



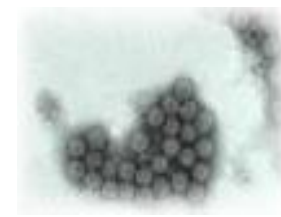
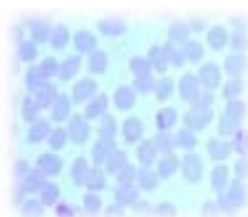
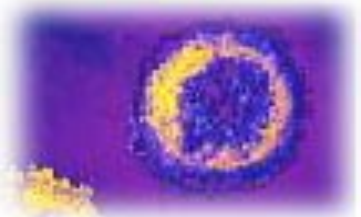
Vaccine Deployment and Policies

MSc in Global Health
Vaccinology Module 2012

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Overview of Session

- Emphasis on public policy issues, including funding issues (much drawn from personal experience)
- The global health context into which vaccines fit
- Overview of mortality figures/deaths from infectious diseases, and possible vaccine interventions (I will skip most of these slides in class though leave them in presentation)
- Issues in the development of vaccines
 - The specific needs of vaccines for global public health
 - Divergence of products – to what extent?
 - Changes over time
 - The R&D process, the economics of vaccines, the roles of public and private sectors in research and development of vaccines
- Issues in the deployment of vaccines
 - Vaccine coverage over time and regions
 - Role of GAVI, PAHO, WHO, etc.
 - GAVI first phase, GAVI second phase... The future of GAVI
- Sustainable funding issues
 - ‘Novel’ funding instruments
- Case studies
 - Malaria, Pandemic Flu, Hep B, Pneumococcal in particular
- Discussion about future policy challenges

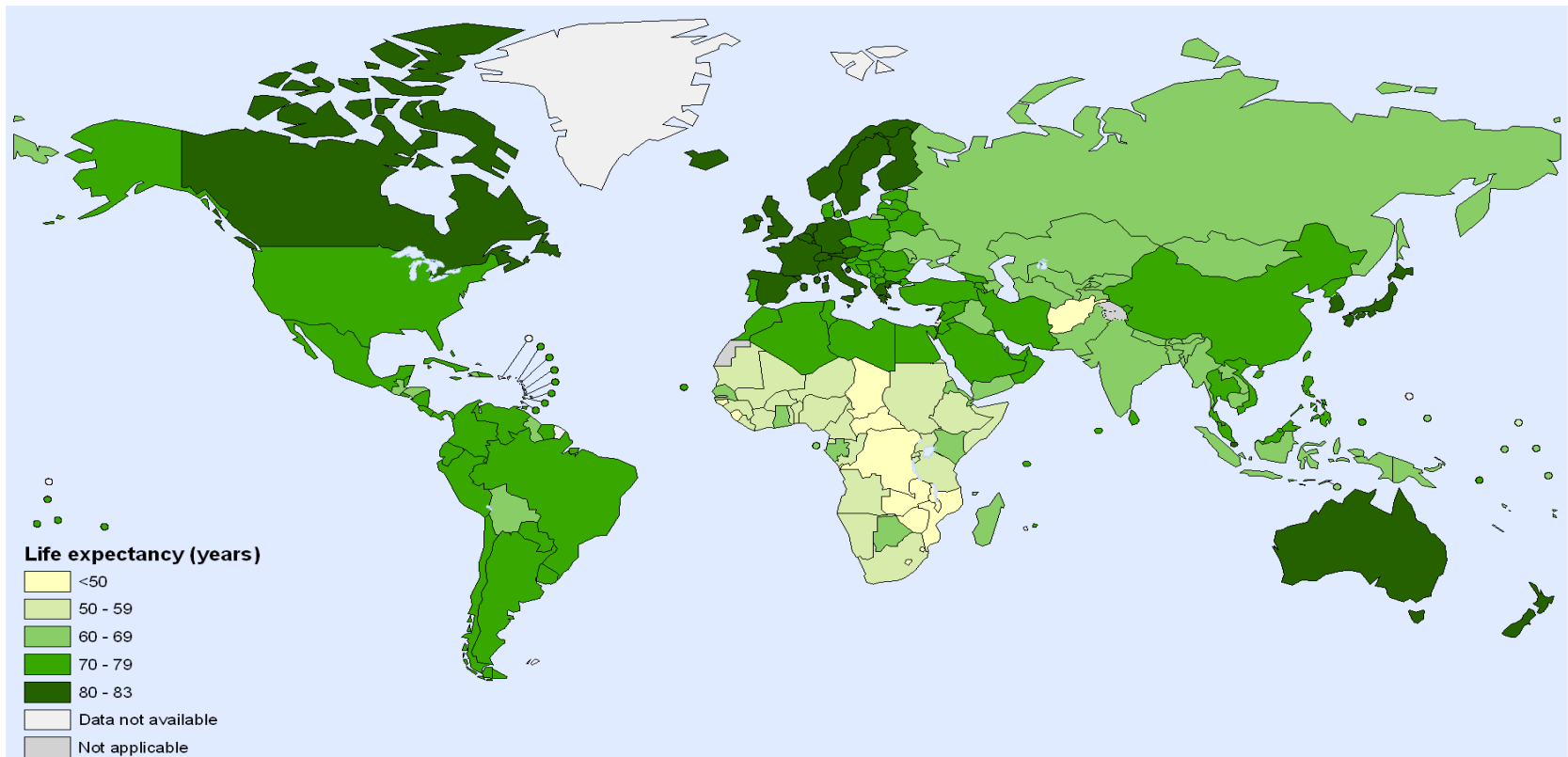
Please Note...

- Please note that this is a very full set of slides and meant in part as a form of note-taking and for revision purposes too.
- We will cover many but not all of the areas covered by the slides. The presentation will go on Weblearn, so the slides will give some interesting visual notes for filling in the gaps.
- Good luck with them!

**SOME OPENING
THOUGHTS:
GLOBAL HEALTH
CONTEXT**

Life expectancy at birth

Life expectancy at birth
Both sexes, 2009



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

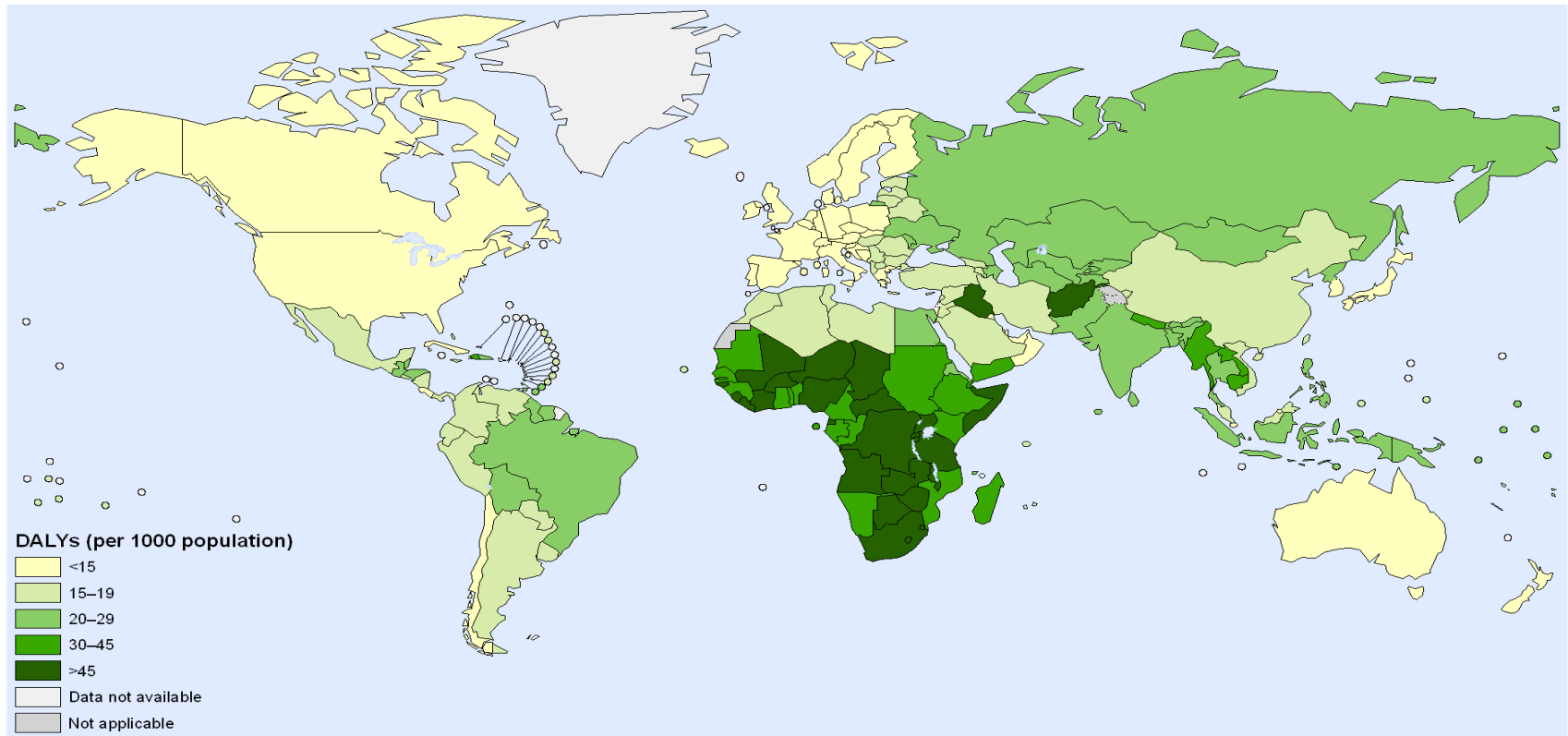
Data Source: World Health Statistics 2011, WHO
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization



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Age standardised DALY rates

Age standardized disability-adjusted life year (DALY) rates, 2004



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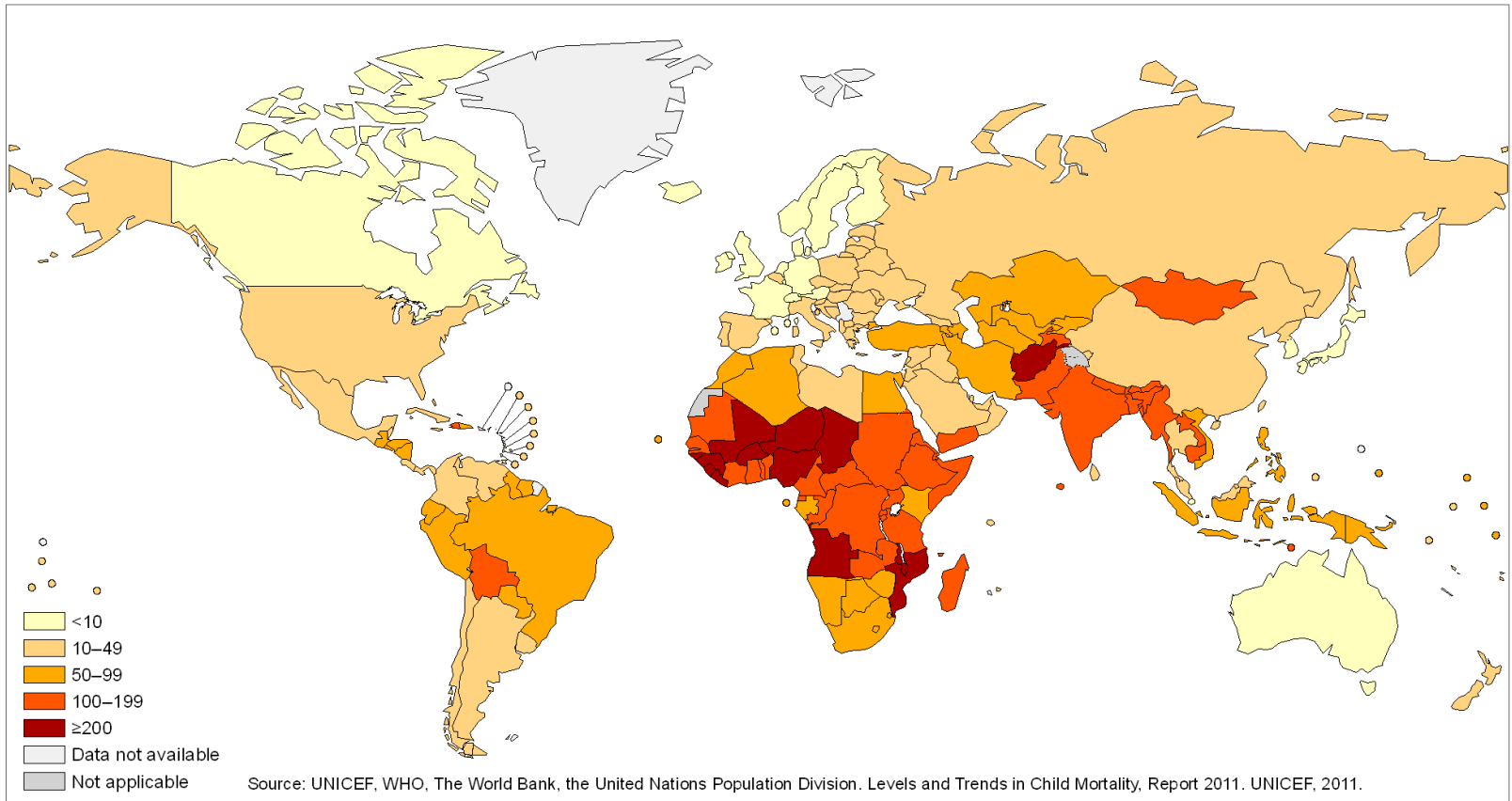
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Under 5 mortality, 1990

