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DEMOGRAPHIC EVIDENCE FROM CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS, HEALTH INFORMATION SYSTEMS AND OTHER ADMINISTRATIVE DATA SOURCES, INCLUDING INSIGHTS PROVIDED BY HEALTH AND DEMOGRAPHIC SURVEILLANCE SITES

HEALTH SECTOR PERSPECTIVES[1]

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Demographic evidence from civil registration and vital statistics systems, health information systems and other administrative data sources, including insights provided by health and demographic surveillance sites: Health sector perspectives

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A. INTRODUCTION

This paper presents some lessons learnt about monitoring key health and demographic statistics since the establishment of the Millennium Development Goals (MDGs) and examines the implications of the Sustainable Development Goals (SDGs) for health and demographic monitoring. It focuses in particular, on the importance of civil registration and vital statistics (CRVS) systems and the strengths and limitations of routine health administrative data for monitoring progress towards health-related goals and targets.

Demographic data, specifically on births, deaths and population are essential for health monitoring, policy-making and programming, and disease surveillance. In particular, the health sector needs detailed information on mortality by age, sex, location and cause of death. In the MDGs era, the health focus was on maternal and child health and survival and on the prevention and management of infectious diseases, notably, HIV/AIDS, tuberculosis and malaria. Because of the fragmentation and perceived inadequacies of many country routine health information systems, tracking progress relied greatly on fertility and mortality data derived from household surveys and censuses. While surveys are valuable tools for monitoring intervention coverage, they are less effective when it comes to tracking relatively rare events, such as deaths by cause, because of sample size limitations and response bias. For global monitoring of mortality, development partners have tended to use estimates based on statistical modelling. However, these have numerous limitations, not the least of which are lack of ownership by country decision makers.

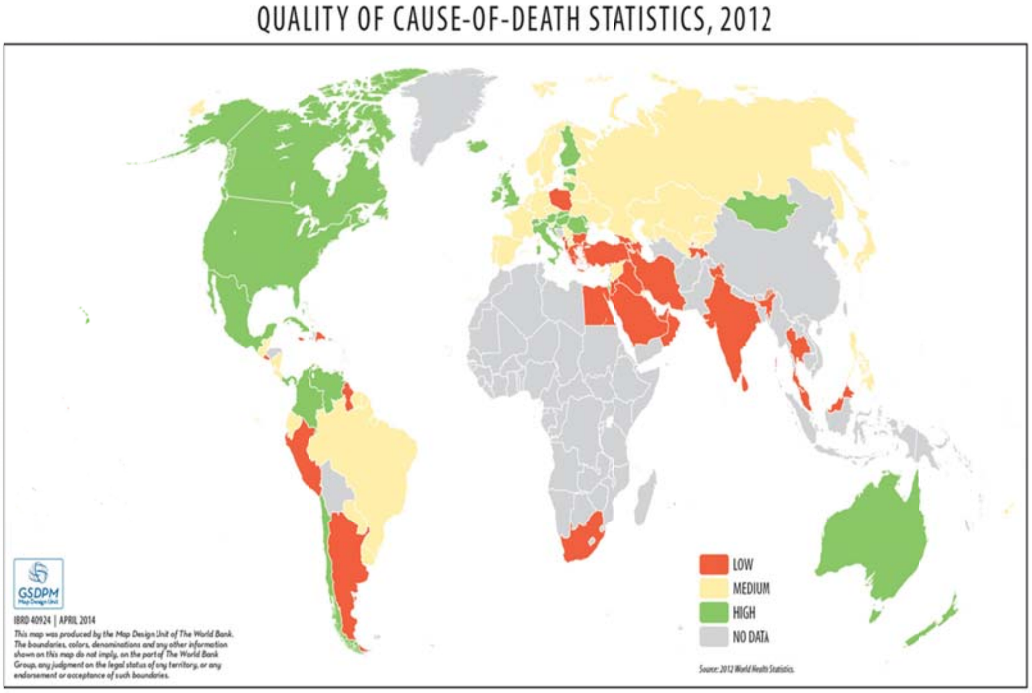
As the attention of the health and development community shifts towards the Sustainable Development Goals (SDGs) the need for reliable data on mortality by cause will increase, not only for monitoring child and maternal health, but also for tracking infectious disease mortality and the growing burden of disease due to noncommunicable diseases such as cancers, diabetes, and cardiovascular conditions. The most effective and sustainable solutions to these challenges is for the health sector to collaborate with the stakeholders of the CRVS system to ensure that all births and deaths are notified, registered and counted and that all deaths have a cause of death ascertained.

