Measurement of Healthy Life Expectancy and Wellbeing

World Health Organization, Geneva

Background

There is increasing interest in the accurate measurement of health, disability and wellbeing, especially in the context of declining mortality due to acute infectious diseases, ageing populations and greater prominence of chronic diseases. More countries are aiming to measure the health and wellbeing of their populations and track changes over time. For example, the EU recently set a target of gaining two healthy life years by 2020 in its member states.

The post 2015 development agenda is likely to be considerably broader than the Millennium Development Goals and have an agenda that includes not only social development, but also inclusive economic development, sustainable environmental development and security, pertaining to all countries, no matter what income group. Discussions on goals, measures and targets related to mortality, health and wellbeing have already started. Health is an essential measure of overall development since improved health is an outcome of economic, social and environmental policies, in addition to health policies specifically.

While life expectancy (LE) is an attractive summary measure of mortality rates at all ages there remain major mortality data gaps that need to be addressed, especially in low- and many middle-income countries. An even more useful indicator is healthy life expectancy (HLE) as it combines both fatal and non-fatal health outcomes in a single measure. As people around the world, including in low and middle income countries, continue to live longer, it is becoming increasingly important to address questions of the physical and mental health of these older adults over time. What is required is a conceptualisation of health that is not just the absence of a disease but full functioning capacity across the range of domains in everyday life. The measurement of this health state in an accurate and comparable manner over time is critical to this endeavour.

In parallel, there is increasing interest in measuring wellbeing of the population. The call for governments to focus on the well-being of its population as a means of measuring progress of societies (e.g. in the recent UN meeting on happiness) has meant that the science of well-being is now being mainstreamed in health and social policy. While health and self-reported wellbeing are intricately related they are not synonymous. The conceptualization and measurement of health will influence our understanding of the relationships between health and self-reported wellbeing cross-sectionally and over time.

These composite measures of healthy life expectancy and subjective well-being offer easily comparable ways to assess both levels, trends and determinants in population health and wellbeing. However, there are major measurement challenges that need to be addressed if countries have to institutionalize them within their respective health information systems.

This technical meeting, organized by the WHO Department of Health Statistics and Information Systems, was organized with the aim to bring together academics and representatives of
selected member states to present and discuss state-of-the-art approaches to measurement of health life expectancy and wellbeing to inform the debate on the post 2015 development goals and enhance the use of such measures in national and international health statistics.

**Objectives**

The meeting was organized with the following main objectives:

- Take stock of current approaches of the measurement of mortality, health and wellbeing
- Discuss the potential for comparative summary measures of mortality, health and wellbeing

The meeting was opened by Dr. Marie-Paule Kieny who reiterated that the monitoring of the health situation and trends, along with their determinants, in the member states of WHO was a core WHO function. There was a need to get agreement on some core indicators that would have appropriate data behind them and were measured according to agreed standards. These data, along with the analyses and synthesis, would form the basis of regularly reported statistics by WHO. She also mentioned that in the post 2015 Sustainable Development agenda discussions were currently under way of the role of health and there seemed to be general support for Universal Health Coverage as a goal with Health Life Expectancy as the top level indicator. It was important to consult with all stakeholders with regard to this and that is why this meeting was very central to this consultation process.

Dr. Ties Boerma echoed these sentiments and said that measuring these outcomes was key to placing health as an important part of the post 2015 agenda. Issues around equity and variations within and across countries needed to be understood better. There are big data gaps in the measurement of levels and causes of mortality and momentum needs to be gathered to fill these. The measurement of healthy life expectancy also posed considerable challenges and WHO would look to advice from this meeting with regard to this as well as with regard to the important area of avoidable mortality. The work being carried out by the Global Burden of Disease (GBD) project would be important as the project is updating estimates of healthy life expectancy. Additionally, survey based approaches that combine self-reported health status with performance tests and biomarkers, such as WHO’s Study on Global Ageing and Adult Health (SAGE), if harmonized could also provide important data for generating such summary measures. Furthermore, the current interest and progress in the measurement of Subjective Well Being in several countries, was an important development that needs to be closely followed. Thus, this was a very important meeting from WHO’s point of view and would inform its core function.