Under-five mortality rate (probability of dying by age 5 per 1000 live births), 1990



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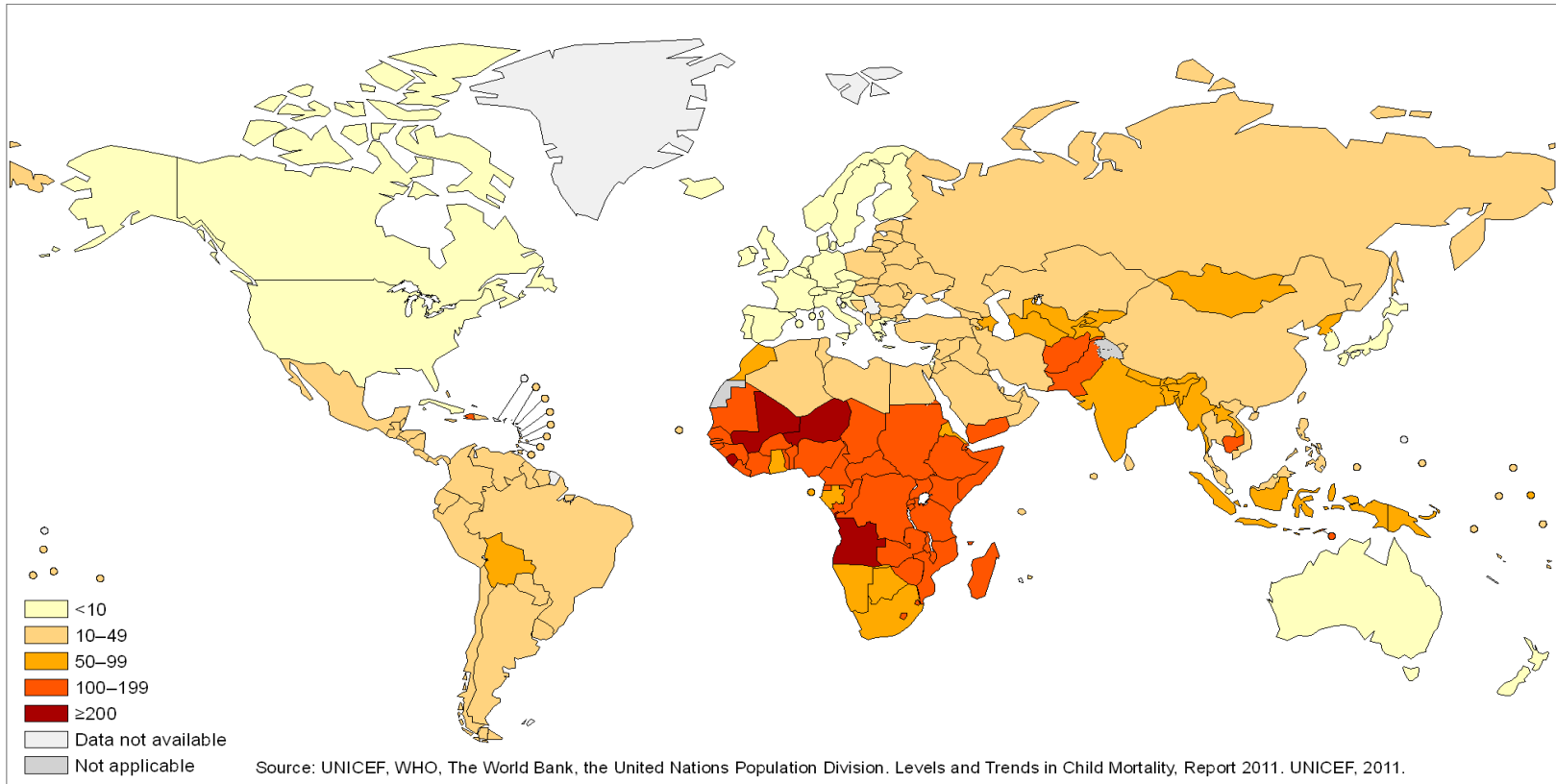
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Under-five mortality rate, 2000

Under-five mortality rate (probability of dying by age 5 per 1000 live births), 2000



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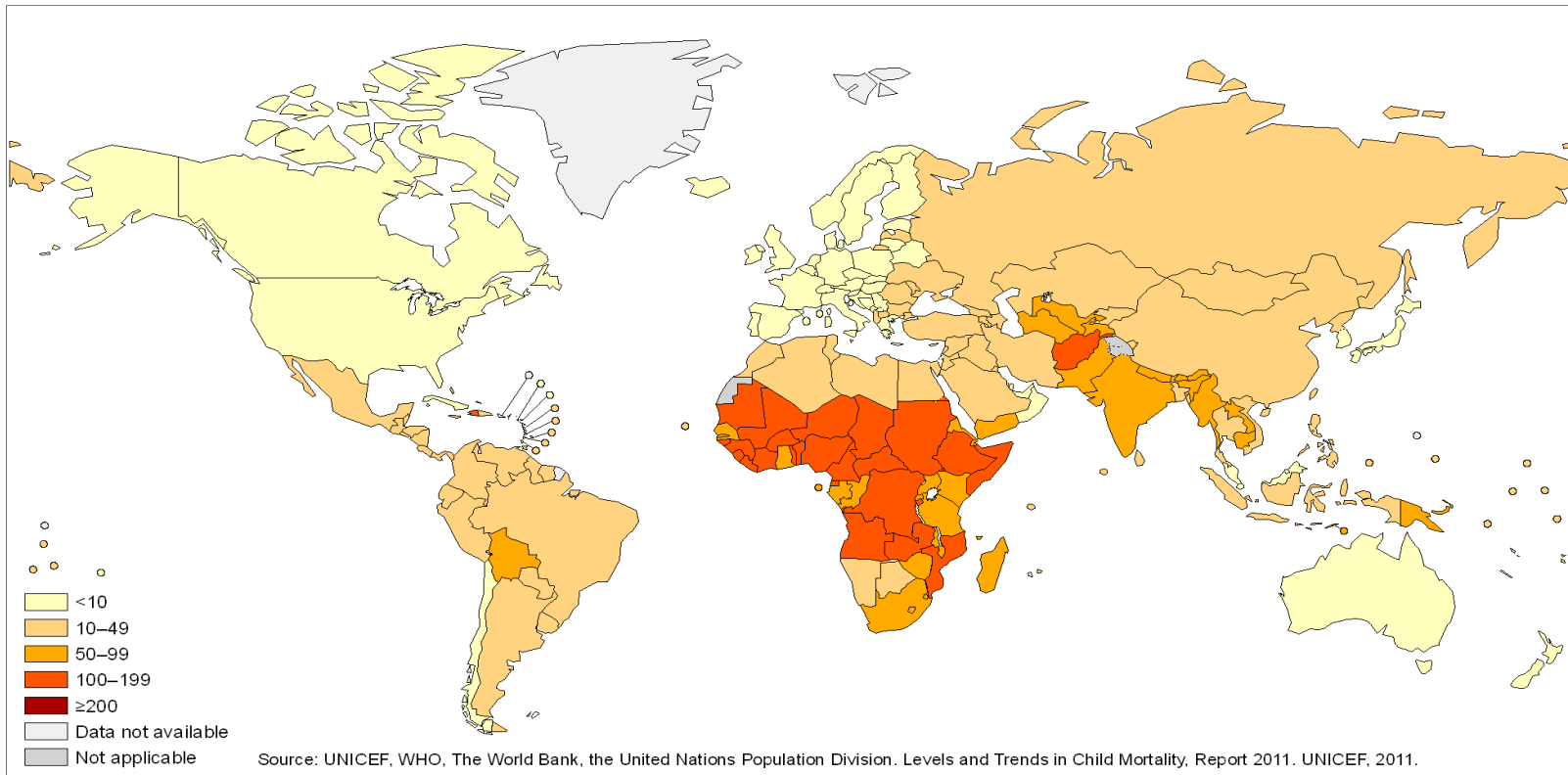
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Under five mortality, 2010

Under-five mortality rate (probability of dying by age 5 per 1000 live births), 2010



