Swiss TPH
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse

Associated Institute of the University of Basel

Department of Epidemiology & Public Health

An economic and health system perspective to global health challenges

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Why is a (political and) economic perspective is useful?

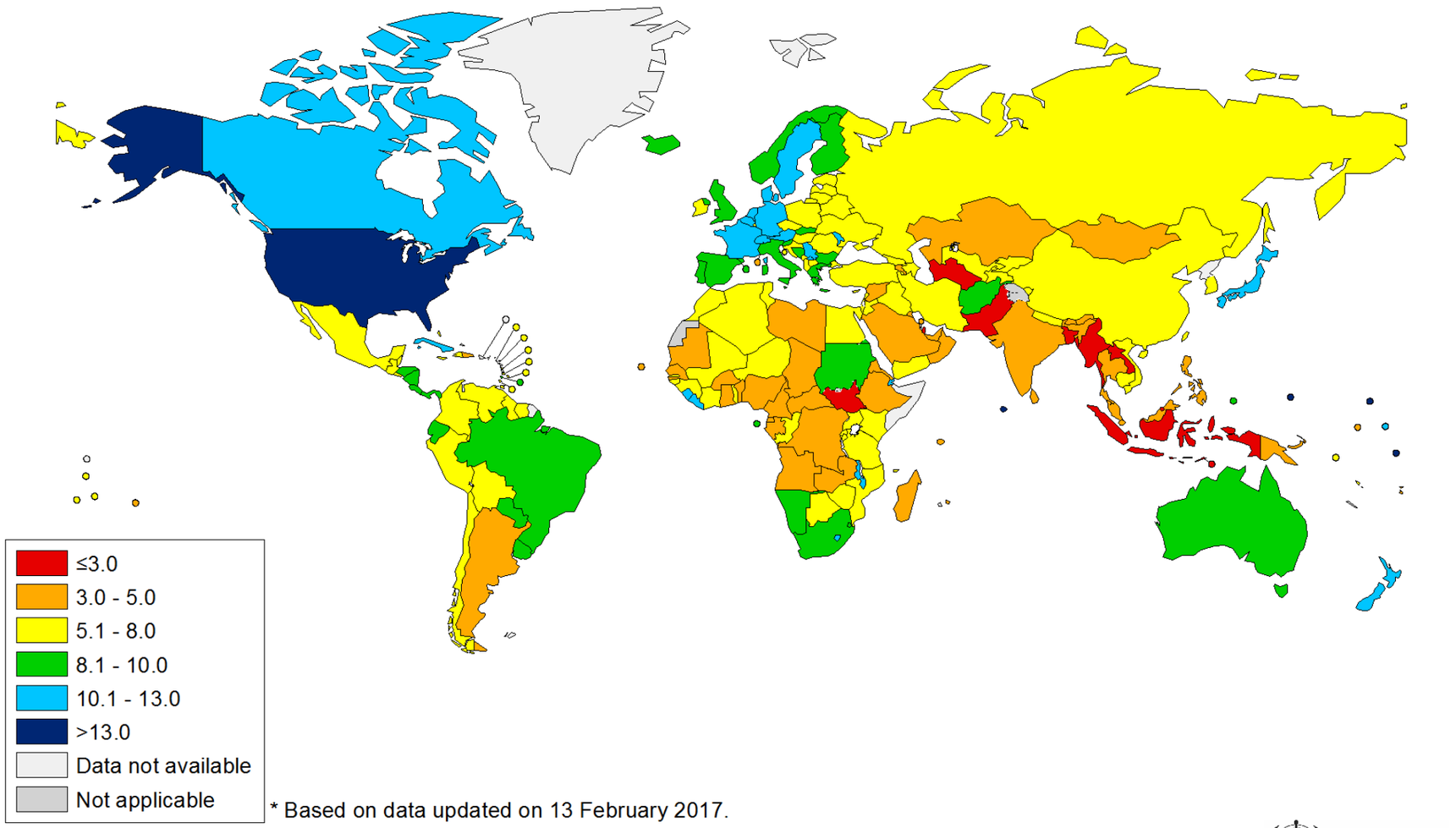
1. Growing economic relevance of health (sector)

Total health expenditure:

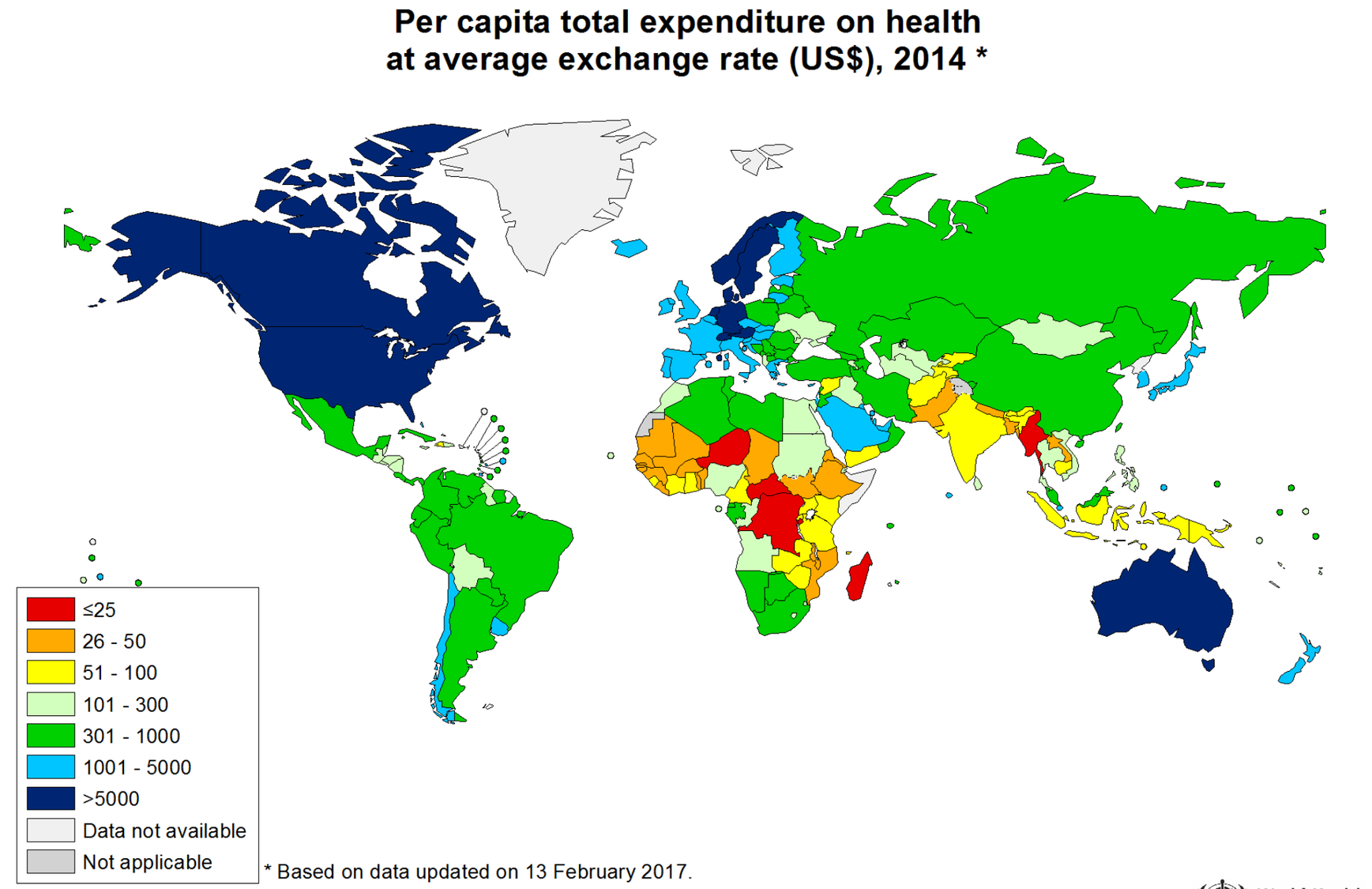
- 10% of global GDP in 2014
- US$Int 1272 per capita per year in 2014
- Huge variations across countries: US$Int 93 LICs- 4609 HICs in 2014

Income is the main determinant of health expenditure growth

Why is a (political and) economic perspective is useful?



Why is a (political and) economic perspective is useful?



Why is a (political and) economic perspective is useful?

1. Growing economic relevance of health (sector)

Health sector both labor and brain intensive

Investments in health sector have impact on quantity and quality of employment

Why is a (political and) economic perspective is useful?

The world's largest employers:

1. US Department of Defense - 3.2 million
2. People's Liberation Army (China) - 2.3 million
3. Walmart - 2.1 million
4. McDonald's - 1.9 million
5. **UK NHS - 1.7 million**
6. China National Petroleum Corporation - 1.6 million
7. State Grid Corporation of China - 1.5 million
8. Indian Railways - 1.4 million
9. Indian Armed Forces - 1.3 million
10. Hon Hai Precision Industry (Foxconn) - 1.2 million ends

Why is a (political and) economic perspective is useful?

