

World Health Statistics

2007

Definition of Indicators



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Acronyms and abbreviations

ACT	artemisinin-based combination treatment
AIDS	acquired immunodeficiency syndrome
ARI	acute respiratory infection
CHERG	Child Health Epidemiology Reference Group
DHS	Demographic and Health Surveys
DOTS	directly-observed treatment, short-course
HIV	human immunodeficiency virus
ICD	International Statistical Classification of Diseases and Related Health Problems
IPA	International Pediatric Association
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification of all Economic Activities
ITN	insecticide-treated net
IUD	intrauterine device
IUNS	International Union of Nutritional Sciences
IVACG	International Vitamin A Consultative Group
MICS	Multiple Indicators Cluster Surveys
MIS	Malaria Indicator Surveys
ORT	oral rehydration therapy
ORT	oral rehydration solution
SCN	Standing Committee on Nutrition of the United Nations System
SP	sulfadoxine/pyrimethamine
TB	tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Health status: mortality

Life expectancy at birth (years)

Rationale for use

Life expectancy at birth reflects the overall mortality level of a population. It summarizes the mortality pattern that prevails across all age groups - children and adolescents, adults and the elderly.

Definition

Average number of years that a newborn is expected to live if current mortality rates continue to apply.

Associated terms

A **life table** presents a set of tabulations that describe the probability of dying, the death rate and the number of survivors for each age or age group. Accordingly, life expectancy at birth is an output of a life table.

Data sources

Vital registration, census and surveys: Age-specific mortality rates required to compute life expectancy at birth.

Methods of estimation

WHO has developed a model life table based on about 1800 life tables from vital registration judged to be of good quality.

For countries with vital registration, the level of completeness of recorded mortality data in the population is assessed and mortality rates are adjusted accordingly. Where vital registration data for 2003 were available, these were used directly to construct the life table. For countries where the information system provided a time series of annual life tables, parameters from the life table were projected using a weighted regression model, giving more weight to recent years. Projected values of the two life table parameters were then applied to the modified logit life table model, where the most recent national data provided an age pattern, to predict the full life table for 2003. In case of inadequate sources of age-specific mortality rates, the life table is derived from estimated under-5 mortality rates and adult mortality rates that are applied to a global standard (defined as the average of all the 1800 life tables) using a modified logit model.

Disaggregation

By sex, location (urban/rural, major regions/provinces).

References

Modified logit life table system: principles, empirical validation and application Murray CJL, et al. Modified logit life table system: principles, empirical validation and application. Population Studies 2003, 57(2):1-18.

The World Health Report 2006: working together for health. Geneva, World Health Organization, 2006. (<http://www.who.int/whr/2006/en>)

Database

WHO Mortality Database: Civil registration data (<http://www.who.int/healthinfo/morttables>)

Comments

The lack of complete and reliable mortality data, especially for low income countries and particularly on mortality among adults and the elderly, necessitates the application of modelling (based on data from other populations) to estimate life expectancy. WHO uses a standard method as explained above to estimate and project life tables for all Member States using comparable data. This may lead to minor differences compared with official life tables prepared by Member States.

Healthy life expectancy (HALE) at birth (years)

Rationale for use

Substantial resources are devoted to reducing the incidence, duration and severity of major diseases that cause morbidity but not mortality and to reducing their impact on people's lives. It is important to capture both fatal and non-fatal health outcomes in a summary measure of average levels of population health. Healthy life expectancy (HALE) at birth adds up expectation of life for different health states, adjusted for severity distribution making it sensitive to changes over time or differences between countries in the severity distribution of health states.

Definition

Average number of years that a person can expect to live in "full health" by taking into account years lived in less than full health due to disease and/or injury.

Data sources

Death registration data reported annually to WHO: Mortality data for calculation of life tables. For countries without such data, available survey and census sources of information on child and adult mortality are analysed and used to estimate life tables.

WHO Global Burden of Disease (GBD) study, WHO Multi-Country Survey Study (MCSS) and World Health Survey (WHS). Estimation of prevalence data. The GBD study draws on a wide range of data sources to develop internally consistent estimates for the incidence, prevalence, duration and years lived with disability for 135 major causes. The World Health Survey, carried out by WHO in more than 70 countries, uses anchoring vignettes to maximize comparability of self-report capacities for a set of core health domains. It also includes a health state valuation module for assessing the severity of reported health states.

Methods of estimation

Since comparable health state prevalence data are not available for all countries, a four-stage strategy is used:

Data from the WHOGBD study are used to estimate severity-adjusted prevalence by age and sex for all countries.

Data from the WHOMCSS and WHS are used to make independent estimates of severity adjusted prevalence by age and sex for survey countries.

Prevalence for all countries is calculated based on GBD, MCSS and WHS estimates.

Life tables constructed by WHO are used with Sullivan's method to compute HALE for countries.

Disaggregation

By age and sex.

References

World Health Report 2004: Changing History. Geneva, World Health Organization, 2004.
(<http://www.who.int/whr/2004/en>)

Mathers CD, et al. Methods for Measuring Healthy Life Expectancy. In: Murray CJL, Evans D, eds. Health systems performance assessment: debates, methods and empiricism. Geneva, World Health Organization, 2003.

Database

Burden of Disease (<http://www.who.int/entity/healthinfo/statistics/bodgbdeathdalyestimates.xls>)

Statistical measures relating to the burden of disease. Includes: Healthy Life Expectancy (HALE); Life Expectancy; Discussion Papers. Also, this is where to find manuals, resources and software for carrying out national burden of disease studies.

Comments

The first challenge is lack of reliable data on mortality and morbidity, especially from low income countries. Other issues include lack of comparability of self-reported data from health interviews and the measurement of health-state preferences for such self-reporting.

Probability of dying aged 15-60 years per 1 000 population (adult mortality rate)

Rationale for use

Disease burden from non-communicable diseases among adults - the most economically productive age span - is rapidly increasing in developing countries due to ageing and health transitions. Therefore, the level of adult mortality is becoming an important indicator for the comprehensive assessment of the mortality pattern in a population.

Definition

Probability that a 15 year old person will die before reaching his/her 60th birthday.

Associated terms

The **probability of dying** between the ages of 15 and 60 years (per 1 000 population) per year among a hypothetical cohort of 100 000 people that would experience the age-specific mortality rate of the reporting year.

Life table (see Life expectancy at birth).

Data sources

Civil or sample registration: Mortality by age and sex are used to calculate age specific rates.

Census: Mortality by age and sex tabulated from questions on recent deaths that occurred in the household during a given period preceding the census (usually 12 months).

Census or surveys: Direct or indirect methods provide adult mortality rates based on information on survival of parents or siblings.

Methods of estimation

Empirical data from different sources are consolidated to obtain estimates of the level and trend in adult mortality by fitting a curve to the observed mortality points. However, to obtain the best possible estimates, judgement needs to be made on data quality and how representative it is of the population. Recent statistics based on data availability in most countries are point estimates dated by at least 3-4 years which need to be projected forward in order to obtain estimates of adult mortality for the current year.

When no adequate source of age-specific mortality exists, the life table is derived as described in the life expectancy indicator.

Disaggregation

By sex, location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. education, wealth quintile). Censuses and surveys provide such detail; civil registration data usually does not include socio-economic variables but can provide the other disaggregations.

References

Methods for estimating adult mortality. United Nations Population Division, July 2002 (ESA/P/WP.175). (<http://www.un.org/esa/population/publications/adultmort/Complete.pdf>)

Database

WHO Mortality Database: Civil registration data (<http://www.who.int/healthinfo/morttables>)

Comments

There is a dearth of data on adult mortality, notably in low income countries. Methods to estimate adult mortality from censuses and surveys are retrospective and possibly subject to considerable measurement error.

Probability of dying aged < 5 years per 1000 live births (under-five mortality rate)

Rationale for use

Under-five mortality rate and infant mortality rate are leading indicators of the level of child health and overall development in countries. They are also MDG indicators.

Definition

Under-five mortality rate is the probability of a child born in a specific year or period dying before reaching the age of five, if subject to age-specific mortality rates of that period.

Infant mortality rate is the probability of a child born in a specific year or period dying before reaching the age of one, if subject to age-specific mortality rates of that period.

Associated terms

Under-five mortality rate and **Infant mortality rate**, are strictly speaking, not rates (i.e. the number of deaths divided by the number of population at risk during a certain period of time) but a probability of death derived from a life table and expressed as rate per 1000 live births.

Live birth refers to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life - e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles - whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.

Data sources

Age-specific mortality rates among children are calculated from birth and death data derived from civil registration, census, and/or household surveys:

Civil registration: Number of deaths by age and numbers of births and children in each age group are used to calculate age specific rates. This systems provides annual data.

Census and surveys: An indirect method is used based on questions to each woman of reproductive age as to how many children she has ever born and how many are still alive. The

Brass method and model life tables are then used to obtain an estimate of under-five mortality.

Surveys: A direct method is used based on birth history - a series of detailed questions on each child a woman has given birth to during her lifetime. To reduce sampling errors, the estimates are generally presented as period rates, for five or 10 years preceding the survey.

Methods of estimation

Empirical data from different sources are consolidated to obtain estimates of the level and trend in under-five mortality by fitting a curve to the observed mortality points. However, to obtain the best possible estimates, judgement needs to be made on data quality and how representative it is of the population. Recent statistics based on data availability in most countries are point estimates dated by at least 3-4

years which need to be projected forward in order to obtain estimates of under-five mortality for the current year. Those are then converted to their corresponding infant mortality rates through model life table systems: the one developed by WHO for countries with adequate vital registration data; Coale-Demeny model life tables for the other countries. It should be noted that the infant mortality from surveys are exposed to recall bias, hence their estimates are derived from under-five mortality, which leads to a supplementary step to estimate infant mortality rates .

Disaggregation

By sex, location (urban/rural, major regions/provinces); and socio-economic characteristics (e.g. mother's education, wealth quintile). Often disaggregated under-five mortality rates are presented for 10-year periods because of the rapid increase in sampling error if multiple categories are used. Censuses and surveys provide such detail; civil registration data usually does not include socio-economic variables but can provide the other disaggregations.

References

Hill K, et al. Trends in child mortality in the developing world: 1990 to 1996, unpublished report, United Nations Children's Fund (UNICEF), New York, January 1998. (<http://www.childinfo.org/cmr/kh98meth.html>)

The World Health Report 2005, Make every mother and child count. Geneva, World Health Organization, 2005. (<http://www.who.int/whr/2005>)

The World Health Report 2006, Working together for health. Geneva, World Health Organization, 2006. (<http://www.who.int/whr/2006/en>)

The State of the World's Children 2006. Excluded and invisible. New York, United Nations Children's Fund (UNICEF), 2005. (<http://www.unicef.org/sowc06>)

Murray CJL, Ferguson BD, Lopez AD, Guillot M, Salomon J.A., Ahmad O. Modified logit life table system: principles, empirical validation and application. *Population Studies* 2003; 57(2):1-18

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

WHO Mortality Database: Civil registration data (<http://www.who.int/healthinfo/morttables>)

UNICEF: statistics and Multiple Indicator Cluster Survey: (<http://www.childinfo.org>)

Comments

Even though many countries have collected information on child mortality in recent years, the high demand for very recent child mortality trend information is difficult to meet through household surveys. High quality of civil registration systems (completeness of registration) and high quality of survey or

census data collection are crucial - WHO does estimate the level of underestimation of civil registration systems and there clearly is substantial variation in data quality and consistency across countries.

Neonatal mortality rate (per 1000 live births)

Rationale for use

Neonatal deaths account for a large proportion of child deaths. Mortality during the neonatal period is considered to be a useful indicator of maternal and newborn health and care.

Definition

Number of deaths during the first 28 completed days of life per 1000 live births in a given year or period.

Associated terms

The **neonatal period** commences at birth and ends 28 completed days after birth.

Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into **early neonatal deaths**, occurring during the first 7 days of life, and **late neonatal deaths**, occurring after the 7th day but before the 28th completed day of life.

Live birth in the tenth revision of the International Statistical Classification of Diseases and Related Health Problems (ICD 10) is defined as the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life such as heartbeat, umbilical cord pulsation, or definite movement of voluntary muscles, whether the umbilical cord has been cut or the placenta is attached.

Data sources

Civil registration: the number of live births and number of neonatal deaths are used to calculate age-specific rates. This system provides annual data.

Household surveys: calculations are based on birth history—a series of detailed questions on each child a woman has given birth to during the 5 or 10 years preceding the survey. The total number of live births surveyed provides the denominator.

Methods of estimation

Empirical data from civil registration and household surveys are compiled and adjusted in order to maintain consistency with the estimates of probability of dying at less than age 5 years. When no survey or registration data point is available, the neonatal mortality rate is estimated from the probability of dying at less than age 5 years, using a regression corrected for AIDS.

Disaggregation

By sex, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. mother's level of education, wealth quintile).

References

WHO. *Neonatal and perinatal mortality. country, regional and global estimates*. Geneva, World Health Organization, 2006 (http://www.who.int/making_pregnancy_safer/publications/neonatal.pdf).

WHO. Annex Table 8. In: *The world health report 2005—make every mother and child count*. Geneva, World Health Organization, 2005 (<http://www.who.int/whr/2005/en/index.html>).

WHO. *International Classification of Diseases. 10th Revision*. Geneva, World Health Organization, 2004.

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

European health for all (HFA) database, WHO Regional Office for Europe (<http://www.who.dk/hfadb>)

WHO Mortality Database (<http://www.who.int/healthinfo/statistics/mortality/en/index.html>)

Comments

The reliability of the estimates of neonatal mortality depends upon the accuracy and completeness of reporting and recording of births and deaths. Underreporting and misclassification are common, especially for deaths occurring early in life.

Table 1. Mortality data in the estimation dataset for 192 countries/areas with a population of 300 000 or more

	Stillbirth rate	Early neonatal mortality rate	Neonatal mortality rate	Infant mortality rate	Child mortality rate
Countries with available data in the estimation dataset	102	141	159	159	152
Percentage of countries with data	53	73	83	83	79
Percentage of births	40	76	95	95	91

From WHO. *Neonatal and perinatal mortality. country, regional and global estimates*. Geneva, World Health Organization, 2006; p. 9.

Table 2. Neonatal mortality data obtained from registration and surveys

	No. of countries	Percentage of countries	Births (thousands)	Percentage of births
Registration data (WHO definition)	54	28	17 558	13
Registration data (United Nations definition)	18	9	818	0.6
Survey data	87	45	108 167	81
Total countries with available data	159	83	126 543	95
Countries/areas with no reliable data	33	17	6 312	5
Grand total	192	100	132 882	100

From WHO. *Neonatal and perinatal mortality. country, regional and global estimates*. Geneva, World Health Organization, 2006; p. 10.

Maternal mortality ratio (per 100 000 live births)

Rationale for use

Complications during pregnancy and childbirth are a leading cause of death and disability among women of reproductive age in developing countries. The maternal mortality ratio represents the risk associated with each pregnancy, i.e. the obstetric risk. It is also a Millennium Development Goal Indicator for monitoring Goal 5, improving maternal health.

Definition

Number of maternal deaths per 100 000 live births during a specified time period, usually 1 year.

Associated terms

Maternal death is the death of a woman while pregnant or within 42 days after termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. To facilitate the identification of maternal deaths in circumstances in which cause-of-death attribution is inadequate, ICD 10 introduced an additional category, **pregnancy-related death**, which is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.

Live birth (see *Neonatal mortality rate*).

Data sources

Vital registration, household surveys, census, health service records and specific studies on reproductive-age mortality (RAMOS).