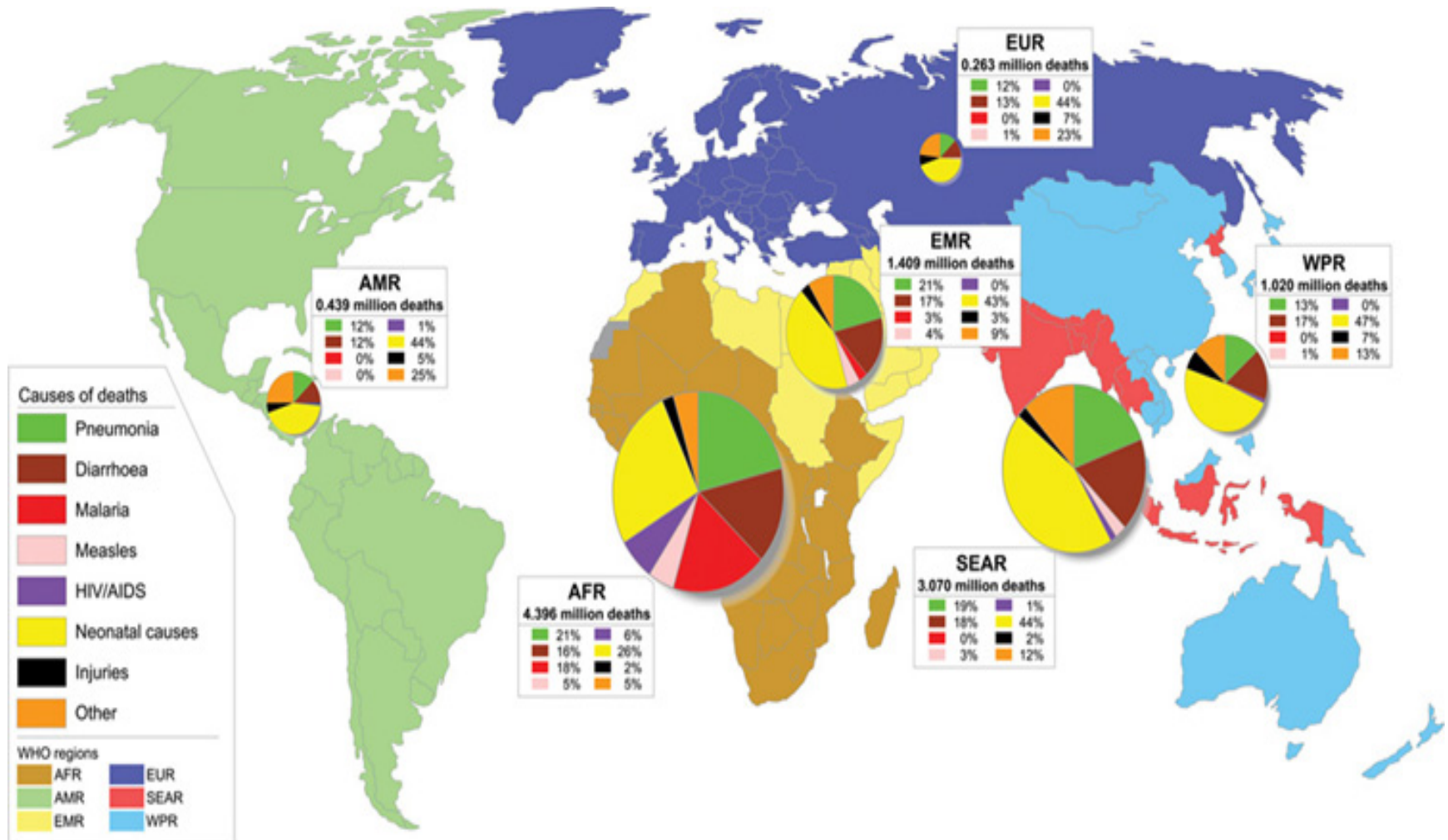
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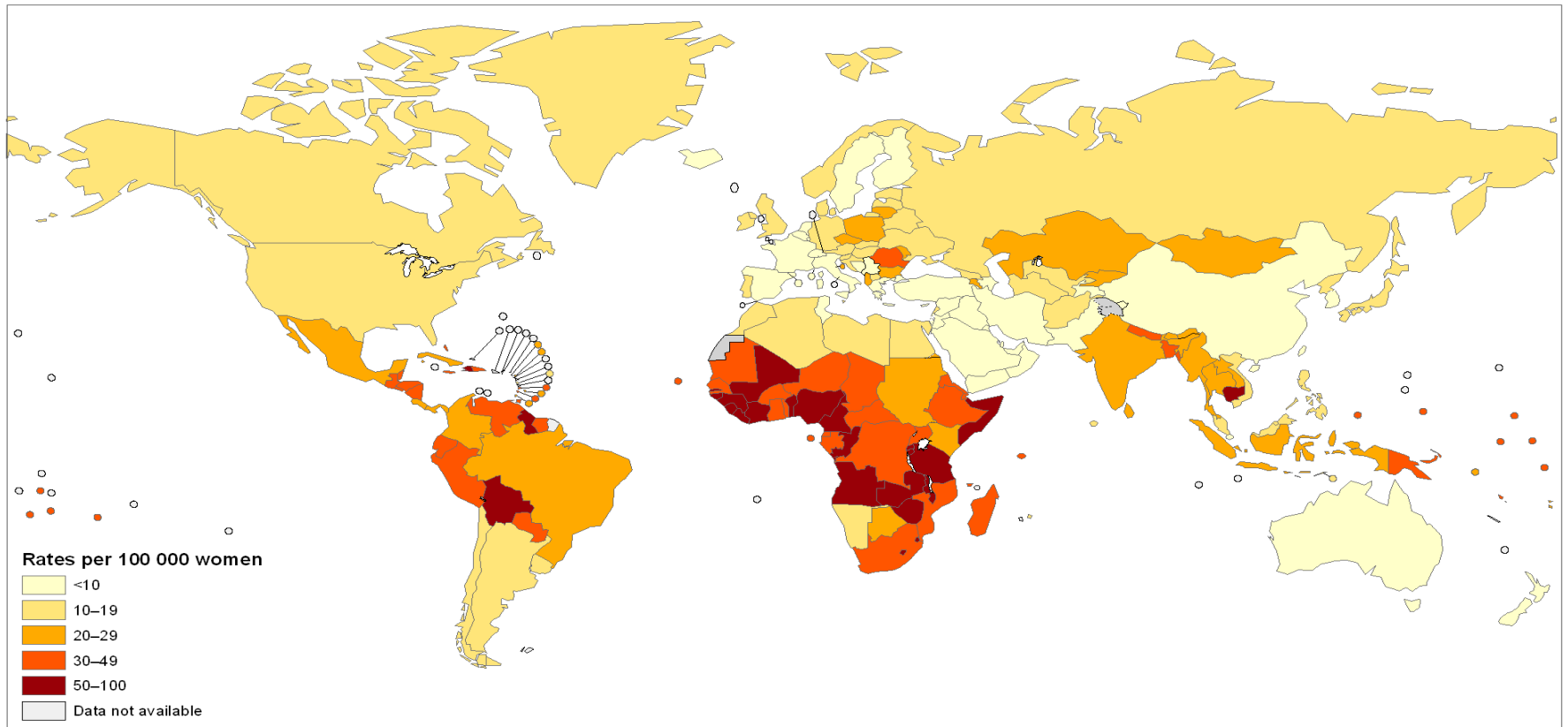
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Distribution of deaths by cause, children <5 years, WHO region, 2008



Rates of cervical cancer

Incidence rates of cervical cancer (age-standardized per 100 000 women, all ages), 2004



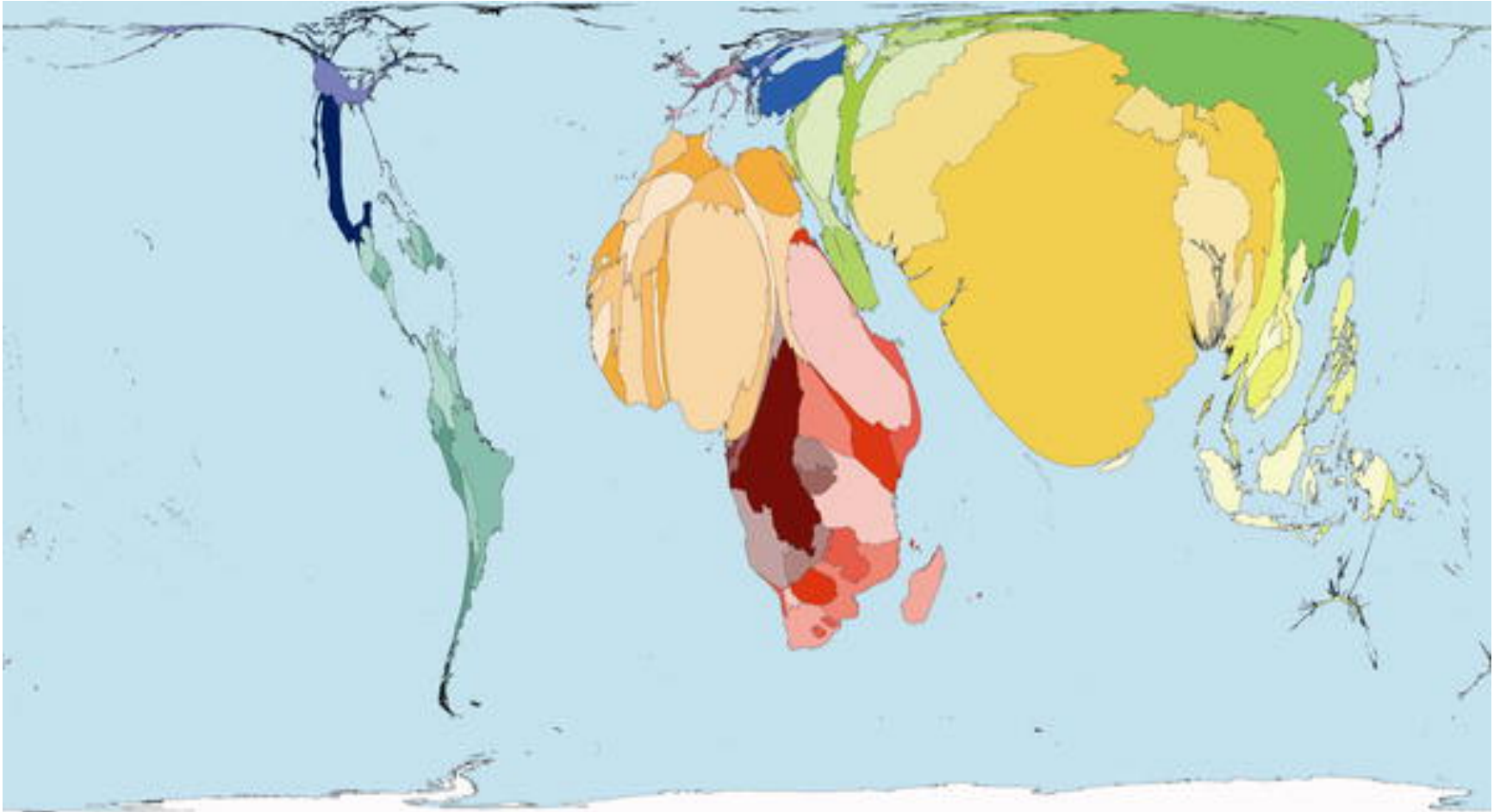
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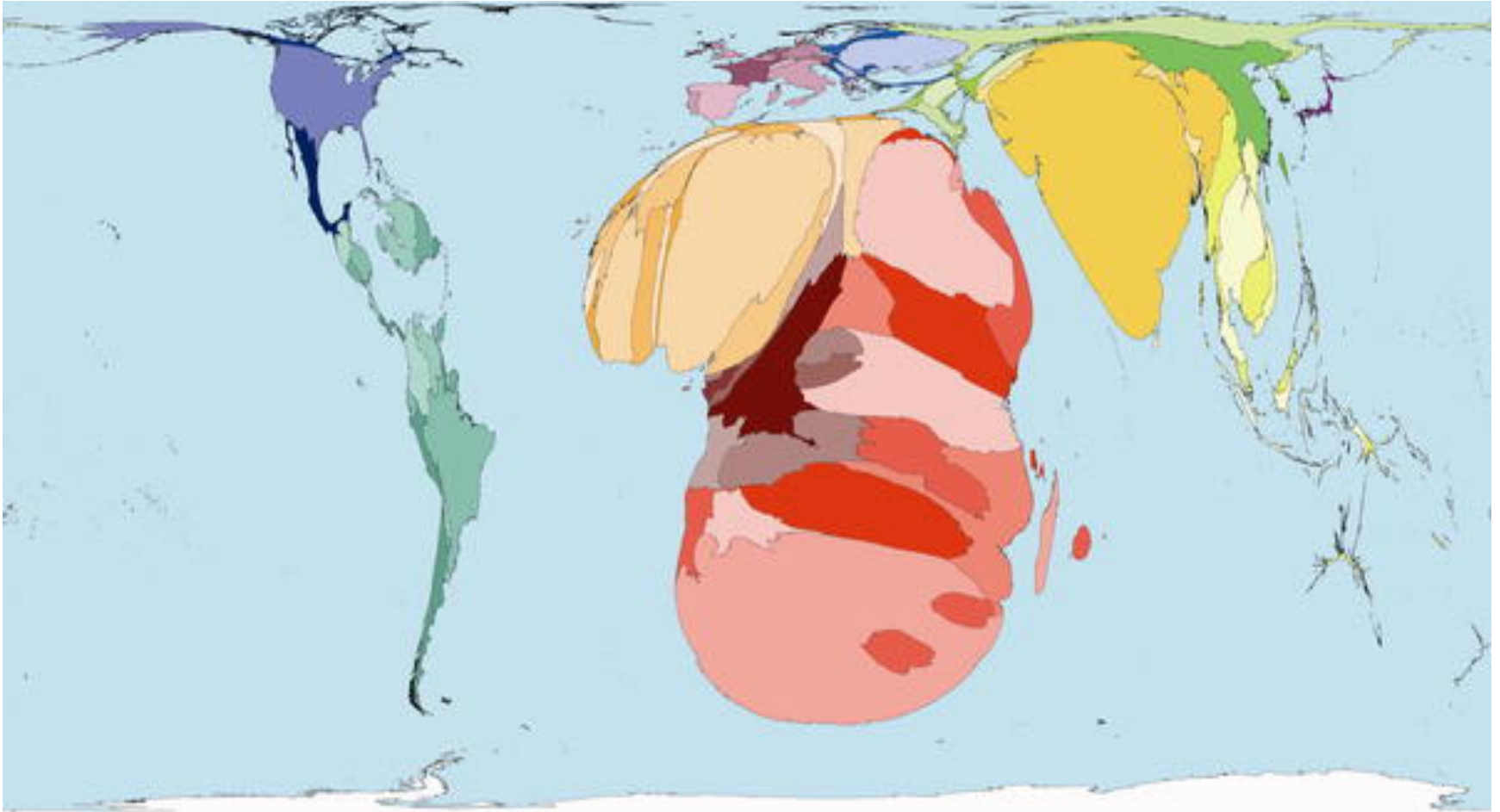
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Early neonatal mortality



