

## Global mortality trends and patterns in older women

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**Objective** To describe mortality patterns in women older than 50 years in light of the growth, seen in almost all countries, in the absolute number of females in this age group and in the proportion of the female population comprising older women.

**Methods** National death record data and World Health Organization estimates of life expectancy and causes of death in women older than 50 years were analysed. Projections of trends in mortality, by cause, at older ages were also made.

**Findings** In both developed and developing countries, the leading causes of death among older women were cardiovascular diseases and cancers. In countries with death registration data, cardiovascular and (to a lesser extent) cancer mortality appears to have declined in older women in recent decades and this decline has resulted in improved life expectancy at age 50. If these trends continue, deaths in older women are still expected to increase in number because of population growth and ageing.

**Conclusion** Noncommunicable diseases, especially cardiovascular diseases and cancers, are expected to cause an increasing share of women's deaths in low- and middle-income countries owing to the ageing of the population and to reductions in child and maternal deaths. Health systems must adjust accordingly, perhaps by drawing on lessons from high-income countries that have succeeded in reducing mortality from noncommunicable diseases.

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### Introduction

In almost all parts of the world, women live longer than men.<sup>1</sup> The cause of the differential between male and female life expectancy is uncertain, but it appears to be partly explained by biological advantages and partly by environmental and behavioural factors. Differences in these external factors result in substantial geographic variation. For example, in 2011 the female advantage in life expectancy at birth was 1 year in Bangladesh, 7 years in Japan and 12 years in the Russian Federation.<sup>1</sup> Changing patterns of environmental and behavioural factors can also explain the recent narrowing of the gap in some developed countries. This may be due, at least in part, to increased smoking among women and to falling rates of cardiovascular disease among men.<sup>2,3</sup>

Because of women's longer life expectancy, older women outnumber older men. Worldwide in 2011, women comprised 53% of adults aged 50 years or older and 59% of adults aged 70 and above.<sup>4</sup> Most of these older women live in less developed regions (as defined by the United Nations Population Division),<sup>4</sup> which in 2011 were home to 555 million women aged 50 years or older. In contrast, about 280 million women in this age group – or just over half as many – were living in developed regions that same year. By 2050, these numbers are projected to increase to 1.5 billion in less developed regions and to 379 million in developed regions.<sup>4</sup> The share of the globe's population comprising older women is also projected to increase – from 12% in 2011 to 19% in 2050.

Despite this demographic transition, the health system needs of women in less-developed settings remain largely confined to reproductive matters, particularly maternal health and access to contraception. Other needs, including the prevention, detection and management of noncommunicable diseases, have received less attention. Given the substantial reduction in maternal and child mortality and the progressive increase in the absolute number of older women that have taken place

over the past 10 years, these broader health system needs have become more important and their importance will continue to increase in the future.

This special issue of the *Bulletin* explores those health problems affecting women that are not directly attributable to their reproductive role. A look at the causes of death among women can provide insight into their health problems. The objective of this study is to describe recent epidemiologic changes in women's health and to identify key health system priorities stemming from these changes. To this end we examined mortality levels, mortality trends and causes of death in women aged 50 years and older (henceforth referred to as "older women"). Although the scope of our analysis is limited by an exclusive focus on mortality – with special attention to countries with reliable and complete mortality statistics – our approach reduces the need to use statistical models to describe patterns and trends in women's health. Recent analyses of years lived with disability and of healthy life expectancy have depended heavily on statistical models because data on morbidity are seldom routinely collected.<sup>5,6</sup>

### Methods

#### Life expectancy

We present women's life expectancy at age 50 over the period from 1985 to 2012. Life expectancy at age 50 is defined as the number of remaining years a 50-year-old could expect to live if she were to pass through life exposed to the mortality rates currently prevailing in her country in the year for which the statistic is calculated. Life expectancy is calculated from World Health Organization (WHO) life tables.<sup>1</sup> Briefly, the procedures used to generate these life tables depend on the data available. For countries with vital registration data, we begin by assessing the completeness of the recorded mortality data for adults by applying demographic techniques. If we

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determine that the data are complete enough to be meaningful, we adjust the death rates for individuals older than 5 years for completeness. For countries without exploitable vital registration data, we use other sources of adult mortality data, such as surveys and censuses, to estimate mortality among adults. We present estimates for countries selected to show a variety of epidemiological patterns representing all WHO regions and country income categories.

### Causes of death in 2008

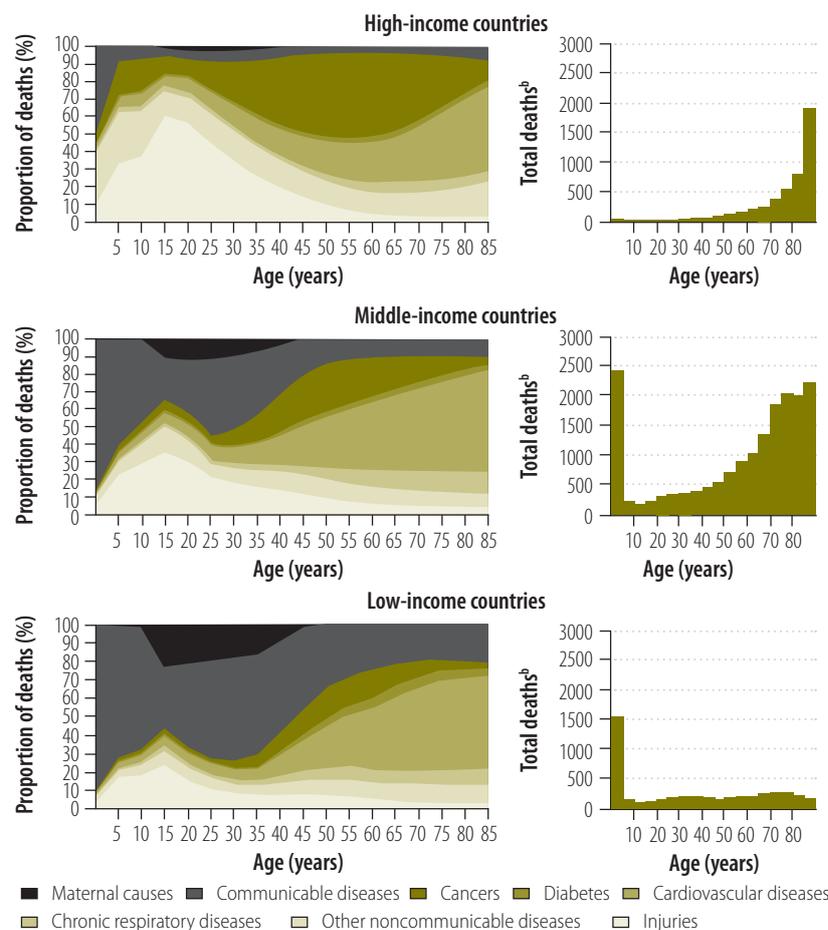
To portray the regional distributions of causes of death in people 50 years of age and older we used WHO's cause-of-death estimates for 2008.<sup>7</sup> We generated country mortality estimates based on national data on mortality and distribution of causes of death that were available at the end of 2010. We combined this data with the most recent information on causes of death of public health importance, as reported by WHO programmes, the International Agency for Research on Cancer and the Joint United Nations' Programme on HIV/AIDS. We categorized countries according to the World Bank's 2009 income classification.<sup>8</sup>

