## 15 leading causes of death worldwide

<table>
<thead>
<tr>
<th>Cause</th>
<th>2002 Rank</th>
<th>2030 Rank (projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic heart disease</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>COPD</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Perinatal conditions</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Trachea, bronchus and lung cancers</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Road traffic accidents</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Malaria</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>Hypertensive heart disorder</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Self-inflicted injuries</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Stomach cancer</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
What factors might explain the 15 leading causes of death and the projected changes?
Potential factors contributing to mortality

• poverty (inadequate food, potable water, and sanitation facilities; poor housing quality, inadequate clothing/shoes)
• acute/chronic food insecurity
• literacy levels/ inadequate access to formal education
• war and displacement
• gender inequality and violence against women
• inequitable access to health care and prevention services
• shortages in human resources for health
• smoking
• physical activity/ diet
Why are we facing significant health disparities globally?
Examples of contributors to global inequalities in health outcomes

- lack of healthcare facilities and/or specialized care, particularly in rural areas
- infrastructure
- historical context
- political and economic situation
- health care financing
- environmental degradation/conditions
- climate change/global warming
- increased smoking in developing world
- urbanization/migration for economic means (permanent and temporary)
- globalization, implications of global economic downturn
Examples of progress vs. program constraints/failures

• *Program successes:*
  – smallpox eradication
  – reductions in under 5 child mortality (globally)
  – oral rehydration therapy
  – access to HIV treatment

• *Program failures:*
  – urban/ rural differential
  – persistence in water-borne illnesses resulting from poor water quality and limited access to sanitation facilities
Moving forward—recent changes that can impact burden of disease in global health

- economic crisis/ food insecurity
- impact of global warming and other aspects of environmental degradation (e.g. deforestation)
- new resources for health (e.g. PEPFAR, GFATM, etc.)
- advancing the Millennium Development Goals
- relying on empirical information to improve health outcomes (epidemiology and biostatistics)
Millennium Development Goals (MDG) and target indicators

- overarching goal: to end poverty
- MDGs adopted by international community in 2000 to advance development activities in over 190 countries worldwide
- for the eight goals, there are over 20 targets and over 60 indicators
- recent MDG report issued in June 2010—five years prior to 2015 target date
Examples of targets that have reflected progress

• despite economic setbacks globally, it is anticipated that the MDG goal to halve the proportion of people who live on less than $1/day is on track
• rural-urban differential in access to skilled delivery personnel has reduced
• increase observed in proportion of women receiving at least one prenatal care visit
• number of deaths due to HIV has declined in recent years: incidence has stabilized, but prevalence of HIV is increasing
Number of people living with HIV, number of people newly infected with HIV and number of AIDS deaths worldwide, 1990-2008 (Millions)

- Number of people living with HIV
- Number of people newly infected with HIV
- Number of deaths due to AIDS

MDG report, 2010
Number of people on antiretroviral therapy in low- and middle-income countries, 2002 to 2005


P. Piot, Harvard Medical School, July 2006
Estimated Number Of Children (Aged 0-14) Living with HIV Comparison (2009)

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimated Number of Children (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrialized countries</td>
<td>0</td>
</tr>
<tr>
<td>Developing countries</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Least developed countries</td>
<td>1,000,000</td>
</tr>
<tr>
<td>World</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

Goals that will not be met or are facing significant obstacles:

- since economic crisis, more employed individuals are living below the poverty line
- declines in level of undernutrition have stagnated due to the economic situation as well as food crisis in recent years
- one in four children under the age of 5 years worldwide remain underweight
- child deaths are falling but target will likely not be met—reduce by two-thirds under 5 child mortality rate
Goal 1: eradicate extreme poverty and hunger

• Target: Halve, between 1990 and 2015, the proportion of people who suffer from hunger (increasing food prices pose a serious problem for the poor and there are significant implications of the current food crisis)

• Indicator: Prevalence of underweight children under-five years of age
Example indicator for MDG1: underweight children < 5 years

- 1,650,660/ 5,002,000 = .33 or 33% (Afghanistan for WHO ref. pop.)

- 313,100/ 15,655,000 = .02 or 2% (Brazil for WHO ref. pop.)