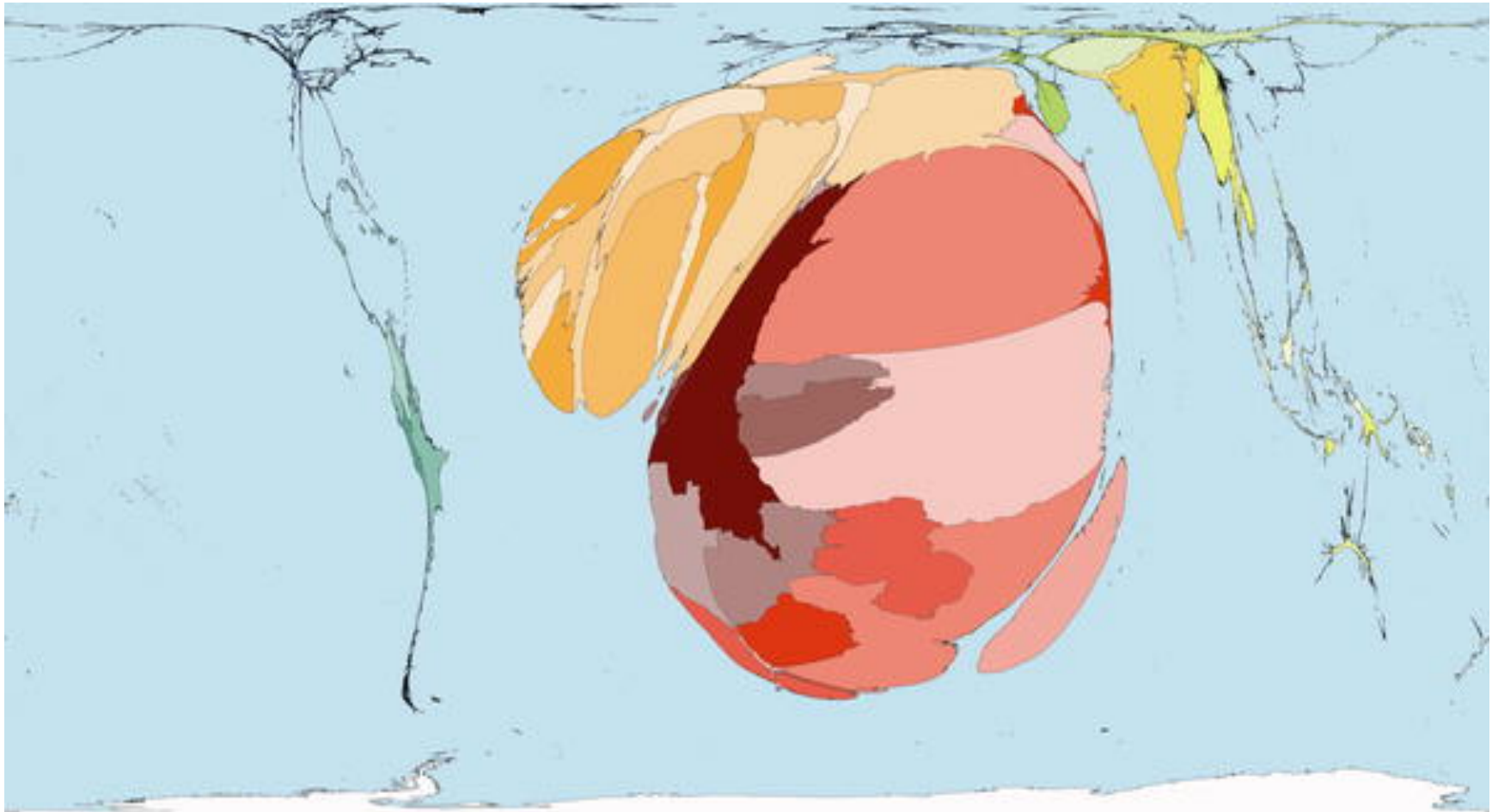
Source: Dorling D (2007) Worldmapper: The Human Anatomy of a Small Planet. PLoS Med 4(1): e1 [doi:10.1371/journal.pmed.0040001](https://doi.org/10.1371/journal.pmed.0040001)

HIV/AIDS prevalence



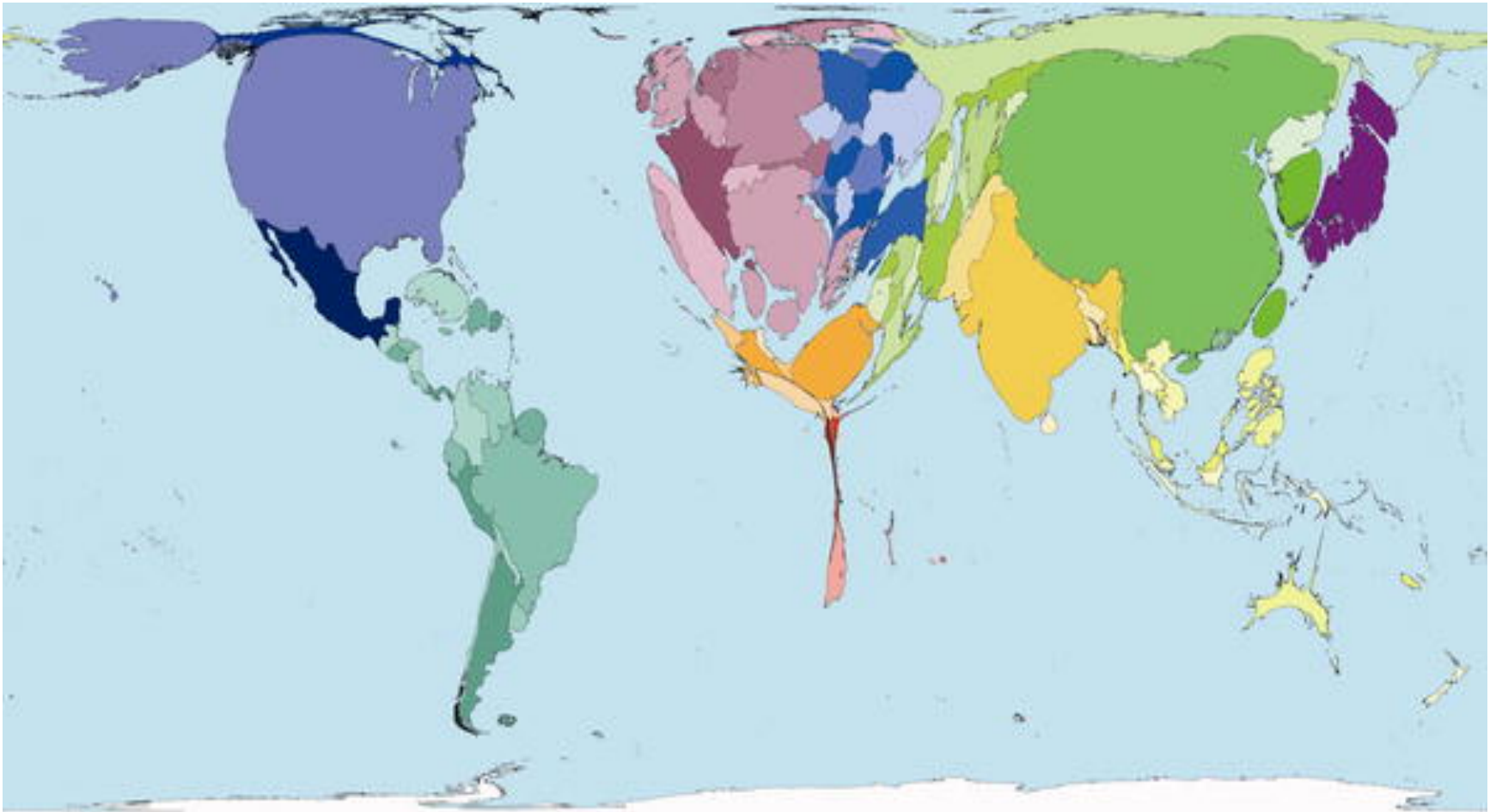
Source: Dorling D (2007) Worldmapper: The Human Anatomy of a Small Planet. PLoS Med 4(1): e1 [doi:10.1371/journal.pmed.0040001](https://doi.org/10.1371/journal.pmed.0040001)

Malaria cases



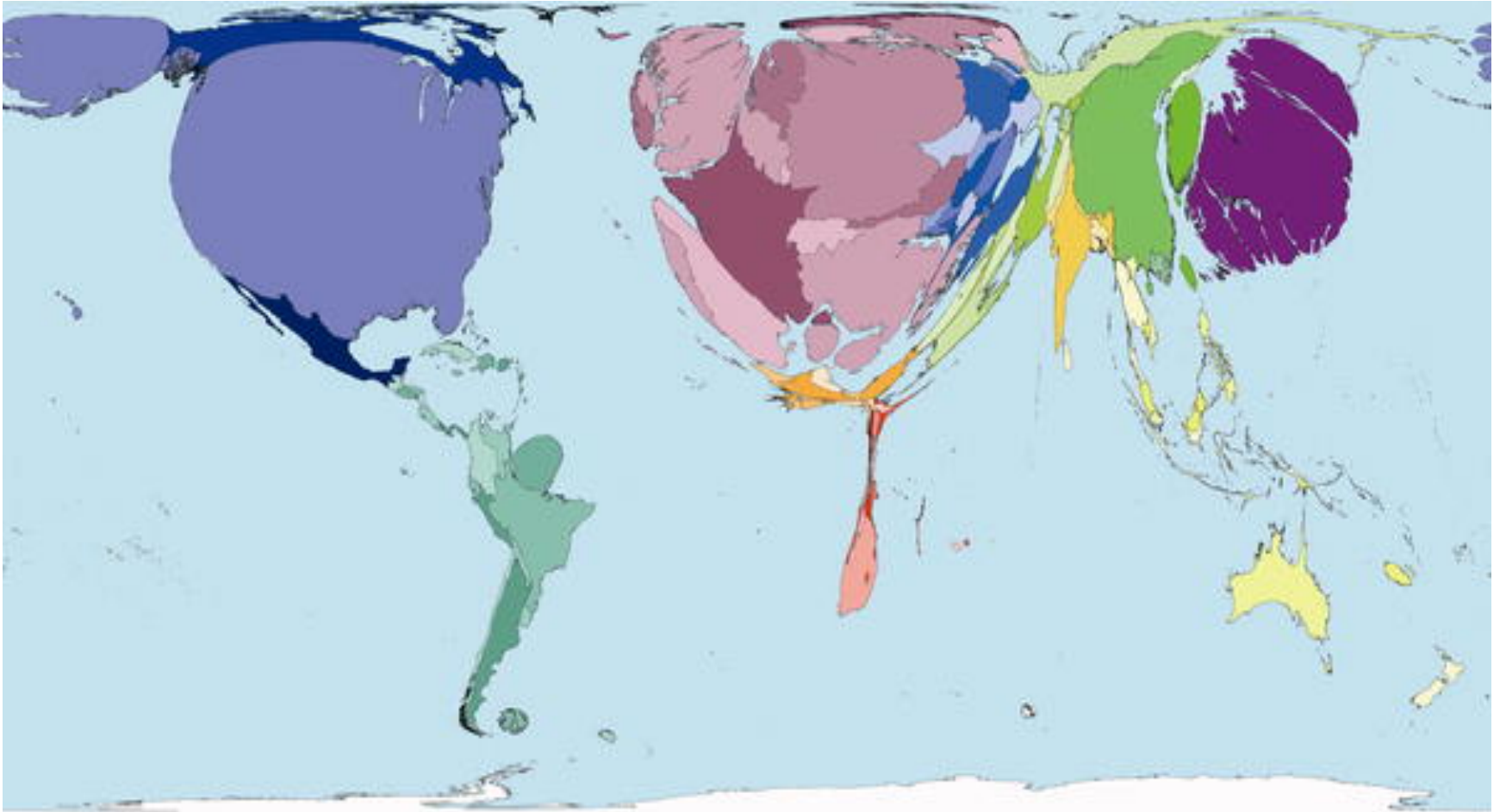
Source: Dorling D (2007) Worldmapper: The Human Anatomy of a Small Planet. PLoS Med 4(1): e1 [doi:10.1371/journal.pmed.0040001](https://doi.org/10.1371/journal.pmed.0040001)