### Analysis of death registration data

We calculated cause-specific mortality rates and their trends from death registration data in the WHO mortality database.<sup>9</sup> To ensure the reliability of the data used, we limited our analysis to countries where the proportion of deaths (recorded and unrecorded) for which cause-of-death information could be obtained exceeded 80% in at least 80% of the years between 1980 and 2008. To determine this we used the estimated completeness of vital registration and the fraction of recorded deaths that were assigned an ill-defined cause-of-death code (e.g. for the 10th revision of the *International classification of diseases and related health problems*, codes R00–R99).<sup>1,10</sup> The data for country-years having less than 100% complete registration coverage were adjusted for incomplete registration.

Many countries were missing data for some years. To create a continuous time series of data, for each country we interpolated mortality rates, by cause of death, if three or fewer consecutive years of data were missing. We also extrapolated up to three years of data at the beginning and end of the data series.

Fig. 1. Percentage of deaths from various causes and distribution of deaths, by age, in low-, middle- and high-income countries,<sup>a</sup> 2008



<sup>a</sup> Countries categorized according to The World Bank's 2009 income classification.

<sup>b</sup> In thousands.

Note: World Health Organization estimates are shown.<sup>7</sup>

To interpolate, we fit a logistic regression model for each missing data point. The dependent variable is the death rate for the specific country, age, sex and cause group. The independent variable is year. The regression was fitted using death rates for the five years before and the five years after every year for which the data were missing. To extrapolate, we fit an equivalent regression to the first or the final six years of data.

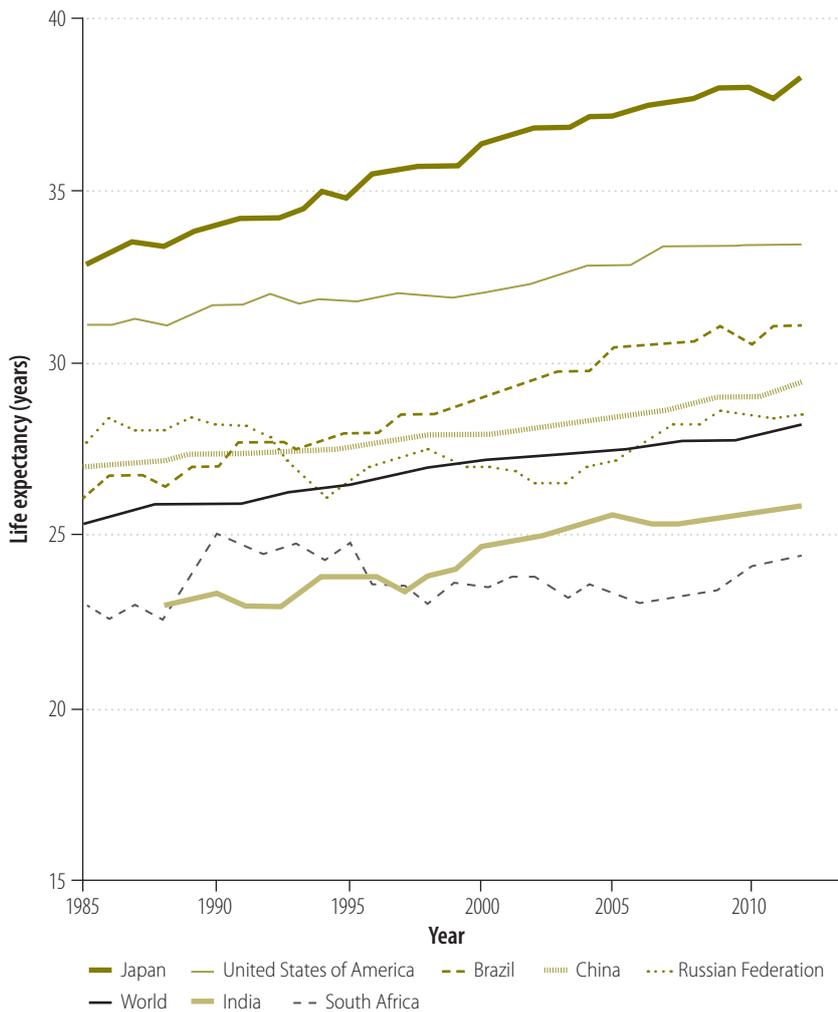
Data from 58 countries whose population in 2010 exceeded 500 000 fulfilled our quality criteria. This comprised 1827 country-years of data from 1970 to 2011, the year for which the most recent data were available. After interpolation and extrapolation, we obtained 2005 country-years of data that provided a complete time series from 1970 to 2010 for 29 countries and from 1980 to 2010 for 39 countries. All 39 of these countries with a high-quality

and relatively complete cause-of-death time series were either high-income countries or middle-income countries in eastern Europe or Latin America. For simplification, in the results section we discuss the results from 11 of these countries, which include two from each of these areas. The countries are Chile, France, Germany, Greece, Japan, Mexico, New Zealand, Poland, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America.

### Causes of death

We reassigned deaths with ill-defined or intermediate causes using previously published methods.<sup>11</sup> We redistributed cancers of unspecified site pro rata to all sites excluding liver, pancreas, ovary, trachea, bronchus and lung, which are cancer sites that are less likely to be assigned an ill-defined cancer code. We

Fig. 2. Female life expectancy at age 50 years, selected countries and the world, 1985–2012



Note: World Health Organization estimates are shown.<sup>1</sup>

redistributed ill-defined cardiovascular causes of death to ischaemic heart disease and other cardiovascular causes of death, as described in Mathers et al.<sup>11</sup> Finally, we redistributed ill-defined causes of death pro rata to all non-injury causes of death.

