Research

Counting the dead and what they died from: an assessment of the global status of cause of death data

Colin D. Mathers,[1] Doris Ma Fat,[1] Mie Inoue,[1] Chalapati Rao,[2] & Alan D. Lopez[2]

Objective We sought to assess the current status of global data on death registration and to examine several indicators of data completeness and quality.

Methods We summarized the availability of death registration data by year and country. Indicators of data quality were assessed for each country and included the timeliness, completeness and coverage of registration and the proportion of deaths assigned to ill-defined causes.

Findings At the end of 2003 data on death registration were available from 115 countries, although they were essentially complete for only 64 countries. Coverage of death registration varies from close to 100% in the WHO European Region to less than 10% in the African Region. Only 23 countries have data that are more than 90% complete, where ill-defined causes account for less than 10% of total of causes of death, and where ICD–9 or ICD–10 codes are used. There are 28 countries where less than 70% of the data are complete or where ill-defined codes are assigned to more than 20% of deaths. Twelve high-income countries in western Europe are included among the 55 countries with intermediate-quality data.

Conclusion Few countries have good-quality data on mortality that can be used to adequately support policy development and implementation. There is an urgent need for countries to implement death registration systems, even if only through sample registration, or enhance their existing systems in order to rapidly improve knowledge about the most basic of health statistics: who dies from what?

Keywords Mortality; Cause of death; Data collection/standards; Registries/standards; Vital statistics (*source: MeSH, NLM*).

Mots clés Mortalité; Cause décès; Collecte données/normes; Registre/normes; Statistique démographique (*source: MeSH, INSERM*).

Palabras clave Mortalidad; Causa de muerte; Recolección de datos/normas; Registros/normas; Estadísticas vitales (*fuente: DeCS, BIREME*).

الكلمات المفتاحية: معدل الوفيات، سبب الوفاة، جمع المعطيات، معايير جمع المعطيات، معايير السجلات، إحصاءات الأحوال المدنية (المصدر: رؤوس الموضوعات الطبية – المكتب الإقليمي لشرق المتوسط)

Bulletin of the World Health Organization 2005;83:171-177.

Introduction

Policies and programmes to combat diseases and injuries should properly be based on current, timely information about the nature and extent of health problems, their determinants, and how the impact of such diseases and injuries is changing, both with respect to magnitude and distribution in populations. Where programmes to improve health are in place, they need to be routinely monitored and evaluated to ensure that their objectives and targets are being met. Equally, priorities for health research should, in part at least, be based on a thorough assessment of the relative importance of various diseases and injuries affecting the population's health. Undoubtedly the most widely available and commonly used data for meeting these needs, and related needs for health policy, are statistics on the number of people who die, by age and sex, and on the causes of those deaths, classified according to a standard set of medical criteria. Almost all countries have legislation that establishes vital registration systems to collect and collate statistics on who dies from what cause. Yet the utility of the data generated from these systems for meeting basic health policy purposes varies substantially from country to country. Indeed, such systems are still inoperative for a large proportion of the world's population, especially in countries with high burdens of disease.

Editorials have drawn attention to the lack of information on causes of death in many developing countries and the urgent need for WHO and other international health agencies to take a lead in redressing this situation (*1*). Indeed, the Director-General of WHO has stated that one of his priorities is the strengthening of vital statistics registration systems (*2*).

Over the past four years, WHO has intensified efforts to support the collection of vital registration information and other mortality data in developing countries. The number of

countries reporting data on recent death registrations to WHO annually has increased from around 65 in 1970, and 90 in 1999, to 115 in 2003. In addition, information from sample registration systems, population studies and epidemiological analyses of specific conditions have been used to improve estimates of patterns of causes of death.

This paper reviews the status of global death registration data as supplied to WHO by Member States and examines several indicators of data quality. Such a review is timely. These data form the cornerstone of analyses of the health situation and disease burden in countries and are a critical input into building the evidence base for health policies and programmes.

Methods

Death registration data supplied to WHO were analysed to determine the extent to which death registration systems cover deaths occurring in the six WHO regions, to summarize the timeliness of available data, and to examine indicators of data quality including completeness of registration, the coding system used for causes of death, and the proportion of deaths coded to various ill-defined categories.

Completeness

Considerable differences exist in the degree of completeness of the vital registration data submitted by countries. In some cases, the vital registration system functions only for part of the country (for example, only in urban areas or some provinces). In other countries, although the registration system attempts to cover the whole country, not all deaths are registered. The proportion of all adult deaths that is registered for the population covered by the vital registration system (referred to as "completeness") has been estimated separately for each sex using standard demographic methods (3) for those Member States submitting data. The completeness of information on deaths occurring among infants and children may be lower in countries with incomplete death registration and can only be qualitatively assessed by comparing childhood mortality as calculated from the vital registration system with estimates derived from censuses and surveys (3).

Each Member State also routinely reports population data for the population covered by the death registration system, which in some cases is a subset of the national population. Death registration data may be complete for the population specified but may not cover the entire population resident in the country. Additionally, the completeness of death registration may be less than 100% for the specified population. Registration of vital events is often less complete in rural areas than in cities and, in general, may be worse in areas with poor living conditions.

