Welcome to ES718
A new workshop on innovation in global health

ANJALI SASTRY

Image removed due to copyright restrictions. See Sangath website.

Plan for today

- First 70 minutes: Global Health briefing
- Next 50 minutes: in-class exercise to review useful data sources
  - you may step out for up to 10 minutes for a mini-break
- last hour: share your review with classmates, form teams, and plan for tomorrow

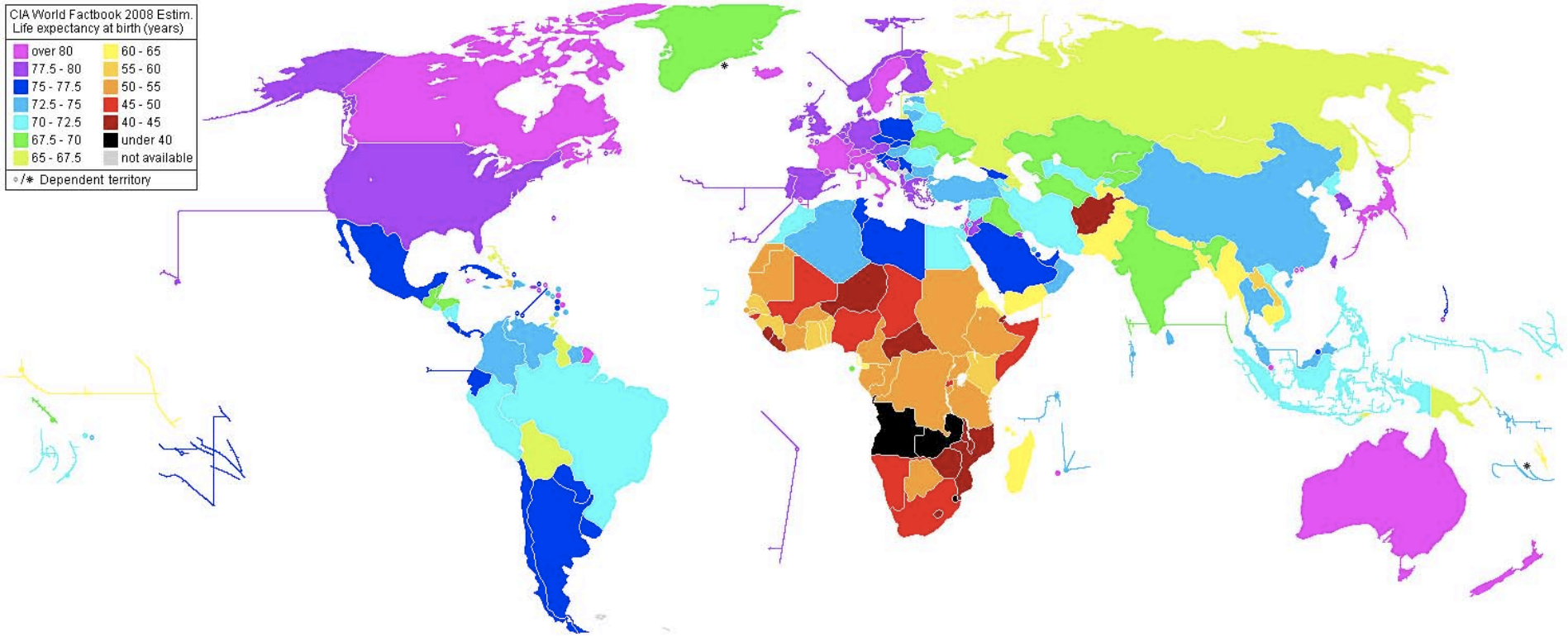
what is global health?

Global health takes on health problems that cross national boundaries, traditionally focusing on those that impose the greatest burden in resource-limited settings. To address the challenges, the field now encompasses a broad range of disciplines. Proponents have argued that it should account for "cultural identities, political organizations, transnational corporations, civil society movements and academic institutions" (Frenk 2010), along with populations.

Recent reframings of global health place interdependence at the center. If the origins and effects of many of today's biggest health problems cross national borders, then global health should be less concerned with geographical location or stage of development, and more concerned with the ways in which health issues are interconnected. This new definition of global health thus aligns with calls for multilateral collaboration and learning that flow both ways across state, sector, and socioeconomic boundaries, and for recognizing "the many contributions of both resource-rich and resource-scarce nations" (Fried et al, 10). In fact, some argue that global health is (or should be) "collaborative trans-national research and action for promoting health for all" (Beaglehole & Bonita, 10). Others note that acknowledging interrelationships requires equity to factor into solutions (Frenk, 10; Piot & Garnett, 10).

Source: Sastry 2011

How long will you live?



Article and interactive map:
http://www.dailymail.co.uk/news/article-2240855/How-does-nation-rank-world-map-life-expectancy.html#ixzz2dy9R5IDx

maternal death

Chance of dying in childbirth

- in Boston
  - 1 in 4,800
- In Burundi
  - 1 in 16
- in Austria
  - 1 in 21,500
- world
  - 1 in 92

A women's lifetime risk of dying from pregnancy-related complications:
Niger: 1 in 7
Ireland: 1 in 48,000

http://data.un.org/Data.aspx?d=SOWC&f=inID%3A132
http://www.who.int/making_pregnancy_safer/topics/maternal_mortality/en/

What’s the response?

Alma Ata Declaration 1978

Health for All in the 21st Century 1998

People's Health Charter 2000

Millennium
Development Goals
2000

Universal Declaration of Human Rights 1948

UN Millennium Goals

- Goal 1: Eradicate extreme hunger and poverty
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, Malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a global partnership for development

See http://www.un.org/millenniumgoals/pdf/(2011_E)%20MDG%20Report%202011_Book%20LR.pdf

Infographic removed due to copyright restrictions. See Institute for Health Metrics and Evaluation (IHME). Millennium Development Goal 4: Accellerated Declines in Child Deaths.

IMPLEMENTATION GAP

Global health delivery failures

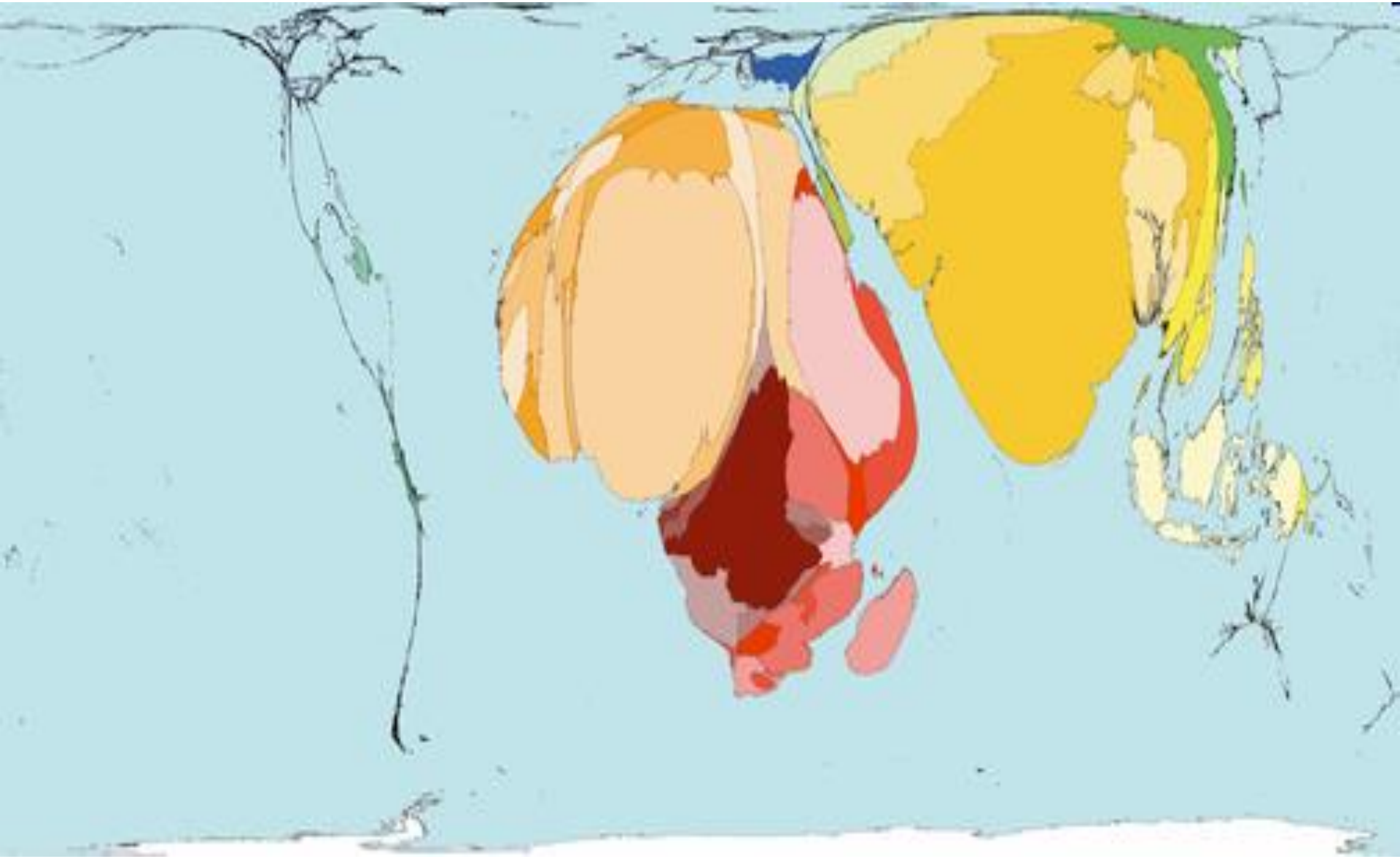
Mothers to Mothers program © USAID Kenya via Flickr. License: CC-BY-NC.