Methods of estimation

Measuring maternal mortality accurately is difficult except where comprehensive registration of deaths and their causes exist. Elsewhere, censuses or surveys can be used to measure levels of maternal mortality. Data derived from health-services records are problematic where not all births take place in health facilities, because of biases the dimensions and direction of which cannot be determined. RAMOS use triangulation of different sources of data on deaths of women of reproductive age, including record review and/or verbal autopsy to accurately identify maternal deaths. Based on multiple sources of information, RAMOS are considered to be the best way to estimate levels of maternal mortality. Estimates derived from household surveys are usually based on information collected retrospectively about the deaths of sisters of the respondents and could refer to deaths that occurred an average of 12 years ago, and are subject to wide confidence intervals. For countries without any reliable data on maternal mortality, statistical models are applied. Global and regional estimates of maternal mortality are developed every 5 years, using a regression model.

Disaggregation

By age and parity, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. level of education, wealth quintile).

References

WHO. *International Classification of Diseases, 10th Revision*. Geneva, World Health Organization, 2004.

WHO. *Maternal mortality in 2000. Estimates developed by WHO, UNICEF and UNFPA*. Geneva, World Health Organization, 2000 (http://www.who.int/reproductive-health/publications/maternal_mortality_2000/index.html)

Database

None.

Comments

Maternal deaths are from an epidemiological perspective, relatively rare events, which necessitates large sample sizes for direct estimates of mortality levels via population surveys. In addition, their accurate identification is usually problematic, even with established registration systems. Many low-income countries have no or very little data and modelling is used to obtain a national estimate.

Deaths due to HIV/AIDS (per 100 000 population)

Rationale for use

The mortality rates of adults and of children aged less than 15 years are leading indicators of the level of impact of the HIV/AIDS epidemic and of the impact of interventions, particularly the scaling-up of treatment and prevention of mother-to-child transmission in countries with generalized HIV epidemics.

Definition

Estimated mortality due to HIV/AIDS is the number of adults and children that have died in a specific year, based on the modelling of HIV surveillance data using standard and appropriate tools.

Associated terms

Adult mortality rate and children mortality rate, are rates in the strict sense, i.e. the number of deaths divided by the number of population at risk during a certain period of time and expressed as rate per 100000 population.

Data sources

Adult and child-specific mortality numbers are derived from estimated prevalence based on HIV surveillance data from sentinel surveillance and/or household surveys and ART and PMTCT intervention coverage data.

Total population above 15 and children are derived from the UN Population Division 2006 revision.

Methods of estimation

Empirical data from different HIV surveillance sources are consolidated to obtain estimates of the level and trend of mortality in adults and children using standard methods and tools for HIV estimates that are appropriate to the pattern of the HIV epidemic. However, to obtain the best possible estimates, judgement needs to be used as to the quality of the data and how representative it is of the population. The Joint United Nations Programme on HIV/AIDS and the World Health Organization (UNAIDS/WHO) produce country-specific estimates every two years.

Disaggregation

By sex, for mortality in adults.

References

Ward H, Walker N, Ghys PD, eds. Methods and tools for HIV/AIDS estimates and projections. *Sexually Transmitted Infections*, 2004, 80(Suppl 1):1–38.

UNAIDS. *2006 Report on the global AIDS epidemic. A UNAIDS 10th anniversary special edition*. Geneva, Joint United Nations Programme on HIV/AIDS, 2006
(http://www.unaids.org/en/HIV_data/2006GlobalReport/default.asp).

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

Statistics by area, and Multiple Indicator Cluster Surveys, UNICEF (<http://www.childinfo.org>)

Civil registration data, WHO Mortality Database
(<http://www.who.int/healthinfo/statistics/mortality/en/index.html>)

Comments

Although many countries have collected information on mortality in adults and children in recent years, underreporting is a feature of systems in many countries, partly owing to stigma and lack of diagnosis. It is crucial that civil registration systems (completeness of registration) and survey or census data-collection are of high quality; WHO does estimate the level of underestimation of civil registration systems and there clearly is substantial variation in data quality and consistency between countries.

Deaths due to tuberculosis (per 100 000 population)

Rationale for use

Prevalence and mortality are direct indicators of the burden of tuberculosis (TB), indicating the number of people suffering from the disease at a given point in time, and the number dying each year. Furthermore, prevalence and mortality respond quickly to improvements in control, as timely and effective treatment reduce the average duration of disease (thus decreasing prevalence) and the likelihood of dying from the disease (thus reducing disease-specific mortality).

Millennium Development Goal 6 is "to combat HIV/AIDS, malaria and other diseases" [including TB]. This goal is linked to Target 8—"to have halted by 2015 and begun to reverse the incidence of malaria and other major diseases"—and indicator 24—"prevalence and mortality rates associated with TB". The Stop TB Partnership has endorsed the related targets of reducing per-capita prevalence and mortality of TB by 50% relative to 1990, by the year 2015. There are few good data with which to establish prevalence of and mortality due to TB, particularly for the baseline year of 1990. However, current best estimates suggest that implementation of the Global Plan to Stop TB 2006–2015 will halve 1990 prevalence and mortality rates globally, and in most regions by 2015, although not in Africa or eastern Europe.

Definition

The estimated number of deaths attributable to TB in a given time period. Expressed in this database as deaths per 100 000 population per year. Includes deaths from all forms of TB, and deaths from TB in people with HIV.

Definition of associated terms

All forms: pulmonary (smear-positive and smear-negative) and extrapulmonary TB.

Sources

Vital registration data where available (few countries with high burdens of TB have complete vital registration systems with good coverage). Elsewhere, mortality is estimated from incidence.

Methods of estimation

Estimates of TB incidence, prevalence and mortality are based on a consultative and analytical process in WHO and are published annually (see WHO, 2007)

The methods used to estimate rates of mortality from TB are described in detail elsewhere (Dye C et al., 1999; Corbett EL et al., 2003; WHO, 2007).

Country-specific estimates of TB mortality are, in most instances, derived from estimates of incidence (see *Incidence of tuberculosis*: <http://www.who.int/whosis/whostat2006/IncidenceOfTuberculosis.pdf>) combined with assumptions about the case fatality rate. The case fatality rate is assumed to vary according to whether the disease is smear-positive or not; whether the individual receives treatment in a DOTS programme or non-DOTS programmes, or is not treated at all; and whether the individual is infected with HIV.

Disaggregation

Estimates are routinely disaggregated into smear-positive and other forms of disease, and by HIV status (in adults aged 15–49 years).

References

Corbett EL et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Archives of Internal Medicine*, 2003, 163:1009–1021.

Dye C et al. Global burden of tuberculosis: estimated incidence, prevalence and mortality by country. *Journal of the American Medical Association*, 1999, 282:677–686.

WHO. *The Global Plan to Stop TB, 2006–2015*. Geneva, World Health Organization, 2006a (WHO/HTM/STB/2006.35).

WHO. *The Stop TB Strategy: building on and enhancing DOTS to meet the TB-related Millennium Development Goals*. Geneva, World Health Organization, 2006b (WHO/HTM/STB/2006.37).

WHO. *Global tuberculosis control: surveillance, planning, financing. WHO report 2007*. Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.376).

Database

Global TB database, WHO (http://www.who.int/tb/country/global_tb_database)

United Nations Millennium Development Goals Indicator database (<http://unstats.un.org/unsd/mdg>)

Comments

Mortality due to TB can be measured directly only where there is a good vital registration system, with accurate coding of cause-of-death. The number of patients dying while receiving treatment for TB (as reported in routine follow-up of cohorts of TB patients) is not an indication of mortality due to TB, as it includes deaths from causes other than TB, and excludes deaths from TB among people not on treatment.

Mortality surveys and demographic surveillance systems using verbal autopsy to determine cause of death are potential sources of improved estimates of mortality due to TB.

Age-standardized mortality rates by cause (per 100 000 population)

Rationale for use

The numbers of deaths per 100 000 population are influenced by the age distribution of the population. Two populations with the same age-specific mortality rates for a particular cause of death will have different overall death rates if the age distributions of their populations are different. Age-standardized mortality rates adjust for differences in the age distribution of the population by applying the observed age-specific mortality rates for each population to a standard population.

Definition

The age-standardized mortality rate is a weighted average of the age-specific mortality rates per 100 000 persons, where the weights are the proportions of persons in the corresponding age groups of the WHO standard population.

The WHO World Standard Population was based on the average world population structure for the period 2000-2025 as assessed every two years by the United Nations Population Division (UNPD) for each country by age and sex. Estimates from the UNDP 1998 assessment (being the latest one at the time the WHO Standard Population was chosen) based on population censuses and other demographic sources, adjusted for enumeration errors were used. The use of an average world population as well as a time series of observations removes the effects of historical events such as wars and famine on population age composition. WHO Standard Population is defined to reflect the average age structure of the world's population over the next generation, from the year 2000 to 2025.

Table 3. WHO World Standard Population Distribution (%), based on world average population between 2000-2025	
Age group	World Average 2000-2025
0-4	8.86
5-9	8.69
10-14	8.6
15-19	8.47
20-24	8.22
25-29	7.93
30-34	7.61
35-39	7.15

40-44	6.59
45-49	6.04
50-54	5.37
55-59	4.55
60-64	3.72
65-69	2.96
70-74	2.21
75-79	1.52
80-84	0.91
85-89	0.44
90-94	0.15
95-99	0.04
100+	0.005
Total	100

From Ahmad O, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. *Age standardization of rates: a new WHO standard*. Geneva, World Health Organization, 2001 (GPE Discussion Paper No. 31).

Associated terms

None.

Data sources

Death registration data for 112 WHO Member States, sample registration systems (India, China), available data on child and adult mortality from censuses and surveys, together with population-based epidemiological studies, disease registers and notifications systems for the estimation of mortality for 21 specific causes of death.

Methods of estimation

Life tables specifying all-cause mortality rates by age and sex for 192 WHO Member States were developed for 2002 from available death registration data, sample registration systems (India, China) and data on child and adult mortality from censuses and surveys.

Cause-of-death distributions were estimated from death registration data for 107 countries, and data from population-based epidemiological studies, disease registers and notifications systems for selected specific causes of death. Causes of death for populations without useable death-registration data were

estimated using cause-of-death models together with data from population-based epidemiological studies, disease registers and notifications systems for 21 specific causes of death.

Disaggregation

By age and sex.

References

Ahmad O, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. *Age standardization of rates: a new WHO standard*. Geneva, World Health Organization, 2001 (GPE Discussion Paper No. 31).

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Database

WHO Mortality Database (<http://www.who.int/healthinfo/statistics/mortality/en/index.html>). The data available on this web site comprise deaths registered in national vital registration systems, with underlying cause of death as coded by the relevant national authority.

Estimates of death rates for 2002 by cause for WHO Member States. The Excel spreadsheet contains estimates of numbers, crude rates and age-standardized rates, as well as information on data sources and levels of evidence (<http://www.who.int/entity/healthinfo/statistics/bodgbdeathdalyestimates.xls>)

Comments

Uncertainty in estimated all-cause mortality rates ranges from around $\pm 1\%$ for high-income countries to $\pm 15\text{--}20\%$ for sub-Saharan Africa, reflecting large differences in the availability and quality of data on mortality, particularly for adult mortality. Uncertainty ranges are generally larger for estimates of death rates from specific diseases. For example, the relative uncertainty for death rates from ischaemic heart disease ranges from around $\pm 12\%$ for high-income countries to $\pm 25\text{--}35\%$ for sub-Saharan Africa. The relatively large uncertainty for high-income countries reflects a combination of uncertainty in overall mortality levels, in cause-of-death assignment, and in the attribution of deaths coded to ill-defined causes.

Distribution of years of life lost by broader causes (percentage of total)

Rationale for use

Years of life lost (YLLs) take into account the age at which deaths occur by giving greater weight to deaths occurring at younger ages and lower weight to deaths occurring at older ages. The YLLs (percentage of total) indicator measures the YLLs due to a particular cause of death as a proportion of the total YLLs lost due to premature mortality in the population.

Definition

YLLs are calculated from the number of deaths multiplied by a standard life expectancy at the age at which death occurs. The standard life expectancy used for YLLs at each age is the same for deaths in all regions of the world and is the same as that used for the calculation of disability-adjusted life years (DALYs). Additionally, 3% time discounting and non-uniform age weights that give less weight to years lived at young and older ages were used, as for the DALY. With non-uniform age weights and 3% discounting, a death in infancy corresponds to 33 YLLs, and deaths at age 5 to 20 years to around 36 YLLs.

Associated terms

The **DALYs** are a health-gap measure that extends the concept of potential years of life lost due to premature death (PYLLs) to include equivalent years of 'healthy' life lost by virtue of being in states of poor health or disability (Lopez et al., 2006). DALYs for a disease or health condition are calculated as the sum of the YLLs because of premature mortality in the population and the years lived with a disability (YLDs) for incident cases of the health condition.

Data sources

Death registration data for 112 WHO Member States, sample registration systems (India, China), available data on child and adult mortality from censuses and surveys, together with population-based epidemiological studies, disease registers and notifications systems for the estimation of mortality due to 21 specific causes of death.

Methods of estimation

Life tables specifying all-cause mortality rates by age and sex for 192 WHO Member States were developed from available death registration data for 2002, sample registration systems (India, China) and data on child and adult mortality from censuses and surveys.

Cause-of-death distributions were estimated from death registration data for 107 countries, together with data from population-based epidemiological studies, disease registers and notifications systems for selected specific causes of death. Causes of death for populations without useable death-registration data were estimated using cause-of-death models together with data from population-based epidemiological studies, disease registers and notifications systems for 21 specific causes of death.

Disaggregation

By age and sex.

References

Lopez AD, Mathers CD, Ezzati M, Murray CJL, Jamison DT. *Global burden of disease and risk factors*. New York, Oxford University Press, 2006 (<http://www.dcp2.org/pubs/GBD>).

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Mathers CD, Ma Fat D, Inoue M, Rao C, Lopez AD. Counting the dead and what they died from: an assessment of the global status of cause of death data. *Bulletin of the World Health Organization*, 2005, 83:171–177 ([http://whqlibdoc.who.int/bulletin/2005/Vol83-No3/bulletin_2005_83\(3\)_171-177.pdf](http://whqlibdoc.who.int/bulletin/2005/Vol83-No3/bulletin_2005_83(3)_171-177.pdf)).

Database

WHO Mortality Database (<http://www.who.int/healthinfo/statistics/mortality/en/index.html>)

The data available on this web site comprise deaths registered in national vital registration systems, with underlying cause of death as coded by the relevant national authority.

Death and disability-adjusted life years (DALYs) estimates for 2002 by cause for WHO Member States. This Excel spreadsheet contains estimates of numbers, crude rates and age-standardized rates, as well as information on data sources and levels of evidence (<http://www.who.int/entity/healthinfo/statistics/bodgbdeathdalyestimates.xls>)

Comments

Uncertainty in the percentage of estimated all-cause YLL ranges from around $\pm 1\%$ for high-income countries to $\pm 15\text{--}20\%$ for sub-Saharan Africa, reflecting large differences in the availability of data on mortality, particularly for adult mortality. Uncertainty ranges are generally larger for estimates of deaths from specific diseases. For example, the relative uncertainty for deaths from ischaemic heart disease ranges from around $\pm 12\%$ for high-income countries to $\pm 25\text{--}35\%$ for sub-Saharan Africa. The relatively large uncertainty for high-income countries reflects a combination of uncertainty in overall mortality levels, in cause-of-death assignment, and in the attribution of deaths coded to ill-defined causes.