Coverage

Coverage of the resident population by death registration data may be less than 100% not only because some geographical areas may be excluded but also because in some cases registration may be restricted to a subset of the resident population, such as citizens or permanent or legal residents, and may thus exclude deaths among groups such as guest workers or refugees. For our study, coverage was calculated by dividing the total number of deaths reported for a country–year by the total number of deaths occurring among the resident population as estimated for that year by WHO. The total number of estimated deaths for the resident population was calculated by applying best estimates of death rates by age and sex (3), which had been calculated from the reported deaths and reported population and adjusted for incompleteness, to the estimates of the resident population taken from the UN Population Division's 2002 revision (4). WHO-estimated coverage for a Member State may be less than 100% due to incompleteness of registration, the fact that only some parts of the resident population are covered, or to differences between the vital registration population and the UN's estimate of the population. Coverage levels above 100% may occur due to small discrepancies between UN and national population estimates; these were rounded to 100%.

Quality of information on causes of death

The comparability of worldwide cause of death data has been facilitated through the development and successive revisions of the *International statistical classification of diseases and related health problems* (known as ICD). The 10th revision of the ICD came into effect in 1993 (5). Although each revision has produced some discontinuities in cause of death data, the revision from ICD–9 to ICD–10 has resulted in more substantial changes than previous revisions. ICD–10 has considerably greater detail than ICD–9 (with almost twice the number of codes) and includes both conceptual and classification revisions as well as changes in the coding rules used to select the underlying cause of death. Additional problems in comparing data on causes of death across countries arise from variations in the accuracy of diagnosing causes of death.

In most developed countries, the underlying cause of death is certified by a medical practitioner although the practitioner may not always have had prior contact with the deceased or access to relevant medical records. In developing countries, a significant proportion of deaths may occur without medical attention, and they may be registered without a medical opinion about the cause of death. In both developing and developed countries, legal, societal and other reasons may lead to the underreporting of causes of a sensitive nature, such as suicide or HIV/AIDS (6, 7). Furthermore, the selection of a single underlying cause of death is frequently problematic in elderly people, who often have had several chronic diseases that concurrently led to death.

Even in countries where causes are assigned by medically qualified staff, there is often substantial use of coding categories for unknown and ill-defined causes (6, 8). The proportion of deaths assigned to the ICD codes for "symptoms, signs, and ill-defined conditions" (ICD–9 codes 780–799 and ICD–10 codes R00–R99) can be used as one indicator of the quality of coding in the registration system (9). There are a number of other ICD codes that do not represent useful underlying causes from a policy perspective and whose inappropriate overuse compromises the usefulness of information on cause of death. These "garbage codes" include deaths from injuries where the intent is not determined (ICD–9 codes E980–989 and ICD–10 codes Y10–Y34 and Y872); cardiovascular disease categories lacking diagnostic meaning, such as cardiac arrest and heart failure (ICD–9 codes 427.1, 427.4, 427.5, 428, 429.0, 429.1, 429.2, 429.9, 440.9 and ICD–10 codes I47.2, I49.0, I46, I50, I51.4, I51.5, I51.6, I51.9, I70.9); and cancer deaths coded to categories for secondary or unspecified sites (ICD–9 codes 195, 199 and ICD–10 codes C76, C80, C97).

Using the most recent year for which cause of death data were available for each Member State, we computed the proportion of deaths coded to each of these four groups of ill-defined codes. This provides one set of indicators of the quality of coding of causes of death.

Taking into account other factors, such as the type of cause coding used, the completeness of death registration, and how recent the latest available data are, it is possible to broadly categorize the overall quality of death registration data. Among countries with at least 50% completeness or coverage of deaths, we have defined three broad categories.

- High-quality data: In this category ICD–9 or ICD–10 coding are used and there is > 90% completeness and ill-defined codes appear on < 10% of registrations.
- Medium-quality data: In this category the completeness of data is 70–90% or ill-defined codes appear on 10–20% of registrations or completeness > 90% and ill-defined codes appear on < 10% of registrations but non-ICD codes are used.
- Low-quality data: In this category completeness is < 70% or ill-defined codes appear on > 20% of registrations.

The cut-off points used to define these categories are to some extent arbitrary, and timeliness of data has not been included beyond requiring that the most recent year be later than 1990. The completeness thresholds of 50% and 90% were chosen because it is likely that death registration data that are more than 90% complete will give a reasonably unbiased picture of the distribution of causes of death and, conversely, that data

that are less than 50% complete are unlikely to yield an unbiased picture (*10*). An exception to these assumptions is the case where a sample registration system has low coverage but has been explicitly designed to provide a representative sample of deaths.

Results
Global coverage of registration

As of December 2003, 115 Member States had supplied death registration data to WHO. Table 1 summarizes the number of countries reporting these data by WHO region. Regional coverage of death registration varies from close to 100% in the European Region to less than 10% in the African region. However, death registration is considered to be essentially 100% complete in only 64 of the 115 countries reporting data, and predominantly these are developed countries in Europe, the Americas and the Pacific regions.

China and India, two countries with large populations, do not have complete vital registration but are reasonably well served by sample registration systems (see Discussion below). In terms of actual deaths recorded by registration systems, data are provided to WHO annually for about 18.6 million deaths, representing one-third of all deaths estimated to be occurring in the world (*11*). If the sample registration systems in India and China are considered to be sufficiently representative to provide information on their whole populations, then information on mortality is available for around 72% of the world's population.