B. USES AND SOURCES OF DEMOGRAPHIC DATA FOR HEALTH

Demographic statistics provide the underpinning for epidemiology and public health analyses. Birth and death data are inputs to the calculation of key health and development indicators, including the infant mortality rate, the under-five mortality rate, and the maternal mortality ratio. Information on deaths, classified by various characteristics of the deceased, especially age and sex, is necessary for calculating life tables and estimating the probability of dying at various ages. These mortality statistics are essential for understanding the growth dynamics of the population; assessment of the human aspects of socioeconomic development; and measurement, for insurance and social security purposes, of the risks of dying for males and females at specific ages and from various causes.

The health sector draws on several data sources, namely, censuses, surveys, CRVS systems, health and demographic surveillance in selected or representative sample sites and routine administrative and clinical data from health facilities. The strengths and limitations of these sources for monitoring levels, trends and differentials in vital statistics are well documented.[1] A functional CRVS system can produce essential health intelligence on all-cause and cause-specific mortality on a continuous basis, for the whole country and its lowest administrative levels. However, in many low- and lower-middle income countries, CRVS are weak, especially for mortality. Two thirds of global deaths are not counted and only a quarter of the global population lives in countries where more than 90 per cent of births and deaths are registered (figure 1). Only 34 countries—representing 15 per cent of the world's population—produce high-quality cause-of-death data, and most are in Europe and the Americas. A further 85 countries—representing 65 per cent of the world's population—produce lower-quality cause-of-death data, while 74 countries lack such data altogether.[2]

Figure 1. WHO estimates of quality of cause-of-death statistics globally, 2012[3]



QUALITY OF CAUSE-OF-DEATH STATISTICS, 2012

IBRD 40924 | APRIL 2014

This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

Source: 2012 World Health Statistics.

C. THE HEALTH SECTOR AS A USER OF CRVS

A functional CRVS system can generate accurate, complete, timely and continuous information on numbers and location of births and deaths. In addition, where deaths are medically certified, the system can produce trend data on deaths by age, sex and cause of death (figure 2).

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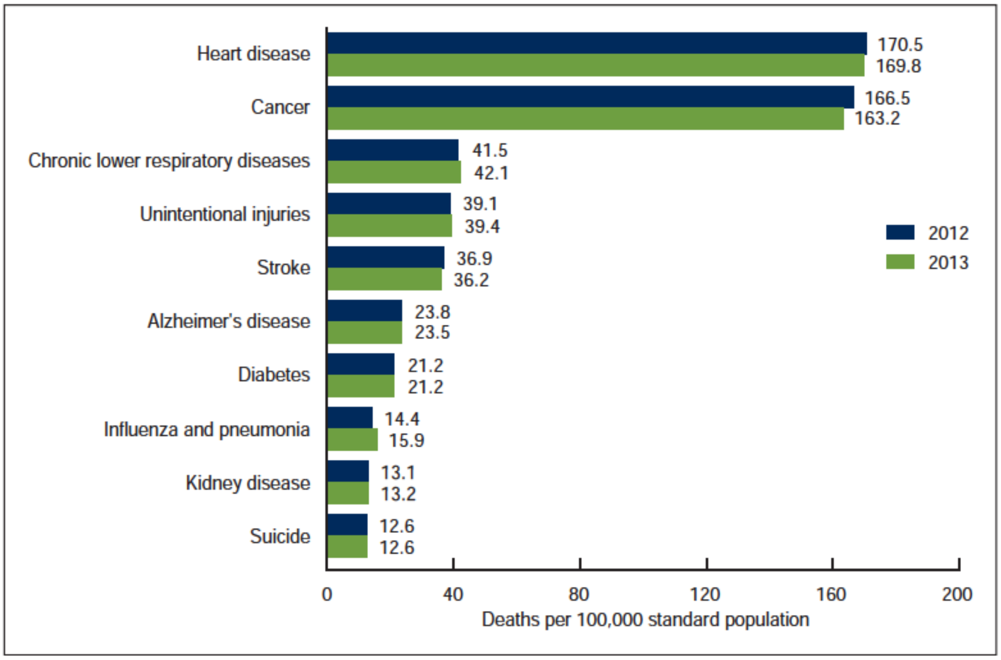
[1] AbouZahr C and others, "Towards universal civil registration and vital statistics systems: the time is now". *The Lancet,* vol. 386, No. 10001, p1407–1418, (3 October 2015). Available from The Lancet-D-14-00221 S0140-6736(15)60170-Publi

[2] World Health Organization. *World Health Statistics 2013* (Geneva, Switzerland, 2013).