1. Growing economic relevance of health (sector)

Commercial/Business practices & interests have significant impact on health and health care delivery – e.g.

- (Big) Tobacco
- (Big) Food
- (Big) Pharma

Importance of global, national, and local regulation and governance

Why is a (political and) economic perspective is useful?

1. Growing economic relevance of health (sector)

Commercial/Business practices & interests have significant impact on health and health care delivery

Global Health Governance challenges-

e.g. WHO Funding sources (budget 2014-15):

- Assessed contributions: 23.4% (929 M US$)
- Voluntary contributions: 76.6% (3049 M US$)

Why is a (political and) economic perspective is useful?

2. Paradigm shift: health from consequence to determinant of economic development

Traditional economic thinking: income growth is a key factor for improved population health

- Policies prescribed by international financial institutions for LICs focused on growth in GDP to the neglect and even the detriment of population health

Health more relevant in global development policies

Why is a (political and) economic perspective is useful?

2. Paradigm shift: health from consequence to determinant of economic development

Strong empirical evidence that relation health and development is bi-directional

- **WHO Commission on Macroeconomics and health (2000)**

Health more relevant in global development policies

Growth in global health financing

GAPMINDER WORLD 2012

Mapping the Wealth and Health of Nations

Healthy

Poor Rich

Sick

Life Expectancy of the World

LIFE EXPECTANCY in years

80 75 70 65 60 55 50

Japan, Italy, France, Spain, South Korea, New Zealand, Israel, San Marino, Iceland, Andorra, Switzerland, Hong Kong, Australia, Sweden, Norway, Canada, Ireland, Netherlands, Singapore, Austria, Greece, Cyprus, UK, Finland, Slovenia, Germany, Belgium, Malta, Taiwan, Denmark, USA, Brunei, Cuba, Costa Rica, Chile, Portugal, Puerto Rico, Mexico, Uruguay, Barbados, Croatia, Poland, Czech Rep., Dominica, Panama, Argentina, Slovak Rep., Bahamas, Bahrain, Kuwait, United Arab Emirates, Monaco, Liechtenstein, Luxembourg, Qatar, Maldives, Albania, Bosnia and H., Belize, Grenada, Serbia, Montenegro, St. Lucia, Ecuador, Thailand, Macedonia, Tunisia, Venezuela, Malaysia, Estonia, Hungary, Seychelles, Saudi Arabia, Oman, Vietnam, Syria, Palestine, Nicaragua, Cape Verde, Libya, Sri Lanka, Armenia, Georgia, Egypt, Dom. R., Peru, Colombia, Turkey, Romania, Mauritius, Latvia, Iran, Lebanon, Bulgaria, Lithuania, Honduras, Jordan, Paraguay, Samoa, Jamaica, Algeria, Morocco, Tonga, El Salvador, St. Vincent and G., Palau, Micronesia, Vanuatu, Guatemala, Suriname, Azerbaijan, Belarus, Trinidad and Tobago, Kosovo, Guyana, Moldova, Iraq, Fiji, Mongolia, Bangladesh, North Korea, Nepal, Indonesia, Uzbekistan, Philippines, Ukraine, Russia, Solomon Islands, Laos, Tajikistan, Kyrgyzstan, Bhutan, Kazakhstan, Madagascar, Pakistan, Bolivia, Nauru, Yemen, Myanmar, Tuvalu, Turkmenistan, Ghana, São Tomé and Príncipe, India, Kiribati, Cambodia, Papua New Guinea, Timor-Leste, Namibia, Gabon, Haiti, Sudan, Eritrea, Comoros, South Sudan, Ethiopia, Senegal, Tanzania, Mauritania, Gambia, Djibouti, Togo, Kenya, Congo, Rep., Liberia, Burkina, Benin, Rwanda, Faso, Cote d'Ivoire, Niger, Malawi, Guinea, Uganda, South Africa, Botswana, Mali, Somalia, Cameroon, Nigeria, Angola, Equatorial Guinea, Zimbabwe, Burundi, Mozambique, Zambia, Chad, Dem. Rep. Congo, Central African Rep., Guinea-Bissau, Afghanistan, Lesotho, Swaziland, Sierra Leone

Income per Person of the World

500 1 000 2 000 5 000 10 000 20 000 50 000

INCOME PER PERSON in US Dollars *(GDP/capita, PPP$ inflation adjusted, log scale)*

Colour by region

Size by population

3 or less 10 100 1000 millions

2011 data for all 193 UN Members and for Hong Kong, Kosovo, Palestine, Puerto Rico and Taiwan.

Documentation and PDF version for print at:

GAPMINDER.ORG/DOWNLOADS/WORLD-PDF

If you want to see more data visit:

www.gapminder.org

Version 11 September 2012

Why is a (political and) economic perspective is useful?

2. Paradigm shift: health from consequence to determinant of economic development

http://www.cddep.org/projects/lancet_commission_investing_health

Millennium Development Goals

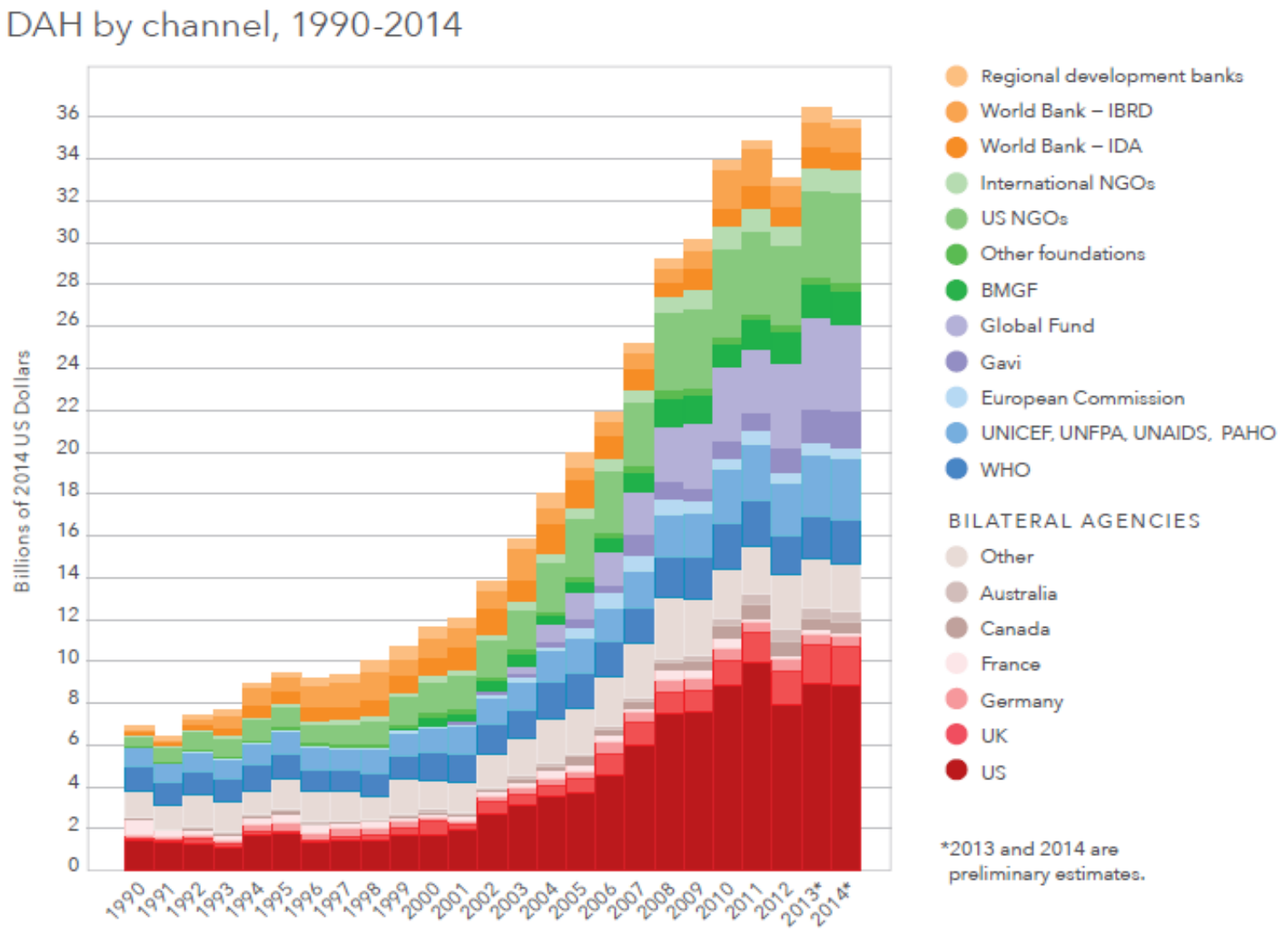
- In 2000 Millennium Development Goals for 2015

Why is a (political and) economic perspective is useful?