Table 1. **Number of countries reporting data on cause of death from their vital registration system to WHO and countries with no recent data, December 2003**

WHO region	No. of countries					Member States with no recent data
	Total No.	Complete data available	Useable data available	No recent data[a]	No data available	
Africa	46	1	4	42	25	Algeria,[b] Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde,[c] Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Swaziland, Togo, Uganda, United Republic of Tanzania, Sao Tome and Principe,[c] Zambia
The Americas	35	14	33	2	0	Bolivia, Honduras[c]
Eastern Mediterranean	21	3	7	12	6	Afghanistan, Djibouti, Jordan,[b,c] Iraq, Libyan Arab Jamahiriya, Pakistan,[b] Somalia, Sudan, Saudi Arabia, Tunisia,[b] United Arab Emirates,[b] Yemen
Europe	52	39	50	2	0	Andorra,[b] Monaco[c]
South-East Asia	11	0	4	7	4	Bangladesh,[b] Bhutan, Indonesia, Democratic People's Republic of Korea, Timor-Leste, Maldives,[b] Nepal[b]
Western Pacific	27	7	17	10	4	Cambodia, Lao People's Democratic Republic, Marshall Islands,[b] Micronesia,[b] Papua New Guinea,[c] Palau,[b] Samoa,[b] Solomon Islands,[b] Vanuatu, Viet Nam
World	**192**	**64**	**115**	**75**	**39**	

[a] Information available from 1990 or later.

[b] Information on deaths is available but cause of death is not included.

[c] Latest available year for information on causes of death is prior to 1990.

Table 1 also lists the Member States for which no recent data on death registration are available (that is, from 1990 or later). In 75 countries, no information is available on causes of death for any year after 1990.

Completeness and coverage by country

The estimated completeness of all cause-of-death registration for both sexes combined is given in Table 2 (web version only, available at: http://www.who.int/bulletin) for Member States reporting data. The overall level of coverage for the latest available year for each country is also shown in Table 2. Although the coverage of the sample registration systems in India and China is low, in China the system provides representative information that can be used to assess causes of death among the national population.

Timeliness

For each Member State reporting data Table 2 shows the years for which death registration data have been provided together with several indicators of data quality. In 18 Member States, death registration systems provide recent data only on deaths due to all causes, without information on the underlying cause of death. A more detailed listing of the specific years for which data are available has been made available on the WHO web site (10). Interested readers can access these data via the online WHO mortality database (available at http://www.who.int/whosis), which contains data supplied by Member States but received after the publication of the 1996 edition of the *World health statistics annual*, the last to appear in printed form (12).

Coding

The number of countries using ICD–10 coding to report data to WHO has increased from 4 in 1995 to 75 in 2003. There are still around 40 countries reporting data using ICD–9, and one is still using ICD–8.

The penultimate column of Table 2 shows the total percentage of deaths coded to the four groups of ill-defined codes. It should be noted that deaths from other coded causes are not necessarily correctly coded; they are subject to diagnostic, certification and coding errors that cannot be detected except through specific studies.

The percentage of deaths coded to the aggregate of the groups of ill-defined causes varies from 4% in New Zealand to more than 40% in Sri Lanka and Thailand. The Ministry of Health in Thailand has recently conducted an investigation into cause-of-death certification and coding (using a sample of 35 000 deaths) to verify the underlying causes of death using verbal autopsy techniques. This sample included about 12 000 deaths from ill-defined causes of which, on investigation, about two-thirds were assigned to specific causes of death (13).

Table 3 shows the distribution of deaths assigned to ill-defined codes for the 105 Member States reporting data on death registrations since 1990 with at least 50% completeness or coverage. The median percentage of deaths coded to ill-defined causes is 12%; the median percentage of symptoms, signs and ill-defined conditions is 4.0%; and the median of ill-defined cardiovascular causes is 5.3%. Such codes are of no use in guiding disease prevention and injury prevention and control programmes.

Quality of death data

Table 4 classifies death registration data into high quality, medium quality or low quality using the criteria described above. There are only 23 countries classified as having high-quality data. There are 28 countries classified as having low-quality data; these include some high-income countries, such as Greece and Portugal. Somewhat surprisingly, among the 55 countries included in the medium-quality category, there are more than 10 high-income countries from western Europe including Austria, Belgium, Denmark, France and Germany. In these countries the percentage of deaths assigned to the ill-defined codes ranges from 10% to 20%, not so much because of overuse of codes for symptoms, signs and ill-defined conditions, but because of excessive use of garbage codes for vascular disease, cancers and injuries.

Discussion

Ideally, vital registration systems should capture all deaths that occur in a given population, should reliably record the age and sex of each deceased person, and the cause of death recorded should be based on the opinion of a medically qualified person. Trained personnel are needed to ensure that information about the medical condition leading to death is coded appropriately so that the underlying cause of each death can be identified. To calculate age-specific death rates, which is the most useful output of a vital registration system for policy purposes, reliable estimates of the population exposed to the risk of dying are also required. Taken together the resources required to establish and maintain a functioning vital registration system, including the incorporation of periodic revisions of the ICD, are considerable. As a result, good vital registration systems are generally more likely to be found in developed countries.

Only 23 Member States were considered to have high-quality death registration data (using quality criteria based on timeliness, completeness, coverage and the sparing use of codes for ill-defined causes). About 10% or more of deaths are assigned to ill-defined codes in a surprisingly high number of developed countries. The use of these codes is a particular problem in some developing countries, exceeding 30% in countries such as Thailand and Sri Lanka.

