

Global Health Measurement and Disease Burden

Prof. Madhukar Pai, MD, PhD
Canada Research Chair in Epidemiology & Global Health
Director, McGill Global Health Programs
madhukar.pai@mcgill.ca



McGill



GLOBAL
HEALTH
PROGRAMS



@paimadhu

Why measurement matters

Imagine you were running a company, how will you measure your success/progress?



— Who We Are —

ANNUAL LETTER 2013

← BACK

Print

Why Measurement Matters | 2013 Annual Letter from Bill Gates | #BillsLetter



WHY DOES
MEASUREMENT
MATTER?



Measuring Progress

https://www.youtube.com/watch?v=380sy5_ZQzo

Measurement is critical for global health

- To understand disease trends and to set priorities
- To assess progress towards elimination or other targets
- To evaluate the effectiveness of interventions
- To provide feedback to improve performance
- To advocate for resources and investments
- To measure impact of donor aid
- For granting agencies to evaluate their investments and strategies

To understand disease trends

Be sure to watch “The River of Myths”, a wonderful video on importance of measurement



<https://www.youtube.com/watch?v=OwII-dwh-bk>



Global Health Observatory (GHO)

Global Health Observatory

Data repository

Reports

Country statistics

Map gallery

Standards



Violence prevention: Globally, interpersonal violence resulted in some 475 000 homicides in 2012, of which 60% were in males aged 15-44 years, making homicide the third leading cause of death for males in this age group. In addition, of all adults, one in four report having been physically abused as children; one in five women and one in 10 men report having been sexually abused as children; one in three women report having been victims of physical and/or sexual intimate partner violence in their lifetime, and one in 17 older people report being abused in the past month.

[View interactive map](#)

[More data and analysis on violence prevention](#)

Homicides

475 000

estimated deaths from homicide (82% male) in 2012, globally

[Homicide estimates, 2012](#)

Child maltreatment

23%

of adults report having been a victim of physical abuse as children

[Child maltreatment, 2012-2014](#)

Violence against women

30%

of ever partnered women have experienced physical or sexual violence by a partner in their lifetime, globally

[Intimate partner violence, 2010](#)

To understand shifts in disease trends



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Global Burden of Disease (GBD)

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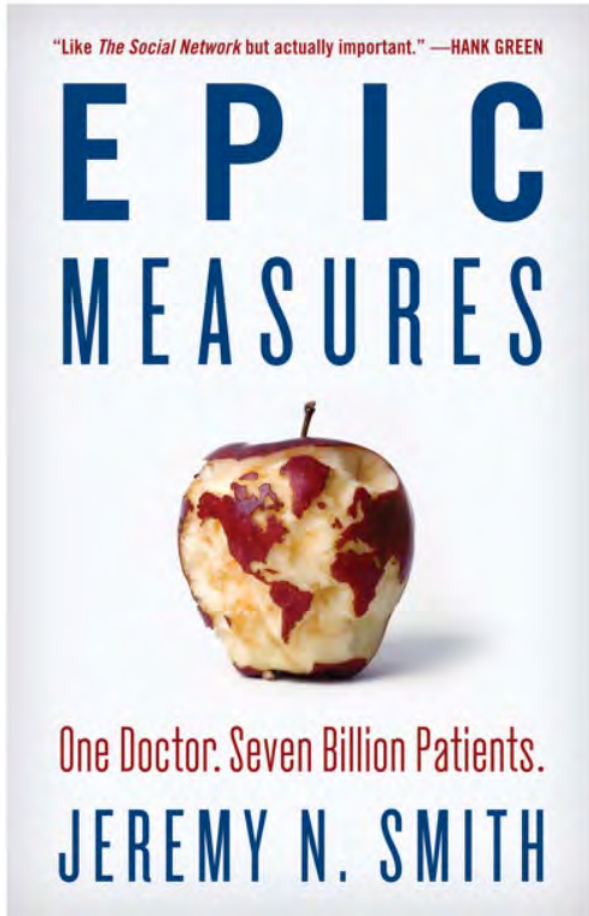
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Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013

Up-to-date evidence on levels and trends for age-sex-specific all-cause and cause-specific mortality is essential for the formation of global, regional, and national health policies. In the Global Burden of Disease Study 2013 (GBD 2013) we estimated yearly deaths for 188 countries between 1990 and 2013. We used the results to assess whether there is epidemiological convergence across countries.

‘To provide policymakers, researchers, donors, and other decision-makers with the most timely and up-to-date picture of population health to inform critical decisions, the Global Burden of Disease (GBD) will produce annual updates to its estimates.’



“Medical doctor and economist Christopher Murray began the Global Burden of Disease studies to gain a truer understanding of how we live and how we die. While it is one of the largest scientific projects ever attempted—as breathtaking as the first moon landing or the Human Genome Project—the questions it answers are meaningful for every one of us: What are the world’s health problems? Who do they hurt? How much? Where? Why?”

Murray argues that the ideal existence isn’t simply the longest but the one lived well and with the least illness. Until we can accurately measure how people live and die, we cannot understand what makes us sick or do much to improve it. Challenging the accepted wisdom of the WHO and the UN, the charismatic and controversial health maverick has made enemies—and some influential friends, including Bill Gates who gave Murray a \$100 million grant.”

ONE MILLION DEATHS

WHAT RESEARCHERS ARE LEARNING FROM AN UNPRECEDENTED SURVEY OF MORTALITY IN INDIA.

The Million Death Study (MDS)

HOW THEY GATHER THE DATA

The Million Death Study (MDS) involved two phases, 1997–2003 and 2004–2013, each of which surveyed a different selection of more than 1 million homes.

800–900

government surveyors visit the homes every six months.



50,000–58,000

verbal autopsies are collected each year.

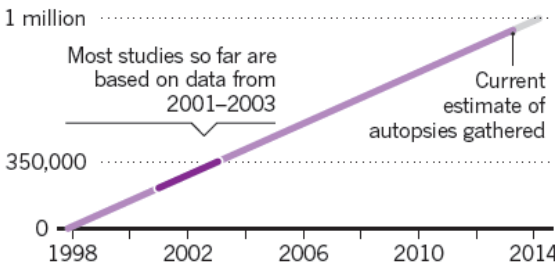


TWO

trained doctors from a pool of 300 assign a cause of death on the basis of each autopsy.

REACHING 1 MILLION

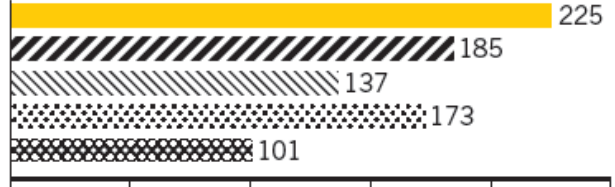
Owing to some delays related to the 2011 national census, the researchers will not have data on all 1 million deaths for a few more years.



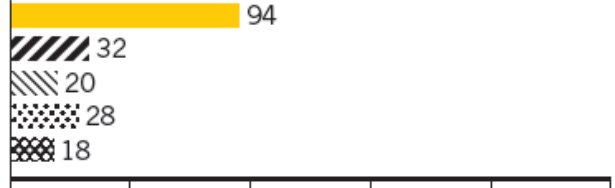
TOP CAUSES OF DEATH

The MDS determined that the four most significant causes of death for Indians aged 30–69 are vascular disease, chronic respiratory disease, tuberculosis and cancer. Some of these burdens look very different in other regions of the world.

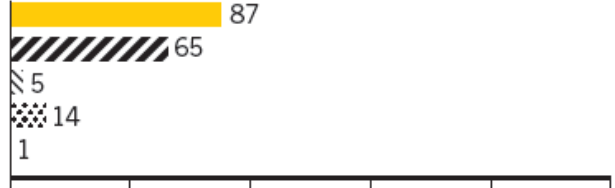
ALL VASCULAR



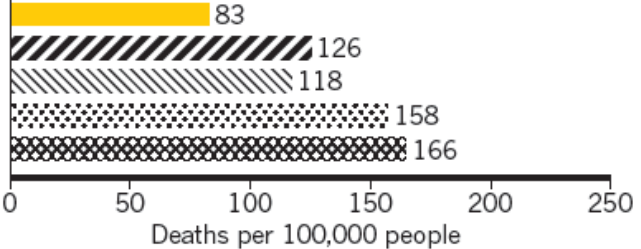
CHRONIC RESPIRATORY DISEASE



TUBERCULOSIS




CANCER



India Sub-Saharan Africa Latin America and Caribbean East Asia and Pacific High-income countries

To establish priorities

To establish priorities




Disease Control Priorities
economic evaluation for health

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DCP3 Chapters Available for Review


The DCP3 chapter, "Vaccine Preventable Diseases in Children" is available for review and public comment (photo provided by UNICEF)

[Read More >](#)

Messages from DCP3 Advisory Committee Members



Professor Lai Meng Looi discusses the role of the Inter-Academy Medical Panel (IAMP) and its important relationship with DCP3.






Professor Folashade Omokhodion on DCP3's role in priority setting for health.

Welcome to DCP3

Disease Control Priorities, Third Edition will summarize and synthesize evidence of the effectiveness of global health interventions and provide comparative economic evaluation of policies to implement those interventions. [Click here to learn more about the project.](#)

Recent News

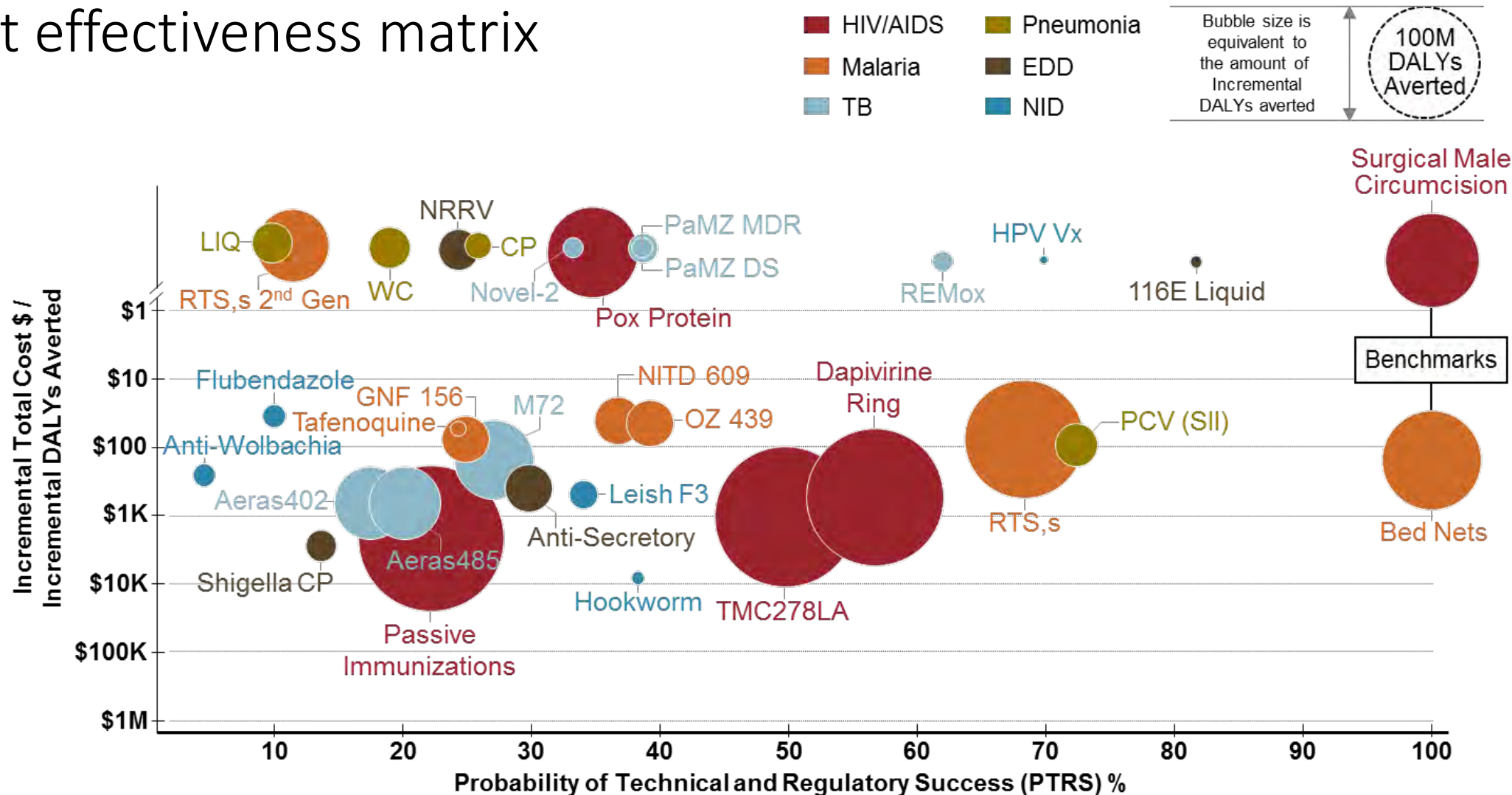


Saving Brains: Literature review of reproductive, neonatal, child and maternal health and nutrition Interventions to mitigate basic risk factors to promote child development

Surgically Avertable Burden of Obstetric Conditions in Low- and Middle-Income Regions: A Modelled Analysis

The Emerging Global Health Crisis: Noncommunicable Diseases in Low- and

Cost effectiveness matrix



- The objective is to be able to compare a portfolio of products using a consistent methodology to gain greater insights into the potential value of BMGF investments

To assess progress towards
elimination or other targets

To assess progress towards elimination or other targets

Confronting Emerging Infections: Lessons from the Smallpox Eradication Campaign

William H. Foege

Emory University, Atlanta, Georgia, USA

Lessons and innovations from the West and Central African Smallpox Eradication Program

William Foege^{a,b,*}

^a Global Health Program, Bill and Melinda Gates Foundation, United States

^b Presidential Distinguished Professor Emeritus of International Health, Rollins School of Public Health, Emory University, United States

“Know the truth. Response requires knowing where the virus is.”