2. Paradigm shift: health from consequence to determinant of economic development

Unprecedented funding to global health – now over?

http://vizhub.healthdata.org/fgh/

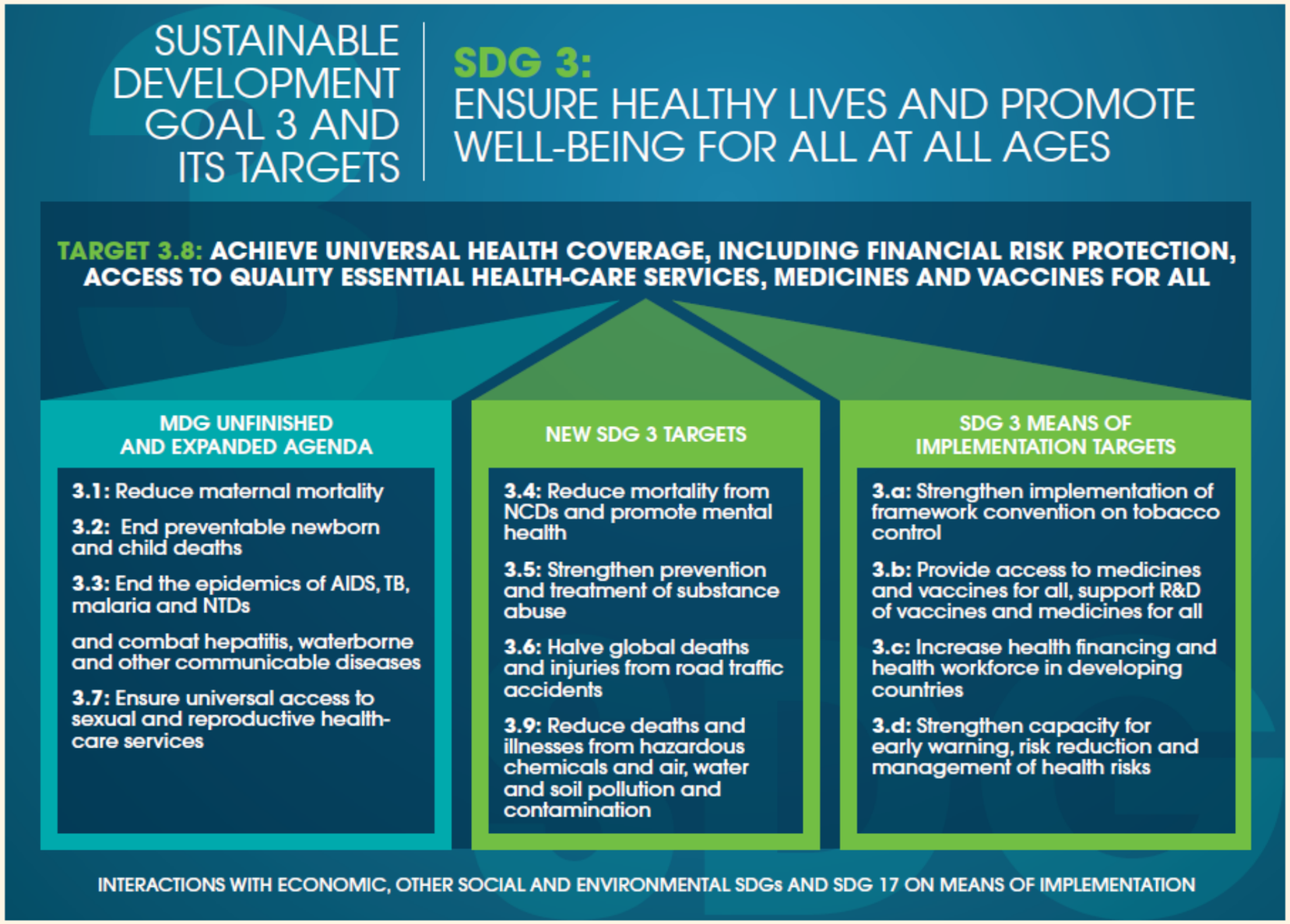


From: Sources and Focus of Health Development Assistance, 1990–2014
JAMA. 2015;313(23):2359-2368. doi:10.1001/jama.2015.5825

Health in Sustainable Development Goals

Health in Sustainable Development Goals

Figure 9.1
A framework for the SDG health goal and targets



Why is a (political and) economic perspective is useful?

3. Relevance of social determinants of health

The greatest share of health problems is attributable to the **social conditions in which people live and work that are key determinants of health**

Health inequalities are caused by inequitable distribution of more fundamental social, political and economic forces

Why is a (political and) economic perspective is useful?

3. Relevance of social determinants of health

Health depends on many factors and policies that are outside of the remit of health ministries

Action needed

- to **improve basic living conditions -**health services, education, and working conditions;
- to **reduce inequalities in power and resources;**
- to create transparency by monitoring and measuring inequalities in health.

Why is a (political and) economic perspective is useful?

4. Inequalities - equity in health and access to care

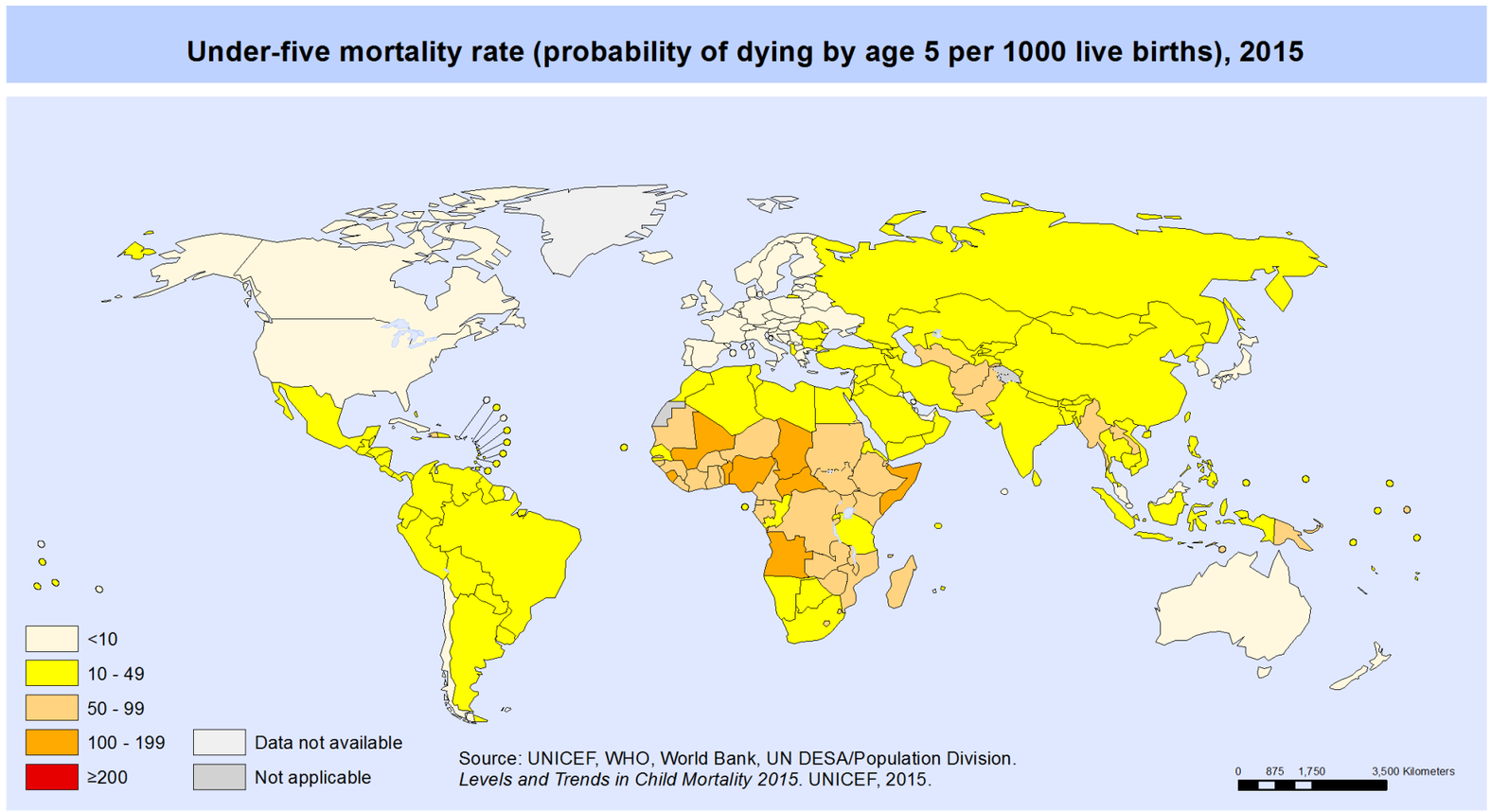
Despite dramatic improvements in average population health, disparities between the poorest and least poor have been increasing:

- in economic burden of ill health;
- in access to health care; and
- in health outcomes

Health systems are ill equipped to identify and respond to health inequities, and often cause greater inequity

Why is a (political and) economic perspective is useful?

