World Health Organization
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Health Situation Analysis in the African Region

Atlas of Health Statistics, 2011

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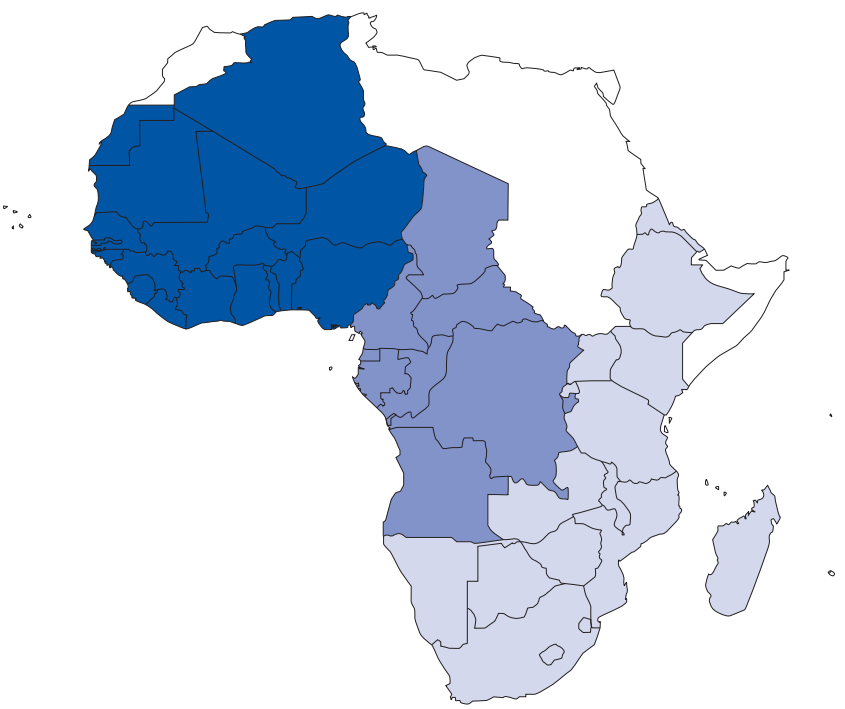

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Message from the Regional Director

Basic data and statistics are at the core of all health systems. Without them, it would be impossible to analyse evidence and extract action-oriented knowledge for decision making.

Clearly, the data should be of the highest quality possible. They should be timely, valid, accurate, derived and analysed by sound methods, consistent, comparable, and repeatable.

This publication presents in numerical and graphical formats the best data available for key health indicators in the 46 countries of WHO's African Region. Although there have been considerable improvements in data collection and analysis and notable examples of success, this is not the case with all the data collected in the Region. Countries have worked long and hard, and with varying degrees of success, on strengthening their national health information systems. Nevertheless, there continue to be gaps in the system.

One approach to strengthening health information systems that is currently underway is the development of an African Health Observatory and national health observations. The overall objective of the African Health Observatory is to contribute to regional and country efforts to narrow the knowledge gap and to strengthen health systems in the African Region by providing easy access to high-quality information, evidence and knowledge, as well as facilitate their use for policy and decision making. The Observatory will monitor regional health status and trends and provide in-depth analysis by priority themes for attainment of the United Nations' Millennium Development Goals and other global and regional commitments, and will identify inequities in health and use evidence-based information in the formulation of public health policies and programmes. The Observatory aims to facilitate the generation, sharing and application of information, evidence and knowledge. It will also serve as the focus for building networks, including communities of practice, around data collection and processing. Systematic reviews and evidence will be drawn from the Observatory's resources and packaged for, and disseminated to, key target audiences. It is essential to enhance and promote the use of evidence for policy and action. The Observatory will also link to national health observatories and all data collection activities in WHO country offices, Inter-Country Support Teams and the Regional Office in a two-way support system, as a way of strengthening national health information systems.

With the continued input and collaboration of the countries, future editions of this publication will be produced as a significant information product of the Observatory.

While thanking all Member States and those in charge of their health information systems for their cooperation in providing country data, I encourage all countries to continue collaborating with WHO to improve the availability and use of information through the African Health Observatory.

Dr Luis Gomes Sambo
Regional Director
WHO – Regional Office for Africa

Overview of Profile of the African Region

Selected indicators**

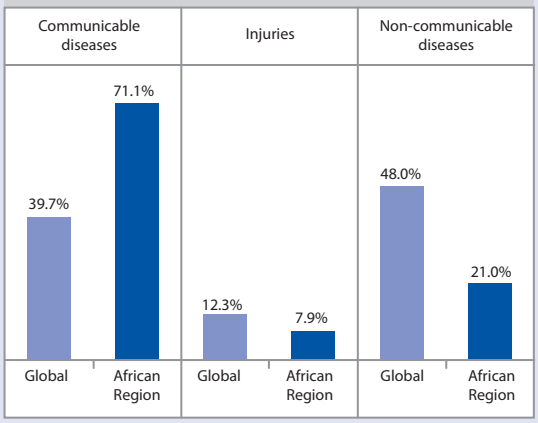
		African Region	Global
Population size (in thousands)	2008	804,865	6,737,480
Population living in urban areas (%)	2008	37	50
	2000	34	47
	1990	29	43
Life expectancy at birth (years), both sexes	2008	53	68
	1990	51	64
Adult mortality rate (probability of dying between 15 and 60 years per 1000 population)	2008	392	180
	1990	371	210
Per capita total expenditure on health (PPP int. $)	2007	137	863
	2000	86	568
Gross national income per capita (PPP int. $)	2008	2,279	10,290
	2000	1,506	6,940
	1990	1,319	4,862

African Health Observatory

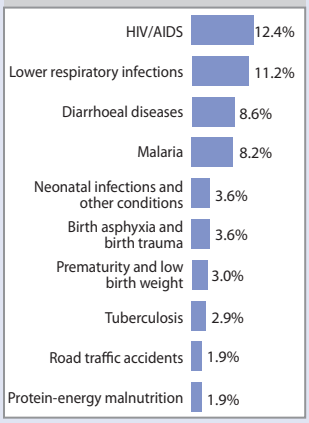
World Health Organization REGIONAL OFFICE FOR Africa

All data sources are given in the African Health Observatory at www.aho.afro.who.int

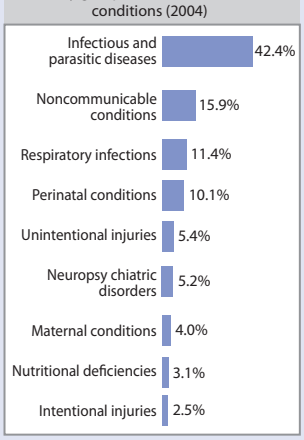
Distribution of burden of diseases as % of total DALYs by broader causes (2004)



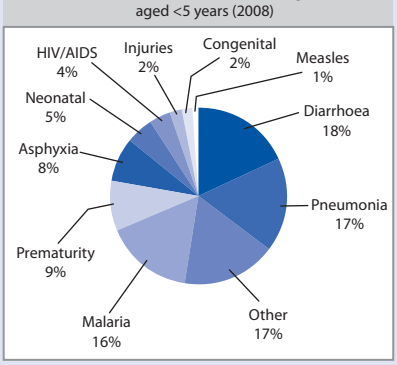
Leading causes of burden of diseases (as % of total DALYs) (2004)



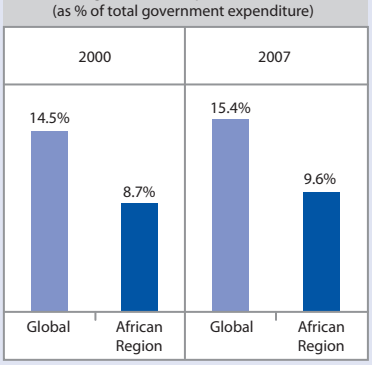
Burden of disease (% of total DALYs) by groups of disorders and conditions (2004)



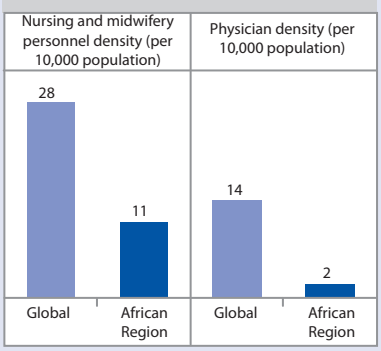
Distribution of causes of death among children aged <5 years (2008)



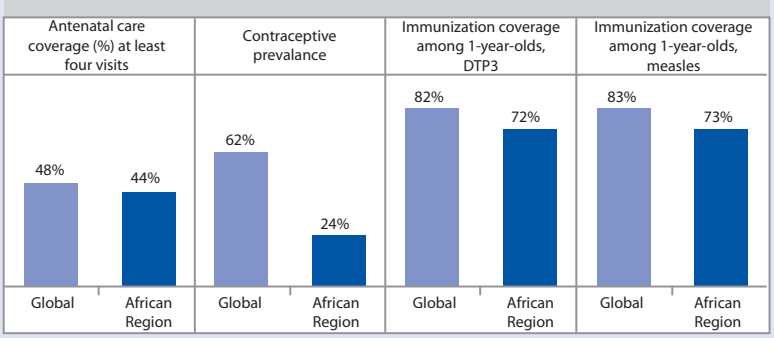
General government expenditure on health (as % of total government expenditure)



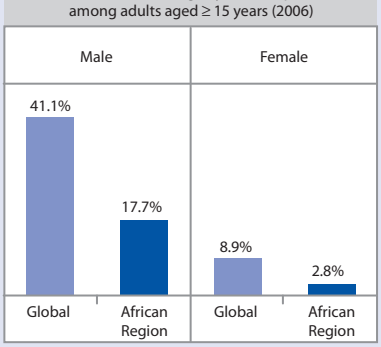
Health workforce (2000–2009)



Utilization of health services (2008)

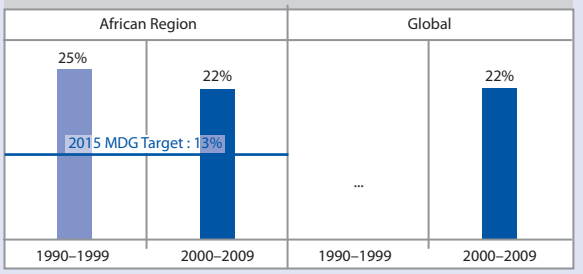


Prevalence of smoking any tobacco product among adults aged ≥ 15 years (2006)

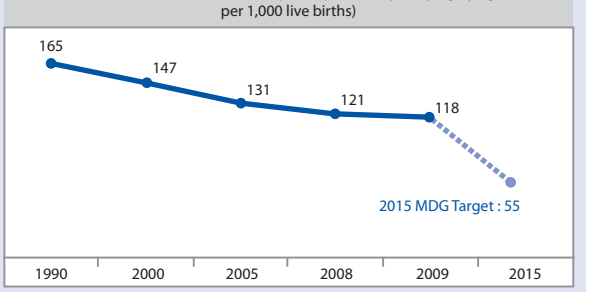


Overview of Progress on the Health-related MDGs in the African Region

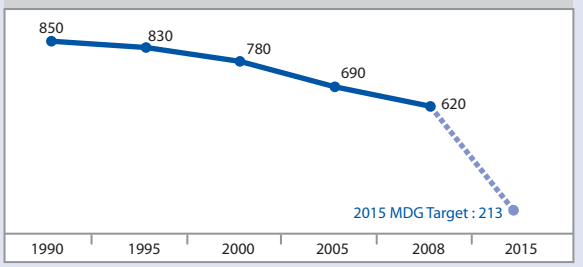
MDG-1: Children aged < 5 years underweight



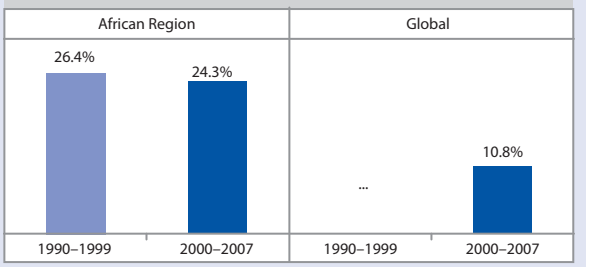
MDG-4: Trend in under-5 mortality rate (probability of dying by age 5; per 1,000 live births)



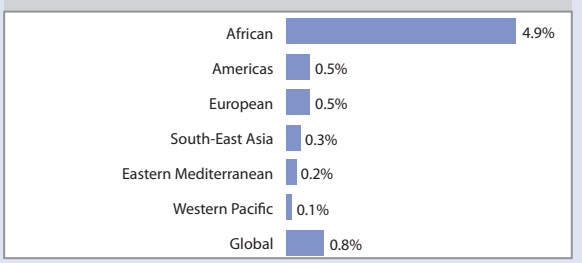
MDG-5: Trend in maternal mortality ratio (per 100,000 live births)



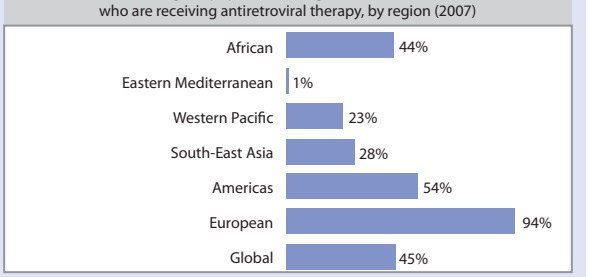
MDG-5: Percentage of unmet need for family planning



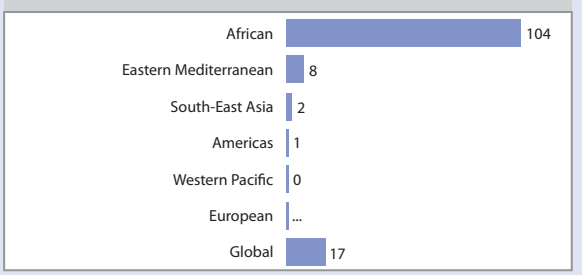
MDG-6: Prevalence of HIV among adults aged 15–49 years, by region (2007)



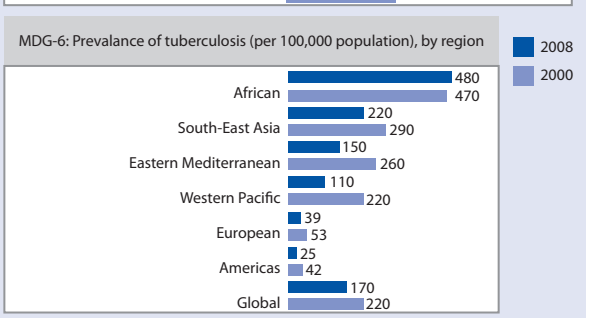
MDG-6: Percentage of population living with advanced HIV infection who are receiving antiretroviral therapy, by region (2007)



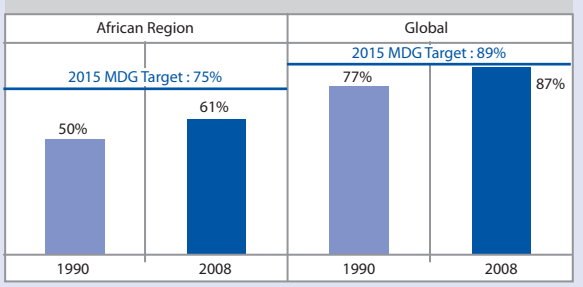
MDG-6: Malaria mortality rate per 100,000 poplation, by region (2006)



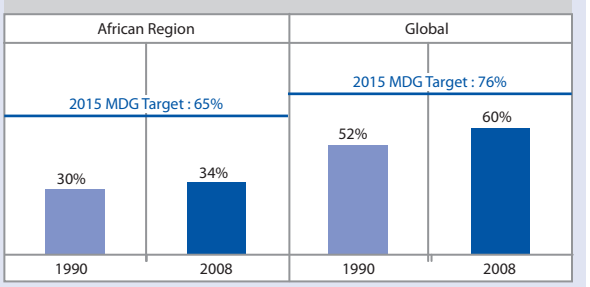
MDG-6: Prevalance of tuberculosis (per 100,000 population), by region



MDG-7: Population using improved drinking water sources



MDG-7: Population using improved sanitation



Introduction

The African Region is one of the six regions in which the World Health Organization (WHO) collaborates with countries in public health. With over 730 million inhabitants in 46 countries (see Figures A and B), it accounts for about one-seventh of the world's population.

This statistical atlas describes the health status and trends in the countries of the African Region, the various components of their health systems, coverage and access levels for specific programmes and services, and the key determinants of health in the

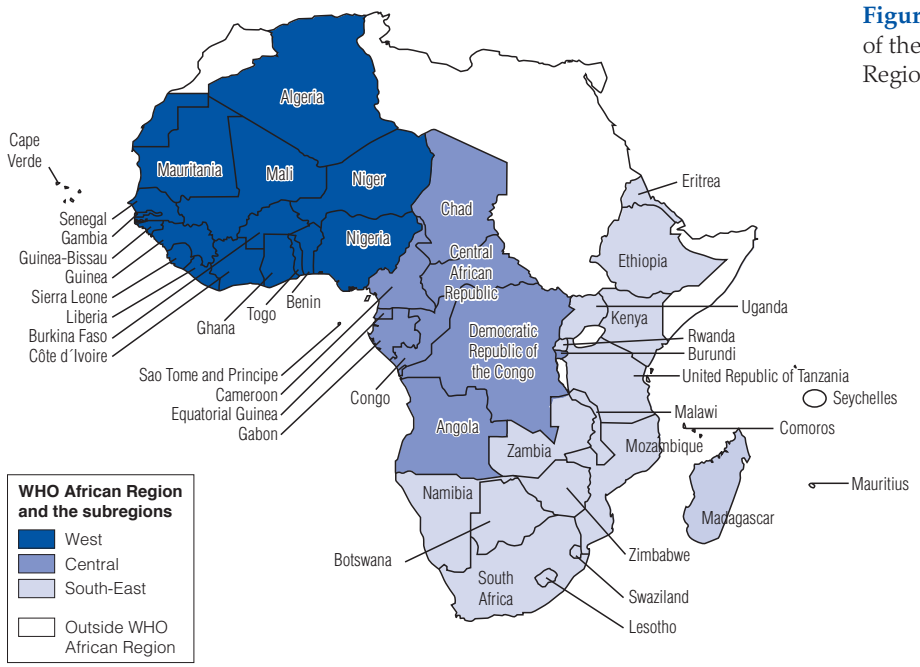


Figure A: The countries of the WHO African Region and the subregions

Region, and the progress made on reaching the United Nations' Millennium Development Goals (MDGs).

Each indicator is described, as appropriate, by place (WHO Regions and countries in the African Region), person (age and sex) and time (various years) using maps and graphs. The aim is to give a comprehensive overview of the health situation in the African Region and its 46 Member States.

The main source for the data is WHO-AFRO's integrated database based on the World Health Statistics 2010. Other UN agency databases have been used when necessary. All the data and figures in this atlas can be accessed through the African Health Observatory (www.aho.afro.who.int).

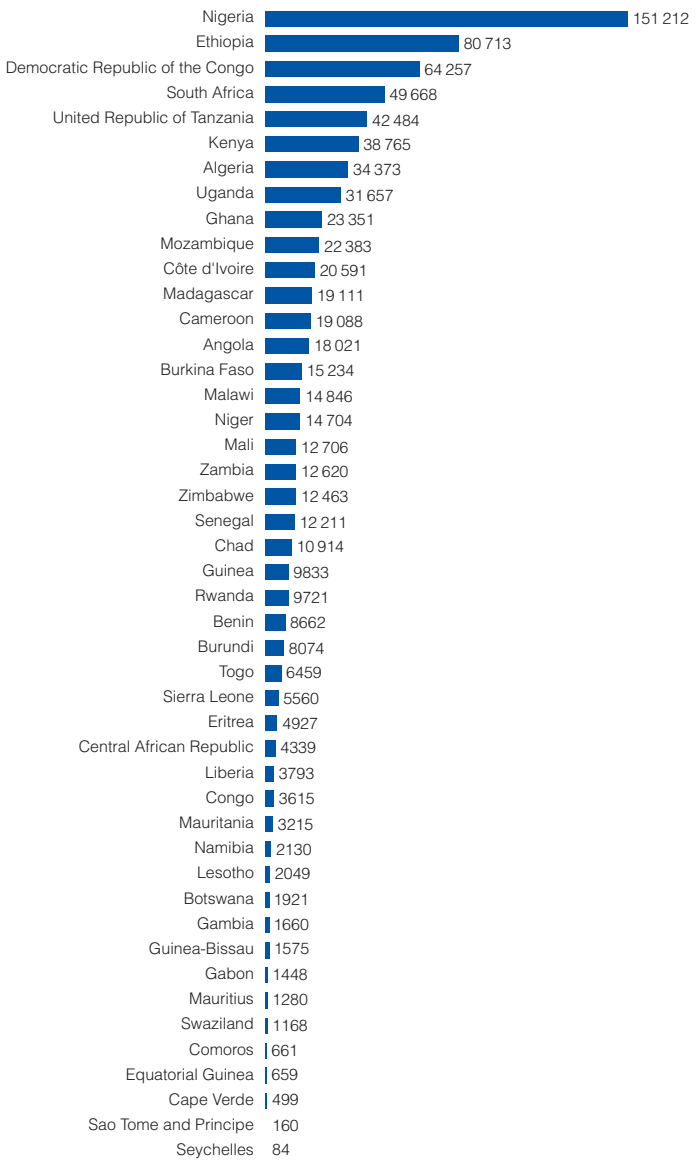


Figure B: Population size (in thousands) of countries of the African Region, 2008

1 Health Status and Trends

Life expectancy

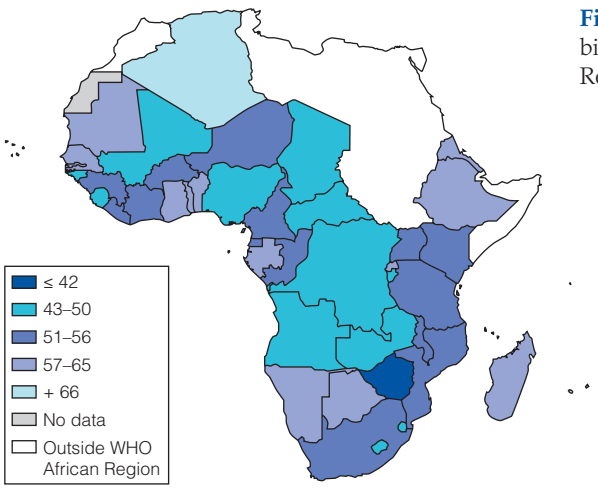


Figure 1: Life expectancy at birth in years in the African Region, 2008

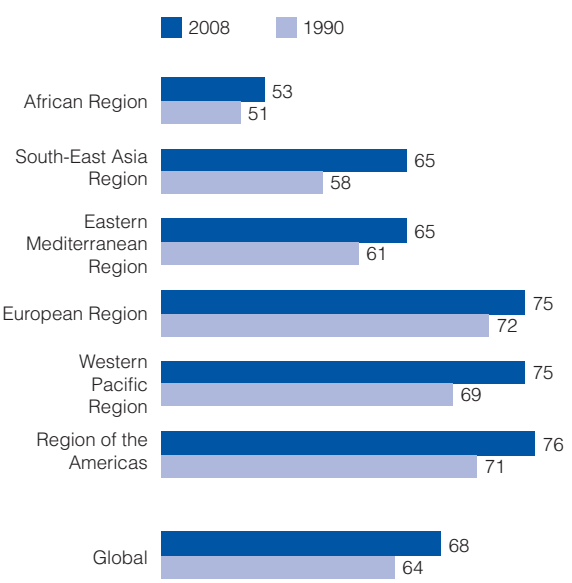


Figure 2: Life expectancy at birth in years in WHO Regions, 2008 and 1990

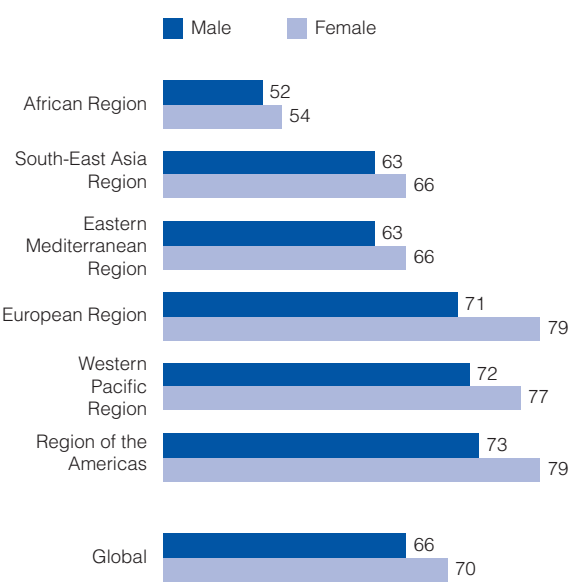


Figure 3: Life expectancy at birth in years in WHO Regions, by sex, 2008

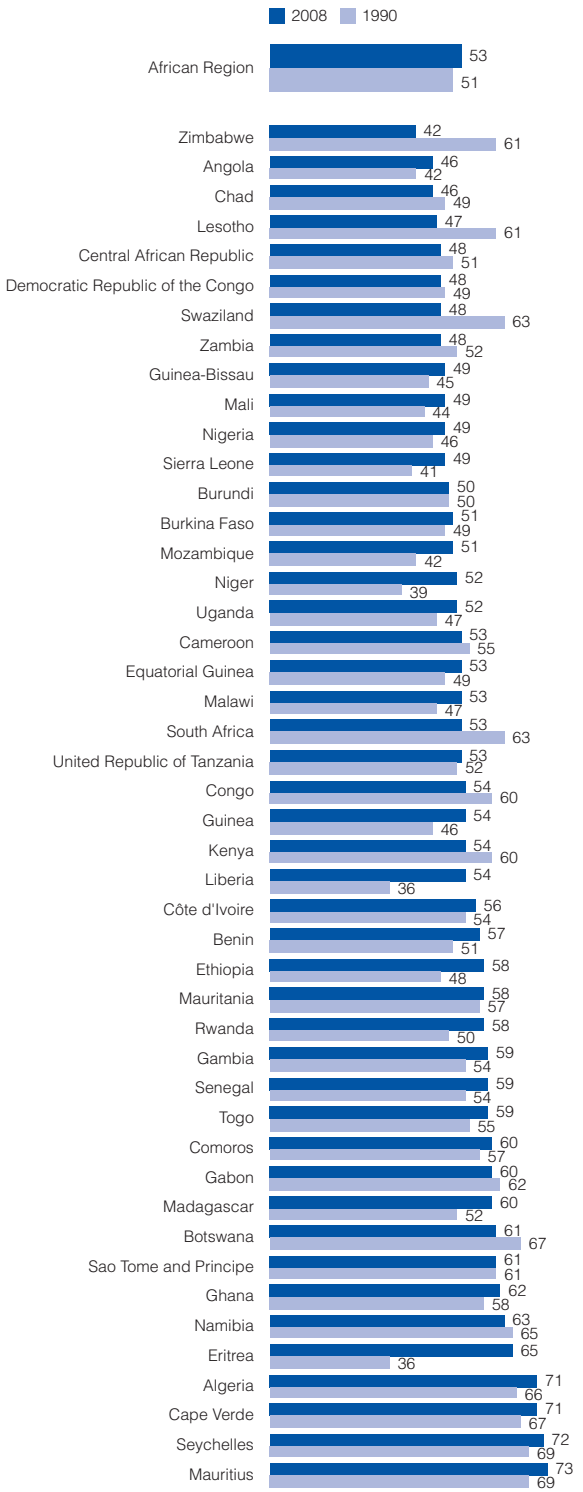


Figure 4: Life expectancy at birth in years in the African Region, by country, 2008 and 1990

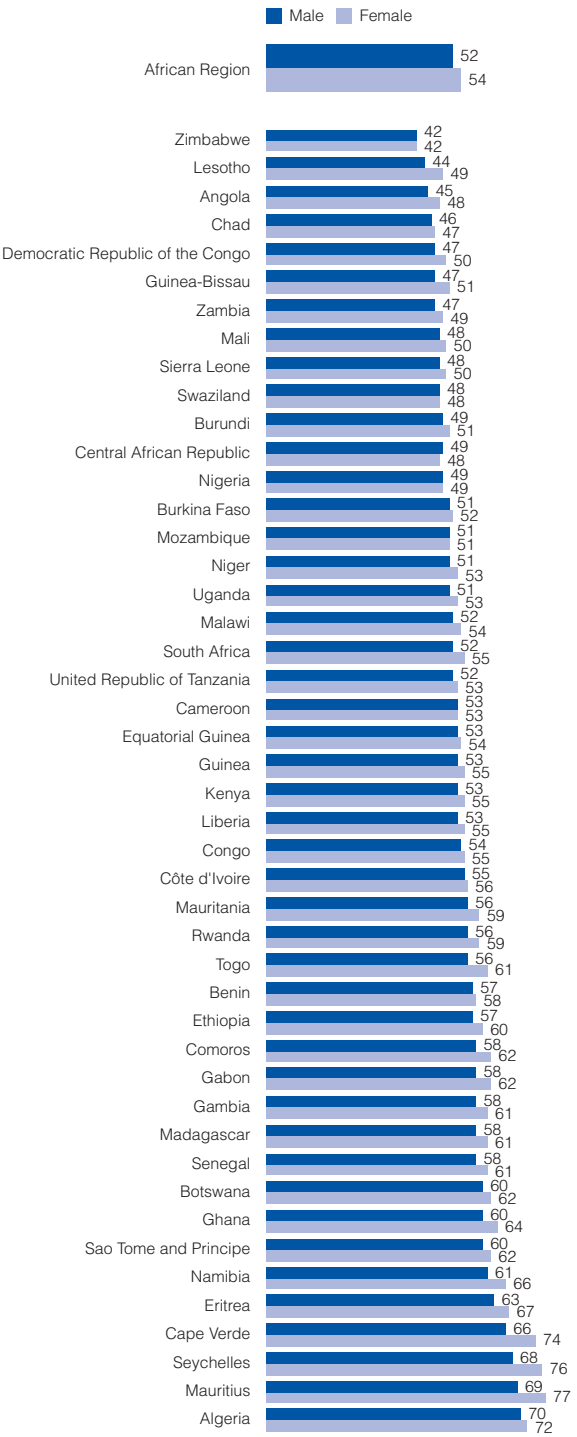


Figure 5: Life expectancy at birth in years in the African Region, by country and sex, 2008

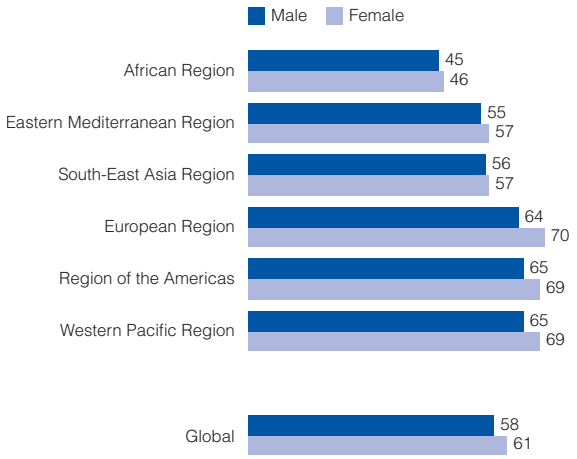


Figure 6: Healthy life expectancy* at birth in years in WHO Regions, by sex, 2007

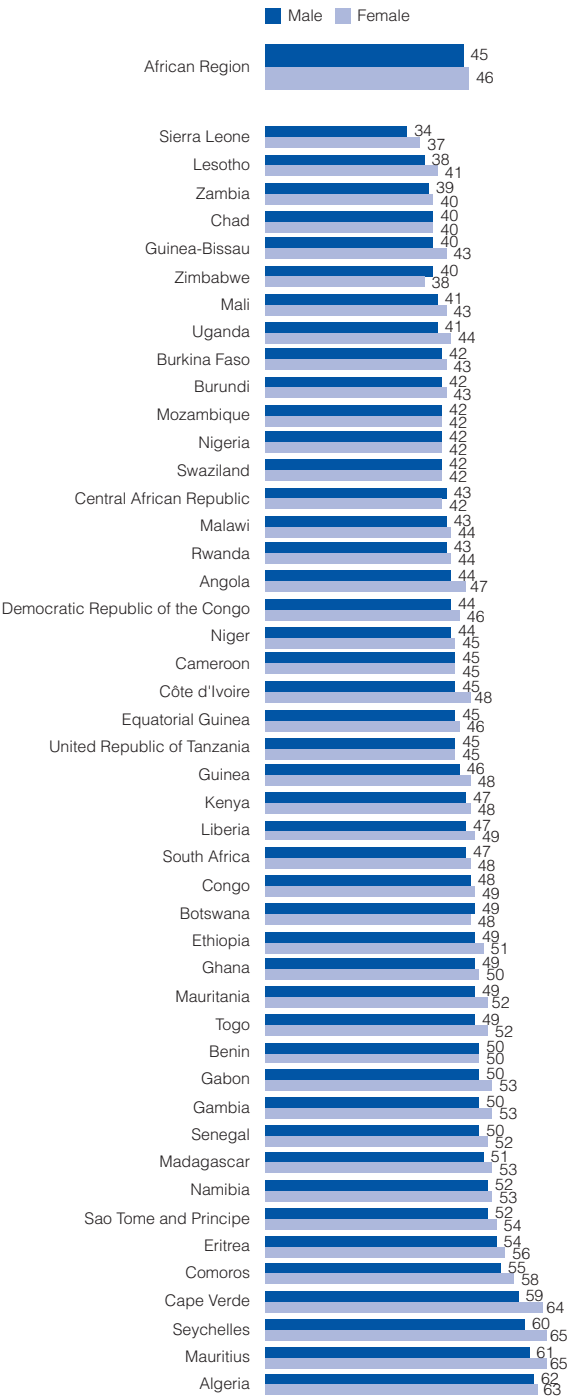


Figure 7: Healthy life expectancy at birth in years in the African Region, by country and sex, 2007

*_Healthy life expectancy_ (HALE) at birth represents the average number of years that a person could expect to live in 'good health' by taking into account years lived in less than full health due to disease and/or injury. As a result, it captures both fatal and non-fatal health outcomes and disabilities.

Mortality

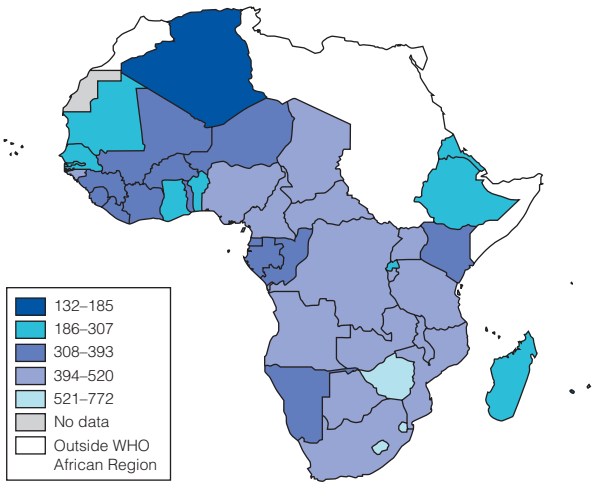


Figure 8: Adult mortality rate per 1000 population in the African Region, 2008

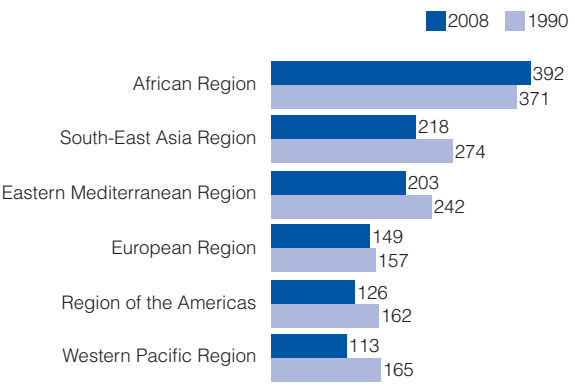


Figure 9: Adult mortality rate per 1000 population in WHO Regions, 2008 and 1990

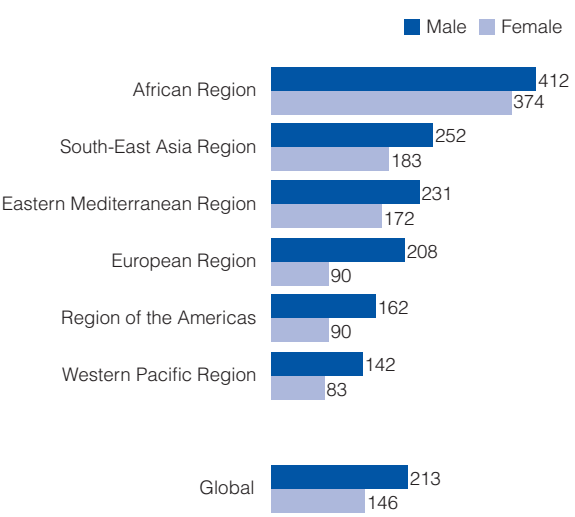


Figure 10: Adult mortality rate per 1000 population in WHO Regions, by sex, 2008

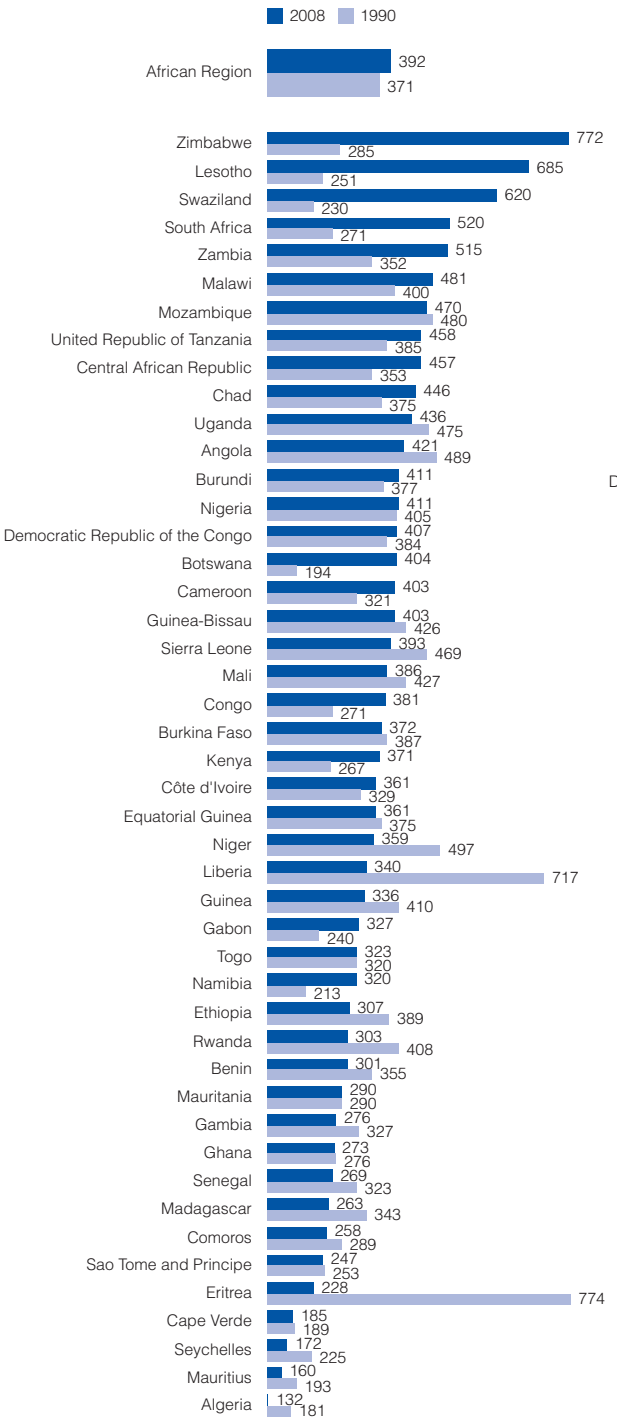


Figure 11: Adult mortality rate per 1000 population in the African Region, by country, 2008 and 1990

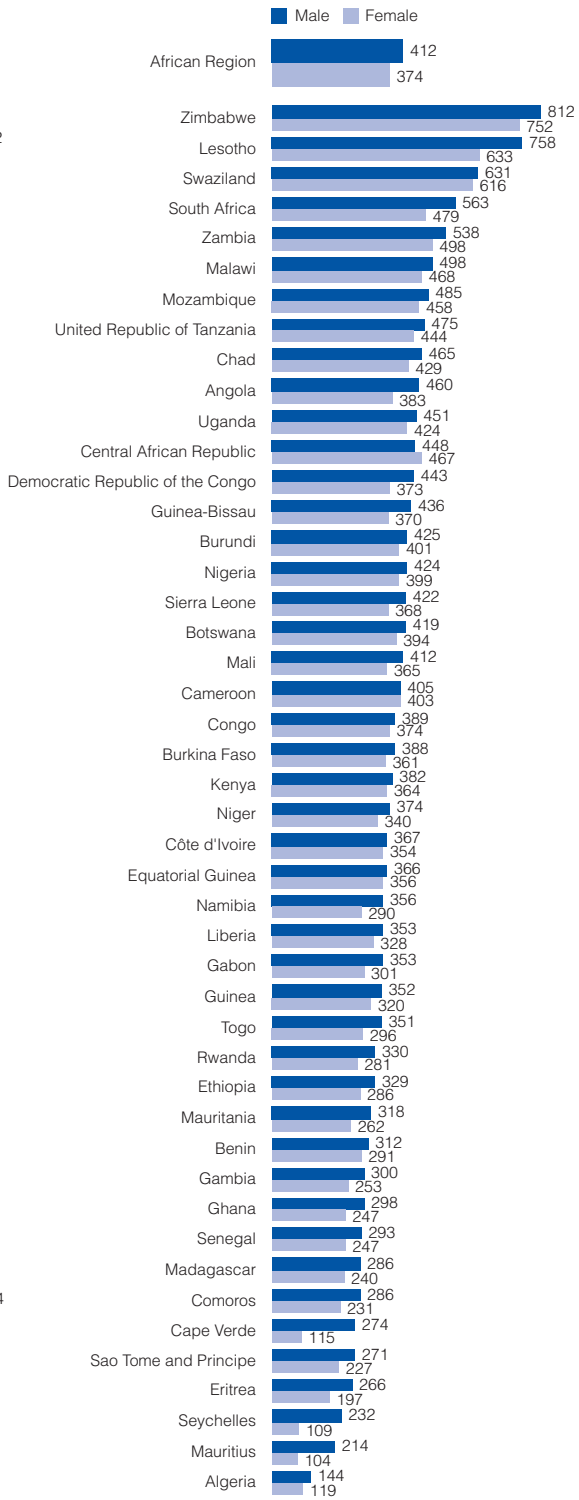


Figure 12: Adult mortality rate per 1000 population in the African Region, by country and sex, 2008

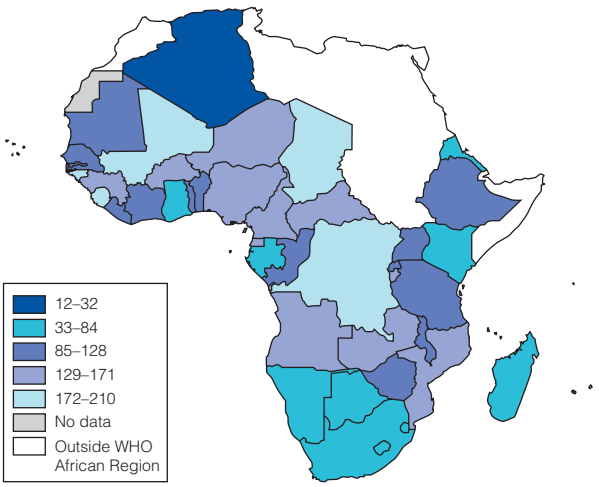


Figure 13: Under-5 mortality rate per 1000 live births in the African Region, 2009*

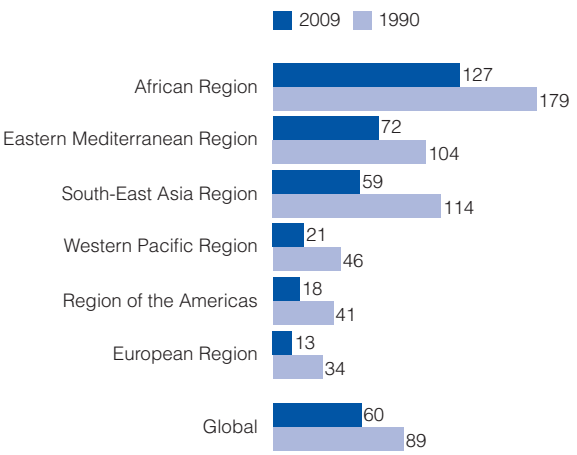


Figure 14: Under-5 mortality rate per 1000 live births in WHO Regions, both sexes, 2009 and 1990*

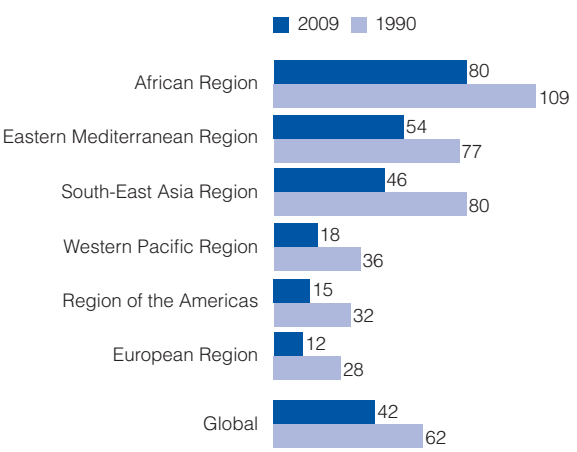


Figure 15: Infant mortality rate per 1000 live births in WHO Regions, 2009 and 1990*

*Source: *Levels and Trends in Child Mortality; Report 2010. Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation*. UNICEF, WHO, The World Bank and United Nations DESA/Population Division. New York: UNICEF, 2010.