These issues can be addressed by making greater efforts to increase coverage, by increasing the proportion of deaths

Table 3. **Distribution of percentage of total deaths assigned to ill-defined codes for most recent available year for 105 WHO Member States[a]**

Ill-defined code group	Percentage of deaths assigned to ill-defined codes			
	Median	25th percentile	75th percentile	Maximum
Symptoms	4.0	2.1	8.7	44.0
Injury	0.5	0.2	1.3	5.1[b]
Cancer	1.0	0.5	1.5	2.7
Cardiovascular disease	5.3	2.7	7.7	23.4
Total ill-defined	**12.0**	**7.0**	**17.2**	**48.8**

[a] Includes those Member States supplying data on death registration for most recent year since 1990 and with at least 50% completeness or coverage.

[b] These data exclude South Africa where 93% of deaths from external causes are coded to ill-defined injuries.

Research

Colin D. Mathers et al.   Assessment of global cause of death data

Table 4. **Quality of cause of death information for WHO Member States supplying death registration data for most recent year (1990 or later) and with at least 50% completeness or coverage. (China and India are not included in this table, although their sample registration systems provide population-representative data)**

Quality of data (No. of countries)	Criterion used	Countries
High (23)	ICD–9 or ICD–10 coding is used and completeness is > 90% and ill-defined codes appear on < 10% of registrations	Australia, Bahamas, Canada, Cuba, Estonia, Finland, Hungary, Iceland,[a] Ireland, Japan, Latvia, Lithuania, Malta, Mexico, New Zealand, Republic of Moldova, Romania, Singapore, Slovakia, Slovenia, United Kingdom, United States of America, Venezuela
Medium (55)	Completeness is 70–90% OR ill-defined codes appear on 10–20% of registrations OR non-ICD codes used although completeness is > 90% and ill-defined codes appear on < 10% of registrations	Antigua and Barbuda,[a] Austria, Azerbaijan, Barbados, Belarus, Belgium,[a] Belize, Brazil, Brunei Darussalam, Bulgaria, Chile, Colombia,[a] Cook Islands, Costa Rica, Croatia, Czech Republic, Denmark,[a] Dominica, El Salvador,[a] France,[a] Georgia, Germany, Grenada,[a] Guatemala, Guyana,[a] Israel,[a] Italy, Kazakhstan, Kuwait, Kyrgyzstan, Luxembourg, Malaysia,[a] Mauritius, Mongolia, Netherlands, Niue, Norway, Panama, the Philippines,[a] Republic of Korea, Russian Federation, Saint Kitts and Nevis,[a] Saint Lucia, Saint Vincent and the Grenadines, Serbia and Montenegro, Seychelles, Spain, Sweden, Switzerland,[a] former Yugoslav Republic of Macedonia, Trinidad and Tobago,[a] Turkmenistan,[a] Ukraine, Uruguay, Uzbekistan
Low (28)	Completeness < 70% OR ill-defined codes appear on > 20% of registrations	Albania, Argentina, Armenia, Bahrain, Bosnia and Herzegovina,[a] Cyprus,[a] Ecuador, Egypt, Fiji, Greece,[a] Jamaica,[a] Kiribati, Nicaragua, Oman, Paraguay, Peru, Poland, Portugal, Qatar, San Marino, South Africa,[a] Sri Lanka,[a] Suriname,[a] Syrian Arab Republic, Tajikistan,[a] Thailand, Tonga,[a] Tuvalu

[a] Latest year for which data are available is 1999 or earlier.

certified by attending and non-attending physicians, by educating physicians and other informants about the importance of accurate and complete reporting on death certificates, and by avoiding, unless absolutely necessary, the use of ill-defined codes. To support public health policy-making and evaluation, research is also needed to assist in improving analyses of causes of death. Priorities for research include assessing the accuracy of cause-of-death certification and improving knowledge about the true distribution of causes of death attributed to ill-defined codes.

In 75 Member States, including more than 90% of African countries, no information on cause of death is available for any year after 1990. For these countries, health planning and priority setting is essentially proceeding on the basis of perceptions or survey-based information on overall levels of child mortality that are used together with model life tables, cause-of-death models and partial information from surveillance systems for some specific causes of disease. Experience in countries such as China, India and the United Republic of Tanzania suggests that sample registration, which is based on a representative set of surveillance sites, with appropriate controls and reporting procedures, can yield extremely useful information about levels, patterns and causes of mortality for large populations (14–17). Setel et al. (unpublished results, 2005) argue that for many low-income developing countries such sample registration systems provide a more cost-effective solution to collecting data than either full registration systems or survey-based methods. In all cases, the key to improving information on causes of death is to ensure that such data become integral to health policy-making at national, regional and district levels.

WHO is working with Member States to evaluate the completeness of their registration systems, to investigate the quality of cause-of-death coding, and to develop and validate a standardized verbal autopsy reporting form. Yet much remains to be done if countries are truly to benefit from methodological advances in measuring mortality. WHO also has a critical part to play in transferring knowledge through the development of training materials and registration standards. Research is needed to identify the most cost-effective strategies for improving information on causes of death in developing countries. These may range from establishing full death registrations systems to using low-cost sample registration systems or implementing regular surveys or collections for census data. ■

Résumé

Recensement des décès et des causes de décès : une évaluation de l'état des données relatives aux causes de décès dans le monde

Objectif Les auteurs se sont donnés pour objectif d'évaluer au niveau mondial l'état actuel des données figurant sur les registres des décès et d'examiner plusieurs indicateurs représentatifs de l'exhaustivité et de la qualité de ces données.