Physicians working



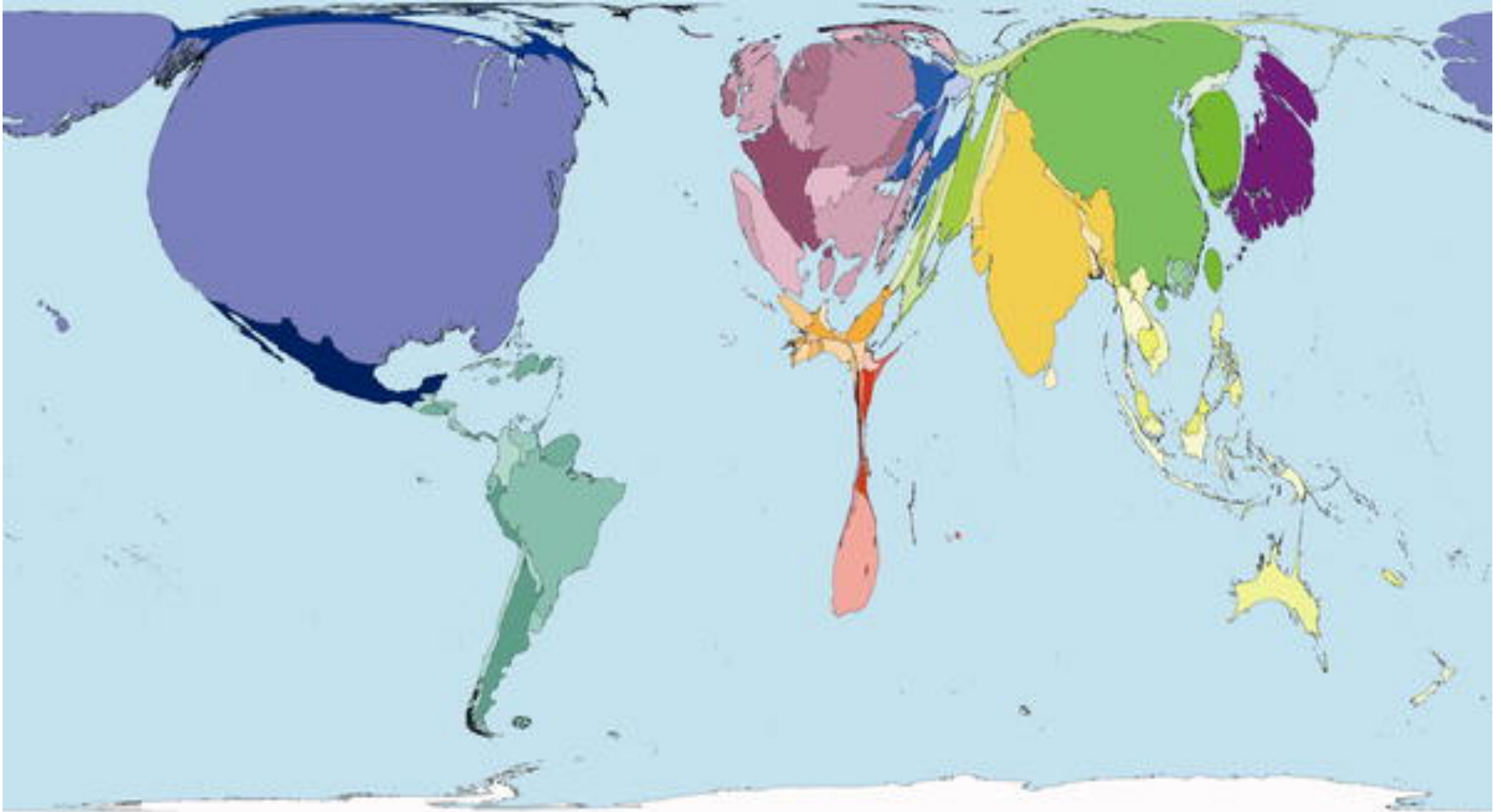
Source: Dorling D (2007) Worldmapper: The Human Anatomy of a Small Planet. PLoS Med 4(1): e1 [doi:10.1371/journal.pmed.0040001](https://doi.org/10.1371/journal.pmed.0040001)

Public health spending



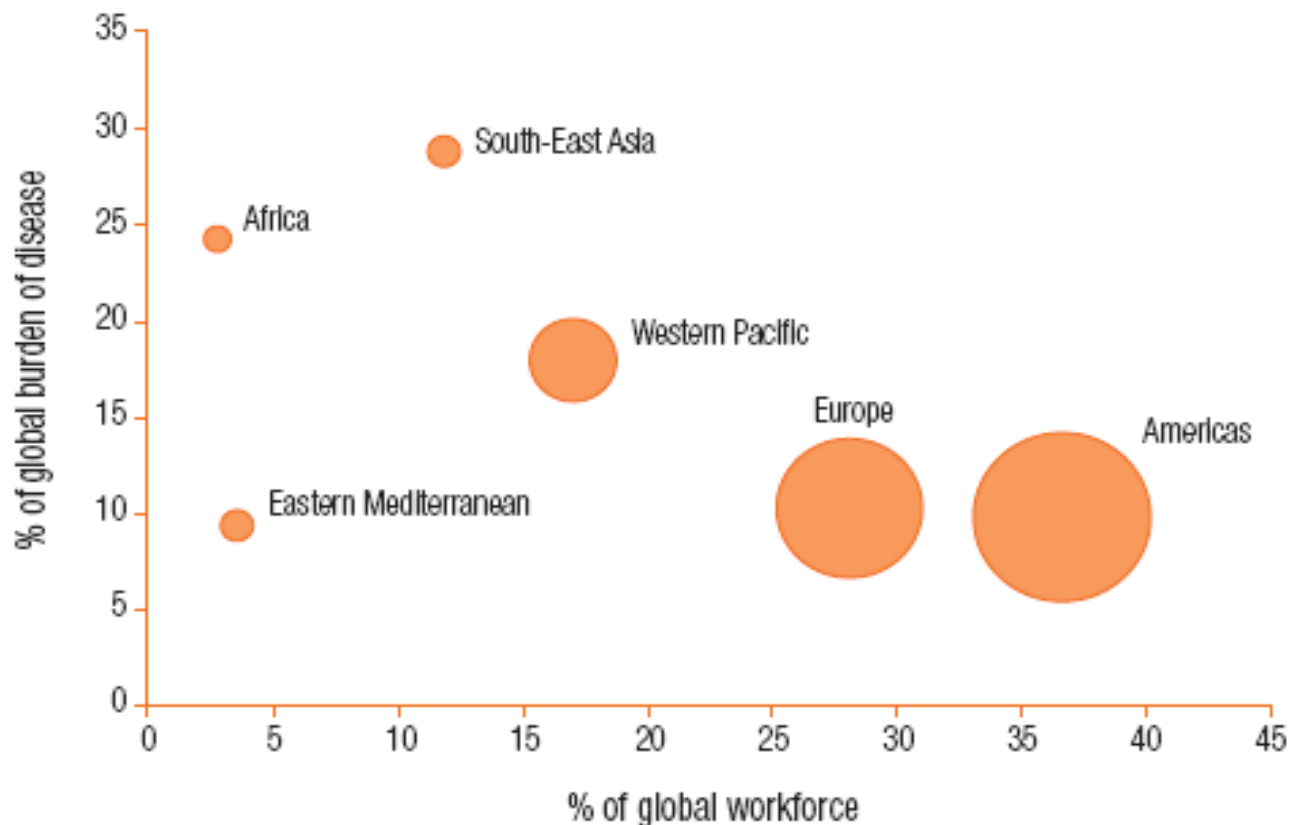
Source: Dorling D (2007) Worldmapper: The Human Anatomy of a Small Planet. PLoS Med 4(1): e1 [doi:10.1371/journal.pmed.0040001](https://doi.org/10.1371/journal.pmed.0040001)

Private health spending



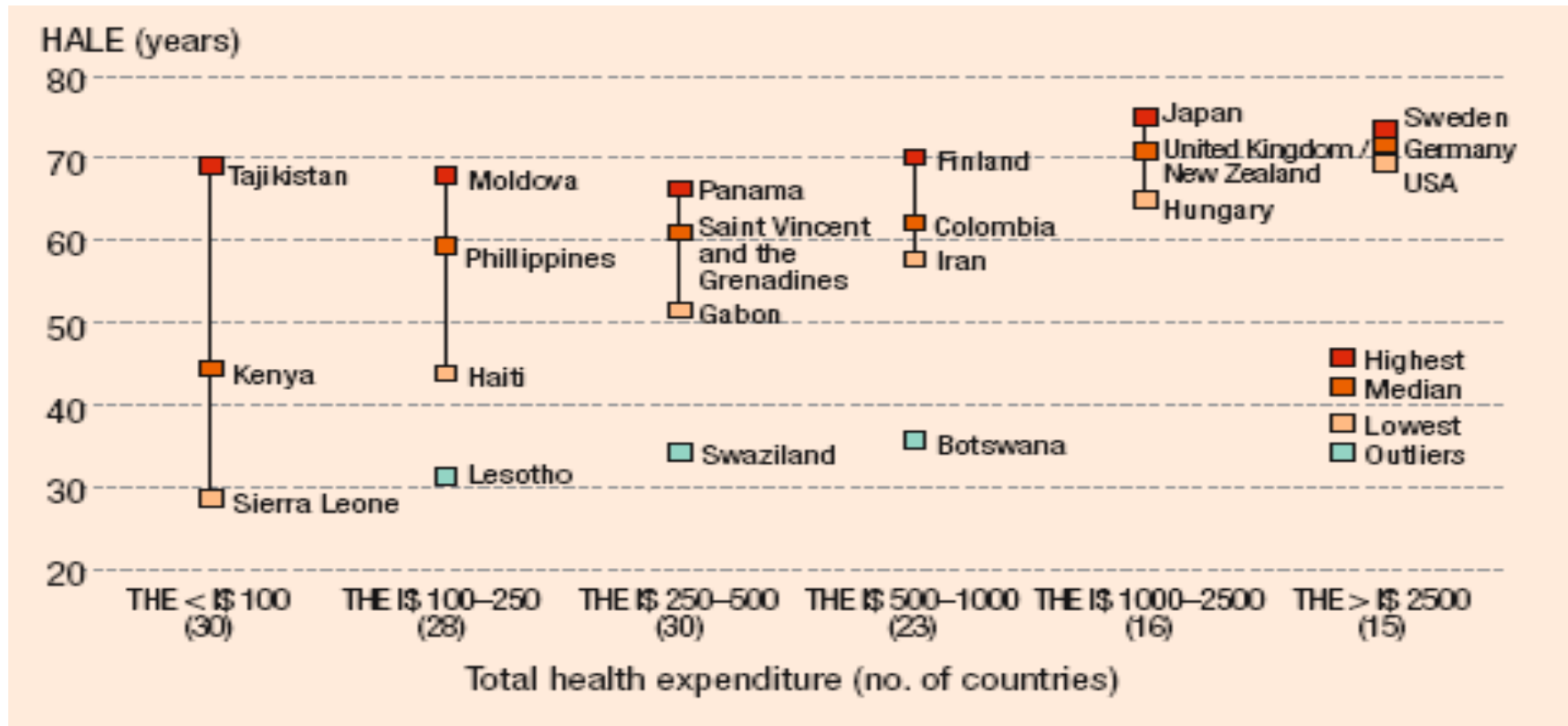
Source: Dorling D (2007) Worldmapper: The Human Anatomy of a Small Planet. PLoS Med 4(1): e1 [doi:10.1371/journal.pmed.0040001](https://doi.org/10.1371/journal.pmed.0040001)

Distribution of health workers by level of health expenditure and burden of disease



Source: WHO World Health Report (2006)