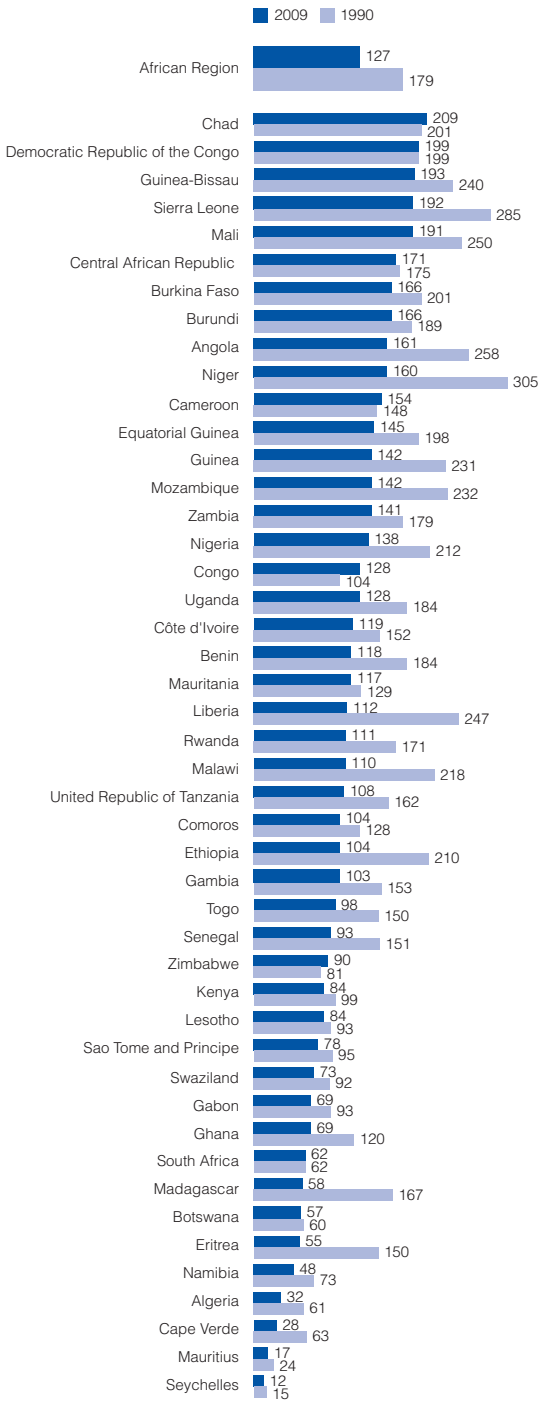


Figure 16: Under-5 mortality rate per 1000 live births in the African Region, by country, 2009 and 1990*

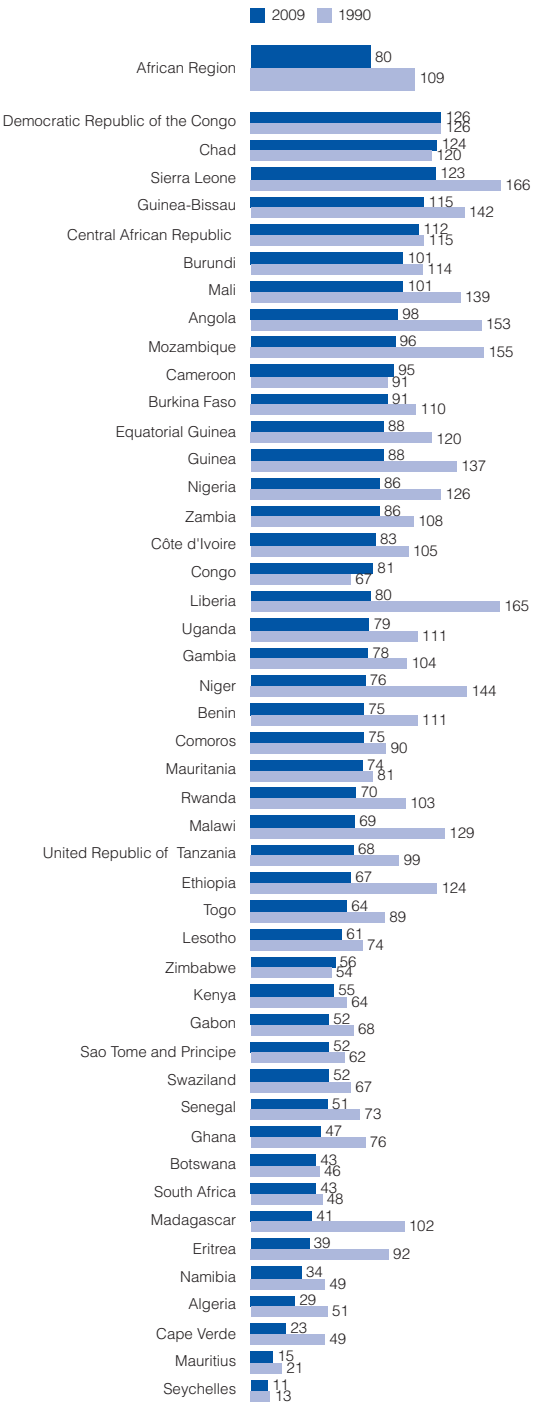


Figure 17: Infant mortality rate per 1000 live births in the African Region, by country, 2009 and 1990*

*Source: *Levels and Trends in Child Mortality; Report 2010. Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation*. UNICEF, WHO, The World Bank and United Nations DESA/Population Division. New York: UNICEF, 2010.

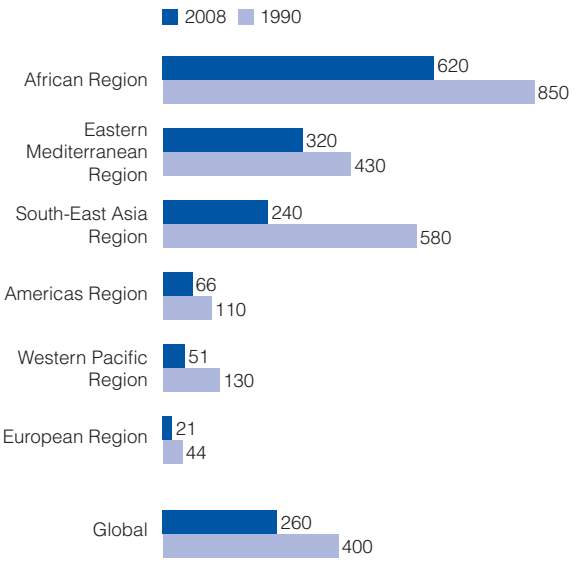


Figure 18: Maternal mortality ratio per 100 000 live births in WHO Regions, 2008 and 1990*

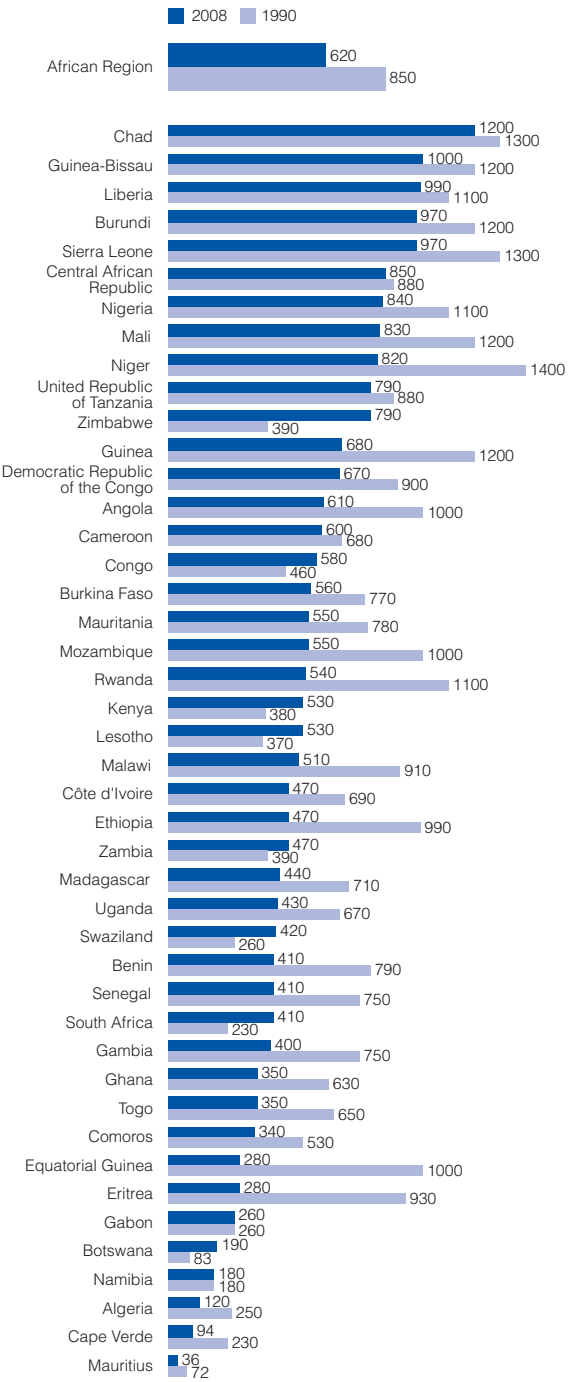


Figure 19: Maternal mortality ratio per 100 000 live births in the African Region, by country, 2008 and 1990*

*Source: *Trends in Maternal Mortality: 1990 to 2008. Estimates Developed by WHO, UNICEF, UNFPA and The World Bank.* Geneva: WHO, 2010.

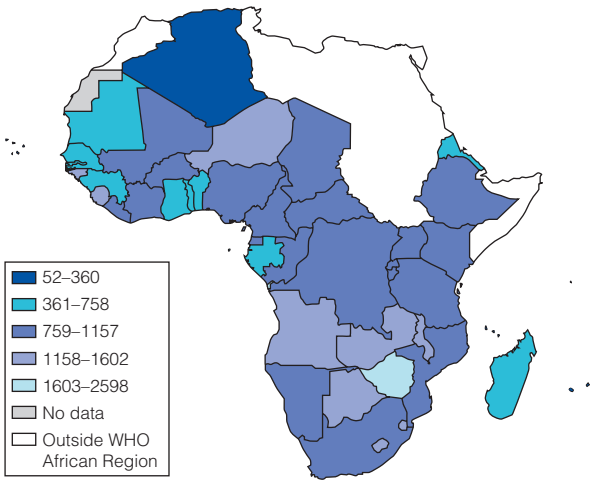


Figure 20: Age-standardized death rates* per 100 000 population due to communicable diseases in the African Region, 2004

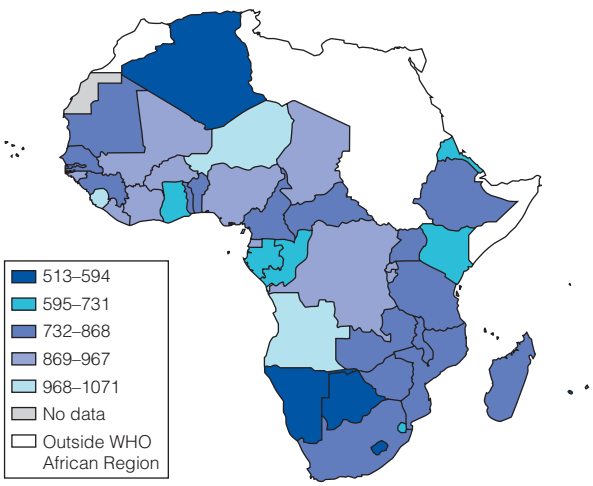


Figure 21: Age-standardized death rates per 100 000 due to non-communicable diseases in the African Region, 2004

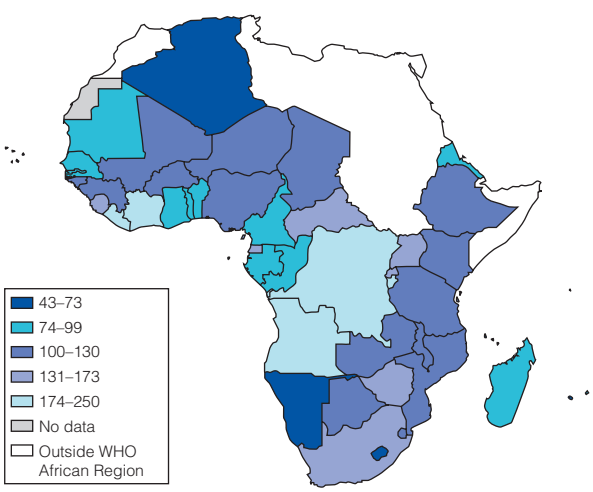


Figure 22: Age-standardized death rates per 100 000 due to injuries and violence in the African Region, 2004

*Rates are age-standardized to WHO's world standard population. Ahmad OB, Boschi-Pinto C, Lopez AD et al. *Age Standardization of Rates: A New WHO Standard*. Geneva: WHO, 2001. Available at: www.who.int/healthinfo/paper31.pdf.

Burden of disease

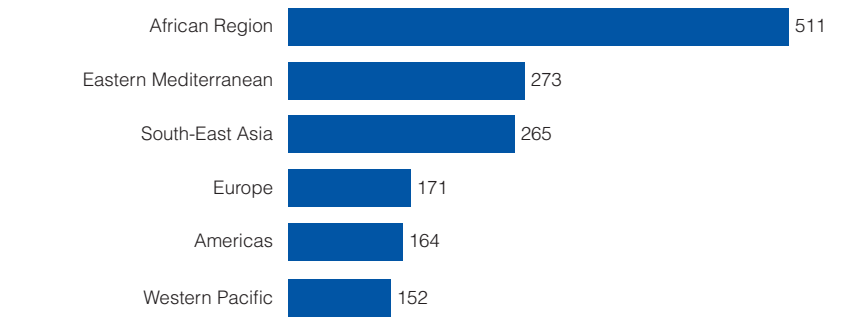


Figure 23: Total burden of disease in DALYs* per 1000 population in WHO Regions, 2004

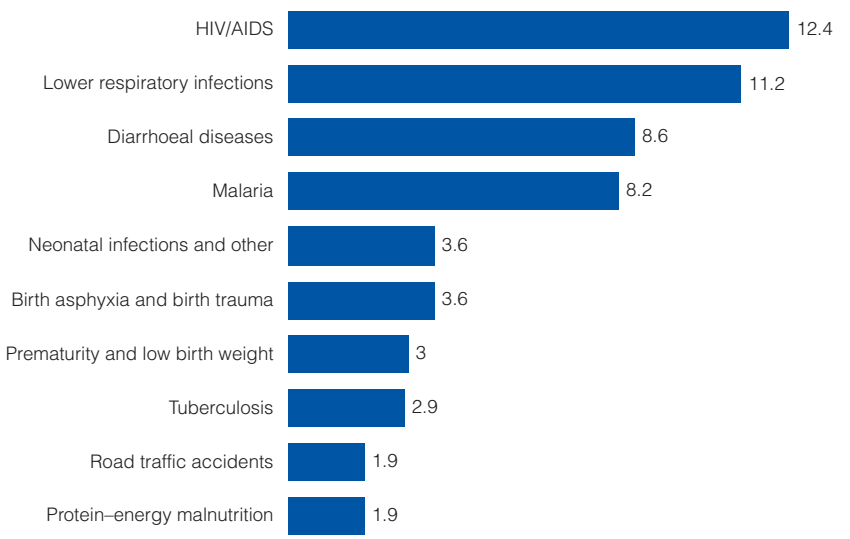


Figure 24: Leading causes of burden of diseases shown as percentage of total DALYs in the African Region, 2004

*The disability-adjusted life-year (DALY) provides a consistent and comparative description of the burden of diseases and injuries needed to assess the comparative importance of diseases and injuries in causing premature death, loss of health and disability in different populations. The DALY extends the concept of potential years of life lost due to premature death to include equivalent years of 'healthy' life lost by virtue of being in states of poor health or disability. One DALY can be thought of as one lost year of 'healthy' life, and the burden of disease can be thought of as a measurement of the gap between current health status and an ideal situation where everyone lives into old age, free of disease and disability. *WHO. Burden of Diseases Update 2004*. Geneva, July 2008.

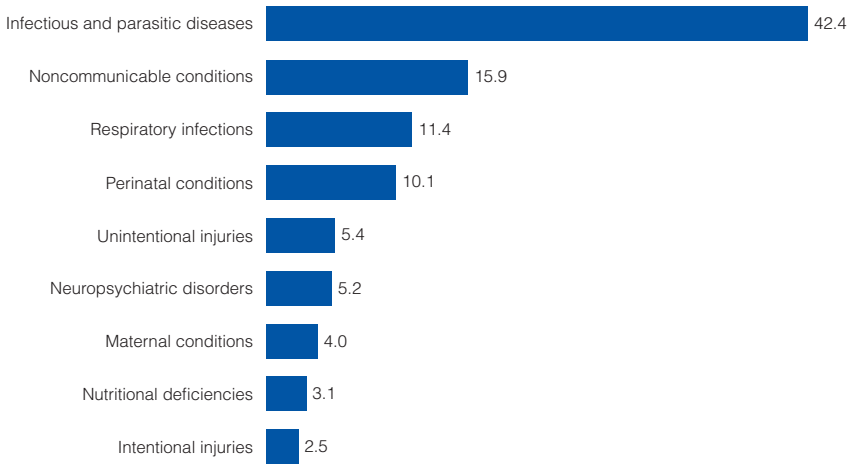


Figure 25: Distribution of burden of diseases as percentage of total DALYs by group in the African Region, 2004

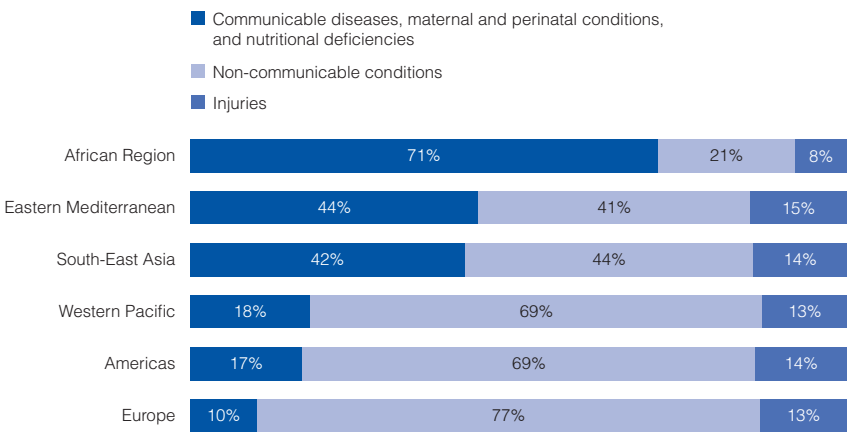


Figure 26: Distribution of burden of diseases as percentage of total DALYs by broader causes in WHO Regions, 2004

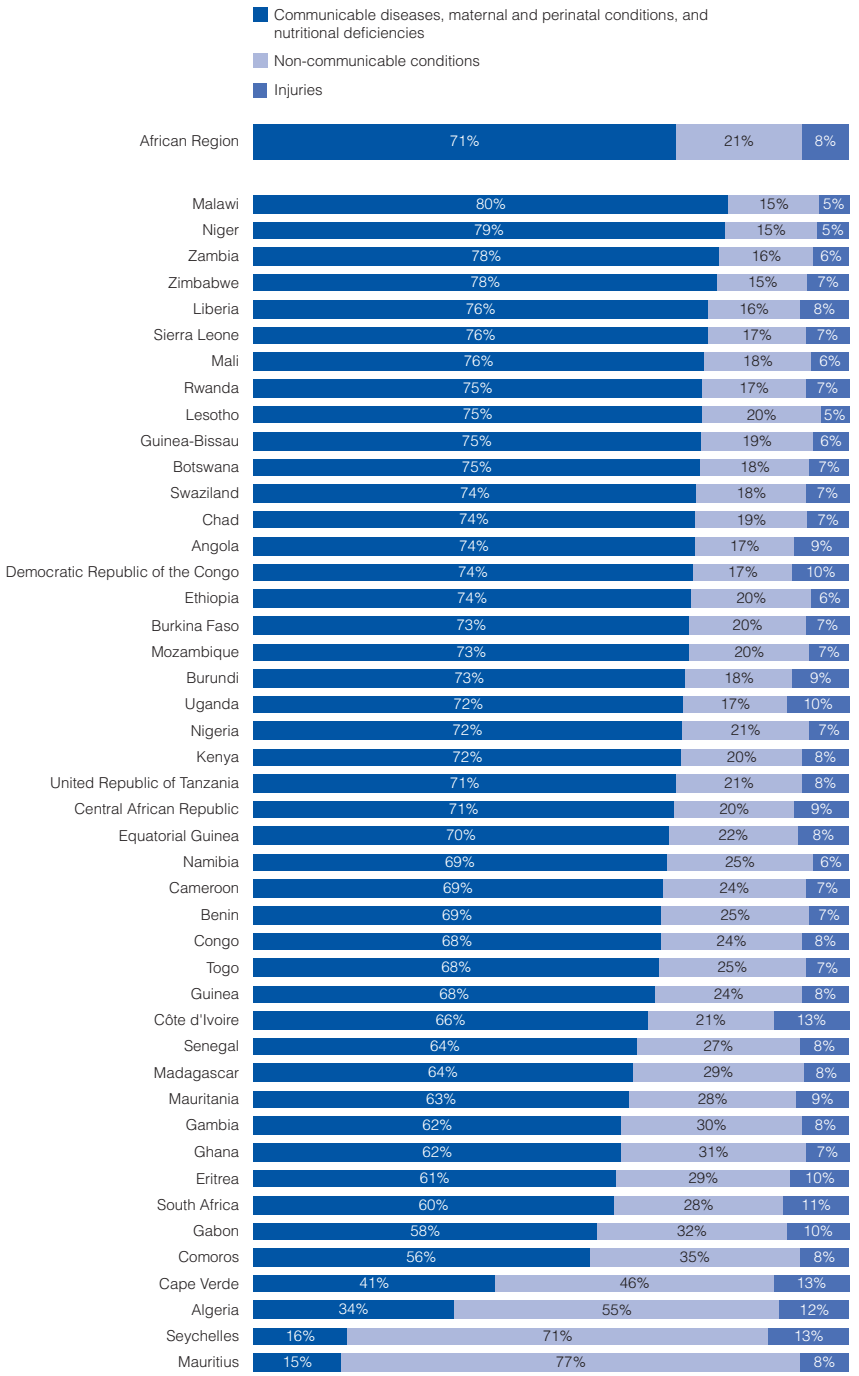


Figure 27: Distribution of burden of diseases as percentage of total DALYs by broader causes in the African Region, by country, 2004

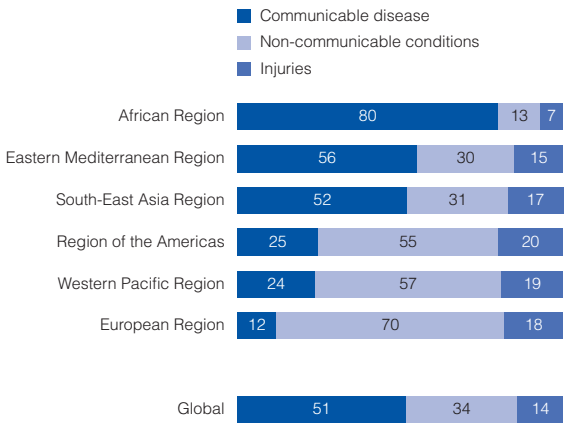


Figure 28: Distribution of years of life lost* by broader causes in WHO Regions, 2004

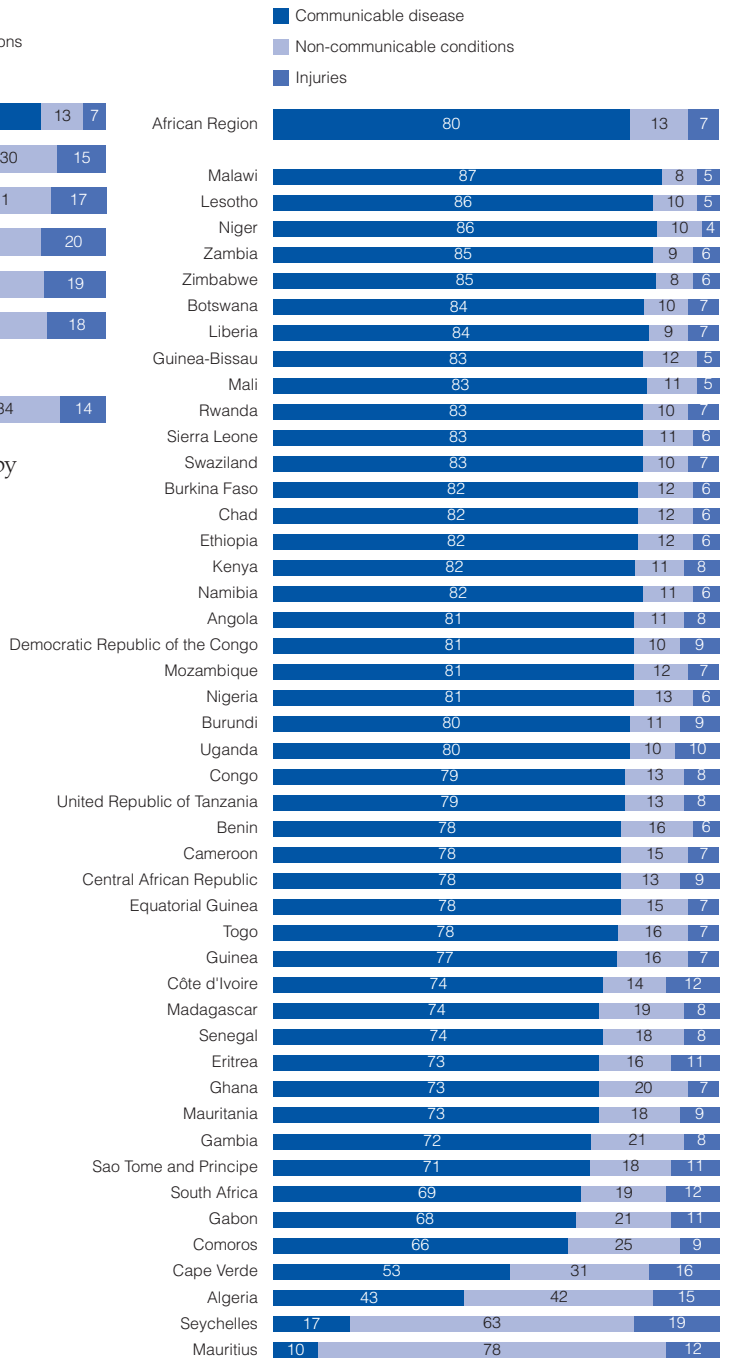


Figure 29: Distribution of years of life lost by broader causes in the African Region, by country, 2004

*Years of life lost (YLL) take into account the age at which deaths occur by assigning greater statistical weight to deaths occurring at younger ages and lower statistical weight to deaths occurring at older ages.

2 The Health System

Health financing

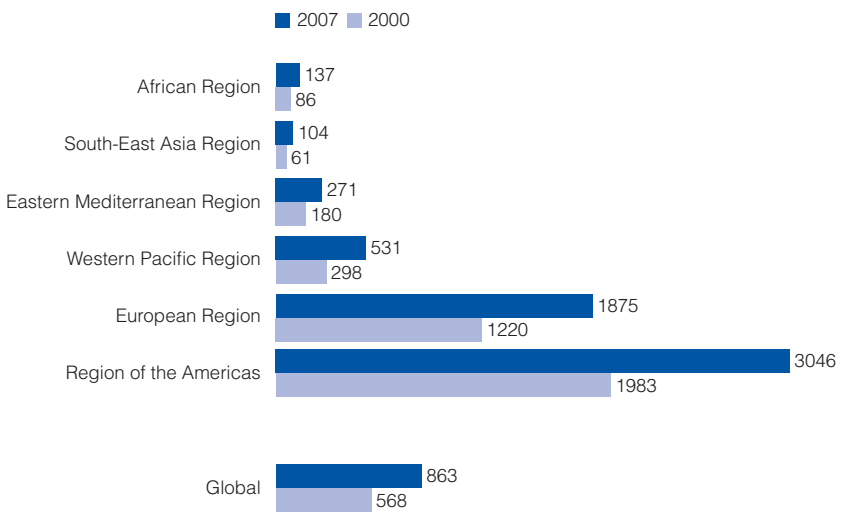


Figure 30: Per capita total expenditure on health (PPP int. $) in WHO Regions, 2007 and 2000

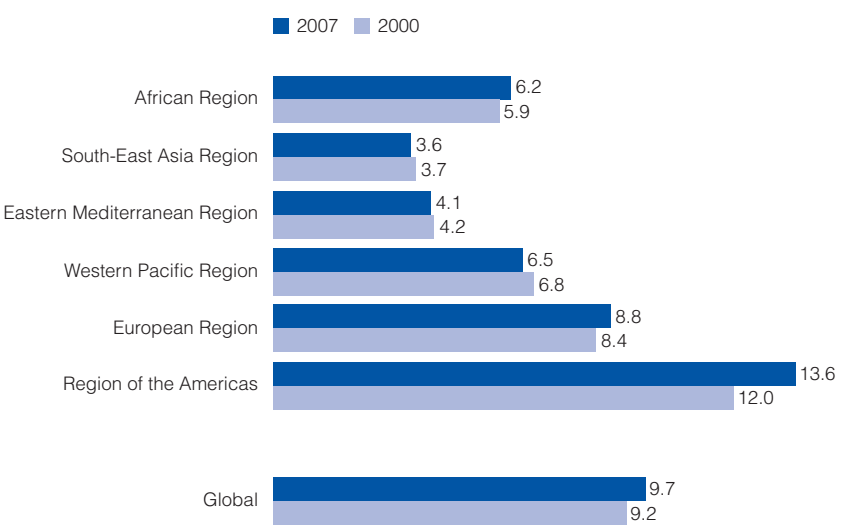


Figure 31: Total expenditure on health as percentage of GDP in WHO Regions, 2007 and 2000

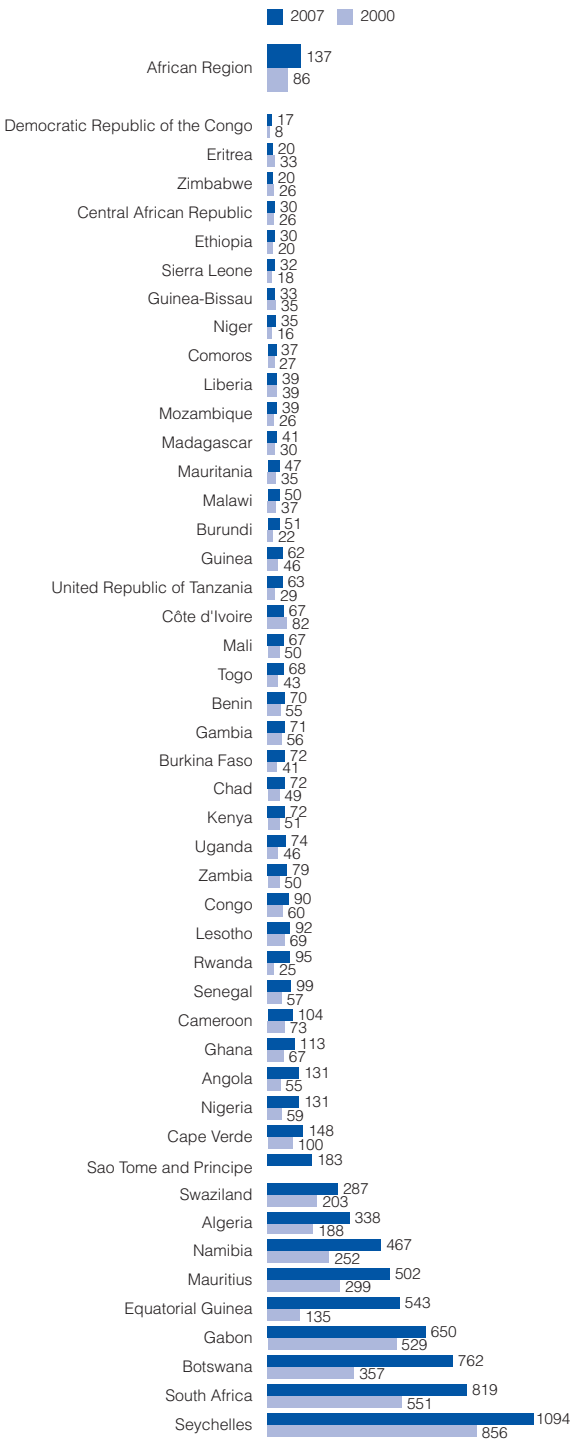


Figure 32: Per capita total expenditure on health (PPP int. $) in the African Region, by country, 2007 and 2000

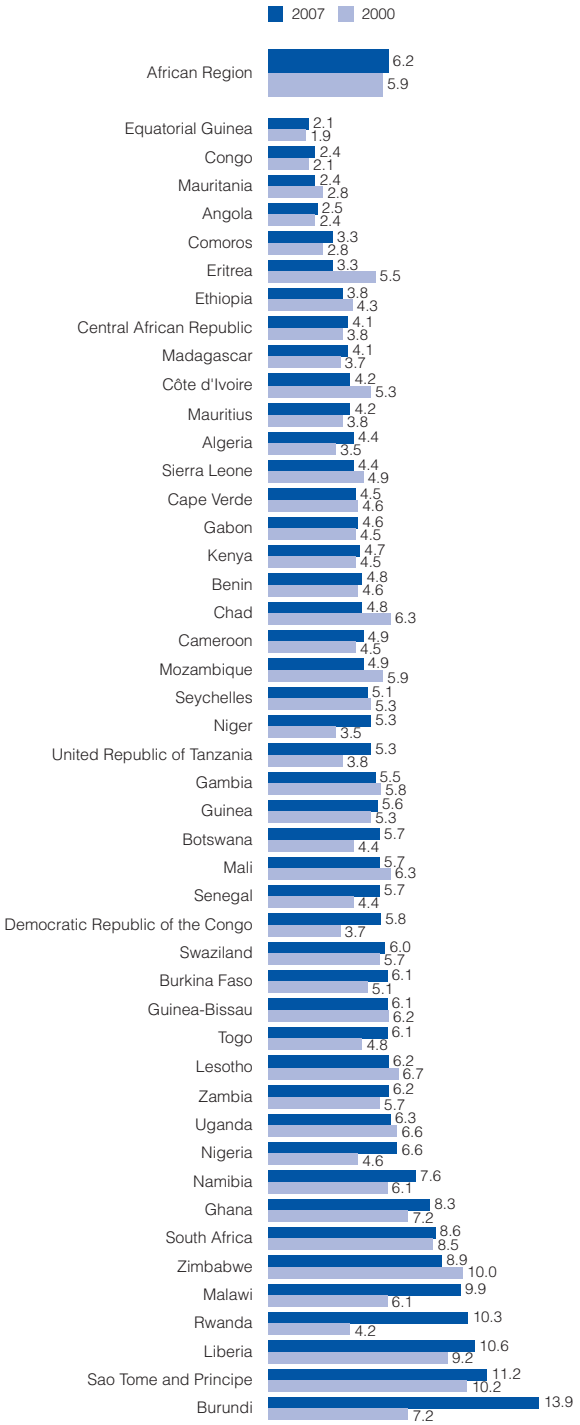


Figure 33: Total expenditure on health as percentage of GDP in the African Region, by country, 2007 and 2000

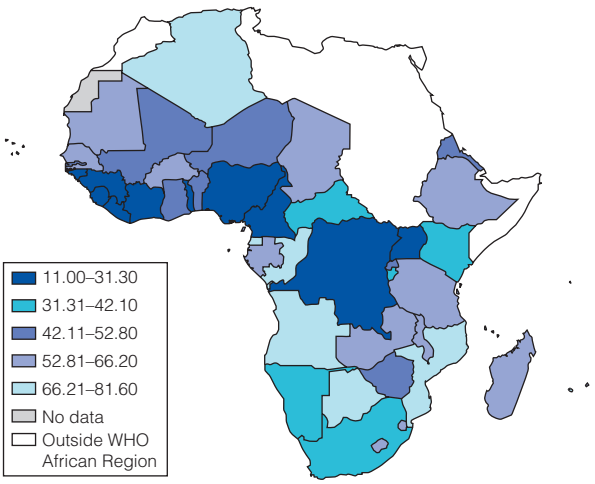


Figure 34: General government expenditure on health as percentage of total expenditure on health in the African Region, 2007

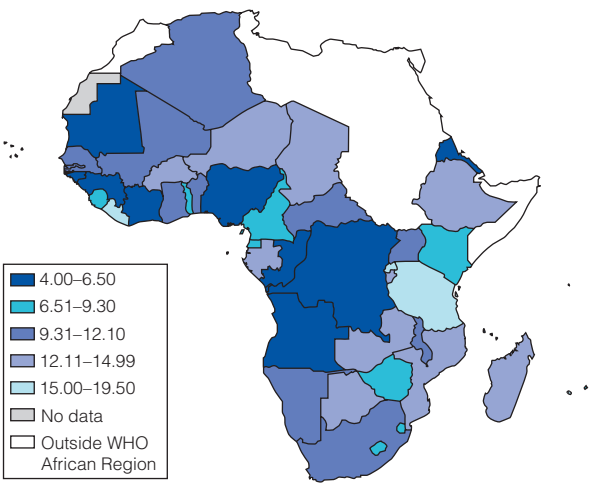


Figure 35: General government expenditure on health as percentage of total government expenditure, 2007

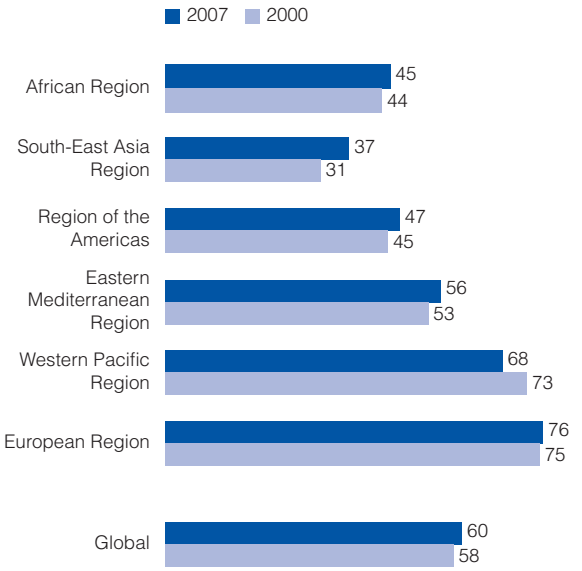


Figure 36 : General government expenditure on health as percentage of total expenditure on health in WHO Regions, 2007 and 2000

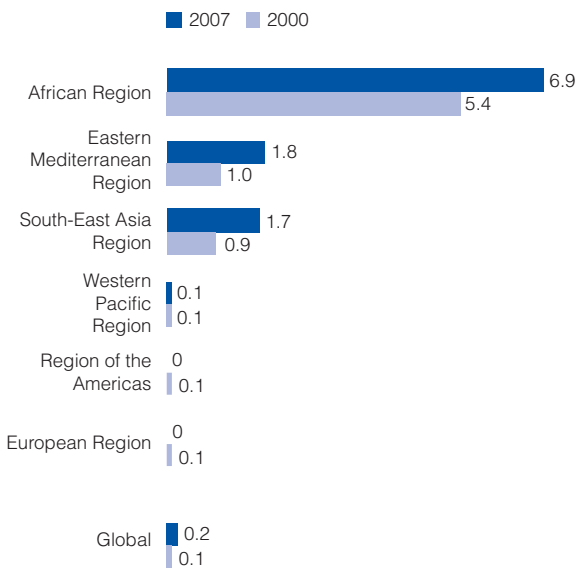


Figure 37: External resources for health as percentage of total expenditure on health in WHO Regions, 2007 and 2000

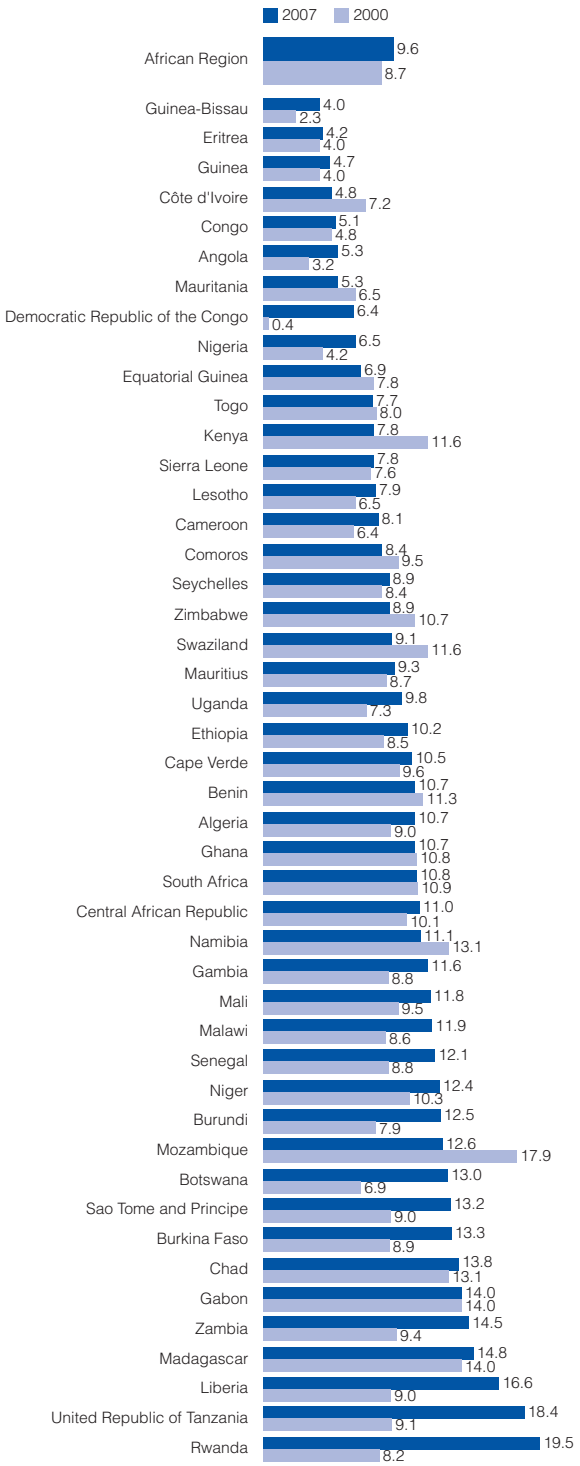


Figure 38: General government expenditure on health as percentage of total government expenditure in the African Region, by country, 2007 and 2000

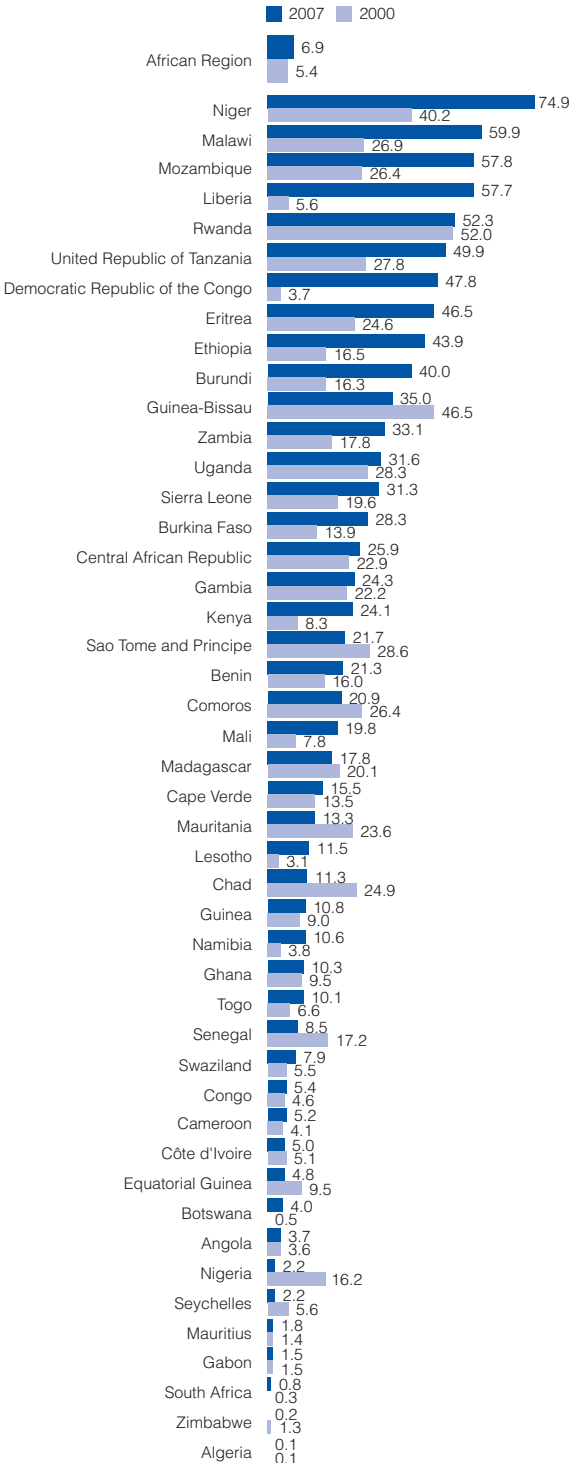


Figure 39: External resources for health as percentage of total expenditure on health in the African Region, by country, 2007 and 2000

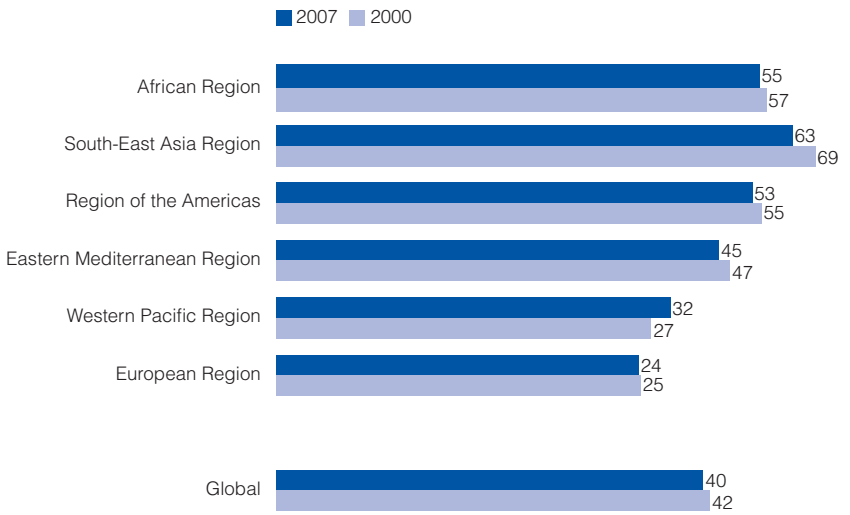


Figure 40: Private expenditure on health as percentage of total expenditure on health in WHO Regions, 2007 and 2000

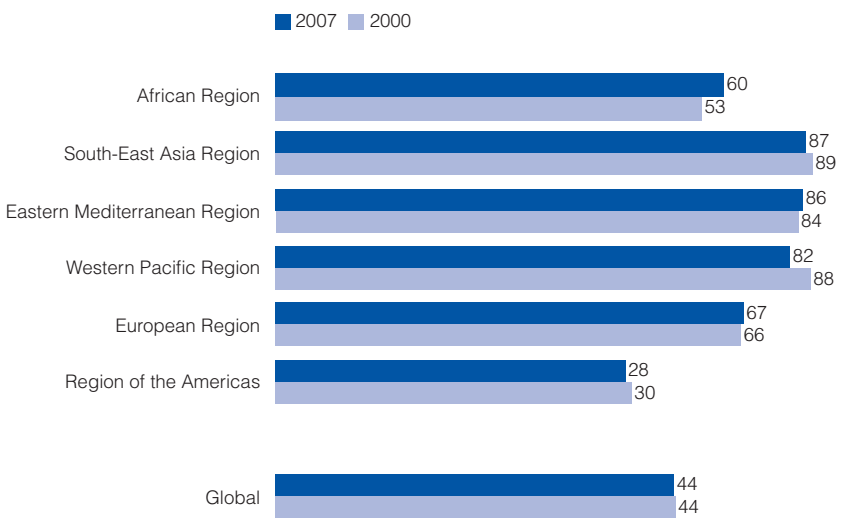


Figure 41: Out-of-pocket expenditure as percentage of private expenditure on health in WHO Regions, 2007 and 2000