Bed with mosquito netting courtesy Joi Ito via Flickr. License: CC-BY.

Intervention	Implementation
ARVs for PMTCT ***Reduce HIV transmission by 40%***	**9%** coverage of women overall and **50%** of women who test positive in a clinic are given ARVs for PMTCT
ITNs for Malaria Prevention ***Reduce infant mortality by 23%***	Only **24%** of children in endemic areas sleep under nets

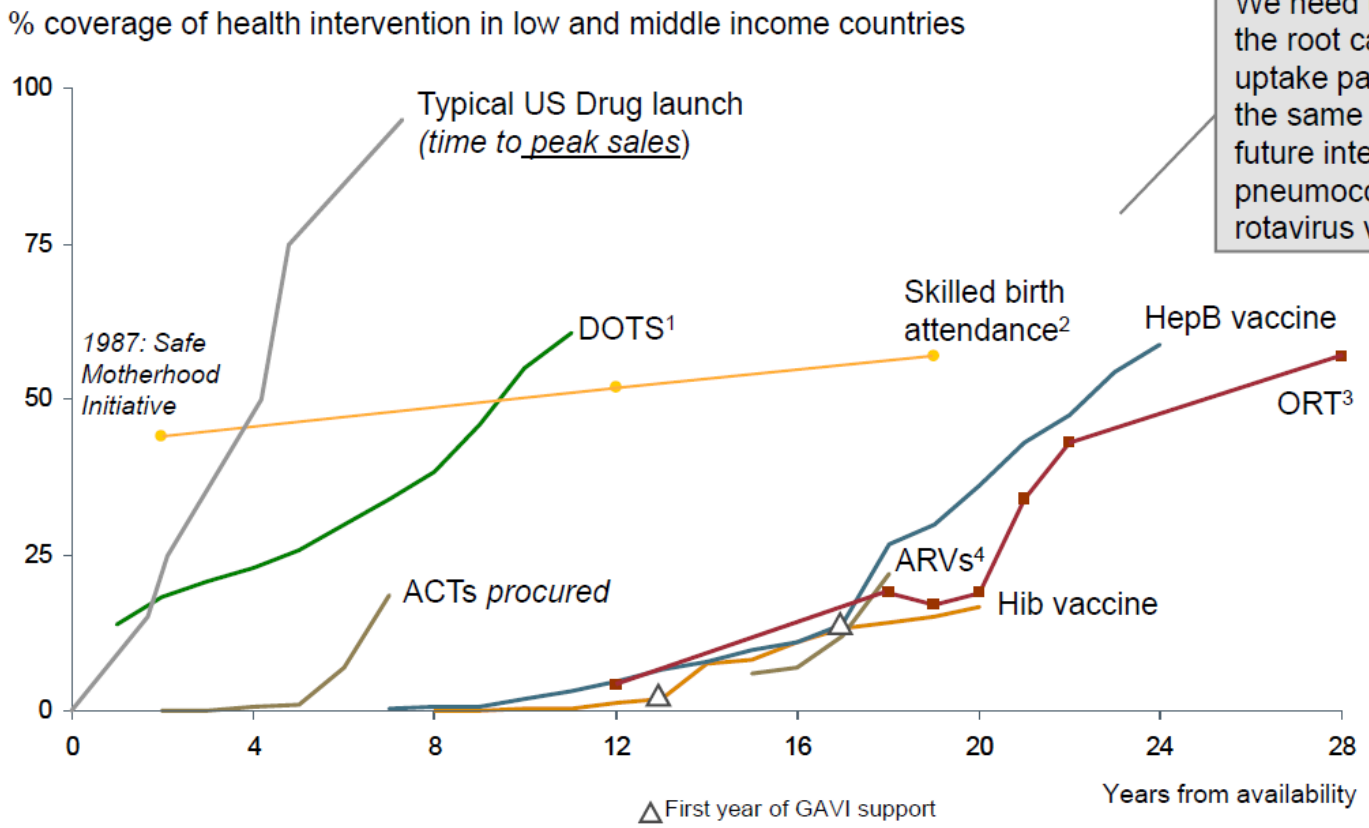
source: Global Health Delivery Project

Vaccine-Preventable Deaths



Critical health interventions have historically faced slow uptake and low coverage

Gaps in coverage fall disproportionately on the poor, and amplify inequity



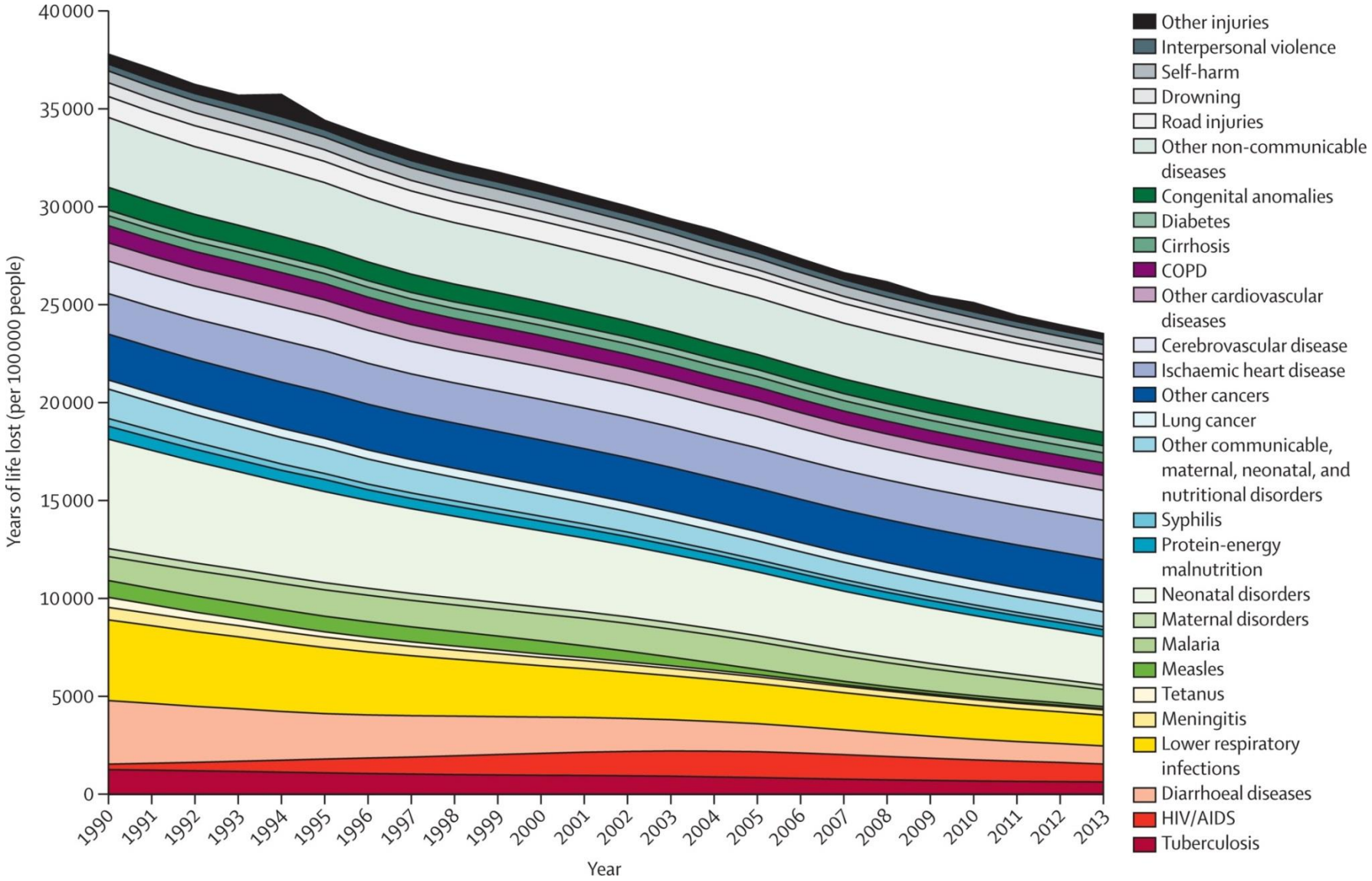
1. DOTS represents a new model to deliver older technologies (drugs), so uptake is faster than completely new interventions 2. Skilled birth attendance is an ancient intervention, but its introduction is measured from 1987, when the Safe Motherhood Initiative was launched. Skilled birth attendance is considerably lower in Sub-Saharan Africa, where it is only 44%.3. Average of 49 countries reporting ORS rates 1999-2005, weighted by population under 15 years old 4. NRTIs were first approved in 1987, which is used as the start date. NNRTIs were approved in 1997 while PIs were approved in 1995. 6 million people are estimated to need ARVs. 5. ACT coverage is overstated as numbers represent only those procured, not those properly administered.
Source: WHO/UNICEF; World Bank; BCG analysis