“Appropriate response requires good epidemiologic analysis. The epidemiology, in turn, can be no better than the facts assembled. Knowledge is dependent on the information system; in public health, the surveillance system forms the foundation of knowledge.”



To assess progress towards elimination or other targets

The Last Percent

The number of polio cases dropped by 99 percent from 1988 to 2000, from 350,000 cases to less than 1,000, yet it's challenging to eradicate the virus. India is a good sign: Once home to the majority of polio cases in the world, the country has been polio-free since 2011, thanks to innovative approaches to eradication.



SOURCE: World Health Organization & Global Polio Eradication Initiative

Polio – the final push!



MDGs: Global Health Report Card

To evaluate the effectiveness
of interventions

Global health interventions: failures are common

A community from nature research


MENU **MICROBIOLOGY** Search Nature Research Microbiology Commu 🔍

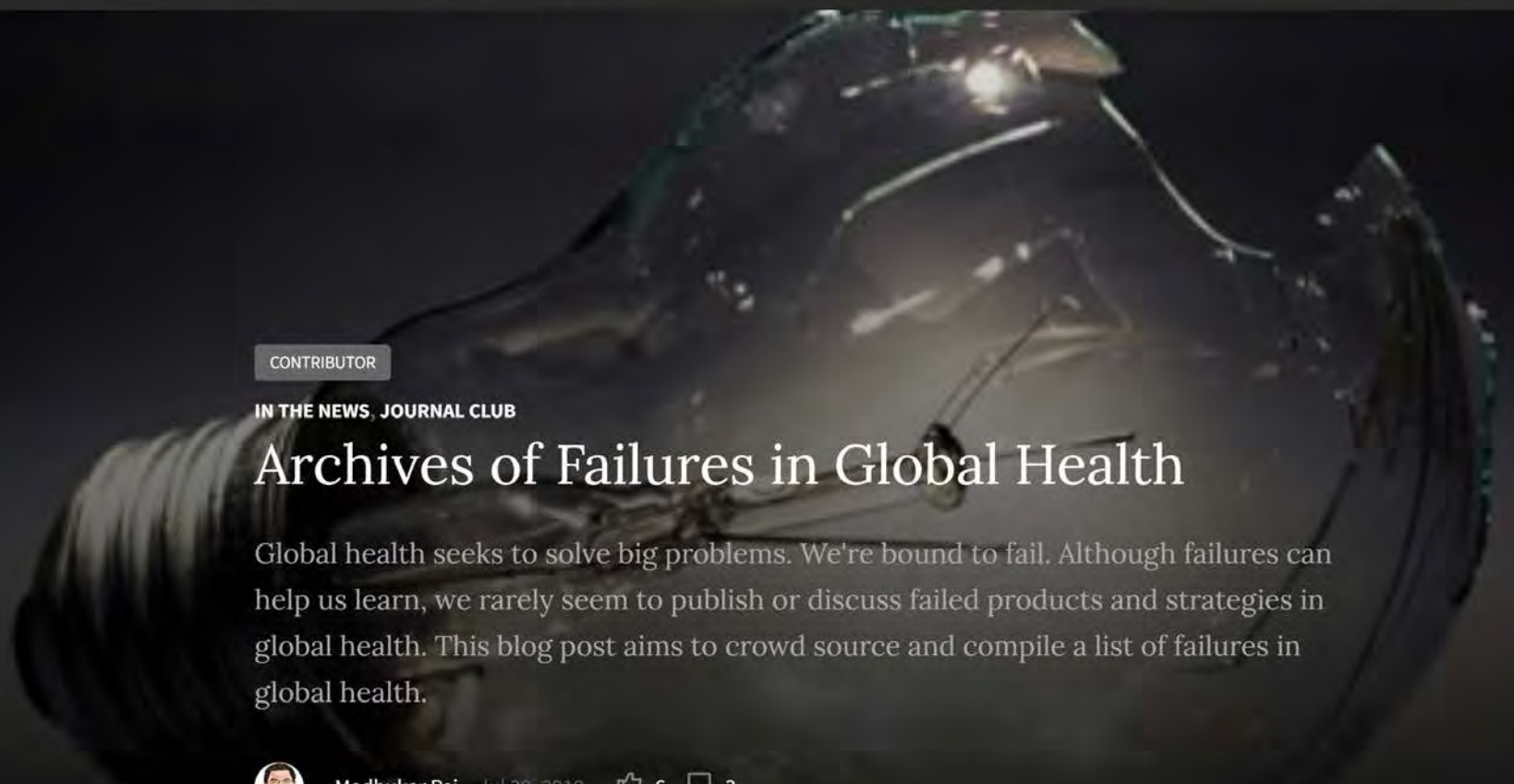
CONTRIBUTOR

IN THE NEWS, JOURNAL CLUB

Archives of Failures in Global Health

Global health seeks to solve big problems. We're bound to fail. Although failures can help us learn, we rarely seem to publish or discuss failed products and strategies in global health. This blog post aims to crowd source and compile a list of failures in global health.

 Madhukar Pai Jul 29, 2019 6 3



<https://naturemicrobiologycommunity.nature.com/channels/303-journal-club/posts/51659-archive-of-failures-in-global-health>

How do we know what works?

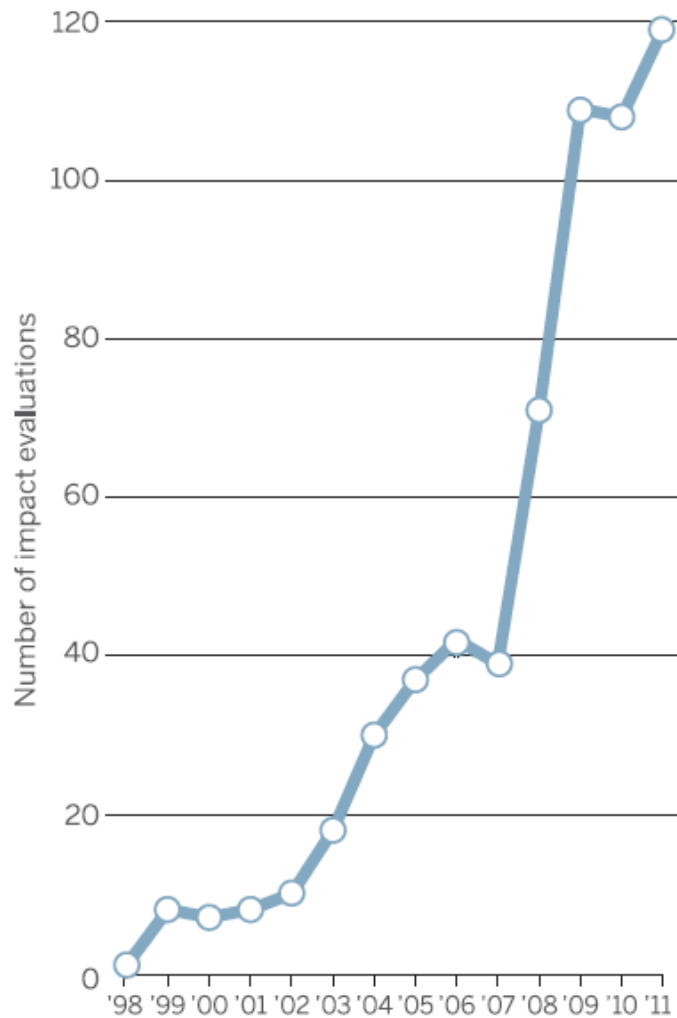


A hard look at global health measures

Researchers seek convincing evidence that large-scale projects save lives

But does it work?

The rise of impact evaluations
in global health and development



Sources: 3ie and William Savedoff

Impact evaluation: a
new industry within
global health

To provide feedback to
improve performance

To provide feedback to improve performance

OPEN ACCESS Freely available online



The Feedback Intervention Trial (FIT) — Improving Hand-Hygiene Compliance in UK Healthcare Workers: A Stepped Wedge Cluster Randomised Controlled Trial

Christopher Fuller¹, Susan Michie², Joanne Savage¹, John McAteer², Sarah Besser^{1,3}, Andre Charlett³, Andrew Hayward¹, Barry D. Cookson³, Ben S. Cooper^{3,4}, Georgia Duckworth³, Annette Jeanes⁴, Jenny Roberts⁵, Louise Teare⁶, Sheldon Stone^{1*}

1 Royal Free Campus, University College London Medical School, University College, London, United Kingdom, **2** University College London, London, United Kingdom, **3** Health Protection Agency, London, United Kingdom, **4** University College London Hospitals, London, United Kingdom, **5** London School of Hygiene and Tropical Medicine, London, United Kingdom, **6** Mid-Essex NHS Trust, Chelmsford, United Kingdom

Abstract

Introduction: Achieving a sustained improvement in hand-hygiene compliance is the WHO's first global patient safety challenge. There is no RCT evidence showing how to do this. Systematic reviews suggest feedback is most effective and for long term well designed RCTs, applying behavioural theory to intervention design to optimise effectiveness.

Methods: Three year stepped wedge cluster RCT of a feedback intervention testing hypothesis that the intervention was more effective than routine practice in 16 English/Welsh Hospitals (16 Intensive Therapy Units [ITU]; 44 Acute Care of the Elderly [ACE] wards) routinely implementing a national cleanyourhands campaign). Intervention-based on Goal & Control theories. Repeating 4 week cycle (20 mins/week) of observation, feedback and personalised action planning, recorded on forms. Computer-generated stepwise entry of all hospitals to intervention. Hospitals aware only of own allocation. Primary outcome: direct blinded hand hygiene compliance (%).

Results: All 16 trusts (60 wards) randomised, 33 wards implemented intervention (11 ITU, 22 ACE). Mixed effects regression analysis (all wards) accounting for confounders, temporal trends, ward type and fidelity to intervention (forms/month used).

Intention to Treat Analysis: Estimated odds ratio (OR) for hand hygiene compliance rose post randomisation (1.44; 95% CI 1.18, 1.76; $p < 0.001$) in ITUs but not ACE wards, equivalent to 7–9% absolute increase in compliance.

Per-Protocol Analysis for Implementing Wards: OR for compliance rose for both ACE (1.67 [1.28–2.22]; $p < 0.001$) & ITUs (2.09 [1.55–2.81]; $p < 0.001$) equating to absolute increases of 10–13% and 13–18% respectively. Fidelity to intervention closely related to compliance on ITUs (OR 1.12 [1.04, 1.20]; $p = 0.003$ per completed form) but not ACE wards.

Conclusion: Despite difficulties in implementation, intention-to-treat, per-protocol and fidelity to intervention, analyses showed an intervention coupling feedback to personalised action planning produced moderate but significant sustained improvements in hand-hygiene compliance, in wards implementing a national hand-hygiene campaign. Further implementation studies are needed to maximise the intervention's effect in different settings.

Trial Registration: Controlled-Trials.com ISRCTN65246961

Citation: Fuller C, Michie S, Savage J, McAteer J, Besser S, et al. (2012) The Feedback Intervention Trial (FIT) — Improving Hand-Hygiene Compliance in UK Healthcare Workers: A Stepped Wedge Cluster Randomised Controlled Trial. PLoS ONE 7(10): e41617. doi:10.1371/journal.pone.0041617

The effect of report cards on the coverage of maternal and neonatal health care: a factorial, cluster-randomised controlled trial in Uttar Pradesh, India

Camilla Fabbri, Varun Dutt, Vasudha Shukla, Kultar Singh, Nehal Shah, Timothy Powell-Jackson

Summary

Background Report cards are a prominent strategy to increase the ability of citizens to express their view, improve public accountability, and foster community participation in the provision of health services in low-income and middle-income countries. In India, social accountability interventions that incorporate report cards and community meetings have been implemented at scale, attracting considerable policy attention, but there is little evidence on their effectiveness in improving health. We aimed to evaluate the effect of report cards, which contain information on village-level indicators of maternal and neonatal health care, and participatory meetings targeted at health providers and community members (including local leaders) on the coverage of maternal and neonatal health care in Uttar Pradesh, India.