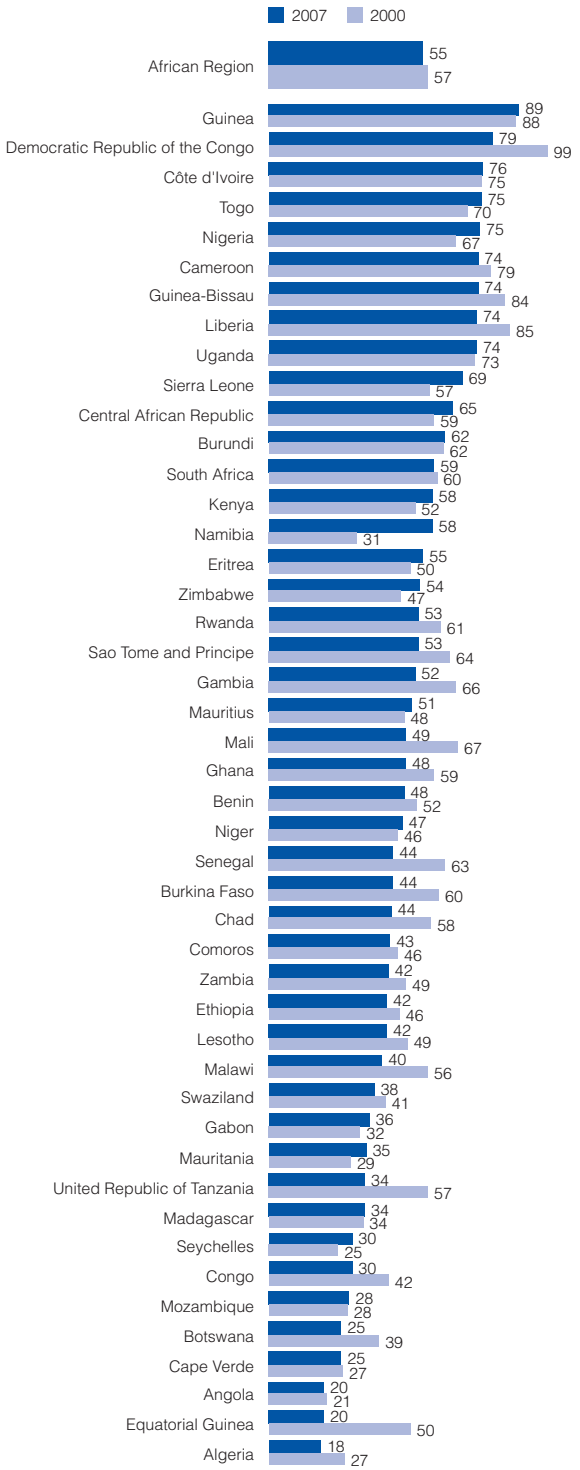


Figure 42: Private expenditure on health as percentage of total expenditure on health in the African Region, by country, 2007 and 2000

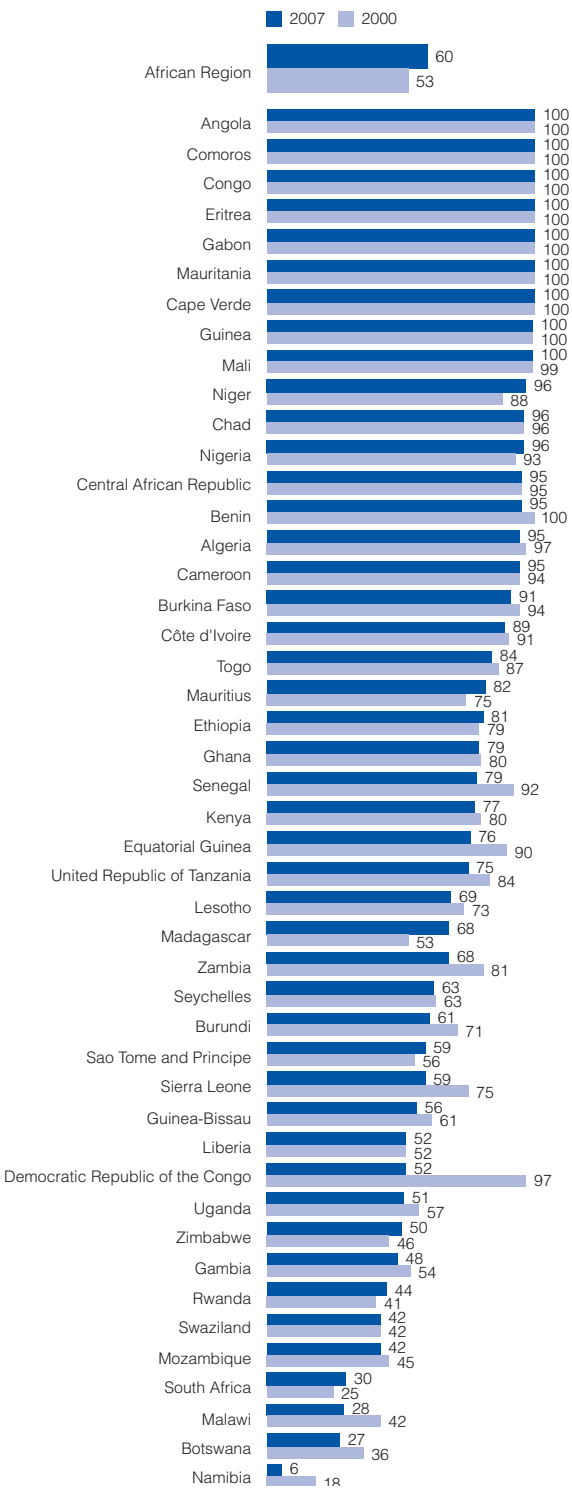


Figure 43: Out-of-pocket expenditure as percentage of private expenditure on health in the African Region, by country, 2007 and 2000

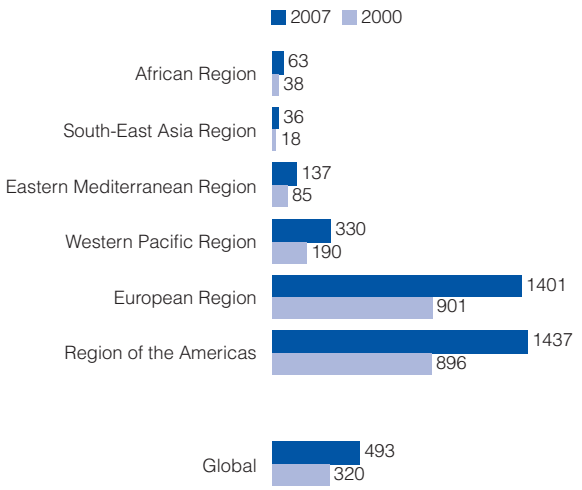


Figure 44: Per capita government expenditure on health (PPP int. $) in WHO Regions, 2007 and 2000

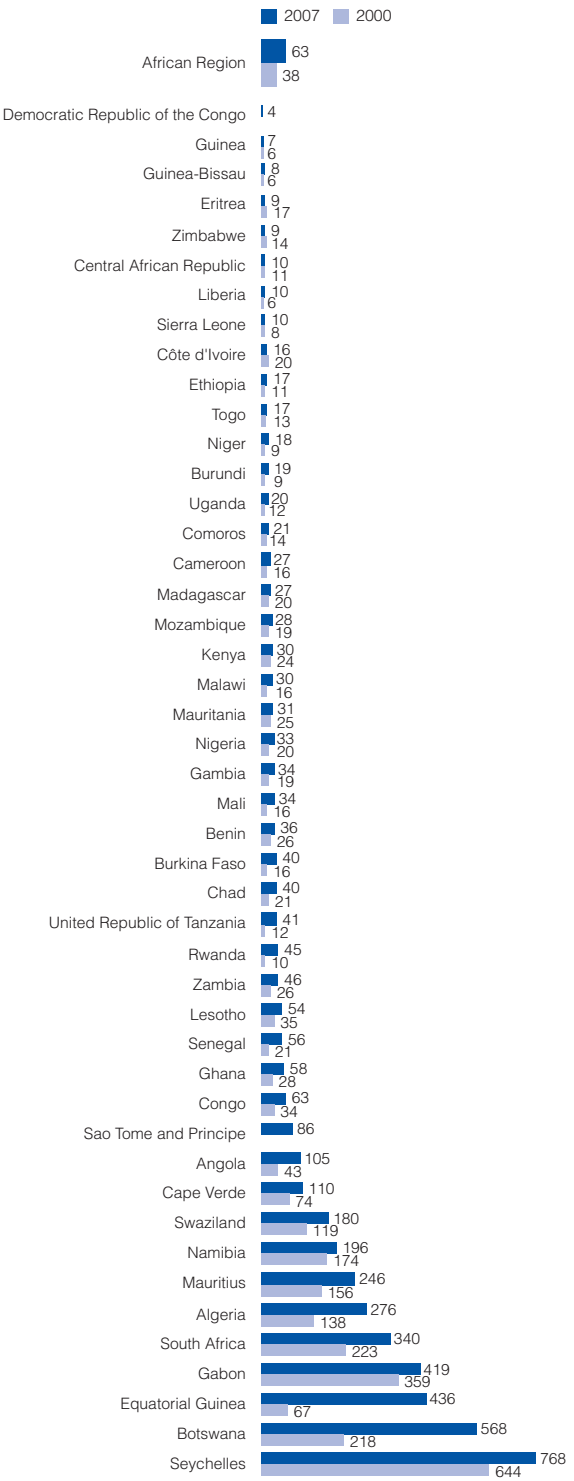


Figure 45: Per capita government expenditure on health (PPP int. $) in the African Region, by country, 2007 and 2000

Health workforce

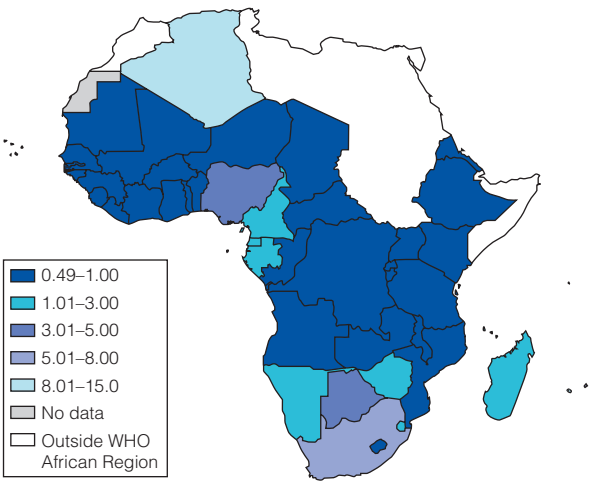


Figure 46: Physician-to-population ratio (per 10 000 population) in the African Region, 2000–2009

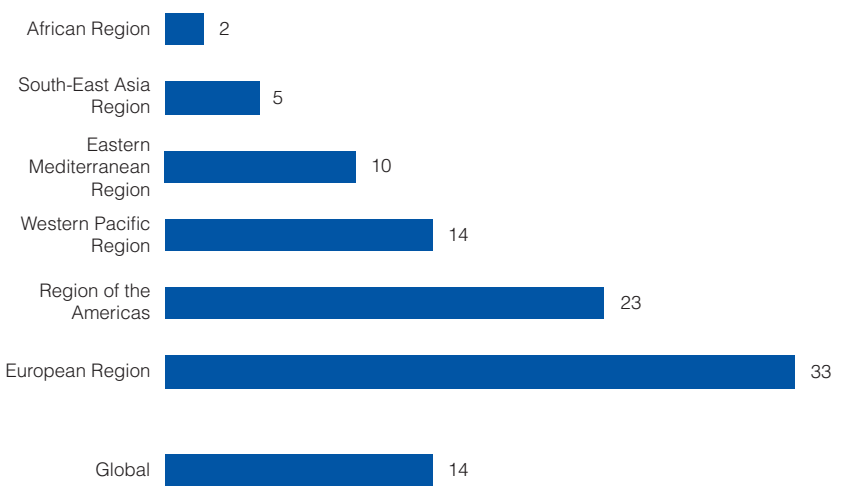


Figure 47: Physician-to-population ratio (per 10 000 population) in WHO Regions, 2000–2009

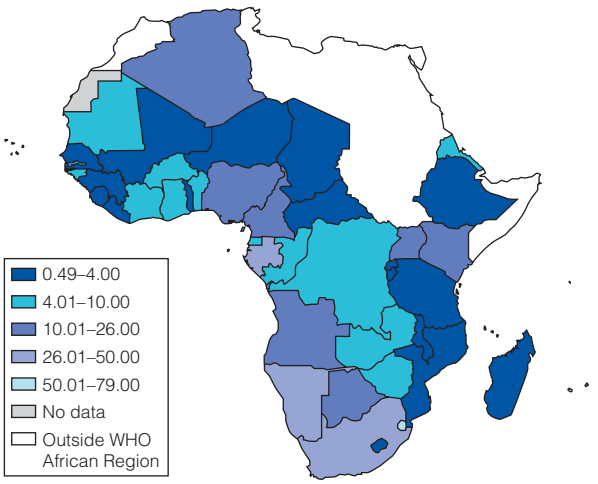


Figure 48: Nursing and midwifery personnel-to-population ratio (per 10 000 population) in the African Region, 2000–2009

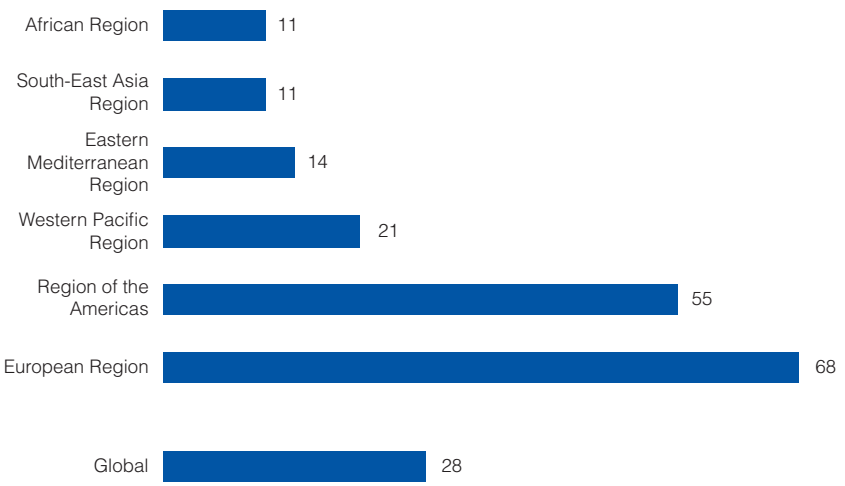


Figure 49: Nursing and midwifery personnel-to-population ratio (per 10 000 population) in WHO Regions, 2000–2009

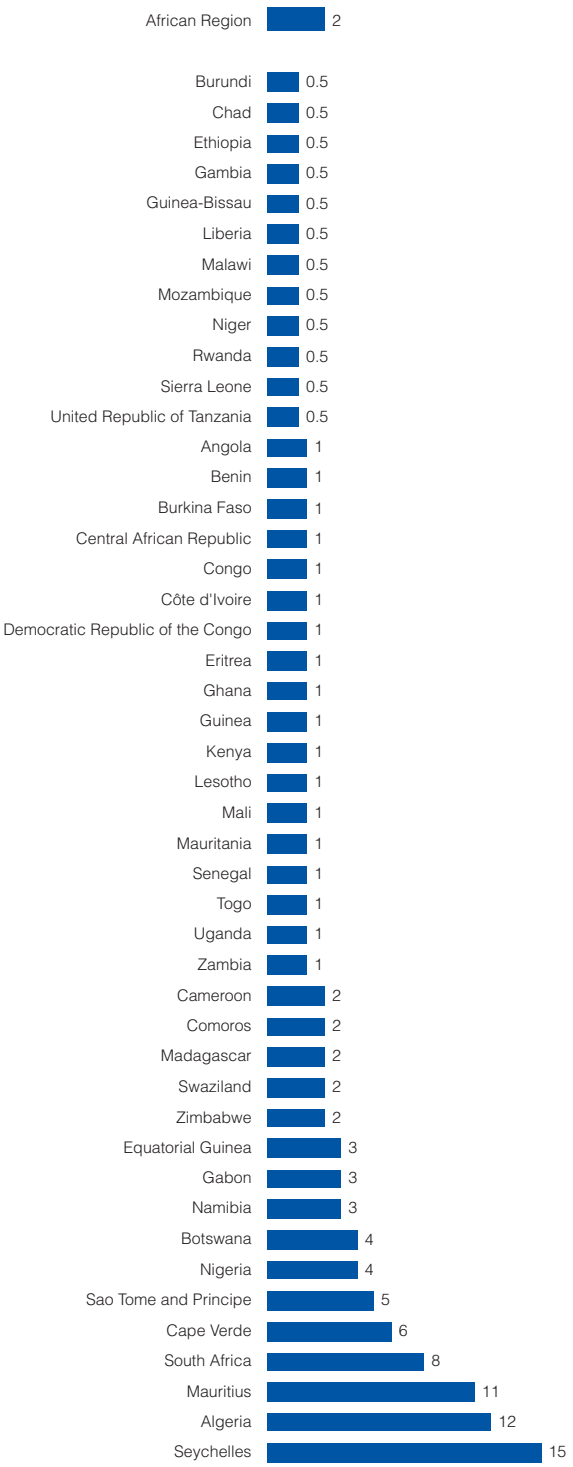


Figure 50: Physician-to-population ratio (per 10 000 population) in the African Region, by country, 2000–2009

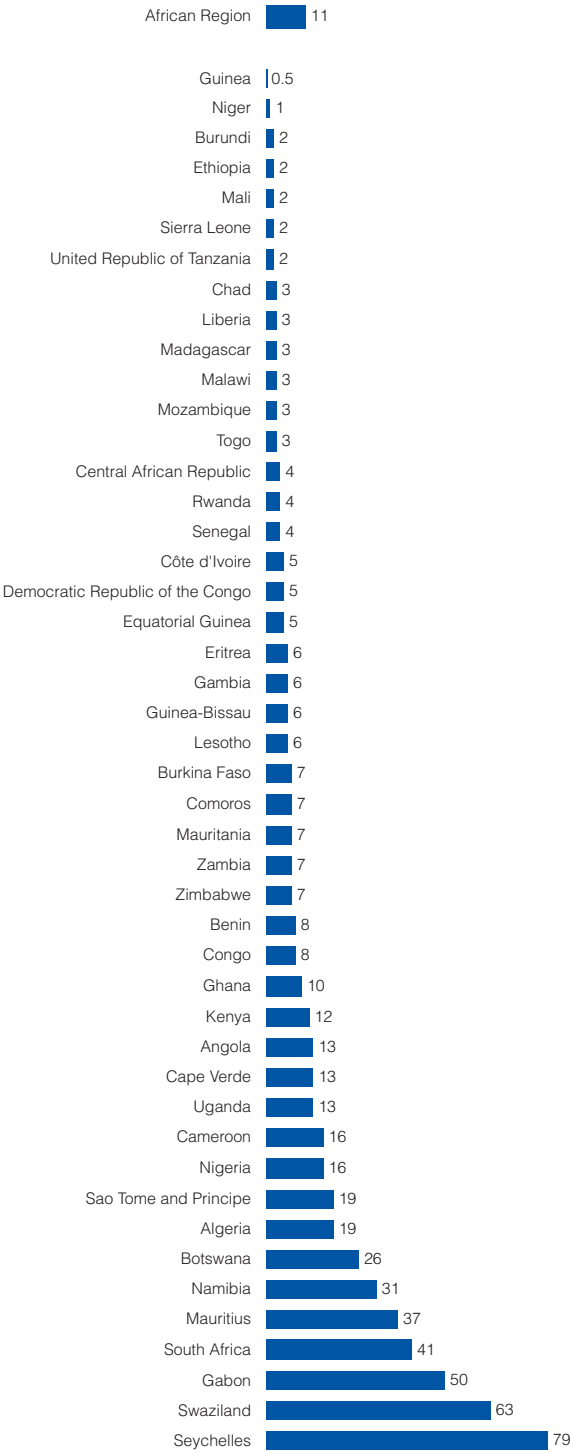


Figure 51: Nursing and midwifery personnel-to-population ratio (per 10 000 population) in the African Region, by country, 2000–2009

Medical products and equipment

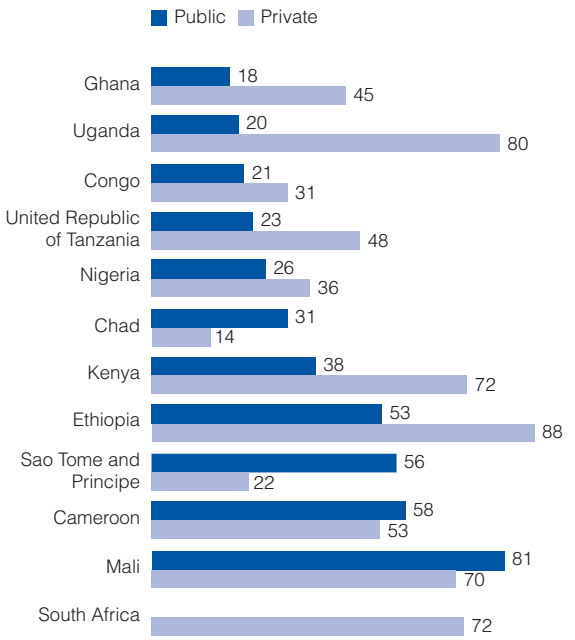


Figure 52: Median percentage availability of selected generic medicines in a sample of health facilities in the African Region, countries with data in 2001–2008

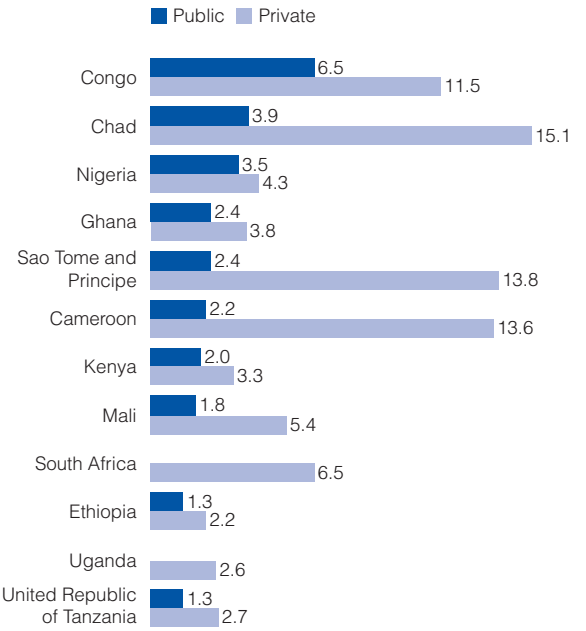


Figure 53: Median consumer price ratio of selected generic medicines (ratio of median local unit price to management sciences for health international reference price), countries with data, 2001–2008

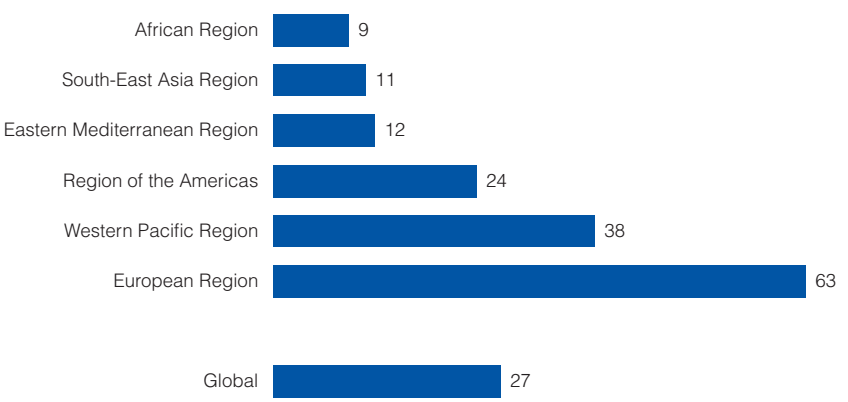


Figure 54: Hospital beds per 10 000 population in WHO Regions, 2000–2009

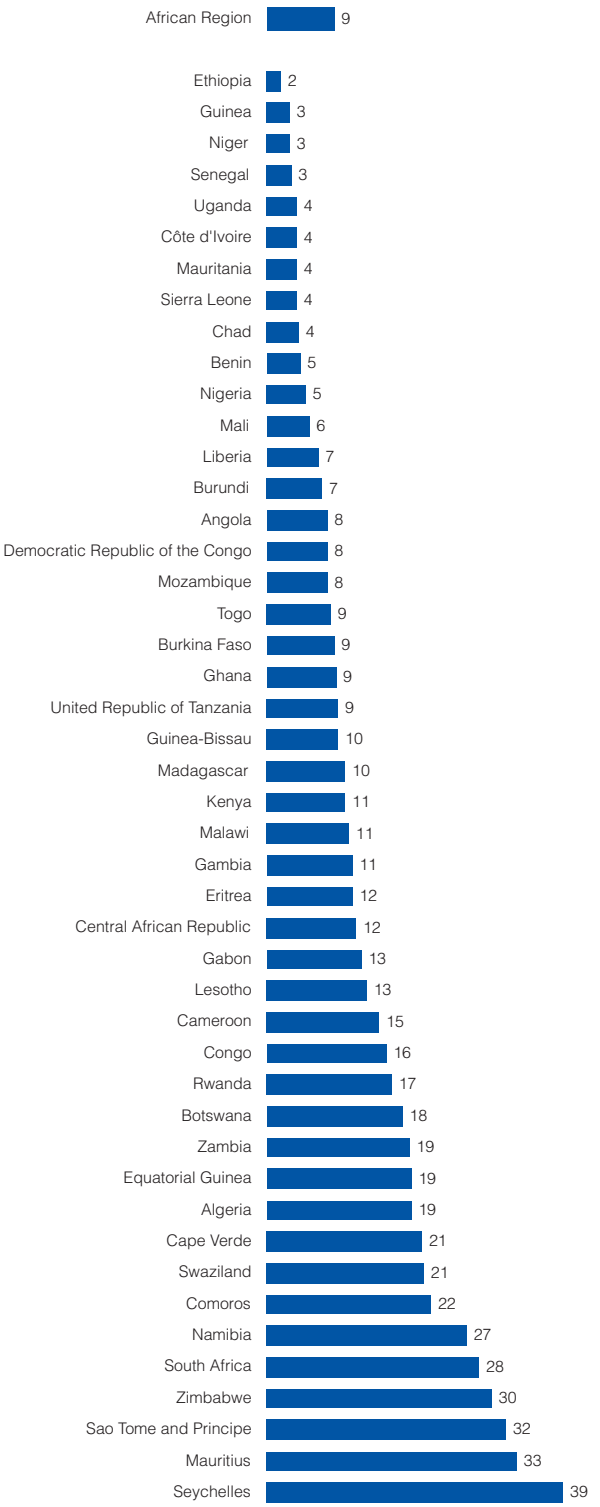


Figure 55: Hospital beds per 10 000 population in the African Region, by country, 2000–2009

Health information – Civil registration coverage

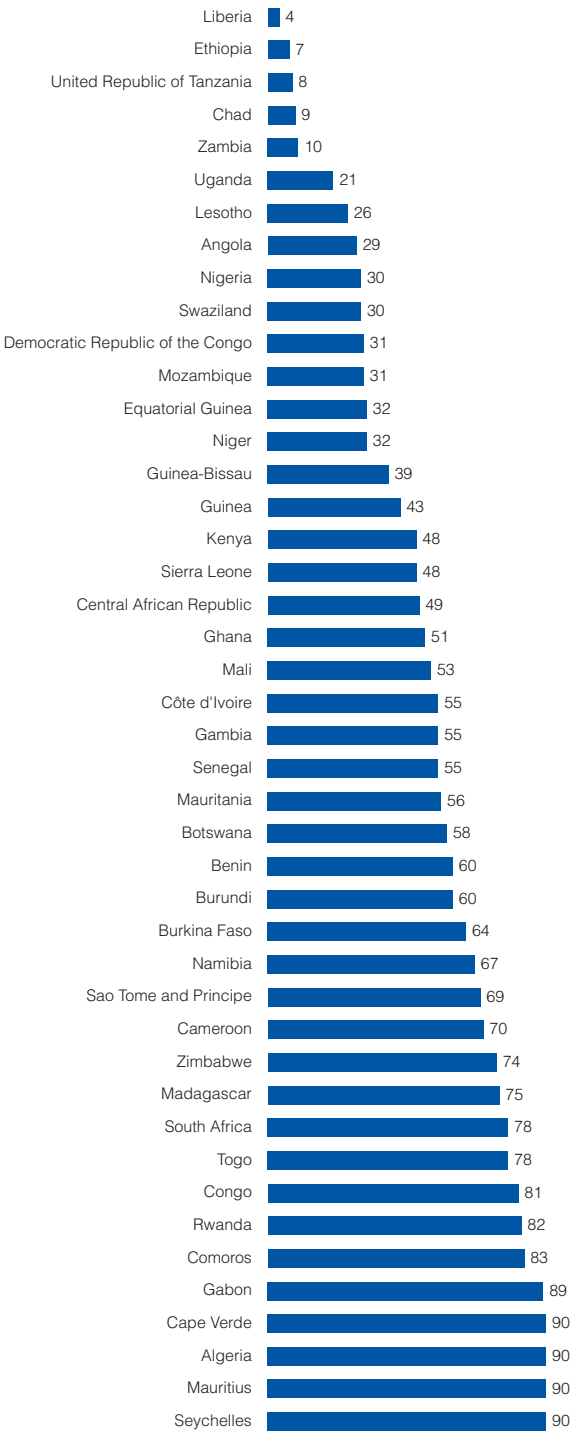


Figure 56: Percentage of civil registration coverage for births in the African Region, by country, 2000–2008

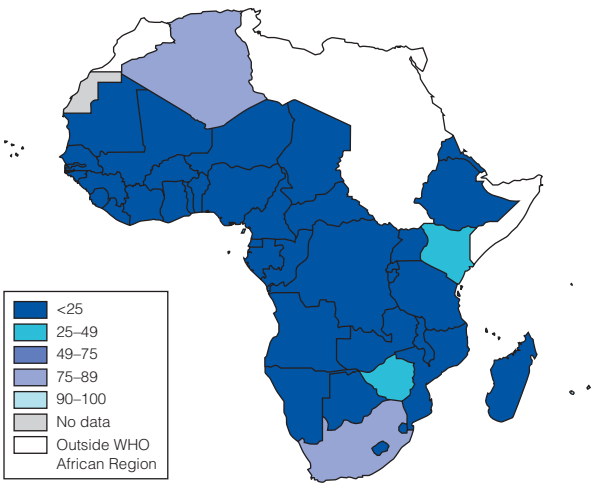


Figure 57: Percentage of civil registration coverage for deaths in the African Region, 2000–2008

Health research

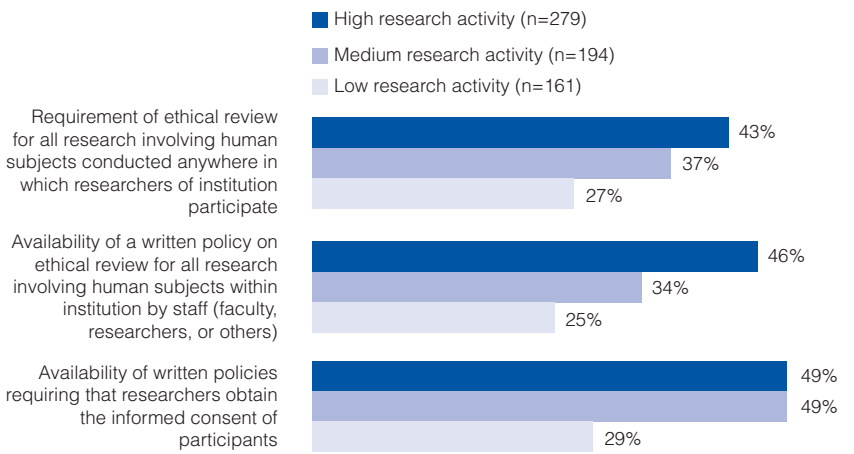


Figure 58: Institutional level policies on research

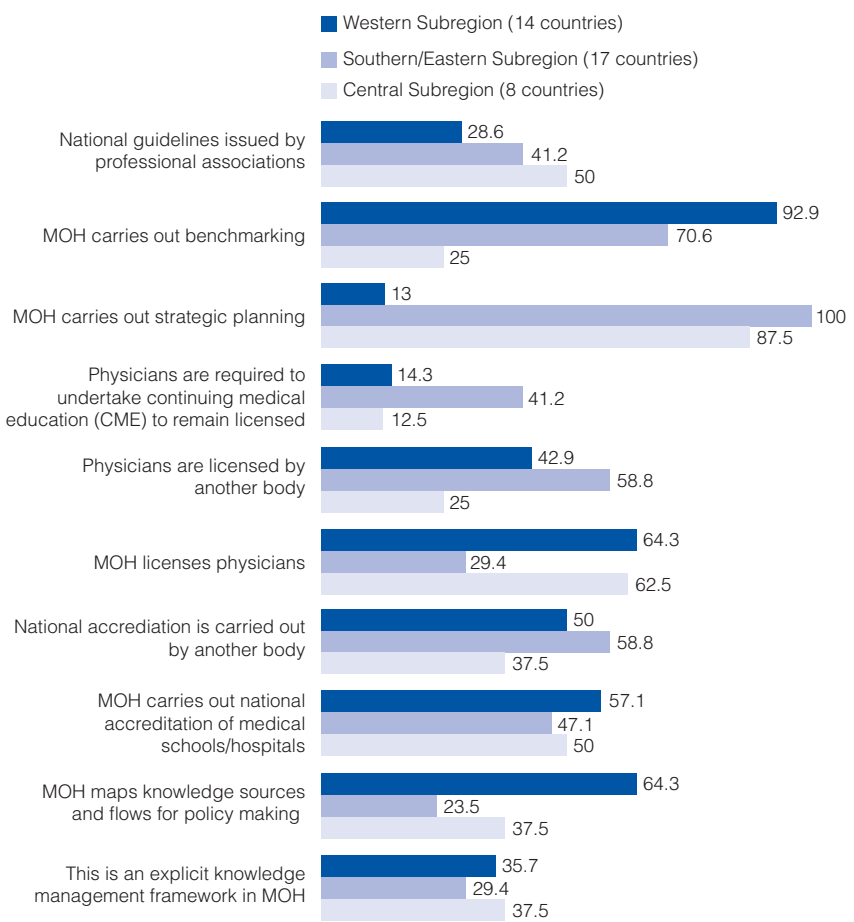


Figure 59: Roles of Ministry of Health (MOH) and other central policy setting and implementing bodies in the African Region as percentage, 2007

3 Specific Programmes and Services

HIV/AIDS

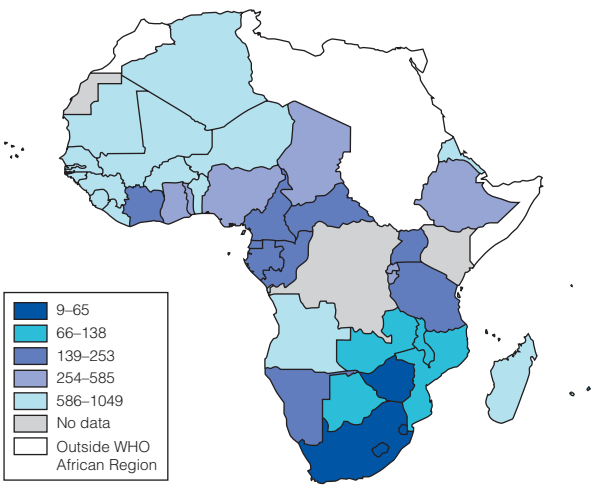


Figure 60: HIV/AIDS mortality rate (per 100 000 population) in the African Region, 2007

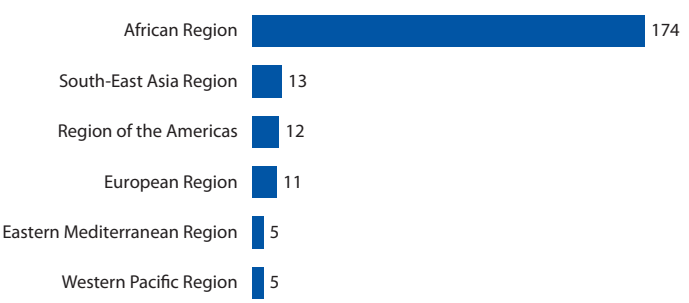


Figure 61: HIV/AIDS mortality rate (per 100 000 population) in WHO Regions, 2007

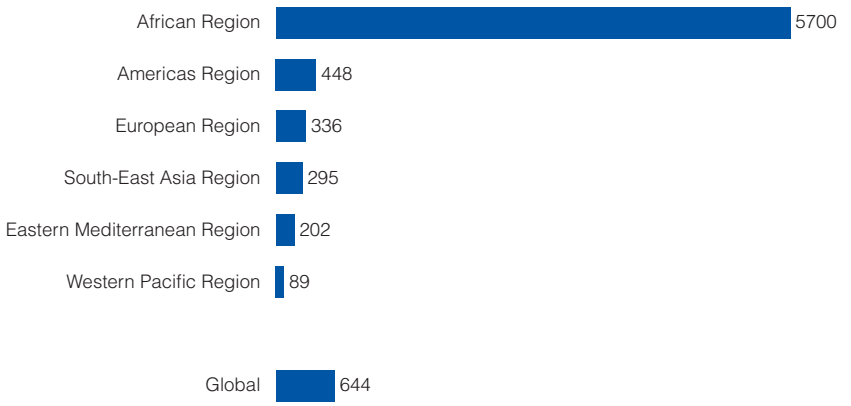


Figure 62: Prevalence of HIV (per 100 000 population) among people aged 15 years or more in WHO Regions, 2007

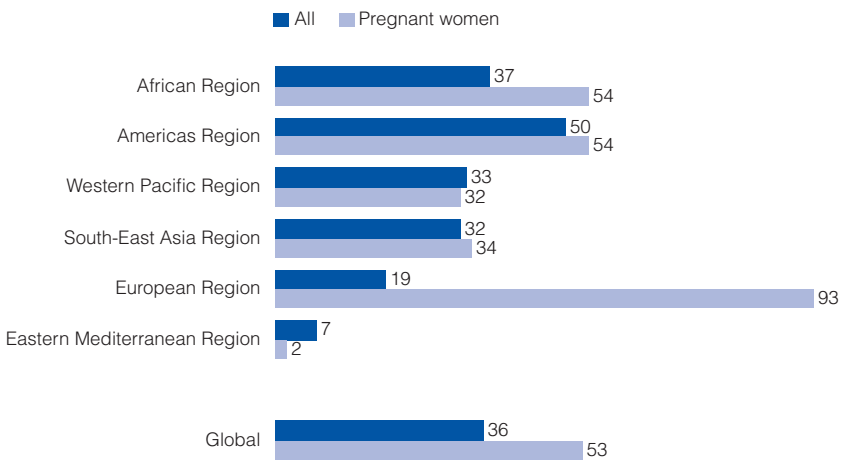


Figure 63: Percentage of antiretroviral therapy among people with HIV/AIDS in need of treatment in WHO Regions, 2009*

*Source: WHO/UNAIDS/UNICEF. *Towards Universal Access: Scaling up Priority HIV/AIDS Interventions in the Health Sector – Progress Report 2010.*

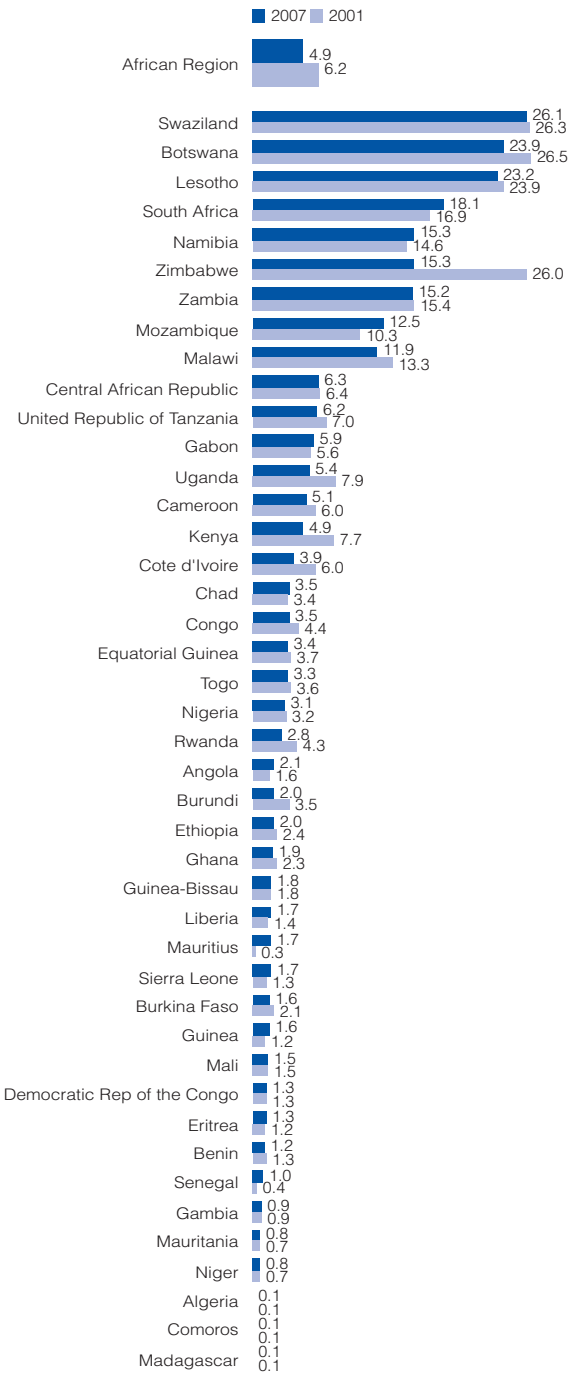


Figure 64: Percentage of people 15–49 years of age living with HIV in the African Region, by country, 2007 and 2001

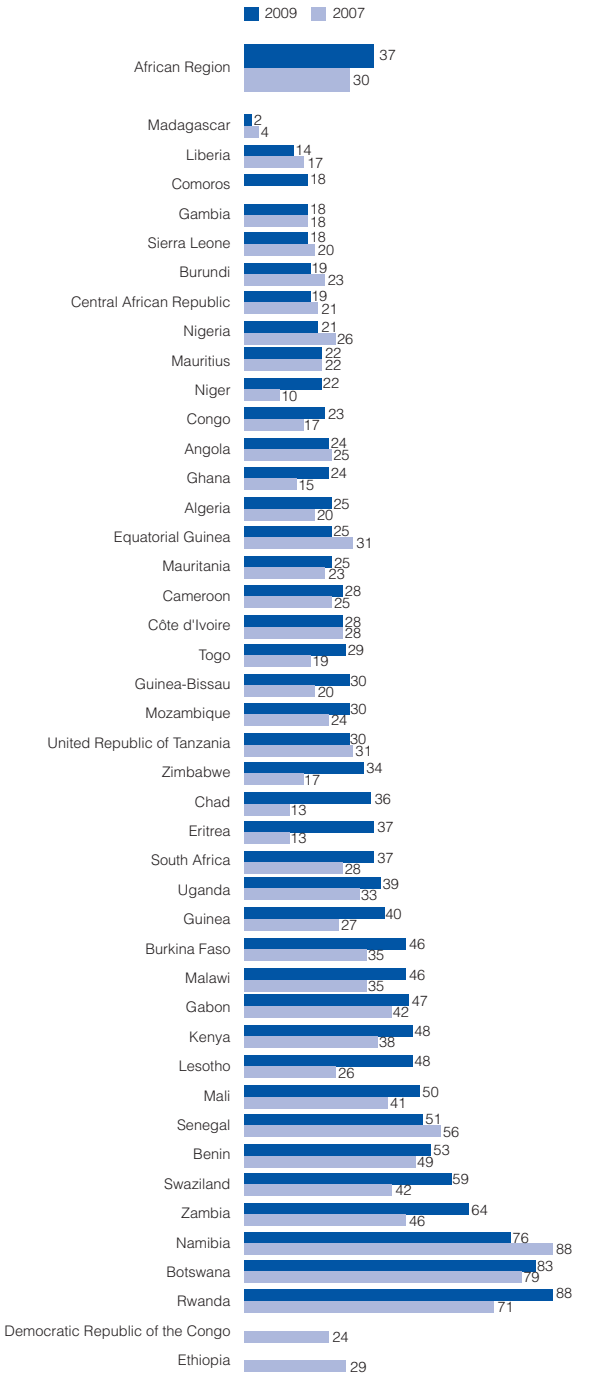


Figure 65: Percentage of people receiving antiretroviral therapy in the African Region, by country, 2009 and 2007*

*Source: WHO/UNAIDS/UNICEF. *Towards Universal Access: Scaling up Priority HIV/AIDS Interventions in the Health Sector – Progress Report 2010*.

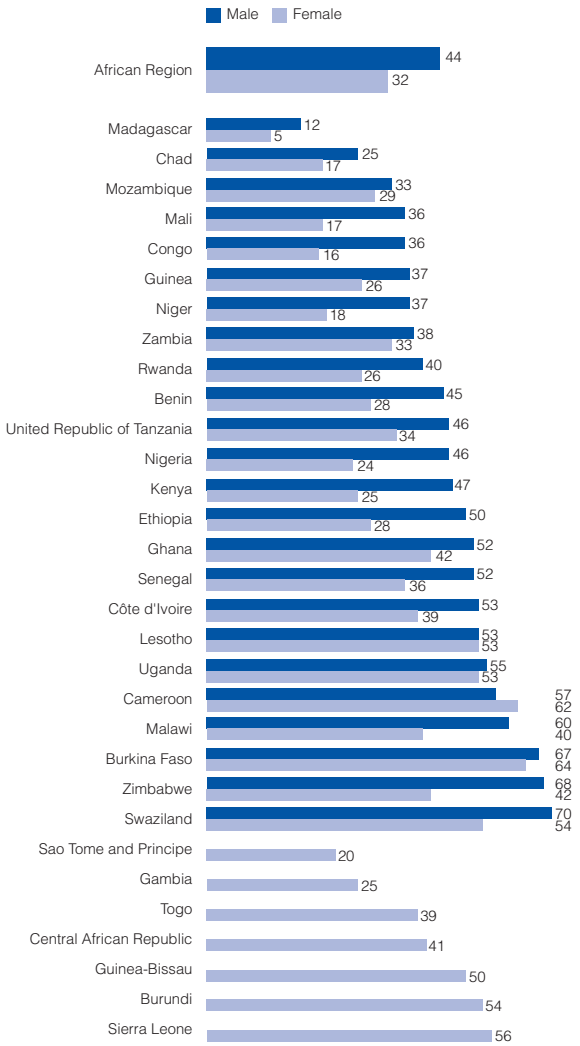


Figure 66: Percentage of men and women aged 15–24 years who used a condom at last high-risk sex, African Region, 2002–2006*

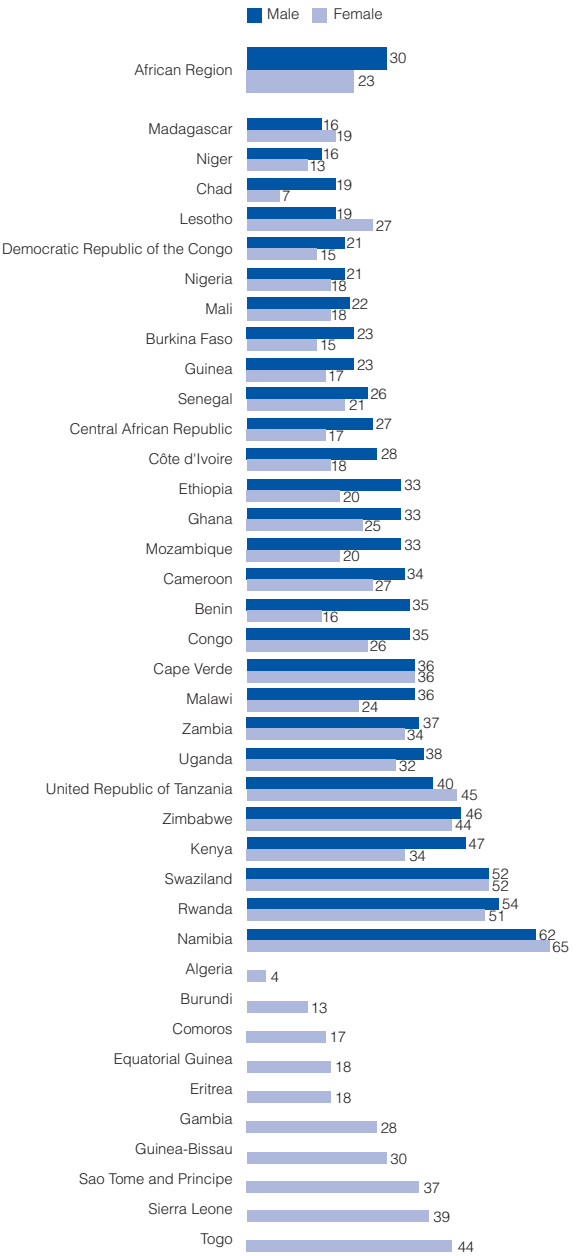


Figure 67: Population aged 15–24 years with comprehensive correct knowledge of HIV/AIDS

*Source: United Nations Statistical Division, MDG Database, June 2010.