2008 data, courtesy of the Bill & Melinda Gates Foundation. Used with permission.

http://csis.org/event/rajeev-venkayya-global-health-delivery-systems

HOW DO YOU CHOOSE WHERE TO FOCUS?
START WITH BURDEN OF DISEASE

Years of life lost by cause



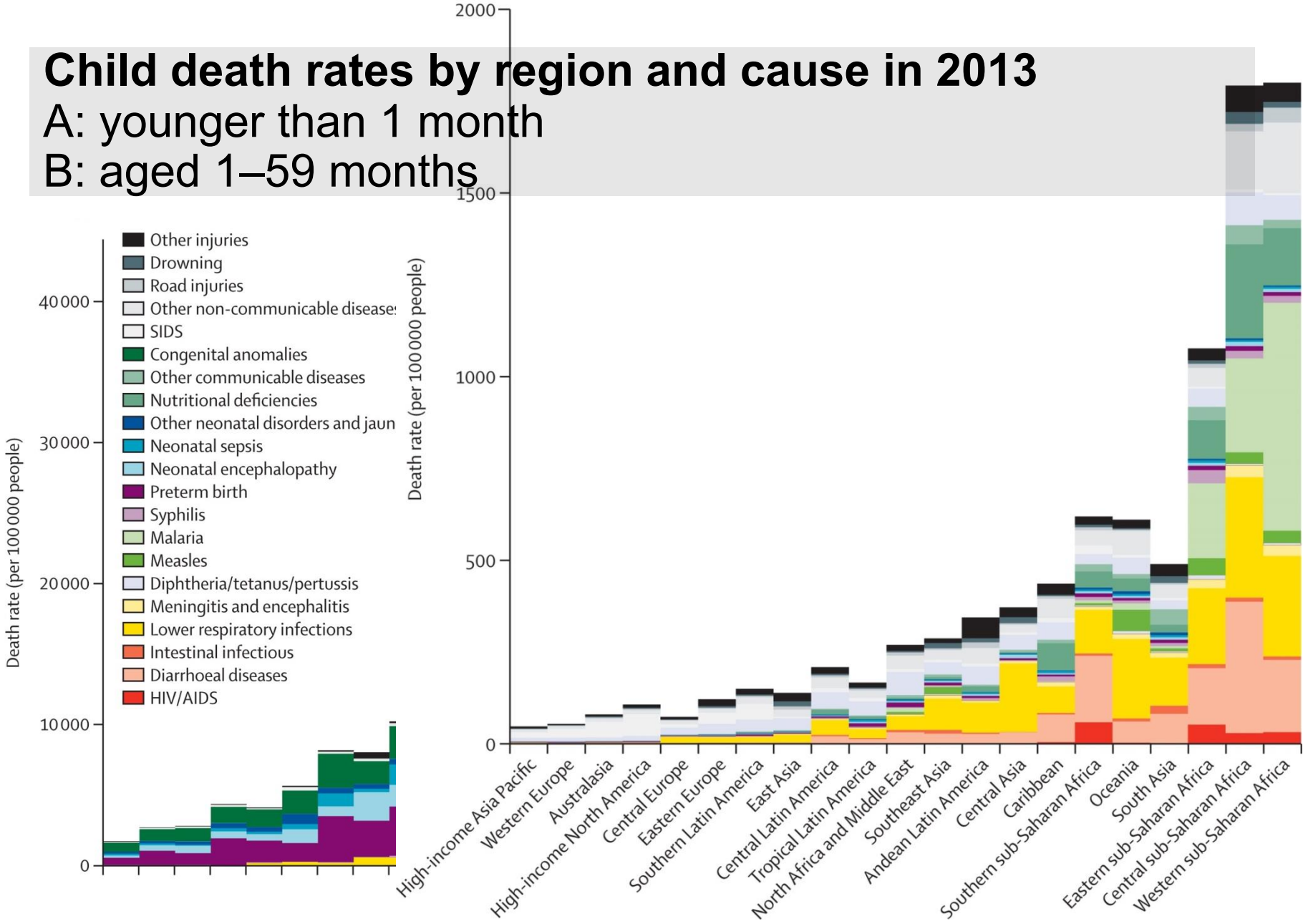
Infographic courtesy of Elsevier, Inc., http://www.sciencedirect.com. Used with permission.
Source: "Global, Regional, and National Age–sex Specific All-cause and Cause-specific Mortality for 240 Causes of Death, 1990–2013." *The Lancet* 385, no. 9963 (2015): 117–71.

The Lancet 2015 385, 117-171DOI: (10.1016/S0140-6736(14)61682-2)

Child death rates by region and cause in 2013

A: younger than 1 month

B: aged 1–59 months



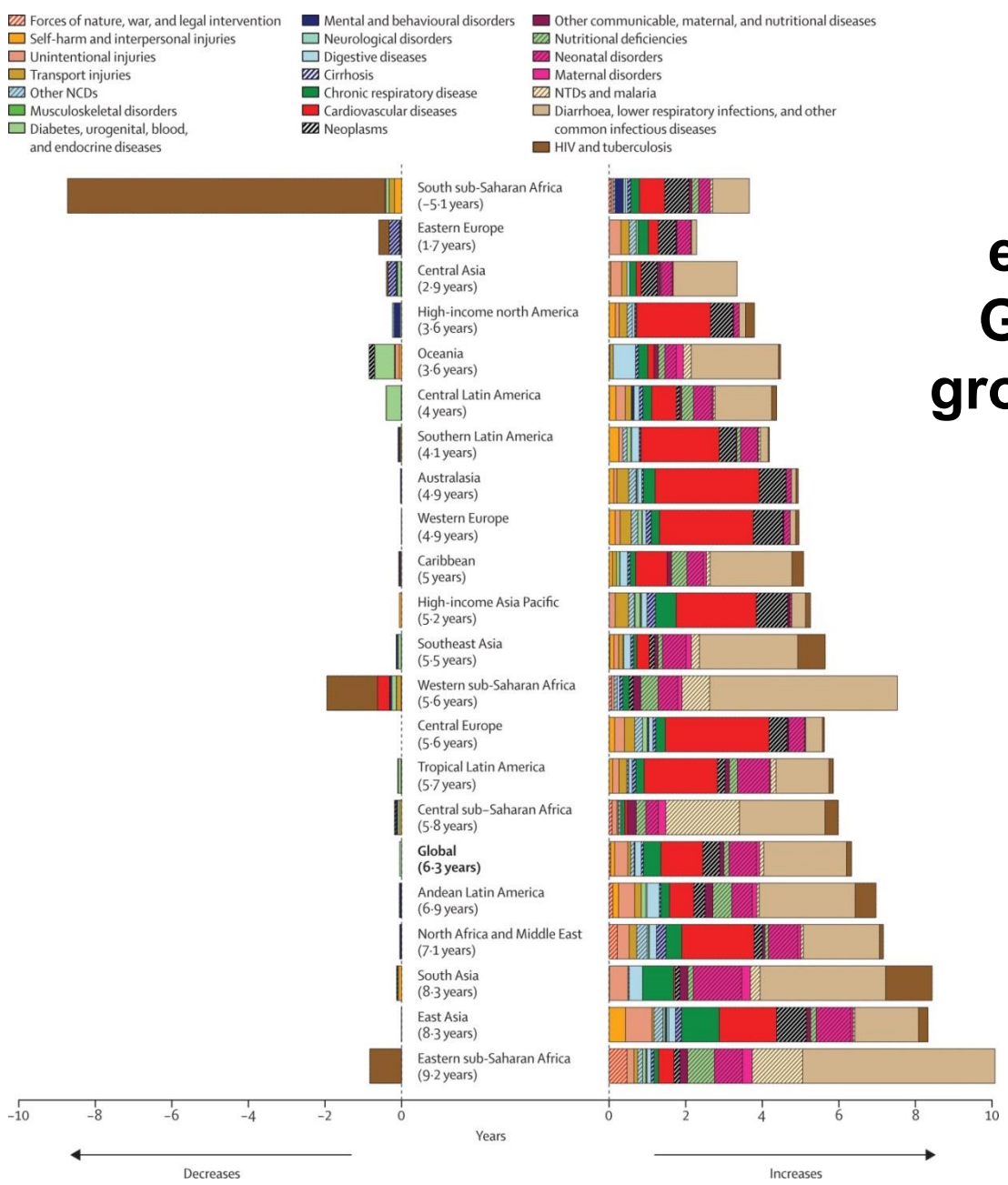
Source: "Global, Regional, and National Age–sex Specific All-cause and Cause-specific Mortality for 240 Causes of Death, 1990–2013." *The Lancet* 385, no. 9963 (2015): 117–71.