Methods We conducted a repeated cross-sectional, 2×2 factorial, cluster-randomised controlled trial, in which each cluster was a village (rural) or ward (urban). The clusters were randomly assigned to one of four groups: the provider group, in which we shared report cards and held participatory meetings with providers of maternal and neonatal health services; the community group, in which we shared report cards and held participatory meetings with community members (including local leaders); the providers and community group, in which report cards were targeted at both health providers and the community; and the control group, in which report cards were not shared with anyone. We generated these report cards by collating data from household surveys and shared the report cards with the recipients (as determined by their assigned groups) in participatory meetings. The primary outcome was the proportion of women who had at least four antenatal care visits (ie, attended a clinic or were visited at home by a health-care worker) during their last pregnancy. We measured outcomes with cross-sectional household surveys that were taken at baseline, at a first follow-up (after 8 months of the intervention), and at a second follow-up (21 months after the start of the intervention). Analyses were by intention to treat. This trial is registered with ISRCTN, number ISRCTN11070792.



Lancet Glob Health 2019;
7: e1097–1108

See [Comment](#) page e994

Department of Global Health and Development, London School of Hygiene & Tropical Medicine, London, UK (C Fabbri MSc, T Powell-Jackson PhD); and Sambodhi Research and Communications, Noida, Uttar Pradesh, India (V Dutt PGDip, V Shukla PhD, K Singh PGDip, N Shah MPH)

Correspondence to: Dr Timothy Powell-Jackson, Department of Global Health and Development, London School of Hygiene & Tropical Medicine, London WC1H 9SH, UK. Timothy.Powell-Jackson@lshtm.ac.uk

To advocate for resources

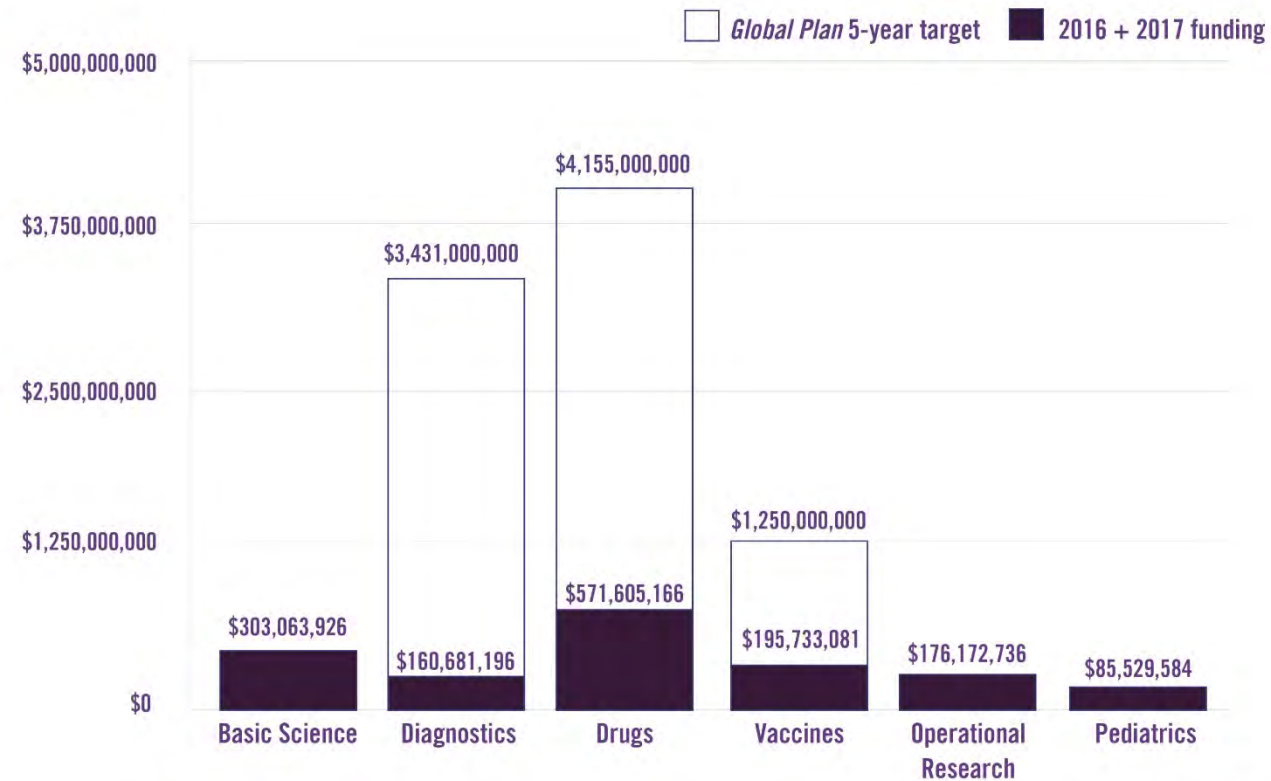
To advocate for resources



<http://www.treatmentactiongroup.org/content/tbrd2018>

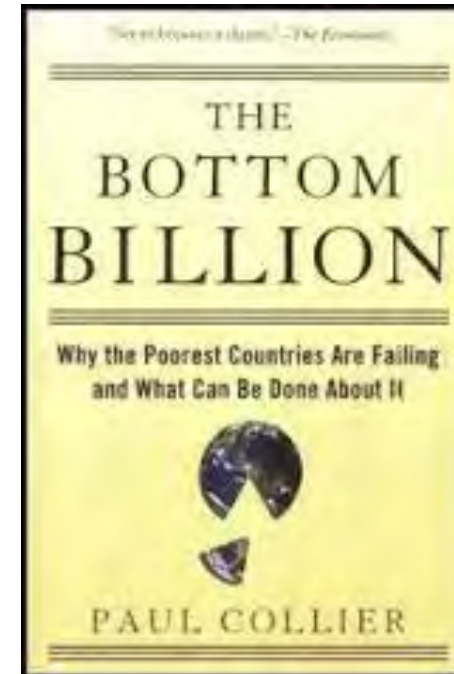
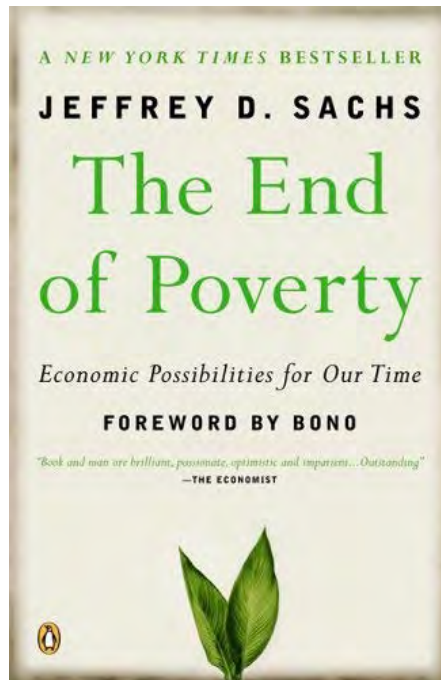
FIGURE 2

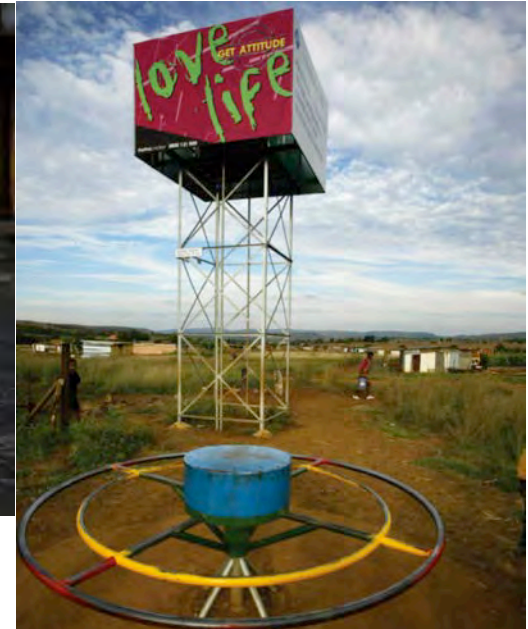
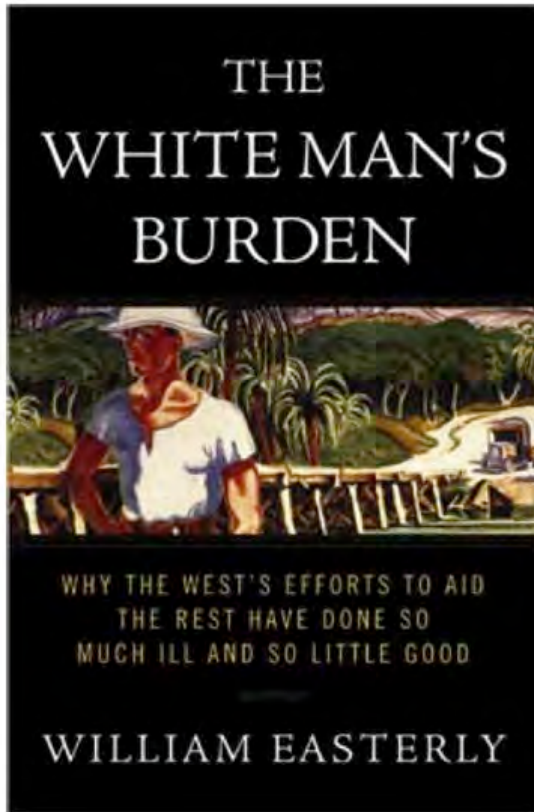
Progress toward *Global Plan* 5-Year TB Research Funding Targets



The Global Plan to End TB did not set funding targets for TB basic science, operational research, or pediatric TB R&D.

To measure impact of donor aid





“Our country is littered with the bones
of successful pilot projects”

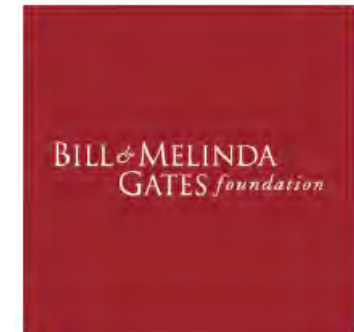
African Health Minister

For granting agencies to evaluate their grantees and their own strategy

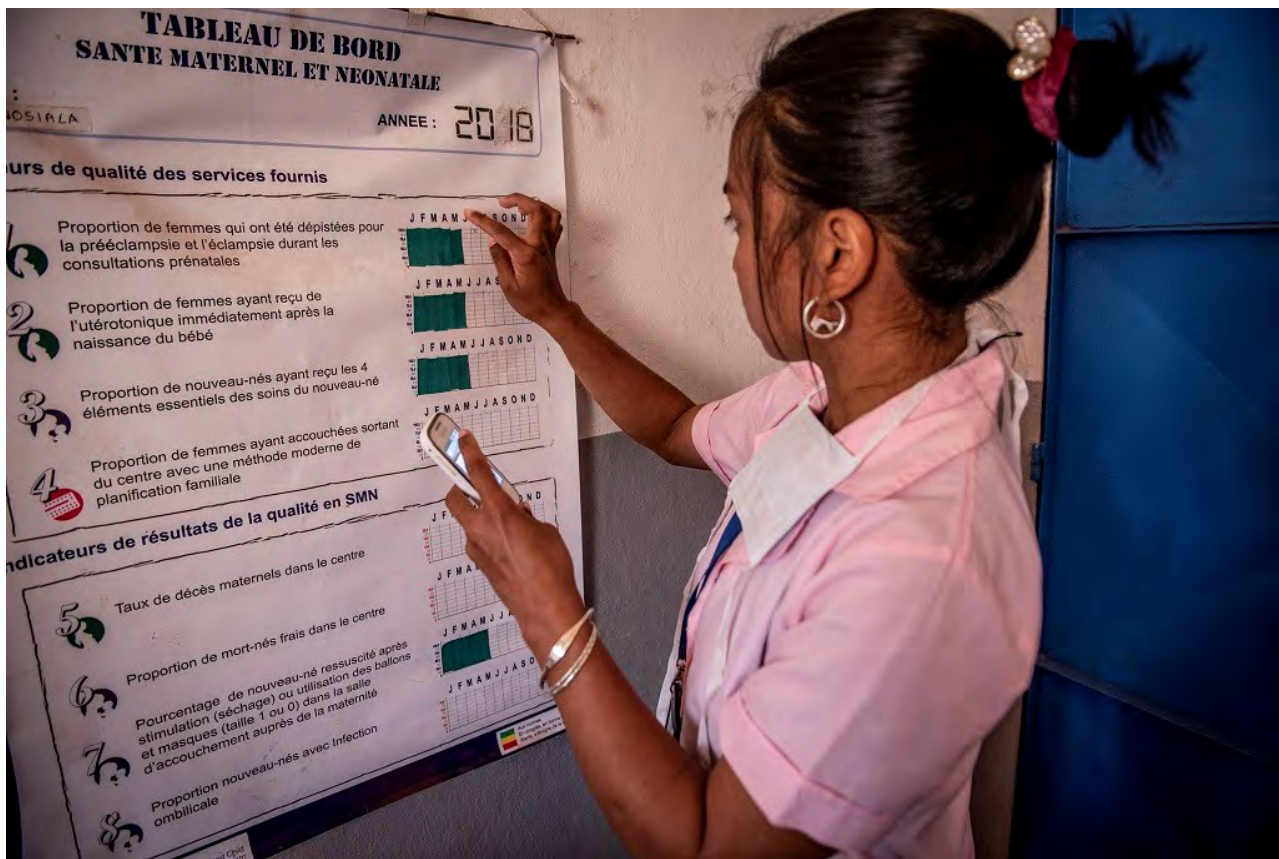
- Evaluation is the systematic, objective assessment of an ongoing or completed intervention, project, policy, program, or partnership. Evaluation is best used to answer questions about what actions work best to achieve outcomes, how and why they are or are not achieved, what the unintended consequences have been, and what needs to be adjusted to improve execution.