Tuberculosis

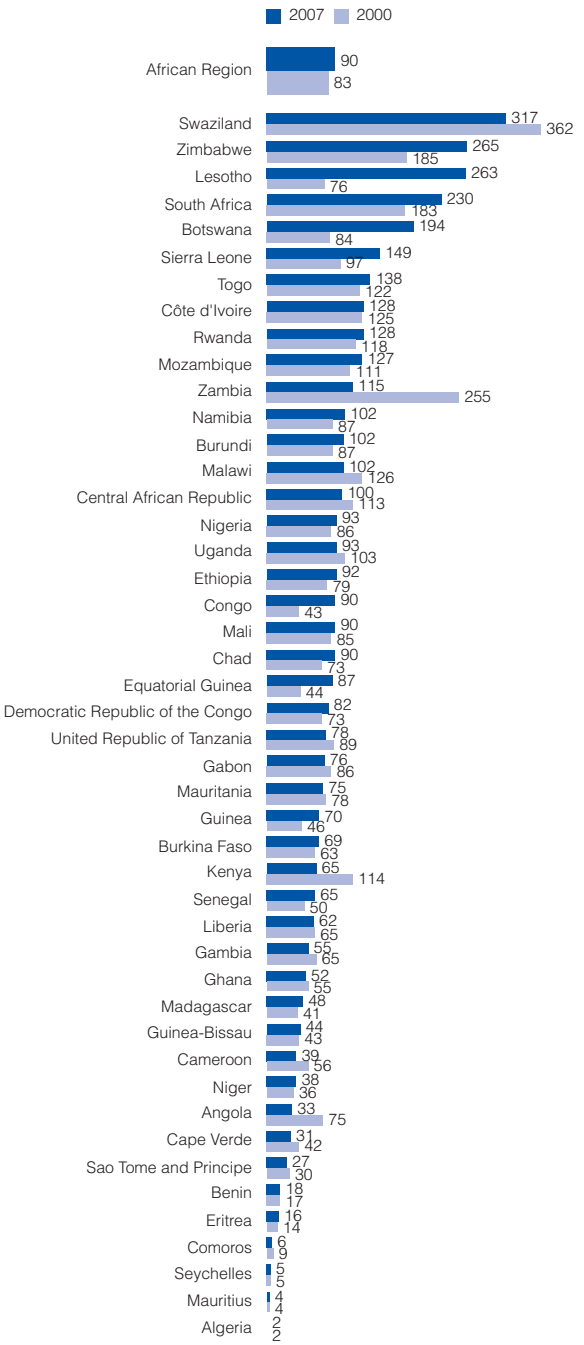


Figure 68: Tuberculosis death rate per 100 000 population per year in the African Region, by country, 2007 and 2000*

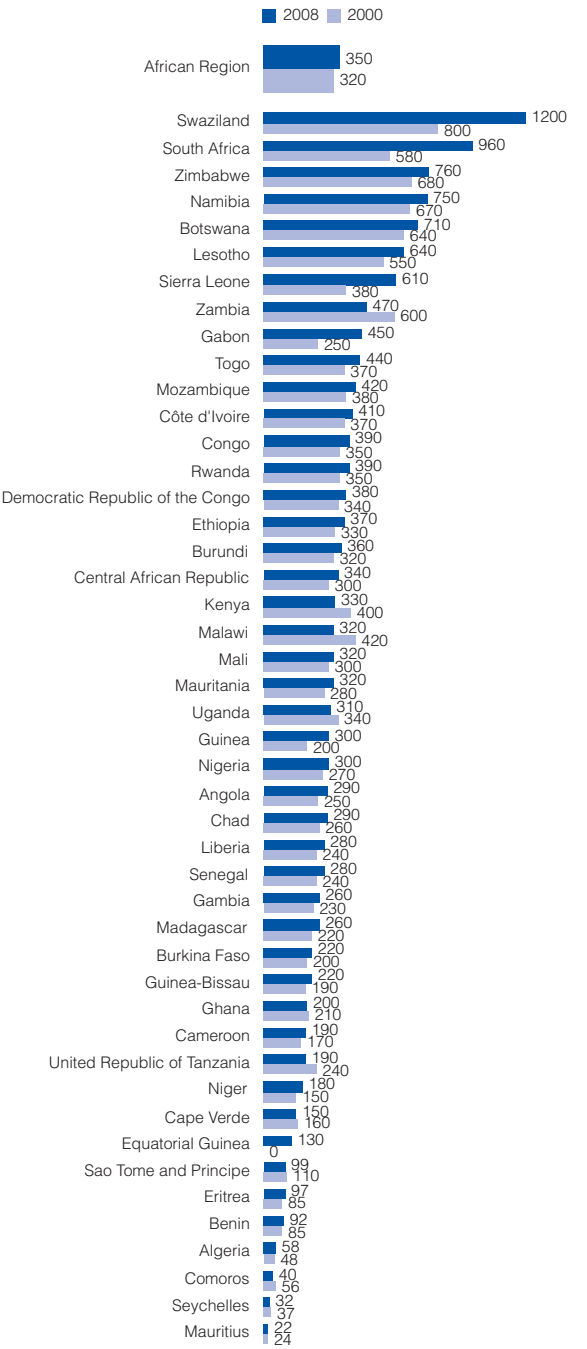


Figure 69: Tuberculosis incidence rate per 100 000 population per year in the African Region, by country, 2008 and 2000*

*Source: United Nations Statistical Division, MDG Database, June 2010.

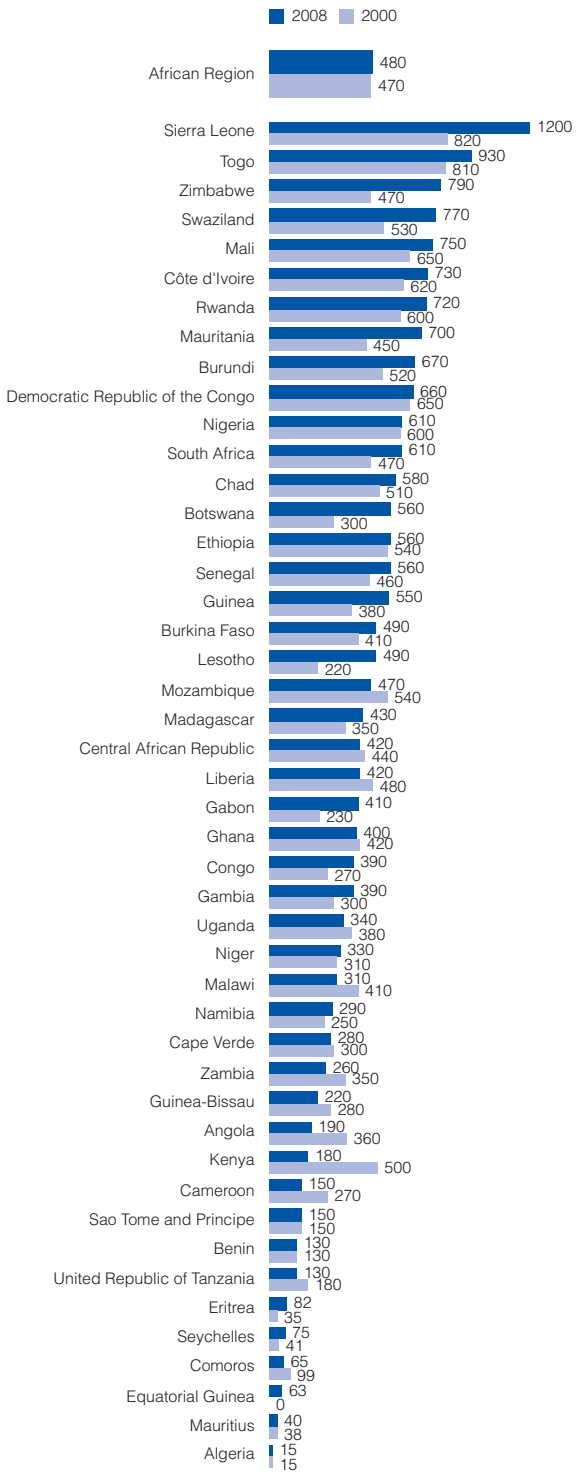


Figure 70: Tuberculosis prevalence per 100 000 population per year in the African Region, by country, 2008 and 2000

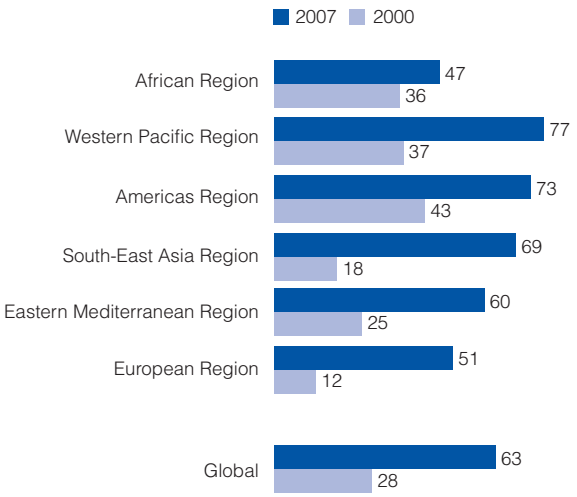


Figure 71: Percentage of tuberculosis detection rate under DOTS in WHO Regions, 2007 and 2000

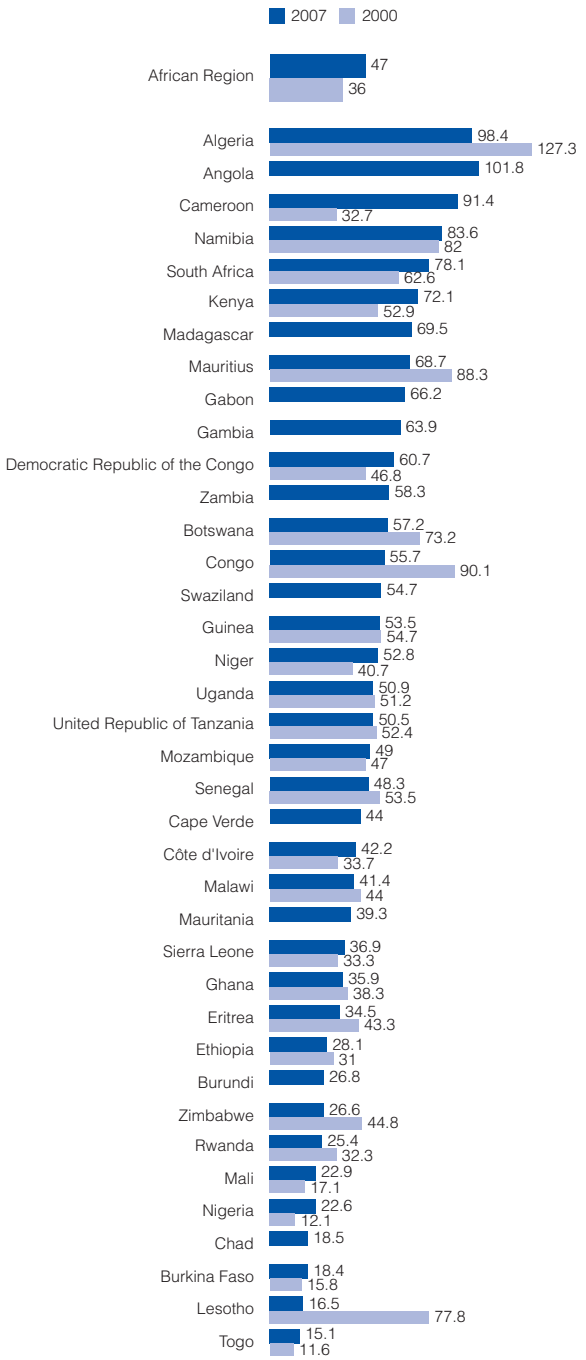


Figure 72: Percentage of tuberculosis detection under DOTS in the African Region, by country, 2007 and 2000*

Malaria

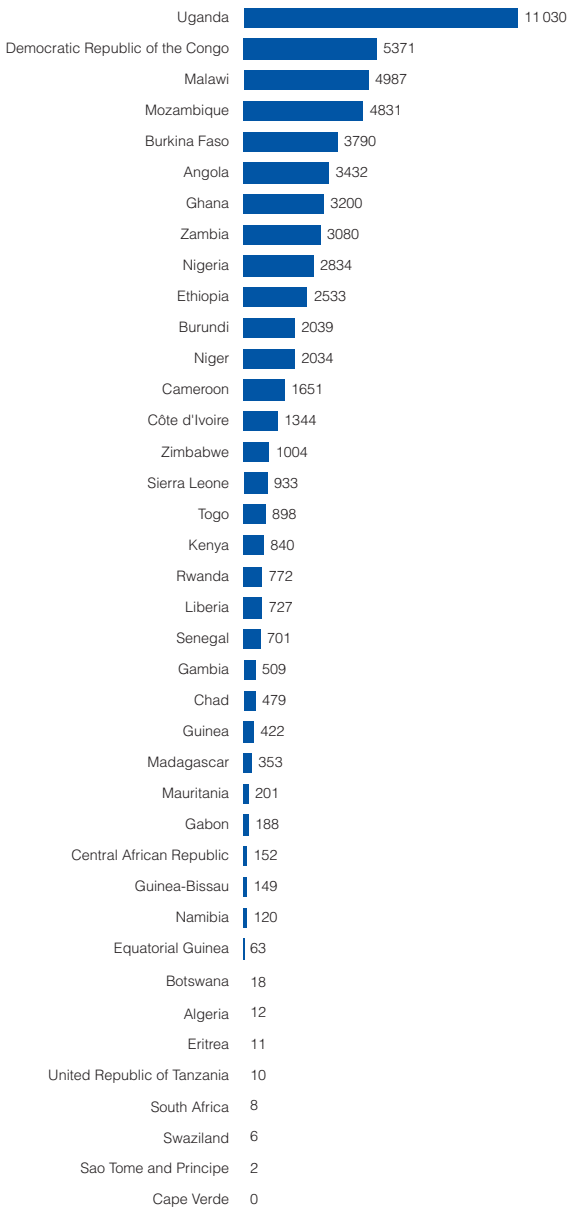


Figure 73: Notified cases of malaria, in thousands, in the African Region, by country, 2008

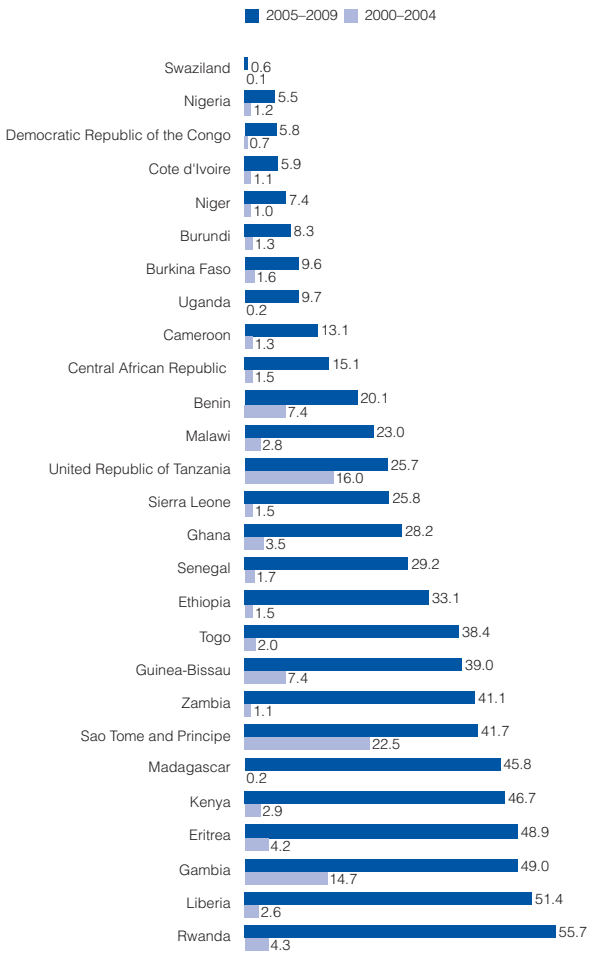


Figure 74: Percentage of children under 5 years of age sleeping under insecticide-treated bed nets in the African Region, by country, 2005–2009 and 2000–2004*

*Source: *World Malaria Report 2009*. Geneva: WHO, 2009.

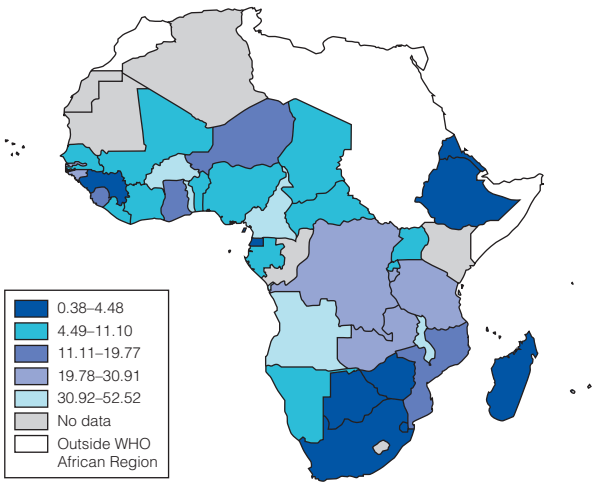


Figure 75: Malaria mortality rate per 100 000 population in the African Region, 2008

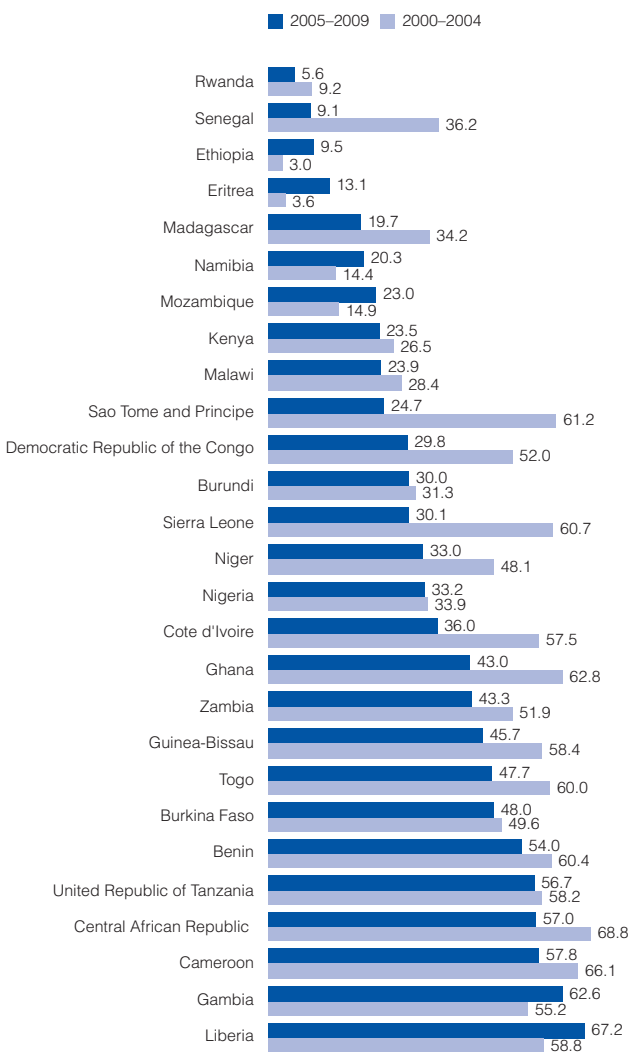


Figure 76: Proportion of children under 5 years of age with fever being treated with antimalarial drugs in the African Region, by country, 2005–2009 and 2000–2004

Vaccine-preventable diseases

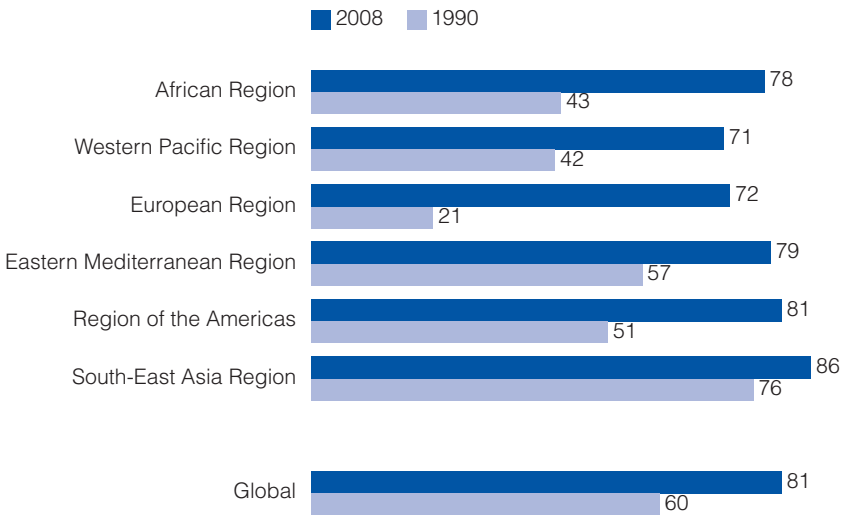


Figure 77: Percentage of neonates protected at birth against neonatal tetanus in WHO Regions, 2008 and 1990

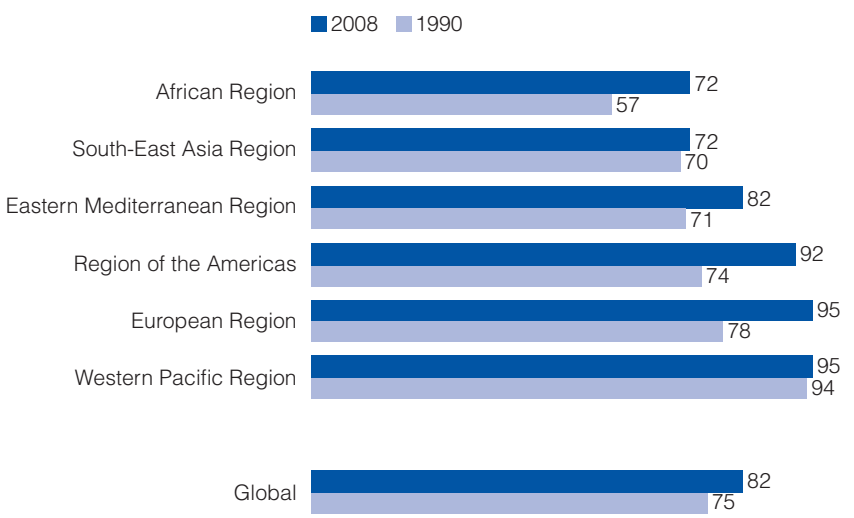


Figure 78: Percentage immunization coverage among 1-year-olds for DTP3 in WHO Regions, 2008 and 1990

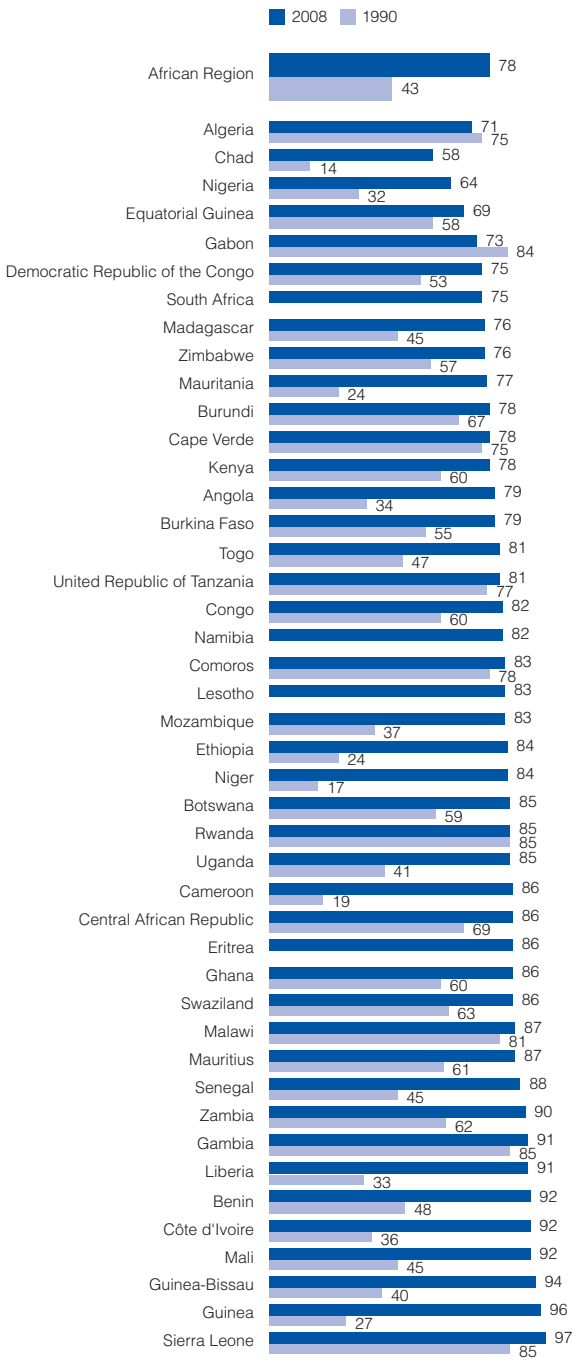


Figure 79: Percentage of neonates protected at birth against neonatal tetanus in the African Region, by country, 2008 and 1990

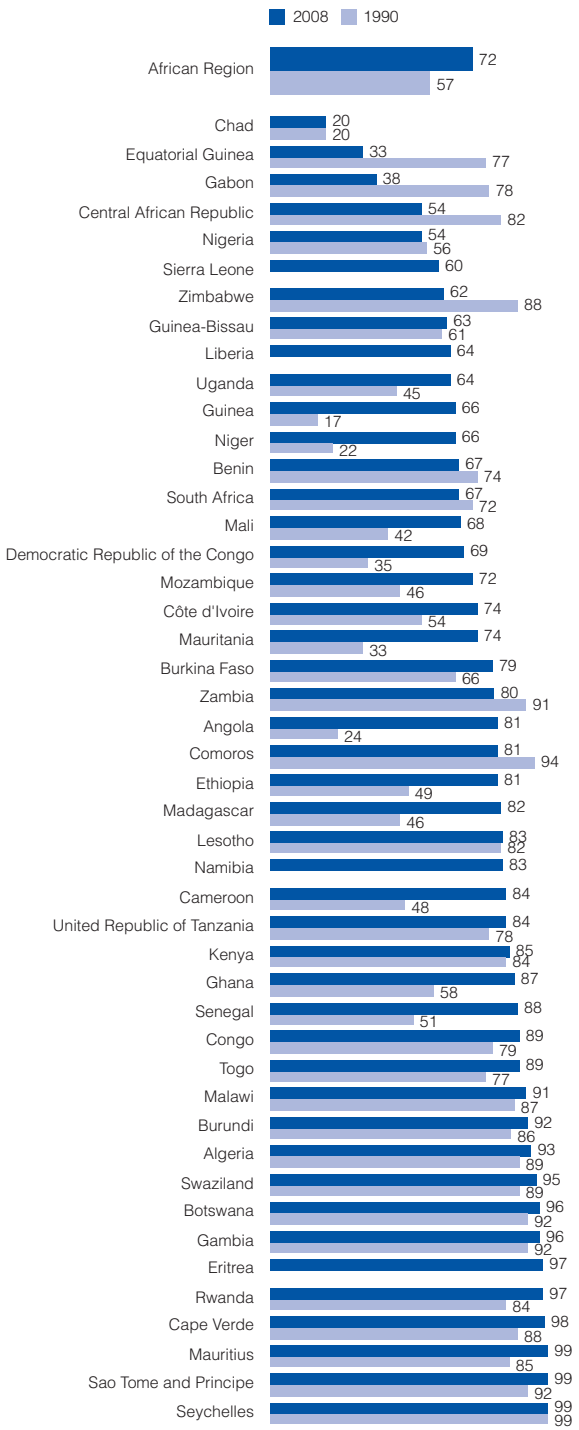


Figure 80: Percentage immunization coverage among 1-year-olds for DTP3 in the African Region, by country, 2008 and 1990

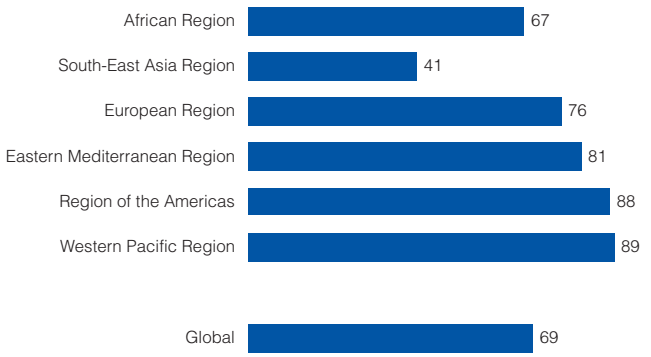


Figure 81: Immunization coverage among 1-year-olds for HepB3 in WHO Regions, 2008

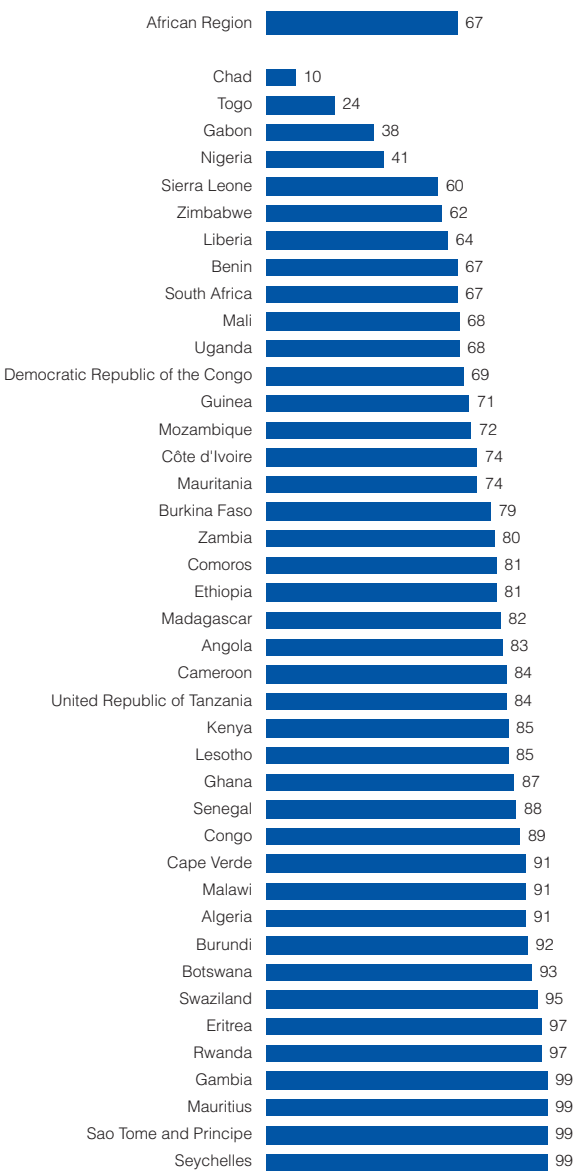


Figure 82: Immunization coverage among 1-year-olds for HepB3 in the African Region, by country, 2008

Child and adolescent health

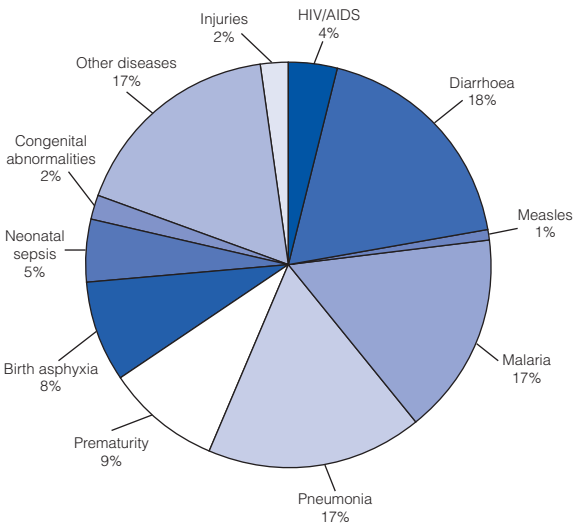


Figure 83: Distribution of causes of death among children aged under 5 years, 2008

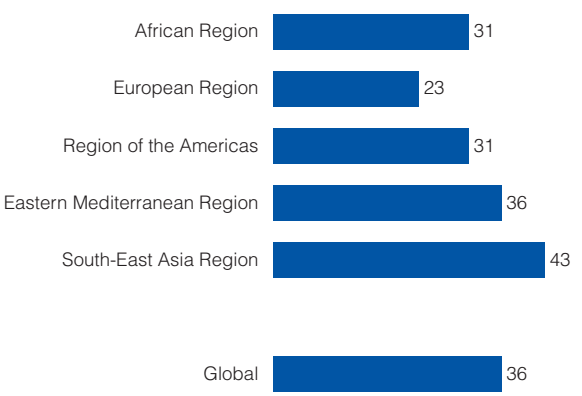


Figure 84: Percentage of infants exclusively breastfed for the first 6 months of life in WHO Regions, 2000–2009

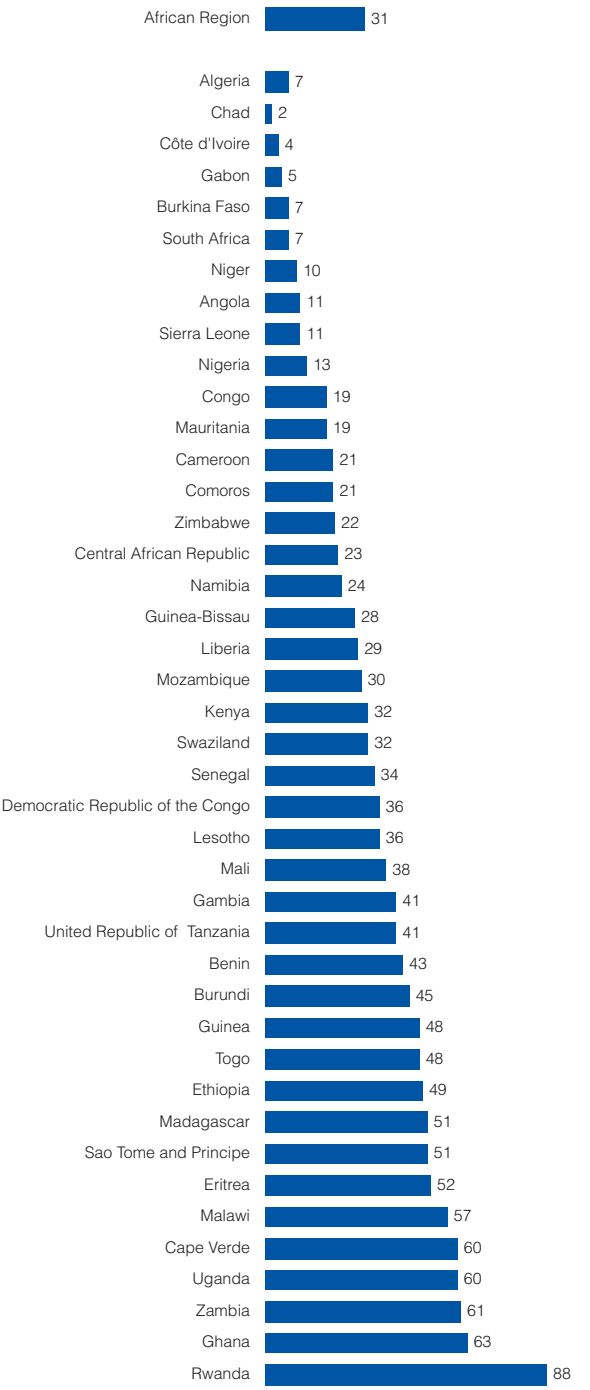


Figure 85: Percentage of infants exclusively breastfed for the first 6 months of life in the African Region, by country, 2000–2009

Maternal and newborn health

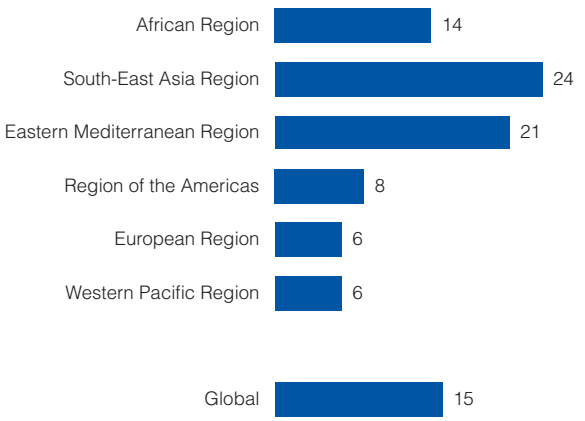


Figure 86: Percentage of low-birthweight newborns in WHO Regions, 2000–2008

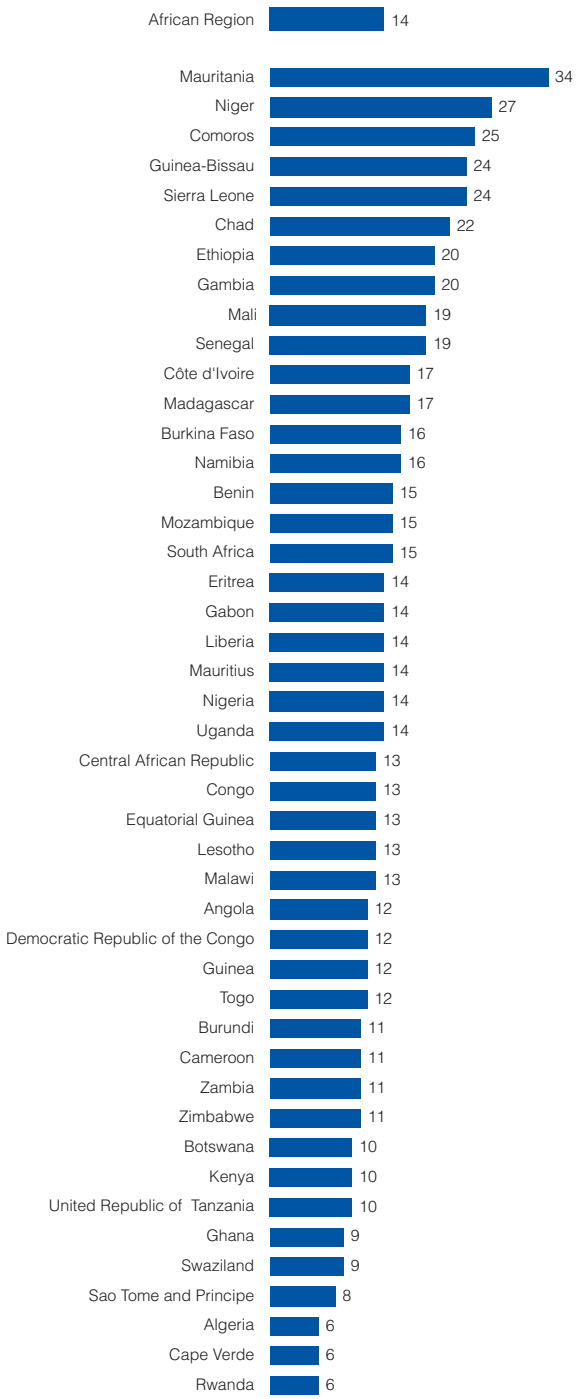


Figure 87: Percentage of low-birthweight newborns in the African Region, by country, 2000–2008

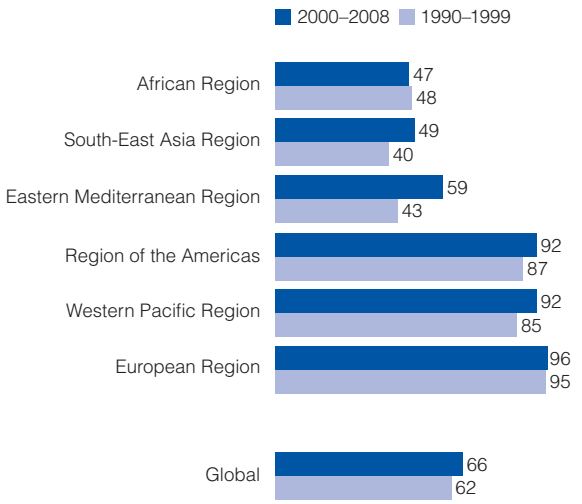


Figure 88: Percentage of births attended by skilled health personnel in WHO Regions, 1990–1999 and 2000–2008

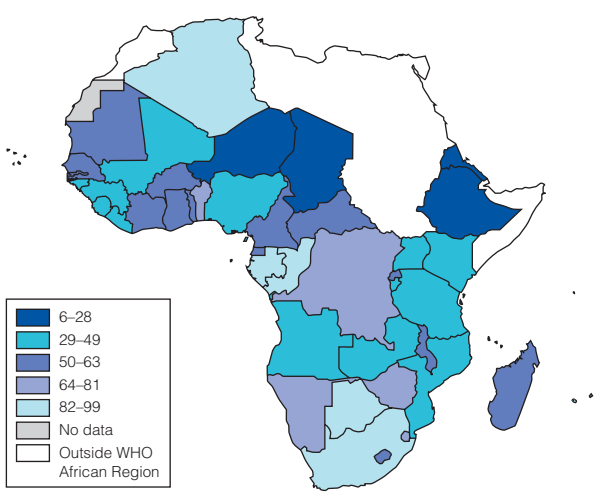


Figure 89: Percentage of births attended by skilled health personnel in the African Region, 2000–2008

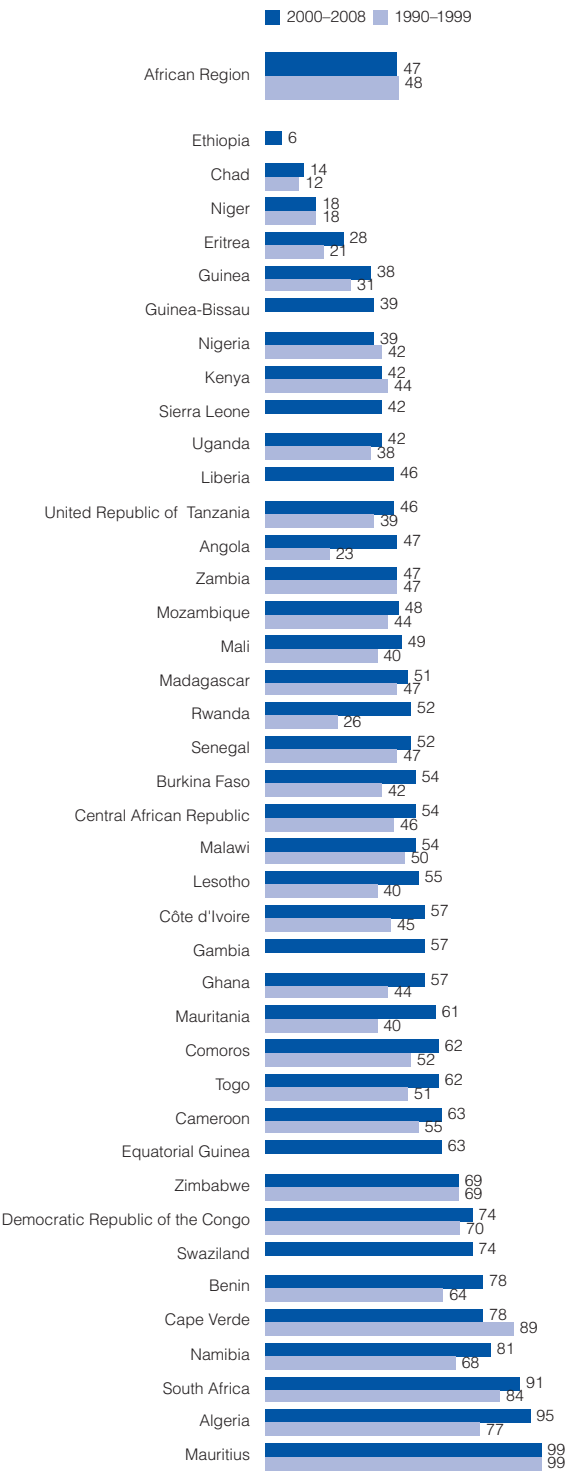


Figure 90: Percentage of births attended by skilled health personnel in the African Region, by country, 2000–2008 and 1990–1999

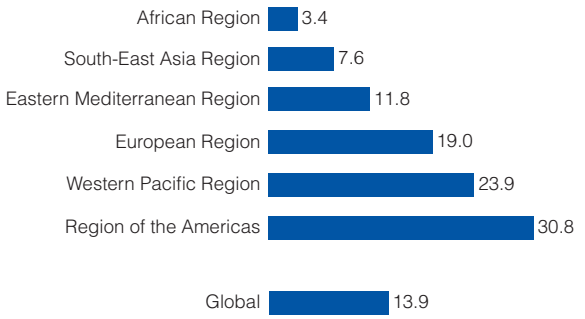


Figure 91: Percentage of births by caesarean section in WHO Regions, 2000–2008

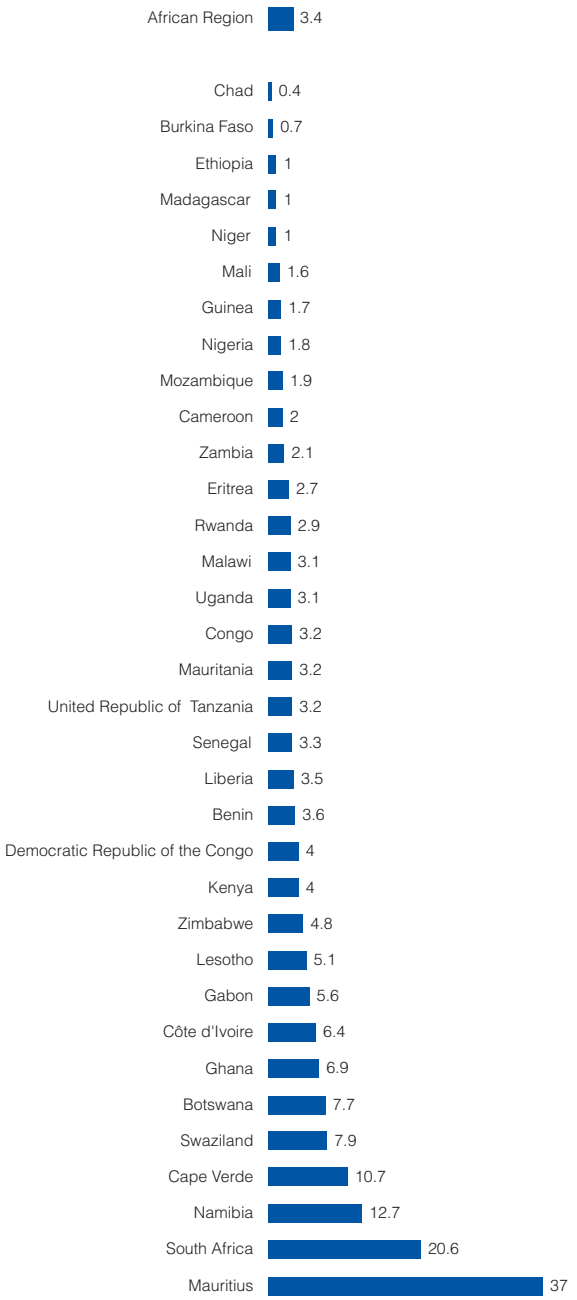


Figure 92: Percentage of births by caesarean section in the African Region, by country, 2000–2008