Dr. Elizabeth Blackburn set the stage for the meeting by emphasizing that it was understanding health outcomes in order to be able to predict them better and before advanced disease processes set in. It was also important to be able to prevent and presumptively treat illnesses. She presented her work related to the role of telomeres in health and disease. She illustrated this with several different strands of evidence that showed that telomere length is associated with healthy years of life and mortality with conditions such as cancer and heart disease. Telomere length was associated with smoking, physical activity, stress, depression and other social factors such as the neighbourhood environment. Shortening of telomere length could be reversed with interventions such as omega 3 and omega 6 fatty acids and exercise. She concluded that the measurement of health outcomes and their determinants, including factors
such as education and early life conditions, combined with biological measures such as telomeres, would be central to monitoring and understanding population health.

Dr. Joshua Salomon presented the work done by the GBD project with regard to the calculation of disability weights for different health conditions as well as the estimates for healthy life expectancy (HALE). He described the process that had been followed by the GBD project and the large amount of data that had been collected that underpin these estimates. He presented the consistency of the results obtained for the disability weights despite the wide variation in the range of participating countries and respondents. The comparison in trends in HALEs showed that over time HALE has increased less than LE suggesting that there is little evidence of a compression of morbidity. This factor combined with increasing LE has led to a loss of healthy life years. The major reason for the expansion of morbidity has been due to increases in disability associated with mental health and musculoskeletal conditions. Over the age of 50, for every year increase in LE there is only a gain of 0.6 years of HALE. With ageing populations these findings would have major implications for health systems. He pointed to some of the limitations of the study such as the limitations in data and the analytical methods which may have overestimated the consistency of these findings.

The work on estimation of levels of mortality and caused of death done by WHO was presented by Dr. Colin Mathers. He once again pointed to the limitations in the data available to WHO to estimate these outcomes. However, he presented evidence that suggested that life expectancy gains were continuing due to globalization, economic development, health systems strengthening and improved coverage of key interventions. However, there were still big differences between and within countries. The major causes of avoidable mortality in older adults are cardiovascular disease and cancers. He concluded that it should be a global priority to implement and strengthen vital registration and health information systems.

The next section of the meeting focussed on the measurement of health outcomes in surveys. Dr. Martin Prince presented data from the 10/66 group of studies that are population based cohorts in catchment areas in 9 countries. The measurement of health outcomes has used the WHO Disability Assessment Schedule (WHODAS) and the focus has been to develop a measure of dependence. He showed data that the WHODAS performs in a robust manner and can be used to compare the impact of a range of health conditions and the effect of interventions. It was a very strong predictor of dependence. He concluded that it was possible to measure disability in the population in a reliable and comparable manner and analytical strategies were available to address the problems faced due to the way health is distributed in the general population.

Dr. Jean Marie Robine presented the work being done in the European region to measure healthy life years over time and its links to the European Union’s target of increasing 2 years of healthy life by 2020. Several national and multi-country surveys in Europe use some summary question of overall health that can be used to monitor this trend. He showed data on their measure of Disability Free Life Expectancy that seems to be decreasing in Greece and Spain and has remained relatively flat in France. There remain significant differences between countries and between men and women suggesting that if the current trends continue several countries will not meet the target and variations between countries in the European Union would actually increase. The measurement of levels and distribution of health life years and strategies to address them on multiple fronts will be required to really monitor the health of the population.
This was followed by a set of presentations using data from WHO’s surveys. Dr. Boerma presented data from the World Health Survey showing consistent differences in health between men and women, with women being in worse health than men in almost all countries studied and across the lifespan. This is true for all the different measures of health: overall self-reported health, difficulties with day-to-day activities and a composite measure of functioning. This could not be attributed to survivor bias. The gap is smaller in high income European countries than in South Asia and Latin America. This gap seems to be due to some underlying biological factor and cannot be attributed only to reporting behaviour.