Distribution of causes of death among children aged < 5 years (percentage of total)

Rationale for use

The target of Millennium Development Goal 4 is to “Reduce by two thirds, from 1990 to 2015, the under-five mortality rate”. Efforts to improve child survival can be effective only if they are based on reasonably accurate information about the causes of childhood deaths. Cause-of-death information is needed to prioritize interventions and plan for their delivery, to determine the effectiveness of disease-specific interventions, and to assess trends in disease burden in relation to national and international goals.

Definition

The causes of death are those that are entered on the medical certificate of cause of death in countries and recorded by the civil (vital) registration systems. For the analyses, we have used the concept of the 'underlying cause of death' as defined by ICD (WHO, 1992). In countries with incomplete or no civil registration, causes of death are those reported as such in epidemiological studies that use verbal autopsy algorithms to establish cause of death.

Associated terms

The **under-5 mortality rate** is strictly speaking not a rate (i.e. the number of deaths divided by the number of population at risk during a certain period of time), but a probability of death derived from a life table and expressed as rate per 1000 live births.

Underlying cause of death has been defined by ICD (WHO, 1992) as “(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury”.

Data sources

WHO regularly receives mortality-by-cause data from Member States, as recorded in national civil (vital) registration systems. These statistics were therefore analysed to obtain the distribution of child deaths by cause in 72 countries where those systems are judged to be sound (on the basis of reliable diagnostic procedures and standard application of cause coding that follows ICD rules as applied to death certificates) and have coverage rates of 85% or above, all of which are high- or middle-income countries. For countries with an incomplete or no vital registration system, epidemiological studies and statistical modelling were used extensively.

Methods of estimation

Cause-of-death data from civil registration systems were evaluated for their completeness. Complete and nationally-representative data were then grouped by ICD codes into the cause categories, and the proportions of these causes with regard to the total number of deaths of children aged less than 5 years were then computed. For countries with incomplete data or no data, the distribution of deaths by cause was estimated in two steps. In the first step, a statistical model was used to assign deaths to one of three broad categories of causes: communicable diseases; noncommunicable diseases; or injuries and external causes. In a second step, cause-specific under-five mortality estimates from the Child Health Epidemiology Reference Group (CHERG), WHO technical programmes, and UNAIDS were taken into

account in assigning the distribution of deaths to specific causes. A variety of methods, including proportional mortality and natural history models, were used by CHERG and WHO to develop country-level cause-specific mortality estimates. All CHERG working groups developed comparable and standardized procedures to generate estimates from the databases.

Disaggregation

Country level, age groups—neonatal (0–27 days) and 28 days to 59 months.

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Database

WHO Mortality Database (<http://www.who.int/healthinfo/statistics/mortality/en/index.html>)

WHO Department of Child and Adolescent Health and Development (CAH) web site (http://www.who.int/child-adolescent-health/OVERVIEW/CHILD_HEALTH/child_epidemiology.htm)

Comments

Percentage of deaths among children aged less than 5 years was estimated for eight cause categories only. There are still estimates of some of the major causes of child deaths (e.g. injuries) that have not yet been developed using the CHERG methods. Also, a better understanding of the indirect contributions of diseases to child deaths is needed in order to assess disease control priorities and evaluate interventions.

Health status: morbidity

HIV prevalence among adults aged ≥ 15 years (per 100 000 population)

Rationale for use

HIV and AIDS has become a major public health problem in many countries and monitoring the course of the epidemic and impact of interventions is crucial. Both the Millennium Development Goals (MDG) and the United Nations General Assembly Special Session on HIV and AIDS (UNGAS) have set goals of reducing HIV prevalence.

The goal in the response to HIV is to reduce HIV infection. As the highest rates of new HIV infections typically occur in young adults, more than 180 countries have committed themselves to achieving major reductions in HIV prevalence among young people—a 25% reduction in the most affected countries by 2005 and a 25% reduction globally by 2010. (UNGASS, MDGS)

Definition

Percentage of adults 15–49 who are HIV infected

Associated terms

For surveillance purposes, HIV infection is diagnosed through HIV testing, according to the HIV surveillance testing strategies recommended by WHO/UNAIDS HIV/AIDS/STI surveillance working group.

Data sources

HIV surveillance: For generalized epidemics, antenatal clinic attendees and population based surveys are primary sources of information. In concentrated and low level epidemics (where HIV prevalence in pregnant women is below 1%), surveillance among populations with high risk behaviours, e.g. injecting drug users, men who have sex with men and sex workers, should be the focus of surveillance. Household surveys: Inclusion of HIV testing is being increasingly adopted by countries e.g. Demographic and Health Surveys (DHS), AIDS Indicator Surveys (AIS).

Methods of estimation

HIV prevalence data from HIV sentinel surveillance systems, which may include national population surveys with HIV testing, are used to estimate HIV prevalence using standardized tools and methods of estimation developed by UNAIDS and WHO in collaboration with the UNAIDS Reference Group on Estimation, Modelling and Projections. Tools for estimating the level of HIV infection are different for generalized epidemics, and concentrated or low level epidemic.

Disaggregation

By sex, location (urban/rural, major regions/provinces),

References

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Database

US Bureau of the Census HIV/AIDS Surveillance database:

(<http://www.census.gov/ipc/www/hivaidsn.html>)

UNAIDS/WHO Global HIV/AIDS Online Database: (<http://www.who.int/globalatlas/default.asp>)

Comments

The main indicator proposed for monitoring progress towards achieving the international goals is HIV prevalence among young people aged 15-24 years which is a better proxy for monitoring HIV incidence than prevalence among 15 to 49 years old. Although countries are moving towards collecting better data on young people, mainly by capturing data on young pregnant women attending antenatal clinics or national population based surveys, comparable data availability is still limited. In 2006 only 6 countries were able to perform analysis on HIV prevalence among young people. Analysis of trends on consistent sites have been proposed as an alternative to tool to assess recent trends and countries have been encouraged to collect report HIV surveillance data by age breakdown.

Incidence of tuberculosis (per 100 000 population per year)

Rationale for use

Incidence (cases arising in a given time period) gives an indication of the burden of TB in a population, and of the size of the task faced by a national TB control programme. Incidence can change as the result of changes in transmission (the rate at which people become infected with *Mycobacterium tuberculosis*, the bacterium that causes TB), or changes in the rate at which people infected with *Mycobacterium tuberculosis* develop TB disease (e.g. as a result of changes in nutritional status or of HIV infection). Because TB can develop in people who became infected many years previously, the effect of TB control on incidence is less rapid than the effect on prevalence or mortality.

Millennium Development Goal 6, Target 8 is to "have halted by 2015 and begun to reverse the incidence of malaria and other major diseases" (including TB). WHO estimates that in 2005 the per-capita incidence of TB was stable or falling in six WHO Regions and had reached a peak worldwide. However, the total number of TB cases was still rising slowly, because the case-load continued to grow in the African, Eastern Mediterranean and South-East Asia regions.

Definition

Estimated number of TB cases arising in a given time period (expressed here as rate per 100 000 population/year). All forms of TB are included, including cases in people with HIV.

Associated terms

All forms: pulmonary (smear-positive and smear-negative) and extrapulmonary TB.

Notification: the process of reporting diagnosed TB cases to WHO; the data collected by this process. This does not refer to the systems in place in some countries to inform national authorities of cases of certain "notifiable" diseases.

Annual **case notifications** (and other data on programme performance) are collected by WHO via an annual data collection form, distributed to national TB control programmes through WHO regional and country offices.

Data sources

Estimates are based on annual case notifications (see "Associated terms", above), on special surveys of the prevalence of infection or disease and on information from death (vital) registration systems.

Methods of estimation

Estimates of incidence, prevalence and mortality are based on a consultative and analytical process in WHO and are published annually (WHO, 2007). Estimates of the incidence of TB for each country are derived using one or more of four approaches, depending on the available data:

1. Incidence = case notifications / proportion of cases detected;
2. Incidence = prevalence / duration of condition;
3. Incidence = annual risk of TB infection × Styblo coefficient;

4. Incidence = deaths / proportion of incident cases that die.

The Stýblo coefficient in equation 3 is taken to be a constant, with an empirically derived value in the range 40–60, relating risk of infection (% per year) to the incidence of sputum smear-positive cases (per 100 000 per year). Given two of the quantities in any of these equations, we can calculate the third, and these formulae can be rearranged to estimate rates of incidence, prevalence and death. The available data differ from country to country but include case notifications and death records (from routine surveillance and vital registration), and measures of the prevalence of infection and disease (from population-based surveys).

For each country, estimates of incidence for each year during the period 1995–2005 were been made as follows. First a reference year for which there is a best estimate of incidence was selected; this may be the year in which a survey was carried out, or the year for which incidence was first estimated. Then the series of case notifications was used to determine how incidence changed before and after that reference year. The time series of estimated incidence rates was constructed from the notification series in one of two ways: if the rate of change of incidence is roughly constant over time, an exponential trend is fitted to the notifications (parts of Africa with a low prevalence of HIV, Latin America, South-East Asia, Western Pacific); if the rate varies through time (eastern Europe, central Europe, parts of Africa with a high prevalence of HIV, Established Market Economies and the Eastern Mediterranean), a 3-year moving average of the notification rates is used. If the notifications for any country are considered to be an unreliable guide to trend (e.g. because reporting effort is known to have changed; or because reports are clearly erratic, changing in a way that cannot be attributed to the epidemiology of TB), the aggregated trend for all other countries from the same epidemiological region that have reliable data is applied. For some countries (China, Indonesia and Nepal), the assessment of the trend in incidence is based on risk-of-infection derived from other sources (e.g. tuberculin surveys for China and Nepal). For those countries that have no reliable data from which to assess trends in incidence (e.g. for countries such as Iraq, for which data are hard to interpret and which are atypical within their own regions), incidence is assumed to be stable. Further details are available from Dye C et al., 1999; Corbett EL et al., 2003; and WHO, 2007.

Disaggregation

Estimates of incidence disaggregated by type of disease (smear-positive pulmonary versus all other forms) and by HIV status (among adults aged 15–49 years) are published annually (see WHO, 2006c and the Global TB database).

National TB control programmes are requested by WHO to provide case notifications disaggregated by site of disease (pulmonary/extrapulmonary), laboratory confirmation (usually sputum smear), and history of previous treatment. New smear-positive cases are broken down by age and sex. Many control programmes are also able to disaggregate cases according to the presence of drug resistance. New recommendations for recording and reporting include disaggregation of notified cases by HIV status.

References

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WHO. *Global tuberculosis control: surveillance, planning, financing. WHO report 2006*. Geneva, World Health Organization, 2006c (WHO/HTM/TB/2006.362).

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Database

Global TB database (http://www.who.int/tb/country/global_tb_database)

United Nations Millennium Development Goals Indicator database (<http://unstats.un.org/unsd/mi>)

Comments

Routine surveillance data provide a good basis for the estimate of incidence in countries where the majority of incident cases are treated and notified to WHO. Where the proportion of cases notified is consistent over time (even if it is low), trends in incidence can be judged from trends in notified cases. Where TB control efforts change over time it is difficult to differentiate between changes in incidence and changes in the proportion of cases notified.

A national surveillance system is an integral part of good TB control, and one of the components of DOTS, which forms the core of the Stop TB Strategy. As surveillance improves in countries implementing the strategy, so will estimates of the incidence of TB.

Prevalence of tuberculosis (per 100 000 population)

Rationale for use

Prevalence and mortality are direct indicators of the burden of TB, indicating the number of people suffering from the disease at a given point in time, and the number dying each year. Furthermore, prevalence and mortality respond quickly to improvements in control, as timely and effective treatment reduce the average duration of disease (thus decreasing prevalence) and the likelihood of dying from the disease (thus reducing disease-specific mortality).

Millennium Development Goal 6 is "to combat HIV/AIDS, malaria and other diseases" [including TB]. This goal is linked to Target 8—"to have halted by 2015 and begun to reverse the incidence of malaria and other major diseases"—and Indicator 24 – "prevalence and mortality rates associated with TB". The Stop TB Partnership has endorsed the related targets of reducing per-capita TB prevalence and mortality by 50% relative to 1990, by the year 2015. There are few good data with which to establish prevalence and mortality, particularly for the baseline year of 1990. However, current best estimates suggest that implementation of the Global Plan to Stop TB 2006–2015 will halve 1990 prevalence and mortality rates globally and in most regions by 2015, although not in Africa or eastern Europe.

Definition

The number of cases of TB (all forms) in a population at a given point in time (sometimes referred to as "point prevalence"). Expressed in this database as number of cases per 100 000 population. Estimates include cases of TB in people with HIV.

Associated terms

All forms: pulmonary (smear-positive and smear-negative) and extrapulmonary TB.

Data sources

Prevalence can be estimated in population-based surveys, and each year a small number of countries carry out such surveys. Where available, these surveys are used to estimate prevalence for those countries for the year in question. Elsewhere, prevalence is calculated from estimated incidence (see *Incidence of tuberculosis*: <http://www.who.int/whosis/whostat2006IncidenceOfTuberculosis.pdf>). Prevalence estimates for years in which surveys are not available are derived from incidence, as described below.

Methods of estimation

Estimates of TB incidence, prevalence and mortality are based on a consultative and analytical process in WHO and are published annually (WHO, 2007).

The methods used to estimate TB prevalence and mortality rates are described in detail elsewhere (Dye C et al., 1999; Corbett EL et al., 2003; WHO, 2007). Country-specific estimates of prevalence are, in most instances, derived from estimates of incidence (see *Incidence of tuberculosis*: <http://www.who.int/whosis/whostat2006IncidenceOfTuberculosis.pdf>), combined with assumptions about the duration of disease. The duration of disease is assumed to vary according to whether the disease is smear-positive or not; whether the individual receives treatment in a DOTS programme, non-DOTS programme, or is not treated at all; and whether the individual is infected with HIV.

Disaggregation

Estimates are routinely disaggregated into smear-positive and other forms of disease, and by HIV status (in adults aged 15–49 years).

References

Corbett EL et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Archives of Internal Medicine*, 2003, 163:1009–1021.

Dye C et al. Global burden of tuberculosis: estimated incidence, prevalence and mortality by country. *Journal of the American Medical Association*, 1999, 282:677–686.

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WHO. *Global tuberculosis control: surveillance, planning, financing. WHO report 2007*. Geneva, World Health Organization, 2006c (WHO/HTM/TB/2007.376).

Database

Global TB database (http://www.who.int/tb/country/global_tb_database)

United Nations Millennium Development Goals Indicator database (<http://www.unstats.un.org/unsd/mi>)

Comments

Prevalence-of-disease surveys are costly and logistically complex, but they do provide a direct and accurate measure of the prevalence of bacteriologically confirmed TB disease, and can serve as a platform for other investigations, e.g. the interactions between patients and the health system. Surveys are particularly useful where routine surveillance data are poor.

Number of confirmed cases of poliomyelitis

Rationale for use

The 1988 World Health Assembly (WHA) called for the global eradication of poliomyelitis.

The number of poliomyelitis cases is used to monitor progress towards this goal and to inform eradication strategies. Countries implement strategies supplementing routine immunization - e.g. national immunization days and sub-national campaigns - or more targeted mop-up activities, depending on the levels of poliomyelitis cases.

Definition

Suspected polio cases (acute-flaccid paralysis - AFP, other paralytic diseases, and contacts with polio cases) that are confirmed by laboratory examination or are consistent with polio infection.

Associated terms

None.

Data sources

Active case finding and reporting of AFP, communicable disease surveillance systems, national and regional laboratory reports*.