4. Inequalities in health



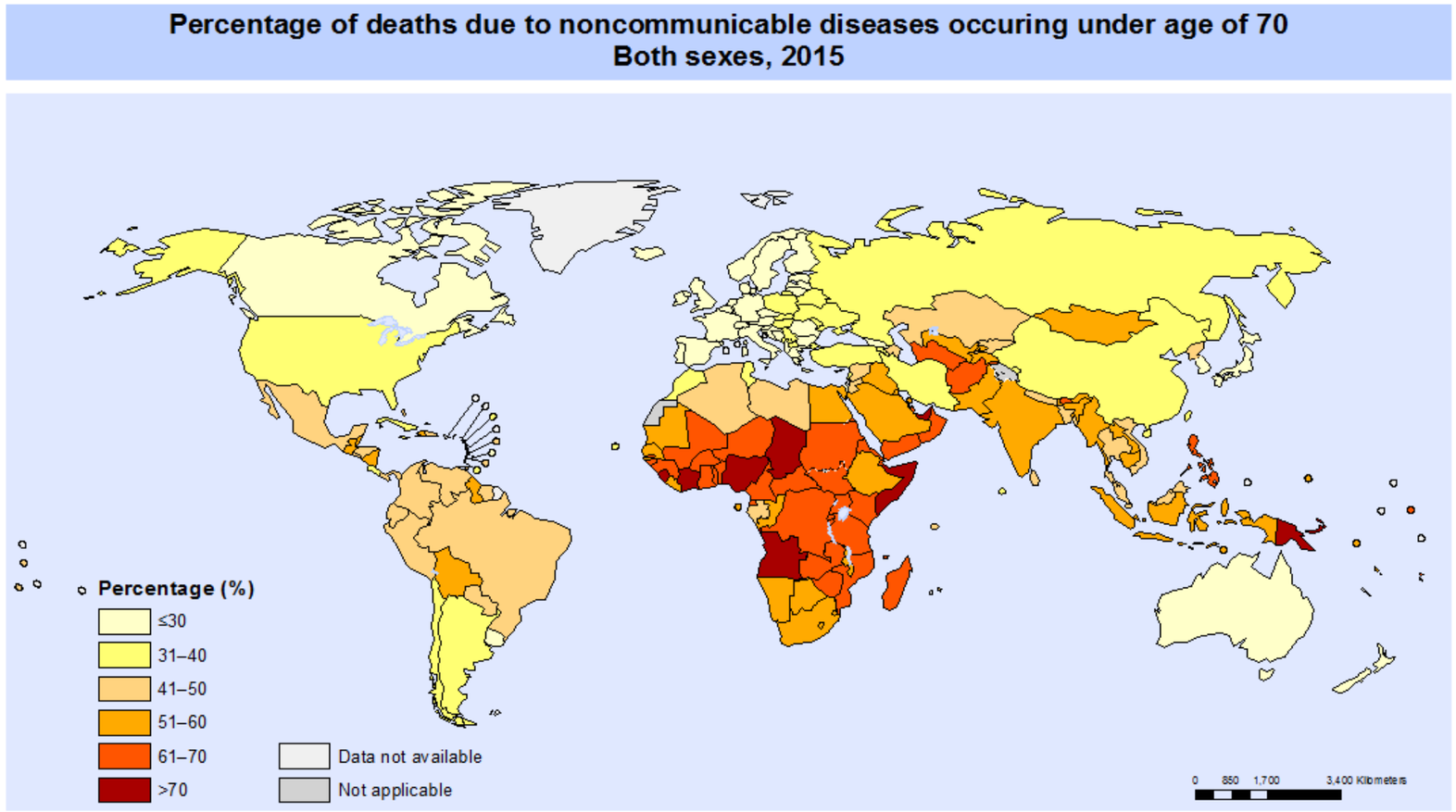
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers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

Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization

World Health Organization

Why is a (political and) economic perspective is useful?

4. Inequalities in health



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 and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Information Evidence and Research (IER)
World Health Organization

World Health Organization

Why is a (political and) economic perspective is useful?

4. Inequalities in health and access to care

Examples:

Maternal mortality:

- http://apps.who.int/gho/data/node.sdg.3-1-viz?lang=en

NCDs - Mortality rate attributed to cardiovascular disease (CVD), cancer, diabetes or chronic respiratory disease (CRD)

- http://apps.who.int/gho/data/node.sdg.3-4-viz-1?lang=en

UHC indicators:

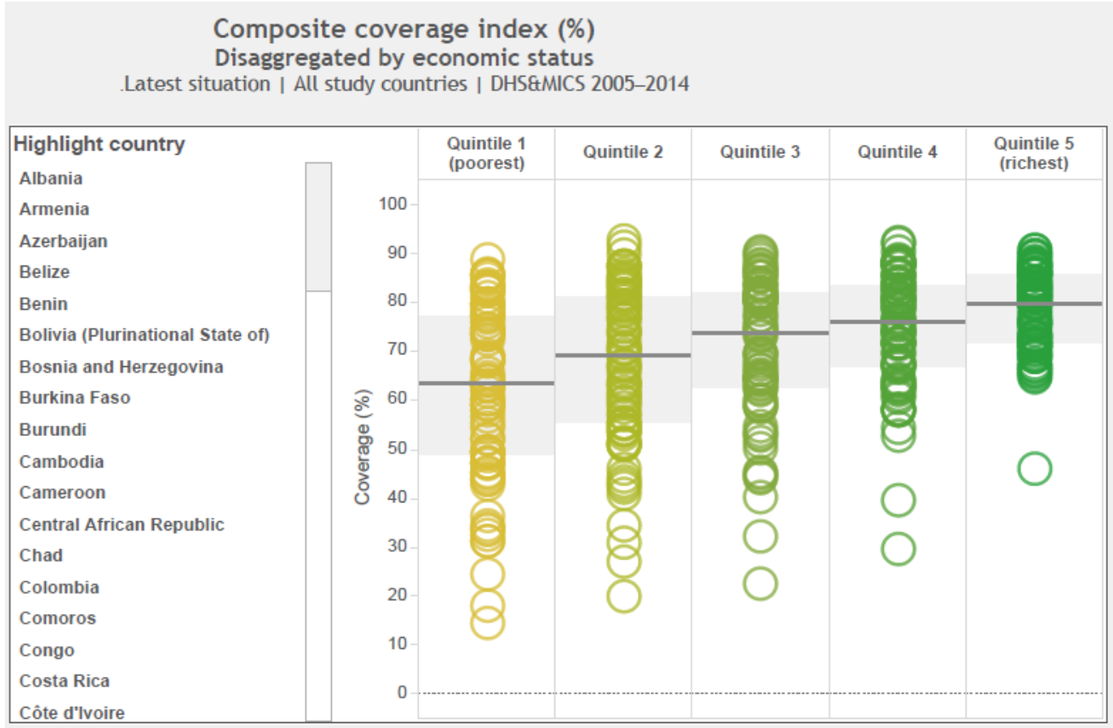
- http://apps.who.int/gho/cabinet/uhc.jsp

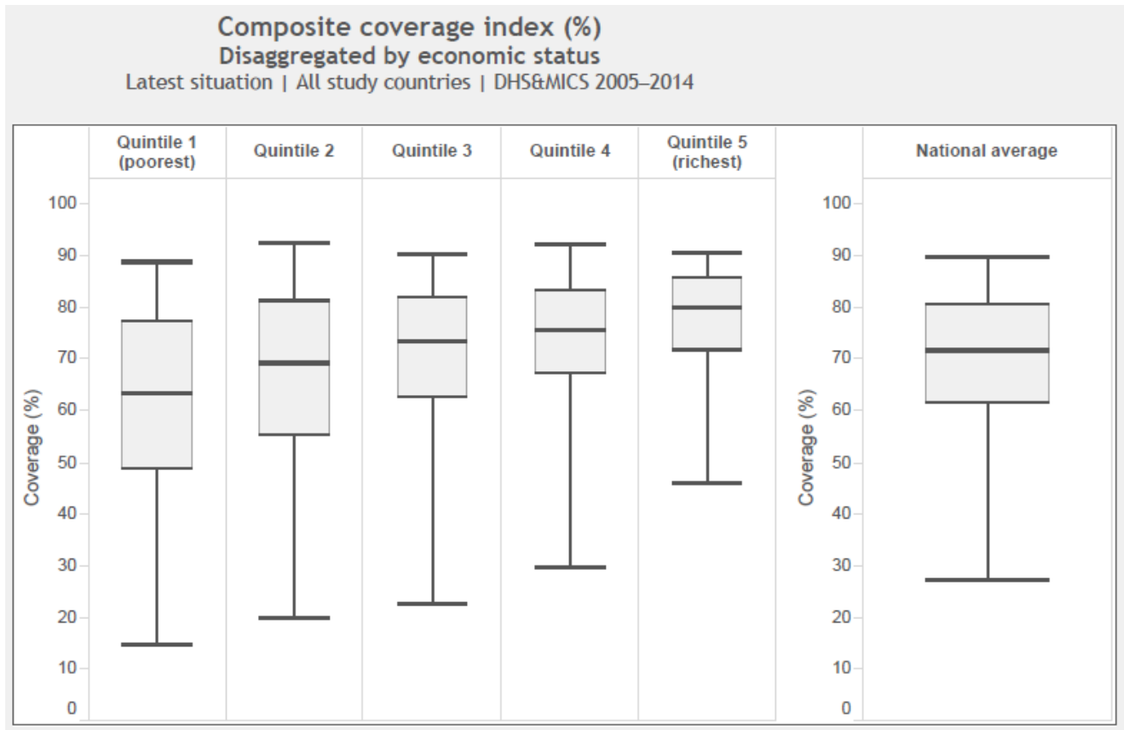
Why is a (political and) economic perspective is useful?