Méthodes Ils ont récapitulé les données issues des registres des décès disponibles par année et par pays. Ils ont évalué des indicateurs de la qualité de ces données pour chaque pays, dont notamment la réalisation en temps voulu, la complétude et la couverture de l'enregistrement, et la proportion de décès attribués à des causes mal définies.

Résultats A la fin de l'année 2003, on disposait de données concernant l'enregistrement des décès provenant de 115 pays, ces données n'étant toutefois pratiquement exhaustives que pour 64 pays. Le taux de couverture des registres des décès va d'une valeur proche de 100 % dans la région Europe de l'OMS à moins de 10 % dans la région Afrique. Seuls 23 pays disposent de données complètes à plus de 90 %, qui mentionnent une cause de décès mal définie dans moins de 10 % des cas et utilisent les codes ICD-9 et ICD-10. Dans 28 pays, moins de 70 % des données sont exhaustives ou plus de 20 % des décès ont donné lieu à l'affectation de codes indiquant une cause de décès mal définie. Douze pays à hauts revenus d'Europe occidentale figurent parmi les 55 pays collectant des données de qualité intermédiaire.

Conclusion Peu de pays disposent de données de bonne qualité sur la mortalité, utilisables pour étayer solidement l'élaboration et la mise en œuvre des politiques. Certains pays ont besoin d'urgence de mettre en place des systèmes d'enregistrement des décès, ne serait-ce qu'un enregistrement par sondage, ou de perfectionner les systèmes existants, de manière à approfondir rapidement les connaissances au sujet des statistiques sanitaires les plus élémentaires : qui meurt de quoi ?

Resumen

Determinar el número de defunciones y las causas de defunción: evaluación de la situación mundial de los datos sobre las causas de mortalidad

Objetivo Decidimos evaluar la situación actual de los datos mundiales sobre los registros de defunción y examinar varios indicadores de la integridad y calidad de esos datos.

Métodos Resumimos la disponibilidad de los datos de los registros de defunción por año y país. Se evaluaron diversos indicadores de la calidad de los datos para cada país, entre ellos la prontitud de los registros, la integridad y cobertura de los mismos y la proporción de defunciones atribuidas a causas mal definidas.

Resultados A finales de 2003 se disponía de datos de registros de defunción de 115 países, aunque sólo podían considerarse completos para 64 países. La cobertura de los registros varía desde cerca del 100% en la Región de Europa de la OMS hasta menos del 10% en la Región de África. Sólo 23 países disponen de registros con datos completos en más del 90% de los casos, donde las causas mal definidas de defunción representan menos del 10% de todas las causas de muerte, y donde se emplean los códigos de la CIE-9 o la CIE-10. Hay 28 países donde menos del 70% de los datos están completos o donde se asignan códigos mal definidos a más del 20% de las defunciones. Entre los 55 países con datos de calidad intermedia figuran doce países de ingresos altos de Europa occidental.

Conclusión Son pocos los países que disponen de datos de mortalidad de buena calidad que puedan emplearse para respaldar adecuadamente la formulación y ejecución de políticas. Es urgente que los países implanten sistemas de registro de las defunciones, aunque sea mediante el registro de muestras, o mejoren los sistemas ya existentes, pues sólo así podremos conocer rápidamente con más detalle la información fundamental de la estadísticas sanitarias; a saber: cuántas personas mueren, y de qué mueren.

ملخص

تعداد الوفيات وأسبابها:
تقييم للوضع العالمي للمعطيات الخاصة بأسباب الوفاة

الغرض: تقييم الوضع الراهن للمعطيات العالمية الخاصة بتسجيل الوفيات، واختبار عدد من المؤشرات المتعلقة باستكمال هذه المعطيات وجودتها.

الطريقة: قمنا في إطار هذه الدراسة بإعداد بيان موجز حول مدى توفر معطيات تسجيل الوفيات موزعة بحسب السنة والبلد. وتم تقييم مؤشرات جودة المعطيات لكل بلد، وشملت هذه المؤشرات: التسجيل في الوقت المناسب، ومدى اكتمال معطيات التسجيل والتغطية به، ونسبة الوفيات الناجمة عن أسباب غير محددة.

الموجودات: في نهاية عام 2003 توافرت معطيات حول تسجيل الوفيات من 115 بلداً، ولكن لم يزد عدد البلدان ذات المعطيات المستكملة على 64 بلداً. وتتفاوت نسبة تسجيل الوفيات من ما يناهز 100% في الإقليم الأوروبي للمنظمة إلى أقل من 10% في الإقليم الأفريقي. وهناك 23 بلداً فقط ذات معطيات مكتملة بنسبة تزيد على 90% ، حيث تمثل الأسباب غير المحددة للوفاة أقل من 10% من إجمالي مسببات الوفاة، وحيث تُستخدم رواميز المراجعة التاسعة والعاشرة للتصنيف الدولي للأمراض. وهناك 28 بلداً تتسم فيها المعطيات بالاكتمال في أقل من 70% ، أو أُسندت رواميز غير محددة لأكثر من 20% من الوفيات التي سُجلت لها. ولوحظ أيضاً أن 12 من البلدان المرتفعة الدخل في أوروبا الغربية هي من بين قائمة البلدان الخمسة والخمسين ذات المعطيات المتوسطة الجودة.