- Sweden: negligible
Under-5-year-old Children Suffering From Stunting Comparison (2003-2009)

Stunting (WHO) – Moderate and severe: Percentage of children aged 0–59 months who are below minus two standard deviations from median height for age of the WHO Child Growth Standards.

Goal 2: achieve universal primary education

• Target: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary school (total net enrolment ratio in primary education (for developing countries, the overall estimate has increased from 80% in 1991 to 89% in 2008))

• Indicator: Net enrolment ratio in primary education
Goal 2: achieve universal primary education

- Primary education *net enrolment* ratio for least developed countries:
  - 85 versus 81 (boys vs. girls)

- Primary education *net enrolment* ratio for industrialized countries:
  - 95 versus 95 (boys vs. girls)

State of the World’s Children, 2011
Goal 3: promote gender equality and empower women

• Target: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015 (girls’ primary school enrollment in relation to boys’ enrollment (girls per 100 boys) improved from 87 in 1991 to 96 in 2008 in the developing world)

• Indicator: ratios of girls to boys in primary, secondary and tertiary education
Goal 3: promote gender equality and empower women

- Ratio of girls to boys in primary education in Mali:
  - net enrolment: 79

- Ratio of girls to boys in primary education in Mali:
  - net attendance: 74

- UNICEF report indicates ratios are 'females as a percent of males'
Goal 4: reduce child mortality

• Target: Reduce by two-thirds, between 1990 and 2015, the *under-five mortality rate (per 1,000 live births)*

• Indicator: Under-five mortality rate (per 1,000 live births)
Goal 4: reduce child mortality

• 2009 under-five mortality rate for Afghanistan:
  - 199/1,000 live births

• 2009 under-five mortality rate for Korea:
  - 5/1,000 live births
Under-5-year-old Children Mortality Rate Comparison (2009)

Under-5-year-old Children Mortality Rate (per 1,000 live births)

- Industrialized countries
- Developing countries
- Least developed countries
- World

Infant Mortality Rate Comparison (2009)

Goal 5: improve maternal health

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

- Indicator: maternal mortality ratio—annual number of deaths of women from pregnancy-related causes per 100,000 live births
Goal 5: improve maternal health

• Maternal mortality ratio for Afghanistan:
  – 1,600 maternal deaths/ 100,000 live births

• Maternal mortality ratio for Germany:
  – 8 maternal deaths/ 100,000 live births
Goal 6: combat HIV/AIDS, malaria, and other diseases

• Target: Have halted by 2015 and begun to reverse the spread of HIV/AIDS
  – Indicator: *HIV prevalence in young people aged 15-24 years*

• Target: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
  – Indicator: *number of new tuberculosis cases per 100,000 population*
Goal 6: combat HIV/AIDS, malaria, and other diseases

- HIV prevalence (aged 15-24 years) in Lesotho:
  - 5.9% (male) and 14.9% (female)

- HIV prevalence (aged 15-24 years) in Brazil:
  - 1.0% (male) and 0.6% (female)
1-year-old Children Immunized Against DPT (3rd Dose) Comparison (2009)

1-year-old Children Immunized Against Measles Comparison (2009)

- Industrialized countries
- Developing countries
- Least developed countries
- World

Under-5-year-old Children With Suspected Pneumonia Receiving Antibiotics Comparison (2005-2009)

Goal 7: ensure environmental sustainability

• Target: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation
  – Indicator: Proportion of population using an improved water source
  – Indicator: Proportion of population using an improved sanitation facility

- Industrialized countries
- Developing countries
- Least developed countries
- World


Goal 8: develop a global partnership for development

- Target: Address the special needs of the least developed countries, landlocked and small island developing countries
  - Only 5 donor countries have reached the UN target for official aid
  - Denmark, Luxembourg, the Netherlands, Norway and Sweden
Net official development assistance from OECD-DAC countries as a proportion of donors’ gross national income, 1990-2009 (Percentage)

Source: MDG Report, 2010
Haiti: Demographics

• Poorest country in the W. Hemisphere
  – ~80% below poverty line; greater in rural areas
  – More than two-thirds of Haitian workforce do not have formal employment