We grouped deaths into the following six broad cause categories: communicable diseases and nutritional deficiencies, cancers, cardiovascular diseases and diabetes mellitus, chronic respiratory diseases, other noncommunicable diseases, injuries. For some analyses, we disaggregated lung cancer mortality from other cancer mortality. We present together cardiovascular and diabetes deaths from death registration data because of inconsistencies across countries and over time in designating the cause of death when both types of diseases contribute to the death. We cal-

culate age-standardized mortality rates using the WHO reference population.<sup>12</sup>

#### Life table methods

Abridged life tables for people aged 50 years or older were constructed using death records data. Mortality rates in 5-year age intervals up to the age of 85 years and beyond were extracted. Life tables were extended to ages beyond 100 years using the Coale–Guo method to estimate  $q_x$  for the following five-year age groups: 85–89, 90–94, 95–99,  $\geq 100$ .<sup>13</sup> The average proportion of each 5-year age range lived by those who die in the age range ( $5_{ax}$ ) was estimated using the iterative method described by Preston et al.<sup>14</sup>

To clearly identify the contribution of deaths caused by tobacco use, we calculated the total deaths attributable to tobacco smoking across all causes of

death using the method of Peto et al., who proposed that current mortality for lung cancer can be used as an indicator of past exposure to tobacco smoke.<sup>15</sup> Briefly, we calculated the smoking impact ratio by comparing lung cancer mortality rates in each population with the lung cancer mortality rates among non-smokers and smokers observed in the American Cancer Society study.<sup>16–19</sup> In the life table analyses presented here, deaths caused by tobacco are grouped in a single cause category and are excluded from the other six cause categories listed above.

Gains in life expectancy between two time points were decomposed into cause contributions using the methods set out by Beltrán-Sánchez et al.<sup>20</sup> The death registration data from the WHO Mortality Database provides cause-specific deaths, by sex, for the single age group of people aged 85 years or older. We assumed that this cause distribution applied within each five-year age interval, starting with the group of people aged 85 to 89 years. For this age group and all five-year age groups above it, we assumed that the force of decrement function from each specific cause is proportional to the force of decrement function for all causes combined in each age interval. For the open-ended interval beginning at age 100, we follow Beltrán-Sánchez et al. in assuming mortality rates to be constant and that no person-years are lived above the age of 110.<sup>20</sup>

#### Mortality projections

We have projected mortality using methods applied in previous studies,<sup>21,22</sup> with updated inputs for baseline deaths and covariates. Briefly, a set of regression models was used to project future health trends for baseline, optimistic and pessimistic scenarios, based on projections of economic and social development and on the historically observed relationships between such development and cause-specific mortality rates. The projections presented in this study have been revised to take into account the updated base estimates of deaths by cause for 2008,<sup>7</sup> updated projections of real change in income per capita that reflect the impacts of the global financial crisis<sup>23,24</sup> and updated projections of tobacco-related deaths that modify the previous smoking impact projections to reflect the recent, flatter trends in tobacco consumption for 1990–2008.<sup>25</sup>

The projected chronic disease mortality rates for older women are not highly sensitive to a reasonably broad range of assumptions about future economic growth and trends in the tobacco epidemic. However, the projections do not take into account trends in major risk factors unrelated to tobacco or to the pace of economic growth. These risk factors may not follow the same historical patterns observed in countries with death registration data.

## Results

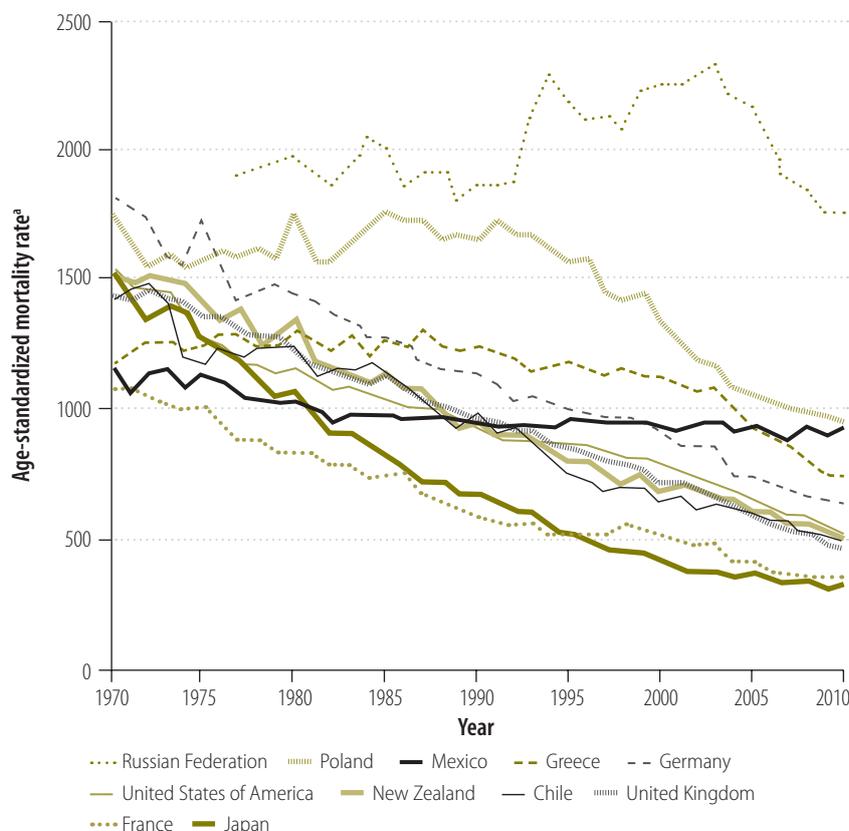
### Mortality over the life course

The distribution of deaths by age group varies substantially between countries as a function of the level of socioeconomic development, population age structure and mortality rates (Fig. 1).<sup>7</sup> In low- and middle-income countries, where child mortality rates are high and younger people comprise a greater fraction of the population than in high-income countries, more female deaths occur in the first 5 years of life than in any other five-year age group; in high-income countries, on the other hand, children's risk of death is very low. In low-income countries, deaths in women over the age of 5 years are spread evenly across the life course, but in medium- and high-income countries, such deaths are more concentrated among older women.

