods and to extend the surveys to more countries. In addition, WHO is investing considerable resources in the revision of the Global Burden of Disease estimates for the year 2000. These estimates will also contribute to improved estimation of healthy life expectancy, which will in turn assist in monitoring global health trends, and in particular, trends in the health and healthy life expectancy of older women.

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