Top 50 causes of global years of life lost in 1990 and 2013

Figure removed due to copyright restrictions. See Figure 10: "Global, Regional, and National Age–sex Specific All-cause and Cause-specific Mortality for 240 Causes of Death, 1990–2013." *The Lancet* 385, no. 9963 (2015): 117–71.

An interactive version of this figure is available at http://vizhub.healthdata.org/gbd-compare/.

Change in life expectancy at birth by GBD region and cause group from 1990 to 2013



An interactive figure with these data is available at http://vizhub.healthdata.org/le. Changes in life expectancy as a result of specific causes were decomposed from the difference between all-cause lifetables and cause-deleted lifetables (mortality set to zero for a specific cause). Because all changes in life expectancy are based on cross-sectional lifetables, the cause-specific changes add up to the total change in life-expectancy. NTDs=neglected tropical diseases

Infographic courtesy of Elsevier, Inc., http://www.sciencedirect.com. Used with permission.
Source: "Global, Regional, and National Age–sex Specific All-cause and Cause-specific Mortality for 240 Causes of Death, 1990–2013." *The Lancet* 385, no. 9963 (2015): 117–71.

Quantifying the Burden of Disease from mortality and morbidity

Disability-Adjusted Life Year (DALY)

Definition

- One DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.
- DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for incident cases of the health condition:

Calculation

$$DALY = YLL + YLD$$

- The YLL basically correspond to the number of deaths multiplied by the standard life expectancy at the age at which death occurs. The basic formula for YLL (without yet including other social preferences discussed below), is the following for a given cause, age and sex: $YLL = N \times L$

  where:

  N = number of deaths

  L = standard life expectancy at age of death in years

- Because YLL measure the incident stream of lost years of life due to deaths, an incidence perspective is also taken for the calculation of YLD. To estimate YLD for a particular cause in a particular time period, the number of incident cases in that period is multiplied by the average duration of the disease and a weight factor that reflects the severity of the disease on a scale from 0 (perfect health) to 1 (dead). The basic formula for YLD is the following (again, without applying social preferences): $YLD = I \times DW \times L$

  where:

  I = number of incident cases

  DW = disability weight

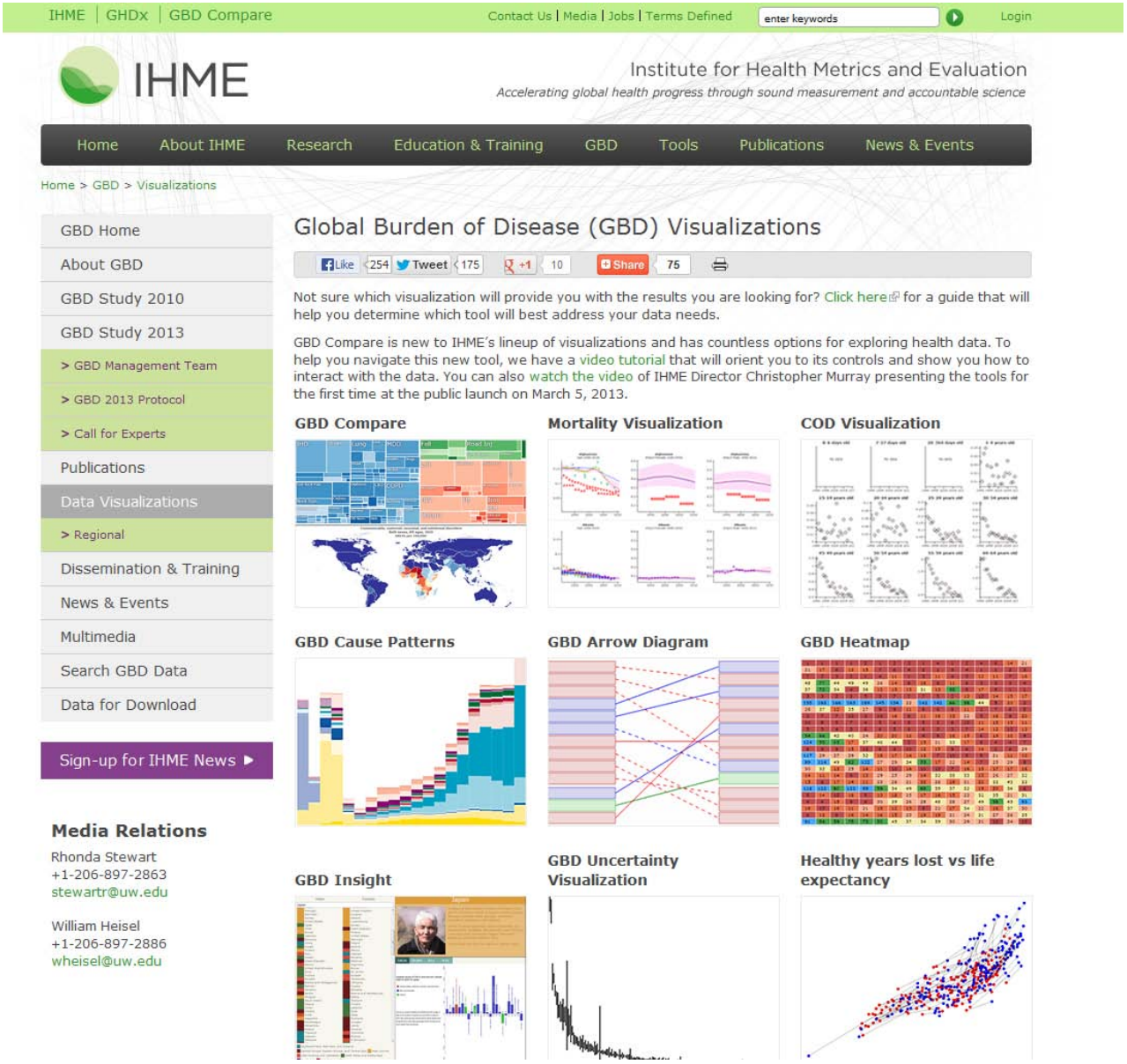
  L = average duration of the case until remission or death (years)

http://www.who.int/healthinfo/global_burden_disease/en/

Figure showing Disability-adjusted Life Years (DALYs) by region removed due to copyright restrictions. See: DALYs by region, 2012. World Health Organization.