The leading causes of death also vary depending on the level of socioeconomic development, and this variation is observed most markedly in younger ages (Fig. 1).<sup>7</sup> In low-income countries, the deaths spike in childhood as a result of communicable, perinatal and nutritional diseases and injuries. In these settings, most women in early adulthood are killed by communicable diseases (primarily acquired immunodeficiency syndrome [AIDS]), maternal causes, injuries and cancers. The pattern is similar in middle-income countries, although the proportion of deaths occurring during early adulthood is much smaller. In high-income countries, deaths in early life are rare and most are caused by injuries, although cancers are also a common cause.

In women over the age of 50 years, noncommunicable diseases, particularly cancers and cardiovascular diseases, are the most common causes of death, regardless of the level of economic development of the country in which they live. Cardiovascular diseases account for

Fig. 3. Trends in age-standardized rates of death from cardiovascular diseases and diabetes among women aged 50 years or older, selected countries with vital registration systems, 1970–2010



United Kingdom, United Kingdom of Great Britain and Northern Ireland.

<sup>a</sup> Per 100 000, standardized using the World Health Organization reference population.

45% of older women's deaths globally and another 15% of deaths are caused by cancers – mainly of the lung, breast, colon and stomach.<sup>7</sup> Chronic respiratory conditions, primarily chronic obstructive pulmonary disease, cause another 10% of the deaths seen in these older women.

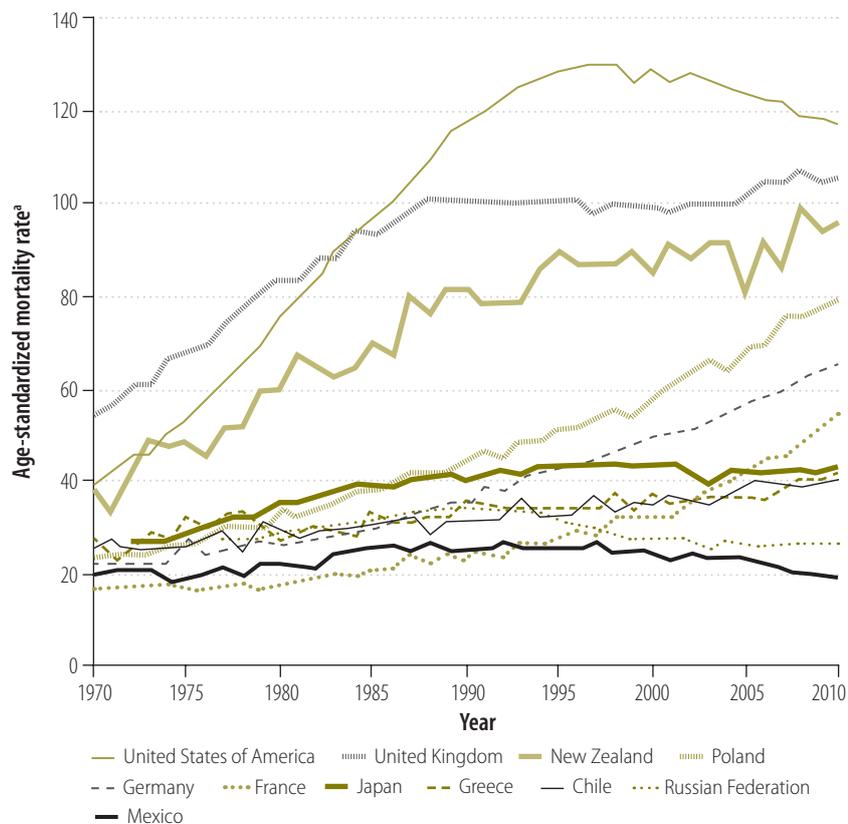
### Recent trends

Worldwide and in most countries, female life expectancy at age 50 has increased in recent decades (Fig. 2).<sup>1</sup> Some countries have shown rapid gains in older women's life expectancy over the 23 years from 1990 to 2012. They include Brazil and Japan – a country that already had the world's second highest life expectancy in 1990 – both with gains of four or more years. Older women in China and the United States experienced measured gains of 2.2 and 1.8 years, respectively – slightly less than the global average of 2.3 years and India's gain of 2.6 years. Some countries faced setbacks during this period. Among them are the Russian

Federation and other eastern European countries, where the economic transition affected female life expectancy, and South Africa, which was affected by the epidemic of human immunodeficiency virus (HIV) infection, like other countries in sub-Saharan Africa. South Africa has recently experienced gains in female life expectancy at age 50, perhaps as a result of the increased use of antiretroviral treatment.

Which causes of death are contributing to these gains in life expectancy can be determined by looking at estimated death rates. Globally, age-standardized death rates for both sexes declined by an estimated 21.5% from 1990 to 2010.<sup>26</sup> Progress by disease has not been uniform. Death rates from some diseases have declined rapidly: chronic respiratory disease death rates declined by 41.9% and cardiovascular death rates declined by 21.2% between 1990 and 2010. In contrast, the overall cancer death rate dropped by 13.8%, the lung cancer death rate decreased by 8.3%

Fig. 4. Trends in age-standardized rates of death from cancers of the lung, trachea and bronchus among women aged 50 years or older, selected countries with vital registration systems, 1970–2010



<sup>a</sup> Per 100 000, standardized using the World Health Organization reference population.

and the diabetes death rate increased by 19.7% since 1990.<sup>26</sup>

Annual data on deaths by age, sex and cause are available for countries with complete or nearly complete death registration, namely most high-income countries and some middle-income countries (Fig. 3, Fig. 4 and Fig. 5). Older women's rates of death from cardiovascular diseases and diabetes combined have declined in all the countries shown in Fig. 3. Of the 11 countries shown in Fig. 3, New Zealand experienced the median decline (66% from 1970 to 2010). Japanese women recorded the greatest relative decline (79%). Declines were moderate in Mexico, where increases in the rate of death from diabetes offset declines in deaths from cardiovascular disease. The Russian Federation also experienced a moderate decline (11%) from 1980 to 2010. Increasing alcohol use may have reduced the rate of decline of cardiovascular deaths recorded in the Russian death records.<sup>27</sup>

Lung cancer mortality rates are determined by past and current ex-

posures to tobacco smoking. They are affected by both the prevalence and the intensity of smoking (i.e. the average number of cigarettes smoked per day). Fig. 4 shows the heterogeneity in lung cancer mortality levels and their trends arising from diverse patterns of tobacco smoking among women across time in different national contexts. In the United States, lung cancer mortality rates peaked in 1998 at 130 per 100 000 and then declined 10% – to 117 per 100 000 – by 2010 (Fig. 4). Rates of death from lung cancer more than doubled from 1970 to 2010 in France, Germany and Poland and are still rising in all three countries.