• One of the highest HIV prevalence estimates in the W. Hemisphere
  – 1.9 percent prevalence overall

• Life expectancy: 60.8 y for men and 63.5 y for women

Haiti: Vital Statistics

- Infant mortality (per 1,000 live births) 64
- Under-5-year-old child mortality (per 1,000 live births) 87
- Maternal mortality (per 100,000 live births) 630
- 1-year-old children immunized against DPT (3rd dose) 59%
- 1-year-old children immunized against measles 59%
- Under-5-year-old children with suspected pneumonia receiving antibiotics 3%
- Under-5-year-old children with diarrhea receiving oral rehydration and continued feeding 43%
- Under-5-year-old children suffering from stunting 29%
- Number of children (aged 0-14) living with HIV 12,000
- Population using improved drinking-water sources 63%
- Population using improved sanitation facilities 17%

Infectious Disease in Haiti

- After HIV/AIDS, tuberculosis (TB) is the leading cause of mortality
- Directly observed therapy coverage for TB (70%), can be as low as 13% in densely populated areas of Port au Prince
- MDRTB rate increased from 1.4% to 1.8% (2003 to 2006)
- Recent cholera epidemic has taken significant toll

USAID, Haiti, Infectious diseases (http://www.usaid.gov/)
Key Historical Facts on Haiti

• In 1517, the trafficking of slaves from Africa to the island of Hispaniola begins. By 1540 there are 30,000 Africans brought to the island.

• Between 1784 and 1791 an average of 29,000 slaves were forcibly taken to Haiti (then called Saint-Domingue) and by 1789 they supplied 75% of the world’s sugar.
Deforestation across the Central Plateau
Key Historical Facts on Haiti

• In 1791, the slaves revolted and independence was achieved in 1804
• The U.S. did not recognize Haiti as a nation-state until after slavery was abolished in the U.S.- over 60 years after Haitian independence
• U.S. occupied Haiti 1915-34
• 1957-1986: Duvalier regime, receiving $40.4 million in aid from the U.S.
• By 1976, 75% of Haitians live in absolute poverty
Key Historical Facts on Haiti

• Over $200 million in aid passed through the hands of the Haitian military in the 18 months after Duvalier departed Haiti in 1986

• Many of the commanders who issued the orders to detain and torture Haitian civilians were trained in Fort Benning, Georgia
Haiti’s Recent History

- Loans through the Inter-American Development Bank (IDB) totaling $146 million for road rehabilitation, education, potable water, and healthcare were blocked in 2001.
- Other international financial institutions, such as the World Bank and the IMF followed suit.
- The humanitarian situation worsened during the embargo—in a March 2003 report published by the UN, Haiti was regarded as a “silent emergency”.
- The embargo also weakened the government, leaving it vulnerable to political instability and regime change in 2004.
Main “highway” through central Haiti
Local School
Patients sleep at the clinic for a chance to be seen the next day
Haiti’s Recent History

- In 2008 a series of terrible hurricanes had a tremendous impact on Haiti
- January 12, 2010 a major earthquake struck Port au Prince, devastating the capitol and surrounding areas, having a direct impact on one-third of Haiti’s population
- Estimated 50,000 to 300,000 deaths, 200,000 injured, 1.3 million internally displaced
- Subsequent cholera outbreak has had a devastating toll (over 320,000 cases, with over 50% hospitalization and nearly 2% death rate)
Haiti’s Recent History
The HIV Equity Initiative

- Community-based prevention efforts initiated in the 1980s
- AZT offered to prevent mother-to-child transmission of HIV in 1995
- ART (triple therapy) offered initially in 1998
- >8000 HIV-positive people followed
- >2000 patients being treated with directly observed antiretroviral therapy
- *Accompagnateurs* provide social support and observe ingestion of therapy at least once a day
Rats and roaches live by competition under the laws of supply and demand; it is the privilege of human beings to live under the laws of justice and mercy.

Wendell Berry
Yes, all human beings are people. It is we, the afflicted who are speaking… The right to health is the right to life.

**Everyone has the right to live.**

*Declaration of Cange,*  
*World AIDS Day, 2001*