http://www.who.int/gho/mortality_burden_disease/daly_rates/en/

Visualizations



Age distribution of burden of disease by country income group, 2004

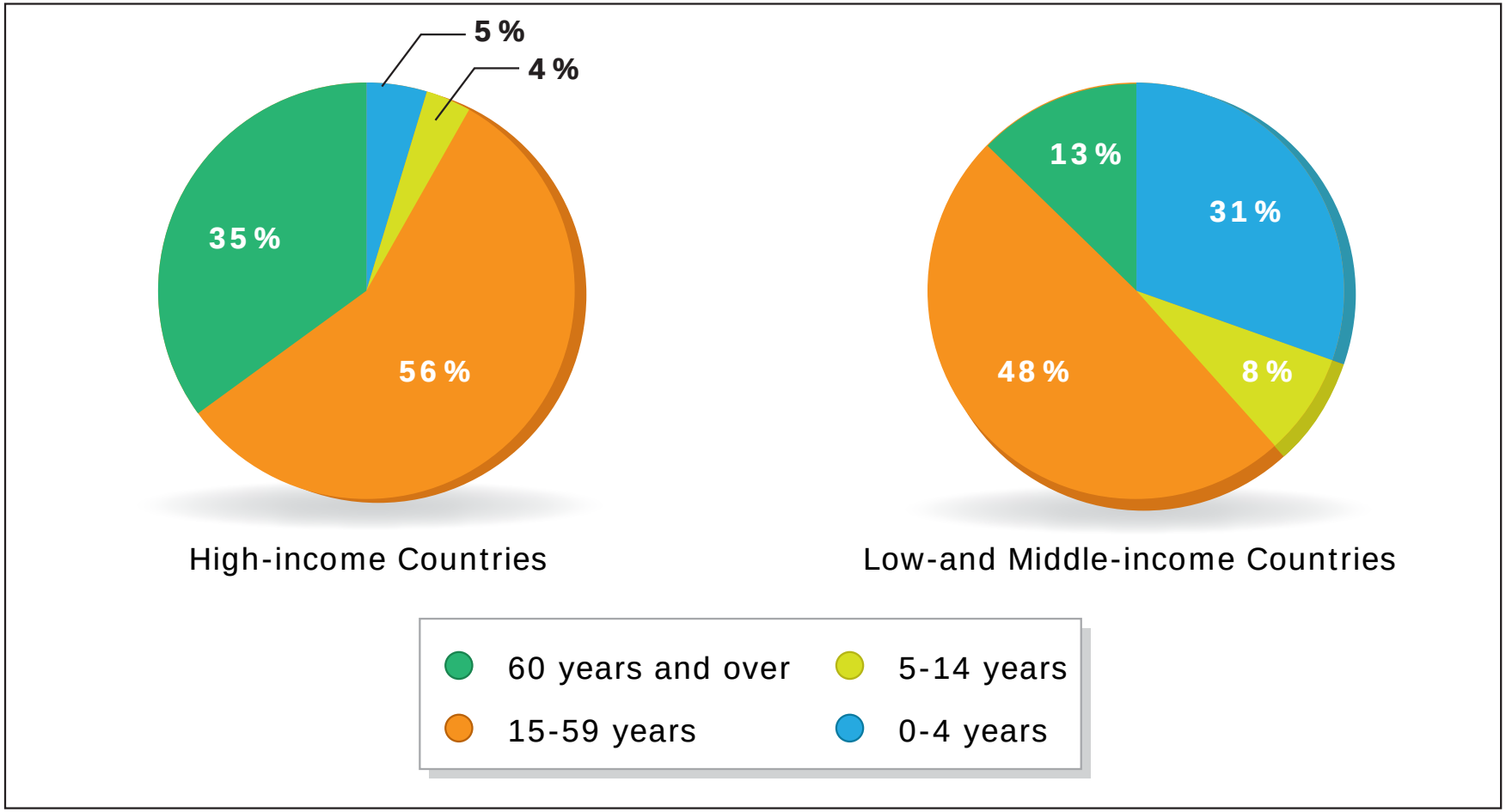
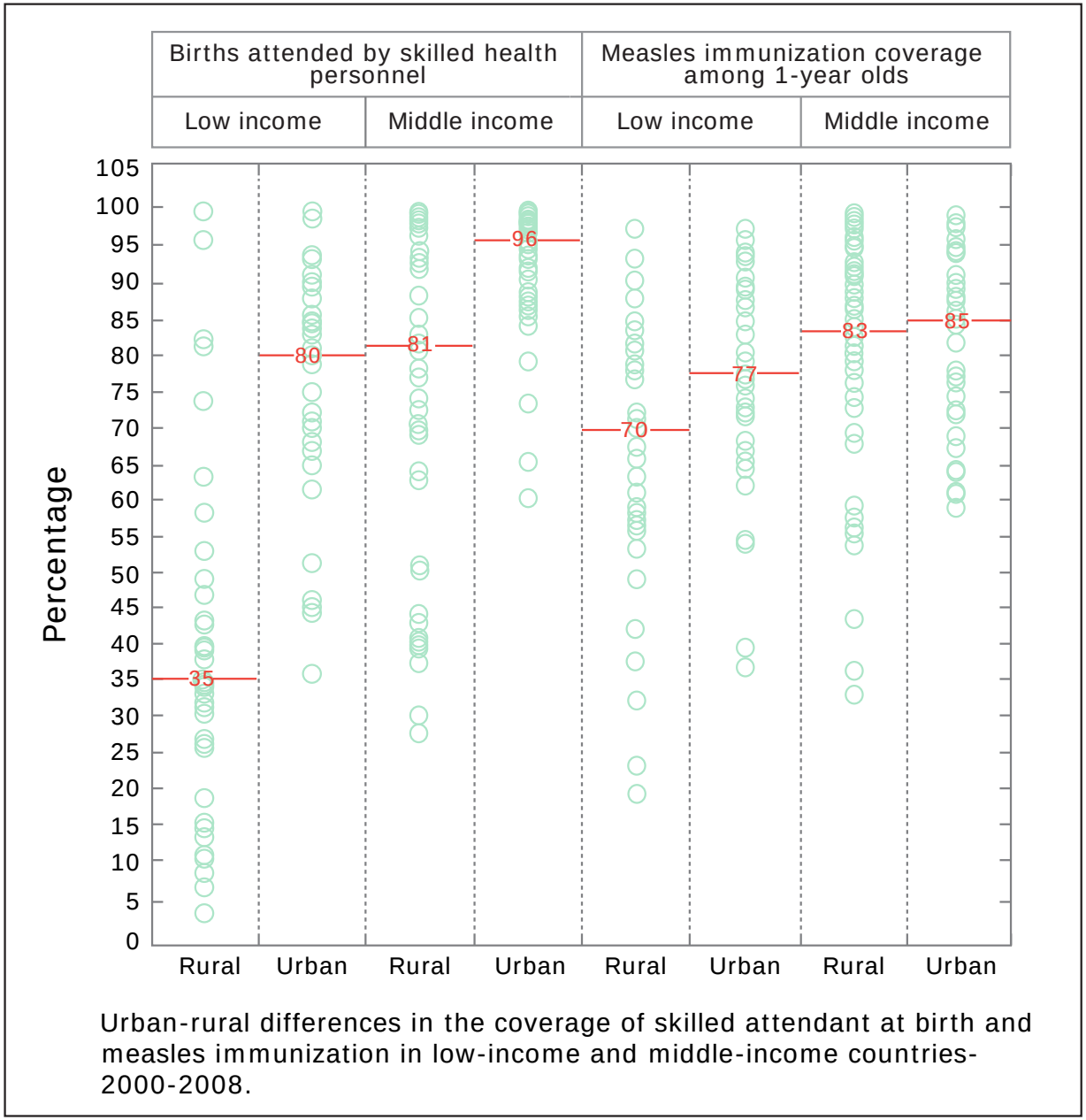


Image by MIT OpenCourseWare.

Source data: World Health Organization. "The Global Burden of Disease, 2004 Update." WHO Press, 2004, p. 42.

http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html

Urban-rural differences, 2000-2008



Urban-rural differences in the coverage of skilled attendant at birth and measles immunization in low-income and middle-income countries-2000-2008.

Source data: World Health Organization. "World Health Statistics 2010." WHO Press, 2011, p. 142.

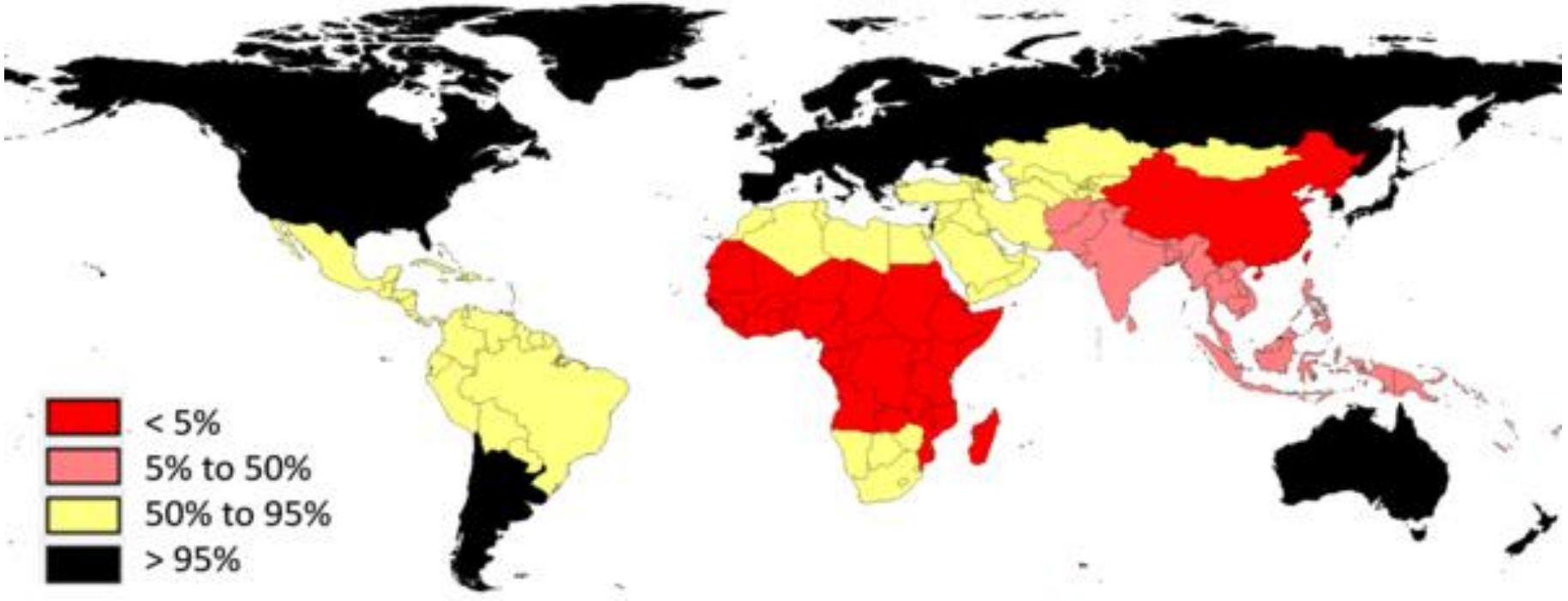
WHO, 2010
WORLD HEALTH STATISTICS

SO, WHAT IS MOST NEEDED?