* Most countries conduct active case search for cases of acute flaccid paralysis among children less than 15 years of age. When possible (approximately 80% of cases) a stool specimen is obtained for laboratory investigation. A regional reference laboratory verifies cases with evidence of polio infection. The principle indicator for the quality of AFP/polio surveillance data is the use of the non-polio AFP rate. Studies have shown that the expected non-polio AFP rate is approximately 1 per 100 000 population under 15 years of age and an effective polio surveillance system should detect and report approximately one AFP case per 100 000 population under 15.

Methods of estimation

Estimates of polio cases are based exclusively on unadjusted surveillance data.

Disaggregation

By location (urban/rural, major regions/provinces).

References

Information on Vaccines, Immunization and Biologicals:

(http://www.who.int/immunization_monitoring/diseases/ poliomyelitis/en/index.html)

Database

Information on Vaccines, Immunization and Biologicals:

(http://www.who.int/immunization_monitoring/en/diseases/poliomyelitis/case_count.cfm)

WHO Vaccines preventable diseases monitoring system:

(http://www.who.int/immunization_monitoring/en/globalsummary/countryprofileselect.cfm)

Comments

Many countries have eliminated indigenous polio and in some instances more than ten years have passed since the last reported case of polio. Intensive, high quality surveillance is difficult to maintain when effective interventions have eliminated the disease locally.

Health service coverage

Immunization coverage among 1-years-olds with one dose of measles (percentage)

Immunization coverage among 1-years-olds with three doses of diphtheria, tetanus toxoid and pertussis (DTP3) (percentage)

Immunization coverage among 1-years-olds with three doses of Hepatitis B (HepB3) (percentage)

Rationale for use

Immunization coverage estimates are used to monitor immunization services, to guide disease eradication and elimination efforts, and are a good indicator of health system performance.

Definition

Measles immunization coverage is the percentage of one-year-olds who have received at least one dose of measles containing vaccine in a given year. For countries recommending the first dose of measles among children older than 12 months of age, the indicator is calculated as the proportion of children less than 24 months of age receiving one dose of measles containing vaccine.

DTP3 immunization coverage is the percentage of one-year-olds who have received three doses of, the combined diphtheria and tetanus toxoid and pertussis vaccine in a given year.

HepB3 immunization coverage is the percentage of one-year-olds who have received three doses of Hepatitis B3 vaccine in a given year.

Associated terms

None.

Data sources

Administrative data: Reports of vaccinations performed by service providers are used for estimates based on administrative data service providers (e.g. district health centres, vaccination teams, physicians). The estimate of immunization coverage is derived by dividing the total number of vaccinations given by the number of children in the target population, often based on census projections.

Household surveys: Survey items correspond to children's history in coverage surveys. The principle types of surveys are the Expanded Programme on Immunization (EPI) 30-cluster survey, the UNICEF Multiple Indicator Cluster Survey (MICS), and the Demographic and Health Survey (DHS).

Methods of estimation

WHO and UNICEF rely on reports from countries, household surveys and other sources such as research studies. Both organizations have developed common review process and estimation methodologies. Draft estimates are made, reviewed by country and external experts and then finalized.

Disaggregation

By sex, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. mother's education level, wealth quintile).

References

WHO-Recommended Standards for Surveillance of Selected Vaccine -Preventable disease.

Geneva, World Health Organization, 2003. (WHO/ V&B/03.01): (<http://www.who.int/vaccines - documents/DocsPDF03/www742.pdf>) (http://www.who.int/health_topics/measles) and (http://www.who.int/immunization_monitoring/diseases)

State of the World's Children. United Nations Children's Fund (UNICEF), 2003: (<http://www.childinfo.org/eddb/immuni/index.htm>) and (<http://www.unicef.org/programme/health/focus/immunization/measles.htm>)

Database

Information on Vaccines, Immunization and Biologicals:

(http://www.who.int/immunization_monitoring/routine/immunization_coverage/en/index4.html)

Estimates on Immunization Coverage:

(<http://www.childinfo.org/areas/immunization/countrydata.php>)

Comments

The principle challenges are to improve the quality (accuracy, validity, completeness and timeliness) of the data. Also, interpretation of available data needs to be improved by adjusting for possible biases for the most accurate estimate of immunization coverage possible.

Antenatal care coverage (percentage)

Rationale for use

Antenatal care coverage is an indicator of access and use of health care during pregnancy.

Definition

Percentage of women who used antenatal care provided by skilled health personnel for reasons related to pregnancy at least once during pregnancy, as a percentage of live births in a given time period.

Associated terms

Antenatal care constitutes screening for health and socioeconomic conditions likely to increase the possibility of specific adverse pregnancy outcomes, providing therapeutic interventions known to be effective; and educating pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them.

Skilled birth attendant (see *Births attended by skilled health personnel*)

Live birth (see *Neonatal mortality rate*).

Data sources

Household surveys: birth history—detailed questions on the last-born child or all children a woman has given birth to during a given period preceding the survey (usually 3 to 5 years), and women are asked about the use of antenatal care. The number of live births to women surveyed provides the denominator.

Routine health-service statistics: number of women receiving antenatal care (numerator). Census projections or in some cases vital registration data are used to provide the denominator (numbers of live births).

Methods of estimation

Empirical data from household surveys are used. At a global level, facility data are not used.

Disaggregation

By location (urban/rural, major regions/provinces) and socioeconomic characteristics (e.g. women's level of education, wealth quintile).

References

WHO, Department of Reproductive Health and Research. *Reproductive health indicators—guidelines for their generation, interpretation and analysis for global monitoring*. Geneva, World Health Organization, 2006 (http://www.who.int/reproductive-health/publications/rh_indicators/index.html).

WHO. *WHO antenatal care randomized trial: manual for the implementation of the new model*. Geneva, World Health Organization, 2002 (http://www.who.int/reproductive-health/publications/RHR_01_30/index.html).

WHO. Annex Table 8. In: *The world health report 2005—make every mother and child count*. Geneva, World Health Organization, 2005 (<http://www.who.int/whr/2005/en/index.html>).

WHO and United Nations Children's Fund. *Antenatal care in developing countries. Promises, achievements and missed opportunities*. Geneva, World Health Organization, 2003.

WHO, Division of Family and Reproductive Health. *Coverage of maternity care. A listing of available information*. Fourth edition. Geneva, World Health Organization, 1997.

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

Comments

A single antenatal visit does not give information about the completeness, components or the quality of the care provided. Additional indicators such as the number of visits (it is recommended by WHO that at least four are made during the pregnancy) and the timing (ideally, antenatal care should be initiated within the first 12 weeks of pregnancy) of the first visit are more useful, although these also do not indicate the content of the care.

Births attended by skilled health personnel (percentage)

Rationale for use

All women should have access to skilled care during pregnancy and at delivery to ensure detection and management of complications. As it is difficult to accurately measure maternal mortality, and model-based estimates of the maternal mortality ratio cannot be used for monitoring short-term trends, the proportion of births attended by skilled health personnel is used as a proxy indicator for this purpose.

Definition

Percentage of live births attended by skilled health personnel in a given period of time.

Associated terms

A **skilled birth attendant** is an accredited health professional—such as a midwife, doctor or nurse—who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. Traditional birth attendants, trained or not, are excluded from the category of skilled attendant at delivery.

In developed countries and in many urban areas in developing countries, skilled care at delivery is usually provided in a health facility. However, births can take place in a range of appropriate places, from home to tertiary referral centre, depending on availability and need, and WHO does not recommend any particular setting for giving birth. Home delivery may be appropriate for a normal delivery, provided that the person attending the delivery is suitably trained and equipped and that referral to a higher level of care is an option.

Live births (see *Neonatal mortality rate*).

Data sources

Household surveys: constitute an important source of information on maternity care on an ad-hoc basis and, for many countries, they are the main source of information on births attended by skilled health personnel. When using survey data, absolute numbers and confidence intervals should be reported to indicate the reliability of the data and facilitate interpretation of trends and differentials.

Health-services statistics: as the point of contact with women, this is the main and most obvious routine source of information for the numerator. However, health-service information cannot provide the accurate size of the denominator population. Census projections or, in some cases, vital registration data are used to provide the denominator (numbers of live births).

Methods of estimation

Empirical data from household surveys are used. At a global level, facility data are not used.

Disaggregation

By place of delivery, type of skilled health personnel, location (urban/rural, major regions/provinces) and socioeconomic characteristics (e.g. level of education, wealth quintile)

References

United Nations Development Group. *Indicators for monitoring the Millennium Development Goals: definitions, rationale, concepts and sources*. New York, United Nations, 2003 (ST/ESA/STAT/SER.F/95; http://devdata.worldbank.org/gmis/mdg/UNDG%20document_final.pdf).

WHO, Department of Reproductive Health and Research. *Reproductive health indicators—guidelines for their generation, interpretation and analysis for global monitoring*. Geneva, World Health Organization, 2006 (http://www.who.int/reproductive-health/publications/rh_indicators/index.html).

WHO. Annex Table 8. In: *The world health report 2005—make every mother and child count*. Geneva, World Health Organization, 2005 (<http://www.who.int/whr/2005/en/index.html>).

WHO. *Making pregnancy safer: the critical role of the skilled attendant. A joint statement by WHO, ICM and FIGO*. Geneva, World Health Organization, 2004 (http://www.who.int/reproductive-health/publications/2004/skilled_attendant.pdf).

WHO. *Reduction of maternal mortality. A joint WHO/UNFPA/UNICEF/World Bank statement*. Geneva, World Health Organization, 1999 (http://www.who.int/reproductive-health/publications/reduction_of_maternal_mortality/reduction_of_maternal_mortality_abstract.htm).

Database

WHO Reproductive Health Indicators database. Proportion of births attended by skilled health personnel. Geneva, World Health Organization (http://www.who.int/reproductive-health/global_monitoring/data.html).

Comments

While efforts are made to standardize definitions of skilled birth attendants, it is probable that these could differ in different countries. The information, mainly from household surveys, relies on women's own reports on who had helped them during delivery, and may not always correctly reflect the characteristics of the delivery attendant. Moreover, skilled health workers' ability to provide appropriate care in an emergency depends on the environment in which they work.

Contraceptive prevalence rate (percentage)

Rationale for use

Contraceptive prevalence rate is an indicator of health, population, development and women's empowerment. It also serves as a proxy measure of access to reproductive health services that are essential for meeting many of the Millennium Development Goals, especially those related to child mortality, maternal health, HIV/AIDS, and gender equality.

Definition

Contraceptive prevalence rate is the proportion of women of reproductive age who are using (or whose partner is using) a contraceptive method at a given point in time.

Associated terms

Contraceptive methods include clinic and supply (modern) methods and non-supply (traditional) methods. Clinic and supply methods include female and male sterilization, intrauterine devices (IUDs), hormonal methods (oral pills, injectables, and hormone-releasing implants, skin patches and vaginal rings), condoms and vaginal barrier methods (diaphragm, cervical cap and spermicidal foams, jellies, creams and sponges). Traditional methods include rhythm, withdrawal, abstinence and lactational amenorrhoea.

Data sources

Household surveys, such as Demographic and Health Surveys (DHS), Multiple Indicators Cluster Surveys (MICS), and contraceptive-prevalence surveys. Estimates can also be made from health-services statistics using census projections as a denominator. Such estimates, however, are often expressed in terms of couple years of protection and may not always be complete.

Methods of estimation

Empirical data only.

Disaggregation

By age (adolescence), marital status, method of contraception, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. level of education, wealth quintile)

References

United Nations Population Division. *World Contraceptive Use 2005*. Wall chart (<http://www.un.org/esa/population/publications/contraceptive2005/WCU2005.htm>).

WHO, Department of Reproductive Health and Research. *Reproductive health indicators—guidelines for their generation, interpretation and analysis for global monitoring*. Geneva, World Health Organization, 2006 (http://www.who.int/reproductive-health/publications/rh_indicators/index.html).

WHO. Annex Table 8. In: *The world health report 2005—make every mother and child count*. Geneva, World Health Organization, 2005 (<http://www.who.int/whr/2005/en/index.html>).

Database

United Nations Population Division.
(<http://www.un.org/esa/population/publications/contraceptive2005/WCU2005.htm>)

Demographic and Health Surveys (<http://www.measuredhs.com>)

Statistics by area, and Multiple Indicator Cluster Surveys, UNICEF (<http://www.childinfo.org>)

Comments

Measures of the prevalence of contraceptive use are usually derived from interviews with representative samples of women of reproductive age. In many surveys, questions on current contraceptive use are confined to married women, including those in consensual unions, in countries where such unions are common.

Children aged < 5 years sleeping under insecticide-treated bednets (percentage)

Rationale for use

In areas of intense malaria transmission, malaria-related morbidity and mortality are concentrated in young children, and the use of insecticide-treated nets (ITN) by children under 5 has been demonstrated to considerably reduce malaria disease incidence, malaria-related anaemia and all cause under 5 mortality. Vector control through the use of ITNs constitute one of the four intervention strategies of the Roll Back Malaria Initiative. It is also listed as an MDG indicator.

Definition

Percentage of children under five years of age in malaria endemic areas who slept under an ITN the previous night, ITN being defined as a mosquito net that has been treated within 12 months or is a long-lasting insecticidal net (LLIN).

Associated terms

Malaria-risk areas include areas of stable malaria transmission (allowing the development of some level of immunity) and areas of unstable malaria transmission (seasonal and less predictable transmission impeding the development of effective immunity).

Data sources

Household surveys such as Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), Malaria Indicator Surveys (MIS), and 'rider' questions on other representative population-based surveys, that include questions on whether children under five years of age slept under an ITN the previous night.

Methods of estimation

Empirical data only.

Disaggregation

By age, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile)

References

WHO/Roll Back Malaria site. (<http://www.rbm.who.int>)

The Africa Malaria Report 2003. Geneva, New York, World Health Organization and United Nations Children Fund, 2004.

World Malaria Report 2005. Geneva, New York, World Health Organization and United Nations Children Fund, 2005. (<http://rbm.who.int/wmr2005>).

Database

UNICEF: statistics and Multiple Indicator Cluster Survey:
(<http://www.childinfo.org/MICS2/MICSDataSet.htm>)

Comments

The accuracy of reporting in household surveys may vary. Also, seasonal influences related to fluctuations in vector and parasite prevalence may affect level of coverage depending on timing of the data collection.

Antiretroviral therapy coverage among people with advanced HIV infections (percentage)

Rationale for use

As the HIV epidemic matures, increasing numbers of people are reaching advanced stages of HIV infection. Antiretroviral therapy (ART) has been shown to reduce mortality among those infected and efforts are being made to make it more affordable even in less developed countries.

This indicator assesses the progress in providing ART to all people with advanced HIV infection.

Definition

Percentage of adults and children with advanced HIV infection receiving antiretroviral therapy according to nationally approved treatment protocol (or WHO/Joint UN Programme on HIV and AIDS standards) among the estimated number of people with advanced HIV infection.

Data sources

Health facility reports compiling data from facility registers, or reports from drug supply management systems, are used to obtain the number of people on antiretroviral therapy i.e. drugs received for the last month of the reporting period. External validation of country reported figures is carried out with data from pharmaceutical industry (if available).

Methods of estimation

The denominator of the coverage estimate is obtained from models that also generate the HIV prevalence, incidence and mortality estimates. The number of adults with advanced HIV infection who need to start treatment is estimated as the number of advanced HIV cases needing treatment in the current year times two, based on the assumption that adults with advanced HIV infection who need ART would die of AIDS in about 2 years in the absence of ART.

The total number of adults needing ART is calculated by adding the number of adults that need to start ART to the number of adults who are being treated in the previous year and have survived to the current year.

Disaggregation

By sex, age (children/adults), location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile).