Mortality from cancers in sites other than the lung has declined moderately but consistently during the past 40 years (Fig. 5). In six of the 11 countries shown in Fig. 5, rates of death from cancers other than lung cancer declined between 20 and 30% from 1970 to 2010. Declines in mortality from cancers of the stomach, colon, breast and cervix contributed most to these overall declines in cancer mortality.

Decomposing gains in life expectancy into their constituent causes provides insight into the epidemiological changes that have driven these improvements (Fig. 6). In the high-income countries shown in Fig. 6, reductions in non-tobacco-related mortality from cardiovascular diseases and diabetes contributed the most to gains in women's life expectancy at age 50 between 1980 and 2011 (gains ranged from 2.5 years in France and the United Kingdom to 3.5 years in Germany and Japan). Although reductions in tobacco-related mortality played an important role in gains in life expectancy among men in high-income countries (data not shown), among women the rates of tobacco-related death increased in France, Germany, Greece and the United States, and this resulted in a reduction in life expectancy at age 50 that ranged from 0.02 years (in the United States) to 0.6 years (in France). Among women, overall declines in cancer mortality led to moderate gains in life expectancy – from 0.3 to 0.7 years – in the high-income countries shown in Fig. 6.

Middle-income countries showed context-specific patterns in cause-specific mortality reductions. Of the three middle-income countries shown in Fig. 6, Chile and Poland resembled high-income countries in terms of the magnitude and patterns of mortality reduction. In Mexico, decreases in communicable disease mortality contributed the most to gains in female life expectancy – a gain of 1.3 years at age 50. The overall gain in life expectancy in Mexico was smaller than in Chile or Poland. Female life expectancy increased even less in the Russian Federation, where life expectancy at age 50 improved by only 1.2 years from 1980 to 2011. The Russian Federation, unlike most high-income countries, experienced little decline in deaths from cardiovascular diseases and diabetes. Such a decline contributed only 0.44 years to its modest gain in life expectancy.

### Mortality projections for 2010 to 2050

The global average female life expectancy at age 50 is projected to increase from 29 years in 2010 to 33 years in 2050. The largest gains over this period are expected to take place in WHO's South-East Asia and Western Pacific regions (5.7 years on average for the two regions combined) and in

the middle-income countries of the European Region (5.1 years). Because high-income countries have already achieved reductions in female mortality at younger ages, in such countries any further decreases in female mortality, mainly at older ages, will have a lesser impact on gains in life expectancy. Thus, women in high-income countries stand to gain less than women in other countries in terms of life expectancy at age 50 – projected to increase 2.7 years (from 33.4 to 36.1 years) over the period from 2010 to 2050.

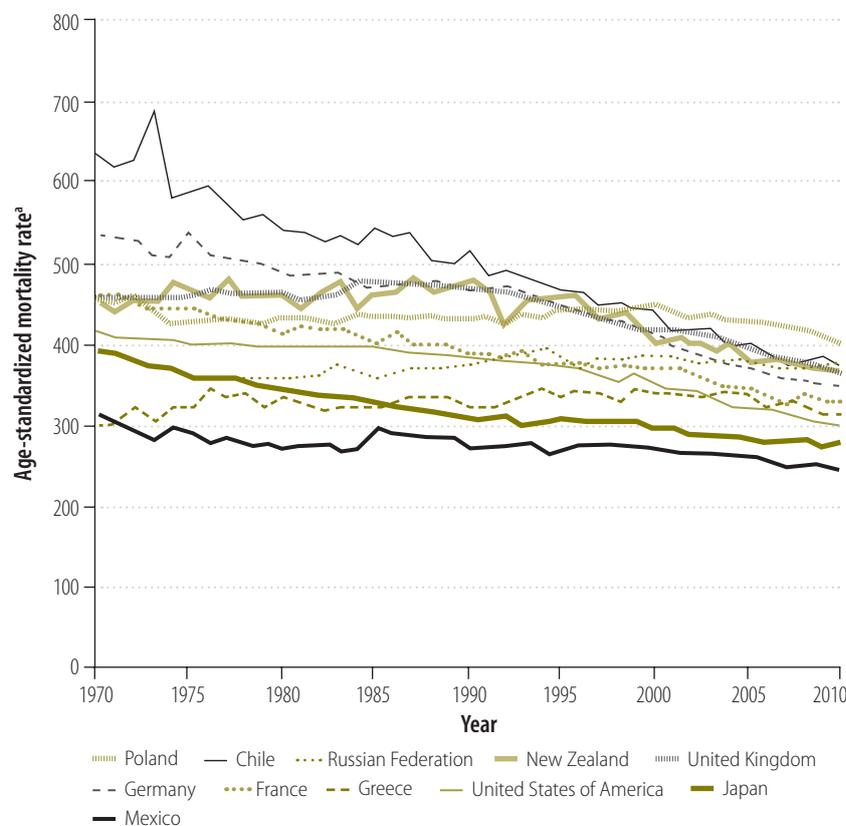
Despite favourable trends in life expectancy at age 50 the world over, globally the absolute number of deaths in women over the age of 50 years is projected to increase from 18.5 million in 2010 to 39.3 million in 2050 (Fig. 7). Most of this increase will be attributable to the leading causes of death seen at present: cardiovascular deaths are projected to increase by 8 million (38% of the total increase in deaths) and cancer deaths by 3.6 million (17% of the total increase). Mortality from some causes will increase at a faster rate than cardiovascular and cancer deaths. Deaths from falls and diabetes among older women are projected to nearly triple between 2010 and 2050: their increase will be from 200 000 to 550 000 and from 700 000 to 2 million, respectively. In 2050, cardiovascular diseases and cancers will continue to be the leading causes of death and be responsible for 46% and 14% of total deaths in women over 50, respectively.