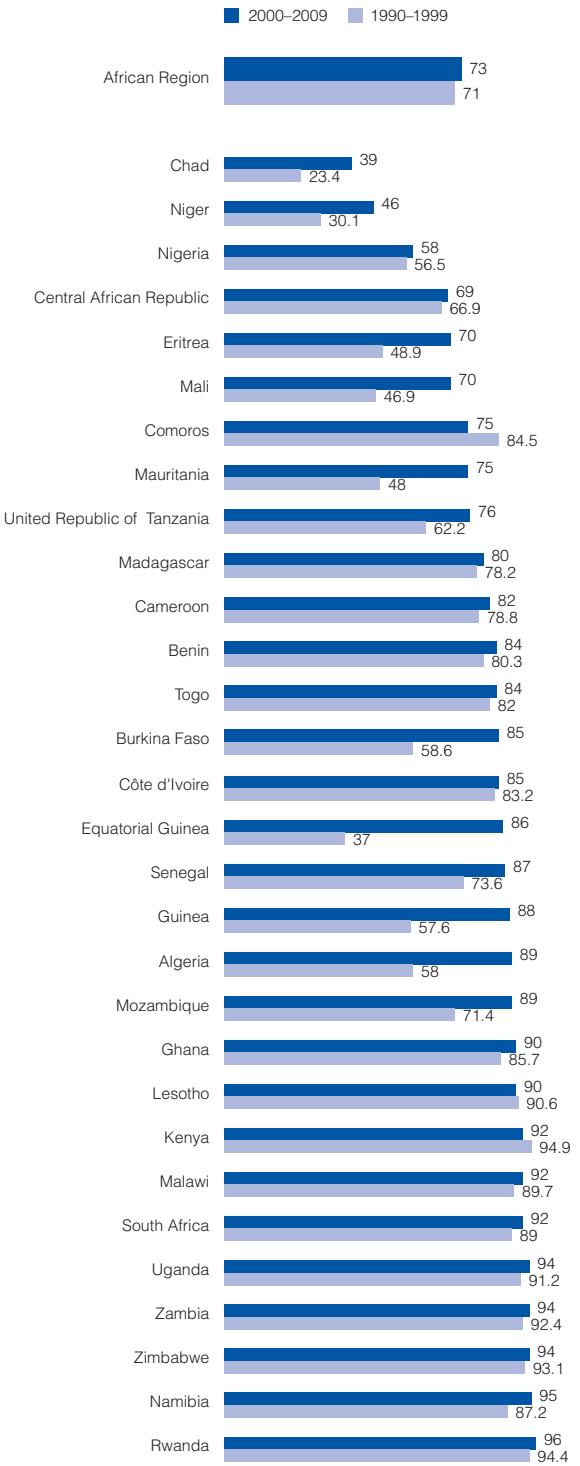


Figure 93: Percentage of antenatal care coverage, at least one visit, in the African Region, by country, 2000–2009 and 1990–1999

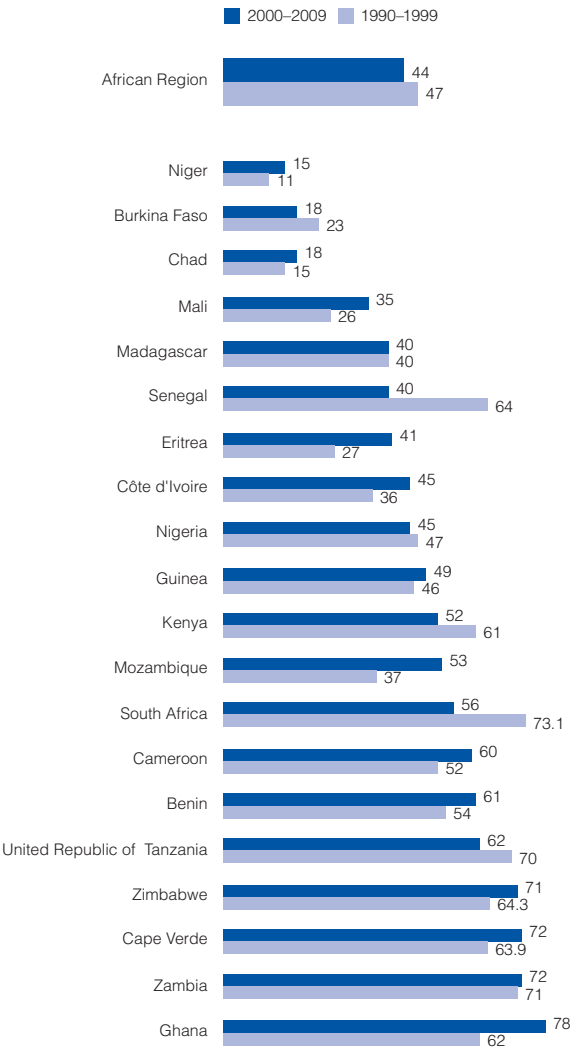


Figure 94: Percentage of antenatal care coverage, at least four visits, in the African Region, by country, 2000–2009 and 1990–1999

Sexual and reproductive health

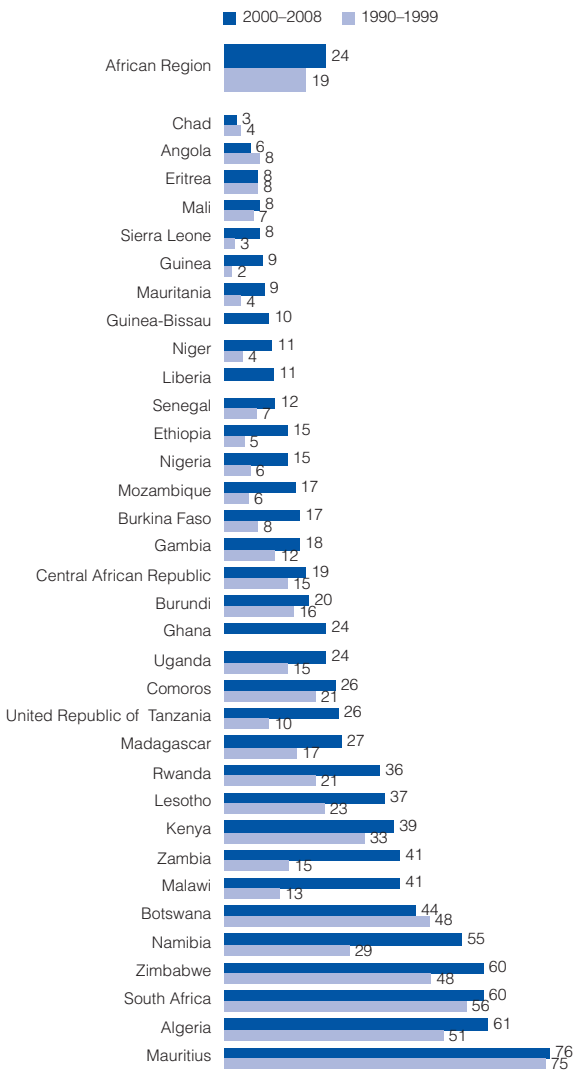


Figure 95: Percentage of current contraceptive use* (any method) among married women 15–49 years of age in the African Region, by country, 2000–2008 and 1990–1999

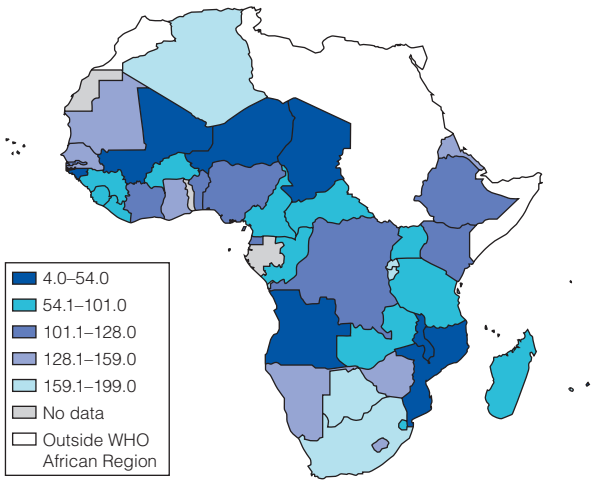


Figure 96: Adolescent fertility rate (per 1000 girls, 15–19 years of age) in the African Region, 2000–2007

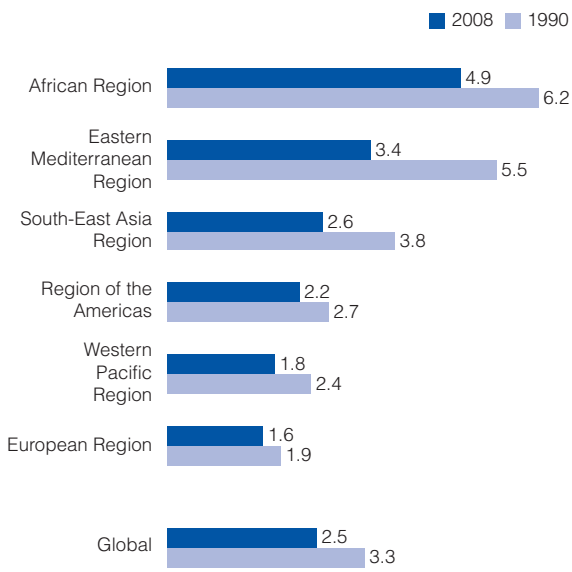


Figure 97: Total fertility rate per woman in WHO Regions, 2008 and 1990

*Percentage of women aged 15–49 married or in union who are currently using, or whose sexual partner is using, at least one method of contraception, regardless of the method used. For details, see Reproductive Health Indicators: Guidelines for their Generation, Interpretation and Analysis for Global Monitoring. Geneva: WHO, 2006 (available at: http://who.int/reproductivehealth/publications/rhindicators/guidelines.pdf) or the website http://www.un..org/esa/population/unpop.html.

Neglected tropical diseases

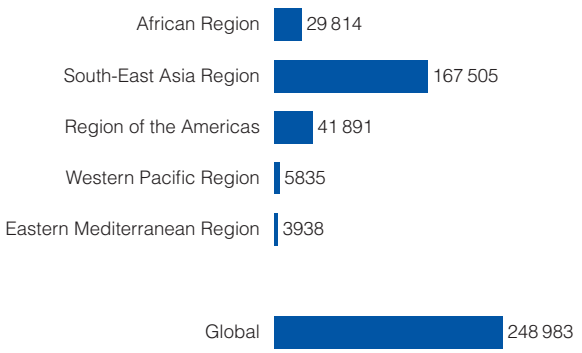


Figure 98: Number of reported cases of leprosy in WHO Regions, 2008

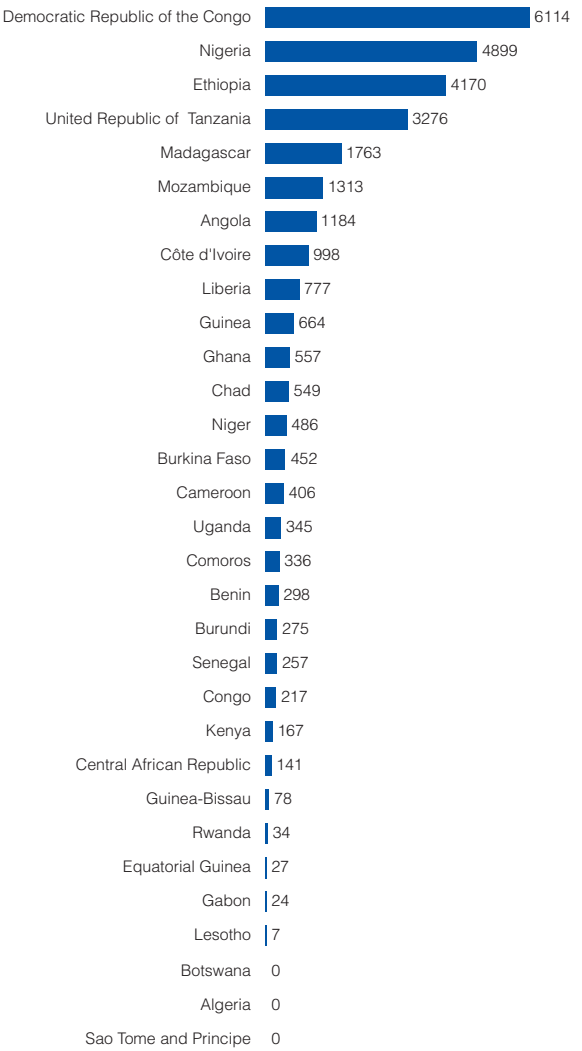


Figure 99: Number of reported cases of leprosy in the African Region, by country, 2008

Non-communicable diseases and conditions

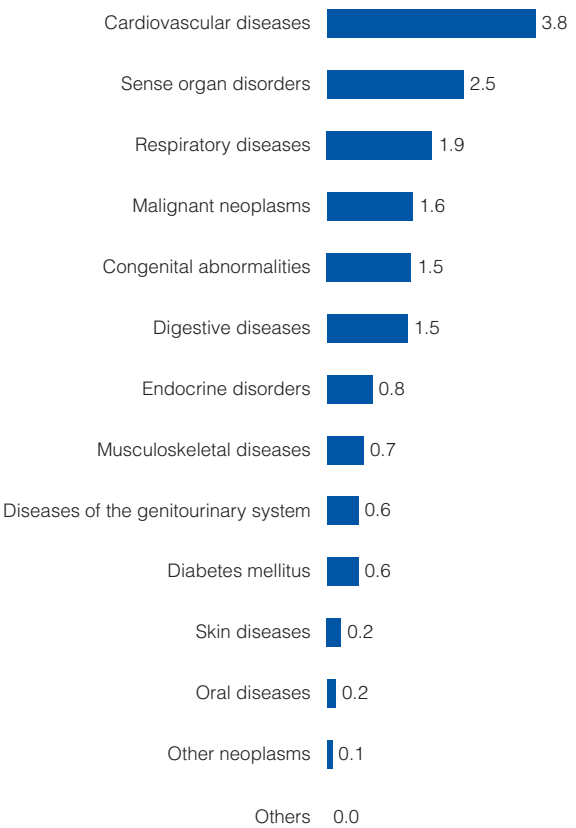


Figure 100: Distribution of causes of non-communicable burden of diseases (percentage of total DALYs) in the African Region, 2004

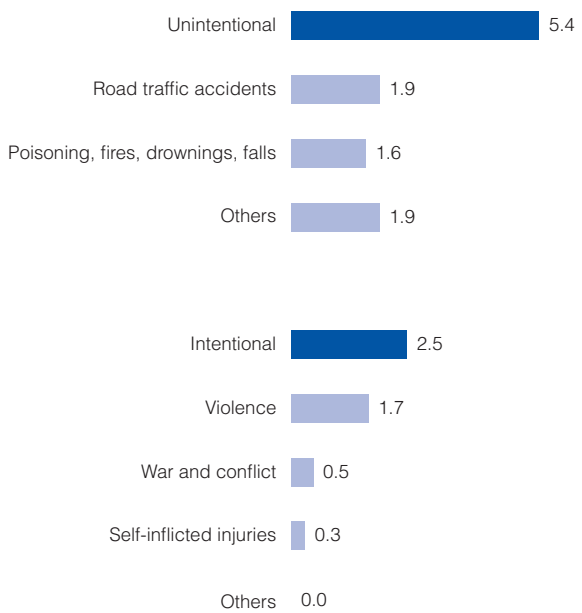


Figure 101: Distribution of causes of intentional and non-intentional injuries (percentage of total DALYs) in the African Region, 2004

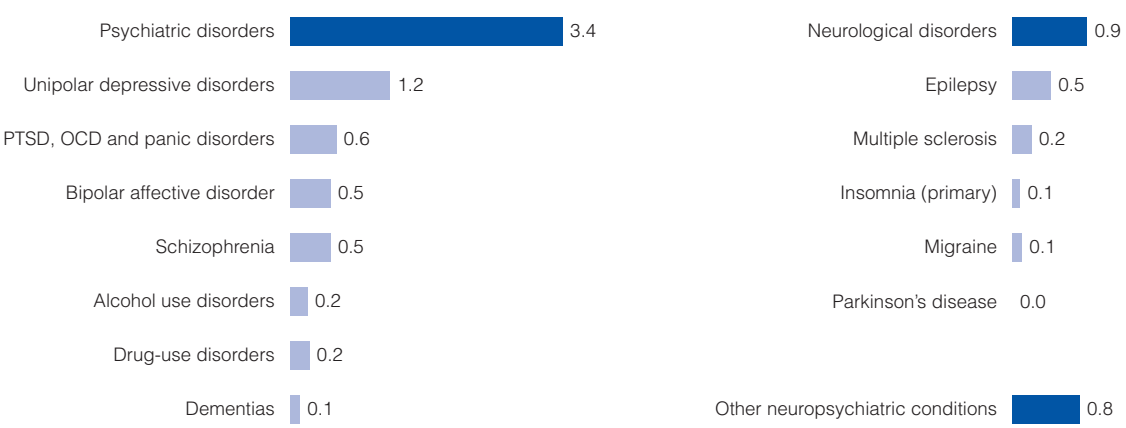


Figure 102: Distribution of causes of neuropsychiatric burden of diseases (percentage of total DALYs) in the African Region, 2004

Risk factors for health

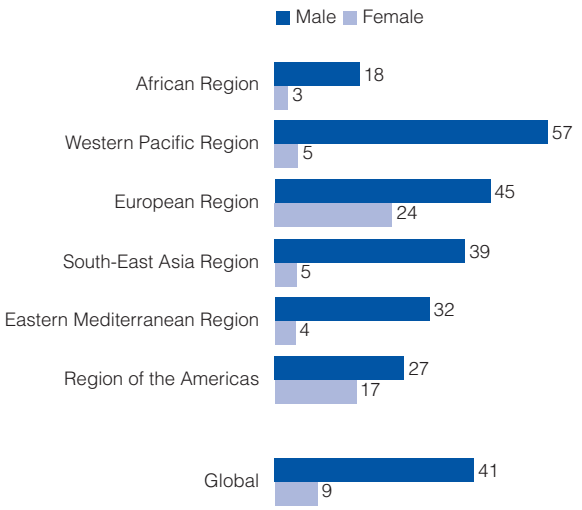


Figure 103: Percentage of current tobacco use in persons 15 years of age or older in WHO Regions, 2006

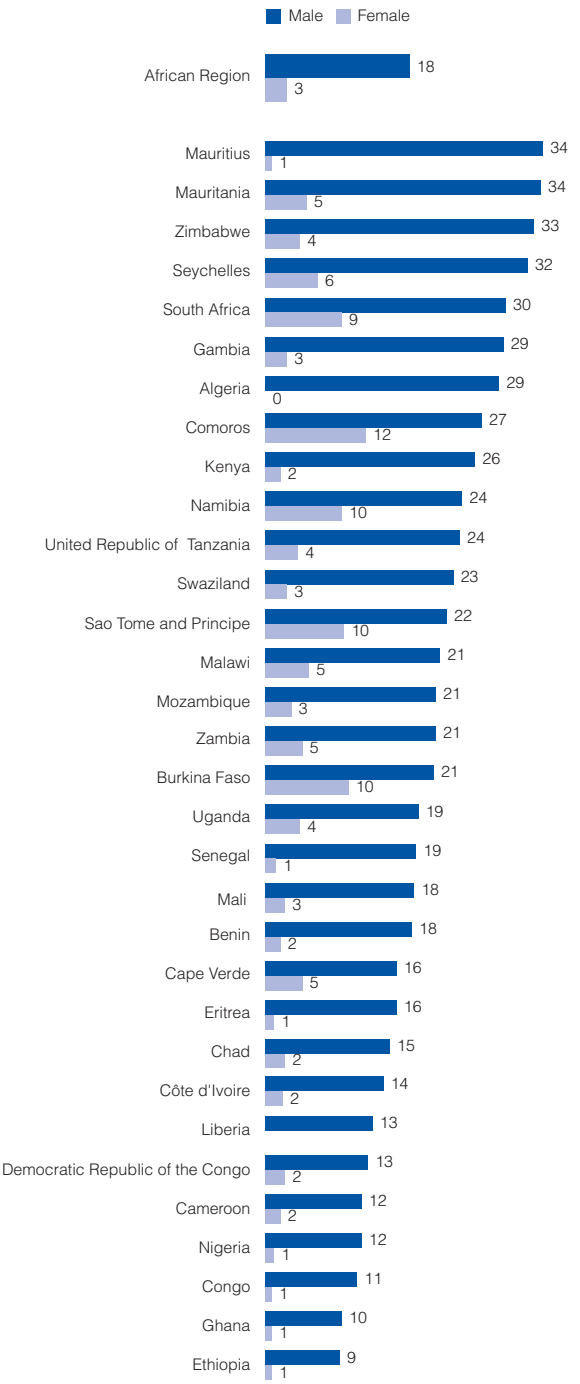


Figure 104: Percentage of current tobacco use in persons 15 years of age or older in the African Region, by country, 2006

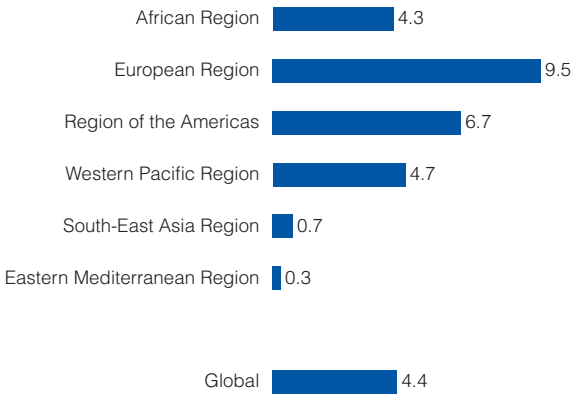


Figure 105: Alcohol consumption (litres per person) among adults aged 15 years of age or older in WHO Regions, 2005

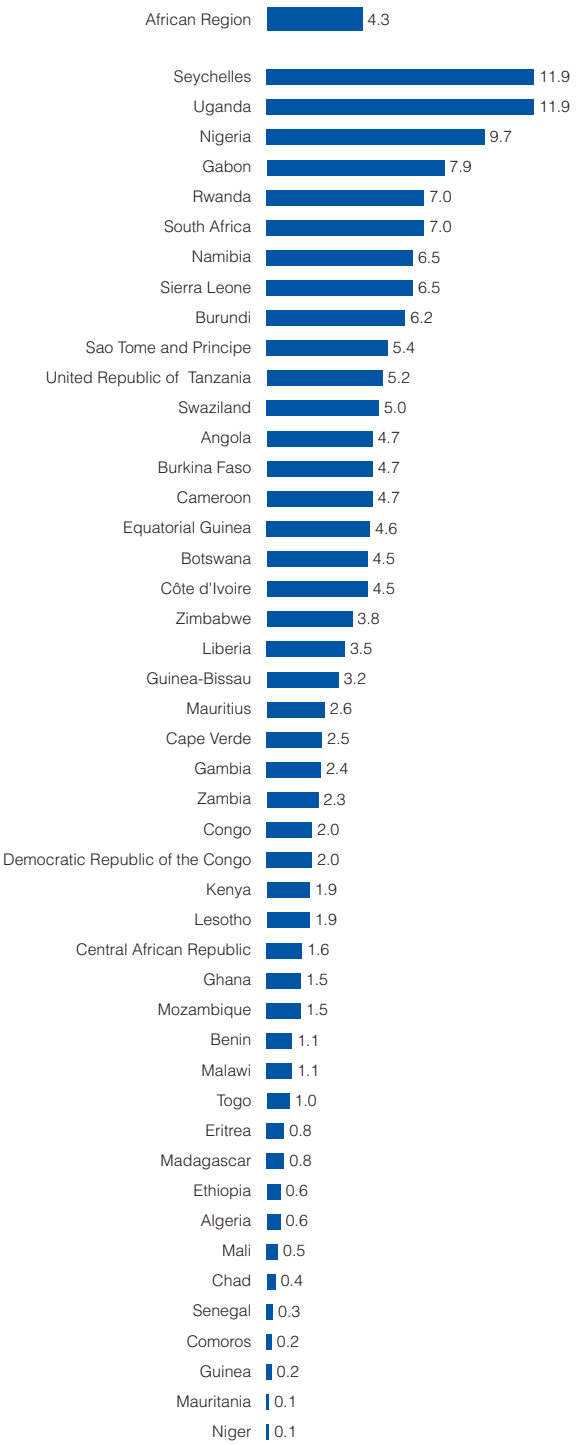


Figure 106: Alcohol consumption (litres per person) among adults aged 15 years or older in the African Region, by country, 2005

Food and nutrition

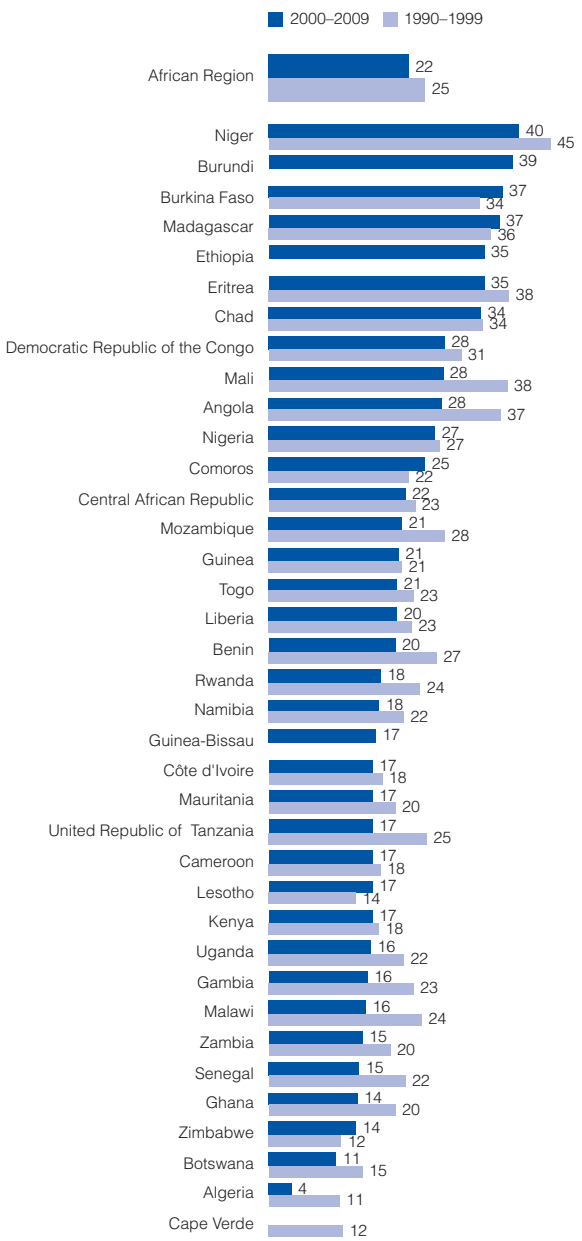


Figure 107: Percentage of underweight* children under 5 years of age in the African Region, by country, 2000–2009 and 1990–1999

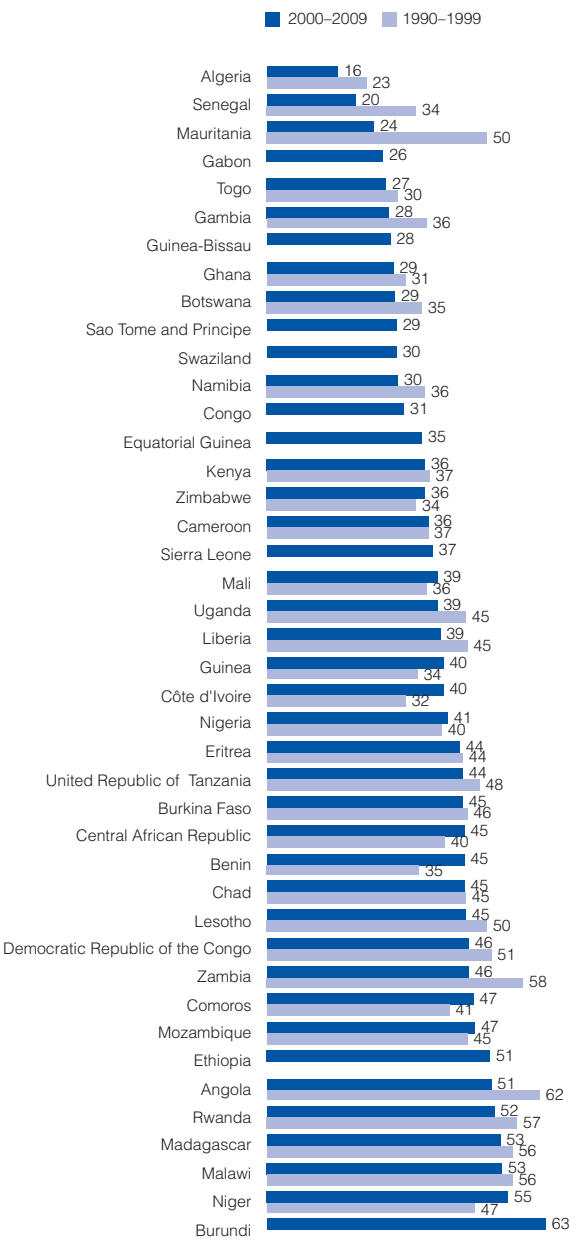


Figure 108: Percentage of stunted* children under 5 years of age in the African Region, by country, 2000–2009 and 1990–1999

*Percentage of children *underweight* describes how many children under 5 years of age have a weight-for-age below minus two standard deviations of the National Center for Health Statistics (NCHS)/WHO reference median. Percentage of children *stunted* describes how many children under 5 years of age have a height-for-age below minus two standard deviations of the NCHS/WHO reference median.

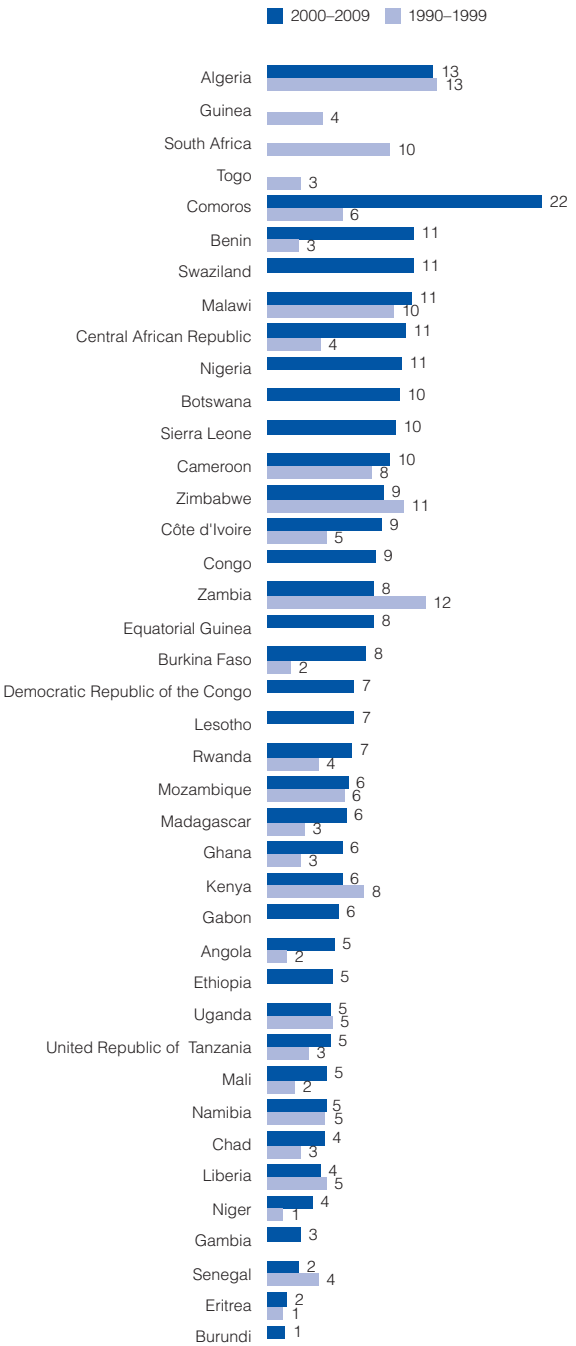


Figure 109: Percentage of overweight* children under 5 years of age in the African Region, by country, 2000–2009 and 1990–1999

*Percentage of children *overweight* describes how many children under 5 years of age have a weight-for-height above two standard deviations of the NCHS/WHO reference median.

4 Key Determinants of Health

Demography

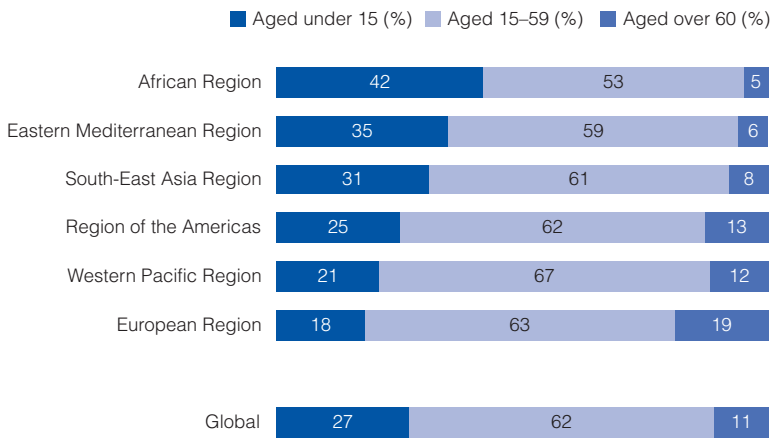


Figure 110: Age distribution of the population in WHO Regions, 2008

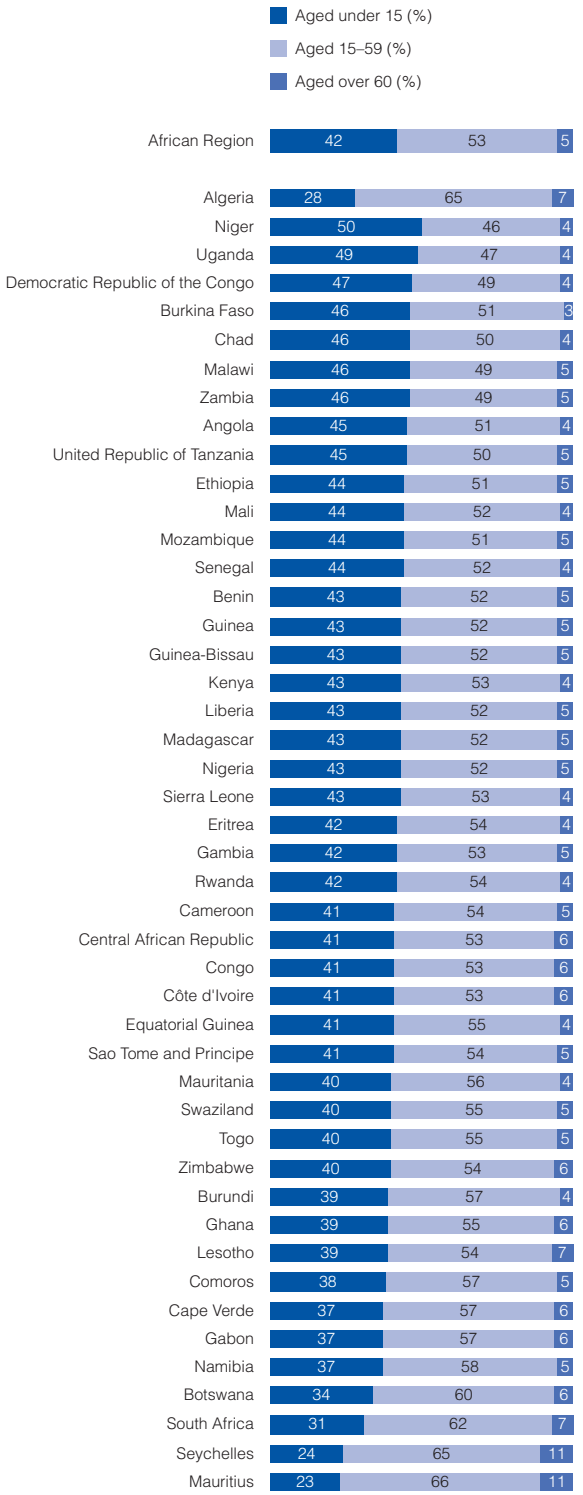


Figure 111: Age distribution of the population in the African Region, by country, 2008

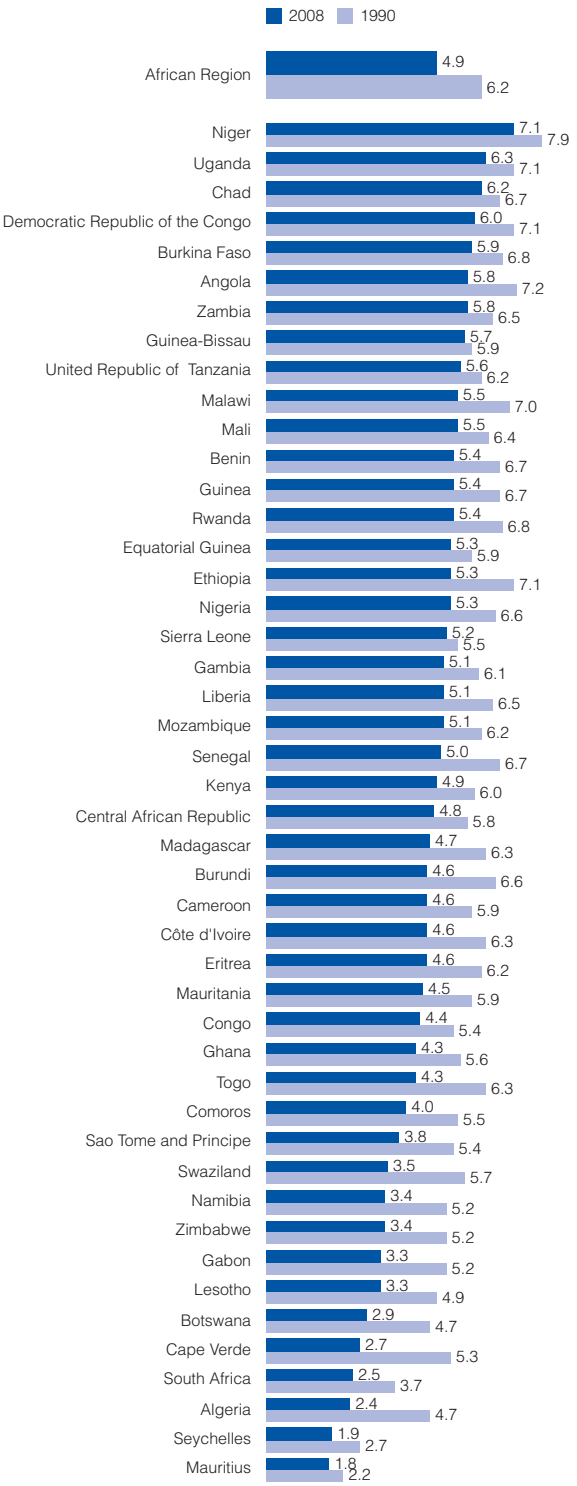


Figure 112: Total fertility rate per woman in the African Region, by country, 2008 and 1990

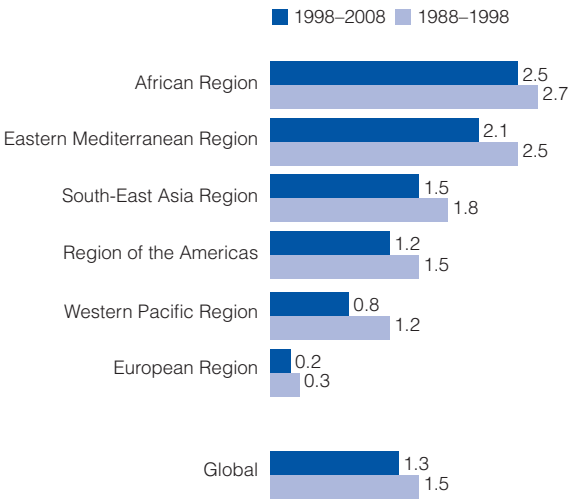


Figure 113: Annual growth rate (in %) of population in WHO Regions, 1998–2008 and 1988–1998

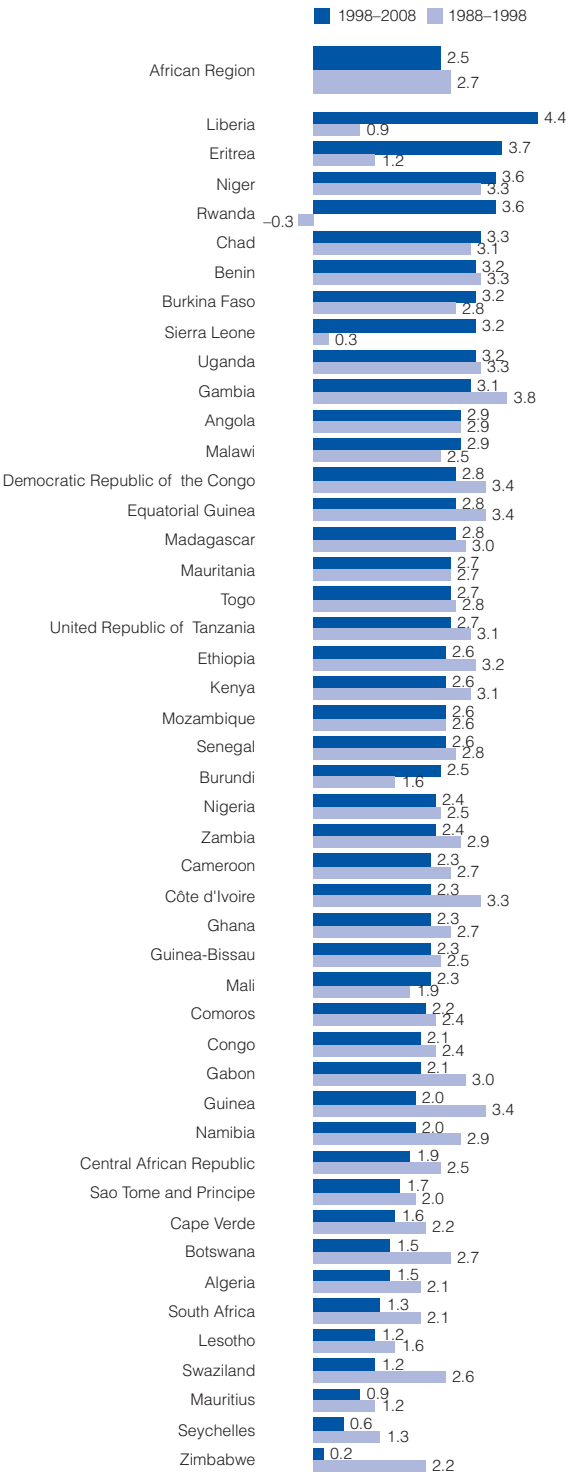


Figure 114: Annual growth rate (in %) of population in the African Region, by country, 1998–2008 and 1988–1998

Resources and infrastructure

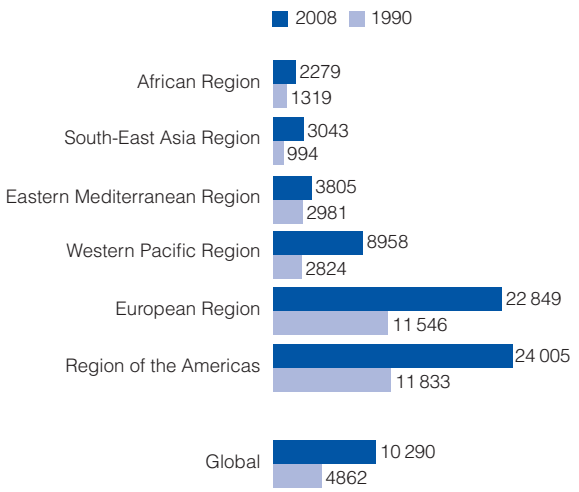


Figure 115: Gross national income* per capita (PPP int. $) in WHO Regions, 2008 and 1990

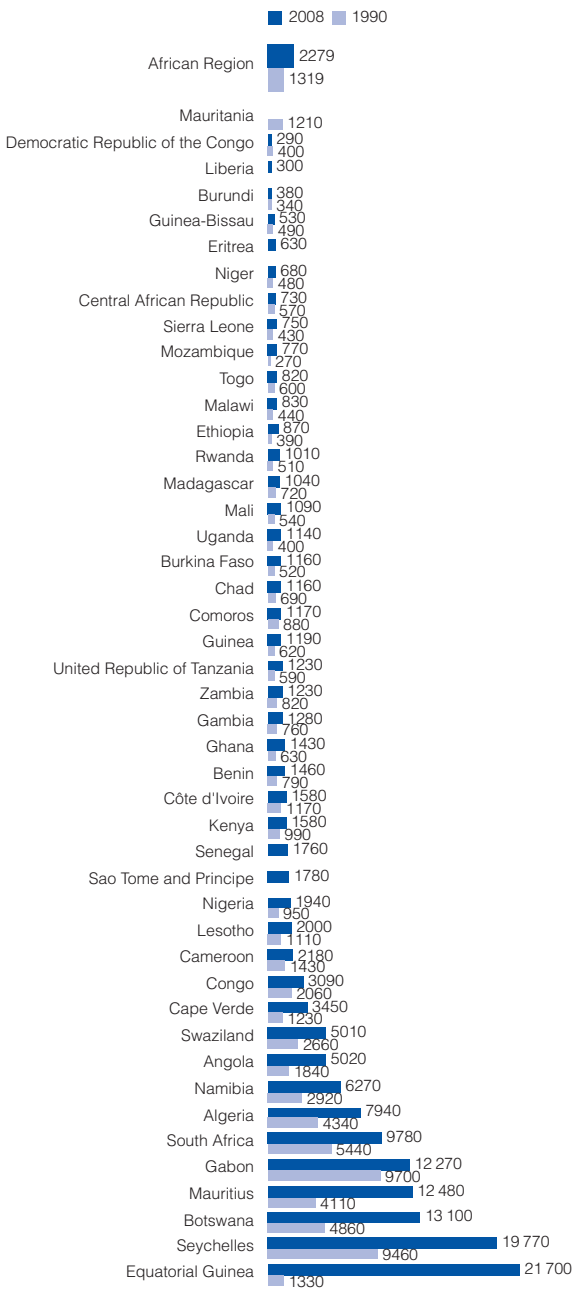


Figure 116: Gross national income per capita (PPP int. $) in the African Region, by country, 2008 and 1990

*Gross national income (GNI) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. GNI per capita is GNI divided by mid-year population For further details, see www.unicef.org/infobycountry/stats_popup1.html.