References

Monitoring the Declaration of Commitment on HIV/AIDS: guidelines on construction of core indicators. Geneva, Joint United Nations Programme on HIV/AIDS, 2002.

3 by 5 progress report. Geneva, World Health Organization and Joint United Nations Programme on HIV/AIDS, 2004-2006

Towards universal access: scaling up priority HIV/AIDS interventions in the health sector. Progress Report, April 2007. Geneva, World Health Organization, 2007.

Monitoring the Declaration of Commitment on HIV/AIDS. GUIDELINES ON CONSTRUCTION OF CORE INDICATORS. 2008 Reporting. Geneva, Joint United Nations Programme on HIV/AIDS (UNAIDS), 2007.

Comments

The accuracy of the reported number of people on antiretroviral therapy needs improvement as programme monitoring systems are still developing.

Although this indicator allows trends to be monitored over time, it does not attempt to distinguish between the different types of regimens available nor does it measure the cost, quality or effectiveness of such treatment.

Antiretrovirals for post exposure prophylaxis are not included in this indicator.

HIV-infected pregnant women receiving antiretrovirals for PMTCT

Rationale for use

In the absence of any preventive interventions, infants born to and breastfed by HIV-infected women can have between 25% to 40% chance of acquiring HIV infection themselves. This can happen during pregnancy, labour and delivery, or after delivery via breastfeeding. The risk of mother-to-child transmission can be reduced through the complementary approaches of antiretroviral drugs for the mother and infant, through implementation of safe delivery practices, and through use of safe infant feeding practices. This indicator aims to measure the extent to which HIV infected pregnant women are provided with antiretroviral drugs for the purpose of prevention of mother to child transmission (PMTCT) of HIV.

Definition

Number of HIV-infected pregnant women who received antiretrovirals (ARV) to reduce mother-to-child transmission, out of the estimated number of HIV-infected pregnant women in the last 12 months

Data sources

Health facility reports with data aggregated from registers are used to obtain the number of HIV-infected pregnant provided with ARVs.

Methods of estimation

Unless otherwise noted, the denominator of this coverage estimate is based on country estimation models used to produce HIV prevalence, incidence and mortality estimates by the UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance. The estimated number of HIV pregnant women is extracted from the country models taking into account total fertility rates, background maternal mortality and HIV sex and age distribution among women.

Disaggregation

By ARV regimen, where appropriate and possible, to capture differential efficacy to enable better modelling of impact.

- Single drug prophylactic regimen
- Combination prophylactic regimen
- Highly active regimen for MTCT prophylaxis
- ART for HIV positive pregnant women eligible for treatment

1. Single drug prophylactic regimen (estimate 10-14 % transmission)	- Single Dose NVP - AZT alone
2. Combination prophylactic regimen (estimate 4-6%)	- AZT + SD NVP - AZT + SD NVP (+7 day post-partum AZT/3TC) - AZT + 3TC - AZT + 3TC + SD NVP
3. Highly active prophylactic regimen for MTCT prophylaxis (3% as long as breastfeeding is not considered in model and the regimen not extended into the post partum period)	- AZT + 3TC + NRTI/NNRTI or PI
4. ART for HIV positive pregnant women eligible for treatment (estimate < 2% trans)	-appropriate ART regimen

References

Monitoring the Declaration of Commitment on HIV/AIDS: guidelines on construction of core indicators, 2008 Reporting. Geneva, Joint United Nations Programme on HIV/AIDS, March 2007

National Guide to Monitoring and Evaluating Programmes for the Prevention of HIV in Infants and Young Children, WHO, 2004. <http://www.who.int/hiv/pub/me/youngchildren/en/index.html>

Note: this guide is currently being updated, revised version forthcoming 2007)

Children and AIDS, A Stocktaking Report, UNICEF/UNAIDS/WHO, 2007.

Towards Universal Access: Scaling Up Priority HIV Interventions in the Health Sector, World Health Organization/UNAIDS/UNICEF, Geneva, April 2007.

Databases

Global HIV/AIDS Database, HIV Department, WHO <http://www.who.int/globalatlas/pgrms/HIV>

Epi Fact Sheets Database <http://www.who.int/GlobalAtlas/predefinedReports/EFS2006/index.asp>

Comments

In 2006 international guidelines were updated to recommend more efficacious regimens for PMTCT, and countries may be at different phases in adopting the newer recommendations. The indicator permits national monitoring of trends in provision of ARVs for PMTCT, however, since different regimens of ARVs for PMTCT are provided by countries, cross-country comparisons of aggregate estimates must be interpreted with caution and with reference to the regimens provided. This indicator captures the provision, and not the actual adherence, consumption, or uptake of ARVs.

Antiretrovirals can be provided to HIV-infected women during pregnancy, at labour, and shortly after delivery and provision can take place at a number of sites. Countries should focus on compiling data for the numerator from patient registers at antenatal clinics, delivery and care sites, and post-partum care

service sites where appropriate. HIV-infected pregnant women who are eligible for ART and receive a treatment regimen will also benefit from the prophylactic effect for PMTCT and thus are included in the numerator.

Tuberculosis detection rate under DOTS (percentage)

Rationale for use

The proportion of estimated new smear-positive cases of TB detected (diagnosed and then notified to WHO) by DOTS programmes provides an indication of the effectiveness of national TB programmes in finding and diagnosing people with TB.

Millennium Development Goal Indicator 24 (under Goal 6, Target 8) is the "proportion of tuberculosis cases detected and cured under DOTS". The Stop TB Partnership has endorsed the targets, linked to the Millennium Development Goals, to diagnose at least 70% of people with sputum smear-positive TB (i.e. under the DOTS strategy), and cure at least 85%, by 2005. These are targets set by the World Health Assembly of WHO.

In 2005, an estimated 60% of new smear-positive cases were treated under DOTS, ranging from 35% in the WHO European Region to 76% in the Western Pacific Region.

Definition

The term 'case detection', as used here, means that TB is diagnosed in a patient and is reported within the national surveillance system, and then to WHO. The case-detection rate is calculated as the number of new smear positive cases notified divided by the number of new smear positive cases estimated for that year, expressed as a percentage.

Associated terms

Smear-positive: a case of TB where *Mycobacterium tuberculosis* bacilli are visible in the patient's sputum when examined under the microscope. For exact definition, see WHO, 2007.

New case: TB in a patient who has never received treatment for TB, or who has taken anti-TB drugs for less than 1 month.

DOTS: the internationally recommended approach to TB control, which forms the core of the Stop TB Strategy (WHO, 2006b). The five components of DOTS are:

1. Political commitment with increased and sustained financing;
2. Case detection through quality-assured bacteriology;
3. Standardized treatment with supervision and patient support;
4. An effective drug supply and management system; and
5. A monitoring and evaluation system, and impact measurement.

In countries that have adopted the DOTS strategy, it may be implemented in all or some parts of the country, and by all or some health-care providers. Only those TB cases notified by health-care facilities providing DOTS services are included in this indicator.

Notification: the process of reporting diagnosed TB cases to WHO; the data collected by this process. This does not refer to the systems in place in some countries to inform national authorities of cases of certain 'notifiable' diseases.

Data sources

The number of new smear-positive cases detected by DOTS programmes is collected as part of the routine surveillance (recording and reporting) that is an essential component of DOTS. Quarterly reports

of the number of TB cases registered are compiled and sent (either directly or via intermediate levels) to the central office of the national TB control programme. Annual case notifications (and other data on programme performance) are collected by WHO via an annual data collection form, distributed to national TB control programmes through WHO regional and country offices.

Estimated number of incident cases: see Dye C et al., 1999; Corbett EL et al., 2003; and WHO, 2007, and description of estimation of incidence.

Methods of estimation

Estimates of incidence are based on a consultative and analytical process in WHO and are published annually (see WHO, 2007).

The DOTS detection rate for new smear-positive cases is calculated by dividing the number of new smear-positive cases notified to WHO by the estimated number of incident smear-positive cases for the same year.

Disaggregation

Detection rates are routinely presented by WHO in four main ways:

1. For new smear-positive cases;
2. For all new and relapse cases (i.e. all forms of TB);
3. For DOTS programmes only; or
4. For cases notified from all sources.

It is the detection rate of new smear-positive cases for DOTS programmes that is included in this database.

References

Corbett EL et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Archives of Internal Medicine*, 2003, 163:1009–1021.

Dye C et al. Global burden of tuberculosis: estimated incidence, prevalence and mortality by country. *Journal of the American Medical Association*, 1999, 282:677–686.

WHO. *The Global Plan to Stop TB, 2006–2015*. Geneva, World Health Organization, 2006a (WHO/HTM/STB/2006.35).

WHO. *The Stop TB Strategy: building on and enhancing DOTS to meet the TB-related Millennium Development Goals*. Geneva, World Health Organization, 2007 (WHO/HTM/STB/2007.376).

WHO. *Global tuberculosis control: surveillance, planning, financing. WHO report 2006*. Geneva, World Health Organization, 2006c (WHO/HTM/TB/2006.362).

Database

Global TB database (http://www.who.int/tb/country/global_tb_database)

United Nations Millennium Development Goals Indicator database (<http://unstats.un.org/unsd/mdg/>)

Comments

Sputum smear-positive cases are the focus of this indicator because they are the principal sources of infection to others, because sputum-smear microscopy is a highly specific (if somewhat insensitive) method of diagnosis, and because patients with smear-positive disease typically suffer higher rates of morbidity and mortality than do smear-negative patients. However, national TB control programmes should aim to provide treatment to all patients, as set out in the Stop TB Strategy.

Tuberculosis treatment success under DOTS (percentage)

Rationale for use

Treatment success is an indicator of the performance of national TB control programmes. In addition to the obvious benefit to individual patients, successful treatment of infectious cases of TB is essential to prevent the spread of the infection.

Detecting and successfully treating a large proportion of TB cases should have an immediate impact on TB prevalence and mortality. By reducing transmission, successfully treating the majority of cases will also affect, with some delay, the incidence of disease.

Millennium Development Goal Indicator 24 (under Goal 6, Target 8) is the "proportion of tuberculosis cases detected and cured under DOTS". The Stop TB Partnership has endorsed the targets, linked to the Millennium Development Goals, to diagnose at least 70% of people with sputum smear-positive TB (i.e. under the DOTS strategy), and cure at least 85% of these, by 2005. These are targets set by the World Health Assembly of WHO.

Treatment success in the 2004 DOTS cohort over 2 million patients was 84% on average, close to the 85% target.

Definition

The proportion of new smear-positive TB cases registered under DOTS in a given year that successfully completed treatment, whether with or without bacteriological evidence of success ("cured" or "treatment completed" respectively).

At the end of treatment, each patient is assigned one of the following six mutually exclusive treatment outcomes: cured; completed; died; failed; defaulted; and transferred out with outcome unknown. The proportions of cases assigned to these outcomes, plus any additional cases registered for treatment but not assigned to an outcome, add up to 100% of cases registered.

Associated terms

Smear-positive: TB case where *M. tuberculosis* bacilli are visible in the patient's sputum when examined under the microscope. For exact definition, see WHO, 2007.

New case: TB in a patient who has never received treatment for TB, or who has taken anti-TB drugs for less than one month.

DOTS: the internationally recommended approach to TB control, which forms the core of the Stop TB Strategy (WHO, 2006b). The five components of DOTS are:

1. Political commitment with increased and sustained financing;
2. Case detection through quality-assured bacteriology;
3. Standardized treatment with supervision and patient support;
4. An effective drug supply and management system; and
5. A monitoring and evaluation system, and impact measurement.

In countries that have adopted the DOTS strategy, it may be implemented in all or some parts of the country, and by all or some health-care providers. Only those TB patients notified by health-care facilities providing DOTS services are included in this indicator.

Data sources

Aggregated reports on treatment outcomes for TB cases, provided annually to WHO by national TB control programmes.

Because treatment for TB lasts 6–8 months, there is a delay in assessing treatment outcomes. Each year, national TB control programmes report to WHO the number of cases of TB diagnosed in the preceding year, and the outcomes of treatment for the cohort of patients who started treatment a year earlier.

Method of estimation

Empirical data compiled by national tuberculosis control programmes.

Disaggregation

Within a national programme, data should be analysed at the level of basic management unit (typically district health office), before aggregation.

Global targets for TB control refer to treatment success for new smear-positive cases treated under DOTS, the indicator included in this database. WHO also reports treatment success rates from non-DOTS programmes, and treatment success rates for patients who have been previously treated (see WHO, 2006c). Both sets of treatment success rates tend to be lower than those for new cases treated under DOTS.

It is also useful, where possible, to analyse treatment success rates disaggregated by drug resistance and HIV status.

References

Corbett EL et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Archives of Internal Medicine*, 2003, 163:1009–1021.

Dye C et al. Global burden of tuberculosis: estimated incidence, prevalence and mortality by country. *Journal of the American Medical Association*, 1999, 282:677–686.

WHO. *The Global Plan to Stop TB, 2006–2015*. Geneva, World Health Organization, 2006a (WHO/HTM/STB/2006.35).

WHO. *The Stop TB Strategy: building on and enhancing DOTS to meet the TB-related Millennium Development Goals*. Geneva, World Health Organization, 2006b (WHO/HTM/STB/2006.37).

WHO. *Global tuberculosis control: surveillance, planning, financing. WHO report 2007*. Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.376).

Database

Global TB database (http://www.who.int/tb/country/global_tb_database)

United Nations Millennium Development Goals Indicator database (<http://unstats.un.org/unsd/mdg>)

Comments

Treatment success rates can be low for a number of reasons. Several factors affect the likelihood of treatment success, including the severity of disease (often related to the delay between onset of disease

and the start of treatment), HIV infection, drug resistance, malnutrition and the support provided to the patient to ensure that he or she completes treatment.

Even where treatment is of high quality, reported treatment success rates will only be high when the routine information system is also functioning well. The treatment success rate will be affected if the outcome of treatment is not recorded for all patients (including those who transfer from one treatment facility to another).

Where treatment success rates are low, the cause of the problem can only be identified by determining which of the unfavourable treatment outcomes is most common.

Children aged < 5 years with ARI symptoms taken to facility (percentage)

Rationale for use

Acute respiratory infections (ARI) are responsible for almost 20% of all deaths of children aged less than 5 years worldwide. The proportion of under-fives with ARI that are taken to an appropriate health-care provider is a key indicator for coverage of intervention and care-seeking, and provides critical inputs to the monitoring of progress towards child survival-related Millennium Development Goals and Strategies.

Definition

Proportion of children aged 0–59 months who had ‘presumed pneumonia’ (ARI) in the last 2 weeks and were taken to an appropriate health-care provider.

Associated terms

Strictly speaking, ‘**ARI**’ stands for ‘acute respiratory infection’. During the UNICEF/WHO Meeting on Child Survival Survey-based Indicators, held in New York, 17–18 June 2004, it was recommended that ARI be described as ‘presumed pneumonia’ to better reflect probable cause and the recommended interventions. The definition of ARI used in the Multiple Indicator Cluster Surveys (MICS) was chosen by the group and is based on mothers’ perceptions of a child who has a cough, is breathing faster than usual with short, quick breaths or is having difficulty breathing, excluding children that had only a blocked nose.

Appropriate health-care provider: the definition of ‘appropriate’ care provider varies between countries.

Data sources

Household surveys such as DHS and MICS.

Methods of estimation

Empirical data.

Disaggregation

By age, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. mother’s level of education, wealth quintile).

References

Boerma JT, Sommerfelt AE, Rutstein SO. *Childhood morbidity and treatment patterns. Demographic and Health Surveys Comparative Studies No 4*. Columbia, Institute for Reserve Development/Macro International, 1991.

Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, and the Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet*, 2003, 362:65–71.

Sazawal S, Black RE. Meta-analysis of intervention trials on case-management of pneumonia in community settings. *Lancet*, 1992, 340:528–533.

Schellenberg JA, Victora CG, Mushi A, et al. Inequities among the very poor: health care for children in rural southern Tanzania. *Lancet*, 2003, 361:561–566.

UNICEF. *State of the world's children, 2003*. New York, United Nations Children's Fund, 2003.

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

Multiple Indicator Cluster Surveys (<http://www.childinfo.org/MICS2>)

Comments

The framework for the review of child survival indicators during the UNICEF/WHO Meeting on Child Survival Survey-based Indicators was the set of prevention and treatment interventions outlined in the *Lancet* series on child survival.

These indicators are usually collected in DHS and MICS surveys; however, the accuracy of reporting in household surveys varies and is likely to be prone to recall bias. Seasonality related to the prevalence of ARI may also affect the results and their comparability between and within countries.

Children < 5 years with diarrhoea receiving oral rehydration therapy (percentage)

Rationale for use

Diarrhoeal diseases remain one of the major causes of mortality among under-fives, accounting for 1.8 million child deaths worldwide, despite all the progress in its management and the undeniable success of the oral rehydration therapy (ORT). Therefore monitoring of the coverage of this very cost-effective intervention is crucial for the monitoring of progress towards the child survival-related Millennium Development Goals and Strategies.

Definition

Proportion of children aged 0–59 months who had diarrhoea in the last 2 weeks and were treated with oral rehydration salts or an appropriate household solution (ORT).

Associated terms

Diarrhoea: according to DHS, the term(s) used for diarrhoea should encompass the expressions used for all forms of diarrhoea, including bloody stools (consistent with dysentery), watery stools, etc. It encompasses the mother's definition as well as the 'local term(s)'.

Treated: child received an electrolyte solution.

Appropriate household solution: definition may vary between countries.

Data sources

Household surveys such as DHS and MICS.

Methods of estimation

Empirical data.

Disaggregation

By age, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. mother's level of education, wealth quintile).

References

Boerma JT, Sommerfelt AE, Rutstein SO. *Childhood morbidity and treatment patterns. Demographic and Health Surveys Comparative Studies No 4*. Columbia, Institute for Reserve Development/Macro International, 1991.

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Sack DA. Use of oral rehydration therapy in acute watery diarrhoea. *Drugs*, 1991; 41:566–573.

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UNICEF. *State of the world's children, 2003*. New York, United Nations Children's Fund, 2003.

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

Multiple Indicator Cluster Surveys (<http://www.childinfo.org/MICS2>)

Comments

The framework for the discussion and review of child health indicators in the UNICEF/WHO Meeting on Child Survival Survey-based Indicators was the set of prevention and treatment interventions outlined in the *Lancet* series on child survival. These indicators are usually collected in DHS and MICS surveys; however, the accuracy of reporting in household surveys varies and is likely to be prone to recall bias. Also, seasonal influences related to the prevalence of diarrhoeal disease may affect the results of data collection for this indicator. Therefore, the comparability of results across countries and over time may be affected. Moreover, frequent changes in the definition of this indicator have seriously compromised the ability to reliably assess trends over time.

There are two specific limitations with some of the associated terms of this indicator:

1. Discussions have been held on whether treated should be considered when the electrolyte solution was 'given', 'received', 'ingested', or 'offered' to the child; and
2. Comparability of data on appropriate household solution.

Children aged < 5 years with fever who received treatment with any antimalarial (percentage)

Rationale for use

Prompt treatment with effective antimalarial drugs for children with fever in malaria-risk areas is a key intervention to reduce mortality. In addition to being listed as a global Millennium Development Goals Indicator under Goal 6, effective treatment for malaria is also identified by WHO, UNICEF, and the World Bank as one of the four main interventions to reduce the burden of malaria in Africa:

1. Use of insecticide-treated nets (ITNs);
2. Prompt access to effective treatments in or near the home;
3. Providing antimalarial drugs to symptom-free pregnant women in stable transmission areas; and
4. Improved forecasting, prevention and response, which are essential to respond quickly and effectively to malaria epidemics.

In areas of sub-Saharan Africa with stable levels of malaria transmission, it is essential that prompt access to treatment is ensured. This requires drug availability at household or community level and, for complicated cases, availability of transport to the nearest equipped facility. Reserve stocks of drugs, transport, and hospital capacity are needed to mount an appropriate response and to prevent the degeneration of malaria from its onset to a highly lethal complicated picture.

Definition

Percentage of the population in malaria-risk areas aged less than 5 years with fever being treated with effective antimalarial drugs.

Numerator (N): the number of children aged less than 5 years in malaria-risk areas with fever being treated with effective antimalarial drugs.

Denominator (D): the number of children aged less than 5 years in malaria-risk areas.

Associated terms

Malaria-risk areas include areas where malaria transmission is stable (or endemic, allowing the development of some level of immunity) and areas where malaria transmission is unstable (or epidemic, as seasonal and less predictable transmission impedes the development of effective immunity).

Data sources

Household surveys such as DHS, MICS, Malaria Indicator Surveys (MIS), and 'rider' questions on other representative population-based surveys that include questions on whether children aged less than 5 years slept under an ITN the previous night.

Effective antimalarial drugs (WHO, 2003): consistent with WHO recommendations, countries in which malaria is endemic and that are experiencing high levels of resistance to currently-used antimalarial drugs such as chloroquine and sulfadoxine/pyrimethamine (SP) are changing treatment policies from monotherapies to combined therapies including available drugs (SP and amidoquine). The purpose of drug combinations is to produce a therapy that acts at more than one stage of the parasitic cycle. Artemisinin-based combination treatments (ACTs) (WHO, 2001) are considered to be the most effective combinations. However, they cannot be broadly recommended because artemisinin-based drugs are not

necessarily available owing to production limitations. ACTs combine an artemisinin compound with a partner antimalarial drug to which there is little or no resistance in the country or situation in which the ACT is to be deployed. The advantages of ACTs relate to the properties of artemisinin compounds, which include rapid reduction of the parasite biomass with fast resolution of clinical symptoms, effectiveness against multidrug-resistant falciparum malaria, no documented resistance, and a good safety profile.

Data sources

Demographic and Health Surveys (<http://www.measuredhs.com>) for both indicators.

Multiple Indicator Cluster Survey (MICS, www.childinfo.org) for both indicators.

Malaria stand-alone surveys (community component) for ITNs and also access to treatment.

Methods of estimation

For prevention, the indicator is calculated as the percentage of children aged less than 5 years who received effective antimalarial drugs during a fever episode. The information is obtained directly from household surveys. The empirical values are reported directly without further estimation.

Disaggregation

By age, sex, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. level of education, wealth quintile).

References

WHO/Roll Back Malaria web site (<http://www.rbm.who.int>).

WHO and UNICEF. *World malaria report 2005*. Geneva, New York, World Health Organization, 2005 (<http://www.rbm.who.int/wmr2005>).

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WHO. *Antimalarial drug combination therapy. Report of a WHO technical consultation, 4–5 April*. Geneva, World Health Organization, 2001 (WHO/CDS/RBM/2001.35).

Database

Multiple Indicator Cluster Survey (<http://www.childinfo.org/MICS2/MICSDataSet.htm>)

Comments

The accuracy of reporting in household surveys may vary.

Children 6-59 months who received vitamin A supplementation (percentage)

Rationale for use

Supplementation with vitamin A is considered to be a critically important intervention for child survival owing to the strong evidence that exists for its impact on reducing child mortality. Therefore, measuring the proportion of children who have received vitamin A within the last 6 months is crucial for monitoring coverage of interventions towards the child survival-related Millennium Development Goals and Strategies.

Definition

Proportion of children aged 6–59 months who received a high-dose vitamin A supplement within the last 6 months.

Associated terms

High dose vitamin A: The International Vitamin A Consultative Group (IVACG) definition is: "doses equal or greater than 25 000 IU"

Data sources

Household surveys such as DHS and MICS.

Methods of estimation

Empirical data.

Disaggregation

By age, location (urban/rural, major regions/provinces), and socioeconomic characteristics (e.g. mother's education level, wealth quintile).

References

Beaton GH, Martorell R, Aronson KL, et al. *Effectiveness of Vitamin A supplementation in the control of young child morbidity and mortality in developing countries*. ACC/SCN State-of-the-art Series. Nutrition Policy Discussion Paper 13, 1993.

Boerma JT, Sommerfelt AE, Rutstein SO. *Childhood morbidity and treatment patterns*. Demographic and Health Surveys Comparative Studies No 4. Columbia, Institute for Reserve Development/Macro international, 1991.

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Rice AL, West KP, Black RE. Vitamin A deficiency. In: Ezzati M, Lopez AD, Rogers A, Murray CJL, eds. *Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors*. Geneva, World Health Organization, 2003.

UNICEF. *State of the world's children 2003*. New York, United Nations Children's Fund, 2003.

Data base

Demographic and Health Surveys (<http://www.measuredhs.com>)

Multiple Indicator Cluster Surveys (<http://www.childinfo.org/MICS2>)

Comments

The framework for the discussion and review of child health indicators in the UNICEF/WHO Meeting on Child Survival Survey-based Indicators was the set of prevention and treatment interventions outlined in the *Lancet* series on child survival. These indicators are usually collected in DHS and MICS surveys; however the accuracy of reporting in household surveys varies and is likely to include recall bias. Therefore, the comparability of results across countries and over time may be affected. There are also significant discrepancies between data obtained through household surveys and those obtained from National Immunization Days and routine service statistics for this indicator, which are currently under investigation.

Births by Caesarean section (percentage)

Rationale for use

The percentage of births by caesarean section is an indicator of access to and use of health care during childbirth.

Definition

Percentage of births by caesarean section among all live births in a given time period.

Associated terms

Live birth (see *Neonatal mortality rate*).

Data sources

Household surveys: birth history—detailed questions on the last-born child or all children a woman has given birth to during a given period preceding the survey (usually 3 to 5 years), including characteristics of the birth(s). The number of live births to women surveyed provides the denominator.

Routine health-service statistics: the number of women having given birth by caesarean section (numerator). Census projections or, in some cases, vital registration data can be used to provide the denominator (numbers of live births).

Methods of estimation

Empirical data from household surveys are used.

Disaggregation

By location (urban/rural, major regions/provinces) and socioeconomic and demographic characteristics (e.g. women's level of education, wealth quintile, age).

References

UNICEF/WHO/UNFPA. *Guidelines for monitoring the availability and use of obstetric services.*, New York, United Nations Children's Fund, 1997 (<http://www.who.int/reproductive-health/publications/unicef/index.html>).

WHO, Department of Reproductive Health and Research. *Reproductive health indicators—guidelines for their generation, interpretation and analysis for global monitoring.* Geneva, World Health Organization, 2006 (http://www.who.int/reproductive-health/publications/rh_indicators/index.html).

WHO. Annex Table 8. In: *The world health report 2005—make every mother and child count.* Geneva, World Health Organization, 2005 (<http://www.who.int/whr/2005/en/index.html>).

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

Comments

This indicator does not provide information on the reason for undergoing caesarean section, and includes caesarean sections that were performed without a clinical indication as well as those that were medically indicated. The extent to which caesarean sections are performed according to clinical need, therefore, is not possible to determine. However, an approximate figure of less than 5% indicates that all women who are in need may not be receiving caesarean section at birth.

Risk factors

Children aged < 5 years stunted for age (percentage)

Children aged < 5 years underweight for age (percentage)

Children aged < 5 years overweight for age (percentage)

Rationale for use

The purpose of these indicators is to measure long-term nutritional imbalance and malnutrition resulting in undernutrition (assessed by underweight and stunting) and overweight. Child growth is the most widely used indicator of nutritional status in a community and is internationally recognized as an important public-health indicator for monitoring health in populations. In addition, children who suffer from growth retardation as a result of poor diets and/or recurrent infections tend to have a greater risk of suffering illness and death.

The percentage of children with low height-for-age reflects the cumulative effects of under-nutrition and infections since birth, and even before birth. This measure, therefore, should be interpreted as an indication of poor environmental conditions and/or long-term restriction of a child's growth potential. The percentage of children with low weight-for-age may reflect the less common 'wasting' (i.e. low weight-for-height) indicating acute weight loss, and/or the much more common 'stunting'. Thus, it is a composite indicator that is difficult to interpret.

Definition

Percentage of underweight (weight-for-age less than -2 standard deviations (SD) of the WHO Child Growth Standards median) among children aged less than 5 years.

Percentage of stunting (height-for-age less than -2 SD of the WHO Child Growth Standards median) among children aged less than 5 years.

Percentage of overweight (weight-for-height greater than $+2$ SD of the WHO Child Growth Standards median) among children aged less than 5 years.

Associated terms

Severe underweight and stunting are defined as less than -3 standard deviations of the weight-for-age and height-for-age WHO Child Growth Standards median, respectively.

Data sources

National household surveys, subnational nutritional surveys and national nutrition surveillance systems.

Methods of estimation

A well-established methodology for the compilation and standardized analysis of nutritional surveys, as well as robust methods for deriving global and regional trends and forecasting future trends, have been published (de Onis & Blössner, 2003; de Onis et al., 2004a, 2004b).

Disaggregation

By sex, age, and location (urban/rural, major regions/provinces)

Database

WHO Global Database on Child Growth and Malnutrition (<http://www.who.int/nutgrowthdb>)

Comments

An international set of standards (i.e. the WHO Child Growth Standards) is used to calculate prevalences for the indicators low weight-for-age, low height-for-age, and high weight-for-height (de Onis et al., 2006; WHO Multicentre Growth Reference Study Group, 2006). The International Pediatric Association (IPA), the Standing Committee on Nutrition of the United Nations System (SCN), and the International Union of Nutritional Sciences (IUNS), have officially endorsed the use of the WHO standards, describing them as an effective tool for detecting and monitoring undernutrition and overweight, thus addressing the double burden of malnutrition affecting populations on a global basis (International Pediatric Association Endorsement; Standing Committee on Nutrition of the United Nations System; International Union of Nutritional Sciences). The WHO standards may be used for all children aged up to 5 years, since the influence of ethnic or genetic factors on young children is considered to be insignificant (WHO Multicentre Growth Reference Study Group, 2006b).

References

de Onis M and Blössner M. The WHO Global Database on Child Growth and Malnutrition: methodology and applications. *International Journal of Epidemiology*, 2003;32:518–526.

de Onis M, Blössner M, Borghi E, Frongillo EA, Morris R. Estimates of global prevalence of childhood underweight in 1990 and 2015. *Journal of the American Medical Association*, 2004a, 291:2600–2606.

de Onis M, Blössner M, Borghi E, Morris R, Frongillo EA. Methodology for estimating regional and global trends of child malnutrition. *International Journal of Epidemiology* 2004b, 33:1260–1270.

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International Pediatric Association. *International Pediatric Association Endorsement. The New WHO Growth Standards for Infants and Young Children*. Geneva, IPA, 2006 (http://www.who.int/childgrowth/Endorsement_IPA.pdf).

International Union of Nutritional Sciences. *Statement of Endorsement of the WHO Child Growth Standards*. California, IUNS, 2006 (http://www.who.int/childgrowth/endorsement_IUNS.pdf).

Standing Committee on Nutrition of the United Nations System. *SCN Endorses the New WHO Growth Standards for Infants and Young Children*. SCN, 2006 (http://www.who.int/childgrowth/endorsement_scn.pdf).