The absolute number of deaths is projected to increase due to the growth in the total population of older women and to an increase in the average age of these women. The projected decline in age-specific death rates will offset these increases to some extent. As a result of these demographic and epidemiological trends, an increasing proportion of older women's deaths will occur in low- and middle-income countries. The increase will be from 76% of deaths in 2010 to 84% in 2050. At every income level, more than 80% of these deaths will be attributable to noncommunicable diseases, predominantly cardiovascular diseases and cancers.

## Discussion

Female mortality and its causes vary considerably depending on a country's level of socioeconomic development.

Fig. 5. Trends in age-standardized rates of death from cancers of all sites excluding lung, trachea and bronchus among women aged 50 years or older, selected countries with vital registration systems, 1970–2010



United Kingdom, United Kingdom of Great Britain and Northern Ireland.

<sup>a</sup> Per 100 000, standardized using the World Health Organization reference population.

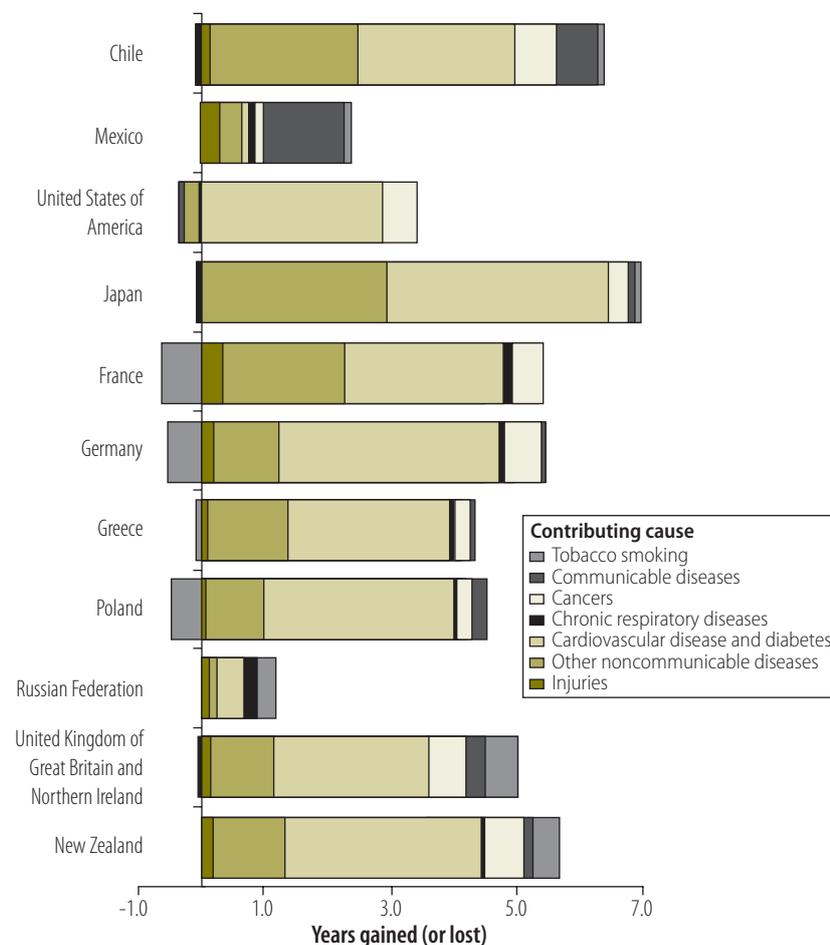
These variations are particularly obvious at younger ages, when communicable diseases and maternal causes of death take many women's lives in low- and middle-income countries but relatively few in high-income countries. However, in later adulthood, differences in female death rates across settings becomes less marked. In women over the age of 50 years, cardiovascular diseases, cancers and chronic respiratory diseases become the overwhelming causes of death everywhere in the world and communicable diseases continue to play a significant role in mortality only in low-income countries.

These patterns are not static. Child and maternal mortality rates have declined rapidly in low- and middle-income countries,<sup>28,29</sup> along with death rates in adult women in countries of all income levels.<sup>1</sup> We project that these declines will continue. At the same time, older women are growing both in number and as a proportion of the total population. As a result, mortality patterns in all countries will increas-

ingly resemble those currently seen in high-income countries. In other words, deaths will be increasingly delayed to older ages and cancers will cause a larger proportion of deaths in people between the ages of 20 and 75 years.

This transition is already under way and may be more complex than initially anticipated. Low- and middle-income countries face a "double burden" of communicable and noncommunicable diseases, but according to our analysis, although the causes of death in women over the age of 50 years are similar in middle- and high-income countries, in middle-income countries women die of these causes at younger ages than they do in high-income countries. This may be because in middle-income countries women are more exposed to various risk factors over life – e.g. psychological stress, raised blood pressure or certain infections – and have less access to appropriate cardiac or cancer care and other health services. Or they may be less resilient to disease in later life because they faced more detrimental early life experiences

Fig. 6. Years gained or lost in women's life expectancy at age 50, by contributing cause, selected countries with vital registration systems, 1980–2010



Note: Deaths caused by tobacco smoking are subtracted from each disease cause category and shown as a single cause group. Thus, for example, the category labelled "Cancers" excludes cancers attributable to tobacco.

than women in high-income countries.<sup>30</sup> Whatever the reasons may be, the fact that noncommunicable diseases strike women at an earlier age in less developed countries has important implications for individuals, families and societies.

The trends described in this paper highlight the urgency of adapting health systems to better meet the changing health-care needs of women in low- and middle-income countries, primarily by improving the capacity to prevent and manage noncommunicable diseases. Some of the strategies adopted in high-income countries to deal with the trends we have reported can perhaps be incorporated into this system adaptation process in low- and middle-income countries.