[3] World Bank and World Health Organization, *Global Civil Registration and Vital Statistics Scaling up Investment Plan 2015–2024* (World Bank, WHO, May 28, 2014)

Figure 2. Age adjusted death rates for the 10 leading causes of death, United States of America, 2012 and 2013[4]



NOTES: Causes of death are ranked according to number of deaths. Access data table for Figure 3 at: http://www.cdc.gov/nchs/data/databriefs/db178_table.pdf#1.
SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

When coupled with socioeconomic and geospatial information, cause-of-death statistics can help identify populations at higher risk of mortality overall and from specific causes. Such information is invaluable for the assessment and monitoring of inequities in health status and for the planning of remedial interventions. Because registration data collection is continuous, mortality statistics can be made available in real time to permit public health surveillance of emerging mortality trends. Information on unusual patterns of deaths by age, sex and causes may suggest to public-health officials that there is a need for intervention (figure 3).

D. THE HEALTH SECTOR AS A CONTRIBUTOR TO CRVS

Not only is the health sector a major user of the data emanating from the civil registration system, it is also a contributor to the effective functioning of CRVS. Health authorities have a responsibility to notify the registration authorities of all vital events of which they are aware. In addition, the health sector provides important additional detailed information on births and deaths, including, for example, births by gestational age, birthweight, parity, maternal age, and other socioeconomic characteristics. With regard to deaths, the health sector has the main responsibility of providing information on cause of death through medical certification of deaths and statistical coding according to international standards.[5]

The health sector fulfils its role in CRVS through the information collected routinely at national, district and community levels. Data are collected both through the Health Management Information System (HMIS), the national disease surveillance system (for diseases notifiable under the International

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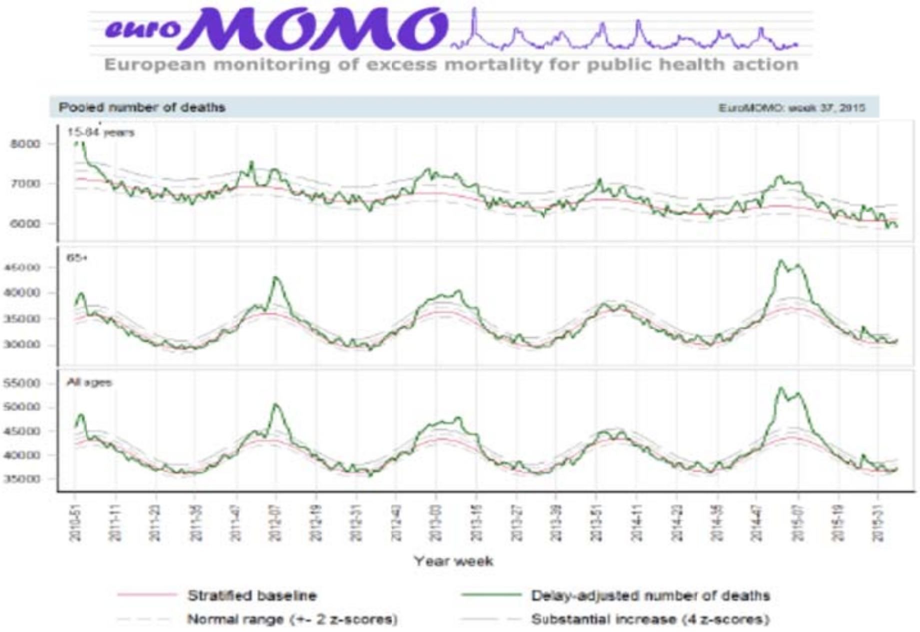
[4] Kochanek KD and others, "Mortality in the United States, 2013". *National Center for Health Statistics Data Brief* No 178 (December 2014). Available from http://www.cdc.gov/nchs/data/databriefs/db178.pdf.

[5] World Health Organization International, *Statistical Classification of Diseases and Related Health Problems, 10th Revision*. (Geneva, World Health Organization, 2014). Available from http://www.who.int/classifications/icd/en/.

Health Regulations, IHR)[6], and through disease-specific programmes, for example, that address HIV/AIDS, tuberculosis, malaria and maternal and child health. Although designed primarily for patient and health facility management rather than for statistical purposes, these data are a potentially rich source of information for compiling many health indicators, including the MDG and SDG indicators. The advantage of the data from the HMIS is that they are collected frequently—often continuously—and generally at lower cost compared to special data collection efforts such as surveys. They can be also presented at various levels of disaggregation, such as by geographical location, even at the lowest administrative levels of the health system such as the district, which is increasingly the locus for health sector programming and resource allocation.