الاستنتاج: تخلص الدراسة إلى أن عدداً قليلاً من البلدان تتوافر بها معطيات عالية الجودة يمكن استخدامها في دعم عمليات إعداد وتنفيذ السياسات بشكل مناسب. ومن الضروري للبلدان أن تطبق نُظُماً لتسجيل الوفيات، ولو كان ذلك لا يتم إلا من خلال التسجيل وفقاً للنماذج، أو أن تحسن البلدان نُظُم التسجيل القائمة بها بما يتيح تحسين أبسط المعلومات الإحصائية الصحية، وهي أسباب الوفاة.

Research

Colin D. Mathers et al.   Assessment of global cause of death data

References

1. Sibai AM. Mortality certification and cause-of-death reporting in developing countries. *Bulletin of the World Health Organization* 2004;82:83.

2. Lee JW. Global health improvement and WHO: shaping the future. *Lancet* 2003;362:2083-8.

3. Lopez AD, Ahmad O, Guillot M, Ferguson B, Salomon J, Murray CJL, et al. *World mortality in 2000: life tables for 191 countries.* Geneva: World Health Organization; 2002.

4. United Nations. *World population prospects: the 2002 revision.* New York: United Nations; 2003.

5. World Health Organization. *International statistical classification of diseases and related health problems, tenth revision.* Geneva: WHO; 1992.

6. Ruzicka LT, Lopez AD. The use of cause of death statistics for health situation assessment: national and international experiences. *World Health Statistics Quarterly* 1990;43:249-58.

7. King MB. AIDS on the death certificate: the final stigma. *BMJ* 1989;298:734-6.

8. Lopez AD. Mortality data. In: Elliot P, Cuzick J, English D, Stem R, editors. *Geographical and environmental epidemiology methods for small-area studies.* Oxford: Oxford University Press; 1992. p. 37-50.

9. Silvi J. On the estimation of mortality rates for countries of the Americas. *Epidemiological Bulletin* 2003;24:1-5.

10. Mathers CD, Bernard C, Iburg KM, Inoue M, Ma Fat D, Shibuya K, et al. *Global burden of disease in 2002: data sources, methods and results.* Geneva: World Health Organization; 2003 (GPE Discussion Paper No. 54).

11. World Health Organization. *The world health report 2004 – Changing history.* Geneva: WHO; 2004.

12. World Health Organization. *World health statistics annual: 1996.* Geneva: WHO; 1998.

13. Ministry of Public Health, Thailand. *Burden of disease and injuries in Thailand: priority setting for policy.* Bangkok: Government of Thailand; 2002.

14. Ministry of Health, United Republic of Tanzania. *The policy implications of Tanzania's mortality burden: a ten-year community-based perspective.* Volume 1. Dar es Salaam: Ministry of Health, United Republic of Tanzania, University of Newcastle upon Tyne, UK Department for International Development; 2004 (Adult Morbidity and Mortality Project-2 Final Report).

15. Mahapatra P, Rao C. Cause of death reporting systems in India: a performance analysis. *National Medical Journal of India* 2001;14:154-62.

16. Registrar General of India. *Sample registration system.* New Delhi: Vital Statistics Division, Office of the Registrar General of India; 2002.

17. Yang GH, Huang ZJ, Tan J. [Priorities of disease control in China – analysis of mortality data of national disease surveillance points system]. *Chinese Journal of Epidemiology* 1996;17:199-202. In Chinese.

Table 2. **Summary of data on death registration available to WHO (December 2003) together with estimated completeness, coverage and percentage of deaths assigned to codes for ill-defined causes**