4. Inequalities in access to care

Inequality in reproductive, maternal, newborn and child health (RMNCH) interventions

Composite coverage index: weighted score reflecting cover age of eight reproductive, maternal, newborn and child health interventions along the continuum of care





Why is a (political and) economic perspective is useful?

4. Inequalities in health and access to care

Wealthy groups often benefit more than the poor from government spending

Private sector weakly governed/regulated - the poorest often receive the poorest quality of care within the private sector

A health system perspective

- Health outcomes mediated by complex interactions between diseases, environment, and socio-economic systems at micro and macro levels

- The “**black box misconception**”: “we must simply get technologies and other inputs in place and then outputs will somehow walk their way” (Frank J., PLoS Med, 2010)

A health system perspective

Characteristics of a sustainable Health System

Affordable

- Public health interventions
- High value
- Low OOPs

Acceptable

- Stakeholders involvement
- Patient Involvement
- Trust

Adaptable

- Respond to changes in BoD, Social & cultural, Tech etc.

Health system complexity

A framework of connected sub-systems

"A system is not the sum of its parts; It is the product of the interaction of its parts"

What happens between the sub-systems is more important than what goes on within them; and is usually neglected".

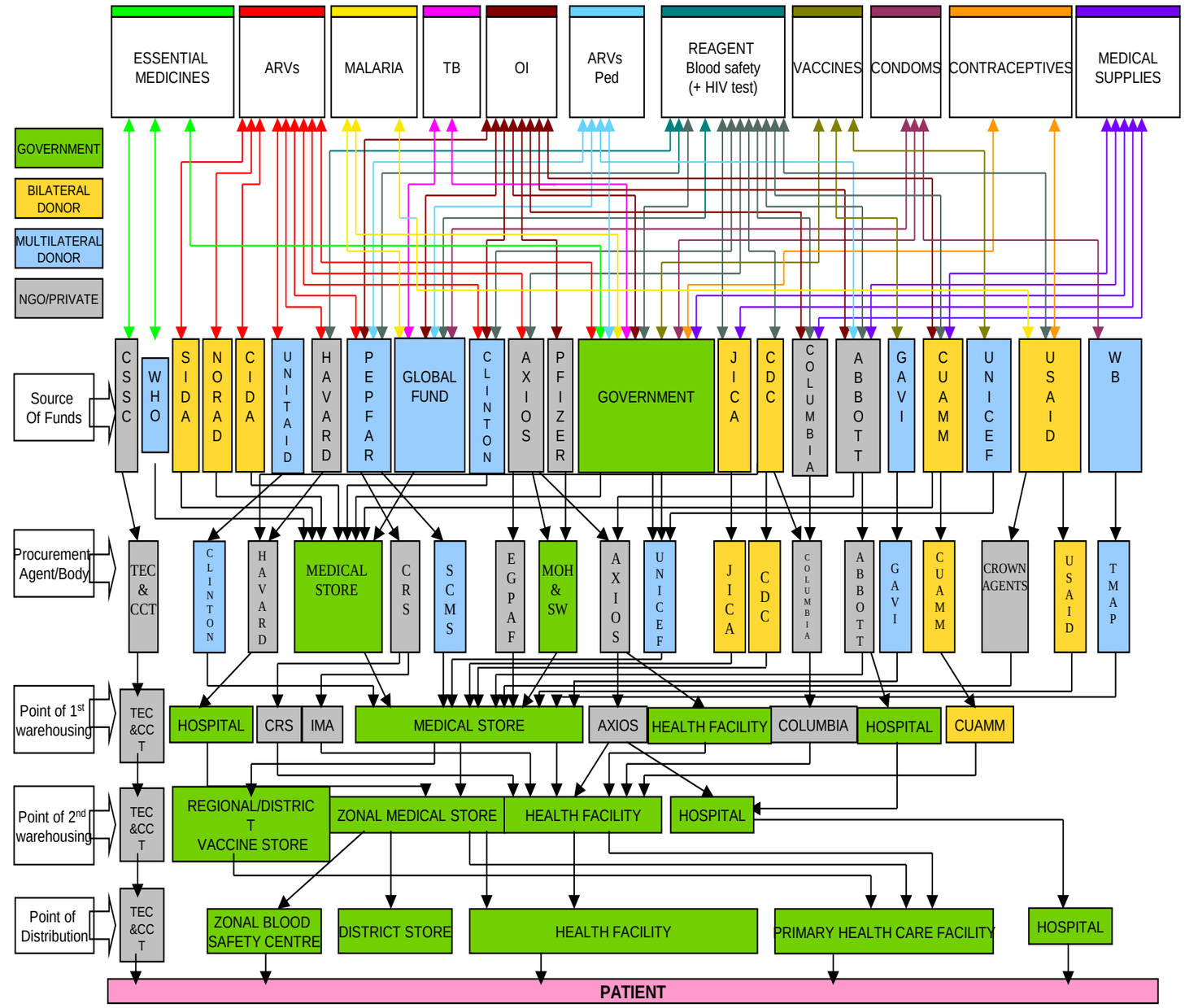
Source: de Savigny and Adam (2009)

Health system complexity

Health systems are complex adaptive systems

All building blocks are fragmented

Medicines & Technologies sub-system – Tanzania 2007



A health system (and economic) perspective

Three sets of health challenges:

1. **The huge health challenges still suffered by vulnerable groups in low and middle income countries**

2. **The shift in the disease burden towards non communicable diseases**

3. **The burden of medical expenditure on households and societies**

Challenge 1: The huge health challenges of vulnerable groups in low and middle income countries

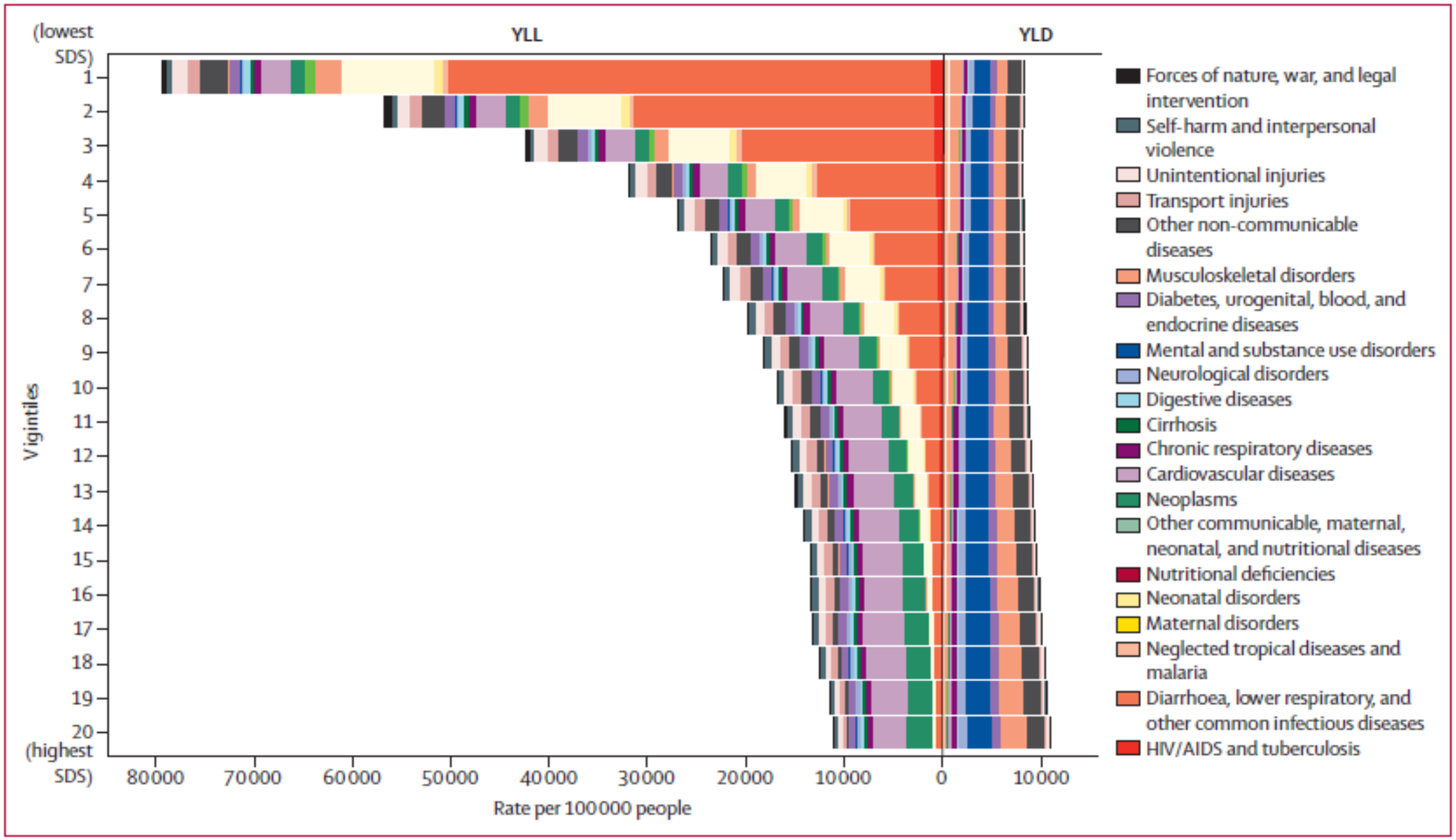


***Figure 5*: YLL and YLD cause composition of DALY rates by sociodemographic status vigintile**

Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990-2013: quantifying the epidemiological transition. Lancet. 2015 Aug 27.