WHO Multicentre Growth Reference Study Group. *WHO Child Growth Standards: length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: methods and development*. Geneva, World Health Organization, 2006a.

WHO Multicentre Growth Reference Study Group. Assessment of differences in linear growth among populations in the WHO Multicentre Growth Reference Study. *Acta Paediatrica Supplementum*, 2006b;450:56-65.

Low-birthweight newborns (percentage)

Rationale for use

At the population level, the proportion of babies with a low birth weight is an indicator of a multifaceted public-health problem that includes long-term maternal malnutrition, ill health, hard work and poor health care in pregnancy. On an individual basis, low birth weight is an important predictor of newborn health and survival.

Definition

Percentage of liveborn infants that weigh less than 2500 g, for a given time period.

Associated terms

Birth weight is the first weight of the fetus or newborn obtained after birth. For live births, birth weight should ideally be measured within the first hour of life before significant postnatal weight loss occurs.

Low birth weight is defined as a weight of less than 2500 g (up to and including 2499 g), irrespective of gestational age.

Low birth weight may be subdivided into **very low birth weight** (less than 1500 g) and **extremely low birth weight** (less than 1 000 g).

Live birth (see *Neonatal mortality rate*).

Data sources

Health-service statistics: the proportion of live births with low birth weight, among births occurring in health institutions.

Household surveys: DHS include questions on birth weight as well as the mothers' subjective assessment of the infant's size at birth (i.e. very large, larger than average, average, smaller than average, very small), for births in the last 5 to 10 years.

Methods of estimation

Where reliable health-service statistics with a high level of coverage exist; 'percentage of low birth weight' births.

For household survey data, different adjustments are made according to the type of information available (numerical birth-weight data or the subjective assessment of the mother).

Disaggregation

By location (urban/rural, major regions/provinces), sex, and socioeconomic characteristics (e.g. mother's level of education, wealth quintile).

References

Blanc A, Wardlaw T. Monitoring low birth weight: an evaluation of international estimates and an updated estimation procedure. *Bulletin of the World Health Organization*, 2005, 83:178–185.

WHO/UNICEF. *Low birthweight: country, regional and global estimates*. New York, United Nations Children's Fund and World Health Organization, 2004 (http://www.who.int/reproductive-health/publications/low_birthweight/low_birthweight_estimates.pdf).

WHO. *International Classification of Diseases. 10th Revision*. Geneva, World Health Organization, 2004.

Database

Demographic and Health Surveys (<http://www.measuredhs.com>)

European health for all (HFA) database, WHO Regional Office for Europe (<http://www.who.dk/hfadb>)

Comments

The large proportion of infants not weighed at birth, and the estimates based on mothers' subjective assessments constitute a significant impediment to the accurate monitoring of low birth weight.

Adults aged ≥ 15 years who are obese (percentage)

Rationale for use

The prevalence of overweight and obesity in adults has been increasing globally. Obese adults (BMI ≥ 30.0) are at increased risk of adverse metabolic outcomes including increased blood pressure, cholesterol, triglycerides, and insulin resistance. Subsequently, an increase in BMI exponentially increases the risk of noncommunicable diseases (NCDs), such as coronary heart disease, ischaemic stroke and type-2 diabetes mellitus. Raised BMI is also associated with an increased risk of cancer.

Definition

Percentage of adults classified as obese (BMI ≥ 30.0 kg/m²) among total adult population (15 years and older).

Associated terms

Adult overweight (BMI ≥ 25.0 kg/m²)

Pre-obese (BMI 25.00-29.99 kg/m²)

Obesity (BMI ≥ 30.00 kg/m²)

Data sources

Nationally representative household surveys, including Demographic and Health Survey (DHS).

Methods of estimation

Estimates are still under development. Only nationally representative surveys with either anthropometric data collection or self-reported weight and height (mostly in high-income countries) are included in the 2007 World Health Statistics.

Disaggregation

By sex, age, location (urban/rural, major regions/provinces).

References

Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. Geneva, World Health Organization, 1995. (WHO Technical Report Series 854).

Obesity: preventing and managing the global epidemic. Report of a WHO Consultation. Geneva, World Health Organization, 2000. (WHO Technical Report Series 894).

World Health Organization. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. The Lancet, 2004; 363: 157-163.

Database

WHO Global Database on Body Mass Index (BMI). (<http://www.who.int/bmi>)

Demographic and Health Surveys (DHS). (<http://www.measuredhs.com>)

Comments

The household surveys focus on different age ranges and sometimes on select samples (such as women of reproductive ages who have a child under five years of age), which affects comparability. Also, self-reported height and weight information are more likely to have problems than measured adult BMI. The existing data are under review and estimation methods are being developed. It is expected that a new set of data and metadata, and eventually estimates, will replace the currently available information.

Access to improved drinking water sources (percentage)

Access to improved sanitation (percentage)

Rationale for use

Access to drinking water and improved sanitation is a fundamental need and a human right vital for the dignity and health of all people. The health and economic benefits of improved water supply to households and individuals (especially children) are well documented. Both indicators are used to monitor progress towards the MDGs.

Definition

Access to improved water source is the percentage of population with access to an improved drinking water source in a given year.

Access to improved sanitation is the percentage of population with access to improved sanitation in a given year.

Associated terms

Improved drinking water sources are defined in terms of the types of technology and levels of services that are more likely to provide safe water than unimproved technologies. Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections. **Unimproved water sources** are unprotected wells, unprotected springs, vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water.

Reasonable access is broadly defined as the availability of at least 20 litres per person per day from a source within one kilometre of the user's dwelling.

Sustainable access has two components with respect to water: one stands for environmental sustainability, the other for functional sustainability. The former insists on environmental protection through limiting extraction of water to a capacity below what is actually available. The latter reflects programme sustainability in terms of supply and management.

Improved sanitation facilities are defined in terms of the types of technology and levels of services that are more likely to be sanitary than unimproved technologies. Improved sanitation includes connection to a public sewers, connection to septic systems, pour-flush latrines, simple pit latrines and ventilated improved pit latrines. Not considered as improved sanitation are service or bucket latrines (where excreta is manually removed), public latrines and open latrines.

Data sources

Household surveys and assessment questionnaires to complement survey data or to provide estimates where survey data are not available. The latter also captures information related to usage and breakdown of self-built water facilities of which service providers may be unaware.

Methods of estimation

Estimates are generated through analysis of survey data and linear regression of data points.

Coverage estimates are updated every two years.

Disaggregation

By location (urban/rural).

References

Meeting the MDG Drinking Water and Sanitation Target. Geneva, New York. World Health Organization and United Nations Children's Fund, 2004. (http://www.who.int/water_sanitation_health/Globassessment)

Meeting the Millennium Development Goals Drinking water and sanitation target. (<http://www.wssinfo.org>)

Database

WHO/UNICEF Joint Monitoring Programme web site: (<http://www.wssinfo.org>)

Comments

Information is missing from many developed countries. More needs to be done to address the issues of sustainability and safety in drinking water provision.

Population using solid fuels (percentage)

Rationale for use

The use of solid fuels in households is associated with increased mortality from pneumonia and other acute lower respiratory diseases among children as well as increased mortality from chronic obstructive pulmonary disease and lung cancer (where coal is used) among adults. It is also a Millennium Development Goal indicator.

Definition

Percentage of population using solid fuels.

Associated terms

Solid fuels include biomass fuels, such as wood, charcoal, crops or other agricultural waste, dung, shrubs and straw, and coal.

Data sources

Household surveys and national censuses.

National energy statistics on the proportion of population using solid fuels are based either on data from surveys or censuses, or on modelling where no survey or census data are available.

Methods of estimation

The data from surveys and censuses are used as reported in the surveys and censuses. A regression model based on gross national income, per capita petroleum consumption and rural population is being used for countries without survey data. All countries without survey data and with a GNP per capita above US\$ 10,500 are assumed to have made a complete transition to cooking with non-solid fuels.

For low- and middle-income countries with a GNI per capita below US\$ 10,500.- and for which no household solid fuel use data are available, a regression model based on GNI, percentage of rural population and location or non-location within the Eastern Mediterranean Region is used to estimate the indicator.

Disaggregation

By location (e.g. urban/rural, major regions/provinces) and socio-economic characteristics (e.g. education level, wealth quintile).

References

Smith KR, et al. Indoor air pollution from household use of solid fuels. In: Ezzati M et al., eds.

Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. Geneva, World Health Organization, 2004.

Rehfuess E, et al. Assessing household solid fuel use - multiple implications for the Millennium Development Goals. In press. Environmental Health Perspectives, March 2006.

Mehta S, et al. Modeling household solid fuel use towards reporting of the Millennium Development Goal indicator. In press. Energy for Sustainable Development, June 2006.

Database

Global indoor air pollution database:

(<http://www.who.int/indoorair/mdg/en/>)

Comments

For 93 countries solid fuel use data were compiled from recent censuses or household surveys.

For the 36 countries, where no data were available, the indicator was modelled. For 52 uppermiddle or high-income countries the indicator was assumed to be less than 5%.

Prevalence of current tobacco use in adolescents (13-15 years) (percentage)

Rationale for use

The risk of chronic diseases starts early in childhood and such behaviour continues to adulthood.

Tobacco is an addictive substance and smoking often starts in adolescence, before the development of risk perception. By the time the risk to health is recognized, the addicted individuals find it difficult to stop tobacco use.

Definition

Prevalence of tobacco use (including smoking, oral tobacco and snuff) on more than one occasion in the 30 days preceding the survey, among adolescent 13-15 year olds.

Data sources

Global Youth Tobacco Survey (GYTS) and Global School Health Survey (GSHS). GYTS started in 1998 and is ongoing. Few countries have repeated surveys. This is a school based selfadministrated questionnaire.

Methods of estimation

Adjustments and standardizations are made as necessary.

Disaggregation

By sex.

References

GYTS: (<http://www.who.int/tobacco/surveillance/gyts/en>)

GSHS: (http://www.who.int/school_youth_health/assessment/gshs/en)

Database

WHO Global InfoBase Online:

(http://www.who.int/ncd_surveillance/infobase/web/InfoBaseOnline/en/index.asp)

Comments

Some of the surveys were conducted in small sub-national populations and therefore may not accurately reflect the national picture.

Prevalence of current tobacco use among adults aged ≥ 15 years (percentage)

Rationale for use

Prevalence of current tobacco smoking among adults is an important measure of the health and economic burden of tobacco, and provides a baseline for evaluating the effectiveness of tobacco control programmes over time. While a more general measure of tobacco use, including both smoked and smokeless products, would be ideal, data limitations restrict the present indicator to smoked tobacco. Occasional tobacco-smoking constitutes a significant risk factor for tobacco-related disease, and is therefore included along with daily tobacco-smoking.

Definition

Prevalence of current tobacco-smoking (including cigarettes, cigars, pipes or any other smoked tobacco products). Current smoking includes both daily and non-daily or occasional smoking.

Associated terms

The specific definition of non-daily or occasional smoking is not necessarily consistent between surveys.

Data sources

The WHO Survey Programme and World Health Survey compile comprehensive baseline information on the health of populations and on the outcomes associated with investment in health systems. The WHO Global InfoBase collects all country-level data on important noncommunicable-disease risk factors for all WHO Member States. It acts as a repository for all survey information relevant to eight risk factors, including tobacco use.

Methods of estimation

Empirical data only. World Health Survey methods can be consulted at <http://www.who.int/healthinfo/survey/en/index.html>. The methods underlying WHO Global InfoBase data vary according to the source, and additional data may have been obtained from communications with authors. Metadata for all surveys contained in the WHO Global InfoBase can be found at http://www.who.int/ncd_surveillance/infobase/web/InfoBaseCommon/.

Disaggregation

Varies by survey; includes disaggregation by sex, age, location and socioeconomic characteristics.

References

World Health Survey, WHO (<http://www.who.int/healthinfo/survey/en>).

WHO Global InfoBase Online (http://www.who.int/ncd_surveillance/infobase/web/InfoBaseCommon).

Database

WHO Global InfoBase Online (http://www.who.int/ncd_surveillance/infobase/web/InfoBaseCommon)

Comments

Cross-country comparisons are problematic as survey methods and definitions may vary between sources. Footnotes in the year column of the tables indicate those surveys that were conducted in subnational populations, among adult subgroups, or for a sub-sample of smoked tobacco products (e.g. cigarettes only).

Per capita recorded alcohol consumption (litres of pure alcohol) among adults (≥ 15 years)

Rationale for use

Harmful use of alcohol is related to many diseases and health conditions, including chronic diseases such as alcohol dependence, cancer and liver cirrhosis, and acute health problems such as injuries. Estimation of per capita consumption of alcohol across the population aged 15 years or older can provide policy makers with some sense of the magnitude and trends likely to be found in alcohol-related problems.

Definition

Litres of pure alcohol per capita, computed as the sum of alcohol production and imports, less alcohol exports, divided by the adult population (aged 15 years or older).

Associated terms

None

Data sources

Food and Agriculture Organization's Statistical Database (FAOSTAT), World Drink Trends, regularly published by Produktschap voor Gedistilleerde Dranken (Netherlands) and direct government data.

Methods of estimation

Estimated amount of pure ethanol in litres of total alcohol, and separately, beer, wine and spirits consumed per adult (15 years and older) in the country during a calendar year, as calculated from official statistics on production, sales, import and export, taking into account stocks whenever possible.

Dissagregation

None

References

Global Status Report on Alcohol. Geneva, World Health Organization, 2004.

Database

Global Alcohol Database:

http://www.who.int/globalatlas/loginmanagement/autologins/gad_login.asp

Comments

It is important to note that these figures comprise, in most cases, the recorded alcohol consumption only. Factors that influence the accuracy of per capita data are: informal production, tourist and overseas consumption, stockpiling, waste and spillage, smuggling, duty-free sales, variation in beverage strength and the quality of the data on which it is based.

Prevalence of condom use by young people (15-24 years) at higher risk sex (percentage)

Rationale for use

Consistent correct use of condoms within non-regular sexual partnerships substantially reduces the risk of sexual HIV transmission. This is especially important for young people who often experience the highest rates of HIV infection. Condom use is one measure of protection against sexual transmission of HIV; others include delaying age at first sex, reducing the number of non-regular sexual partners, being faithful to one uninfected partner, avoidance of concurrent sexual partnerships and high -risk sexual practices such as unprotected anal sex.

Definition

Percentage of young people aged 15-24 years reporting the use of a condom during the last sexual intercourse with a non-regular partner among those who had sex with a non-regular partner in the last 12 months.

Associated terms

A **non-regular sexual partner** is a non-marital and non-cohabiting partner.

Data sources

Household surveys such as Demographic and Health Surveys (DHS), Multiple Indicators Cluster Survey (MICS), Behavioural Surveillance Surveys.

Methods of estimation

Empirical data only. Survey respondents aged 15-24 years are asked whether they have commenced sexual activity. Those who report sexual activity and have had sexual intercourse with a non-regular partner in the last 12 months, are further asked about the number of non-regular partners and condom use the last time they had sex with a non-regular partner.

Disaggregation

By sex, location (urban/rural, major regions/provinces), and socio-economic characteristics (education level).