Dr. Somnath Chatterji presented data from SAGE from the six national surveys in China, Ghana, India, Mexico, Russia, and South Africa. Health declines with age in all these countries with China being in better health than in other countries in the study. Declines in mobility happen much more so with age in older adults as compared to worsening of sleep or problems in affect. While linear increases in activities of daily living occur with age, the increase is more pronounced after age 60. Health also declines much more rapidly in the oldest old after age 80. When examining domain specific declines, cognitive performance, for example also shows a linear decline with age in all countries in both men and women. Combining self-report data with measured performance and biomarkers may be the way forward. Drs. Wu Fan and Perianayagam Arokiasamy presented results from China and India respectively. Hypertension is a major problem in China with close to 60% of respondents being hypertensive. About 20% of women were overweight or obese. There was a systematic underreporting of chronic conditions. Stroke, Asthma, and Depression produced the most significant declines in health status. Data from Shanghai using biomarkers revealed that close to 11% of the population had diabetes as indicate by their fasting blood glucose levels. Glycoselated hemoglobin seems to be a more sensitive and specific measure for diagnosing diabetes early than fasting blood glucose levels. Nearly half the population had hyperlipidemia as assessed by total blood cholesterol and triglyceride levels. In India there is a systematic gradient in health as measured by the overall self-reported health, functioning, chronic diseases and measured outcomes such as the presence of hypertension, obstructive lung disease, poor nutrition and vision problems. These gradients are seen across education and wealth quintiles with the more disadvantaged being in worse health. In addition, gradients across age were much more marked in the poorer segment of the population.

The activities of the US Census Bureau and EUROSTAT with regard to measurement of health and well-being were presented by Drs. Wan He and Marleen de Smedt respectively. The US Census Bureau has a particular interest in the area of ageing and has produced several reports on this topic that have either been global or country specific. The US Census Bureau has also collaborated with WHO to produce a report from the SAGE surveys stressing the generation of new knowledge on ageing populations in low and middle income countries. Differences between China and India are striking in several health outcomes that will need to be understood better with future waves of data collection and improvement in measurement methods.

EUROSTAT has created a Sponsorship Group that presented a report to the European Statistical System that will inform the work of the Commission’s Statistical Work Programme. One of the key ingredients of this work will be the measurement of quality of life (QoL) and well-being with information available to decision makers in a timely manner. Data on QoL will be collected chiefly through the EU Statistics on Income & Living Conditions (EU-SILC) from household surveys and will be complemented through other data sources. Health will be measured using
the LE or possibly the HLE metric. Measurement will include mental health outcomes, (un)healthy behaviour and possibly access to health care. Subjective well-being, including the evaluative, affective and eudaimonic components, will also be measured in the EU SILC in an ad hoc module with the possibility of incorporating it into the core survey in the future along with the other dimensions of well-being.

The section on Subjective Well-Being (SWB) of the meeting comprised of presentations by Drs. Mick Power, Arthur Stone and Andrew Steptoe as well as a presentation by Carrie Exton on the work being done by the OECD in this area. Dr. Power stated that WHO's QOL group had developed the WHO Quality of Life (WHOQOL) instrument along with several special modules that have been used extensively in international studies, including those in the general and clinical populations. He suggested incorporating measures of flexibility and resilience while measuring SWB since that may be an important characteristic of individuals that may mediate the relationship between health and well-being.

Dr. Stone summarized the current state-of-the-art with regard to the measurement of SWB. While summary assessments at the end of the day are useful, better granularity is obtained with methods such as the Day Reconstruction Method or Experience Sampling combined with time use data in order to understand the process that underlies reporting of SWB. While such data from reports on SWB may be noisy they show consistent patterns. The field is growing rapidly and could have implications for policy as suggested by several national efforts to begin collecting this data.