In richer countries, falls in mortality from cardiovascular diseases constitute the most dramatic of the changes

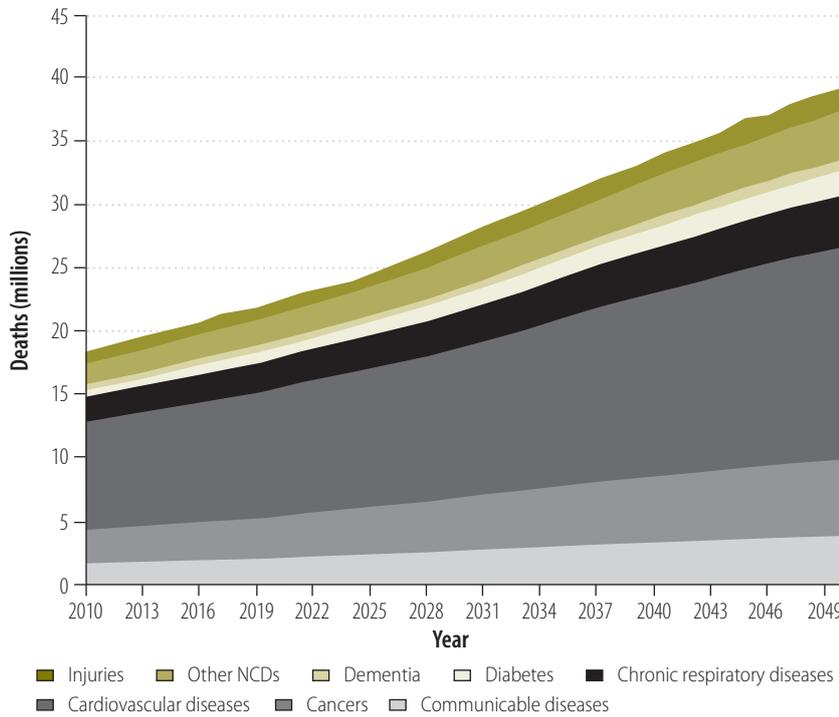
witnessed in noncommunicable disease mortality among older women. This reduction can probably be attributed in approximately equal measure to better prevention and management of the metabolic risk factors for cardiovascular disease, such as high blood pressure and high serum cholesterol, and to improved treatment of cardiovascular conditions.<sup>31–33</sup> However, low- and middle-income countries have not experienced the decreases in women's systolic blood pressure and serum cholesterol levels that high-income countries have attained, despite the increase in the prevalences of overweight, obesity and diabetes in these wealthier countries.<sup>34–37</sup> This suggests that stepping up efforts to stem the rise in these metabolic disorders in low- and middle-income countries could further accelerate improvements in cardiovascular mortality rates.

In high-income countries, reductions in cancers of the stomach, colon, breast and cervix have made small but important contributions to overall improvements in older women's life expectancy. These reductions were achieved through a mixture of prevention and treatment. Breast cancer mortality has declined despite an increase in disease incidence, which suggests that improved treatment was the driving factor behind the decline. On the other hand, the drop seen in recent decades in the incidence of cervical cancer<sup>38</sup> suggests improvements in prevention. These improvements are likely to have resulted from screening with the Papanicolaou (Pap) test.<sup>39</sup> Given the high incidence of cervical cancer in low-income countries and the likelihood that breast cancer incidence will increase in these countries owing to socioeconomic development and improved female longevity, health systems need to take prompt measures against these conditions too. In the case of cervical cancer, it makes sense to focus on strengthening the effective screening and preventive interventions; in the case of breast cancer, it may be more appropriate to focus on early detection and treatment.

Analyses of the causes of chronic obstructive pulmonary disease have identified smoking as a major contributor (responsible for around 40% of deaths from this condition), together with indoor air pollution from solid fuel cooking stoves (responsible for around 30% of deaths). Occupational exposures and outdoor air pollution have been found to contribute in smaller measure.<sup>19</sup>

In high-income countries, declining tobacco use among men has been a major driver of the increase in male life expectancy. Because women in high-income countries are at a later stage in the tobacco epidemic,<sup>40</sup> they have not experienced the same reduction in tobacco smoking, and the associated lowering of mortality, as men have in recent decades. In most developing countries, rates of tobacco smoking among women remains low.<sup>41,42</sup> If more women in those countries take up tobacco smoking, mortality among women over 50 years of age will increase.<sup>21</sup> Effective policies designed to discourage women from taking up tobacco smoking in low- and middle-income countries do exist, but they have not been sufficiently implemented.<sup>41</sup>

Fig. 7. Projections of global deaths from selected causes among women aged 50 years or older, 2010–2050



NCD, noncommunicable disease.

Finally, regardless of how avidly health systems promote prevention and early intervention, many older women will still develop noncommunicable diseases. These can lead to a loss of function and independence. In lower-income settings, innovative approaches to rehabilitation for stroke victims and others who experience functional decline are needed, together with measures to ensure that the family members who care for them do not become overwhelmed. Access to palliative care also needs to be improved so that people everywhere can die with dignity and without unnecessary pain. ■

#### Acknowledgements

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**Competing interests:** None declared.

#### ملخص

##### اتجاهات الوفيات العالمية وأنماطها لدى النساء المسنات

انخفضت، على ما يبدو، وفيات الأمراض القلبية الوعائية و(إلى حد أقل) السرطان لدى النساء المسنات في العقود الأخيرة، ونتج عن هذا الانخفاض تحسن متوسط العمر المأمول عند عمر 50 عاماً. وإذا استمرت هذه الاتجاهات، فسيظل من المتوقع ازدياد عدد الوفيات لدى النساء المسنات بسبب نمو السكان والشيخوخة. الاستنتاج من المتوقع أن تتسبب الأمراض غير السارية، وخاصة الأمراض القلبية الوعائية والسرطان، في ازدياد نسبة وفيات النساء في البلدان المنخفضة والمتوسطة الدخل وهو ما يُعزى إلى شيخوخة السكان والانخفاضات في وفيات الأطفال والأمهات. ويجب تعديل النظم الصحية وفقاً لذلك، وقد يكون ذلك عن طريق الاستفادة من دروس البلدان المرتفعة الدخل التي نجحت في خفض الوفيات الناجمة عن الأمراض غير السارية.

الغرض وصف أنماط الوفيات لدى النساء اللاتي تزيد أعمارهن عن 50 عاماً في ضوء النمو، الذي يتم ملاحظته في جميع البلدان تقريباً، في العدد المطلق للإناث في هذه الفئة العمرية وفي نسبة السكان الإناث التي تشكلها النساء المسنات.

الطريقة تم تحليل بيانات السجلات الوطنية للوفاة وتقديرات منظمة الصحة العالمية لمتوسط العمر المأمول وأسباب الوفاة لدى النساء اللاتي تزيد أعمارهن عن 50 عاماً. وتم كذلك إجراء توقعات للاتجاهات في الوفيات، حسب السبب، في الأعمار الأكبر سناً.