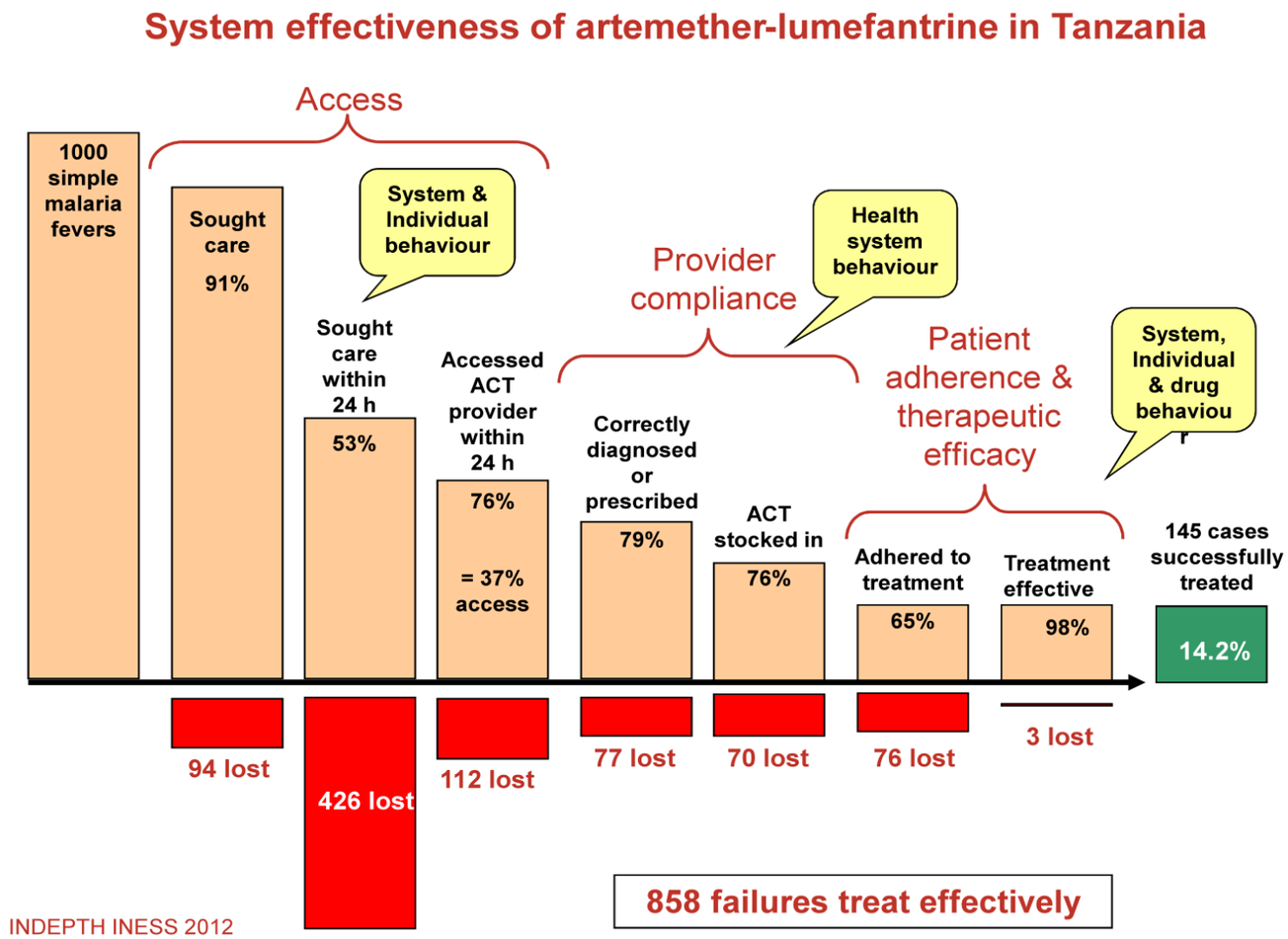
Challenge 1: The huge health challenges of vulnerable groups in low and middle income countries

Most of the BoD suffered by vulnerable groups is for **communicable diseases, neonatal, maternal, nutritional conditions –** that can be prevented or treated with “available” interventions relatively inexpensive

Scaling up **Effective Coverage** of available preventive and curative interventions would dramatically reduce this burden

Example: Effective coverage of malaria case management

A few studies estimated low effective coverage of malaria case management in malaria endemic areas in Africa (e.g. INESS http://indepth-network.org/projects/iness)