Figure 3. Real-time weekly reporting of deaths by age group in Europe[7]



Source: http://www.euromomo.eu/bulletin_pdf/2015/2015_37_bulletin.pdf

Conversely, health administrative data suffer from a number of weaknesses and biases that reduce their utility when it comes to constructing demographic indicators. These include incomplete coverage, biased reporting, misclassifications, transcription errors and other data quality issues. A major concern is that the data collected relate only to users of health services and cannot be considered representative of the population as a whole. In some settings, HMIS data collection and analysis is limited to the public facilities and non-profit NGO services. Data from private, for profit health facilities and from services such as those for military personnel are often excluded from the HMIS.

The calculation of population-based indicators from administrative systems can be problematic due to lack of reliable and accurate denominator data (live births, relevant population by age and sex). Although it is possible to estimate total population using intercensal projections, these are often unreliable, especially at subnational level, due to migration. These limitations have led many donors and development partners to prioritise support to the implementation of household surveys in order to

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[6] http://www.who.int/ihr/about/en/.

[7] Mortality monitoring in Europe http://www.euromomo.eu.

generate key health and demographic indicators, especially for monitoring the MDGs. These have many advantages but also some limitations, as discussed in the following section.

E. LESSONS LEARNT FROM MONITORING THE HEALTH-RELATED MDGS

Three of the eight MDGs—MDG4, reduce child mortality; MDG5, improve maternal health; and MDG6, combat HIV/AIDS, malaria and other diseases—focused on health, while health was also a component of several other MDGs (nutrition, water and sanitation). The eight MDGs have 21 targets, monitored by 60 indicators of which 22 are health-related. Annual progress reports have been produced by the Inter-agency and Expert Group (IAEG) on MDG Indicators, coordinated by the United Nations Statistics Division and based on the contributions of technical agencies.[8] The World Health Organization (WHO) has conducted annual reviews of progress since 2009, based on a report prepared by the Secretariat derived from WHO's annual statistical overview and the WHO global health observatory.[9] [10]

The momentum behind the establishment of the MDGs was not accompanied by support to strengthen the country health information and statistical systems. Some commentators argued that the set of MDG indicators, the measurement strategies, and the implementation of the health-related indicators, were uniformly poor.[11] An analysis in 2007 estimated data availability for developing countries overall at 15 per cent. The situation has improved since that assessment, particularly with regard to data on child mortality, intervention coverage and household/individual behaviours.[12] While in 2003, only 2 per cent of developing countries had at least two data points for 16 or more of the 22 indicators, by 2014 this figure had reached 79 per cent. These improvements are almost entirely due to the widespread and repeated application of household surveys, in particular the USAID-supported Demographic and Health Surveys (DHS)[13] and the UNICEF-supported Multiple Indicator Cluster Surveys (MICS).[14] The success of household surveys for tracking progress towards intervention coverage indicators stimulated their use for monitoring progress towards mortality indicators as well.[15, 16] Survey instruments are less effective when it comes to tracking demographic events that are relatively rare—such as deaths—than they are for monitoring high frequency events such as births and immunisation. Different instruments tend to generate mortality estimates with wide margins of uncertainty, reducing their utility for monitoring purposes (figure 4). Dependence on surveys that require expensive financial and technical assistance to implement has tended to diminish the incentives to national authorities to invest in civil registration or other routine administrative systems.[17]

The paucity of empirical mortality data in many settings has led to the development of statistical models to impute missing values, address bias and quality problems in available country data, and ensure

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[8] United Nations. *The Millennium Development Goals Report. 2015*, (New York, 2015). Available from http://unstats.un.org/unsd/mdg/News.aspx?ArticleId=84.

[9] Updated from World Health Organization, *World Health Statistics 2015*, (Geneva. 2015). http://www.who.int/gho/publications/world_health_statistics/en/.

[10] http://www.who.int/gho/en/.

[11] Murray CLJ, "Towards good practice for health statistics: Lessons from the Millennium Development Goal health indicators", *Lancet*, vol. 369, pp.862–73, (2007).

[12] United Nations. *The Millennium Development Goals Report. 2015*. (New York. 2015).

[13] https://www.usaid.gov/what-we-do/global-health/cross-cutting-areas/demographic-and-health-surveys-program.

[14] http://www.unicef.org/statistics/index_24302.html.