Member State	Years of mortality data (all causes)	Complete-ness[b]	Years with cause-of-death data	ICD revision used[c]	Cover-age[d]	Deaths coded to ill-defined codes (%)[e]	Quality[i]
Albania	1950–2001[a]	60	1987–2001[a]	9	69	19	Low
Algeria	1950–2000[a]	69					
Andorra	1950–2000[a]	NA[j]					
Antigua and Barbuda	1950–1999[a]	90	1961–1995[a]	9	84	13[g]	Medium
Argentina	1950–2001[a]	100	1966–2001[a]	10	100	22	Low
Armenia	1981–2001[a]	68	1981–2001[a]	9	91	4[g]	Low
Australia	1950–2001	100	1950–2001	10	100	5	High
Austria	1950–2001	100	1955–2001	9	100	14	Medium
Azerbaijan	1981–2001	74	1981–2001[a]	10	71	2[h]	Medium
Bahamas	1965–2000[a]	100	1969–2000[a]	10	93	5	High
Bahrain	1980–2001[a]	100	1985–2001[a]	10	90	25	Low
Barbados	1950–2001	100	1955–2000	10	100	12	Medium
Belarus	1981–2001	100	1981–2001[a]	9	98	10[g]	Medium
Belgium	1950–2001	100	1954–1997	9	100	15	Medium
Belize	1950–1998	100	1964–1998[a]	10	99	12	Medium
Bosnia and Herzegovina	1985–1999[a]	100	1985–1999[a]	10	88	12[h]	Low
Brazil	1974–2000	84	1977–2000	10	79	20	Medium
Brunei Darussalam	1950–2000[a]	84	1996–2000	10	100	7[h]	Medium
Bulgaria	1950–2002	100	1964–2002	9	100	18	Medium
Canada	1950–2000	100	1950–2000	10	100	7	High
Cape Verde	1955–1980[a]	NA	1980	8			
Chile	1950–2000	100	1954–1999	10	100	11	Medium
China[f]	1987–2000	54	1987–2000	9	<50	3[h]	
Colombia	1950–2001[a]	81	1953–1999[a]	10	79	7	Medium
Cook Islands	1951–2001[a]	100	1995–2001	10	100	3[h]	Medium
Costa Rica	1950–2002[a]	90	1956–2002	10	79	6	Medium
Croatia	1982–2001	100	1985–2001	10	98	16	Medium
Cuba	1959–2001[a]	100	1959–2001[a]	10	100	9	High
Cyprus	1950–2001[a]	100	1996–1999	10	70	44[h]	Low
Czech Republic	1982–2001	100	1985–2001	10	100	13	Medium
Denmark	1950–2002	100	1951–1999	10	100	12	Medium
Dominica	1950–1999[a]	100	1961–1999[a]	9	100	7[g]	Medium
Dominican Republic	1950–1999[a]	<50	1950–1998[a]	10	<50		
Ecuador	1954–2000[a]	70	1961–2000[a]	10	76	22	Low
Egypt	1950–2000[a]	85	1954–2000[a]	ICD	80	40	Low
El Salvador	1950–1999[a]	76	1950–1999[a]	10	73	19	Medium
Estonia	1981–2001	100	1981–2001[a]	10	100	5	High
Fiji	1950–2000[a]	100	1978–2000[a]	10	100	29	Low
Finland	1950–2001	100	1952–2001	10	100	3	High
France	1950–2001	100	1950–1999	9	100	14	Medium
Georgia	1981–2000[a]	75	1981–2000[a]	10	66	8	Medium
Germany	1969–2000	100	1969–2000	10	100	14	Medium
Greece	1951–2001	100	1956–1999	9	88	26	Low
Grenada	1950–1996[a]	NA	1974–1996[a]	9	86	6[g]	Medium
Guatemala	1950–1999[a]	87	1958–1999[a]	9	86	14[g]	Medium
Guyana	1950–1996[a]	67	1975–1996[a]	9	74	8[g]	Medium
Haiti	1972–1999[a]	<50	1980–1999[a]	10	<50		
Honduras	1950–1983	NA	1966–1983[a]	9			
Hungary	1950–2002	100	1955–2002	10	100	7	High
Iceland	1950–2001	100	1951–1999	10	100	5	High
India[f]	1990–1999	88[f]	1996–1998	9	<50	18	
Iran, Islamic Republic of	1983–2001[a]	56[k]	1999–2001	10	<50		
Ireland	1950–2001	100	1950–2000	9	100	7	High
Israel	1953–2000	100	1975–1999	10	100	11	Medium
Italy	1950–2000	100	1951–2000	9	99	12	Medium

(Table 2, cont.)

Member State	Years of mortality data (all causes)	Complete-ness[b]	Years with cause-of-death data	ICD revision used[c]	Cover-age[d]	Deaths coded to ill-defined codes (%)[e]	Quality[i]
Jamaica	1950–1999[a]	75	1960–1991[a]	9	60	13[g]	Low
Japan	1950–2002	100	1950–2000	10	97	9	High
Jordan	1953–2001[a]	63	1959–1979[a]	8			
Kazakhstan	1981–2001	89	1981–2001[a]	9	80	5[g]	Medium
Kiribati	1991–2002	86	1999–2002	10	76	35	Low
Kuwait	1962–2002[a]	100	1972–2001[a]	10	96	13	Medium
Kyrgyzstan	1981–2001	84	1981–2001[a]	10	73	6	Medium
Latvia	1980–2002	100	1980–2001	10	100	5	High
Lebanon	1997–1999	<50	1997–1999	10	<50		
Lithuania	1981–2001	100	1981–2001[a]	10	97	5	High
Luxembourg	1950–2002	100	1955–2002[a]	10	100	14	Medium
Malaysia	1990–1998	90	1990–1998	9	<50	17	Medium
Maldives	1978–1998	61					
Malta	1950–2002	100	1955–2002	10	95	10	High
Marshall Islands	1986–1997	NA					
Mauritius	1950–2001	100	1957–2000	9	100	14	Medium
Mexico	1950–2002	100	1955–2001	10	96	5	High
Micronesia, Federated States of	1986–1994	74					
Monaco	1950–1987[a]	NA	1986–1987	9			
Mongolia	1987–2001	100	1990–2000	9	76	1[h]	Medium
Morocco	1990–1998	< 50	1990–1997	10	<50		
Mozambique	1961–1973[a]	NA					
Myanmar		NA	1977–2000[a]	10	<50		
Nauru	1965–1996[a]	NA	1994–1996	Other	<50		
Netherlands	1950–2001	100	1950–2000	10	100	15	Medium
New Zealand	1950–2001	100	1950–2000	10	100	4	High
Nicaragua	1950–2000[a]	58	1959–2000[a]	10	55	9	Low
Niue	1950–2000[a]	70	1995–2000	10	100	0	Medium
Norway	1950–2001	100	1951–2001	10	98	12	Medium
Oman	1997, 2000	NA	1997, 2000 2001	10	71	9[h]	Low
Palau	1985–1999[a]	100					
Panama	1950–2000[a]	88	1954–2000[a]	10	86	12	Medium
Papua New Guinea		NA	1977, 1980	9			
Paraguay	1950–2000[a]	74	1961–2000[a]	10	74	28	Low
Peru	1950–2000[a]	50	1966–2000[a]	10	50	20	Low
Philippines	1950–1998[a]	77	1963–1998[a]	9	85	12	Medium
Poland	1950–2001	100	1959–2001	10	100	25	Low
Portugal	1950–2001	100	1955–2000	9	100	21	Low
Qatar	1981–2001[a]	100	1995–2001[a]	10	83	24	Low
Republic of Korea	1957–2001[a]	89	1985–2001	10	88	14	Medium
Republic of Moldova	1981–2001	100	1981–2001[a]	10	83	3	High
Romania	1956–2002	100	1959–2002[a]	10	100	8	High
Russian Federation	1980–2002	100	1980–2002	10	100	5[h]	Medium
Saint Kitts and Nevis	1950–2000	100	1961–1995[a]	9	100	2[g]	Medium
Saint Lucia	1950–2001[a]	100	1968–2001[a]	10	100	12	Medium
Saint Vincent and the Grenadines	1950–1999[a]	100	1970–1999[a]	9	99	2[g]	Medium
Samoa	1955–2002[a]	51					
San Marino	1962–2001[a]	100	1995–2000	9	76	35	Low
Sao Tome and Principe	1955–1987[a]	NA	1984–1987[a]	9			
Serbia and Montenegro	1982–2000[a]	100	2000	10	97	8[h]	Medium
Seychelles	1952–2000[a]	94	1981–2000[a]	10	100	5[h]	Medium
Singapore	1950–2001	100	1955–2001	9	81	3	High
Slovakia	1982–2001	100	1992–2001	10	100	4	High
Slovenia	1982–2001	100	1985–2001	10	100	10	High
South Africa	1980–1999[a]	88	1993–1996	10	<50	37	Low