Dr. Steptoe presented data showing the relationship between SWB and health. Results from the English Longitudinal Study of Ageing reveal increased risk of dying prematurely associated with poorer ‘enjoyment’ of life. These effects are more marked with the experience of positive affect even when depression has been controlled for. The measures of SWB are strongly correlated with biological markers such as salivary cortisol, blood pressure and heart rate. He suggested that there is a bidirectional relationship between SWB and health and that biological and behavioural pathways may mediate this relationship. He proposed that the measurement of SWB needs to be taken seriously within the health context.

Carrie Exton summarized the work of the OECD in the broader area of measuring well-being and more specifically with regard to SWB. The motivation for this work stems from the report of the Stiglitz Commission and the need to go beyond GDP as a measure of progress. She presented the OECD’s work on the Better Life Initiative that includes indicators for both objective and subjective well-being. For the latter, they are currently using the data from the Gallup World Poll in the 34 countries of the OECD to examine within and between country differences and to monitor trends over time. The intent is to engage the public and to address issues of possible cultural bias. The OECD guidelines for the measurement of SWB will be published in 2013. Improving the data for SWB, understanding individual differences and the influence of public policy, will continue to be a part of future work in this area for the OECD.

Discussion and Summary

The meeting agreed that against a background for a single high level health goal in the post 2015 agenda there was a need for one or a few high level indicator/s with clear targets that can be used to measure progress. This also needs to resonate with policy makers. Several activities in
the European Union following on from the Stiglitz report have led to the recognition of improving the Quality of Life of populations as being an important goal of countries. In addition, a goal of gaining 2 years of health life by 2020 has been agreed by the countries.

There are several candidate measures such as mortality, life expectancy, causes of death; HLE as estimated using an approach such as the GBD study; HLE estimated from population surveys that capture health status in reliable, valid and comparable manner; and a measure of QoL or SWB. Each of these approaches present their own challenges. Even in high income countries, there are delays of 2-3 years in producing estimates of LE from death registration data with this being suboptimal in low and middle income countries. Measurement of avoidable mortality tends to rely on assumptions of avoidability and a changing frontier poses additional difficulties.

Measuring HLE using an approach as used in the GBD is constrained by the lack of availability of data on prevalence of a range of conditions in addition to the mortality data. Estimation methods tend to overstate consistency. The disability weights that are a major input to quantify non-fatal health states and derived from surveys may often not match intuitive notions that experts have, e.g., the disability associated with profound mental retardation being higher than that for low back pain. An additional limitation of this approach is the inability to disaggregate information by socioeconomic stratifiers for monitoring equity.

The survey approach to measuring HLE is not without its own challenges. The comparison of self-reports across countries and population groups remains a challenge since systematic reporting biases need to be quantified and corrected for. Health examination surveys are still not extensively carried out in most countries. Even if high quality data were to become available, consensus needs to be built around the best way of examining the issue of compression in morbidity in populations over time.

Measurement of SWB, both the evaluative as well as the affective component, share many of the same problems as the measurement of the abovementioned health outcomes. While there is a growing interest in measuring SWB in large scale population surveys attempts have to be made to facilitate implementation on a large scale and to achieve consistency in the measurement approach across countries.

The meeting concluded that progress has been made towards measuring health and well-being outcomes and their determinants internationally. While further work needs to be undertaken to refine the measurement methodologies and estimation methods, in the interim countries should:

- Improve the completeness and quality of registration of deaths and their causes
- Implement regular health examination surveys with biomarkers
- Include short measures of SWB in their national surveys

The inclusion of HLE as a top level indicator for the post 2015 agenda is promising and efforts should continue to be made to refine the measurement methodology, specify the data requirements, provide a clear documentation of estimation approaches and demonstrate its utility for monitoring health goals.
# Monday, December 10 2012

## agenda

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<td>Marleen de Smedt, EUROSTAT</td>
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**Tuesday, December 11 2012**

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Measurement of Healthy Life Expectancy and Wellbeing

World Health Organization, Geneva

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