Exhibit 4: The Actionable Measurement Matrix

	Inputs	Activities	Outputs	Outcomes	Impacts
Strategy				Measure changes in populations and systems	
Initiative	Measure progress toward targets, test assumptions, identify what works, how, and why				
Sub-Initiative					
Grant	Track implementation and progress toward targets				
Sub-Grant					



Dashboards and score cards



<https://www.mcsprogram.org/across-africa-data-dashboards-in-health-facilities-are-improving-decision-making/>

AFGHANISTAN HEALTH SECTOR		BENCHMARKS		BAGHLAN							
BPHS Balanced Scorecard 2004 - 2011/12		LB	UB	2004	2005	2006	2007	2008	2009 /10	2011 /12	2012 /13
Domain A: Client and Community											
1	Overall Patient Satisfaction	66.4	90.9	90.9	91.9	89.2	78.4	91.1	85.3	-	-
	Patient Perception of Quality Index	66.2	83.9	82.2	74.5	82.4	78.2	90.3	85.6	-	-
	Overall Client Satisfaction and Perceived Quality of Care Index	73.3	81.3	-	-	-	-	-	-	76.3	77.2
2	Written Shura-e-sehie activities in community	18.1	66.5	34.2	76.2	84.1	69.4	91.7	95.5	-	-
	Community Involvement and Decision Making Index	72.4	90.0	-	-	-	-	-	-	78.3	93.5
Domain B: Human Resources											
3	Health Worker Satisfaction Index	56.1	67.9	67.9	62.4	69.0	69.5	76.4	73.3	-	-
	Revised Health Worker Satisfaction Index	61.7	66.6	-	-	-	-	-	-	65.6	72.0
4	Health Worker Motivation Index	66.7	72.8	-	-	-	-	-	-	69.1	76.7
5	Salary Payment Current	52.4	92.0	45.8	84.6	38.4	92.2	82.7	62.4	29.7	56.0
6	Staffing Index -- Meeting minimum staff guidelines	10.1	54.0	42.7	64.4	69.8	55.5	79.4	93.2	-	-
	Revised Staffing Index -- Meeting minimum staff guidelines	11.4	33.3	-	-	-	-	-	-	26.2	37.5
7	Provider Knowledge Score	44.8	62.3	49.3	68.3	72.3	66.3	-	-	-	-
	Revised Provider Knowledge Score	71.5	86.0	-	-	-	-	86.0	-	-	-
	Revised Revised Provider Knowledge Score	61.9	77.7	-	-	-	-	-	73.3	-	-
	New Provider Knowledge Score	59.4	67.6	-	-	-	-	-	-	66.7	67.8
8	Staff received training in last year	30.1	56.3	39.0	74.5	85.3	73.2	75.5	49.5	-	-
	Revised Staff Received Training (in last year)	7.1	14.9	-	-	-	-	-	-	5.9	9.4
Domain C: Physical Capacity											
9	Equipment Functionality Index	61.3	90.0	57.5	65.6	83.9	81.3	91.8	92.1	-	-
	Revised Equipment Functionality Index	67.4	85.0	-	-	-	-	-	-	77.6	92.4
10	Drug Availability Index	53.3	81.8	72.8	82.0	65.9	74.7	78.5	90.8	-	-
	Pharmaceuticals and Vaccines Availability Index	71.8	88.6	-	-	-	-	-	-	76.6	84.3
11	Laboratory Functionality Index (Hospitals & CHCs)	5.6	31.7	15.2	36.3	43.0	53.7	69.4	70.8	-	-
	Revised Laboratory Functionality Index (CHCs only)	53.1	76.3	-	-	-	-	-	-	37.5	74.1
12	Clinical Guidelines Index	22.5	51.0	29.9	48.9	78.7	72.2	90.5	95.7	-	-
	Revised Clinical Guidelines Index	64.3	85.9	-	-	-	-	-	-	66.8	96.3
13	Infrastructure Index	49.3	63.2	50.0	38.7	45.7	27.3	62.3	77.7	-	-
	Revised Infrastructure Index	48.9	73.4	-	-	-	-	-	-	47.2	77.4
Domain D: Quality of Service Provision											
14	Patient History and Physical Exam Index	55.1	83.5	55.1	81.6	81.8	76.7	88.5	90.1	-	-
	Client Background and Physical Assessment Index	66.7	81.2	-	-	-	-	-	-	73.8	86.2
15	Patient Counseling Index	23.3	48.9	29.3	40.3	36.2	33.1	71.1	48.8	-	-
	Client Counselling Index	31.7	58.5	-	-	-	-	-	-	40.1	43.8
16	Proper sharps disposal	34.1	85.0	76.9	58.1	96.2	63.4	85.5	93.2	-	-
	Universal Precautions	51.8	70.4	-	-	-	-	-	-	44.1	77.6
17	Time Spent with Client	3.5	31.2	1.2	4.1	1.6	11.5	67.4	30.8	7.5	47.8
Domain E: Management Systems											
18	HMIS Use Index	49.6	80.7	40.0	68.7	86.9	81.4	96.3	81.6	-	-
	Revised HMIS Use Index	66.1	86.2	-	-	-	-	-	-	86.2	94.3
19	Financial Systems	2.2	20.3	-	-	-	-	-	-	0.0	11.4
20	Health Facility Management Functionality Index	40.0	57.6	-	-	-	-	-	-	68.0	58.2
Domain F: Overall Mission											
21	Outpatient visit concentration index	48.0	52.7	51.9	50.8	51.7	50.7	48.2	-	-	-
	New Outpatient visit concentration index	46.2	56.9	-	-	-	-	-	51.2	46.9	45.5
22	Patient satisfaction concentration index	49.0	50.9	49.8	50.2	50.1	50.1	49.7	-	-	-
	New Patient satisfaction concentration index*	49.6	50.8	-	-	-	-	-	51.0	49.3	50.2
COMPOSITE SCORES											
Percent of Upper Benchmarks Achieved		-	-	5.0	35.0	45.0	45.0	75.0	70.0	9.1	59.1
Percent of Lower Benchmarks Achieved		-	-	80.0	90.0	85.0	95.0	100.0	100.0	68.2	95.5
Overall Means (Provincial)		-	-	49.1	61.1	65.6	62.9	78.6	74.6	51.8	65.0

Courtesy: David Peters, JHSPH

Some challenges with
measurement

Challenges

- Routinely collected data are often unreliable in LMICs
- Insufficient planning and funding for measurement (MLE)
 - There are many projects with impact never quantified!
- Denialism: do we really want to know the truth?
- Pressure to succeed can result in biased/fabricated data
- There is no guarantee that evidence will change policy
- Advocacy, sometimes, is more impactful than measurement and evidence!

China and the SARS cover-up

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China accused of Sars 'cover-up'

China has been urged to reveal the full extent of its Sars outbreak amid claims that true case numbers are being concealed.



Corona virus taken from a Sars patient (Image courtesy of the Lancet)

The appeal came after a team of epidemiologists from the World Health Organization ended a six-day tour of Guangdong province in southern China, where the illness is believed to have first appeared.

South Africa has now reported a "probable" Sars case - which, if confirmed by the WHO, would be the first on the continent.

A spokesman asked the Chinese authorities to be transparent about the numbers of people affected by the bug.

"We are always insisting that to address this outbreak you need full and open reporting," said Chris Powell, a spokesman for the organisation.

The Chinese authorities have been accused of a slow and secretive handling of the Sars outbreak in order to avoid spreading panic.

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China hid SARS patients - report

Friday, April 18, 2003 Posted: 12:08 PM EDT (1608 GMT)

BEIJING, China -- Beijing authorities have gone to staggering lengths to hide SARS patients from visiting World Health Organization (WHO) inspectors, according to TIME magazine.

At one of the most reputable of the city's hospitals, 31 patients suffering the potentially lethal disease were driven around in ambulances for the duration of the WHO visit, said TIME.

And at a military hospital, 40 SARS patients were said to have been moved to a hotel for the duration of the WHO tour, in an apparent attempt to deceive inspectors about the true extent of the outbreak.

The timing of the revelations could prove a major embarrassment to the Chinese government.

This image is no longer available

SARS could have big impact on Beijing's May Day holidays.

[Story Tools](#)

India and the drug-resistant TB denial

Correspondence

Totally Drug-Resistant Tuberculosis in India

TO THE EDITOR—Three years after extensively drug-resistant (XDR) tuberculosis was first described in 2006, Velayati et al [1] drew attention to the emergence of totally drug-resistant (TDR) tuberculosis in a cohort of 15 patients from Iran, resistant to all first- and second-line drugs. Since the first cases of XDR tuberculosis in India were reported from the P. D.

individually and often in incorrect doses, from multiple private practitioners (mean, 4 physicians during a 18-month period) in an attempt to cure their multidrug-resistant (MDR) tuberculosis (Table 1). The latest WHO global resistance report estimated 110 132 cases of MDR tuberculosis from India in 2006, which accounts for 20% of the world's MDR tuberculosis load [3]. Although India's RNTCP has been a tremendous success,

Note

Potential conflicts of interest. All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

Zarir F. Udhwadia, Rohit A. Amale, Kanchan K. Ajbani, and Camilla Rodrigues

P. D. Hinduja National Hospital and Medical Research Centre, Mumbai, India

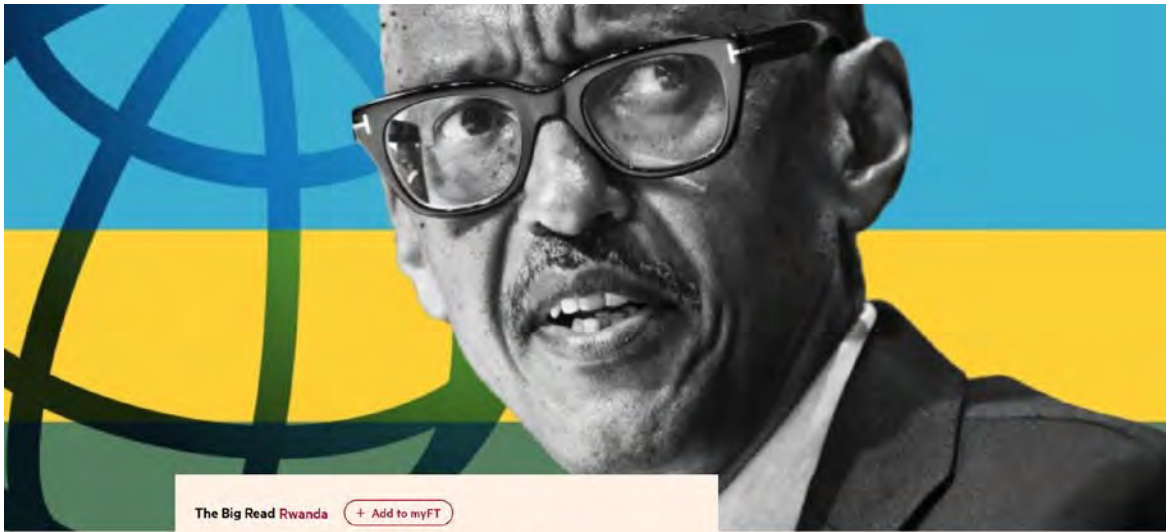
TDR-TB: The Indian Government Denies It

BY MARYN MCKENNA 01.29.12 | 12:09 PM | PERMALINK

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An update to the news two weeks ago of totally drug-resistant tuberculosis, TDR-TB, being identified in India (and earlier in Italy and Iran): The Indian government has announced that it doesn't exist, and is putting pressure on the physicians who identified it to say they made a mistake.