WE DEFINITELY NEED BETTER DATA

Map removed due to copyright restrictions. See "Civil Registration Coverage of Cause of Death (%), 2005-2011."

Proportions of deaths covered by vital registration (by GBD-2010 regions)



Courtesy of Byass et al., 2013. License CC-BY. Source: "Reflections on the Global Burden of Disease 2010 Estimates." *PLoS Medicine* 10, no. 7 (2013).

PLOS | MEDICINE™

NEEDED INPUTS ARE MISSING

Doctors per person

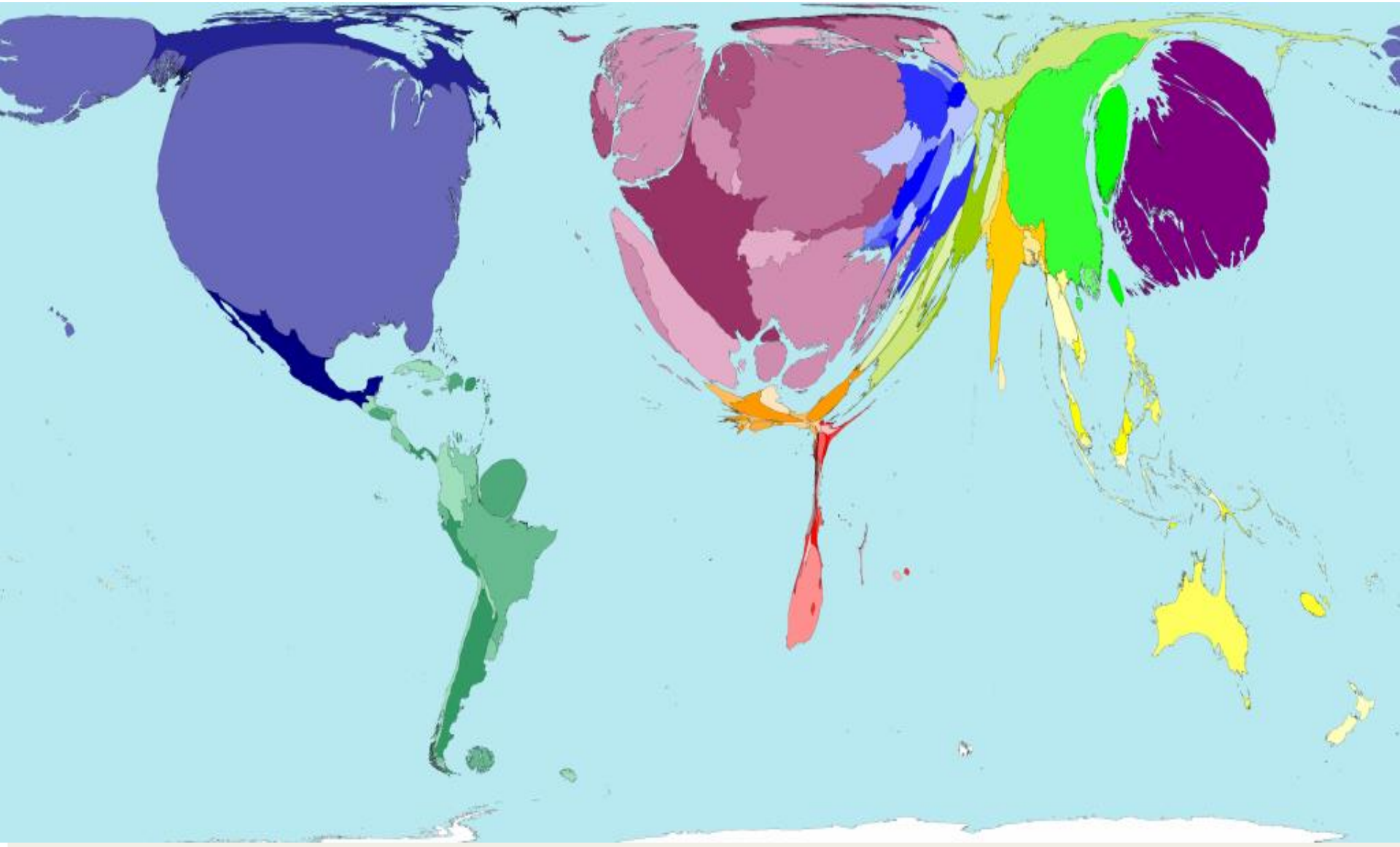
- In Massachusetts? 4.69 (nonfederal) per 1,000
- In Malawi? 0.02

Infographic removed due to copyright restrictions.
Source: EuroRSCG Amsterdam, Netherlands. "Doctors of the World, Netherlands: Perspective."

http://adsoftheworld.com/media/print/doctors_of_the_world_netherlands_perspective?size=_original

MAYBE IT COMES DOWN TO MONEY: NEED MORE ECONOMIC INPUTS

Public Health Spending



Health Expenditure Per Capita (PPP; International $, 2010)

World map depicting health expenditure per capita removed due to copyright restrictions.
Source: Kaiser Family Foundation. "Health Expenditure Per Capita (PPP; International $, 2010)."

http://kff.org/global-indicator/health-expenditure-per-capita/#

Comparing the US and Malawi

	Malawi	US
% GDP on health	9.1	15.2
Percapita health spending (PPP $)	49	**7,164**
Pvt spend as % of total	39.4	52.2
Children/woman	5.5	2.1
Gross nat'l income per capita (PPP $)	**760**	45,640
% population living on under PPP$1/day	73.9	-

Note 2008 & 2009 data. Source: http://www.who.int/whosis/whostat/2011/en/index.html

Development Assistance For Health, By Channel Of Assistance, 1990–2013.

Figure removed due to copyright restrictions. See Exhibit 1: Dieleman, Joseph L., et al. "Global Health Development Assistance Remained Steady In 2013 But Did Not Align With Recipients' Disease Burden." *Health Affairs.* 2014. doi:10.1377/hlthaff.2013.1432.

US-based NGOs with highest cumulative overseas health expenditure, 2007–2010

Rank	Organization	Overseas health expenditure, adjusted	Overseas health expenditure, unadjusted	Overseas expenditure, unadjusted	Percent of revenue from private sources	Percent of revenue from in-kind contributions
1	Population Services International	1392.35	1392.36	1784.37	17.72	0.00
2	Catholic Relief Services	910.90	916.74	2750.85	32.11	0.85
3	Food for the Poor	793.18	3009.92	4709.03	98.55	90.08
4	PATH	667.75	683.20	799.46	78.67	2.91
5	Clinton Health Access Initiative	626.77	631.74	709.96	55.57	1.11
6	Management Sciences for Health, Inc.	577.22	577.22	609.58	0.77	0.00
7	Elizabeth Glaser Pediatric AIDS Foundation	411.98	413.23	434.94	15.60	0.37
8	CARE	355.95	358.28	2418.42	29.20	0.79
9	Save the Children	319.19	334.16	1701.05	50.34	5.70
10	World Vision	312.68	418.08	3440.61	78.01	30.81
11	Pathfinder International	307.76	310.04	354.37	22.83	0.85
12	MAP International	292.88	1384.72	1509.19	99.51	96.67
13	International Medical Corps	276.74	397.24	414.48	49.65	37.05
14	Rotary Foundation of Rotary International	271.83	271.83	587.14	99.99	0.00
15	Brother's Brother Foundation	239.60	1277.34	1919.16	99.96	99.36
16	Academy for Educational Development	232.72	233.93	943.28	11.21	0.62
17	Project HOPE	230.00	593.09	643.90	94.00	75.02
18	United Nations Foundation	219.47	230.85	342.12	88.30	8.63
19	Catholic Medical Mission Board	217.70	877.54	928.34	99.37	91.99
20	Feed the Children	212.60	738.36	2114.31	99.64	87.13