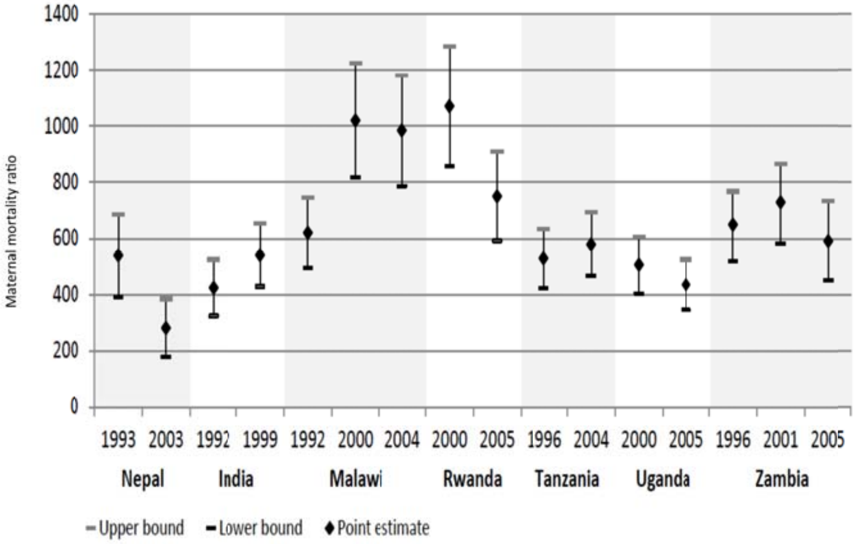
[15] World Health Organization, *State of Inequality: Reproductive, Maternal, Newborn and Child Health*, (Geneva. 2015). Available from http://www.who.int/gho/health_equity/report_2015/en/

[16] Barros, A.J.D. and C.G. Victora, "Measuring Coverage in MNCH: Determining and Interpreting Inequalities in Coverage of Maternal, Newborn, and Child Health Interventions", *PLoS Med*, vol. 10, No. 5 (2013). Available from http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001390.

[17] Setel and others, on behalf of the Monitoring of Vital Events (MoVE) writing group. Who Counts? 1. A scandal of invisibility: making everyone count by counting everyone. *The Lancet*, vol. 370 No. 9598, pp. 1569–1577 (2007 Available from http://www.who.int/healthinfo/statistics/WhoCounts1.pdf.

comparability over time and across countries.[18, 19] However, concerns have been expressed that the international estimates are not accurate reflections of country progress and that the focus by donors on cross-country comparability tends to undermine confidence in locally available data.[20] It is, therefore, essential to direct increased resources and technical support to strengthening country health information and statistical systems and to build analytical capacities in countries in order to maximise the utility of available data.[21, 22] This is a key issue as perspectives of the global health and development community shift from the MDGs to the SDGs.

Figure 4. Confidence intervals for estimated values of maternal mortality produced from selected household surveys[23]



F. CHALLENGES OF MONITORING THE HEALTH-RELATED SDGS

In September 2015, the United Nations General Assembly adopted the new development agenda including the Sustainable Development Goals (SDGs).[24] In the SDG framework, health is goal 3 of 17 goals—*Ensure healthy lives and promote wellbeing for all at all ages*, and is associated with 13 targets out of 169 in the SDG framework (box 1). As well as incorporating the MDG health-related goals and

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[18] The PLoS Medicine Editors (2010) Can We Count on Global Health Estimates? PLoS Med 7(11): e1001002. doi:10.1371/journal.pmed.1001002.

[19] Mokdad AH (2015) Better data for better health: The role of the Institute for Health Metrics and Evaluation. Presentation to the WHO technical meeting in Glion 24-25 June 2015.

[20] World Health Organization. “The utility of estimates for health monitoring and decision-making: global, regional and country perspectives. Report of a technical meeting”, *Glion sur Montreux, Switzerland 24–25 June 2015* WHO/HIS/HSI/2015.7 (2015).

[21] Chan, M. and others. “Meeting the Demand for Results and Accountability: A call for Action on Health Data from Eight Global Health Agencies”, *PLoS Medicine*, vol. 7 No. 1, pp. 1–4 (2010). . Available from *PLoS Medicine;* 7 1 1–4doi:10.1371/journal.pmed.1000223.

[22] AbouZahr, C. “Making sense of maternal mortality estimates”. Working Paper No. 11. University of Queensland School of Population Health, Health Information Systems Knowledge Hub, Brisbane, Australia (2010). Retrieved 22 August 2012 from: http://www.uq.edu.au/hishub/all-publications.

[23] AbouZahr, C. “Making sense of maternal mortality estimates”. Working Paper No. 11. University of Queensland School of Population Health, Health Information Systems Knowledge Hub, Brisbane, Australia (2010). Retrieved 22 August 2012 from: http://www.uq.edu.au/hishub/all-publications.