The Big Read Rwanda + Add to myFT

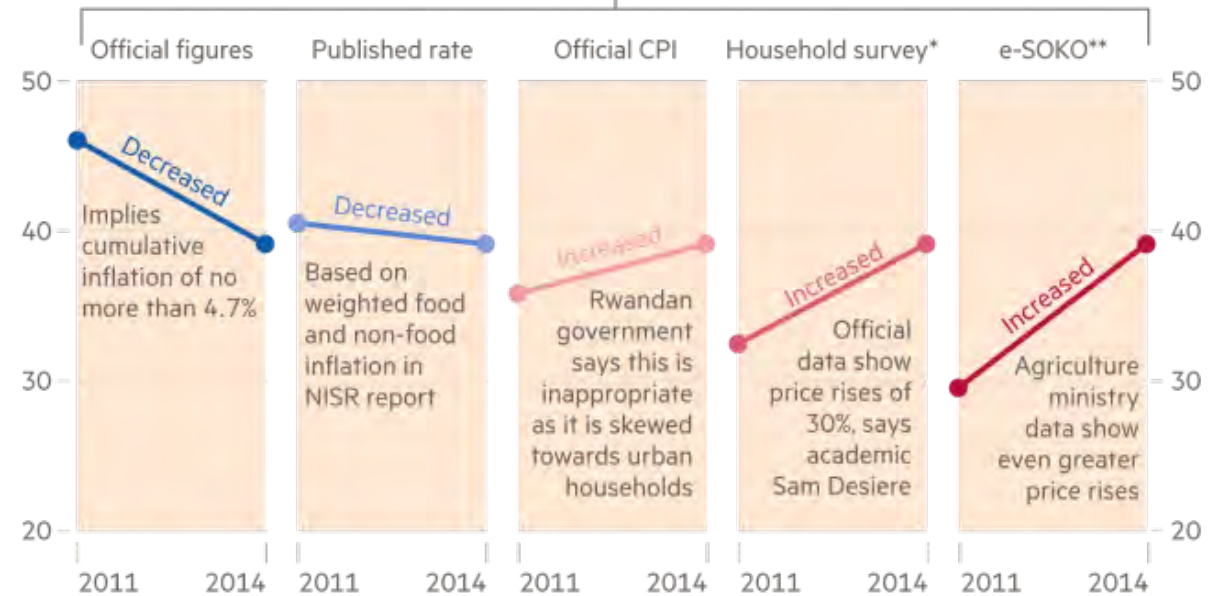
Rwanda: where even poverty data must toe Kagame's line

An FT investigation reveals that some statistics could have been manipulated

Differing views of poverty in Rwanda

Poverty rate (%)

Variations in 2011 figure based on inflation measure used in calculation



* Food inflation only; sources' estimates derived from price data

** Government initiative to inform farmers' market pricing decisions

Graphic: David Blood Source: FT research

© FT

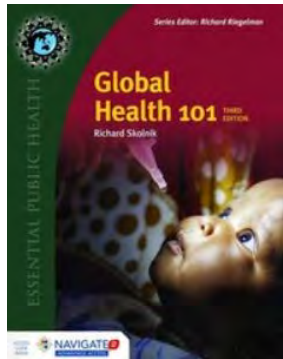
<https://www.ft.com/content/683047ac-b857-11e9-96bd-8e884d3ea203>

BURDEN OF DISEASE

Key Health Indicators

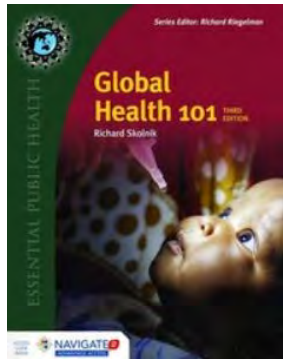
Terms

- Prevalence - number of people suffering from a certain health condition over a specified time period
- Incidence - the rate at which new cases of a disease occur in a population



SNAPSHOT OF GLOBAL HEALTH STATUS: KEY HEALTH STATUS INDICATORS

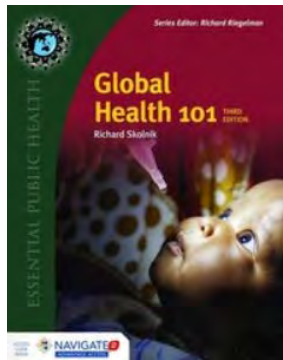
- Maternal mortality ratio
- Neonatal mortality rate
- Infant mortality rate
- Under-five mortality
- Life expectancy
- All-cause mortality rate



Measuring the Burden of Disease

Health-Adjusted Life Expectancy (HALE)

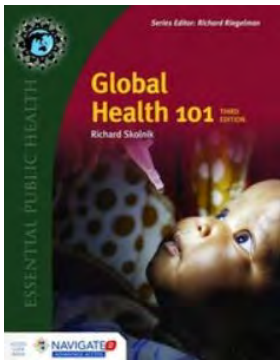
- Summarizes expected number of years to be lived in what might be termed the equivalent of good health
- A health-expectancy measure
- To calculate the HALE: the years of ill health are weighted according to severity and subtracted from the overall life expectancy



Measuring the Burden of Disease

Disability-Adjusted Life Year (DALY)

- The sum of years lost due to premature death (YLLs) and years lived with disability (YLDs). DALYs are also defined as years of healthy life lost
- A health-gap measure
- Indicates losses due to illness, disability and premature death in a population, accounting for health conditions like mental illness that rarely cause death



Measuring the Burden of Disease

Quality-Adjusted Life Year (QALY)

A measure of the state of health of a person or group in which the benefits, in terms of length of life, are adjusted to reflect the quality of life.

One QALY is equal to 1 year of life in perfect health.

To be dead is associated with 0 QALYs.

YouTube CA

University of California
San Francisco

UCSF

Philip R. Lee Institute
for Health Policy Studies
School of Medicine

UCSF GLOBAL HEALTH SCIENCES
Improving health and reducing inequities worldwide

The DALY Show

James G Kahn MD MPH,
Professor of Health Policy, Epidemiology,
and Global Health at UCSF

0:00 / 9:08

The DALY Show, Disability-Adjusted Life Year (DALY)

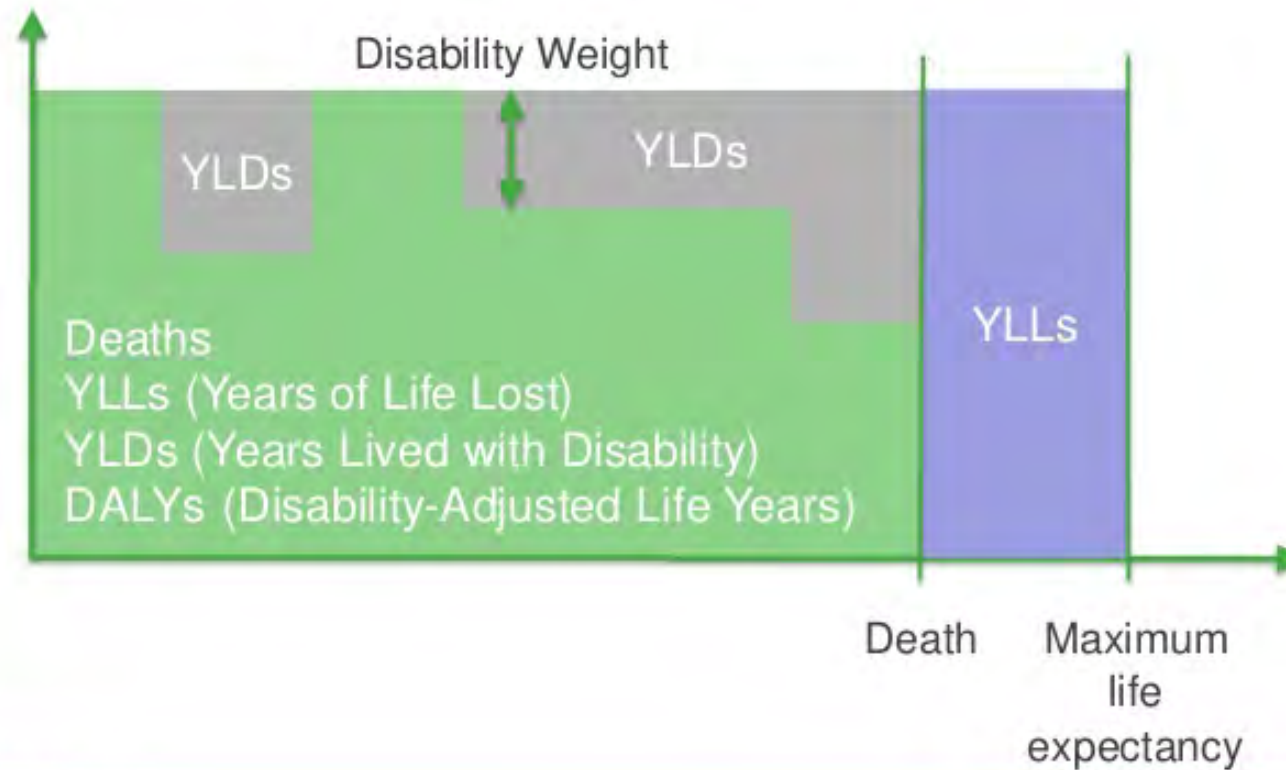
Philip R. Lee Institute for Health Policy Studies

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<https://www.youtube.com/watch?v=Exce4gy7aOk>

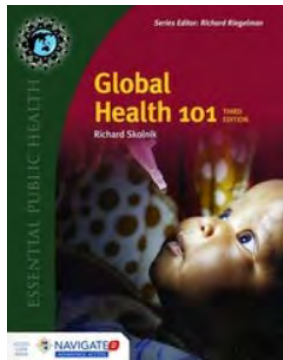
Understanding burden



Burden of Disease Data

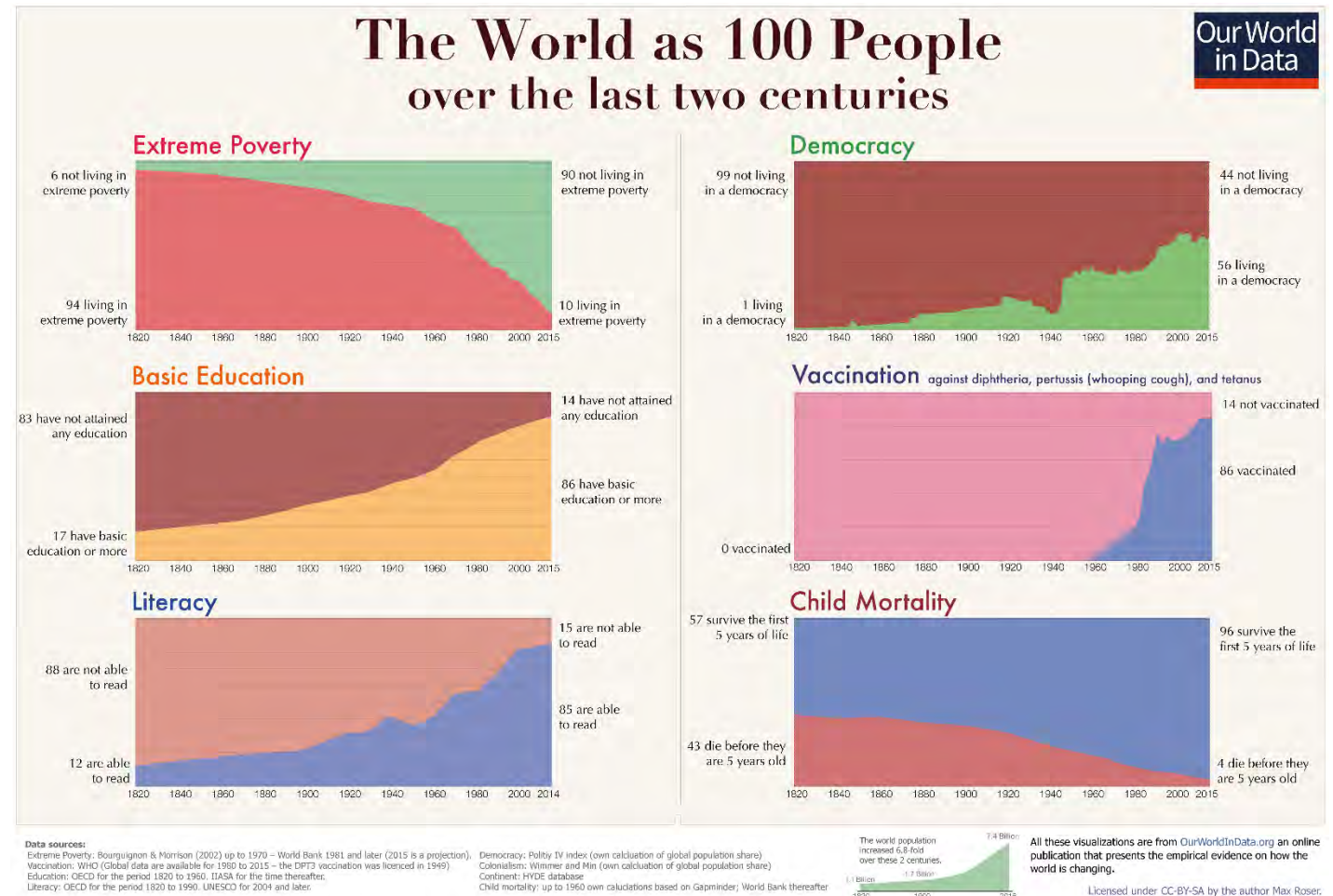
Important to gain an understanding of:

- Leading causes of illness, disability, and death in the world
- Variations in these causes by age, sex, ethnicity, and socioeconomic status
- Changes over time and how these causes might change in the future