Source: IHME DAH Database 2013

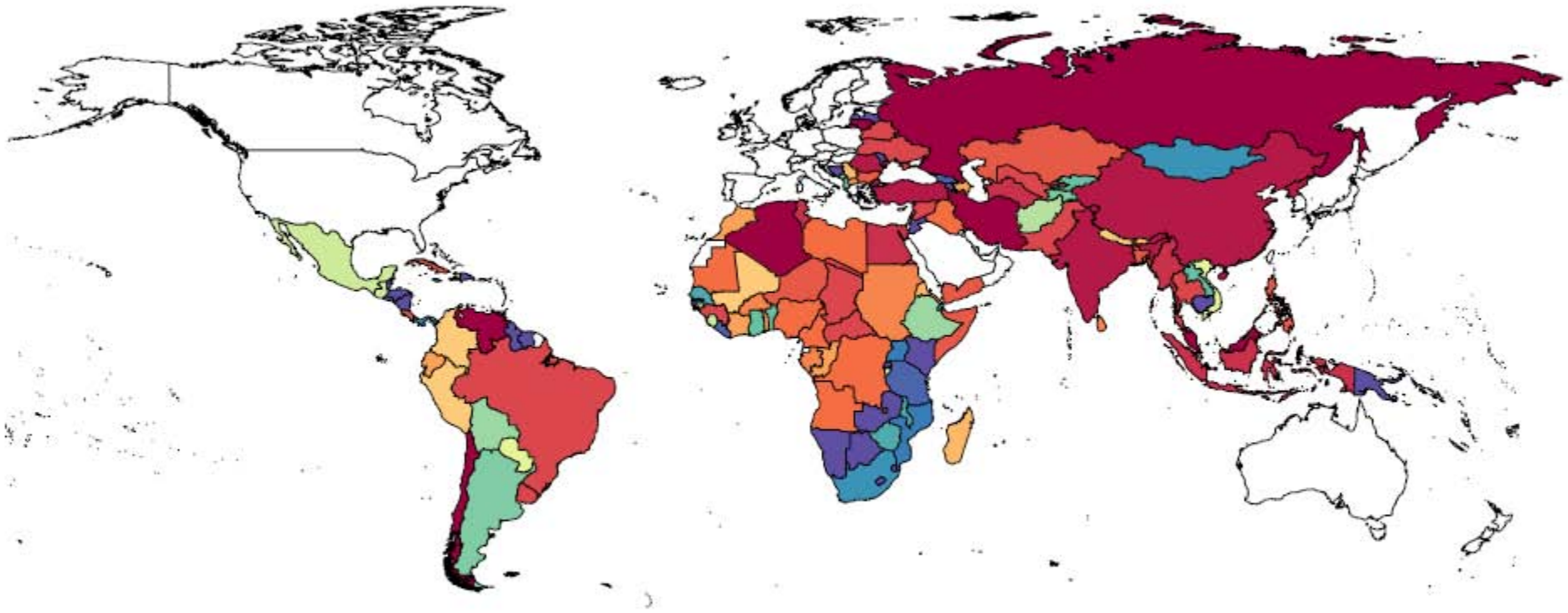
Notes: Expenditures shown in millions of 2011 US dollars. Overseas health expenditure for 2011–2013 is not included because of data limitations. Data reflect NGOs registered with USAID. Adjusted overseas health expenditure reflects deflated private in-kind donations plus unadjusted financial assistance.

Institute for Health Metrics and Evaluation (IHME). Financing Global Health 2013: Transition in an Age of Austerity. IHME, University of Washington, 2013. Available at http://www.healthdata.org/policy-report/financing-global-health-2013-transition-age-austerity. Used with permission.

Figure removed due to copyright restrictions. See Exhibit 3: Dieleman, Joseph L., et al. "Global Health Development Assistance Remained Steady In 2013 But Did Not Align With Recipients' Disease Burden." *Health Affairs.* 2014. doi:10.1377/hlthaff.2013.1432.

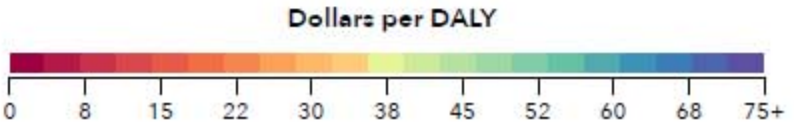
http://www.healthdata.org/research-article/global-health-development-assistance-remained-steady-2013-did-not-align-recipients%E2%80%99

DAH per all-cause DALY, 2009–2011

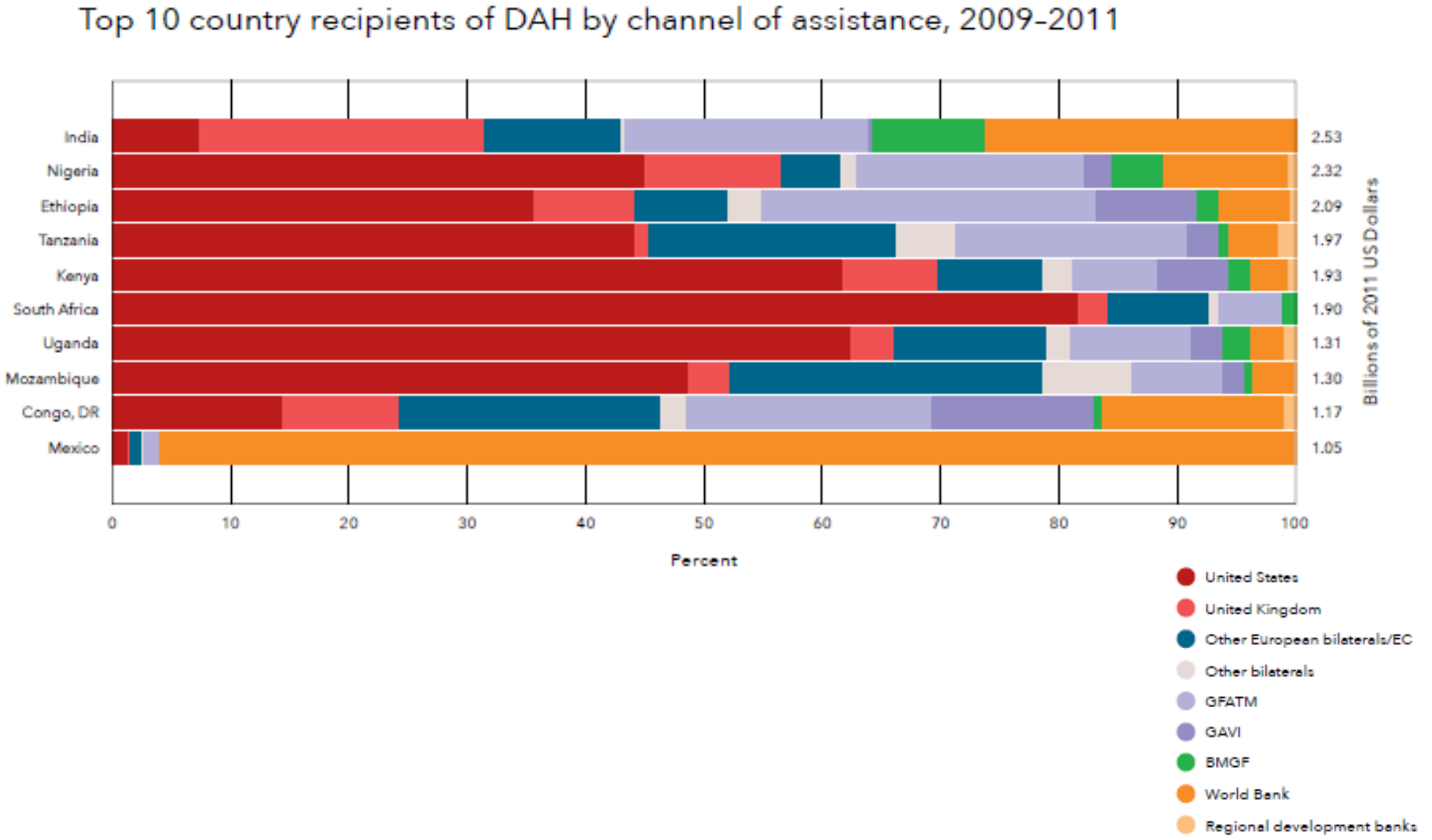


Source: IHME DAH Database 2013

Notes: Countries that were ineligible for DAH based on their World Bank income classification are shown in white. DAH received is shown in real 2011 US dollars.



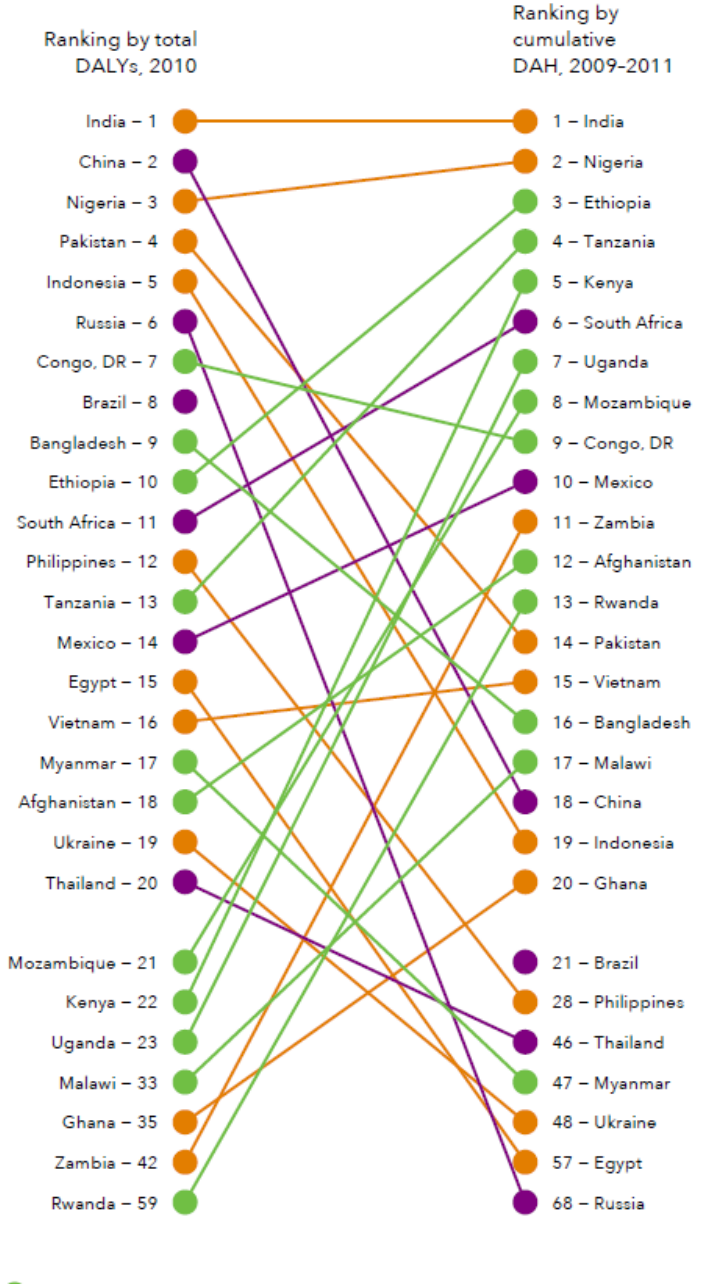
Institute for Health Metrics and Evaluation (IHME). Financing Global Health 2013: Transition in an Age of Austerity. IHME, University of Washington, 2013. Available at http://www.healthdata.org/policy-report/financing-global-health-2013-transition-age-austerity. Used with permission.