النتائج في البلدان المتقدمة والنامية على حد سواء، كانت الأسباب الرئيسية للوفاة بين النساء المسنات هي الأمراض القلبية الوعائية والسرطان. وفي البلدان التي يتوفر بها بيانات عن تسجيل الوفيات،

#### 摘要

##### 老年妇女的全球死亡率趋势和模式

**目的** 根据 50 岁以上年龄组妇女绝对数量以及由老年妇女组成的妇女人口所占比例的增长 (几乎所有国家中都看到这种增长), 说明此年龄组老年妇女的死亡率模式。

**方法** 对 50 岁以上妇女的国家死亡记录数据和世界卫生组织的预期寿命估计和死亡原因进行了分析。同时按原因对老年人的死亡率趋势做了预测。

**结果** 在发达国家和发展中国家, 老年妇女的主要死亡原因是心血管疾病和癌症。在有死亡登记数据的国家

中, 最近几十年心血管和 (在较小程度上) 癌症死亡率似乎有所下降, 这种下降提高了 50 岁人口的预期寿命。如果这种趋势保持下去, 由于人口增长和老龄化, 老年妇女的死亡数仍会有所增长。

**结论** 由于人口老龄化和儿童及孕产妇死亡率的降低, 预计在中低收入国家非传染性疾病 (尤其是心血管疾病和癌症) 导致妇女死亡所占比例会越来越大。卫生系统必须进行相应的调整, 也许可以借鉴成功降低非传染性疾病死亡率的高收入国家的经验。

## Résumé

### Tendances et modèles de la mortalité mondiale chez les femmes âgées

**Objectif** Décrire les modèles de mortalité chez les femmes âgées de plus de 50 ans, au vu de l'augmentation, observée dans presque tous les pays, du nombre absolu de femmes dans ce groupe d'âge et de la proportion de la population féminine composée de femmes âgées.

**Méthodes** Les données nationales de mortalité et les estimations de l'Organisation mondiale de la Santé sur l'espérance de vie et les causes de décès chez les femmes âgées de plus de 50 ans ont été analysées. Des projections des tendances de mortalité par cause ont également été réalisées à des âges avancés.

**Résultats** Dans les pays développés et en voie de développement, les principales causes de décès chez les femmes âgées étaient les maladies cardiovasculaires et les cancers. Dans les pays disposant de données d'enregistrement des décès, la mortalité due aux maladies cardiovasculaires et (dans une moindre mesure) aux cancers semble

avoir diminué chez les femmes âgées au cours des dernières décennies, et cette baisse a entraîné une amélioration de l'espérance de vie à 50 ans. Si ces tendances se maintiennent, les décès chez les femmes âgées sont encore susceptibles d'augmenter en nombre en raison de la croissance démographique et du vieillissement.

**Conclusion** Les maladies non transmissibles, notamment les maladies cardiovasculaires et les cancers, pourraient être à l'origine de la mort d'un nombre de plus en plus important de femmes dans les pays à revenu faible et moyen en raison du vieillissement de la population et de la réduction de la mortalité infantile et maternelle. Les systèmes de santé doivent s'adapter en conséquence, peut-être en tirant les leçons des pays à revenu élevé, qui ont réussi à réduire la mortalité due aux maladies non transmissibles.

## Резюме

### Глобальные тенденции и структура смертности среди пожилых женщин

**Цель** Описание структуры смертности среди женщин в возрасте старше 50 лет, в свете роста, наблюдаемого почти во всех странах в абсолютном количестве женщин этой возрастной группы и в пропорции части женского населения, которую составляют женщины пожилого возраста

**Методы** Были проанализированы данные национальных записей о смертях и расчеты средней продолжительности жизни, произведенные Всемирной организацией здравоохранения, а также случаи смерти женщин в возрасте старше 50 лет. Был произведен расчет предполагаемых показателей тенденций смертности с указанием причин смерти для пожилых людей.

**Результаты** Как в развитых, так и в развивающихся странах, основными причинами смертности среди пожилых женщин являются заболевания сердечно-сосудистой системы и рак. В странах, где ведется регистрация смертей, смертность от заболеваний сердечно-сосудистой системы и (в меньшей

мере) от рака снизилась среди пожилых женщин за последние десятилетия, и это снижение привело к увеличению вероятной средней продолжительности жизни для лиц старше 50 лет. Если эти тенденции сохранятся, ожидается, что смертность пожилых женщин в абсолютных числах все равно будет возрастать по причине увеличения старения населения.

**Вывод** Ожидается, что доля неинфекционных заболеваний, особенно заболеваний сердечно-сосудистой системы и рака среди причин смерти женщин будет увеличиваться в странах с низким и средним уровнем дохода, по причине старения населения и снижения уровня детской и материнской смертности. Системы здравоохранения должны соответствующим образом адаптировать свою деятельность, возможно, перенимая методы стран с более высоким уровнем дохода, которые успешно снижают уровень смертности от неинфекционных заболеваний.

## Resumen

### Las tendencias y los patrones de mortalidad mundial en las mujeres mayores

**Objetivo** Describir los patrones de mortalidad en las mujeres mayores de 50 años a la vista del crecimiento observado, en casi todos los países, tanto en el número total de mujeres de dicho grupo de edad como en la proporción de la población femenina de edad más avanzada.

**Métodos** Se analizaron los datos nacionales de los registros de defunción y las estimaciones de la Organización Mundial de la Salud sobre la esperanza de vida y las causas de muerte entre las mujeres mayores de 50 años. Asimismo, se hicieron pronósticos sobre las tendencias de la mortalidad en función de la causa en edades más avanzadas.

**Resultados** Tanto en los países desarrollados como en los países en desarrollo, las principales causas de muerte entre las mujeres mayores fueron las enfermedades cardiovasculares y el cáncer. En los países con datos del registro de defunciones, la mortalidad por cáncer y, en menor

medida, por enfermedades cardiovasculares parece haber disminuido en las mujeres mayores durante las últimas décadas. Esta disminución se ha traducido en una mejora de la esperanza de vida a los 50 años. Si estas tendencias continúan, se espera que el número de muertes en mujeres mayores aumente debido al crecimiento demográfico y al envejecimiento.

**Conclusión** Se espera que las enfermedades no transmisibles, especialmente las enfermedades cardiovasculares y el cáncer, aumenten la proporción de los fallecimientos entre las mujeres de países de ingresos bajos y medianos debido al envejecimiento de la población y a la reducción de muertes infantiles y maternas. En este sentido, es necesario adaptar los sistemas de salud, tal vez recurriendo a las lecciones de los países de ingresos altos que han tenido éxito en la reducción de la mortalidad por enfermedades no transmisibles.

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