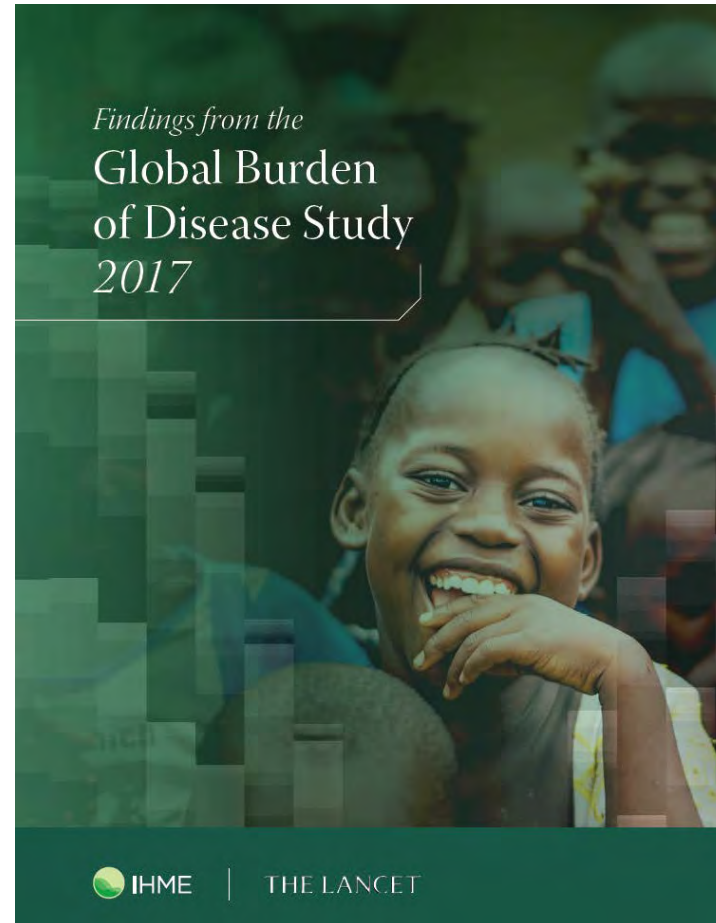


Examples

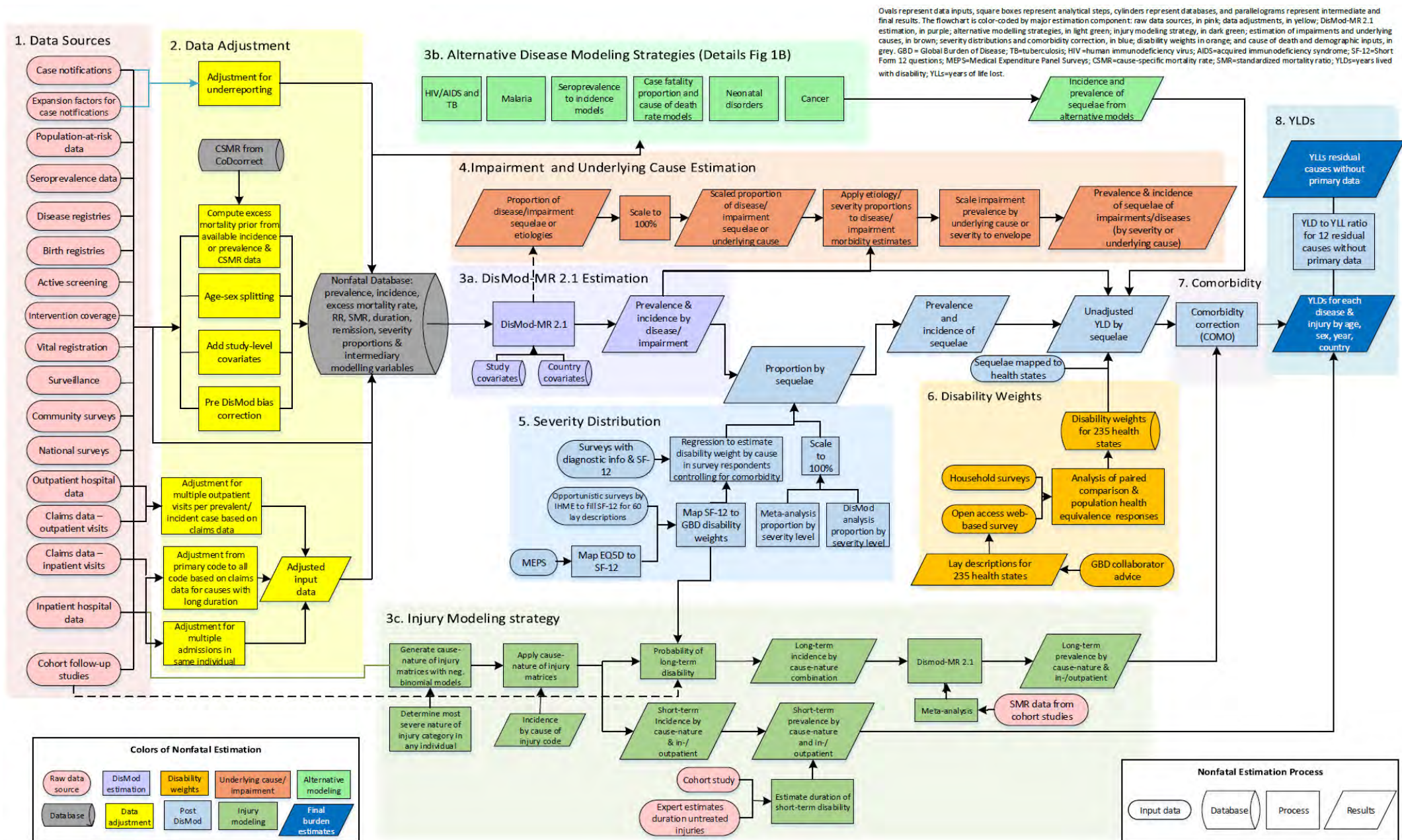
- Trends in global poverty
- Trends in life expectancy
- Trends in under 5 mortality
- Trends in maternal mortality



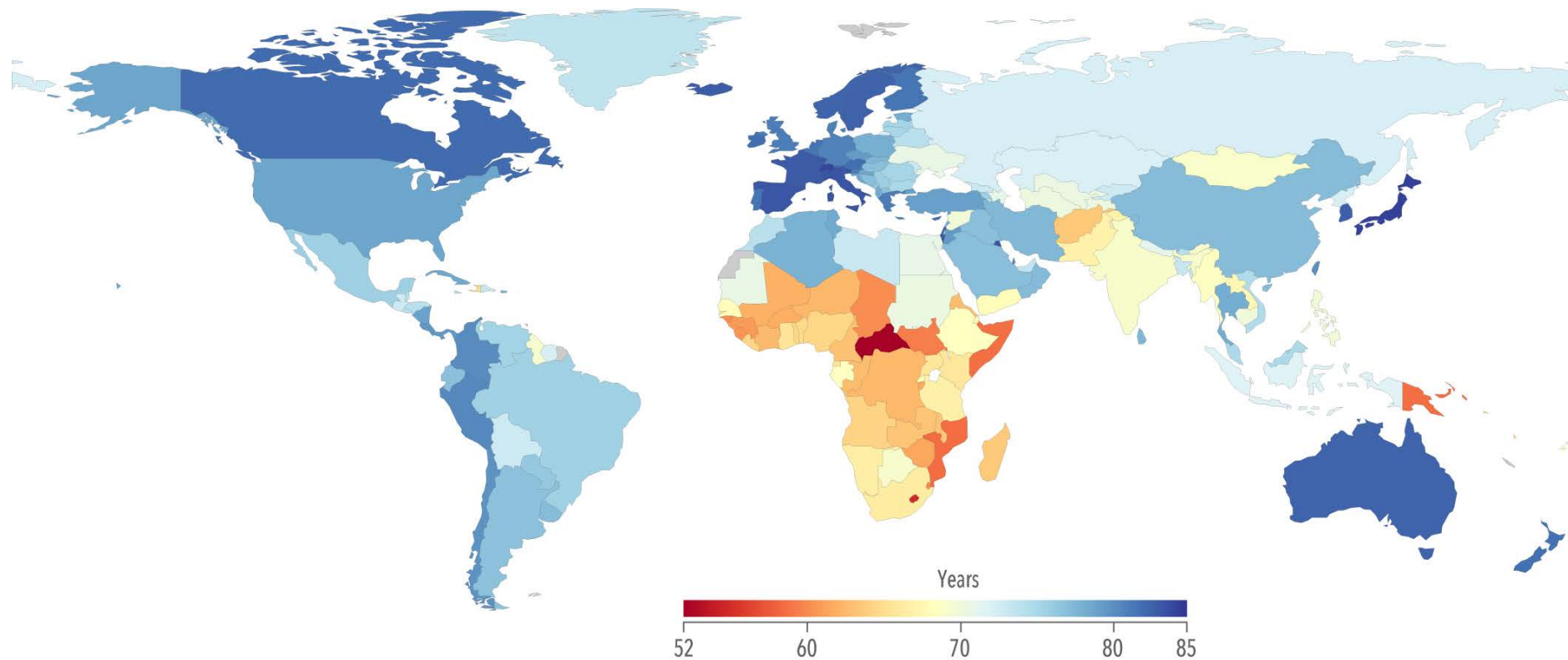
Global Burden of Diseases, Injuries, and Risk Factors Study: over 1,000 people from over 100 countries put together all the world's data on more than 1,000 different clinical outcomes



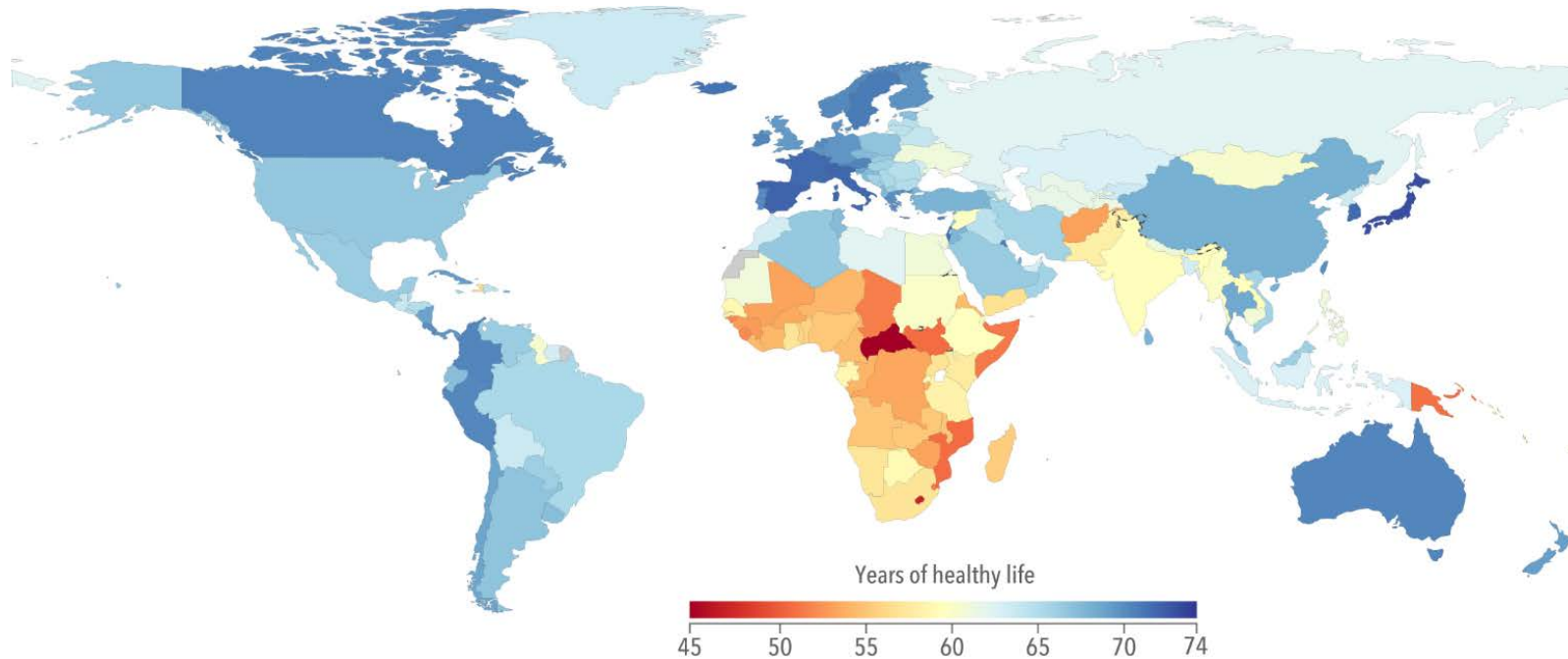
http://www.healthdata.org/sites/default/files/files/policy_report/2019/GBD_2017_Booklet.pdf