Institute for Health Metrics and Evaluation (IHME). Financing Global Health 2013: Transition in an Age of Austerity. IHME, University of Washington, 2013. Available at http://www.healthdata.org/policy-report/financing-global-health-2013-transition-age-austerity. Used with permission.

http://www.healthdata.org/sites/default/files/files/policy_report/2014/FGH2013/IHME_FGH2013_Chapter2.pdf

Top 20 countries by 2010 all-cause burden of disease versus cumulative 2009–2011 DAH



Low-income countries

Lower-middle-income countries

Upper-middle-income countries

Sources: IHME DAH Database 2013 and Global Burden of Disease Study 2010

Institute for Health Metrics and Evaluation (IHME). Financing Global Health 2013: Transition in an Age of Austerity. Seattle, WA: IHME, University of Washington, 2013. Available at http://www.healthdata.org/policy-report/financing-global-health-2013-transition-age-austerity. Used with permission.

humoungous CAVEAT: Spending does not equal health outcomes

Infographic removed due to copyright restrictions.
Source: Kane, Jason. "Health Costs: How the U.S. Compares With Other Countries."
October 22, 2012. *PBS Newshour The Rundown* (blog).

http://www.pbs.org/newshour/rundown/2012/10/health-costs-how-the-us-compares-with-other-countries.html

Infographic removed due to copyright restrictions.

Source: Kane, Jason. "Health Costs: How the U.S. Compares With Other Countries." October 22, 2012. *PBS Newshour The Rundown* (blog).

Infographic removed due to copyright restrictions.
Source: Kane, Jason. "Health Costs: How the U.S. Compares With Other Countries." October 22, 2012. *PBS Newshour The Rundown* (blog).

Table 1: Health Status of the United States and Rank among the 29 Other OECD Member Countries removed due to copyright restrictions.
Source: Schroeder, Steven A. "We Can Do Better—Improving the Health of the American People." *New England Journal of Medicine* (2007).

http://www.nejm.org/doi/full/10.1056/NEJMsa073350

Now go watch this!

Reducing child mortality – a moral and environmental imperative

[15 minutes run time] September 27, 2010

Alternate link to the video

Many countries are making good progress towards MDG4 and it's time to stop talking about Sub-Saharan Africa as one place.
So, it's not all bad news—and
Rosling makes stats
and data compelling!
For more Rosling, see http://www.gapminder.org/videos

http://www.gapminder.org/videos/reducing-child-mortality-a-moral-and-environmental-imperative/

MENTAL HEALTH

Mental health workforce shortages in 58 low- and middle-income countries

Figure removed due to copyright restrictions. See Figure 1: Bruckner, Tim A., et al. "The Mental Health Workforce Gap in Low- and Middle-income Countries: A Needs-based Approach." *Bulletin of the World Health Organization* 89 (2011): 184-94.

Table 1 removed due to copyright restrictions. See Table 1: Bruckner, Tim A., et al. "The Mental Health Workforce Gap in Low- and Middle-income Countries: A Needs-based Approach." *Bulletin of the World Health Organization* 89 (2011): 184-94.

The mental health workforce gap in low- and middle-income countries: a needs-based approach.

Full Text Available Academic Journal

(English) ; Abstract available. By: Bruckner TA; Scheffler RM; Shen G; Yoon J; Chisholm D; Morris J; Fulton BD; Dal Poz MR; Saxena S, Bulletin Of The World **Health** Organization [Bull World **Health** Organ], ISSN: 1564-0604, 2011 Mar 1; Vol. 89 (3), pp. 184-94; Publisher: World **Health** Organization; PMID: 21379414

Table 2 removed due to copyright restrictions. See Table 2: Bruckner, Tim A., et al. "The Mental Health Workforce Gap in Low- and Middle-income Countries: A Needs-based Approach." *Bulletin of the World Health Organization* 89 (2011): 184-94.

Table 3 removed due to copyright restrictions. See Table 3: Bruckner, Tim A., et al. "The Mental Health Workforce Gap in Low- and Middle-income Countries: A Needs-based Approach." *Bulletin of the World Health Organization* 89 (2011): 184-94.

Map removed due to copyright restrictions. See: "Age-standardized Suicide Rates (per 100 000 population), both Sexes, 2011." Mental Health. World Health Organization, 2014.

http://gamapserver.who.int/mapLibrary/app/searchResults.aspx

Map removed due to copyright restrictions. See: "Existence of a Mental Health Policy, 2011." Mental Health. World Health Organization, 2014.

Map removed due to copyright restrictions. See: "Psychiatrists Working in Mental Health (per 100 000 population), 2011." Mental Health. World Health Organization, 2014.

Graph removed due to copyright restrictions. See: "Rate of Mental Health Outpatient Facilities per 100 000 population, 2011: By WHO Region." Mental Health. World Health Organization, 2014.

http://apps.who.int/gho/data/node.main.MHFAC?lang=en

Key background knowledge you'll need

1. India health outcomes; budget and government
2. technology, mHealth
3. innovations in mental health care; mental health in India
4. India healthcare delivery (esp mental hlth), service quality, HR, task shift
5. India health system
6. India social factors, poverty, equity

Next 40 minutes

Peruse your assigned materials, working in pairs

- Skim all articles
- Read several of them carefully

For your favorite readings, prepare a three-point briefing

- What's the particular resource about, in a nutshell?
- What is really great/interesting/valuable?
- What is missing? (what do you wish you knew more about?)

feel free to note pages or figures you think are most useful

Form groups

- Please mingle and form teams of 4; there may be one team of 5.
- Look for diverse backgrounds in your team
- You will work together tomorrow and Wednesday.
- I will assign your topics shortly.

Aging

Alcohol use disorders, addiction

Child development and disability

Maternal mental health

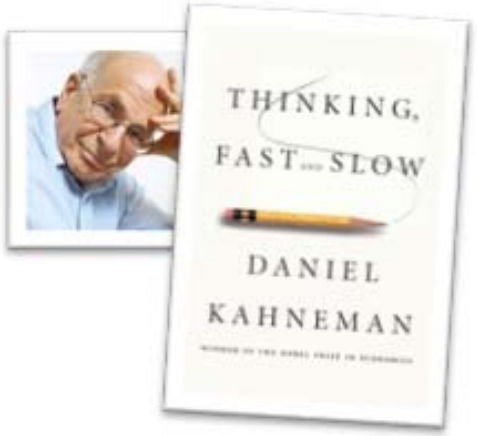
OUR FOUR FOCAL AREAS ARE GLOBAL NEEDS

Sustaining Healthy Behavior Change

Personalized Health Technology + **Behavioral Economics** + **Smart Data Analytics**

wirelessly and simultaneously tracks behavior change and delivers tailored recommendations to advance individual health.

incentivizes and nudges individuals to make healthy decisions.



Analyses using health data provides new insights to drive healthy behaviors.

Healthy Behavior Change

Tonight's assignment

Read the following:

- Patel on SUNDAR (2.5 pp)
- Sangath for MIT intro, biosketches, key concepts (10 pp)
- Sangath Biennial report (review map to p. 30; p. 34-43; p. 47-60; p. 64-65; total 50 pages)
- Optional readings are also included in the folder numbered 0.

Come to class with at least one question for Sangath mapped out in writing. We kick off at 8 am with a joint call to all seven experts assigned to work with us.

15.ES718 Global Health Innovation: Delivering Targeted Advice to an Organization in the Field
Spring 2015