Same per capita total health expenditure, radically different outcomes



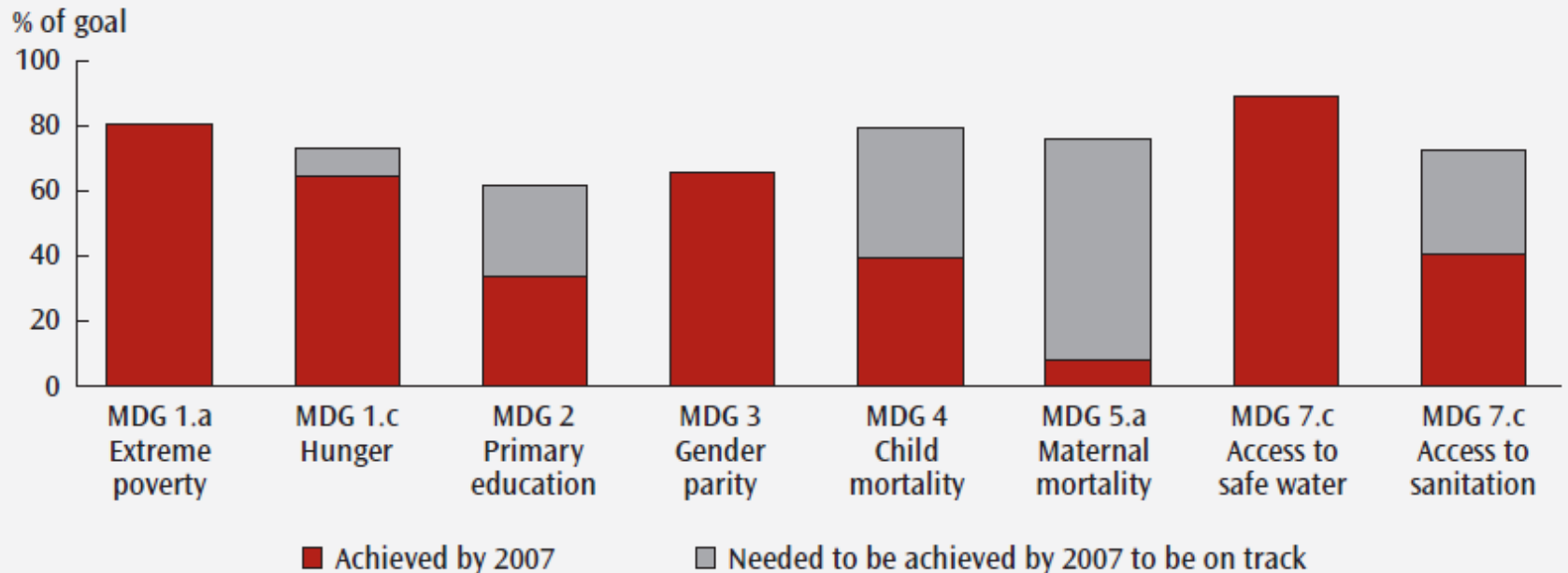
HALF: Health-adjusted life year Source World Health Report 2008

Please note that there are some arguable data issues in some cases.

Performance against Health MDG priorities

- Mid 2008 MDG halfway point
- “We face nothing less than a development emergency”
 - UN Secretary General
- “A global poverty emergency”
 - The U.K. Prime Minister
- An MDG Call to Action was released
- And this was before the financial crisis hit

Progress against MDGs?



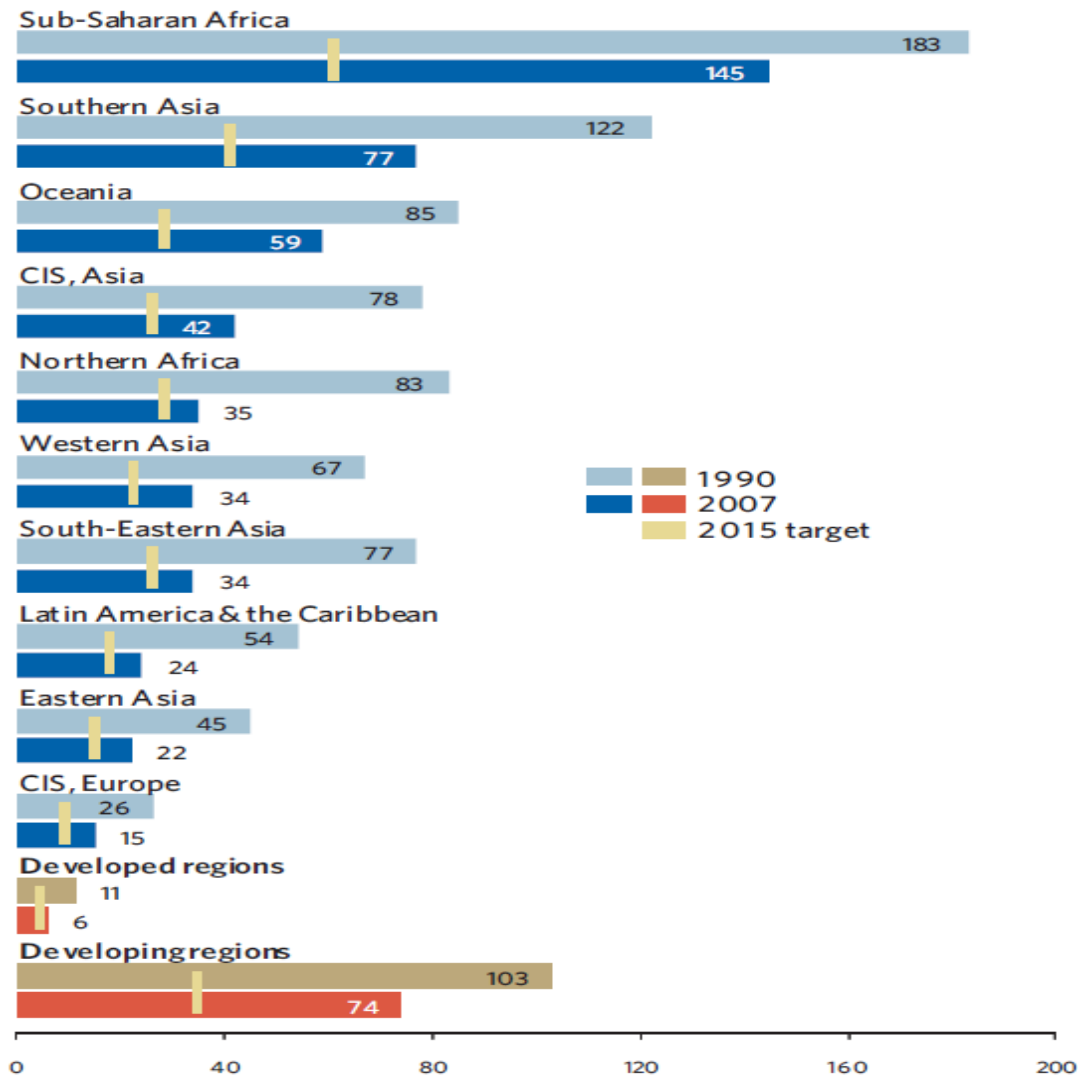
Source: Staff calculations based on World Development Indicators database.

Note: Calculations are based on the most recent year for which data are available. MDG 1.a: Poverty headcount ratio (PPP2005 US\$1.25 a day); MDG 1.c: Underweight under-five children (U.S. child growth standards); MDG 2: Primary education completion rate; MDG 3: Gender parity in primary and secondary education; MDG 4: Under-five mortality rate; MDG 5.a: Maternal mortality ratio (modeled estimates); MDG 7.c: Access to improved water source; MDG 7.c: Access to improved sanitation facilities.

World Bank Global Monitoring Report 2009: A Development Emergency
(large data gaps though)

NOTE: These are % of a goal set, not % of any ratio, access measure, etc.

Performance against Health MDGs: Goal 4 Reduce child mortality



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

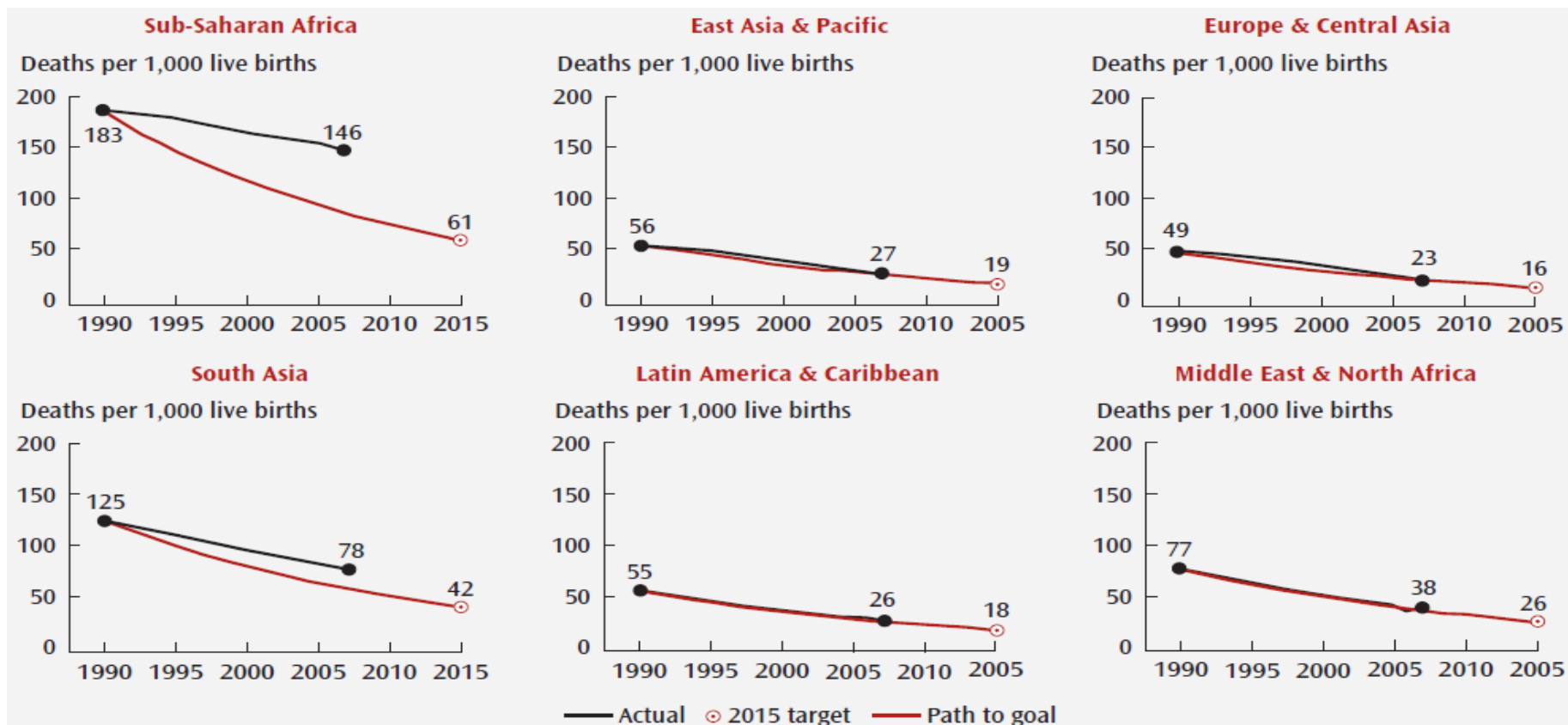
Deaths by age 5 per 1,000 live births

Currently 9 million per year.
3.5million fewer than in 1990

Still nearly 750,000 every month.

That's about 2,500 during our session this afternoon.

Progress of child mortality (chance newborn reaches age 5, per 1000)

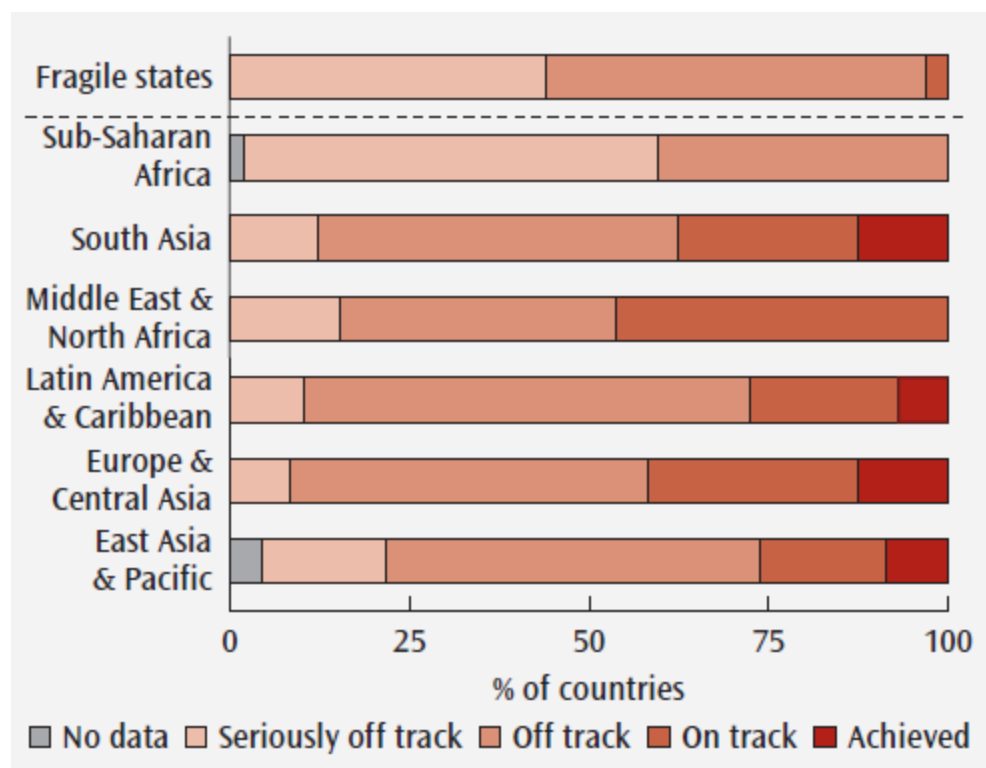


- In 2007, close to one in seven children in sub-Saharan Africa died before his or her fifth birthday. This is half of all under-five deaths
- Given high levels of fertility, the absolute number of under-five deaths rose from 4.2 million in 1990 to 4.6 million in 2007