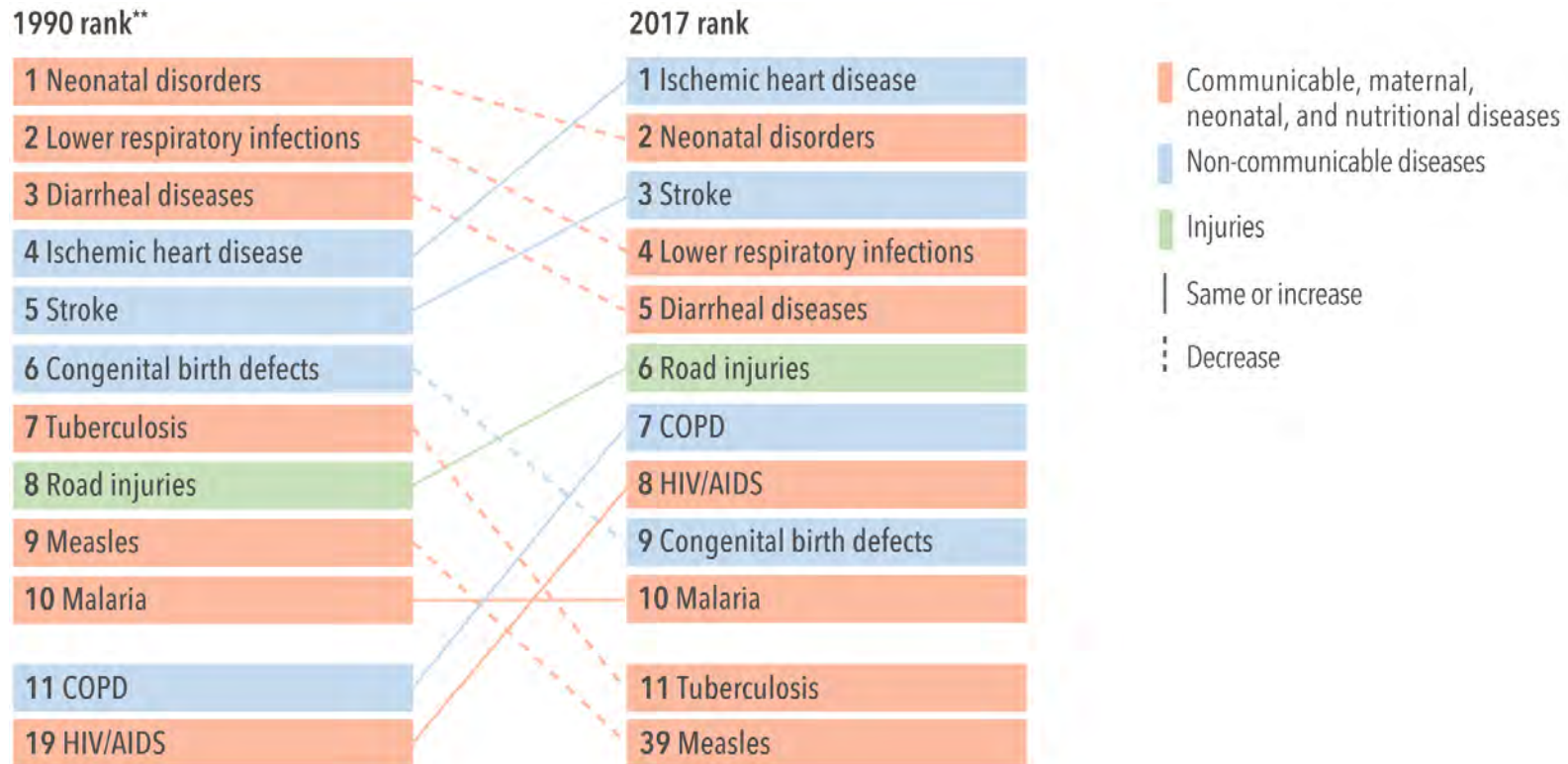
Life expectancy, 2017



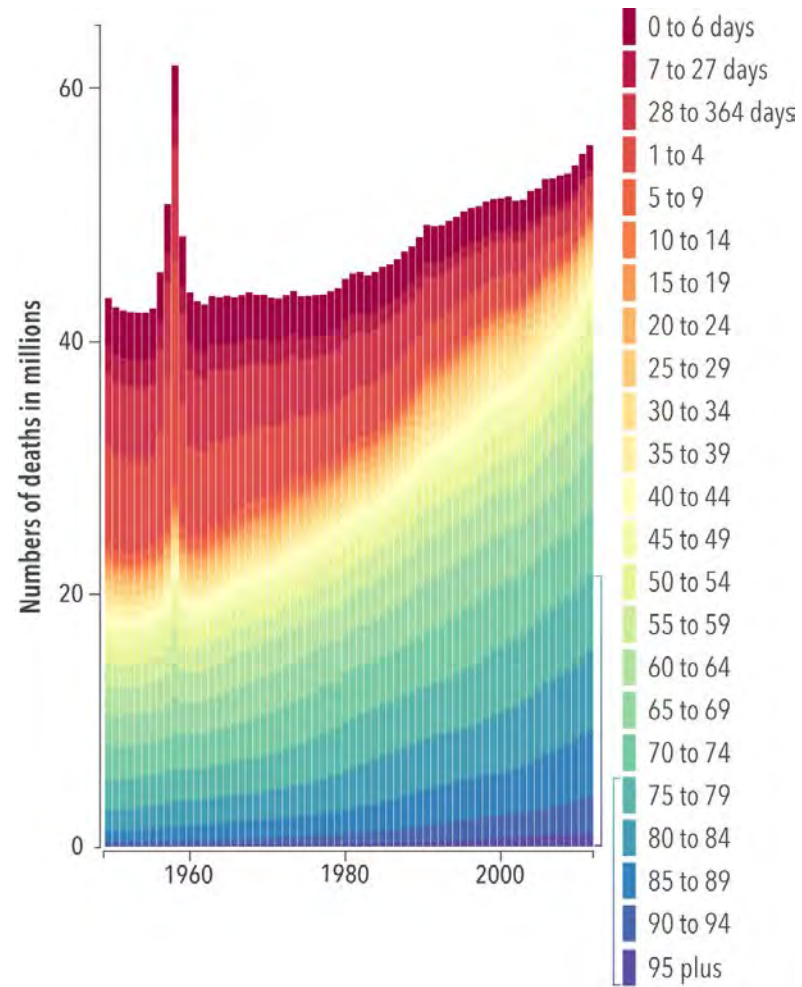
Years someone can expect to live in full health in 2017 (Healthy life expectancy at birth)



Leading causes of early death, 1990 and 2017



Total Number of Global Deaths, 1950-2017



Leading causes of early death and disability† at lowest and highest levels of development, 2017

Low Socio-demographic Index (SDI)[§] countries

- 1 Neonatal disorders
- 2 Lower respiratory infections
- 3 Diarrheal diseases
- 4 Malaria
- 5 Congenital defects

High SDI countries

- 1 Ischemic heart disease
- 2 Low back pain
- 3 Stroke
- 4 Lung cancer
- 5 COPD

- Communicable, maternal, neonatal, and nutritional diseases
- Non-communicable diseases

Leading risk factors causing early death and disability, by sex, 2017

Males*

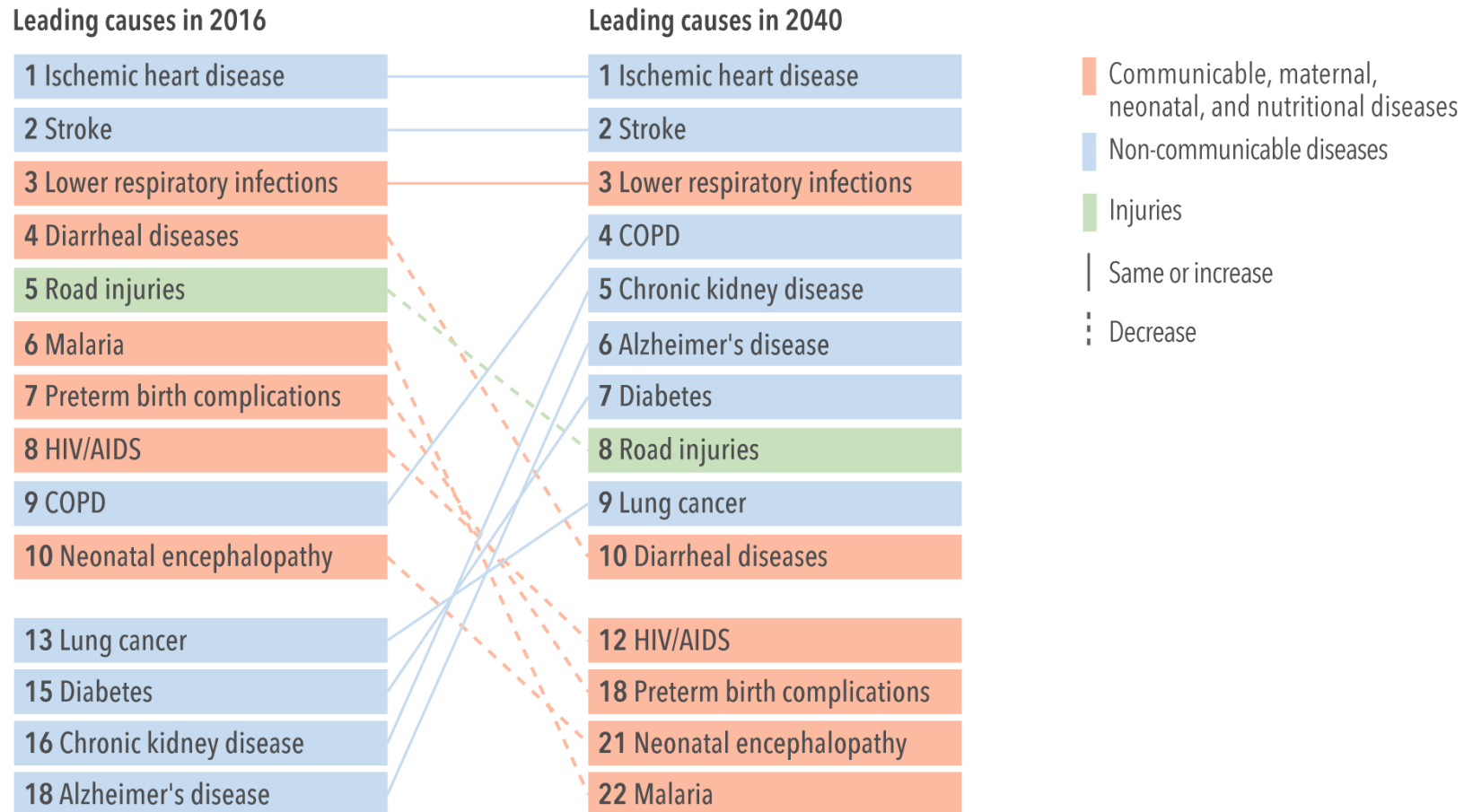
- 1 Smoking
- 2 High systolic blood pressure
- 3 High fasting plasma glucose
- 4 Alcohol use
- 5 Short gestation for birth weight

Females*

- 1 High systolic blood pressure
- 2 High fasting plasma glucose
- 3 High body mass index
- 4 Short gestation for birth weight
- 5 Low birth weight for gestation

- Metabolic risks
- Behavioral risks

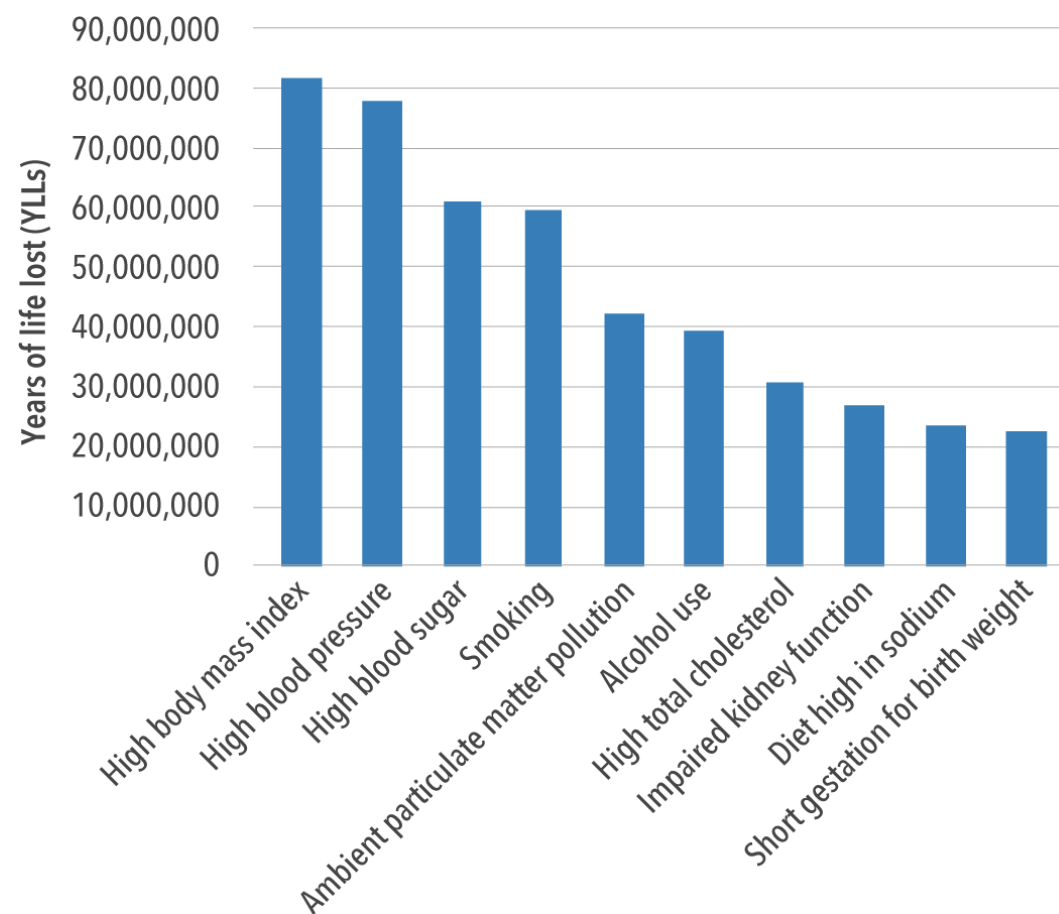
Forecast: Leading causes of early death, 2016 and 2040