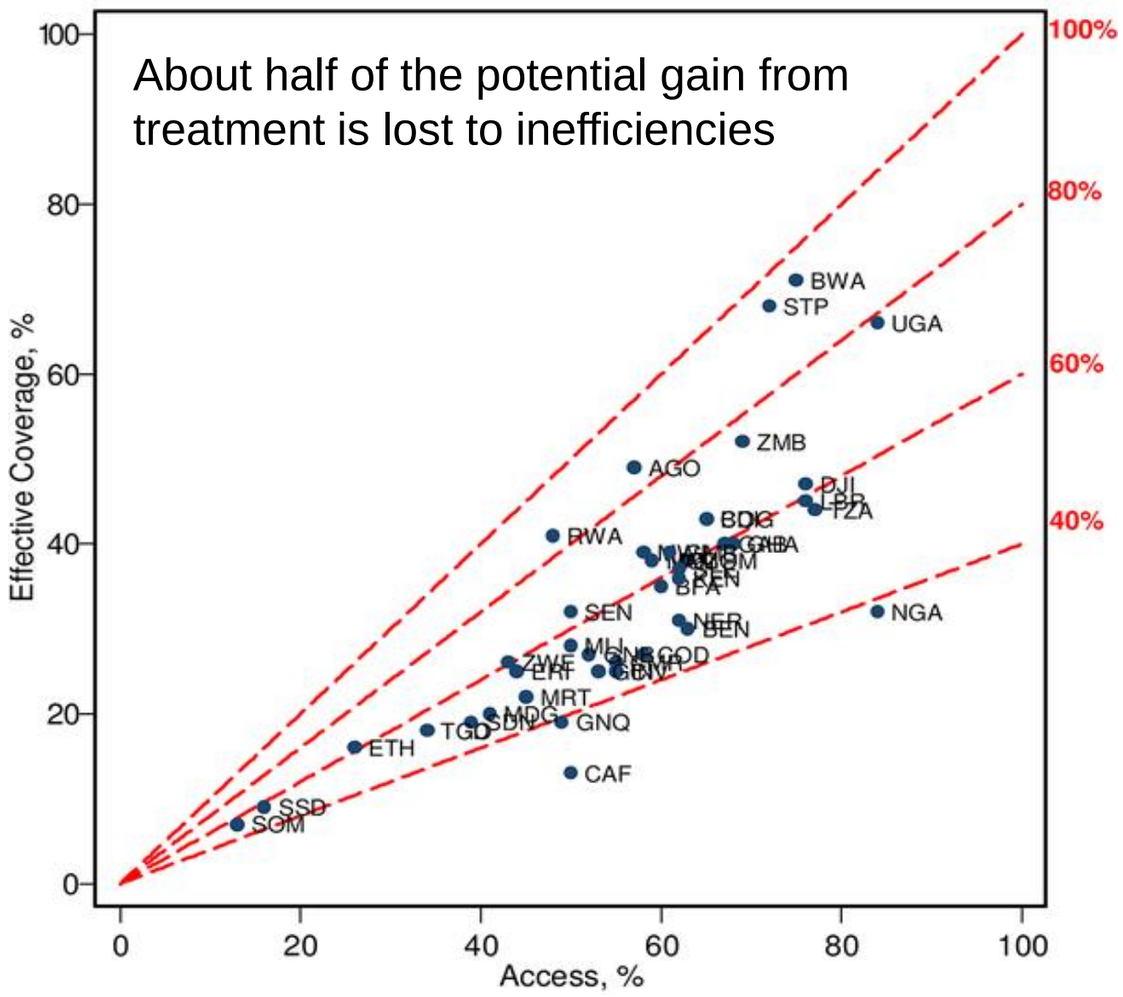


Source: INESS http://indepth-network.org/projects/iness

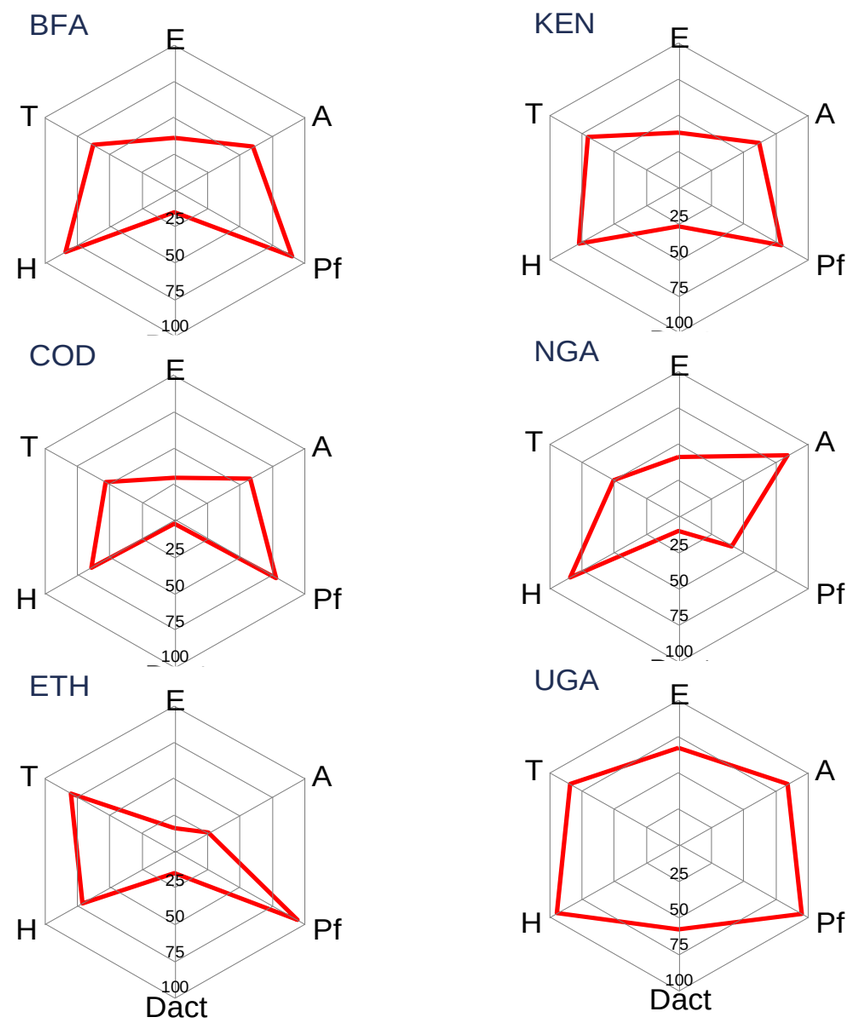
Example: Effective coverage of malaria case management

We used Demographic Health Surveys and published sources to estimated effective coverage of Malaria Case Management in 43 high burden African Countries

Effective Coverage (E) and Access to Any Provider (A) by Country (%).

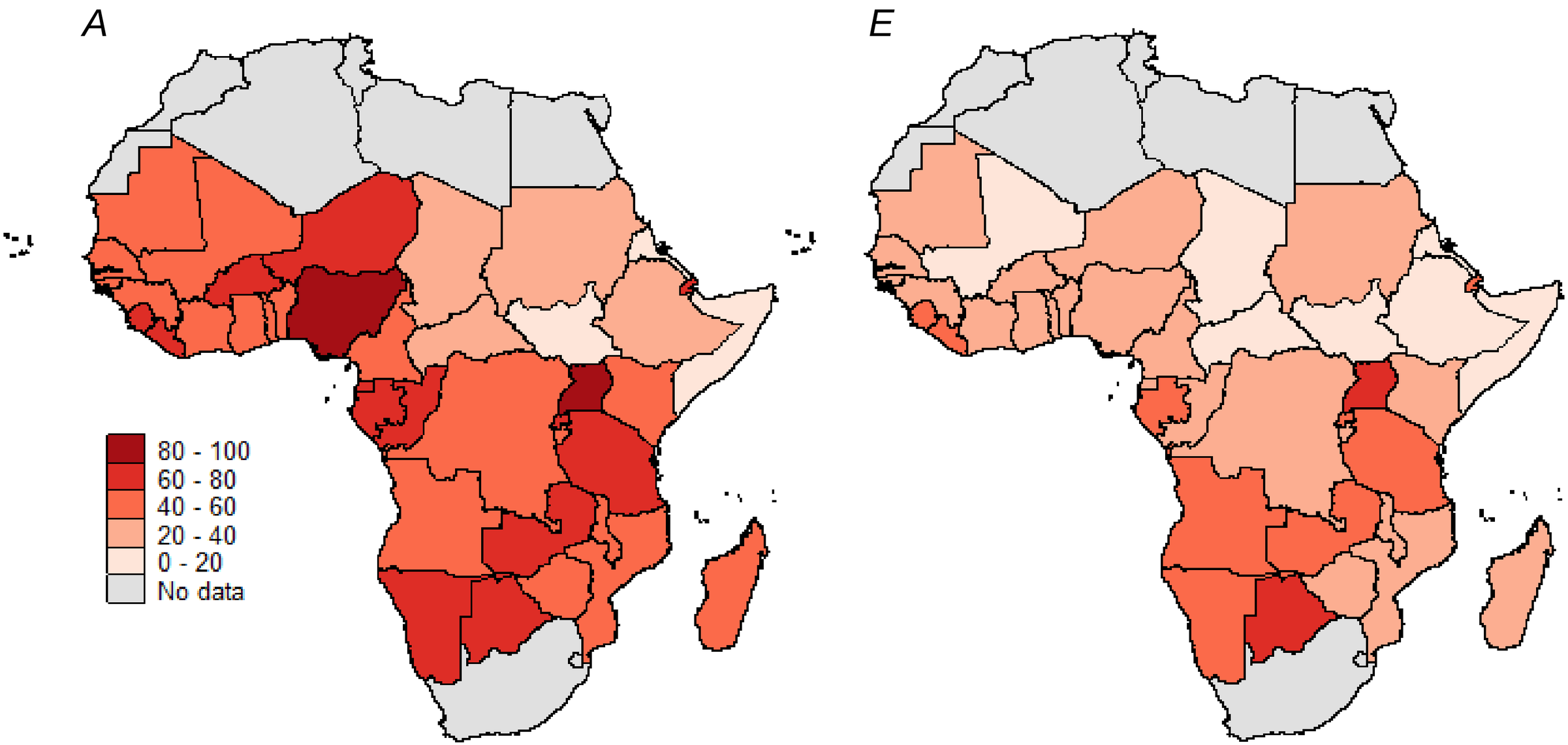


Effective coverage and malaria service indicators



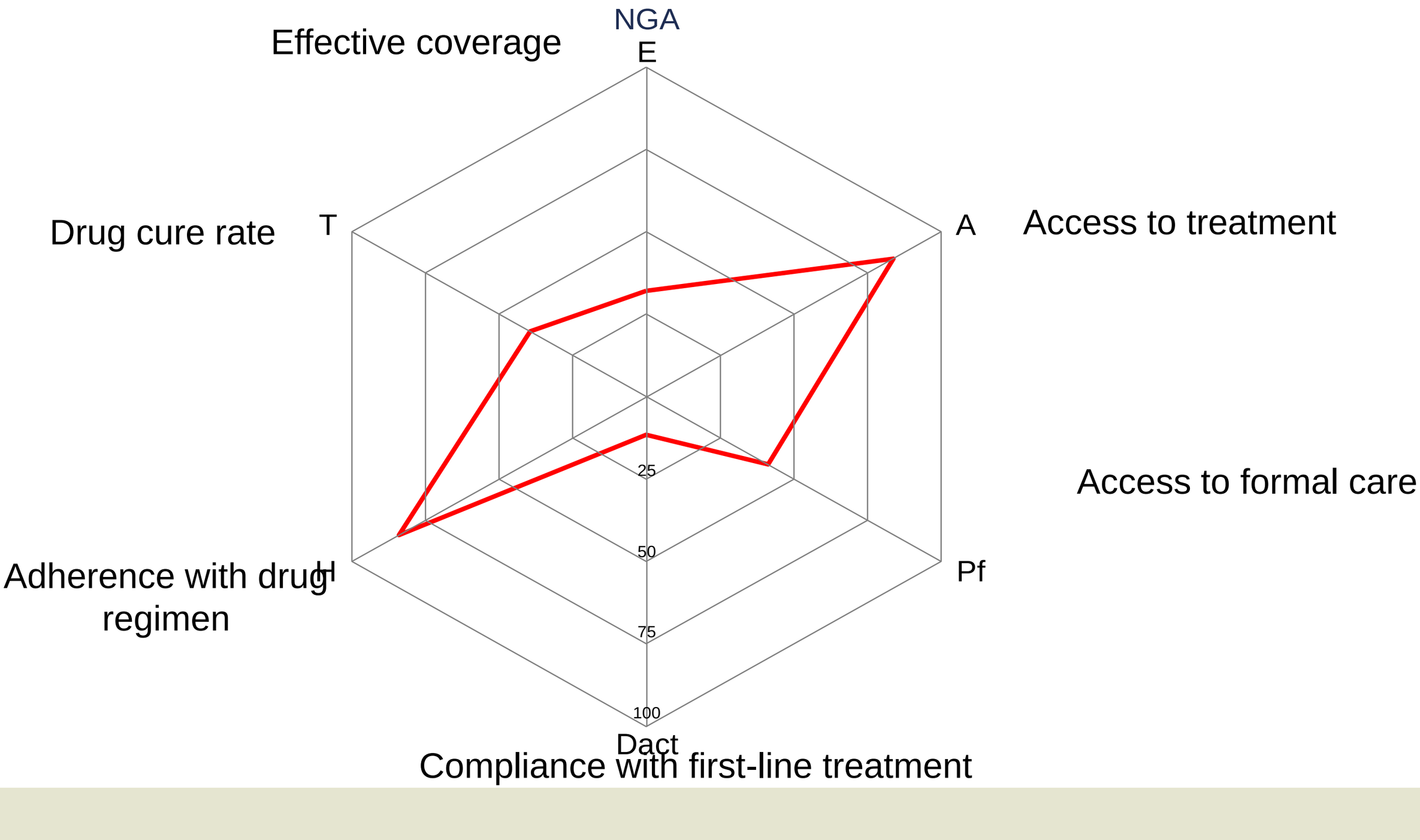
Galactionova K, Tediosi F, et al (2015) Effective Coverage and Systems Effectiveness for Malaria Case Management in Sub-Saharan African Countries. PLoS 10(5): e0127818. doi:10.1371/