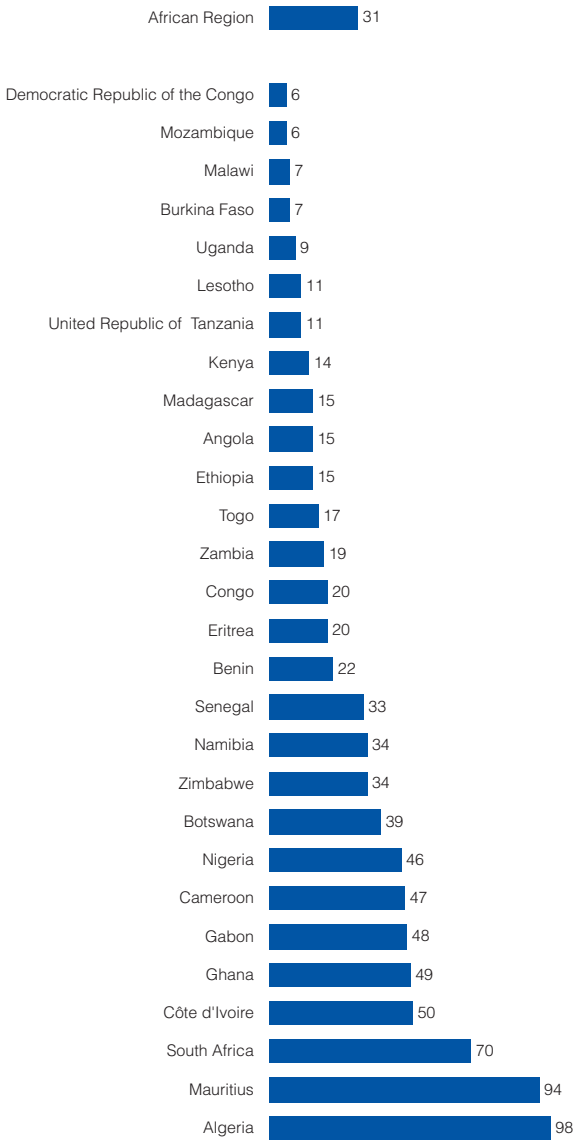


Figure 117: Electrification rate in the African Region, by country, 2000–2005

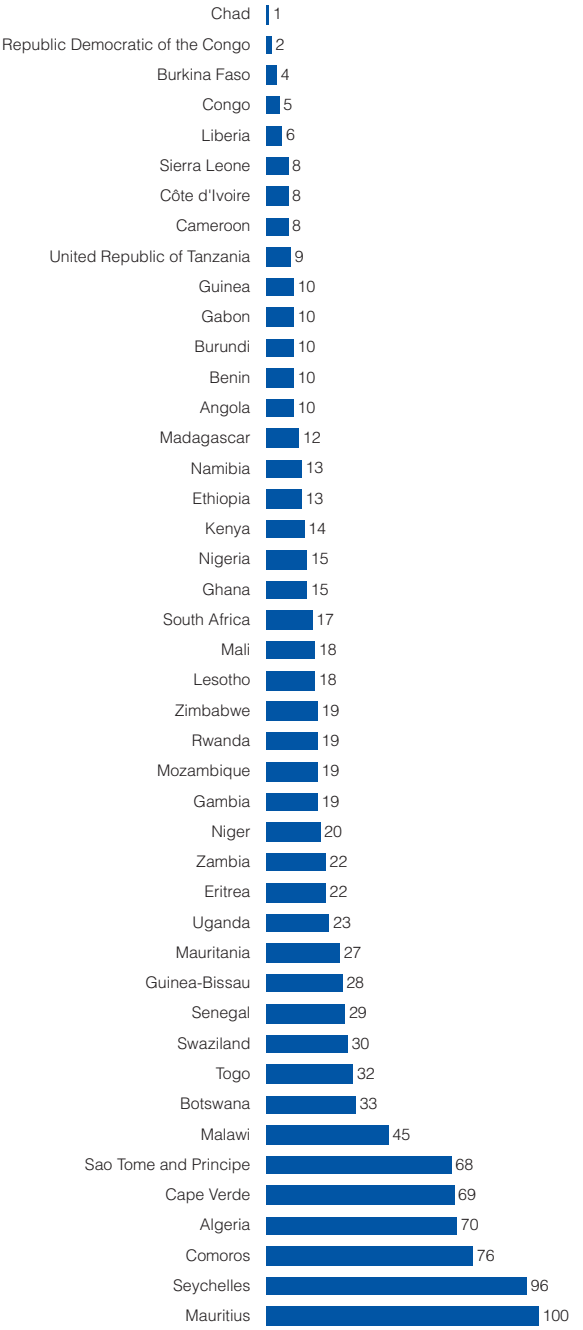


Figure 118: Paved roads* as percentage of all roads in the African Region, by country, 2000–2007†

*Paved roads are those surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones, as a percentage of all the country's roads, measured in length.

†Source: http://data.worldbank.org/indicator/IS.ROD.PAVE.ZS.

Poverty and income inequality

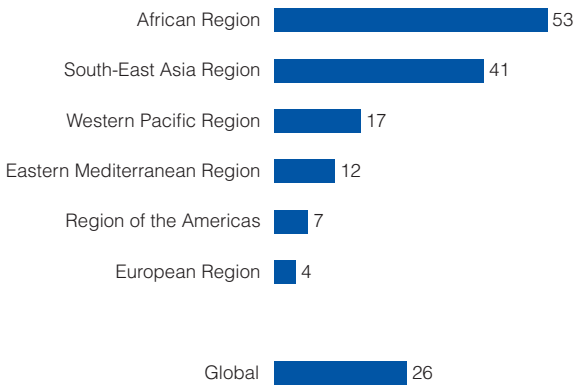


Figure 119: Percentage of the population living under $1 (PPP int. $) a day (i.e. in absolute poverty) in WHO Region, 2000–2007

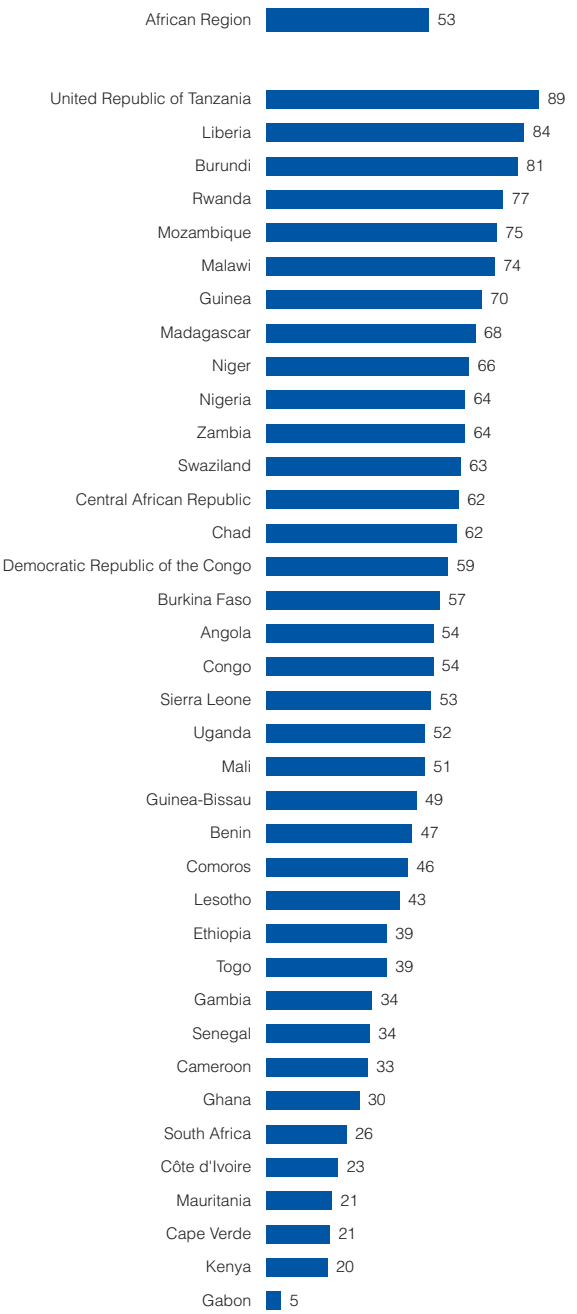


Figure 120: Percentage of the population living under $1 (PPP int. $) a day (i.e. in absolute poverty) in the African Region, by country, 2000–2007

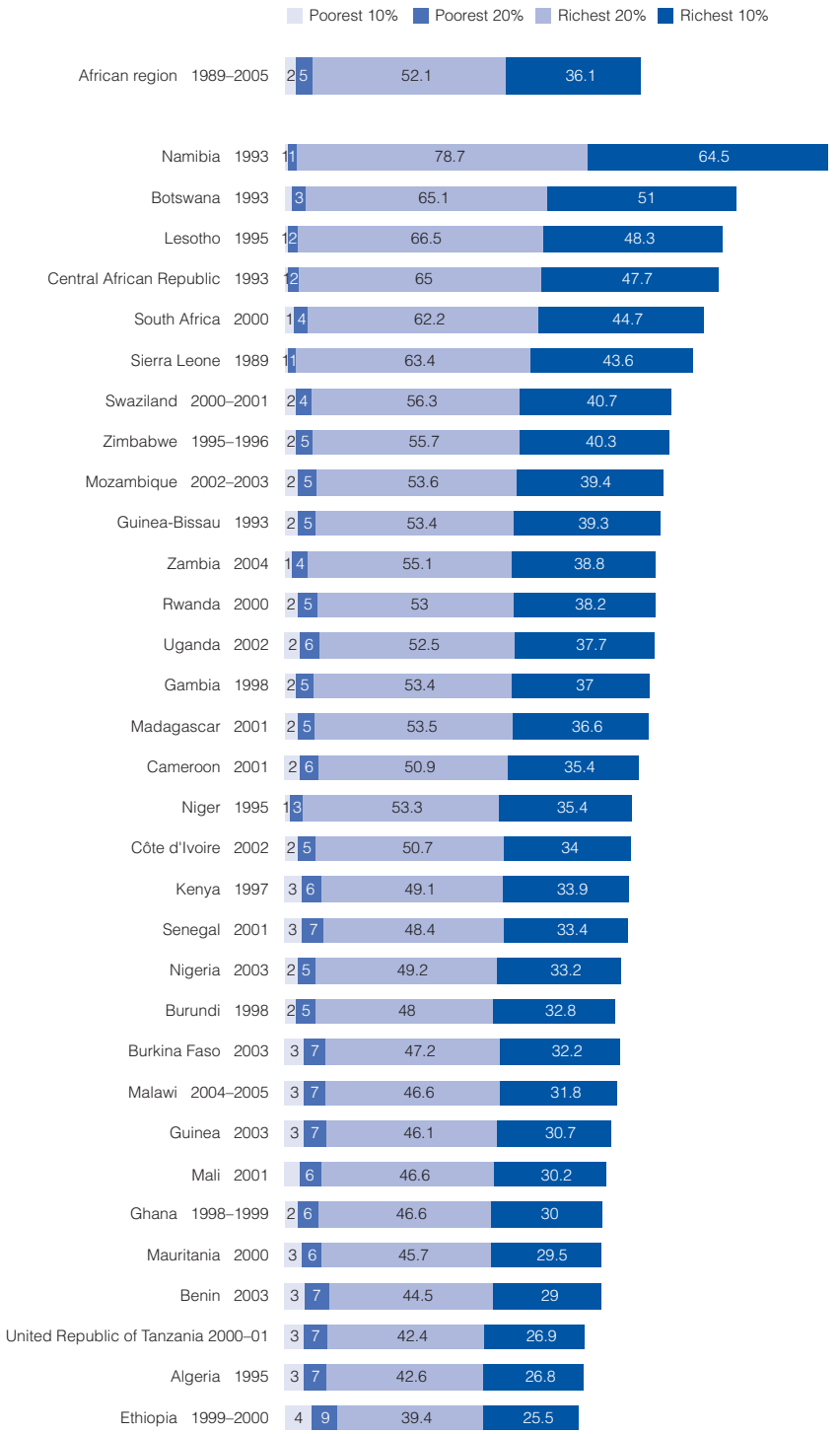


Figure 121: Share of incomes by poorest and richest section of the population in the African Region, by country, 1989–2005*

*Source: World Bank, 2010.

Gender inequity

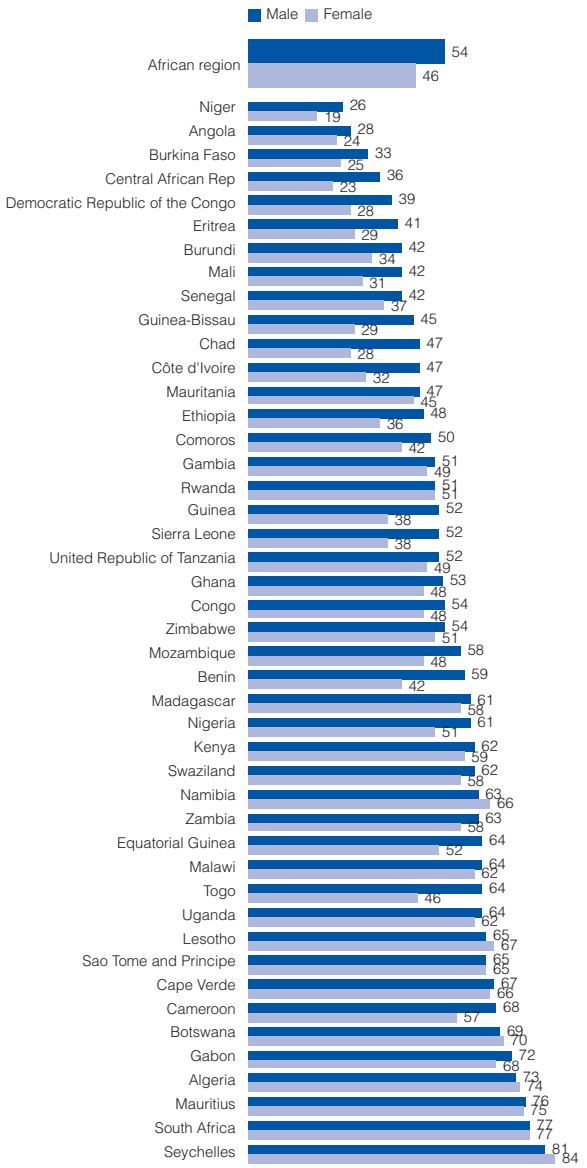


Figure 122: Percentage of female and male combined gross enrolment ratio* for primary–secondary–tertiary education in the African Region, by country, 2005†

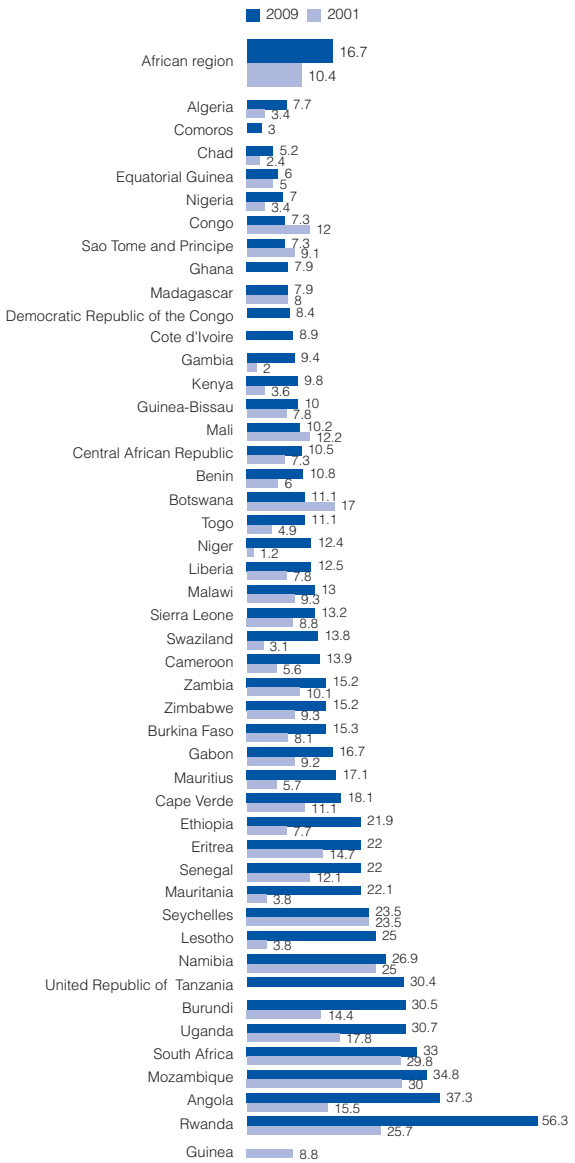


Figure 123: Percentage of seats‡ held by women in national parliaments in the African Region, by country, 2009 and 2001†

*Number of students enrolled in primary, secondary and tertiary levels of education, regardless of age, as percentage of the population of official school age for the three levels. The gross enrolment ratio can be greater than 100% as a result of grade repetition and entry at ages younger or older than the typical age at that grade level (UNDP definition).

†Source: United Nations Statistical Division, MDG Database, June 2010.

‡Number of seats held by women expressed as a percentage of all occupied seats. Women's representation in parliaments is one aspect of women's opportunities in political and public life, and it is therefore linked to women's empowerment. For additional information, see the website www.milleniumindicators.un.org/unsd/mdgsmetadata

Education

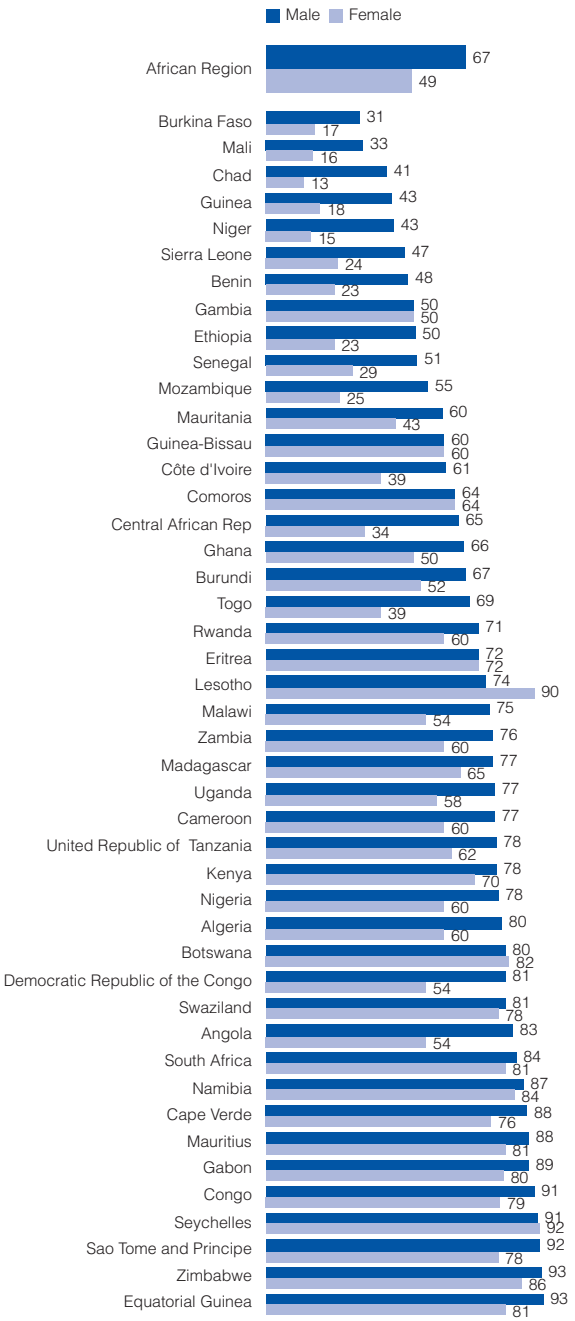


Figure 124: Adult literacy rate (percentage aged 15 and older) in the African Region, by country and sex, 1995–2005†

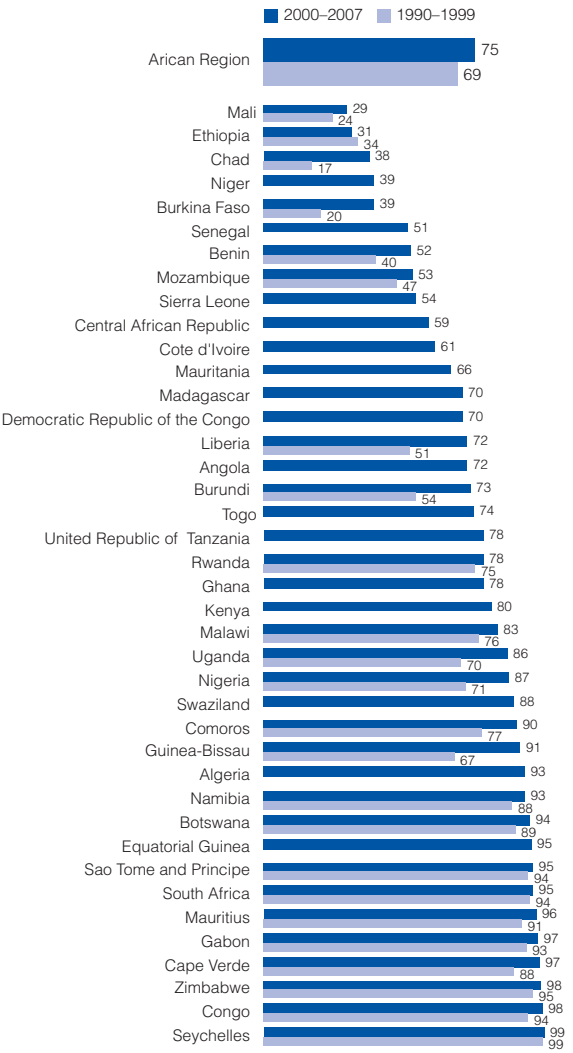


Figure 125: Percentage of the population aged 15–24 years who can both read and write (i.e. youth literacy rate*) in the African Region, by country, 2000–2007 and 1990–1999‡

*The youth literacy rate reflects the outcomes of primary education over the previous 10 years or so. As a measure of the effectiveness of the primary education system, it is often seen as a proxy measure of social progress and economic achievement. The literacy rate for this analysis is simply the complement of the illiteracy rate. For details, see the websites www.unescobkk.org/infores/efa2000/tech.html and www.uis.unesco.org.

†Source: UNESCO Institute for Statistics, 2007.

‡Source: United Nations Statistical Division, MDG Database, June 2010.

Environment

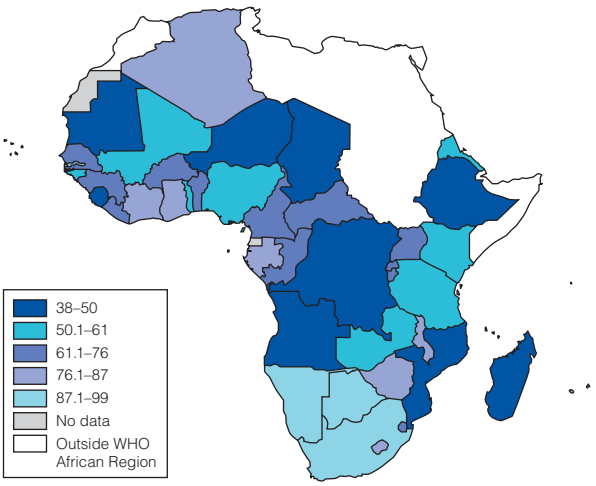


Figure 126: Percentage of the population using improved drinking water sources in the African Region, 2008

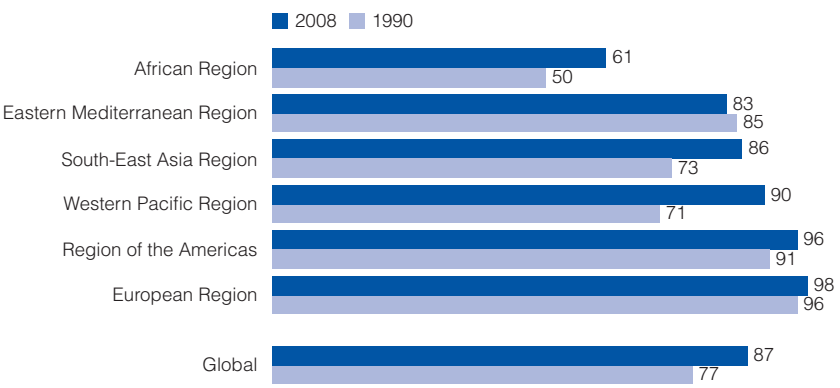


Figure 127: Percentage of the population using improved drinking water sources* in WHO Regions, 2008 and 1990

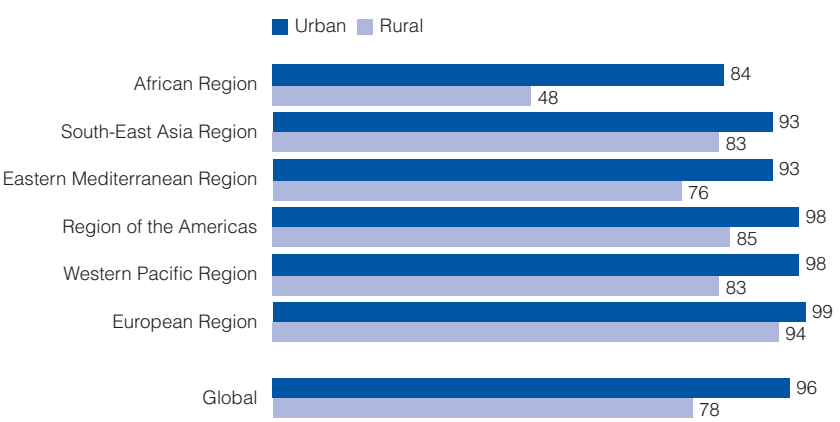


Figure 128: Percentage of the urban and rural population with access to improved drinking water sources in WHO Regions, 2008

*An improved drinking water source, by nature of its construction and design, is likely to protect the source from outside contamination, in particular from faecal matter. Improved drinking water sources include piped water into dwelling, plot or yard; a public tap or stand pipe; a tube well or borehole; a protected dug well; and protected spring and rainwater collection. For additional information, see the WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation website: www.wssinfo.org/en/welcome.html.

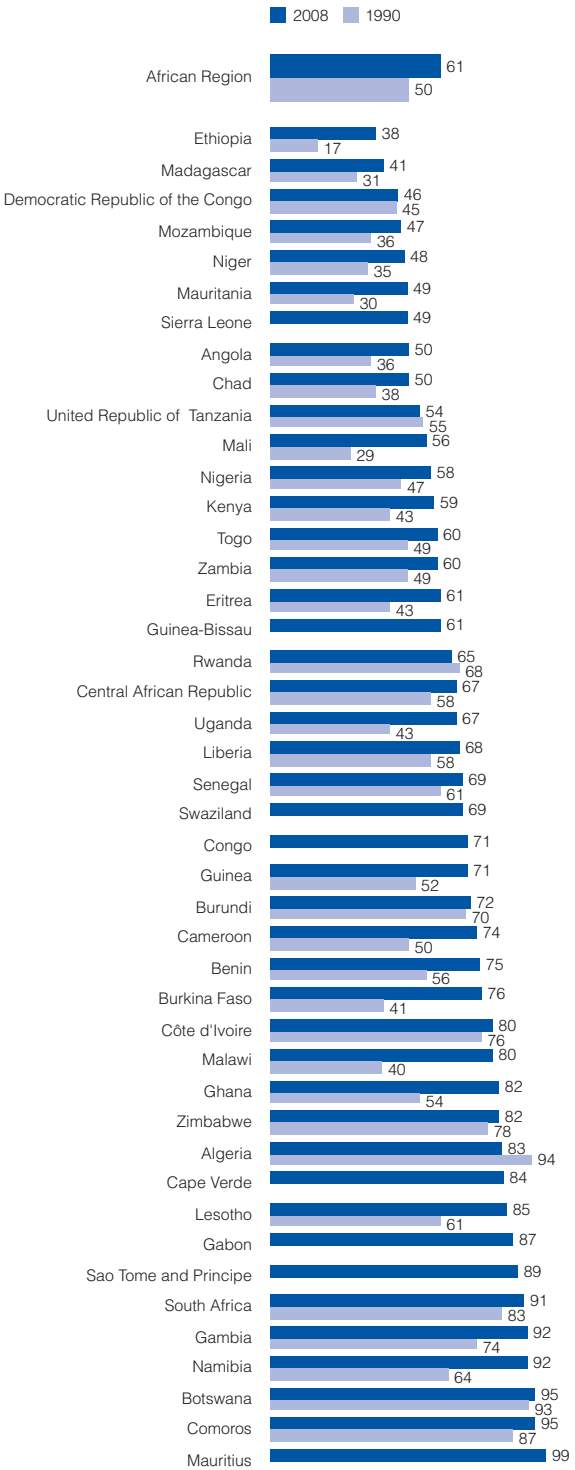


Figure 129: Percentage of population using improved drinking water sources in the African Region, by country, 2008 and 1990

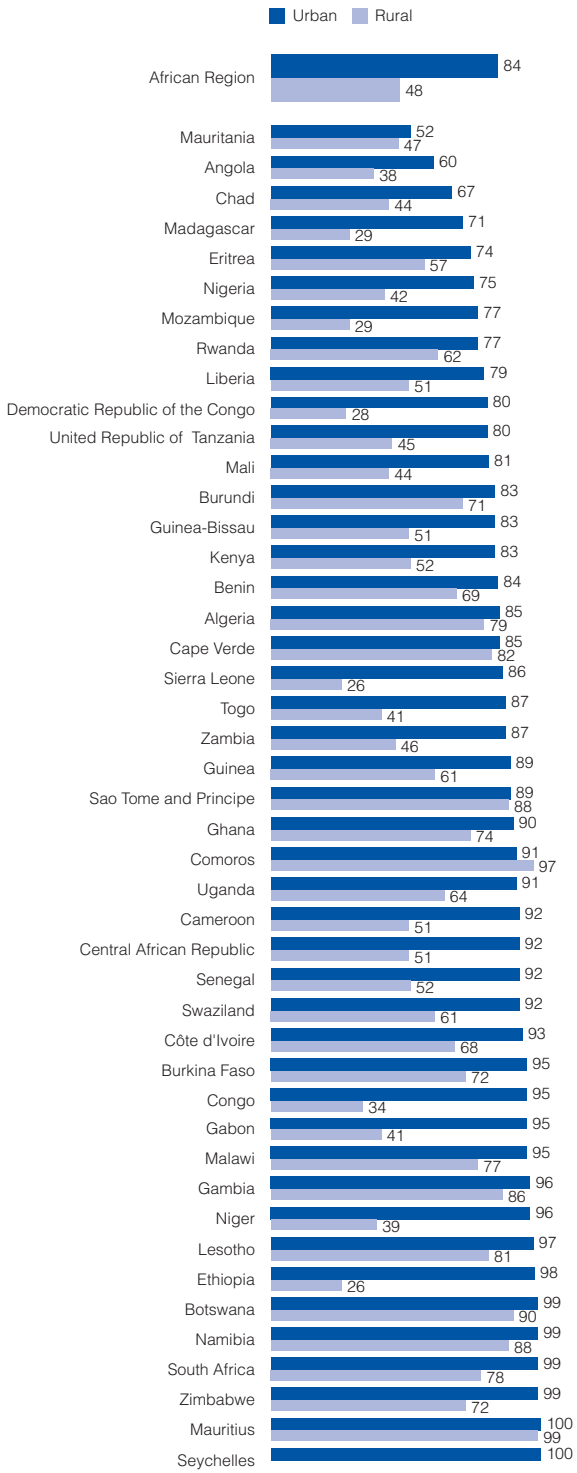


Figure 130: Percentage of urban and rural population with access to improved drinking water sources in the African Region, by country, 2008

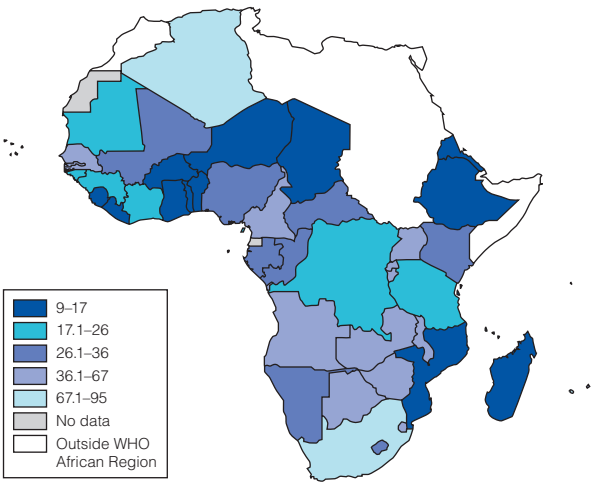


Figure 131: Percentage of the population using improved sanitation facilities in the African Region, 2008

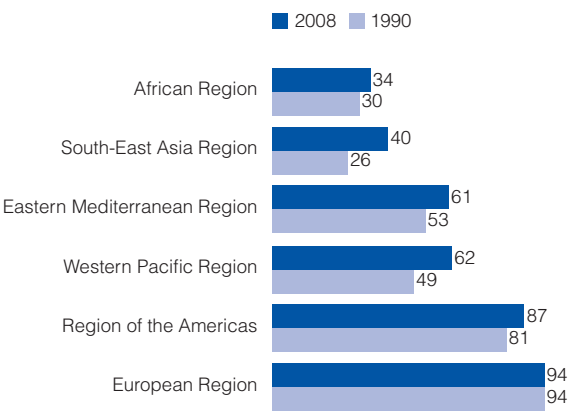


Figure 132: Percentage of the population using improved sanitation facilities in WHO Regions, 2008 and 1990

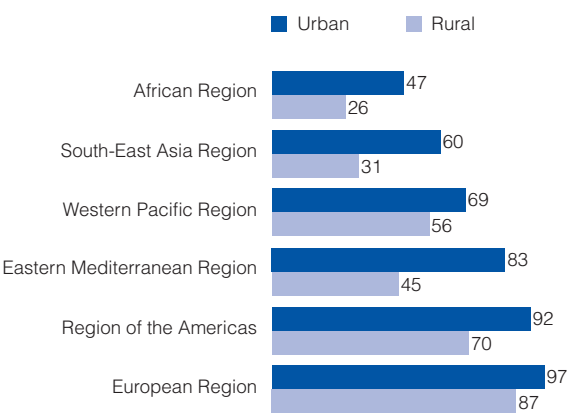


Figure 133: Percentage of the population using improved sanitation facilities in WHO Regions, urban and rural, 2008

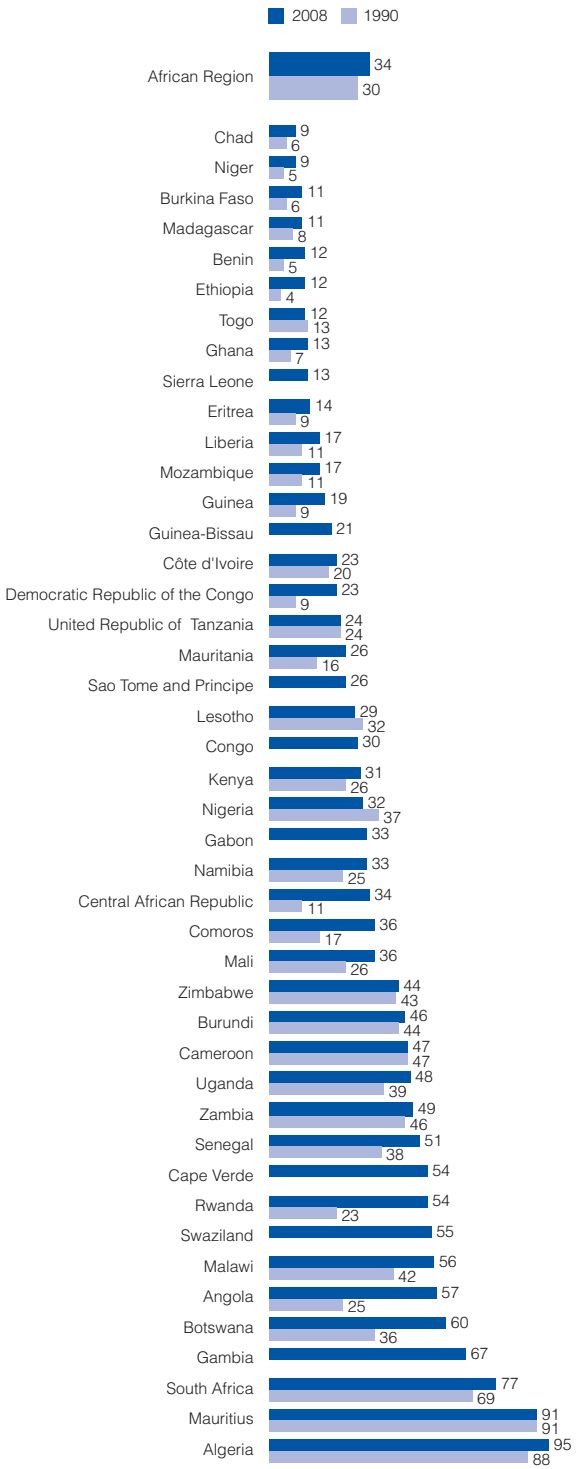


Figure 134: Percentage of the population using improved sanitation facilities in the African Region, by country, 2008 and 1990

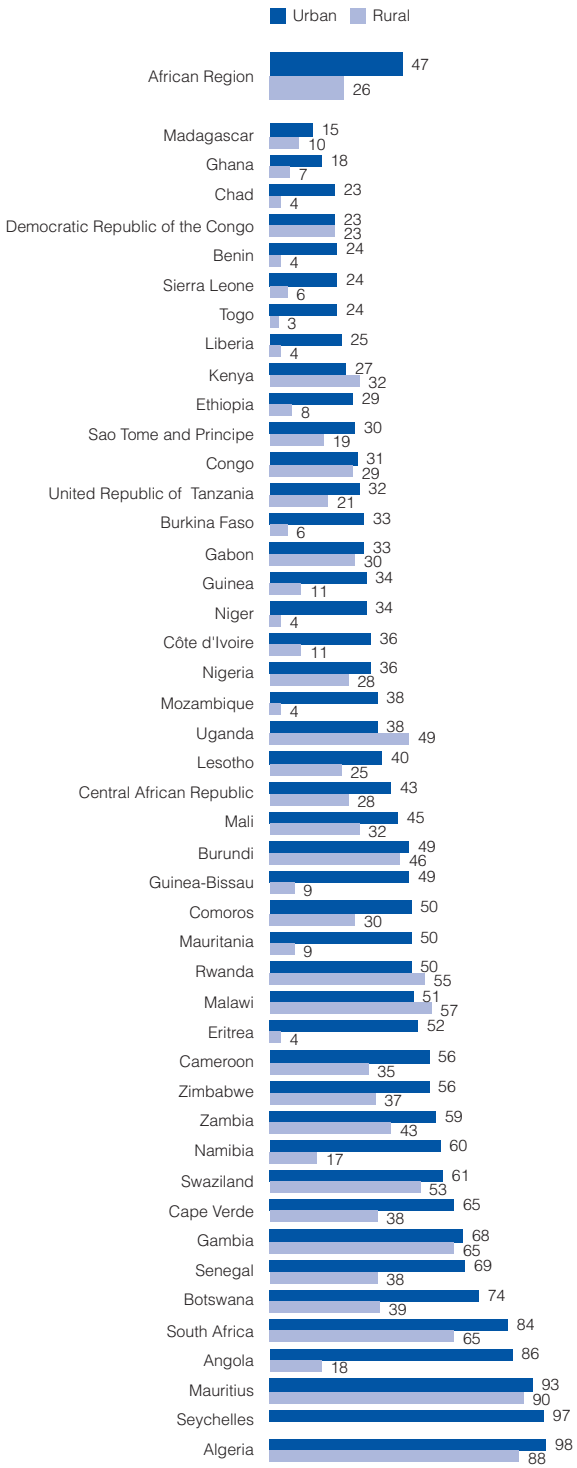


Figure 135: Percentage of the population using improved sanitation facilities in the African Region, by country, urban and rural, 2008

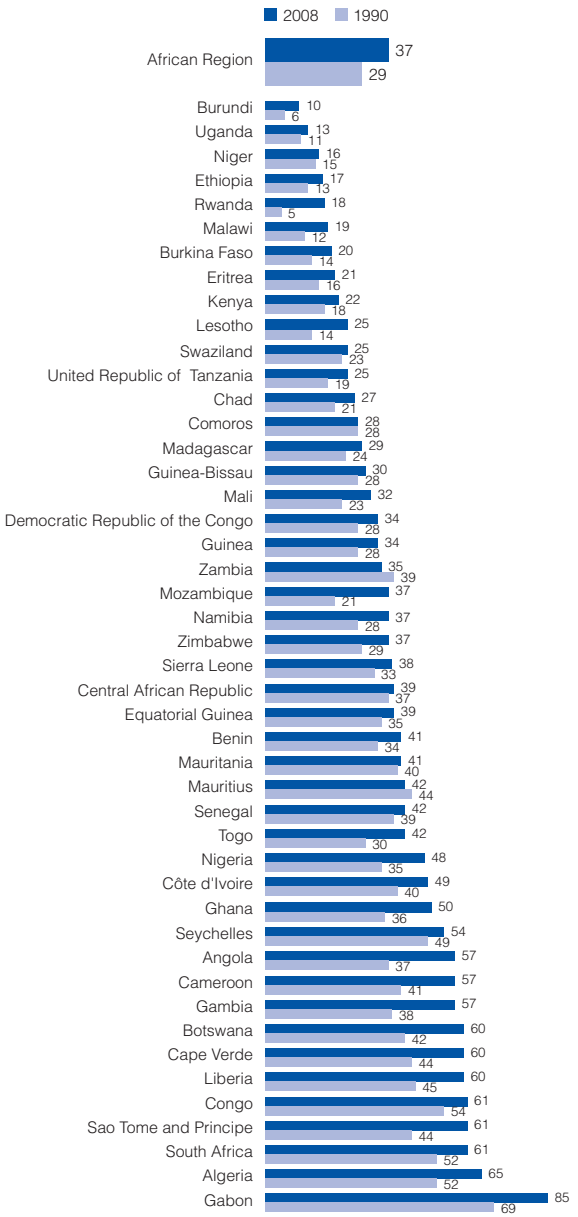


Figure 136: Percentage of the population living in urban areas in the African Region, by country, 2008 and 1990

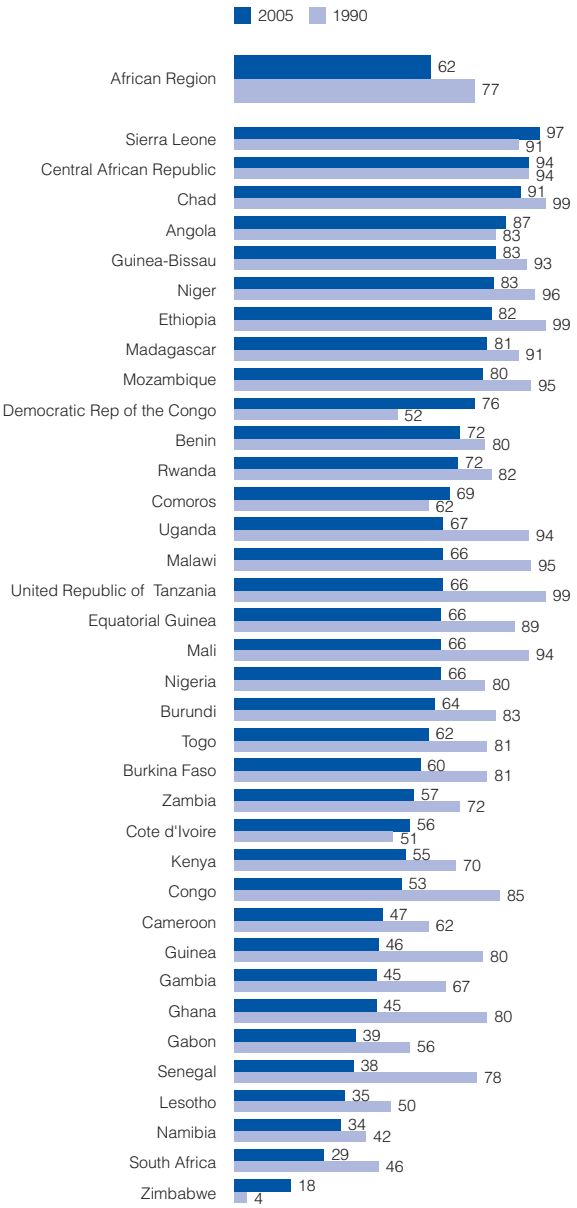


Figure 137: Percentage of urban population living in slums* in the African Region, by country, 2005 and 1990†

*_A slum household_ is defined as a group of individuals living under the same roof lacking one or more of the following conditions: access to improved water, access to improved sanitation, sufficient living area, durability of housing, and security of tenure. However, since information on secure tenure is not available for most of the countries, only the first four indicators are used to define a slum household, and then to estimate the proportion of urban population living in slums. The indicator is intended to provide an overview of the share of the urban population living in conditions of poverty and physical and environmental deprivation. For details, see the United Nations Human Settlements Programme (UN-HABITAT) Global Urban Observatory, Nairobi (available at the website: www.unhabitat.org/programmes/guo).

†Source: United Nations Statistical Division, MDG database, June 2010.