References

Monitoring the Declaration of Commitment on HIV/AIDS - Guidelines on Construction of Core Indicators. (<http://www.unaids.org/en/in+focus/monitoringevaluation.asp>)

UNAIDS National AIDS Programmes: A Guide to Monitoring and Evaluation. Geneva, Joint United Nations Programme on HIV/AIDS 2000. (<http://www.cpc.unc.edu/measure/guide/guide.html>)

Database

Measure Demographic and Health Surveys (DHS): HIV/AIDS database:
(<http://www.measuredhs.com/hivdata>)

Health systems

Human resources for health

Number of physicians (per 1000 population)

Number of nurses (per 1000 population)

Number of midwives (per 1000 population)

Number of dentists (per 1000 population)

Number of pharmacists (per 1000 population)

Number of public and environmental-health workers (per 1000 population)

Number of community health workers (per 1000 population)

Number of laboratory health workers (per 1000 population)

Number of other health workers (per 1000 population)

Number of health-management and support workers (per 1000 population)

Rationale for use

The availability and composition of human resources for health is an important indicator of the strength of the health system. Although there is no consensus about the optimal level of health workers for a population, there is ample evidence that the number and quality of workers are positively associated with immunization coverage, outreach of primary care, and infant, child and maternal survival.

Definition

Physicians: includes generalists and specialists.

Nurses: includes professional nurses, auxiliary nurses, enrolled nurses and other nurses, such as dental nurses and primary care nurses.

Midwives: includes professional midwives, auxiliary midwives and enrolled midwives. Traditional birth attendants are counted as community health workers (see below).

While much effort has been made to ensure accuracy, caution must be exercised in using the data for nurses and midwives; for some countries the available information does not distinguish clearly between the two groups.

Dentists: includes dentists, dental assistants and dental technicians.

Pharmacists: includes pharmacists, pharmaceutical assistants and pharmaceutical technicians.

Laboratory health workers: includes laboratory scientists, laboratory assistants, laboratory technicians and radiographers.

Environment and public health workers: includes environmental and public health officers, sanitarians, hygienists, environmental and public health technicians, district health officers, malaria technicians, meat inspectors, public health supervisors and similar professions.

Community health workers: includes traditional medicine practitioners, faith healers, assistant/community health-education workers, community health officers, family health workers, lady health visitors, health extension package workers, community midwives, institution-based personal care workers and traditional birth attendants.

Other health workers: includes a large number of occupations such as dietitians and nutritionists, medical assistants, occupational therapists, operators of medical and dentistry equipment, optometrists and opticians, physiotherapists, podiatrists, prosthetic/orthetic engineers, psychologists, respiratory therapists, speech pathologists, medical trainees and interns.

Health management and support workers: includes general managers, statisticians, lawyers, accountants, medical secretaries, gardeners, computer technicians, ambulance staff, cleaning staff, building and engineering staff, skilled administrative staff and general support staff.

Associated terms

The classification of health workers given above is based on criteria for education, regulation, activities and tasks, i.e. a combined WHO and International Labour Organization (ILO) classification system.

The 2004 Joint Learning Initiative report on human resources for health used three categories to identify the density of health workers as low, medium or high: less than 2.5, 2.5–5.0 and 5.0 or more health workers respectively per 1000 population.

Data sources

The indicators needed to describe the characteristics of the health workforce and monitor its development over time are often generated from a multitude of sources and cover many areas (such as profession, level of training and industry of employment). The data provided were compiled from four major sources: establishment surveys, household and labour-force surveys, population and housing censuses and records from professional and administrative sources.

The diversity of sources meant that harmonization had to be undertaken to arrive at comparable estimates of the health workforce for each Member State. The harmonization process was based on internationally standardized classification systems, mainly the International Standard Classification of Occupations (ISCO), but also the International Standard Classification of Education (ISCED) and the International Standard Industrial Classification of all Economic Activities (ISIC).

Some difficulties experienced in harmonizing data based on a variety of definitions and classification systems could not be solved through the application of the ISCO. For example, in order to include country-specific types of workers, many ministries of health apply their own national classification system. Community health workers and traditional birth attendants are not captured through the standard ISCO system, but sometimes account for up to one third of the health workforce and form an important part of the infrastructure for service delivery.

Apart from harmonization of health-workforce categories, an additional challenge was the triangulation of various data from different sources in one country. Generally, when data were available from more than one source, we chose censuses because they provide information on both health-service providers and health management and support workers. However, not many recent censuses with sufficiently detailed ISCO coding were both available and accessible.

The present data set includes recent and sufficiently detailed census data from 12 countries: Australia, Bolivia, Brazil, Costa Rica, Honduras, Mexico, Mongolia, New Zealand, Panama, Paraguay, Thailand and Turkmenistan.

For a further three countries—Estonia, the United Kingdom (UK) and the United States of America (USA)—the data presented are from representative labour-force or household surveys that are part of the

Luxembourg Income (or Employment) Study. These surveys were as detailed as census data in terms of the occupational categories they provided and at the same time were based on the ISCO classification system (in the case of Estonia) or a national system with equivalent detail (in the cases of the surveys for the UK and USA).

For all countries in the WHO African Region as well as for many countries in the South-East Asia Region and the Eastern Mediterranean Region, the data presented were obtained through a special survey developed by WHO and executed through its regional and country offices. As much as possible, the survey attempted to obtain information on both health-service providers and health management and support workers; it was based mainly on the ISCO system but maintained some country-specific classifications for selected occupations. The survey was implemented in the following countries:

Algeria, Angola, Bahrain, Bangladesh, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic People's Republic of Korea, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, India, Indonesia, Iran, Iraq, Jordan, Kenya, Lebanon, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mauritius, Morocco, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Oman, Pakistan, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, South Africa, Sri Lanka, Sudan, Swaziland, Timor-Leste, Togo, Tunisia, Uganda, United Republic of Tanzania, Yemen, Zambia, Zimbabwe.

For the following countries, which were not included in the WHO special survey, data were obtained from records of departments of health, lists maintained by public service commissions or other administrative sources:

Argentina, Belize, Brunei Darussalam, Cambodia, Chile, China, Colombia, Cook Islands, Cuba, Dominican Republic, Ecuador, El Salvador, Fiji, Finland, Jamaica, Malaysia, Nicaragua, Papua New Guinea, Philippines, Tonga, Tuvalu, Uruguay, Venezuela, Viet Nam.

For the remaining countries, the relevant data were compiled from the OECD Health Data database, the European health for all database or the previous WHO database. These data were the least detailed of all, containing information on only four to five occupations and almost always containing no information on health management and support workers.

The countries for which data was obtained from these sources are the following:

Afghanistan, Albania, Andorra, Angola, Antigua and Barbuda, Armenia, Austria, Azerbaijan, Bahamas, Barbados, Belarus, Belgium, Bosnia and Herzegovina, Canada, Croatia, Cyprus, Czech Republic, Denmark, Dominica, France, Georgia, Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Hungary, Iceland, Ireland, Israel, Italy, Japan, Kazakhstan, Kiribati, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Libyan Arab Jamahiriya, Lithuania, Luxembourg, The former Yugoslav Republic of Macedonia, Malta, Marshall Islands, Micronesia (Federated States of), Monaco, Nauru, Netherlands, Niue, Norway, Palau, Peru, Poland, Portugal, Qatar, Republic of Korea, Republic of Moldova, Romania, Russian Federation, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Serbia and Montenegro, Slovakia, Slovenia, Solomon Islands, Somalia, Spain, Suriname, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Trinidad and Tobago, Turkey, Ukraine, United Arab Emirates, Uzbekistan, Vanuatu.

Country reports to WHO regional offices or headquarters, based on administrative records such as databases of registered physicians/nurses in the country. In some countries, data are obtained from the census, labour-force or other surveys that include questions about occupations of the household members. Data on physicians and nurses are generally the best available information on human resources.

Methods of estimation

No methods of estimation have been developed.

Disaggregation

None

References

Background papers for *The world health report 2006—working together for health*.
(http://www.who.int/hrh/documents/Background_papers_web_version_jtc.pdf).

Database

WHO Global Atlas of the Health Workforce (http://who.int/globalatlas/autologin/hrh_login.asp)

Comments

National health accounts

Total expenditure on health as a percentage of GDP

General government expenditure on health as a percentage of total general government expenditure

Per-capita total expenditure on health at international dollar rate

Rationale for use

Health financing is a critical component of health systems. National health accounts (NHA) provide a large set of indicators on the basis of the expenditure information collected within an internationally recognized framework. NHA are a synthesis of the financing and spending flows recorded in the operation of a health system, from funding sources to the distribution of funds between providers, and functions of health systems and benefits across geographical, demographic, socioeconomic and epidemiological dimensions.

Definition

Total health expenditure as a percentage of gross domestic product (GDP).

Percentage of total general government expenditure that is spent on health.

Per-capita total expenditure on health at international dollar rate.

Associated terms

Total expenditure on health is the sum of general government health expenditure and private health expenditure in a given year, calculated in national currency units in current prices.

GDP is the value of all goods and services provided in a country by residents and non-residents without regard to their allocation among domestic and foreign claims. This corresponds to the total sum of expenditure (consumption and investment) of the private and government agents.

General government expenditure (GGE) includes consolidated direct outlays and indirect outlays (e.g. subsidies to producers, transfers to households), including capital of all levels of government, social security institutions, autonomous bodies, and other extrabudgetary funds.

General government expenditure on health (GGHE) comprises the direct outlays earmarked for the enhancement of the health status of the population and/or the distribution of medical-care goods and services in the population by the following financing agents: central/federal, state/provincial/regional, and local/municipal authorities; extrabudgetary agencies, social security schemes; parastatals. All can be financed through domestic funds or through external resources.

International dollars: derived by dividing local currency units by an estimate of their purchasing power parity (PPP) compared with the US dollar, i.e. the measure that minimizes the consequences of differences in prices between countries.

Data sources and Methods of estimation

Only about 95 countries have either produced full national health accounts or report expenditure on health to the Organisation for Economic Co-operation and Development (OECD). Standard accounting estimation and extrapolation techniques have been used to provide time series. The principal international references used are the International Monetary Fund (IMF) government finance statistics and international financial statistics; OECD health data and international development statistics; and the United Nations national accounts statistics. National sources include: national health accounts reports, public expenditure reports, statistical yearbooks and other periodicals, budgetary documents, national accounts reports, statistical data on official web sites, central bank reports, nongovernmental organization reports, academic studies, and reports and data provided by central statistical offices and ministries.

Disaggregation

By public and private components and subcomponents: is not presented here but is available on the NHA website.

References

WHO. *The world health report 2006—working together for health*. Geneva, World Health Organization, 2006 (<http://www.who.int/whr/2006/en>).

Database

National health accounts, World Health Organization. (<http://www.who.int/nha/country/en/index.html>)

Comments

Data on estimated health expenditure are collected by triangulating information from several sources to ensure that the outlays constitute the bulk of the government/private expenditure on health. Some figures may be underestimated when it is not possible to obtain data on expenditures for local governments, nongovernmental organizations or insurance.

General government expenditure on health as a percentage of total expenditure on health

General government expenditure on health as a percentage of total government expenditure

External resources for health as a percentage of total expenditure on health

Social security expenditure on health as a percentage of general government expenditure on health

Out-of-pocket expenditure as a percentage of private expenditure on health

Private prepaid plans as a percentage of private expenditure on health

Per-capita total expenditure on health at average exchange rate (US\$)

Per-capita government expenditure on health at average exchange rate (US\$)

Per-capita government expenditure on health at international dollar rate

Rationale for use

Health financing is a critical component of health systems. National health accounts (NHA) provide a large set of indicators on the basis of expenditure information collected within an internationally recognized framework. NHA are a synthesis of the financing and spending flows recorded in the operation of a health system, from funding sources to the distribution of funds between providers, and functions of health systems and benefits across geographical, demographic, socioeconomic and epidemiological dimensions.

Definition

Key indicators for which the data are available:

Level of **total health expenditure** (THE) as a percentage of gross domestic product (GDP), and per-capita health expenditures in US dollars and in international dollars.

Distribution of public and private sectors in financing health and their main components, such as: extent of social and private health insurance; burden on households through out-of-pocket spending; and reliance on external resources in financing health care.

Associated terms

GDP is the value of all goods and services provided in a country by residents and non-residents. This corresponds to the total sum of expenditure (consumption and investment) of the private and government agents of the economy during the reference year.

General government expenditure (GGE) includes consolidated direct outlays and indirect outlays, such as subsidies and transfers, including capital, of all levels of government social security institutions, autonomous bodies, and other extrabudgetary funds.

Total expenditure on health (THE) is the sum of general government health expenditure and private health expenditure in a given year, calculated in national currency units in current prices. It comprises the outlays earmarked for health maintenance, restoration or enhancement of the health status of the population, paid for in cash or in kind

General government expenditure on health (GGHE) is the sum of outlays by government entities to purchase health-care services and goods. It comprises the outlays on health by all levels of government, social-security agencies, and direct expenditure by parastatals and public firms. Expenditures on health include final consumption, subsidies to producers, and transfers to households (chiefly reimbursements for medical and pharmaceutical bills). It includes both recurrent and investment expenditures (including capital transfers) made during the year. Besides domestic funds it also includes external resources (mainly as grants passing through the government or loans channelled through the national budget).

Social security expenditure on health (SSHE) includes outlays for purchases of health goods and services by schemes that are mandatory and controlled by government. Such social-security schemes that apply only to a selected group of the population, such as public sector employees only, are also included here.

External resources (ExtHE) includes all grants and loans for health goods and services, passing through governments or private entities, in cash or in kind.

Private health expenditure (PvtHE) is defined as the sum of expenditures on health by the following entities:

Prepaid plans and risk-pooling arrangements (prepaidHE): the outlays of private insurance schemes and private social insurance schemes (with no government control over payment rates and participating providers but with broad guidelines from government)

Firms' expenditure on health: the outlays by private enterprises for medical care and health-enhancing benefits other than payment to social security or other pre-paid schemes.

Non-profit institutions serving mainly households (NGOs): outlays of those entities whose status do not permit them to be a source of financial gain for the units that establish, control or finance them. This includes funding from internal and external sources.

Household out-of-pocket spending (OOPs): the direct outlays of households, including gratuities and in-kind payments made to health practitioners and to suppliers of pharmaceuticals, therapeutic appliances and other goods and services. This includes household direct payments to public and private providers of health-care services, non-profit institutions, and non-reimbursable cost-sharing, such as deductibles, copayments and fees for services.

Exchange rate: the annual average or year-end number of units at which a currency is traded in the banking system

International dollars are derived by dividing local currency units by an estimate of their purchasing power parity (PPP) compared with US dollars, i.e. the measure that minimizes the consequences of differences in prices between countries.

Data sources and Methods of estimation

About 100 countries have either produced full national health accounts or report expenditure on health to the Organisation for Economic Co-operation and Development (OECD). Standard accounting estimation and extrapolation techniques have been used to provide time series (1998–2004). Ministries of health have responded to the draft updates sent for their inputs and comments.

The principal international references used are the International Monetary Fund (IMF), government finance statistics and international financial statistics; OECD health data; and the United Nations national accounts statistics. National sources include: national health accounts reports, public expenditure reports, statistical yearbooks and other periodicals, budgetary documents, national accounts reports, central bank reports, nongovernmental organization reports, academic studies, reports and data provided by central statistical offices and ministries and statistical data on official web sites.

For details on sources and methods see annex notes to the *World health report* on the website <http://www.who.int/whr/2006/en>.

Disaggregation

By providers and functions: data are not available here but could be accessed from individual NHA reports of the countries.

References

WHO. *The world health report 2006—working together for health*. Geneva, World Health Organization, 2006 (<http://www.who.int/whr/2006/en>).

Database

National health accounts, World Health Organization (<http://www.who.int/nha/country/en/index.html>)

Comments

Data on estimated health expenditure are collected by triangulating information from several sources to ensure that the outlays constitute the bulk of the government/private expenditure on health. Some figures may be underestimated when it is not possible to obtain data on expenditures for local governments, nongovernmental organizations or insurance.