[24] United Nations.Transforming our world: the 2030 agenda for sustainable development. Finalised text for adoption by UN General Assembly September 25-27 2015 (version 1 August).Available fromhttps://sustainabledevelopment.un.org/content/documents/7891TRANSFORMING %20OUR% 20WORLD.pdf.

updated targets, the health SDG includes new targets on noncommunicable diseases (NCDs), mental health, substance abuse, injuries, health impact from hazardous chemicals, water and soil pollution and contamination, and tobacco control. In addition, there are health-related elements included in several of the non-health SDG goals and targets.[25]

For monitoring progress towards the overarching high-level health goal, *"Ensure healthy lives and promote wellbeing for all at all ages"*, the World Health Organization (WHO) has considered several summary indicators, including life expectancy, premature mortality (before age 70 years) and healthy life expectancy.[26] If it could be measured reliably, *healthy life expectancy* would be a suitable single indicator that captures both mortality and years of life lived in less than good health (i.e. with a disability).[27] [28] However, challenges remain with regard to the availability of data on population level functional status that are comparable over time and across population collected through regular surveys.[29] Notwithstanding the current limitations in country statistical systems, mortality remains more amenable to accurate measurement than morbidity.

Life expectancy is an attractive indicator for monitoring the overall health goal 3. It is a summary measure of mortality rates at all ages, to which all health and health-related programmes contribute, as do many of the underlying determinants of health such as socioeconomic and environmental conditions. Consideration is also being given to a measure of *premature mortality* with a target of reducing the number of deaths before age 70 by 40 per cent by 2030 globally and in every country.[30] This would allow countries at different stages of development to focus their efforts on the relevant priorities for their situation.

Box 1. Targets associated with SDG 3 "Ensure healthy lives and promote wellbeing for all at all ages" (*mortality target in italics*)

1. *By 2030, reduce the global* ***maternal mortality*** *ratio to less than 70 per 100,000 live births*
2. *By 2030, end preventable deaths of* ***newborns and children under 5 years*** *of age*
3. *By 2030, end the epidemics of* ***AIDS, tuberculosis, malaria and neglected tropical diseases*** *and combat* ***hepatitis, water-borne diseases and other communicable diseases***
4. *By 2030, reduce by one third premature mortality from n****on-communicable diseases*** through prevention and treatment and promote **mental health** and well-being
5. Strengthen the prevention and treatment of **substance abuse**, including narcotic drug abuse and harmful use of alcohol
6. *By 2020, halve the number of global deaths and injuries from* ***road traffic accidents***
7. By 2030, ensure universal access to **sexual and reproductive health-care services,** including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
8. Achieve **universal health coverage**, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
9. *By 2030, substantially reduce the number of deaths and illnesses from* ***hazardous chemicals and air, water and soil pollution and contamination.***

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[25] United Nations. "Transforming our world: the 2030 agenda for sustainable development". Finalised text for adoption by UN General Assembly September 25-27 2015 (version 1 August 2015).

[26] The World Health Orgamization has organized two technical meetings to assess different options for high-level outcome measures of health. Post-2015 health outcome measures. Technical meeting, WHO, Geneva, 11-12 December 2014. Measurement of Healthy Life Expectancy and Wellbeing. Geneva, 10-11 December 2012. http://www.who.int/healthinfo/sage/meeting_reports/en/ .

[27] http://ec.europa.eu/health/europe_2020_en.htm.

[28] http://www.eurohex.eu/. Includes Joint Action: European Health & Life Expectancy Information System.

[29] The World Health Organization. "An overarching health indicator for the Post-2015 Development Agenda". Brief summary of some proposed candidate indicators (December 2014).

[30] Norheim, OF and others. "Avoiding 40 per cent of the premature deaths in each country, 2010- 30: review of national mortality trends to help quantify the United Nations Sustainable Development Goal for health". *Lancet*, No. 385 pp. 239-252 (2015).