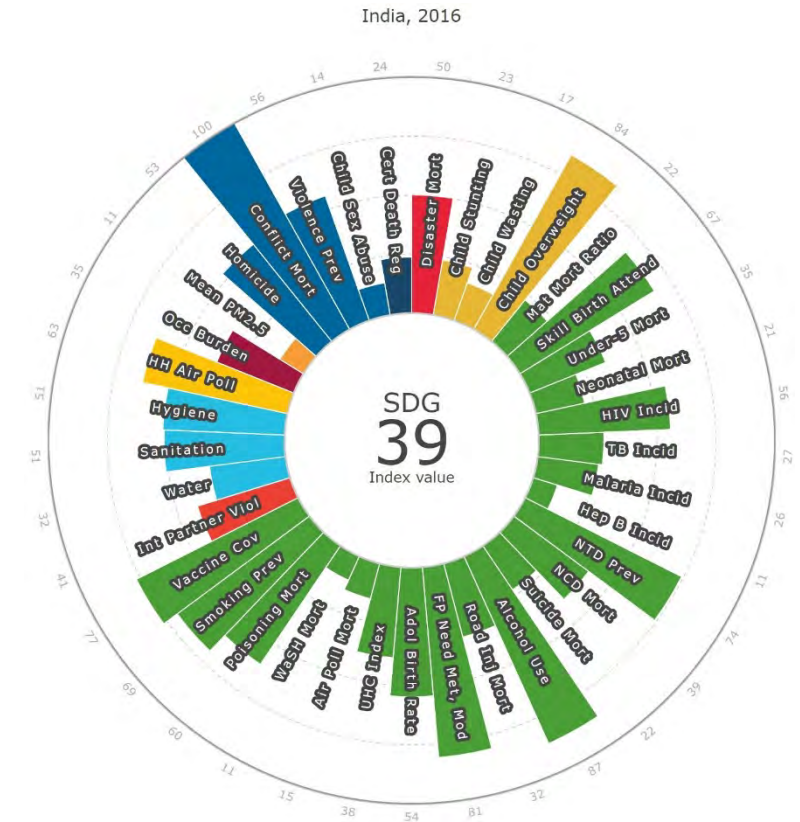
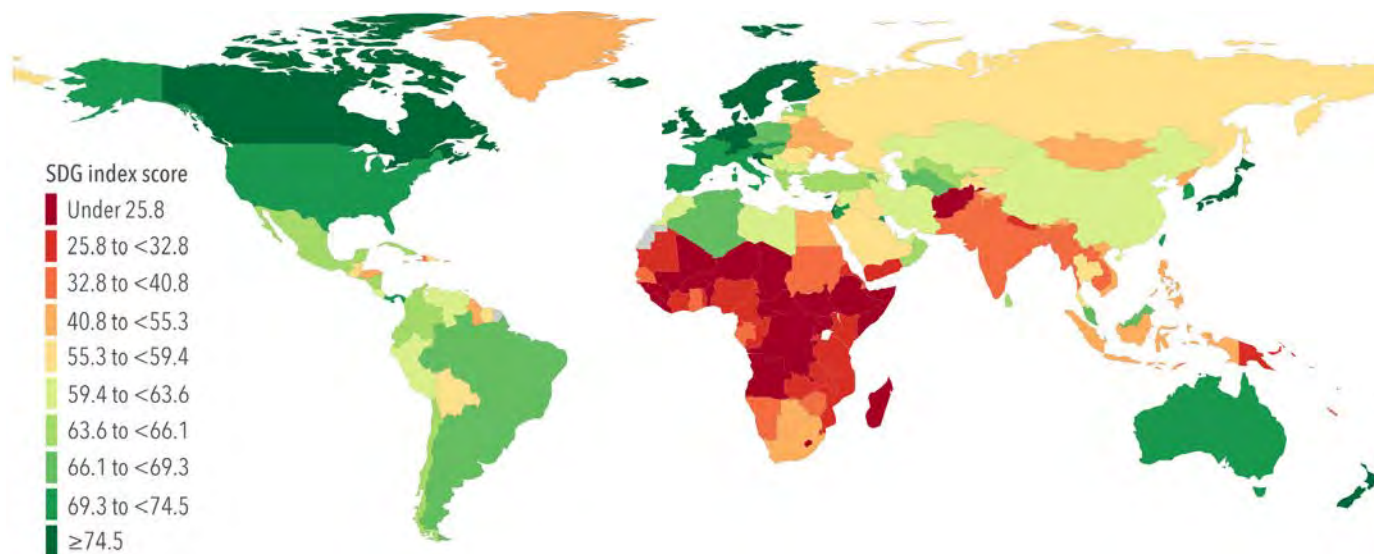
Institute for Health Metrics and Evaluation (IHME). Findings from the Global Burden of Disease Study 2017. Seattle, WA: IHME, 2018.

http://www.healthdata.org/sites/default/files/files/policy_report/2019/GBD_2017_Booklet.pdf

Forecast: Potential loss of life averted through reduction of exposure to key risk factors, 2040



SDG index score, 2017

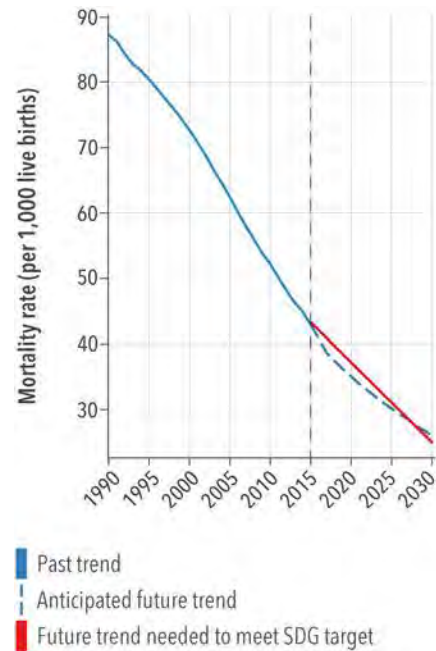


Institute for Health Metrics and Evaluation (IHME). Findings from the Global Burden of Disease Study 2017. Seattle, WA: IHME, 2018.

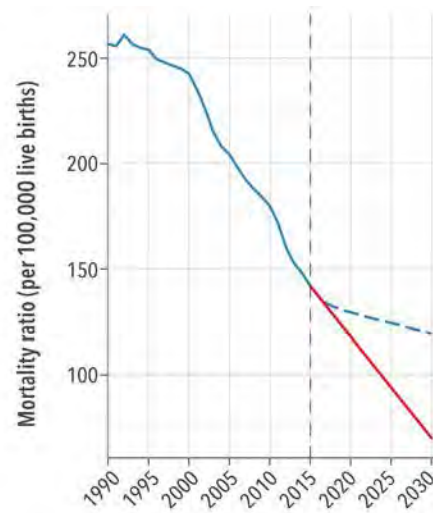
http://www.healthdata.org/sites/default/files/files/policy_report/2019/GBD_2017_Booklet.pdf

Progress towards SDG targets

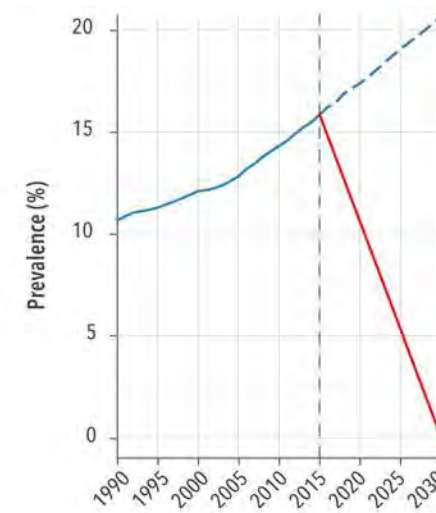
Global under-5 mortality rate, 1990–2030



Global maternal mortality ratio, 1990–2030



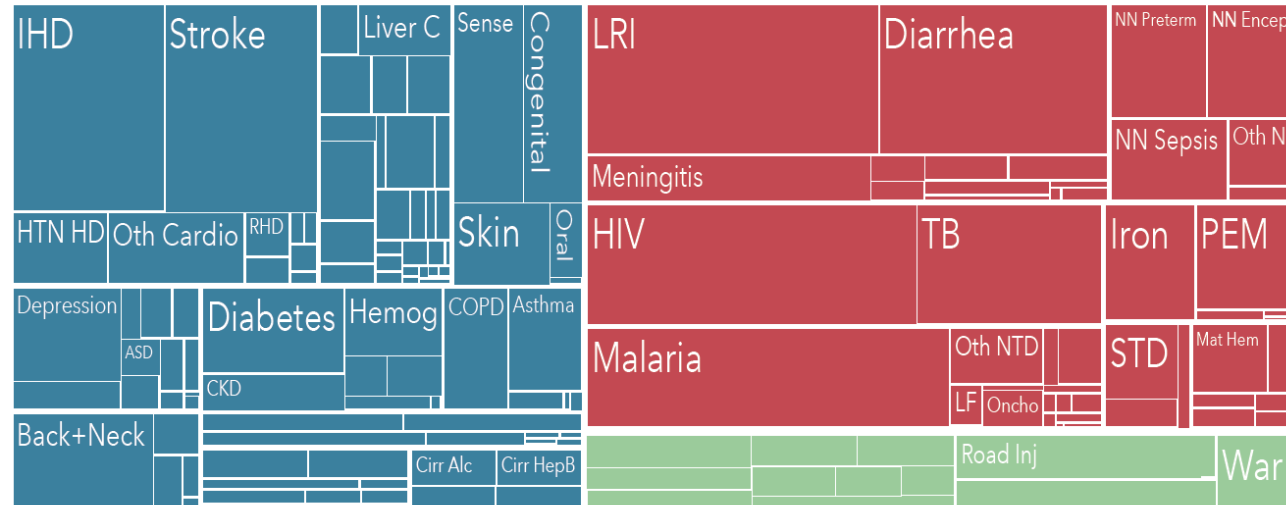
Global prevalence of overweight in children aged 2 to 4, 1990–2030



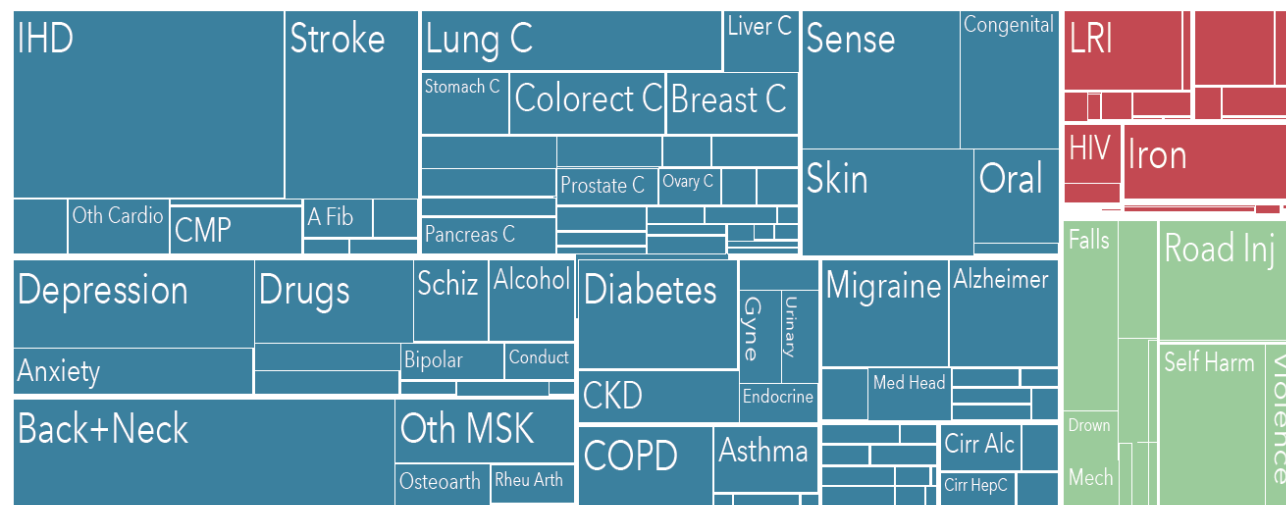
Age-standardized DALYs, low-SDI versus high-SDI countries, 2015

● Communicable, maternal, neonatal, and nutritional disorders ● Non-communicable diseases ● Injuries

Low SDI



High SDI



Socio-demographic Index (SDI), based on income per capita, average level of educational attainment, and fertility rate

Criticisms of GBD

- Black box and methods are hard to understand; lack of transparency
- Uses modeling and extrapolation to counteract systematic biases or inaccurate reporting in country collected data
 - “even the best recipes and best chefs in the world can’t make a meal out of spoiled (or non-existent) ingredients” Victoria Fan
- Data from all sorts of sources are combined (mixing apples and oranges)
- Confusing for policy makers when GBD estimates diverge from WHO or other sources
- Too reliant on DALYs, which has limitations
- Heavily funded by Gates Foundation

Great resources to explore



<http://www.healthdata.org/results/data-visualizations>



<http://ourworldindata.org/>



<http://www.gapminder.org/>