Research

Colin D. Mathers et al.   Assessment of global cause of death data

(Table 2, cont.)

Member State	Years of mortality data (all causes)	Complete-ness[b]	Years with cause-of-death data	ICD revision used[c]	Cover-age[d]	Deaths coded to ill-defined codes (%)[e]	Quality[i]
Spain	1950–2000	100	1951–2000	10	100	11	Medium
Sri Lanka	1950–1996[a]	91	1950–1996[a]	9	74	46	Low
Suriname	1950–1997[a]	100	1963–1992[a]	9	66	17[g]	Low
Sweden	1950–2001	100	1951–2001	10	100	11	Medium
Switzerland	1950–2001	100	1951–2000	10	100	13	Medium
Syrian Arab Republic	1973–2001[a]	71	1973–2001[a]	10	100	21[h]	Low
Tajikistan	1981–1999[a]	60	1981–1999[a]	9	<50	9[g]	Low
Thailand	1950–2000	86	1955–2000[a]	10	89	49	Low
The former Yugoslav Republic of Macedonia	1982–2000	100	1991–2000	9	92	13	Medium
Tonga	1957–2002[a]	86	1998	Other	70	19[h]	Low
Trinidad and Tobago	1950–1998	100	1951–1998	9	93	2[g]	Medium
Tunisia	1960–2000[a]	64					
Turkey	1967–2000[a]	89[l]	1987–1998	8	<50		
Turkmenistan	1981–1998[a]	78	1981–1998[a]	9	76	3[g]	Medium
Tuvalu	1991–2000	77	1992–2000	Other	100	27[h]	Low
Ukraine	1981–2000	100	1981–2000[a]	9	95	5[g]	Medium
United Arab Emirates	2001–2002	NA					
United Kingdom	1950–2001	100	1950–2000	9	100	7	High
United States of America	1950–2001	100	1950–2000	10	100	7	High
Uruguay	1950–2000	100	1955–2000[a]	10	100	16	Medium
Uzbekistan	1981–2000	91	1981–2000[a]	9	82	2[g]	Medium
Venezuela	1950–2000	96	1955–2000[a]	10	97	8	High
Zimbabwe	1990–1995[a]	<50	1990–1995[a]	9	<50		

[a] Incomplete series with data unavailable for some years.

[b] Completeness refers to the proportion of all deaths that are registered in the population covered by the vital registration system for a country. For completeness < 100% the figures refer to completeness for adult deaths.

[c] ICD = *International statistical classification of diseases and related health problems.* "Other" indicates that other coding systems are used.

[d] Coverage is calculated by dividing the total number of deaths reported from the vital registration system for a country–year by the total number of deaths estimated by WHO for that year for the national population.

[e] Percentage of deaths coded to symptoms, signs and ill-defined conditions (ICD–9 codes 780–799 and ICD–10 codes R00–R99), injury deaths with undetermined intent (ICD–9 codes E980–989 and ICD–10 codes Y10–Y34 and Y872), secondary neoplasms and neoplasms of unspecified sites (ICD–9 codes 195, 199 and ICD–10 codes C76, C80, C97) and ill-defined cardiovascular causes (ICD–9 codes 427.1, 427.4, 427.5, 428, 429.0, 429.1, 429.2, 429.9, 440.9 and ICD–10 codes I47.2, I49.0, I46, I50, I51.4, I51.5, I51.6, I51.9, I70.9). Percentages reported are for the most recent year for countries with > 50% coverage or completeness and the latest available year from 1990 or later.

[f] These countries have sample vital registration systems. Although coverage is low, the sample provides population-representative information.

[g] These countries include only data coded to the ICD chapter on symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified and to ill-defined injuries.

[h] These countries include only data coded to the ICD chapter on symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified.

[i] Quality was classified using criteria described in the Methods section for WHO Member States supplying data on cause-of-death registrations for most recent year (from 1990 or later) and with at least 50% completeness or coverage as estimated by WHO.

[j] NA = not available or not applicable.

[k] Based on 2001 data from vital registration in 18 provinces.

[l] For urban areas only.