There is improvement on the way

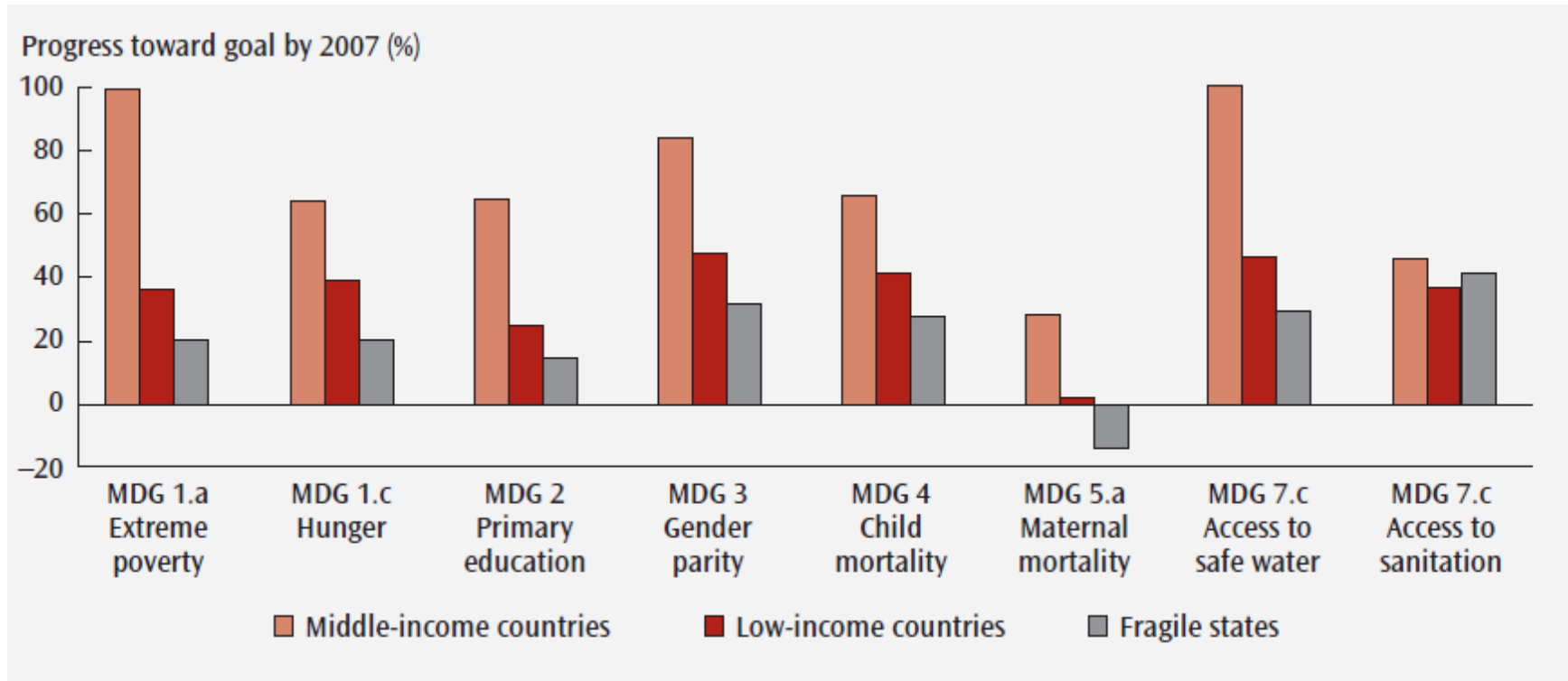
- The figures don't tend to show the expected improvements on the horizon brought about by recent huge efforts
- Across sub-Saharan Africa, survey data show remarkable improvements in several key child-survival interventions that are expected to yield further declines in under-five mortality over the next few years. These include:
 - Vitamin A supplementation
 - Wider use of insecticide-treated bed nets to prevent malaria
 - Exclusive breastfeeding
 - Immunization
 - Wider coverage of antiretroviral treatment for pregnant mothers who are HIV-positive to help prevent transmission of HIV to their babies

Proportion of countries on track to achieve the child mortality target



Source: World Development Indicators.

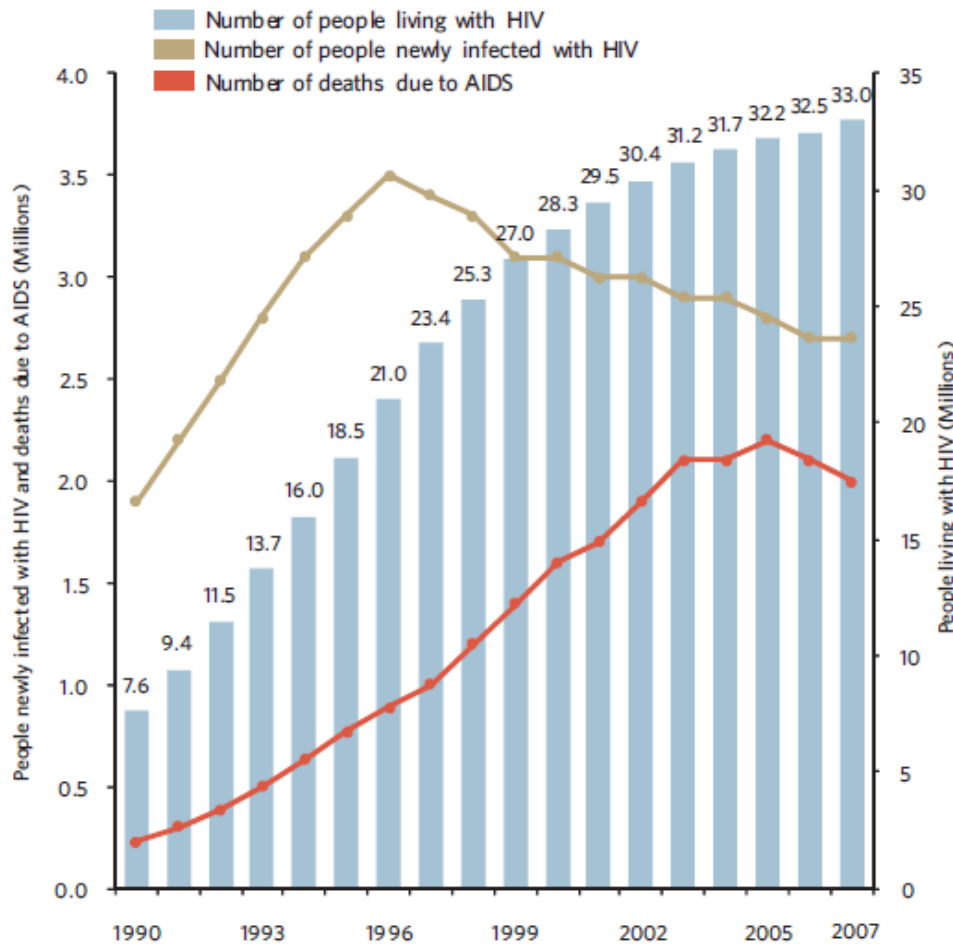
Fragile states have made the least progress towards MDGs



World Bank Global Monitoring Report 2009: A Development Emergency
(large data gaps though)

- Of 49 low-income countries, 26 are fragile states
- About 80% of fragile states have been or are still engaged in conflict

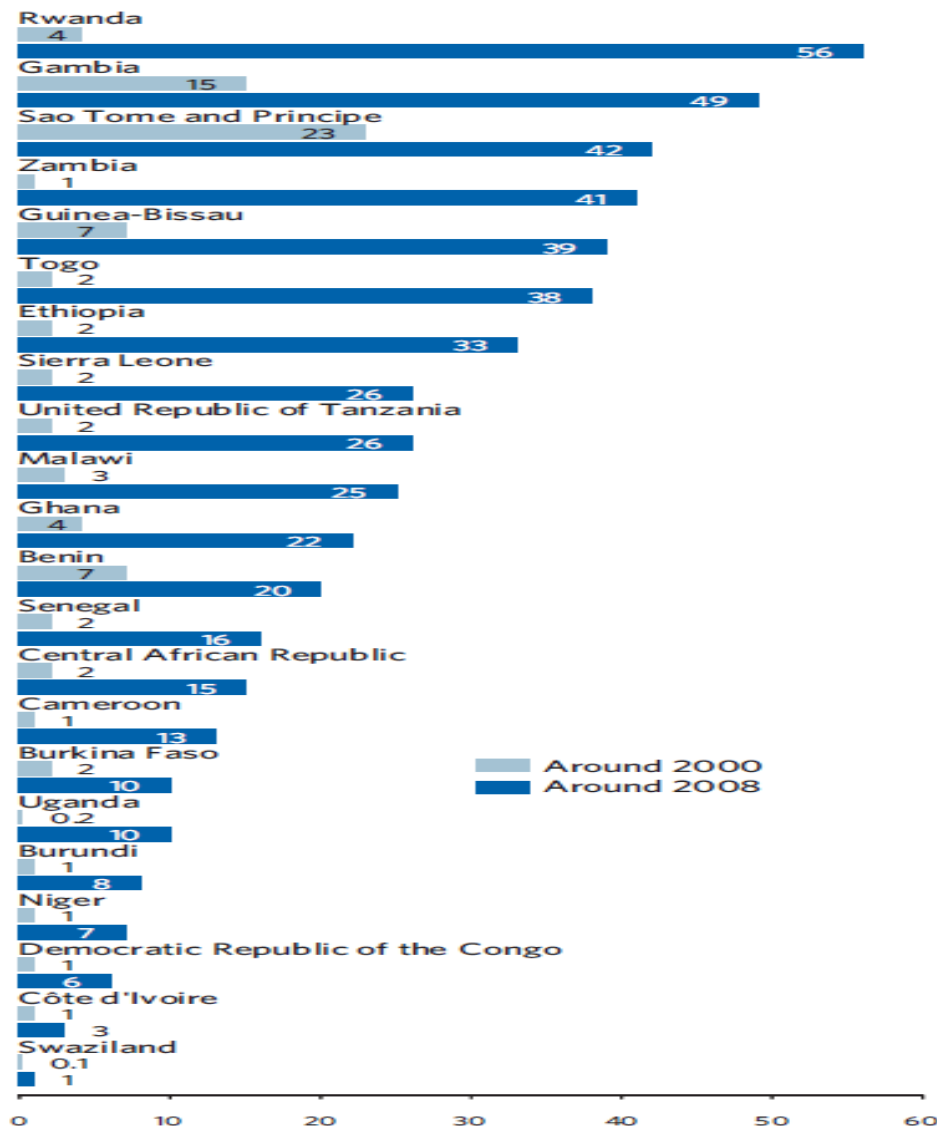
MDG goal 6 Combat HIV/AIDS, malaria and other diseases