Global partnerships and financial flows

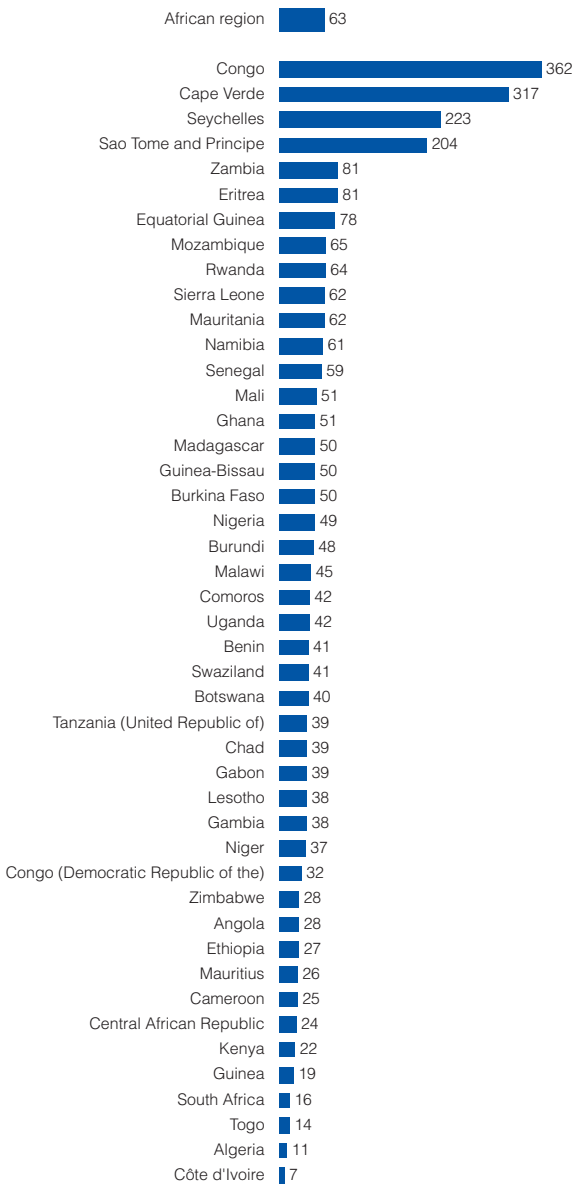


Figure 138: Per capita official development assistance* received (US$) in the African Region, by country, 2005†

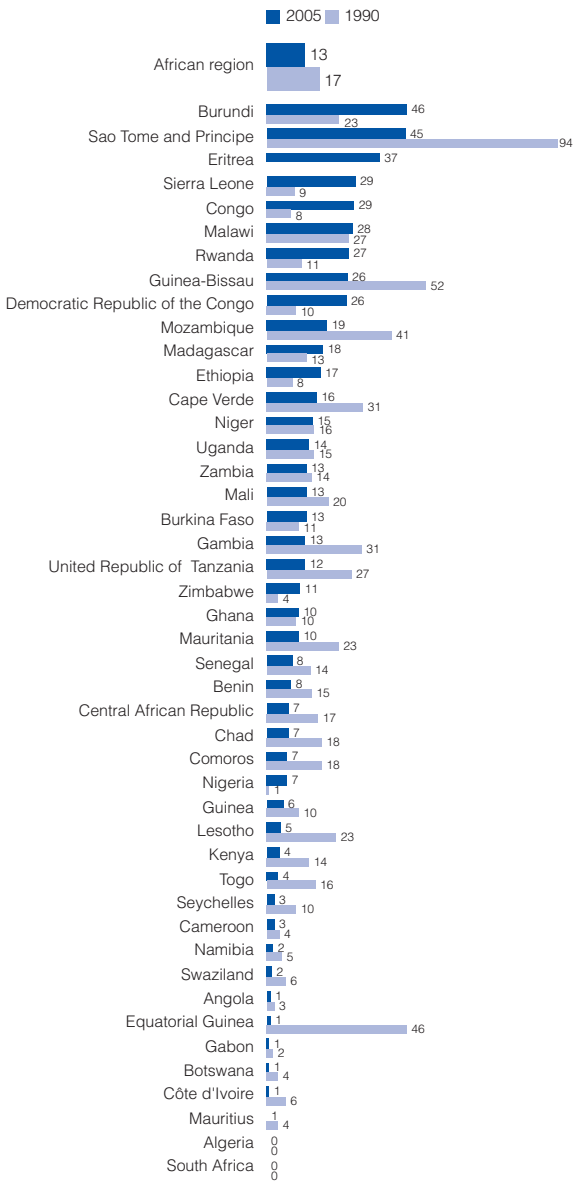


Figure 139: Official development assistance received as percentage of GDP in the African Region, by country, 2005 and 1990

**Official Development Assistance* (ODA) is defined as those flows to countries and territories on the DAC List of ODA Recipients (available at www.oecd.org/dac/stats/daclist) and to multilateral development institutions (1) that are provided by official agencies, including state and local governments, or by their executive agencies; and (2) each transaction of which is (a) administered with the promotion of the economic development and welfare of developing countries as its main objective and (b) concessional in character and conveys a grant element of at least 25% (calculated at a rate of discount of 10%).

†Source: OECD–DAC 2007; World Bank, 2007.

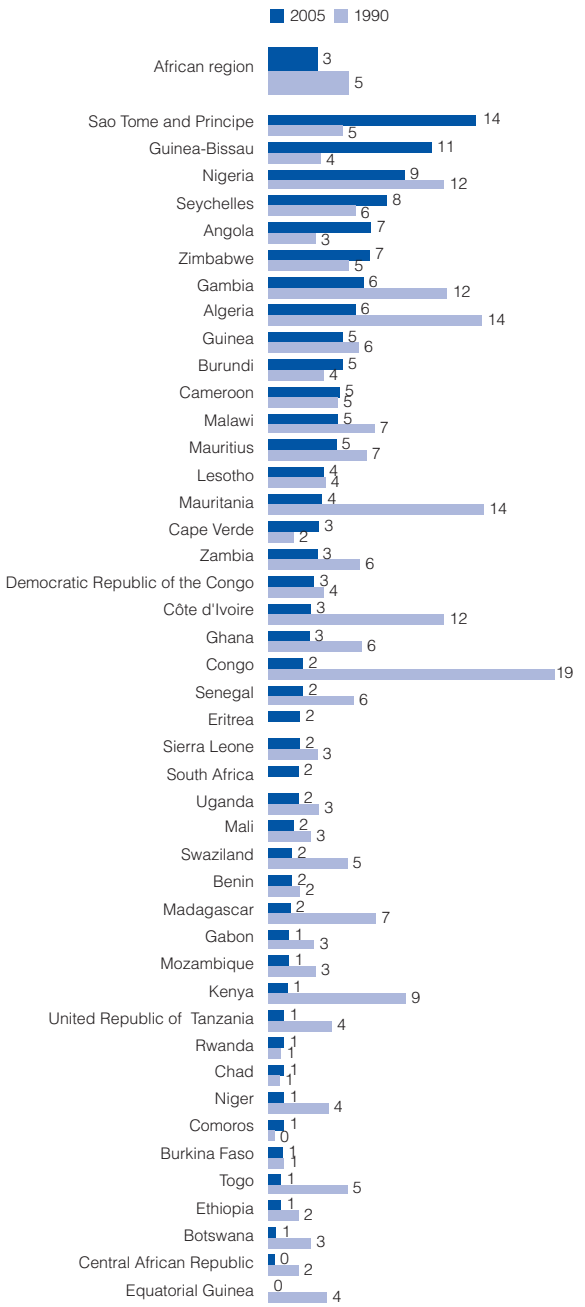


Figure 140: Total debt service as percentage of GDP in the African Region, by country, 1990 and 2005*

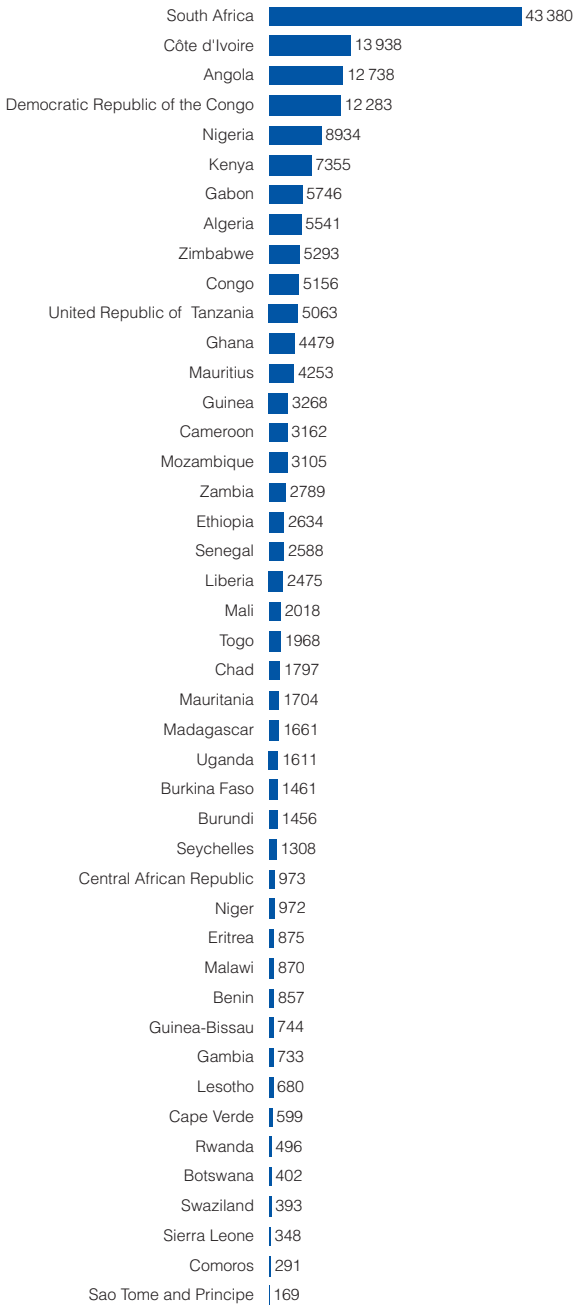


Figure 141: Total external debt stocks† (in millions of current US$) in the African Region, by country, 2007‡

*Source: World Bank, 2010.

†Total external debt is debt owed to non-residents repayable in foreign currency, goods or services. Total external debt is the sum of public, publicly guaranteed and private non-guaranteed long-term debt, use of IMF credit and short-term debt. Short-term debt includes all debt having an original maturity of 1 year or less and interest in arrears on long-term debt.

‡Source: World Bank, Global Development Finance

Science and technology

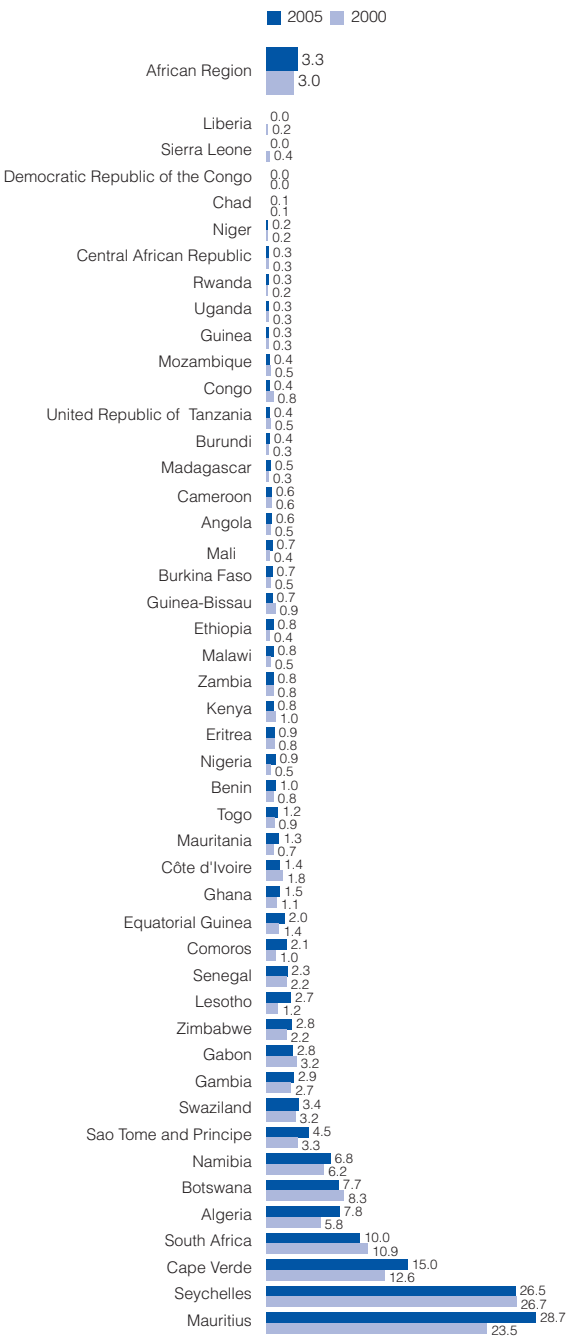


Figure 142: Percentage of population with telephone in the African Region, by country, 2005 and 2000*

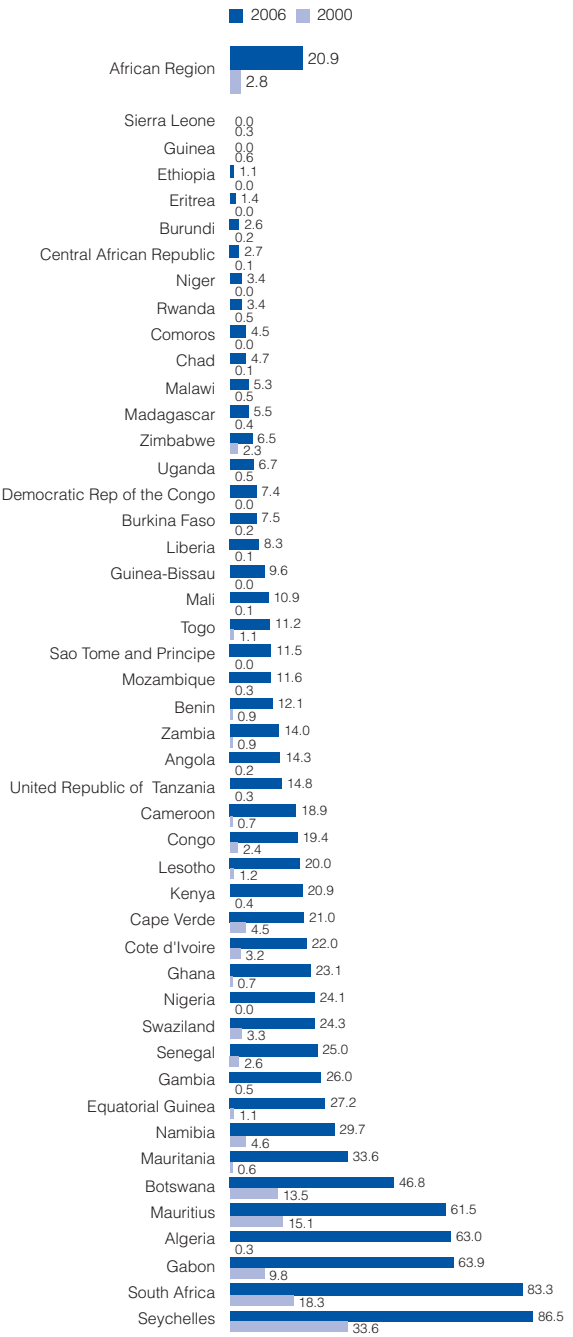


Figure 143: Percentage of population who are cellular or mobile subscribers in the African Region, by country, 2006 and 2000*

*Source: International Telecommunication Union, September 2009.

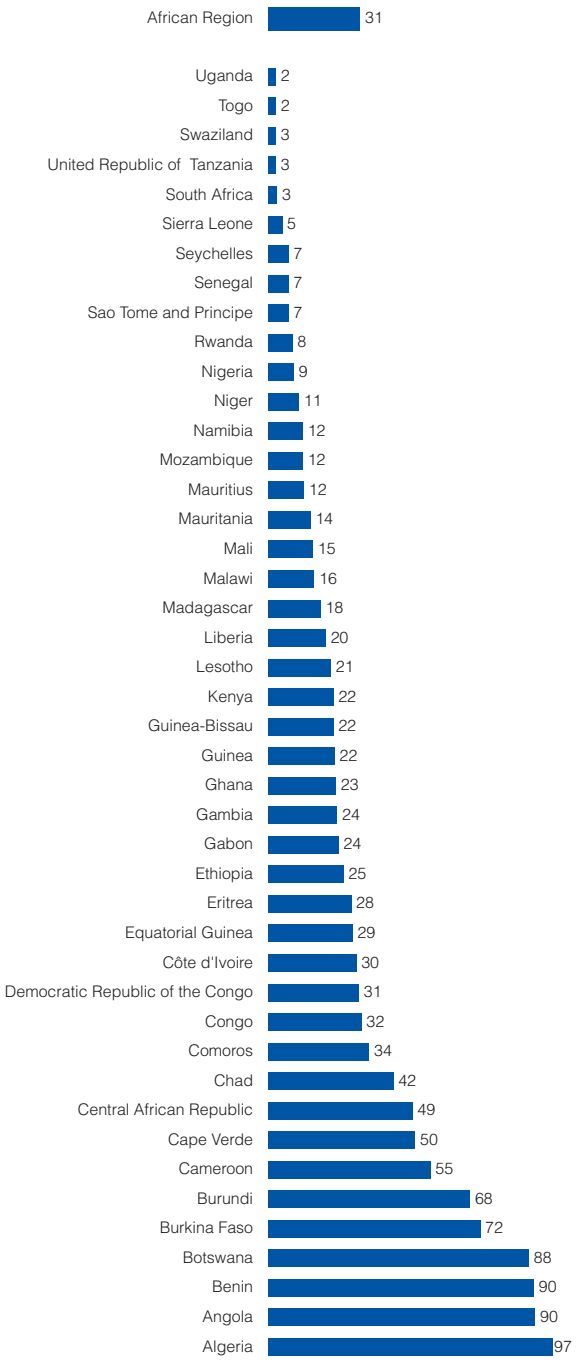


Figure 144: Percentage of population who are telephone (fixed and mobile) subscribers in the African Region, by country, 2007*

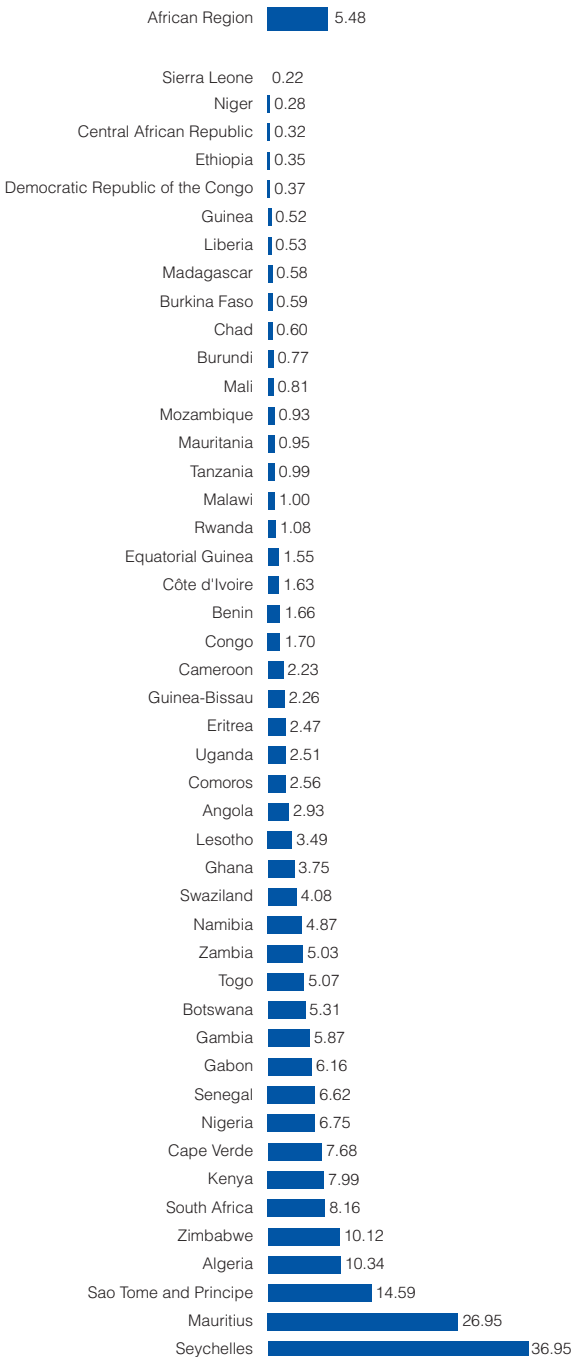


Figure 145: Percentage of the population who are Internet users in the African Region, 2007†

*Source: International Telecommunication Union, September 2009.

†Source: United Nations Statistical Division, MDG database, June 2010.

Emergencies and disasters

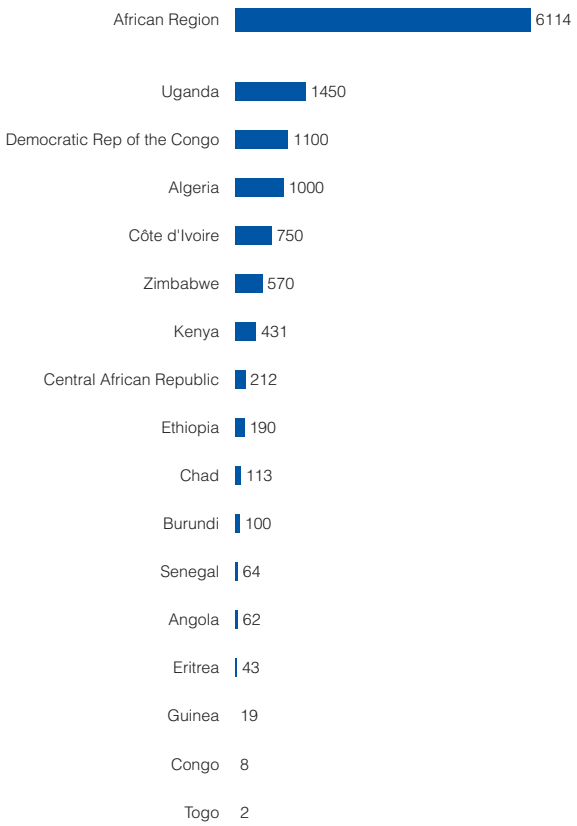


Figure 146: Total number of internally displaced* people (thousands) in the African Region, by country, 2006

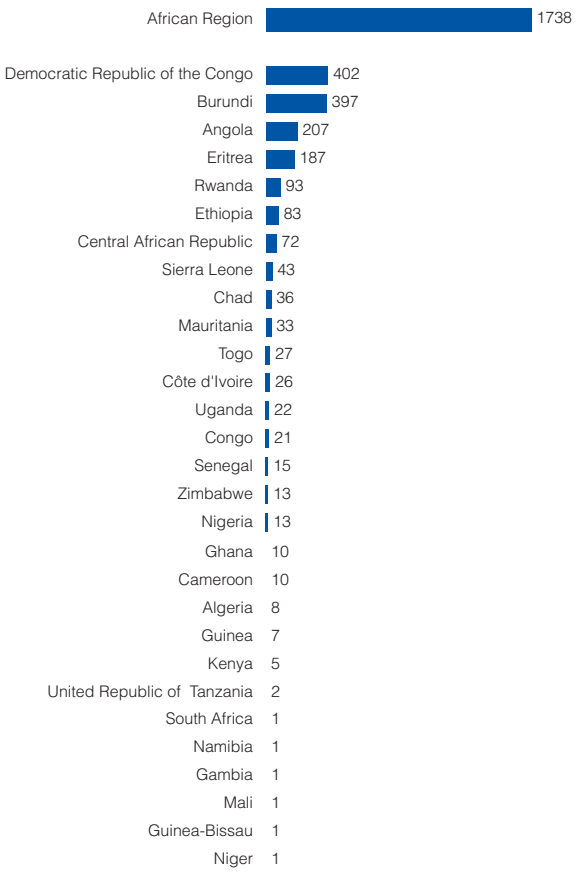


Figure 147: Total number of refugees (in thousands) in the African Region, by country of origin, 2006†

**Internally displaced people* (IDP) are 'persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border.' For more information, see www.internal-displaced.org.

†Source: UNHCR, 2007.

5 Progress on the Health-Related MDGs

MDG-4 (Child health)

Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-5 mortality rate

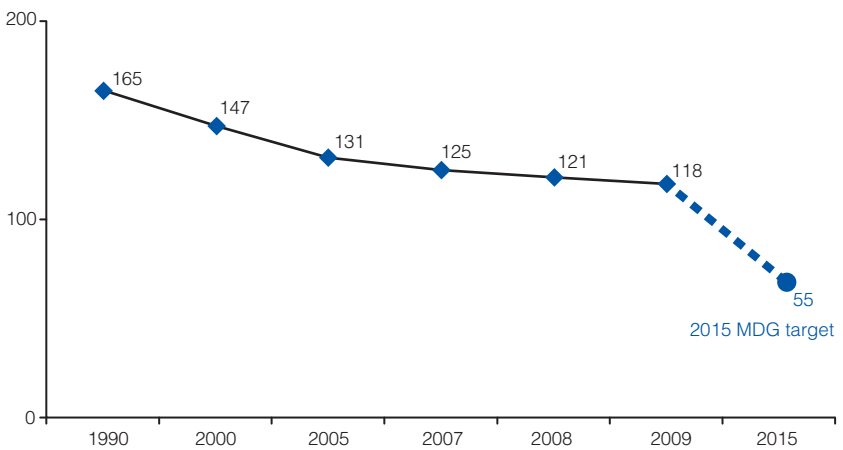


Figure 148: Trend in under-5 mortality rate in the WHO African Region, 1990–2009

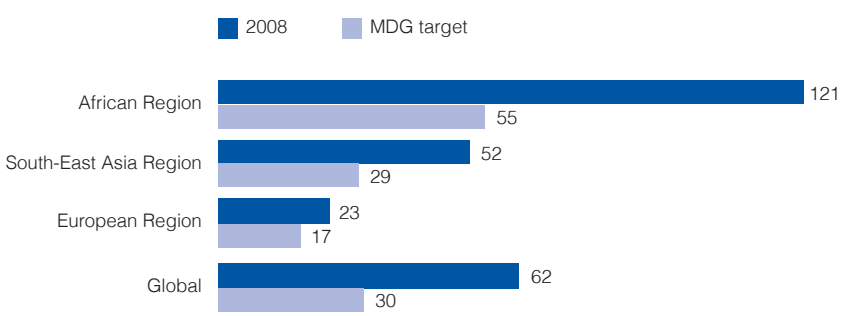


Figure 149: Under-5 mortality rate (per 1000 live births) in WHO Regions, both sexes, 2008 and 1990

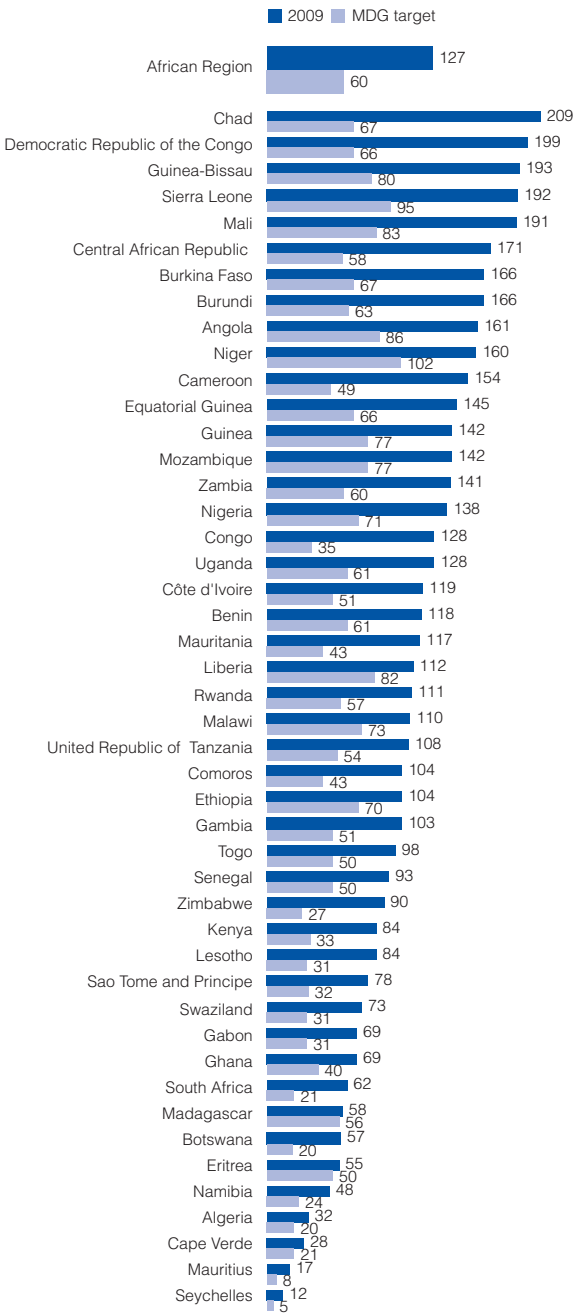


Figure 150: Under-5 mortality rate (per 1000 live births) in the African Region, by country, 2008 and the MDG target*

*Source: *Levels and Trends in Child Mortality; Report 2010. Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation*. UNICEF, WHO, The World Bank and United Nations DESA/Population Division. New York: UNICEF, 2010.

MDG-5 (Maternal health)

Target 5.A: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio

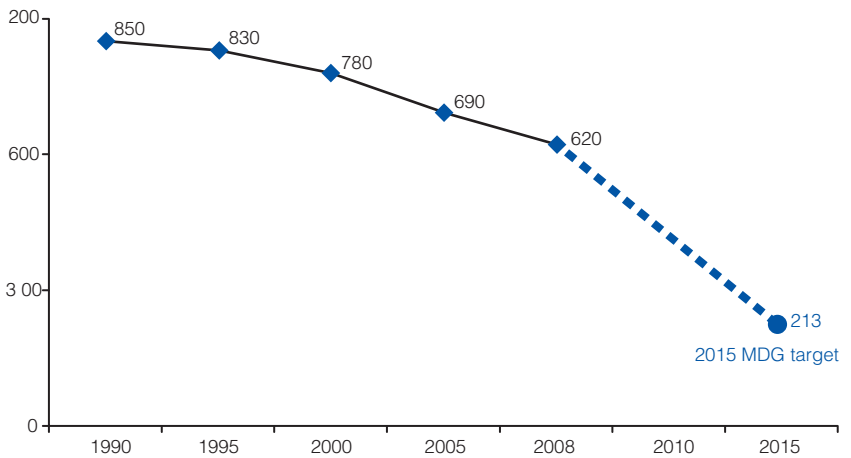


Figure 151: Trend in maternal mortality ratio (per 100,000 live births) in WHO African Region, 1990–2008

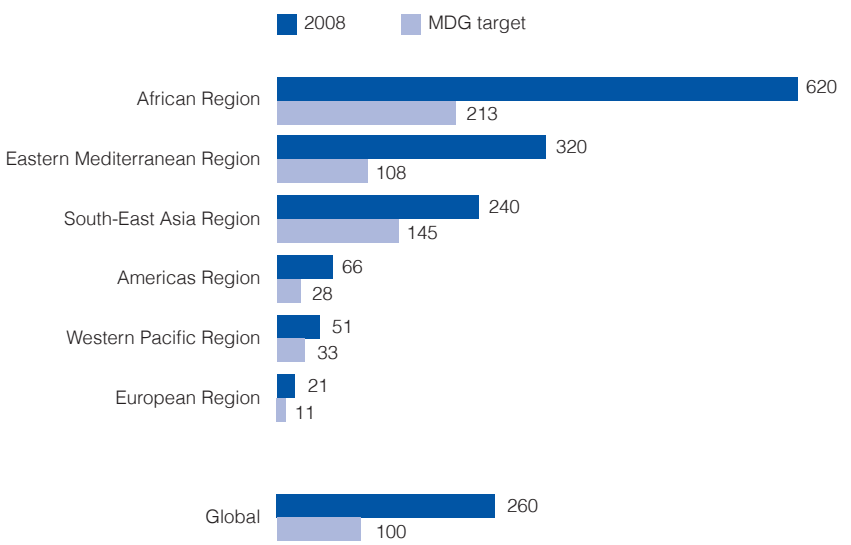


Figure 152: Trend in maternal mortality ratio (per 100,000 live births) in WHO Regions in 2008

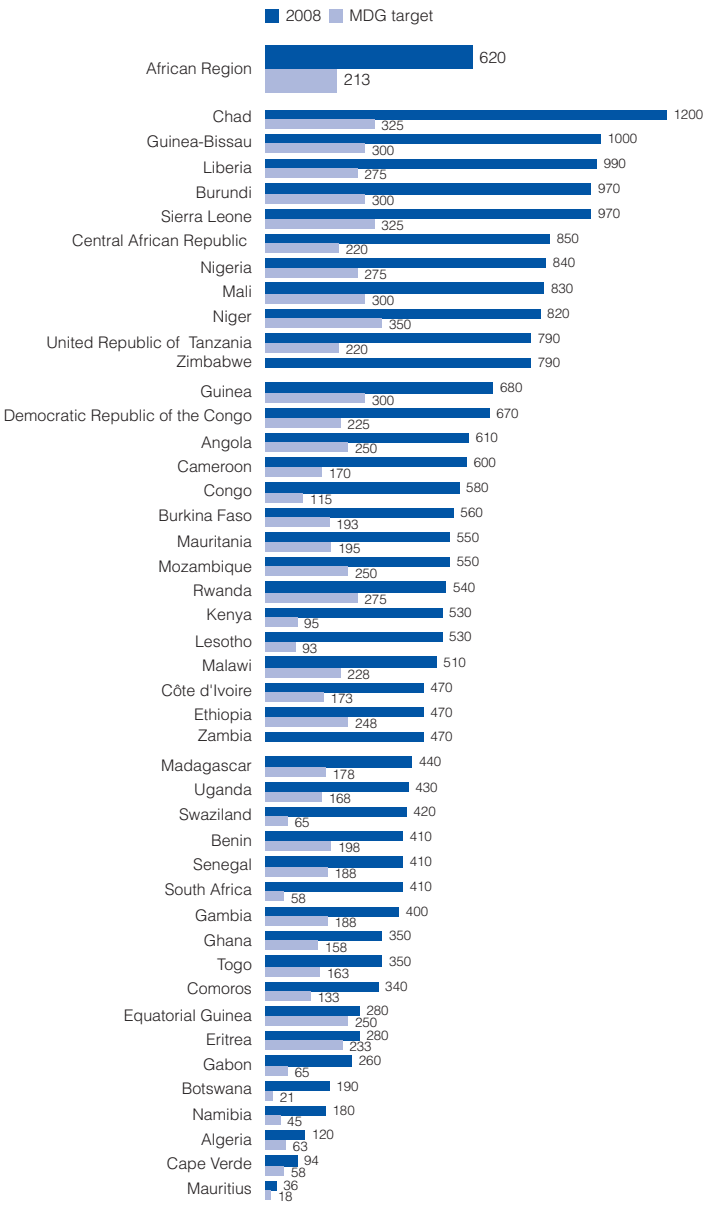


Figure 153: Maternal mortality ratio (per 100 000 live births) in the African Region, by country, 2008 and the MDG target*

*Source: *Trends in Maternal Mortality: 1990 to 2008. Estimates Developed by WHO, UNICEF, UNFPA and The World Bank.* Geneva: WHO, 2010.

Target 5.B: Achieve, by 2015, universal access to reproductive health

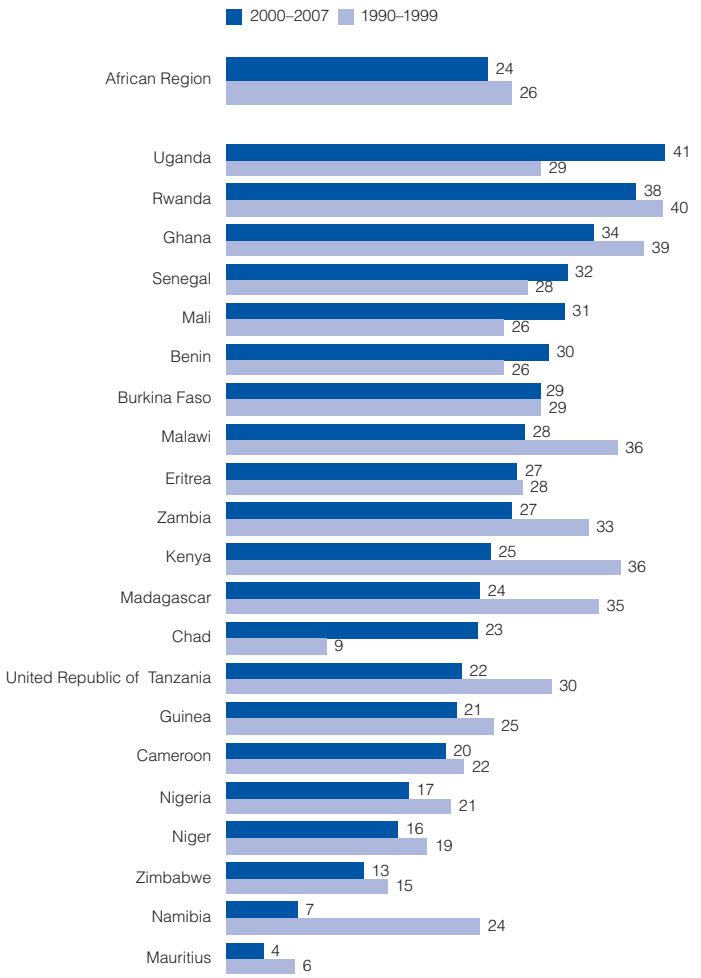


Figure 154: Percentage of unmet need for family planning* in the African Region, by country, 2000–2007 and 1990–1999

*The proportion of women of reproductive age (15–49 years) who are married or in union and who have an unmet need for family planning, i.e. who do not want any more children or want to wait at least 2 years before having a baby, and yet are not using contraception. Further details can be found on the websites http://www.unfpa.org and http://www.un.org/esa/population/unpop.html.

MDG-6 (AIDS, malaria and TB)

Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS

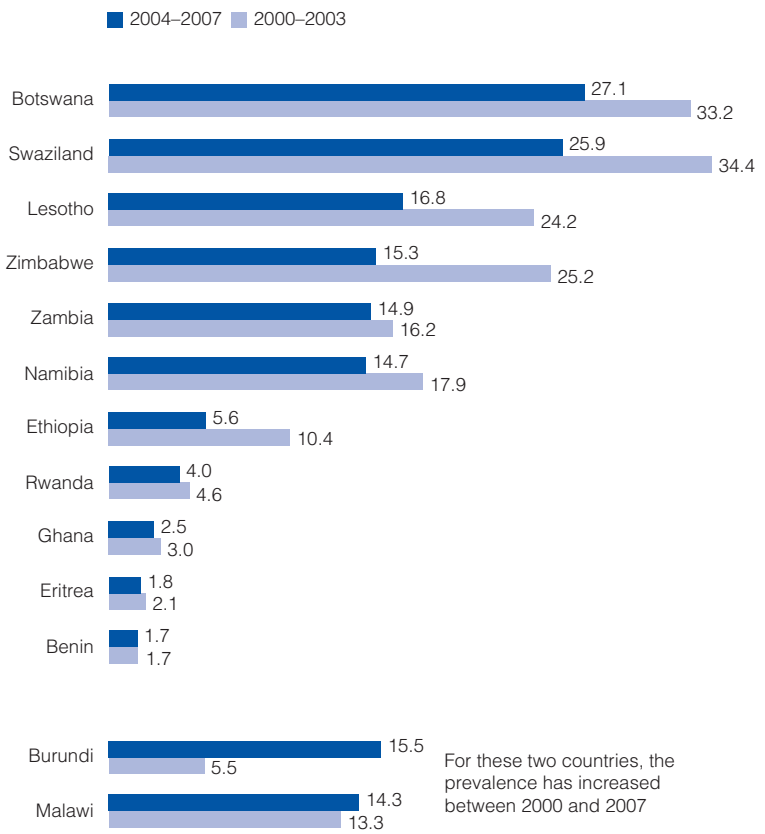


Figure 155: Percentage of HIV-positive pregnant women 15–24 years of age for 13 countries with trend data in the African Region, 2004–2007 and 2000–2003

Target 6.B: Achieve, by 2015, universal access to treatment for HIV/AIDS for all those who need it

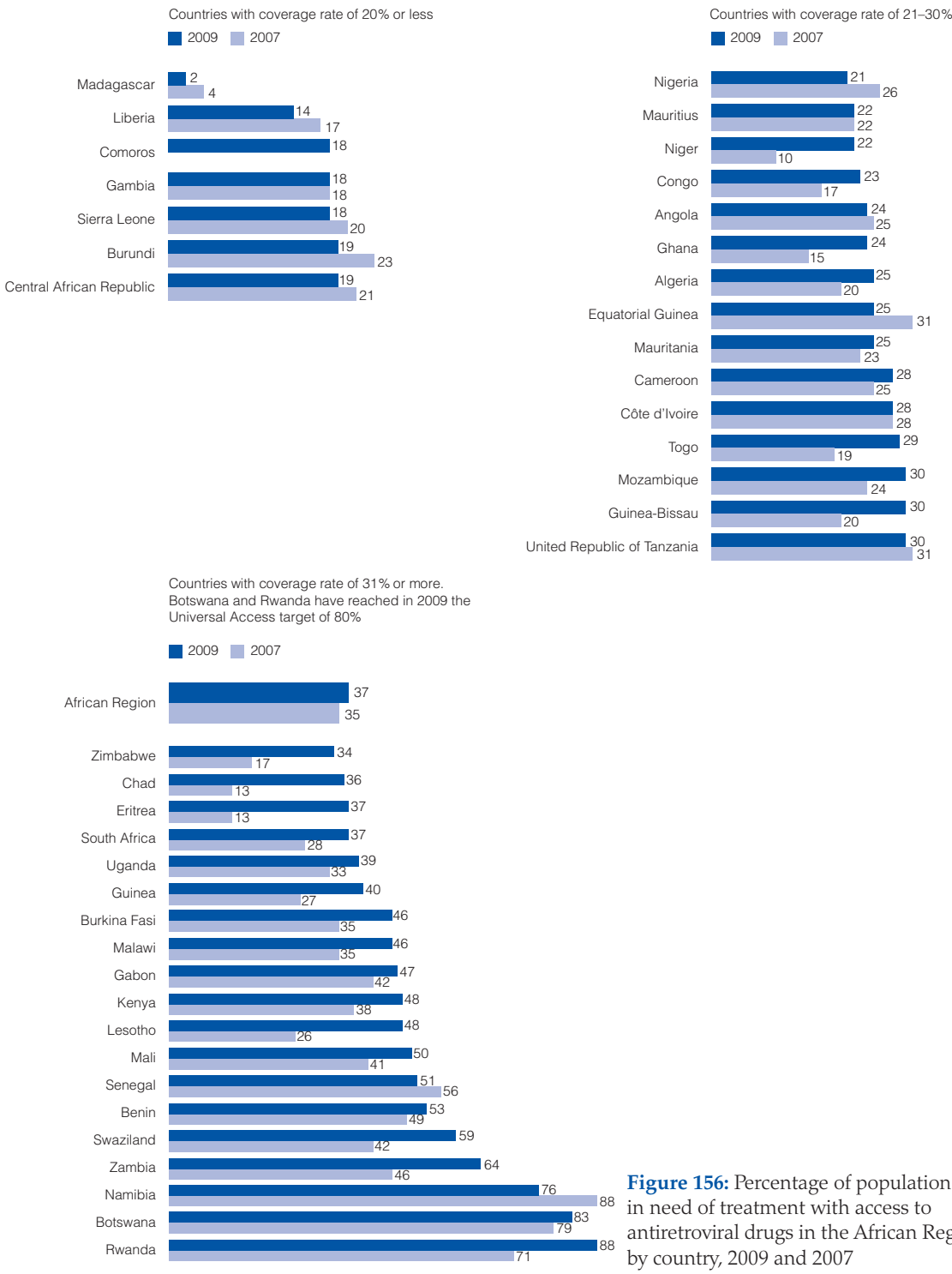


Figure 156: Percentage of population in need of treatment with access to antiretroviral drugs in the African Region, by country, 2009 and 2007

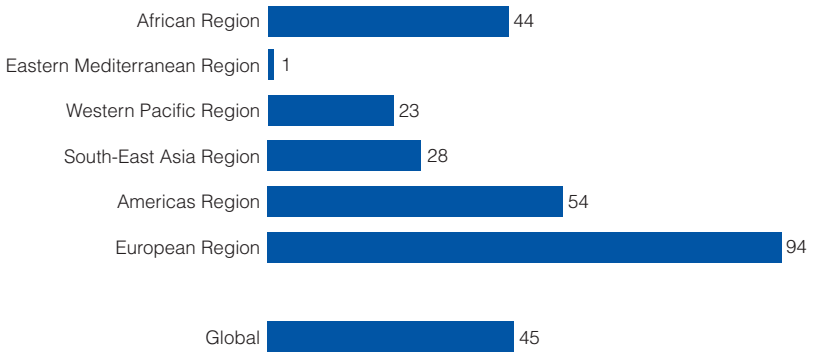


Figure 157: Percentage of population living with advanced HIV infection who are receiving antiretroviral therapy in 2007

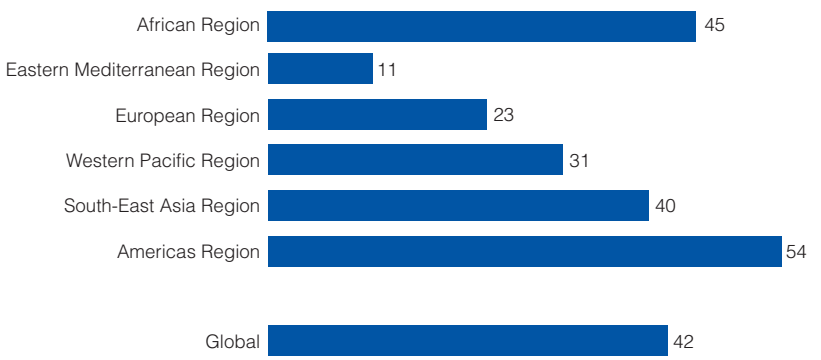


Figure 158: Percentage of pregnant women living with HIV infection who are receiving antiretroviral therapy for preventing mother-to-child transmission, 2008

Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

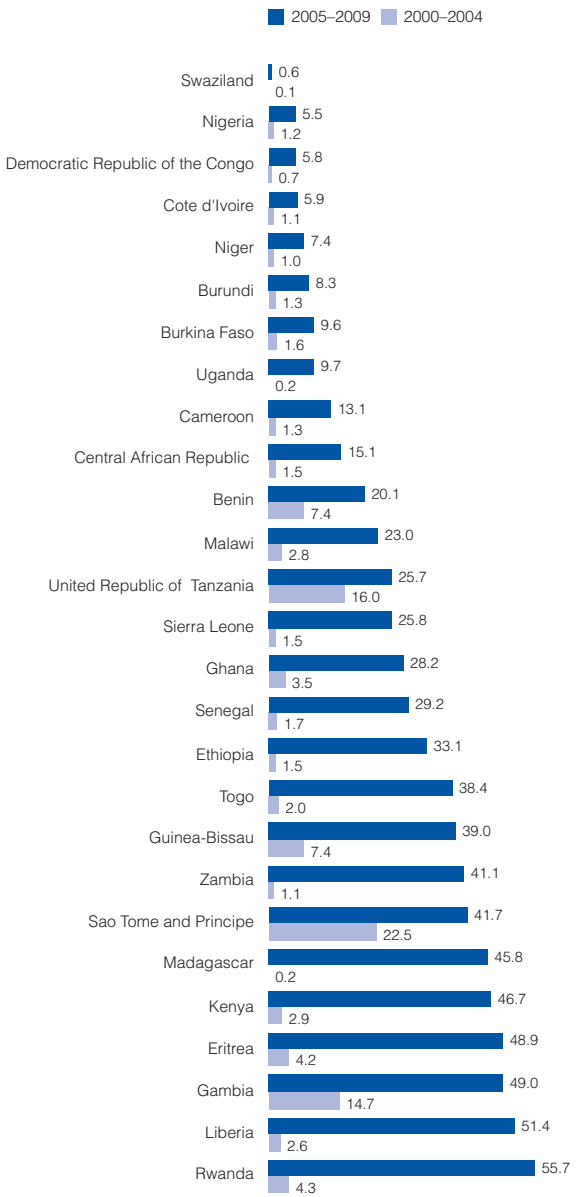


Figure 159: Percentage of children under 5 years of age sleeping under insecticide-treated bed nets in the African Region, 2005–2009 and 2000–2004