In addition, several disease-specific mortality indicators are under discussion for monitoring the individual health targets (box 2). Monitoring cause-specific mortality indicators requires the capacities and skills to implement the international standards for cause of death information, the International Classification of Diseases (ICD).[31] However, in most developing countries, physicians able to correctly certify cause of death are in short supply and poorly distributed. Moreover, most people die at home rather than in a health facility.[32] Work is currently under way to promote the routine implementation of verbal autopsy techniques in such settings. Verbal autopsy involves interviews with family members and care-givers of the decedent, along with examination of medical records where available, in order to come up with a probable cause of death.[33] Although verbal autopsy cannot match the exactitude of medical certification of cause of death at the individual level, it can produce cause-specific mortality fractions at the population level, thus improving the evidence base for public health decision-making.[34]

Box 2. Disease-specific mortality indicators proposed for monitoring the SDG health targets (Sept 2015)

- Maternal deaths per 100,000 live births
- Under-five mortality per 1,000 live births
- Neonatal mortality per 1,000 live births
- HIV deaths per 100,000 population
- TB deaths per 100,000 population
- Malaria deaths per 100,000 population
- Probability of dying of cardiovascular disease, cancer, chronic respiratory disease or diabetes at ages 30-70
- Suicide-related mortality per 100,000 population
- Number of deaths due to road traffic accidents

The SDG framework requires that indictors be disaggregated to enable tracking of inequities (SDG10). This implies that the fertility and mortality indicators should be capable of disaggregation across multiple stratifiers, including geography, socioeconomic status, ethnicity and others. Whereas household surveys are useful vehicles for generating service coverage indicators by key socioeconomic stratifiers, they are less appropriate for producing disaggregated mortality statistics due to sample size limitations. This reinforces the need for administrative data sources that include complete counts of events rather than samples.

G. THE WAY FORWARD

Monitoring the health-related SDGs will be challenging, especially for all-cause and cause-specific mortality targets, and will crucially depend on the availability of comprehensive CRVS systems and well functioning routine health information systems. The UN has defined principles and standards for CRVS[35]; the challenge is how to operationalize these standards in countries where resources are limited. Simplifying the process and providing a vital event registration service within existing structures with

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[31] World Health Organization. International Statistical Classification of Diseases and Related Health Problems, 10th Revision. Geneva, World Health Organization (2010). Available from http://www.who.int/classifications/icd/en/.

[32] World Health Organization. “Outlining strategies for implementing the International Classification of Diseases in Africa”. Workshop report (2015). Available from WHO/HIS/HSI/2014.3. http://www.who.int/healthinfo/civil_registration/ ICDinAfrica_WorkshopReport_August 2014.pdf?ua=1.

[33] World Health Organization. Available fromhttp://www.who.int/healthinfo/statistics/verbalautopsystandards/.

[34] Murray. CJL and others. “Using verbal autopsy to measure causes of death: the comparative performance of existing methods”. *BMC Medicine*, (2014; 12: 5).

[35] United Nations Department of Economic and Social Affairs UN Principles and Recommendations for a Vital Statistics System Revision 3 (2014). Available from http://unstats.un.org/unsd/demographic/standmeth/principles/default.htm.

which people interact—for example, health facilities—can dramatically increase registration coverage. Well-functioning ICT infrastructure at the level where services are provided, including a reliable power source, internet, and cell phone coverage, can provide the enabling environment for developing local information and modern CRVS systems. Experience is growing with innovative solutions such as electronic registries, mobile applications, open source and integrated ICT solutions, electronic coding, and verbal autopsy tools. It is time to explore the potential of social media as a source of information about the occurrence of vital events.

Given the many institutions and government departments responsible for different aspects of CRVS, national coordination and oversight mechanisms are needed that include representatives from the civil registration office, ministry of health, national statistics office, local government, justice and planning authorities and government departments responsible for collecting or using vital statistics. Other important stakeholders include community actors, NGOs, local chiefs, burial authorities, and faith leaders.[36, 37]

Countries that have made gains or that have functioning systems, use a variety of mechanisms to improve registration of births and deaths, and recording of causes of death:

- **Birth Registration** can be linked to health service delivery, particularly maternity care, postpartum care and child health services including immunization.[38] Innovative technologies can play a key role, such as short messaging services (SMS) for early notification of birth, and mobile outreach registration units to cover remote areas and establishing seasonal offices for registration in areas with extreme weather conditions. The backlog of unregistered children can be reduced through requiring registration at schools, while ensuring that the absence of a birth certificate does not impede the enjoyment of rights such as education or health care.
- **Death registration** can be improved through better reporting of deaths by health facilities, collaboration with religious and mortuary officials, and enforcement of public health legislation on the disposal of bodies. Information on deaths that occur in health facilities should be immediately sent to the civil registration authorities along with relevant key characteristics such as age, sex, date, geographic location, place (home/hospital) and cause of death. Completeness can be improved by requiring death certificates for burial, as well as for claiming hereditary and property rights and social insurance benefits.
- **Cause of death registration** requires building knowledge and skills for the accurate certification of cause of death and statistical coding according to the International Classification of Diseases (ICD) standards. Collaboration between registration authorities and the health sector is required to apply verbal autopsy appropriately in settings where medical certification of all deaths is not feasible.[39] This includes some settings where there may be areas with high completeness of death registration by age and sex, for example in urban areas, but limited data on causes of death.[40]

In order to better understand evolving patterns of mortality, some countries have set up

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[36] For information about the use of health data in a functioning system, see the diagram on data collection in ABS Causes of Death Explanatory notes, cat 3303.0.