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

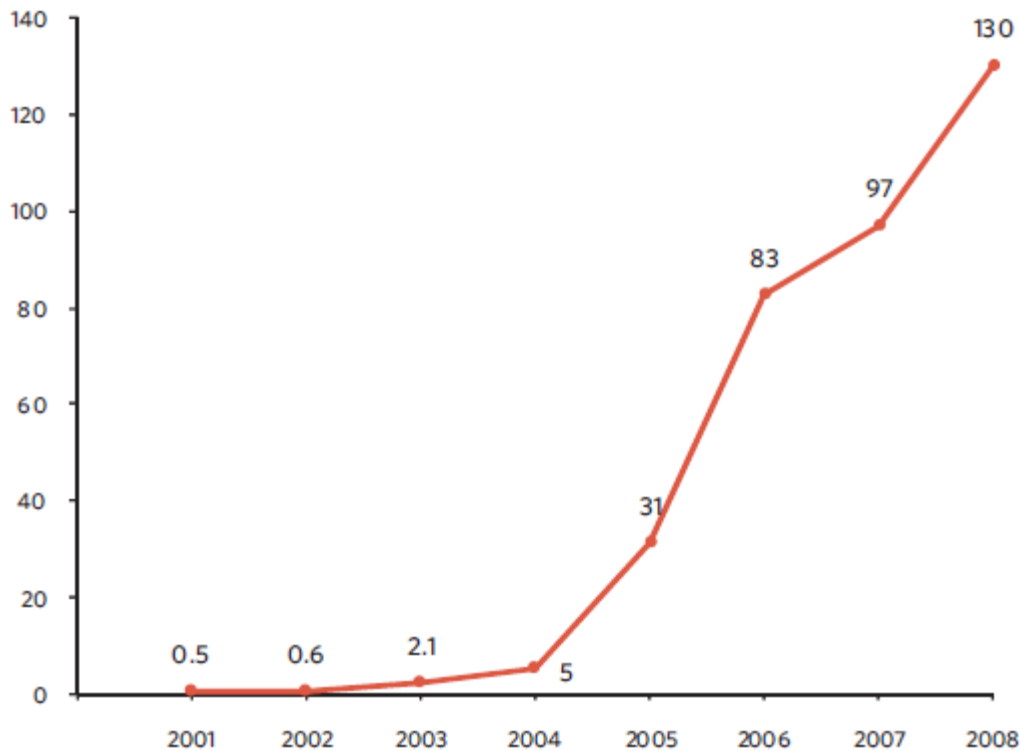
TARGET 6B
 Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it

Combat HIV/AIDS, malaria and other diseases



- TARGET 6C
- Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
- Proportion of children under five sleeping under **insecticide-treated bed nets**, selected countries, around 2000 and around 2008 (Percentage)

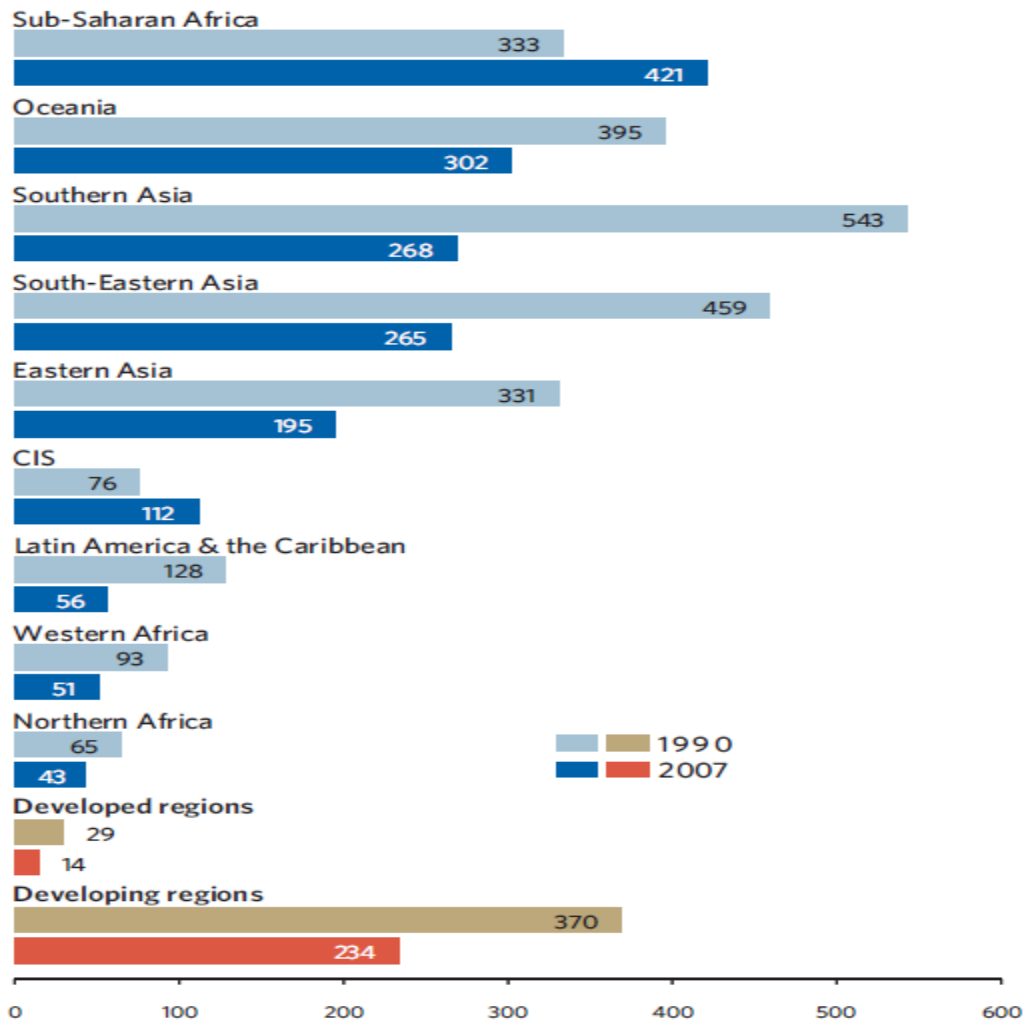
Tackling malaria



Number of doses of artemisinin-based combination therapies procured worldwide, 2001-2008 (Millions)

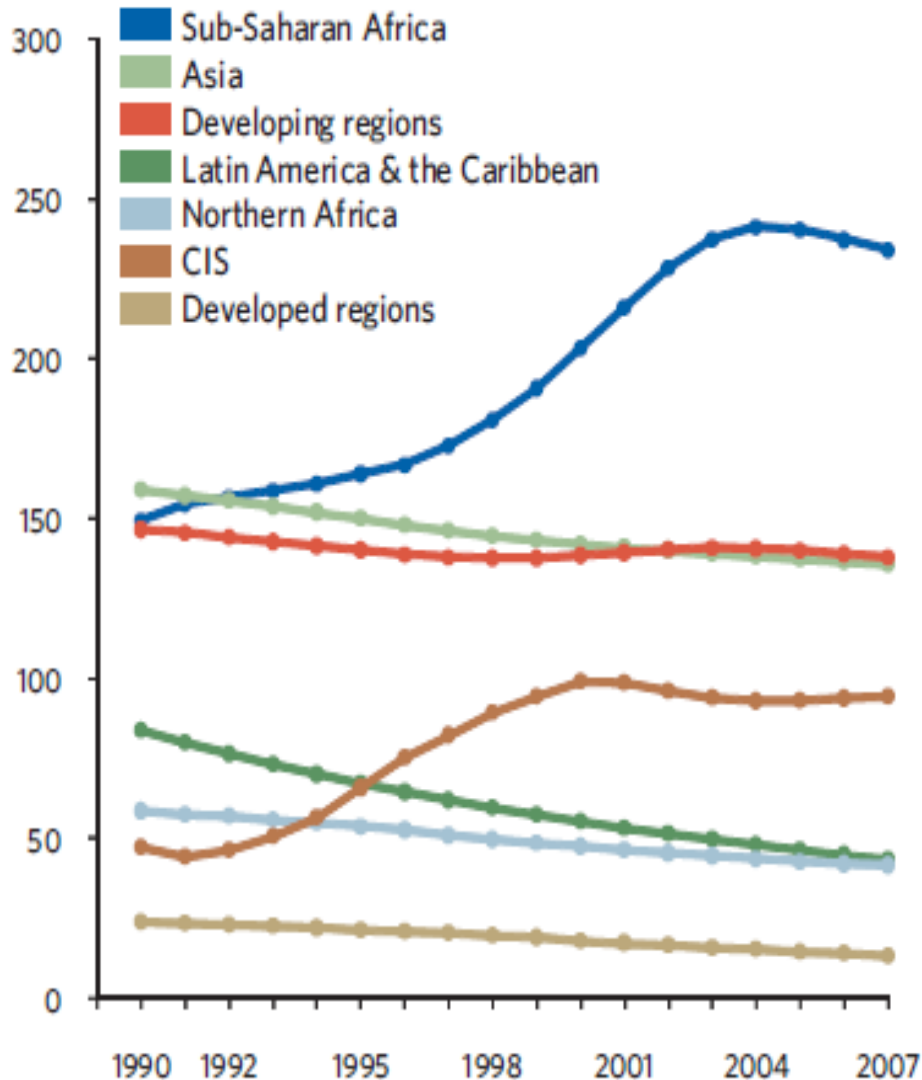
Across sub-Saharan Africa, the use of insecticide-treated bed nets among children jumped from 2 per cent in 2000 to 20 per cent in 2006. In fact, 19 of 22 sub-Saharan African countries with trend data showed at least a threefold increase during this time period; 17 of them saw at least a fivefold increase

MDG: TB



- Tuberculosis prevalence and mortality rates are falling, but not fast enough to meet global targets
- Number of tuberculosis cases per 100,000 population (excluding people who are HIV-positive), 1990 and 2007

MDG: TB



- Incidence of tuberculosis is levelling off, but the number of new cases continues to rise (pop. growth)
- Number of new tuberculosis cases per 100,000 population (excluding people that are HIV-positive), 1990-2007

Not just vaccines...

- 42% of Africa's population – 300 million people – have no access to safe water.
- Without clean water, anti-retroviral treatment for AIDS sufferers is not as effective, and formula milk cannot safely be used to prevent transmission of HIV from mother to child.
- Better water management can greatly reduce malaria mosquito breeding sites.

Not just vaccines...

- Two-thirds of all the African children who die under the age of five could be saved by low-cost treatments such as vitamin A supplements, oral rehydration salts and insecticide-treated bed-nets to combat malaria.
- A tenth of all the diseases suffered by African children are caused by intestinal worms
 - These can be treated for 25 US cents per child
- Research on virus-resistant maize for Africa
- **LOADS OF EXISTING UNDERUSED TECHNOLOGIES**
- Lots of competing financial demands...

Table A9.5.1: Costings of the Commission's Recommendations – Taking No Account of Constraints of Absorptive Capacity*

	Resource Estimates for 2010 (US\$ billion)
Governance (Chapter 4)	2.6
- APRM trust fund	0.01
- AU Institutional Transformation Program	0.02
- Programme costs for AU (excl. Peace & Security)	0.02
- Improve statistical systems	0.06
- Higher education	0.50
- Science & technology (Centres of Excellence)	2.00
Peace and Security (Chapter 5)**	1.7
- Arms control	0.04
- UN peacebuilding fund	0.25
- Expand World Bank Post-Conflict Reconstruction Trust Fund	0.06
- Clearing arrears for post-conflict countries	1.00
- AU Peace Fund	0.30
HIV and AIDS (Chapter 6)	10.0
Education (Chapter 6)	7.5
- Primary education (incl. through FTI)	3.75
- Secondary education	3.75
- Extra for curriculum development	0.04
Health (Chapter 6)	19.6
- WHO/NEPAD health systems strengthening	1.50
- Human resources	5.00
- GAVI	0.50
- Polio eradication	0.00
- Malaria and HIV and AIDS vaccine development	1.00
- Sexual and reproductive health services	0.29
- Programmes against parasitic and infectious debilitating and blinding diseases and micronutrients	0.30
- 'Tuberculosis and HIV and AIDS linkages' program	0.25
- Commission for Macroeconomics and Health basic health package	10.58
- Protection against vitamin and mineral deficiency	0.14
Social Inclusion (Chapter 6)	4.0
Growth (Chapter 7)	20.1
- Infrastructure (incl. irrigation, water, sanitation, slum upgrading, transport, power)	20.00
- Investment Climate Facility	0.08
- MIGA	0.02
- Africa Enterprise Challenge Fund	0.01
- Youth Employment Network	0.01
- Growing Sustainable Business Initiative	0.004
Environment (Chapter 7)	0.01
Trade (Chapter 8)	0.1
- Meeting sanitary and phytosanitary standards	0.07
- Improve productive capacity	0.02
- Trade facilitation (inc. customs reform)	0.004
Mitigation of Shocks (Chapter 9)	3.8
Contingency Funding	5.6
TOTAL	75.0

Commission for Africa costings

There is always a budget constraint

“Opportunity cost”

The alternative you were prevented from doing because you spent on the project you chose

Vaccines: A global ‘public good’

- Child protected
- Family: vaccinate child and reduce risk of transmission across siblings/generations
- National governments: Reduced transmission nationally
- International Level: Across borders
- Such public goods tend to get underprovided