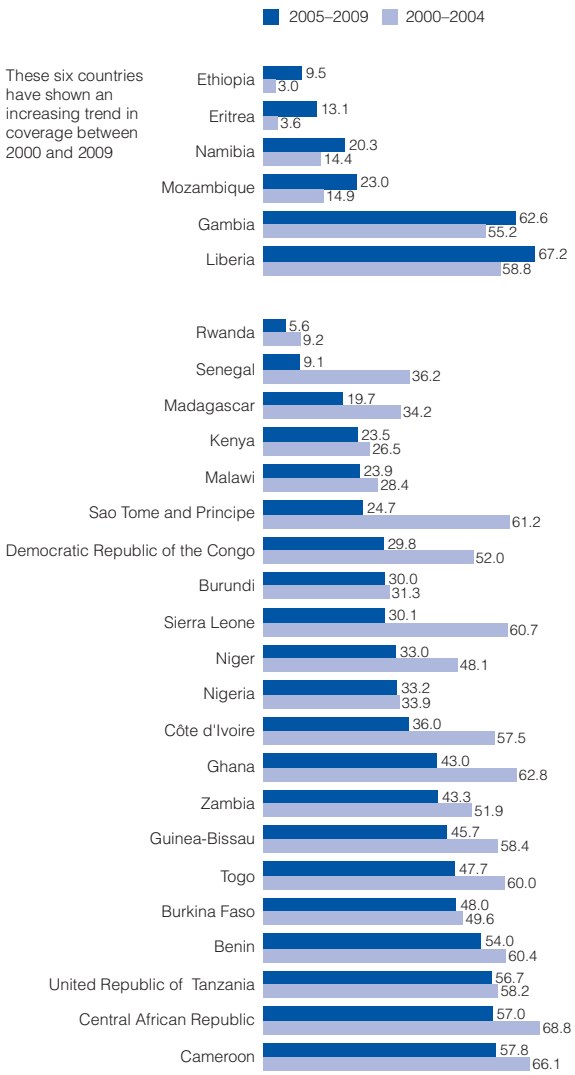


Figure 160: Percentage of children under 5 years of age with fever being treated with antimalarial drugs in the African Region, 2005–2009 and 2000–2004

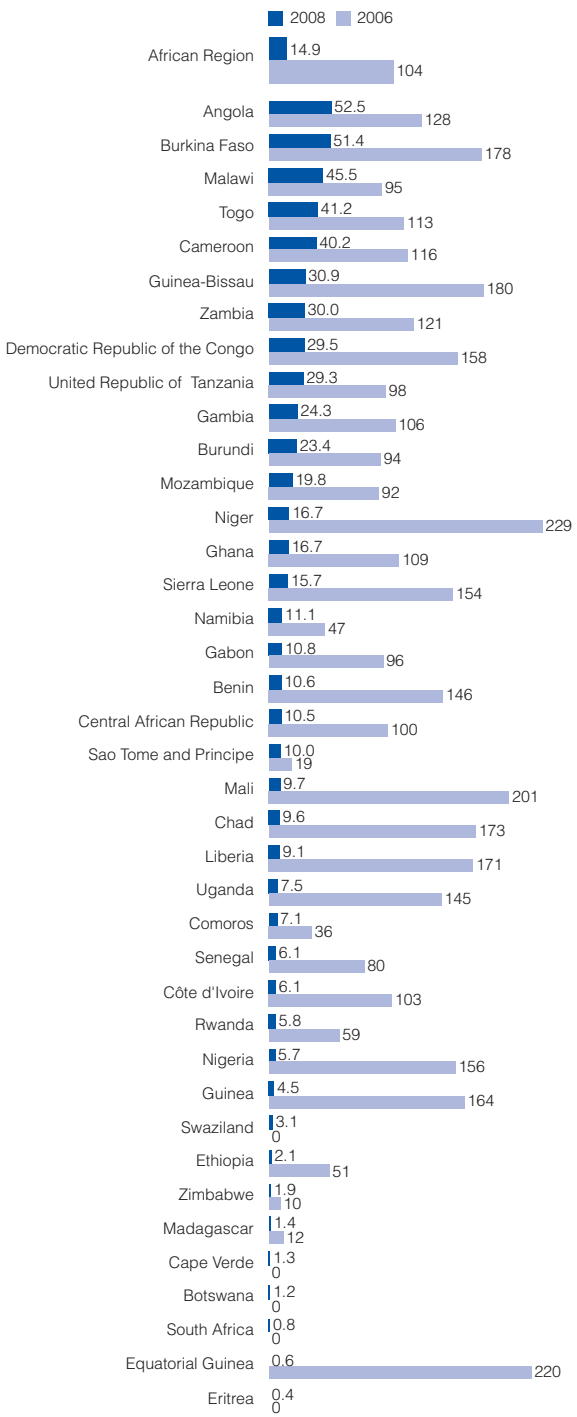


Figure 161: Malaria mortality rate (per 100 000 population) in the African Region, by country, 2008 and 2006*

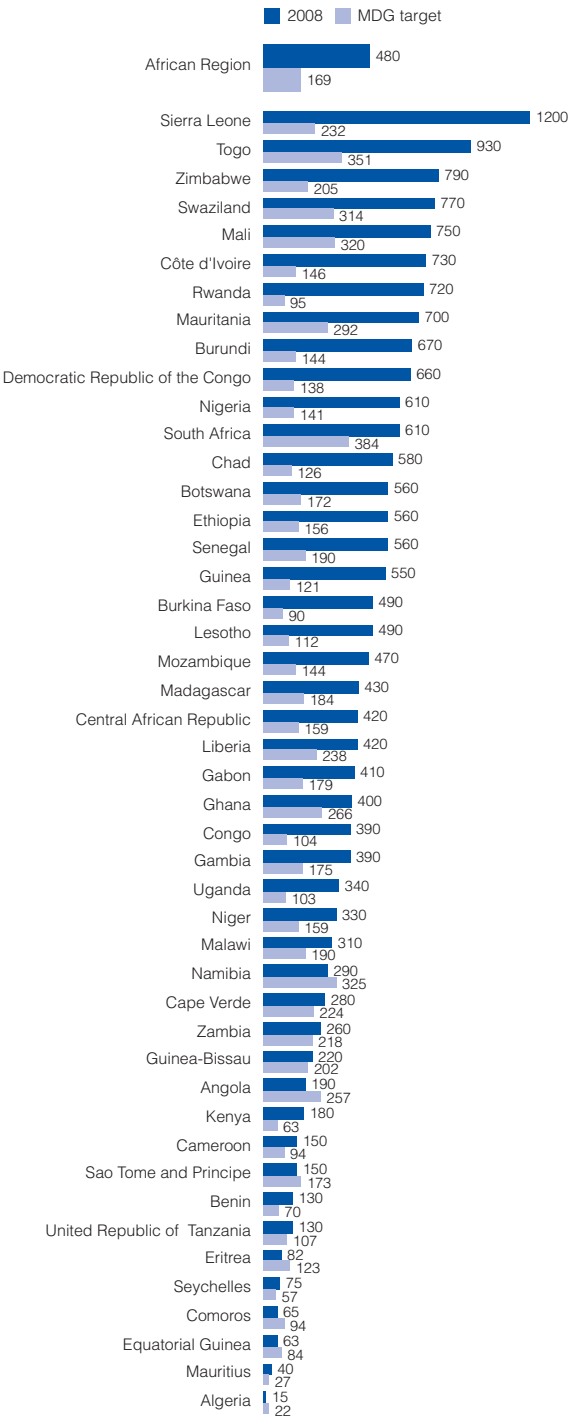


Figure 162: Prevalence of tuberculosis (per 100 000 population) in the African Region, by country, 2008 and the MDG target

*Source: *World Malaria Report 2009*. Geneva: WHO, 2009.

MDG-1 (Malnourished children)

Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

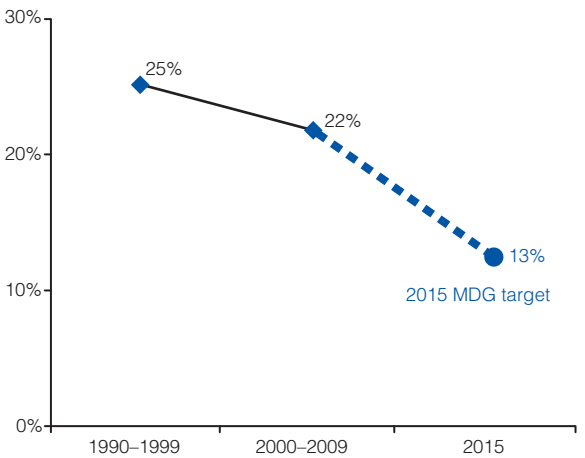


Figure 163: Trend in children aged under 5 years that are underweight

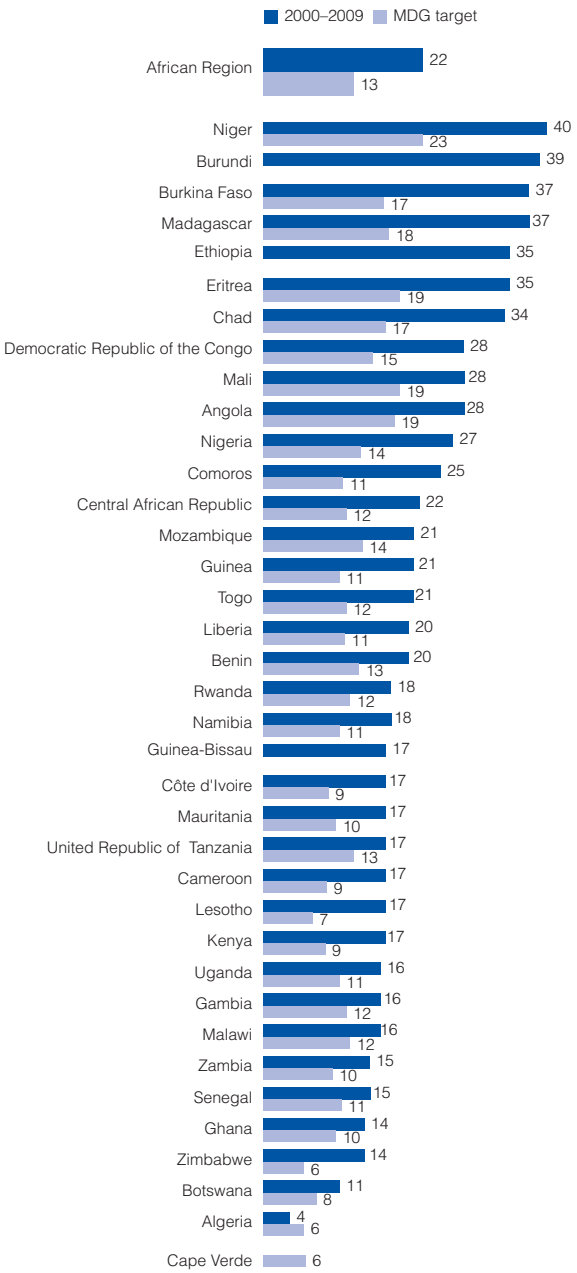


Figure 164: Percentage of underweight children under 5 years of age in the African Region, by country, 2000–2009 and the MDG target

MDG-7 (Water and sanitation)

Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation

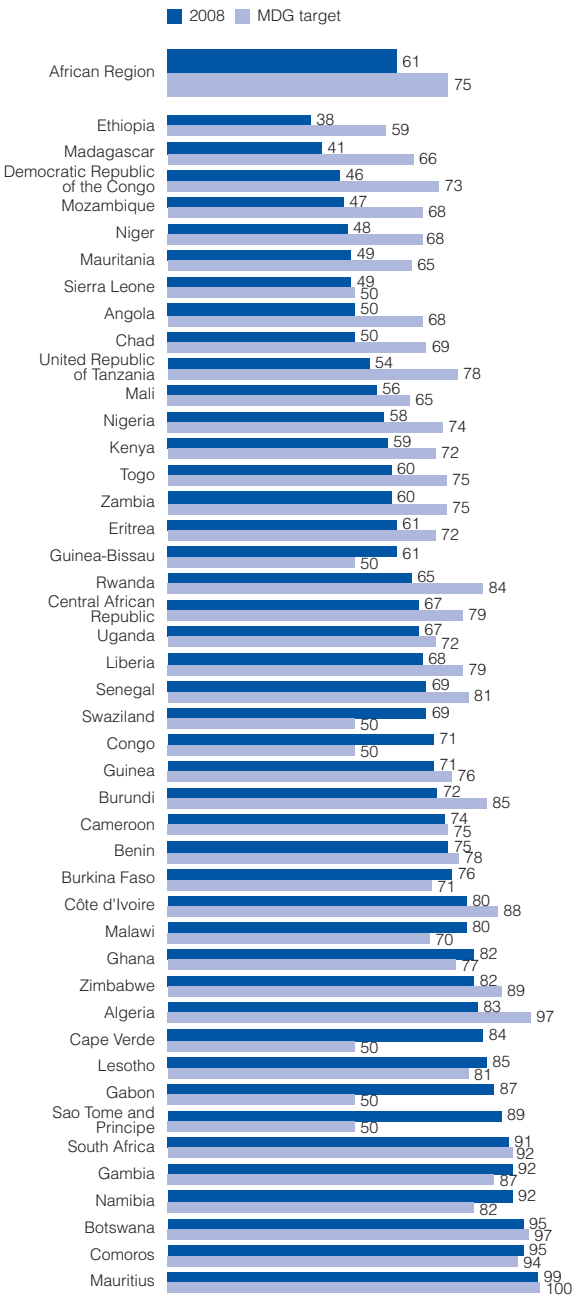


Figure 165: Percentage of the population using improved drinking water sources in the African Region, by country, 2008 and the MDG target

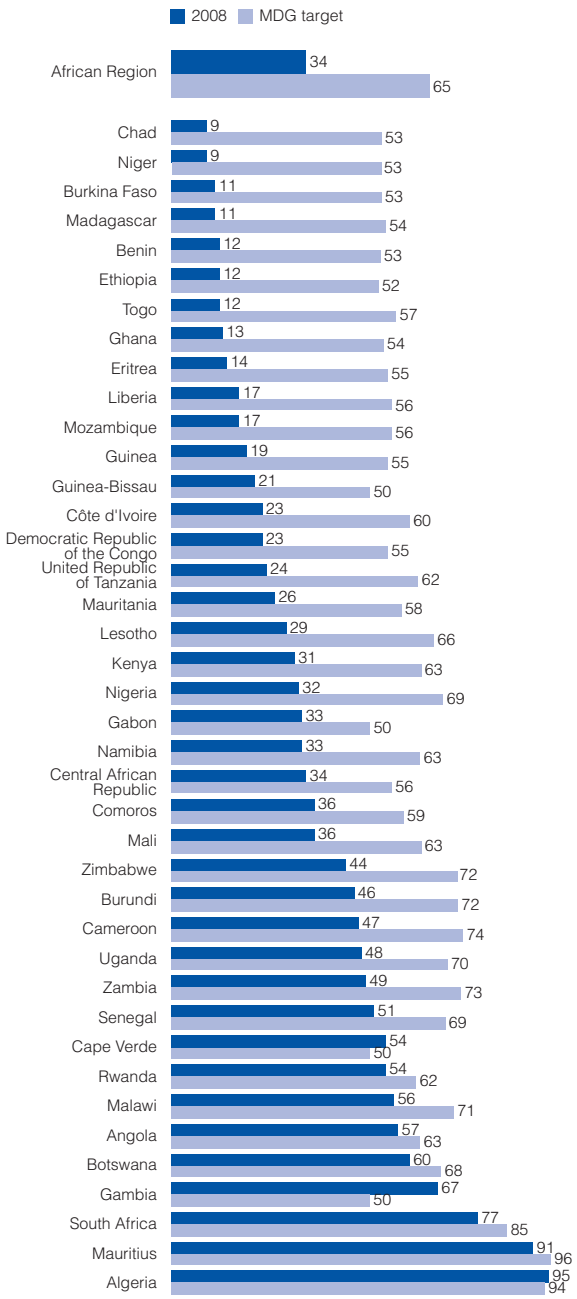


Figure 166: Percentage of the population using improved sanitation facilities in the African Region, by country, 2008 and the MDG target

MDG-8 (Develop a global partnership for development)

Target 8.D: Deal comprehensively with debt problems of developing countries for national and international measures in order to make debt sustainable in the long term

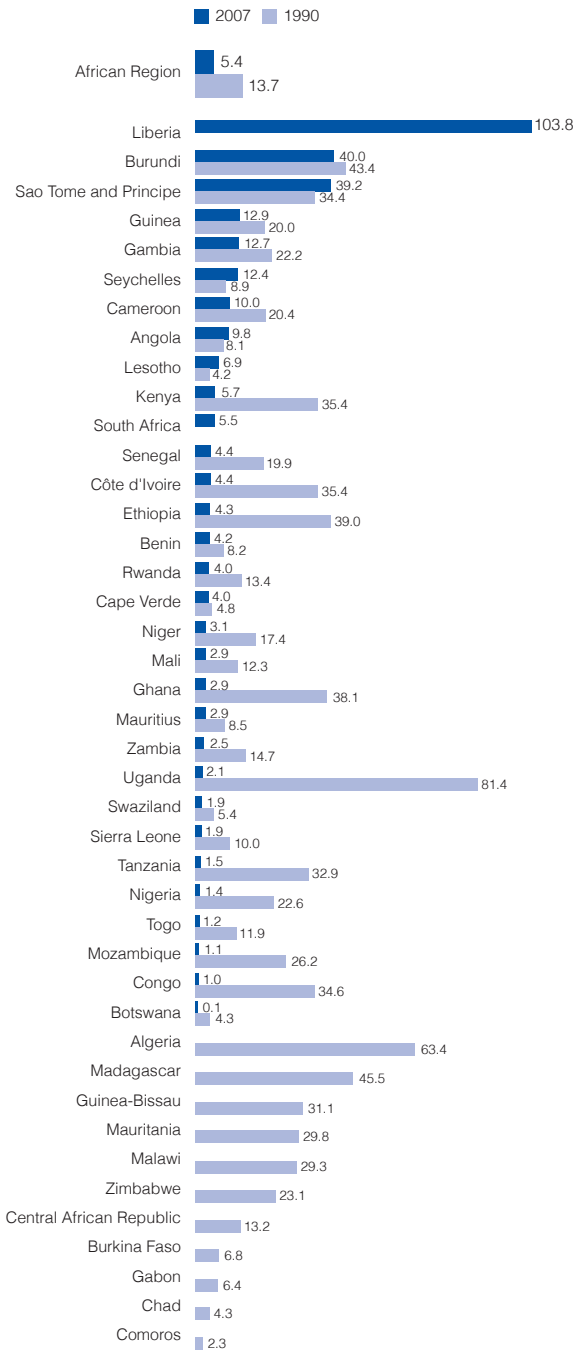


Figure 167: Total debt service as percentage of exports of goods, services and income

6 Explanatory Notes

The following provides the definition of the health statistics categories included in this volume, as well as the rationale for their inclusion and the estimation methods used in their production.

• HEALTH STATUS

1. Life expectancy at birth

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.

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).

Source: *Life Tables for WHO Member States*. Geneva, WHO, 2010. Available at: www.who.int/whosis/database/life_tables/life_tables.cfm.

2. Healthy life expectancy (HALE)

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.

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.

HALE estimates use methods described in the statistical annex to the *World Health Report 2004*.

Estimates for 2007 have been revised to take into account the Global Burden of Disease estimates for Member States for the year 2004 and may not be entirely comparable with those for 2002 published

in *World Health Statistics 2007*. Income-group aggregates are based on the 2008 World Bank list of economies.

3. Life table (see Life expectancy at birth)

Data sources: (i) civil or sample registration: mortality by age and sex is used to calculate age-specific rates. (ii) Census: mortality by age and sex is tabulated from questions on recent deaths that occurred in the household during a given period preceding the census (usually 12 months). (iii) 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.

4. Probability of dying (per 1000) between ages 15 and 60 years (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 owing 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.

Mortality data: World Health Organization, 2010 (www.who.int/healthinfo/statistics/mortality/en/).

5. Probability of dying (per 1000) under age 5 years (under-5 mortality rate)/ Probability of dying (per 1000) under age one year (infant mortality rate)

Rationale for use: Under-5 and infant mortality rates are leading indicators of the level of child health and overall development in countries. They are also MDG indicators.

Definition: The under-5 mortality rate is the probability of a child born in a specific year or period dying before reaching the age of 5, if subject to age-specific mortality rates of that period. The 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.

Methods of estimation: Empirical data from different sources are consolidated to obtain estimates of the level and trend in under-5 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-5 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 and Coale–Demeny model life tables for the other countries. It should be noted that the infant mortality data from surveys are exposed to recall bias; hence their estimates are derived from under-5 mortality, which leads to a supplementary step to estimate infant mortality rates.

6. Maternal mortality ratio (per 100 000 live births)

Rationale for use: Complications during pregnancy and childbirth are leading causes of death and disability among women of reproductive age in developing countries. The maternal mortality ratio (MMR) represents the risk associated with each pregnancy, i.e. the obstetric risk. It is also an MDG indicator for monitoring Goal 5 of improving maternal health.

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

Methods of estimation: Measuring maternal mortality accurately is difficult except where comprehensive registration of deaths and their causes exists. 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 whose dimensions and direction cannot be determined. Reproductive-age mortality studies (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 the best way to estimate levels of maternal mortality. Estimates derived from household surveys are usually based on information retrospectively collected about the deaths of sisters of the respondents and could refer back up to an average 12 years, and they 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.

Sources: (i) Towards Reaching Health-Related Millennium Development Goals: Progress Report and Way Forward. Report of the Regional Director. Brazzaville: WHO Regional Office for Africa, 2009. (ii) Maternal Mortality in 2005. Estimates Developed by WHO, UNICEF, UNFPA and the World Bank. Geneva: WHO, 2008. Available at: http://whqlibdoc.who.int/publications/2007/9789241596213_eng.pdf.

7. Age-standardized death rates per 100 000 by cause

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 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 population age distribution 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.

Rates are age-standardized to WHO's World Standard Population. See *Age Standardization of Rates: A New WHO Standard.* Geneva, WHO, 2001 (GPE Discussion Paper Series No. 31). Available at: www.who.int/healthinfo/paper31.pdf.

8. Years of life lost (percentage of total)

Rationale for use: Years of life lost (YLL) take into account the age at which deaths occur by giving greater weight to deaths at younger age and lower weight to deaths at older age. The years of life lost (percentage of total) indicator measures the YLL due to a cause as a proportion of the total YLL lost in the population due to premature mortality.

Definition: YLL 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 YLL 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 YLL, and deaths at ages 5–20 to around 36 YLL.

Source: Mortality and Burden of Disease Estimates for WHO Member States in 2004. Geneva, WHO, 2009. Available at: www.who.int/entity/healthinfo/statistics/bodgbddeathdalyestimates.xls. Communicable diseases include maternal causes, conditions arising during the perinatal period and nutritional deficiencies. Income-group aggregates are based on the 2004 World Bank list of economies. Individual percentages may not add up to 100% owing to rounding

9. The disability-adjusted life-year (DALY)

Rationale for use: DALY is a health gap measure that extends the concept of potential years of life lost due to premature death (PYLL) to include equivalent years of 'healthy' life lost by virtue of being in states of poor health or disability. DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population and the years lost due to disability (YLD) for incident cases of the health condition.

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 and 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 notification 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 notification systems for 21 specific causes of death.

10. Causes of death among children under 5 years of age (%)

Rationale for use: MDG4 consists in the reduction of under-5 mortality by two-thirds in 2015, from its level in 1990. Child survival efforts 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 cause(s) of death (CoD) as entered on the medical certificate of cause of death in countries with civil (vital) registration system. The underlying CoD is being analysed. 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 CoD.

Methods of estimation: CoD 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 their proportions to total under-5 deaths were then computed. For countries with incomplete 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; non-communicable diseases; or injuries and external causes.

In a second step, cause-specific under-5 mortality estimates from the Child Health Epidemiology Reference Group (CHERG), WHO Technical Programmes and the Joint United Nations Programme on HIV/AIDS (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.

Source: *Mortality Data*. Geneva, WHO, 2010. Available at: www.who.int/healthinfo/statistics/mortality/en/.

• THE HEALTH SYSTEM

Health Financing

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

12. General government expenditure on health as percentage of total general government expenditure

13. 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 (NHAs) provide a large set of indicators based on the expenditure information collected within an internationally recognized framework. NHAs 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 across providers and functions of health systems and benefits across geographic, demographic, socioeconomic and epidemiological dimensions.

Definitions:

- Total health expenditure as percentage of GDP
- Percentage of total general government expenditure that is spent on health
- Per capita total expenditure on health at international dollar rate

Methods of estimation: Only about 95 countries either have produced a full NHA 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 websites, central bank reports, non-governmental organization reports, academic studies, and reports and data provided by central statistical offices and ministries.

Source: WHO National Health Accounts (NHA), Country Health Expenditure Database. Geneva: WHO, February 2010. Available at: www.who.int/nha/country/. The regional, income and global figures are calculated using Purchasing Power Parity (PPP) terms. When the number is smaller than 0.05%, the percentage may appear as zero. For per capita expenditure indicators, this is represented as <1. In countries where the fiscal year begins in July, expenditure data have been allocated to the later calendar year (for example, 2008 data will cover the fiscal year 2007–08). Absolute values of expenditures are expressed in nominal terms (current prices). National currency units per US$ are calculated using the average exchange rates for the year. For 2008, the use of yearly average exchange rates (compared with year-end exchange rates) may not fully represent the impact of the global financial crisis.

14. General government expenditure on health as percentage of total expenditure on health

15. General government expenditure on health as percentage of total government expenditure

16. External resources for health as percentage of total expenditure on health

17. Out-of-pocket expenditure as percentage of private expenditure on health

18. Per capita total expenditure on health at average exchange rate (US$)

19. Per capita government expenditure on health at average exchange rate (US$)

20. Per capita government expenditure on health at international dollar rate

Rationale for use: Health financing is a critical component of health systems. NHAs provide a large set of indicators based on the expenditure information collected within an internationally recognized framework. NHAs 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 across providers and functions of health systems and benefits across geographic, demographic, socioeconomic and epidemiological dimensions.

Definitions: Key indicators for which the data are available:

- Level of *total expenditure on health* as percentage of 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
  - Reliance on external resources in financing health

Associated terms:

- *Gross domestic product* (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 or for 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 and by 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 health expenditure* (ExtHE) includes all grants and loans, whether passing through governments or private entities for health goods and services, 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) are 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* are the outlays by private enterprises for medical care and health-enhancing benefits other than payment to social security or other prepaid schemes.
    - *Non-profit institutions serving mainly households* are the 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) comprises 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 fee for services.
- *Exchange rate* is 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 the US dollar, i.e. the measure that minimizes the consequences of differences in price levels between countries.

Methods of estimation and sources: About 100 countries either have produced full national health accounts or report expenditure on health to the 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.

For details on sources and methods, see www.who.int/nha.

Health Workforce

21. Number of:

- physicians per 10000 population
- nurses per 10000 population
- midwives per 10000 population

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

Definitions:

- *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, who are counted as community health workers, appear elsewhere.
- *Dentists*: includes dentists, dental assistants and dental technicians.
- *Pharmacists*: includes pharmacists, pharmaceutical assistants and pharmaceutical technicians.
- *Public and environmental health workers*: includes environmental and public health officers, sanitarians, hygienists, public and environmental 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.
- *Laboratory health workers*: includes laboratory scientists, laboratory assistants, laboratory technicians and radiographers.
- *Other health workers*: includes a large number of occupations such as dieticians and nutritionists, medical assistants, occupational therapists, operators of medical and dentistry equipment, optometrists and opticians, physiotherapists, podiatrists, prosthetic/orthotic engineers, psychologists, respiratory therapists, speech pathologists, and 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.

Methods of estimation: No methods of estimation have been developed.

Source: *WHO Global Atlas of the Health Workforce*. Geneva: WHO, 2009. Available at: http://apps.who.int/globalatlas/default.asp. See this source for the latest updates, time-trend statistics and disaggregated data, as well as metadata descriptors. In general, the denominator data for health workforce density (i.e. national population estimates) were obtained from the World Population Prospects Database of the United Nations Population Division. In some cases, official reports provided only workforce density indicators, from which estimates of the absolute numbers were calculated. Depending on the organization of national health systems and means of monitoring, data may not be exactly comparable across countries. Data from the years prior to 2000 were excluded from this edition.

Medical Products and Equipment

22. Number of hospital beds per 10 000 population

Rationale for use: Service delivery is an important component of health systems. To capture availability, access and distribution of health services delivery, a range of indicators or a composite indicator is needed. Currently, there are no such data for the majority of countries. Inpatient bed density is one of the few available indicators on a component of level of health service delivery.

Definition: Number of inpatient beds per 10 000 population.

Methods of estimation: Empirical data only, with possible adjustment for underreporting (e.g. missing private facilities). Additional data are compiled by the WHO Regional Office for Africa.

Health Information – Civil Registration Coverage

23. Coverage of vital registration of deaths

Rationale for use: *Health* information is an essential component of health systems. The registration of births and deaths with causes of death, called 'civil registration (vital registration)', is an important component of a country's health information system.

Definition: Percentage of estimated total deaths that are 'counted' through a civil registration system.

Methods of estimation: Expected numbers of deaths by age and sex are estimated from current life tables, based on multiple sources. Reported numbers are compared with expected numbers by age and sex to obtain an estimate of coverage of the vital registration system.

Sources: (i) ***United Nations Demographic Yearbook 2007***. New York: United Nations Statistics Division, 2009. Available at: http://unstats.un.org/unsd/demographic/products/dyb/dybsets/2007%20DYB.pdf; (ii) *WHO Mortality Database: Tables*. Geneva: WHO, 2009. Available at: www.who.int/healthinfo/morttables.

• SPECIFIC PROGRAMS AND SERVICES

24. Estimated rate of adults (15 years and older) dying of HIV/AIDS (per 1000)/ Estimated rate of children below 15 years of age dying of HIV/AIDS (per 1000)

Rationale for use: The mortality rates for adults and children below 15 are leading indicators of the level

of impact of the HIV/AIDS epidemic and the impact of interventions, especially scale-up of treatment and prevention of mother-to-child transmission in countries.

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

Methods of estimation: Empirical data from different HIV surveillance sources are consolidated to obtain estimates of the level and trend in adult and child mortality by using standard methods and tools for HIV estimates appropriate to the level of HIV epidemic. However, to obtain the best possible estimates, judgement needs to be made on data quality and how representative it is of the population. UNAIDS/WHO produce country-specific estimates every 2 years.

Source: Based on the *2008 Report on the Global AIDS Epidemic*. Geneva, UNAIDS and WHO, 2008. See *Annex: HIV and AIDS Estimates and Data, 2007 and 2001*. Available at: http://data.unaids.org/pub/GlobalReport/2008/jc1510_2008_global_report_pp211_234_en.pdf. Ranges of estimates are available from this document. WHO regional and global figures are updates for the year 2008. Income-group aggregates are based on the 2008 World Bank list of economies.

25. HIV prevalence among the population aged 15–49 years

Rationale for use: HIV/AIDS has become a major public health problem in many countries, and monitoring the course of the epidemic and the impact of interventions is crucial. Both the MDGs and the United Nations General Assembly Special Session on HIV and AIDS (UNGAS) have set goals for reducing HIV prevalence.

Definition: Percentage of people with HIV infection among all people aged 15–49 years.

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 epidemics.

26. People with advanced HIV infection receiving antiretroviral (ARV) combination therapy (%)

Rationale for use: As the HIV epidemic matures, increasing numbers of people are reaching advanced stages of HIV infection. ARV combination therapy 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 ARV combination therapy to everyone with advanced HIV infection.

Definition: Percentage of people with advanced HIV infection receiving ARV 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.

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 AIDS cases in the current year times 2. The total number of adults needing ARV therapy is calculated by adding the number of adults who need to start ARV therapy to the number of adults who are being treated in the previous year and have survived into the current year.

Source: *Towards Universal Access: Scaling Up Priority HIV/AIDS Interventions in The Health Sector: Progress Report, 2008*. Geneva: WHO, Joint United Nations Programme on HIV/AIDS, United Nations Children's Fund, 2008. WHO regional and global figures are updates for the year 2008. Income-group aggregates are based on the World Bank 2008 list of economies.

27. Incidence of tuberculosis

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 *M. 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 immediate than the effect on prevalence or mortality. MDG6, Target 8 is 'to have halted by 2015 and begun to reverse the incidence of' TB. WHO estimates that in 2004 the per capita incidence of TB was stable or falling in 5 out of 6 WHO Regions, but growing globally at 0.6% per year. The exception was the African Region, where incidence is apparently still increasing, but less rapidly each year. Implementation of the Stop TB Strategy, following the Global Plan to Stop TB 2006–2015, is expected to reverse the rise in incidence globally by 2015.

Definition: Estimated number of TB cases arising in a given time period (expressed as per capita rate). All forms of TB are included, as are cases in people with HIV.

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

incidence = case notifications/proportion of cases detected

incidence = prevalence/duration of condition

incidence = annual risk of TB infection × Stýblo coefficient

incidence = deaths/proportion of incident cases that die

Data are for all forms of tuberculosis, including tuberculosis in people with HIV infection.

Source: *Global Tuberculosis Control: A Short Update to the 2009 Report*. Geneva: WHO, 2009 (WHO/HTM/TB/2009.426). Available at: www.who.int/tb/publications/global_report. WHO region, income group and global aggregates include territories.

28. Prevalence of tuberculosis

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 treatments reduce the average duration of disease (thus decreasing prevalence) and the likelihood of dying from the disease (thus reducing disease-specific mortality). MDG6 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 MDG 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 TB 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, though not in Africa and 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.

Methods of estimation: Estimates of TB incidence, prevalence and mortality are based on a consultative and analytical process in WHO and are published annually. The methods used to estimate TB prevalence and mortality rates are described in detail elsewhere. Country-specific estimates of prevalence are, in most instances, derived from estimates of incidence, 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 or non-DOTS programmes, or is not treated at all; and whether the individual is infected with HIV.

29. Tuberculosis: DOTS case detection rate

Rationale for use: The proportion of estimated new smear-positive cases that are detected (diagnosed and notified to WHO) by DOTS programmes provides an indication of how effective national TB programmes are in finding people with TB and diagnosing the disease.

Methods of estimation: Estimates of incidence are based on a consultative and analytical process in WHO, and are published annually. 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.

30. Tuberculosis: DOTS treatment success

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.

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

The treatment-success rate is the percentage of new smear-positive patients registered for treatment who were cured (with laboratory confirmation) or who completed their course of treatment.

Source: *Global TB Control: A Short Update to the 2009 Report*. Geneva: WHO, 2009 (WHO/HTM/TB/2009.426). Available at: www.who.int/tb/publications/global_report. WHO Regional, income group and global aggregates include territories.

31. Tuberculosis mortality

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 reduces the average duration of disease (thus decreasing prevalence) and the likelihood of dying from the disease (thus reducing disease-specific mortality).

Definition: Estimated number of deaths due to TB in a given time period. It is 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.

Methods of estimation: Estimates of TB incidence, prevalence and mortality are based on a consultative and analytical process in WHO and are published annually. The methods used to estimate TB mortality rates are described in detail elsewhere. Country-specific estimates of TB mortality are, in most instances, derived from estimates of incidence, 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.

These are classified as deaths from tuberculosis according to the *International Statistical Classification of Diseases and Related Health Problems,* 10th revision. Geneva, WHO, 1992.

Source: *Global Tuberculosis Control: A Short Update to the 2009 Report*. Geneva, WHO, 2009 (WHO/HTM/TB/2009.426). Available at: www.who.int/tb/publications/global_report. WHO Regional, income group and global aggregates include territories.

32. Children under 5 years of age with fever who received treatment with any antimalarial therapy (%)

Rationale for use: Prompt treatment with effective antimalaria drugs for children with fever in malaria risk areas is a key intervention to reduce mortality. In addition to being listed as a global MDG indicator under Goal 6, effective malaria treatment 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: (i) use of insecticide-treated nets (ITNs); (ii) prompt access to effective treatments in or near the home, (iii) provision of antimalaria drugs to symptom-free pregnant women in stable transmission areas; and (iv) improved forecasting, prevention and response, 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 access to prompt treatment be ensured. This requires drug availability at household or community level and, for complicated cases, availability of transport to the nearest equipped facility. Reserve drug stocks, transport and hospital capacity are needed to mount an appropriate response to malaria cases and prevent

the onset of malaria from degenerating to a highly lethal complicated malaria picture.

Definition: Percentage of population under 5 years of age in malaria-risk areas with fever being treated with effective antimalaria drugs.

Methods of estimation: For prevention, the indicator is calculated as the percentage of children under 5 years of age who received effective antimalaria drugs upon a fever episode. The information is obtained directly from household surveys. The empirical values are directly reported without further estimation.

33. Children under 5 years of age sleeping under insecticide-treated nets (%)

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 (ITNs) by children under 5 years of age 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 constitutes 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 5 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).

Methods of estimation: Empirical data only.

Source: *World Malaria Report 2009*, Annex 6. Geneva: WHO, 2009. Available at: www.who.int/malaria/world_malaria_report_2009/mal2009_annex6_0010.pdf.

34. Number of poliomyelitis cases

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.

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

Source: Data from WHO Polio Eradication Initiative, as of 12 January 2010. Updated information can be found at: www.who.int/immunization_monitoring/en/diseases/poliomyelitis/case_count.cfm. Confirmed polio cases refer to any circulating polioviruses (wild poliovirus and circulating vaccine-derived poliovirus (cVDPV)).

35. One-year-olds immunized with:

- one dose of measles (%)
- three doses of diphtheria, tetanus toxoid and pertussis (DTP3) (%)
- three doses of hepatitis B (HepB3)(%)

Rationale for use: Immunization coverage estimates are used to monitor immunization services and to guide disease eradication and elimination efforts, and are a good indicator of health systems performance.

Definition: Measles immunization coverage is the percentage of 1-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 1-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 1-year-olds who have received three doses of Hepatitis B3 vaccine in a given year.

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.

Sources: Unless otherwise stated, data are derived from Demographic and Health Surveys (DHS) conducted since 2000. The DHS figures were extracted using STATcompiler software (www.measuredhs.com/). When not available using STATcompiler software, figures were extracted directly

from DHS reports. For some countries and some of the indicators, there were differences in the figures extracted from the country reports and STATcompiler. In these cases, following discussions with staff from the MEASURE DHS implementation group (ICF Macro), data from the country reports were used. Further information regarding the source of individual country data can be obtained on request from WHO.

36. Antenatal care coverage (%)

Rationale for use: Antenatal care coverage is an indicator of access and utilization of health care during pregnancy.

Definition: Percentage of women who utilized 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.

Methods of estimation: Empirical data from household surveys are used. At global level, facility data are not used.

Source: *UNICEF Global Database on Maternal Health*. New York: UNICEF, 2010. Available at: www.childinfo.org/antenatal_care_country.php.

37. Births by caesarean section (%)

Rationale for use: The proportion of births by caesarean section is an indicator of access to and utilization of health care during childbirth.

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

Methods of estimation: Empirical data from household surveys.

38. Births attended by skilled health personnel (%)

Rationale for use: All women should have access to skilled care during pregnancy and at delivery to ensure detection and management of complications. Moreover, because it is difficult to measure maternal mortality accurately, model-based maternal mortality ratio (MMR) estimates 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.

Methods of estimation: Empirical data from household surveys are used. At a global level, facility data are not used.

Source: ***WHO Global Database on Maternal Health Indicators***, 2009 update. Geneva: WHO, 2009. Available at: www.who.int/reproductive-health/global_monitoring/index.html. In order to enhance comparability over time, the reported figures are derived, to the extent possible, from broadly comparable data sources. Therefore, reported figures may not refer to the most recently available data. Refer to the source for more complete information on time trends and metadata.

39. Contraceptive prevalence (%)

Rationale for use: Contraceptive prevalence 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 MDGs, especially the child mortality, maternal health, HIV/AIDS and gender-related goals.

Definition: Contraceptive prevalence 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

Methods of estimation: Empirical data only.

Source: *World Contraceptive Use 2009*. New York: Population Division, Department of Economic and Social Affairs, United Nations Secretariat, 2009 (POP/DB/CP/Rev2009).

40. Condom use at higher-risk sex among young people aged 15–24 years (%)

Rationale for use: Consistent correct use of condoms within non-regular sexual partnerships substantially reduces the risk of sexual HIV transmission.

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.

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.

Source: Data are from Demographic and Health Surveys (DHS) and exclude country-reported data. *2008 Report on the Global AIDS Epidemic*. Geneva: Joint United Nations Programme on HIV/AIDS, WHO, 2008. Available at: www.unaids.org/en/KnowledgeCentre/HIVData/GlobalReport/2008/2008_Global_report.asp. See Annex 2: Country Progress Indicators.

41. Children under 5 years of age with acute respiratory infection and fever (ARI) taken to facility

Rationale for use: Respiratory infections are responsible for almost 20% of all under-5 deaths worldwide. The number of under-5s with ARI who are taken to an appropriate health provider is a key indicator for both coverage of intervention and care-seeking and provides critical inputs to the monitoring of progress towards the child-survival-related MDGs 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 provider.

Methods of estimation: Empirical data.

42. Children under 5 years of age with diarrhoea who received ORT

Rationale for use: Diarrhoeal diseases remain one of the major causes of under-5 mortality, accounting for 1.8 million child deaths worldwide, despite all the progress in their management and the undeniable success of oral rehydration therapy (ORT). Therefore, the monitoring of the coverage of this very cost-effective intervention is crucial for the monitoring of progress towards the child-survival-related MDGs 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).

Methods of estimation: Empirical data.

43. Children 6–59 months of age who received vitamin A supplementation

Rationale for use: Vitamin A supplementation is considered a critically important intervention for child survival owing to the strong evidence that exists of its impact on child mortality. Therefore, measuring the proportion of children who have received vitamin A in the last 6 months is crucial for monitoring coverage of interventions towards the child-survival-related MDGs and strategies.

Definition: proportion of children 6–59 months of age who have received a high-dose vitamin A supplement in the last 6 months

Methods of estimation: Empirical data.

Source: Data compiled by WHO from Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS), January 2010. Available at: www.measuredhs.com and www.unicef.org/statistics/index_24302.html .

44. Prevalence of current tobacco use in adolescents (13–15 years of age)

Rationale for use: The risk of chronic diseases starts early in childhood, and tobacco use 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 adolescents 13–15 years old.

Source: *WHO/CDC Global Youth Tobacco Survey (GYTS)*. Geneva: WHO, 2010. Available at: www.cdc.gov/tobacco/global/GYTS/results.htm. Data relate to tobacco use in any form in the past 30 days.

45. Prevalence of current (daily or occasional) tobacco smoking among adults (15 years and older) (%)

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.

Methods of estimation: Empirical data only.

Source: Based on *WHO Report On The Global Tobacco Epidemic, 2009: Implementing Smoke-Free Environments*. Geneva: WHO, 2009. Available at: www.who.int/tobacco/mpower/en/. See Appendix VII: Age-Standardized Prevalence Estimates for WHO Member States, 2006. 'Smoking' is defined as smoking at the time of the survey of any form of tobacco, including cigarettes, cigars, pipes, bidis, etc. and excluding smokeless tobacco. These figures represent age-standardized prevalence rates for smoking tobacco, and should only be used to draw comparisons of prevalence between countries and between men and women within a country. They should not be used to calculate the number of smokers in a country, region, income group or globally.

46. Children under 5 years of age

- stunted for age (%)
- underweight for age (%)
- overweight for age (%)

Rationale for use: All three indicators measure growth in young children. Child growth is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. In addition, children who suffer from growth retardation as a result of poor diets and/or recurrent infections tend to have greater risks of illness and death.

Definition: Percentage of children stunted describes how many children under 5 years have a height-for-age below minus two standard deviations of the National Center for Health Statistics (NCHS)/WHO reference median. Percentage of children underweight describes how many children under 5 years have a weight-for-age below minus two standard deviations of the NCHS/WHO reference median. Percentage of children overweight describes how many children under 5 years have a weight-for-height above two standard deviations of the NCHS/WHO reference median.

Methods of estimation: Empirical values. Several countries have limited data for recent years and current estimations are made using models that make projections based on past trends.

Source: *Global Database on Child Growth and Malnutrition*. Geneva: WHO, 2009. Available at: www.who.int/nutgrowthdb/database/en. Prevalence estimates are based on WHO standards.

47. Newborns with low birthweight (%)

Rationale for use: the low-birthweight rate at the population level is an indicator of a public health problem that includes long-term maternal malnutrition, ill-health and poor health care. On an individual basis, low birthweight is an important predictor of newborn health and survival.

Definition: Percentage of live-born infants with birthweight less than 2500 g in a given time period. Low birthweight may be subdivided into very low birthweight (less than 1500 g) and extremely low birthweight (less than 1000 g).

Methods of estimation: Where reliable health service statistics with a high level of coverage exist, percentage of low-birthweight births. For household survey data, different adjustments are made according to the type of information available (numerical birthweight data or subjective assessment by the mother).

Source: *UNICEF Global Database on Low Birthweight*. New York: UNICEF, 2009. Available at: www.childinfo.org/low_birthweight_table.php (November 2009 update).

48. Prevalence of adults (15 years and older) who are obese (%)

Rationale for use: The prevalence of overweight and obesity in adults has been increasing globally. Obese adults (BMI ≥ 30.0 kg/m^2) 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 non-communicable 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/m^2) among total adult population (15 years and older).

Methods of estimation: Estimates are still under development and will be published later in 2006.

Only nationally representative surveys with either anthropometric data collection or self-reported weight and height (mostly in high income countries) are included in the *2006 World Health Statistics*.

Comparisons between countries may be limited owing to differences in sample characteristics or survey years.

Source: *Global Database on Body Mass Index*. Geneva, WHO, 2010. Available at: www.who.int/bmi.

• KEY DETERMINANTS OF HEALTH

49. Population with:

- sustainable access to an improved water source (%)
- access to improved sanitation (%)

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

Methods of estimation: Estimates are generated through analysis of survey data and linear regression of data points. Coverage estimates are updated every 2 years.

Source: ***WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation***. Geneva: WHO and UNICEF, 2010. Available at: www.wssinfo.org/en/welcome.html.

50. Population using solid fuels (%)

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 an MDG indicator.

Definition: Percentage of population using solid fuels.

Methods of estimation: The data from surveys and censuses are used as reported in the surveys and censuses. All countries with a Gross National Income (GNI) 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.

These estimates use methods developed and implemented by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation. Where solid fuel use information is available for two or more separate years (spaced at least 5 years apart) linear regression is performed. The linear regression line is extrapolated up to 2 years after the latest survey point and up to 2 years before the earliest survey point. Outside these time limits, the extrapolated regression line is flat for 4 years in either direction. Where coverage reaches 0% or 100%, a horizontal line is drawn from the year before coverage reaches 0% or 100%. For countries with solid fuel use at less than 5%, 0% is assumed for the calculation of regional or global aggregates; for countries with more than 95%, 95% is assumed in the calculation of the aggregate.

Source: *WHO Household Energy Database*. Geneva: WHO, 2010. Available at: www.who.int/indoorair/health_impacts/he_database/en/.

Basic data and statistics are at the core of all health systems. Without them, it would be impossible to analyse evidence and extract action-orientated knowledge for decision making.

The development of an African Health Observatory and national health observatories aim to narrow the knowledge gap and strengthen health systems in the African Region by providing easy access to high quality information, evidence and knowledge, as well as facilitate their use for policy and decision making.

WHO Health Situation Analysis in the Africa Region: Atlas of Health Statistics, 2011 presents in numerical and graphical formats the best data available for key health indicators in the 46 countries of WHO's African Region.

With the continued input and collaboration of the African countries, this publication and its future editions will be a significant, constantly updated information product of the Observatory.