[37] Using innovative approaches in the health sector to strengthen and modernize civil and vital statistics (CRVS) systems: guiding principles and good practices. Report of a technical meeting sponsored by WHO with Canada, UNICEF, USAID and the World Bank, Geneva, 17–18 December 2013

[38] PAHO 2012, vol. XXXIV

[39] Verbal autopsy standards: The 2012 WHO verbal autopsy instrument. WHO

[40] . *Improving Mortality Statistics Through Civil Registration And Vital Statistics Systems. Strategies for Country And Partner Support* World Health Organization (2014). Available from http://www.who.int/healthinfo/civil_registration/CRVS_MortalityStats_Guidance_Nov2014 .pdf?ua=1.

demographic surveillance systems to track all births and deaths in representative sample districts. Verbal autopsy is used to ascertain the distribution of causes of death at the population level. Examples of this approach include the Disease Surveillance Point (DSP) system in China, the Sample Registration System (SRS) in India and the use of sample vital registration with verbal autopsy (SAVVY) in the United Republic of Tanzania and Zambia.[41] In the past, these systems have functioned separately from CRVS but there is increasing interest in forging links with the civil registration system. This would ensure both the rapid production of nationally representative birth, death and cause of death statistics, while also building the capacities needed for a comprehensive CRVS system in the longer term.

H. CONCLUSIONS

The demand for reliable and timely demographic and health statistics will increase significantly in the post-2015 era. The CRVS system offers the most effective and efficient platform for generating the data needed for SDG monitoring, policy and planning but cannot be established or strengthened overnight. In the interim, birth, death and cause-of-death data should continue to be generated from a range of data sources—surveys, censuses, sentinel and sample registration systems, and health facilities—while ensuring optimal integration with CRVS systems. Drawing on data from multiple sources implies the need to build country capacities to analyse and reconcile statistics from different sources.

Internationally, a number of regional initiatives are supporting countries in Asia, Africa, Middle East and Latin America, seeking to strengthen CRVS. These initiatives, particularly in Africa[42] and Asia[43] can play important roles in mobilising political will and high-level commitment—including domestic resource allocation—and improving cross-sectoral coordination across responsible line ministries and sharing of knowledge.[44]

This paper has focused on the role of CRVS in generating demographic statistics but CRVS systems are also central to the SDG theme “leave no-one behind”. Civil registration provides people with legal evidence of birth and family relations, thus facilitating claims to nationality and access to social protection, and enabling individuals to exercise their social, political and economic rights.[45] The growing interest in national identity and biometric systems—often driven by demands for security, management of elections and targeting of benefits—provides an additional reason to focus on CRVS systems, which are foundational to identity systems, providing documentary evidence of identity from birth and enabling the continuous updating of identity databases with information on deaths.[46]

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[41] Mudenda, S.S.and others. “Feasibility of using a World Health Organization-standard methodology for Sample Vital Registration with Verbal Autopsy (SAVVY) to report leading causes of death in Zambia: results of a pilot in four provinces (2010)”, *Population Health Metrics*, vol. 9, No. 40. doi:10.1186/1478-7954-9-40. Retrieved 22 August 2012 from: http://www.pophealthmetrics.com/content/9/1/40/

[42] Conference of African Ministers responsible for Civil Registration. http://www.uneca.org/crmc2

[43] http://getinthepicture.org/docs/E.ESCAP.MCCRVS.L3.Ministerial%20Declaration.English.pdf

[44] *Global civil registration and vital statistics: Scaling–up investment plan 2014-2025*. (2014) World Bank and World Health Organization. Available from http://www.worldbank.org/content/dam/Worldbank/document/HDN/Health/CRVS%20Scaling-up%20plan%20final%205-28-14web.pdf

[45] *Every Child’s Birth Right; inequities and trends in birth registration* (United Nations Children Fund) Available from http://www.unicef.org /media/files/Embargoed_11_Dec_Birth_Registration_report_low_res.pdf.

[46] Government of Korea, Proceedings of the International Identity Management Conference Seoul, Korea September 23–25, 2014. ADB, IADB, IDB. https://publications.iadb.org/bitstream/handle/11319/7125/International_Identity_Management_Conference_Proceedings.pdf?sequence=4