Effective coverage (E) and Access to malaria treatments (A)



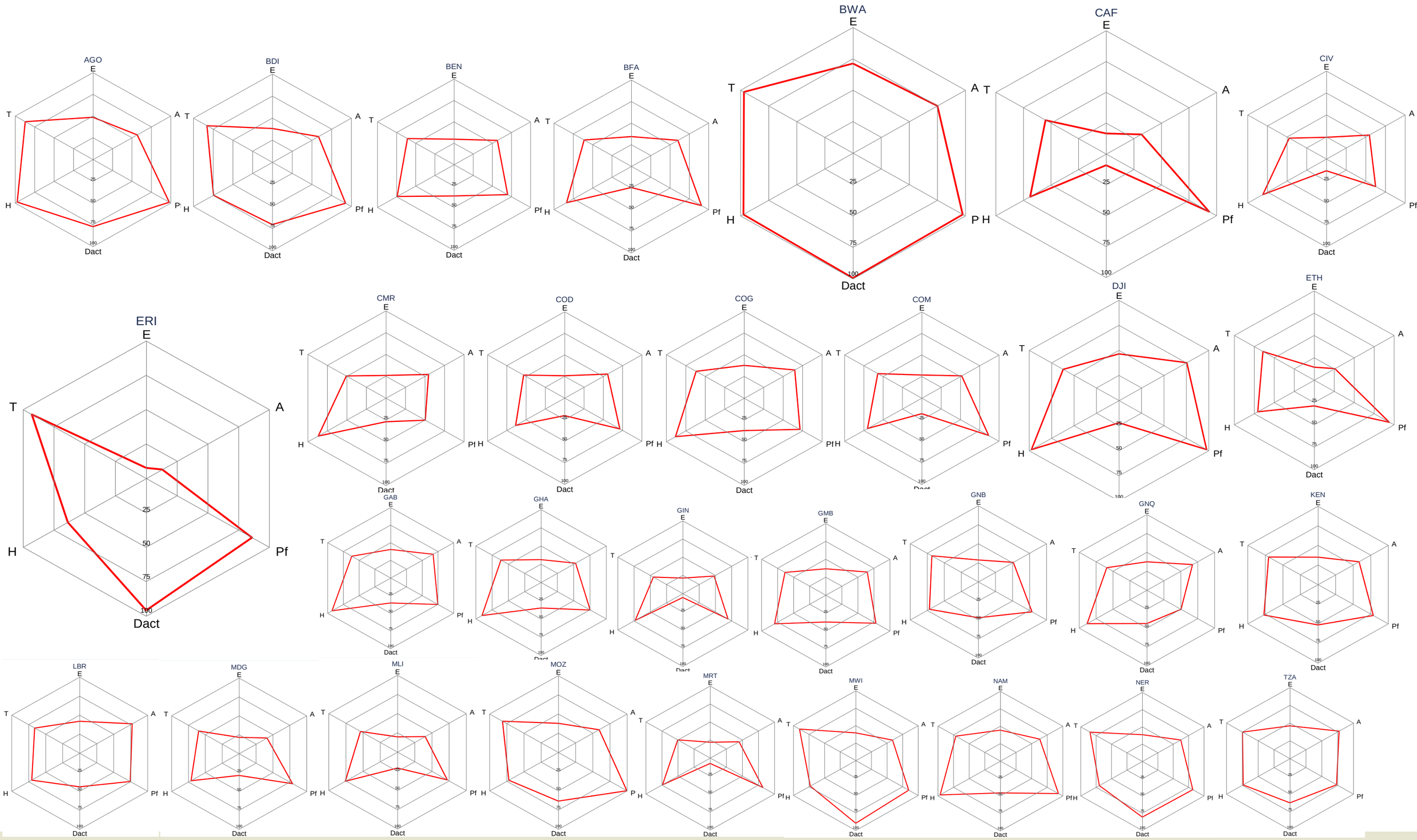
Galactionova K, Tediosi F, de Savigny D, Smith T, Tanner M (2015). *Effective Coverage and Systems Effectiveness for Malaria Case Management in Sub-Saharan African Countries. PLoS ONE* 10(5): e0127818. doi:10.1371/journal.pone.0127818

Effective coverage of malaria case management: Nigeria



Bottlenecks in service provision: each country has different challenges

SwissTPH

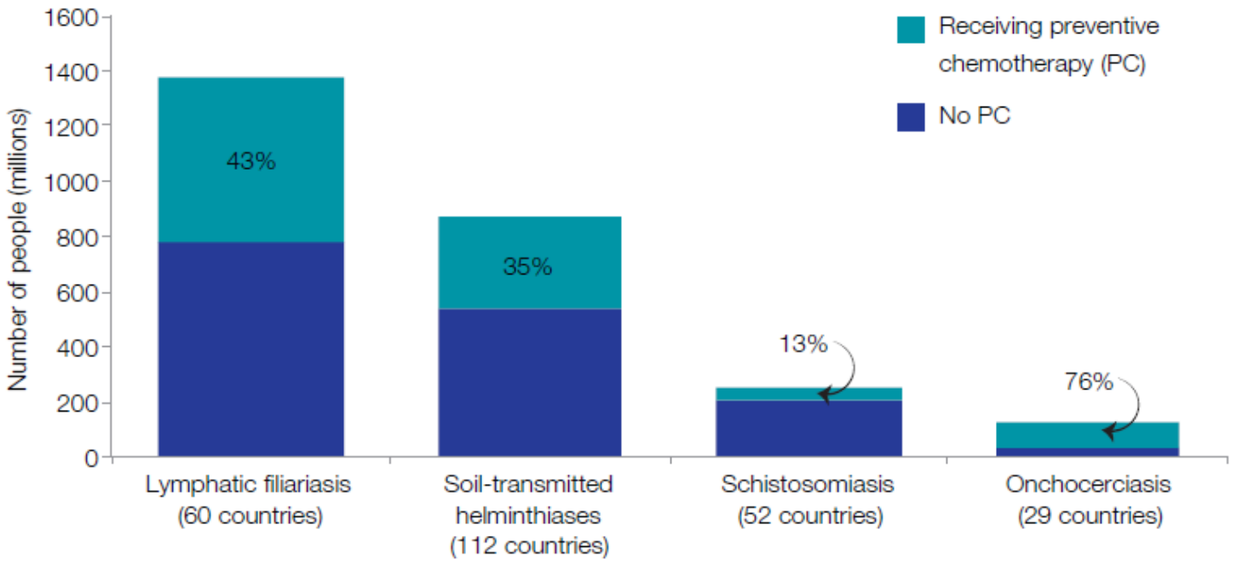


Galactionova K, Tediosi F et al. *PLoS ONE* 10(5): e0127818. doi:10.1371/journal.pone.0127818

Example: Impact of strategies to control and eliminate Neglected Tropical Diseases

- Neglected Tropical Diseases affect vulnerable people mainly in marginalized areas of low and middle income countries
- Many of them could be prevented or treated with relatively simple interventions – e.g. preventive chemotherapy

Figure 2.13. Number of people (millions) requiring preventive chemotherapy for selected neglected tropical diseases with intervention coverage and number of countries requiring preventive chemotherapy



WHO-WB Tracking universal health coverage: first global monitoring report
http://www.who.int/healthinfo/universal_health_coverage/report/2015/en

Example: Impacts of strategies to control and eliminate Neglected Tropical Diseases

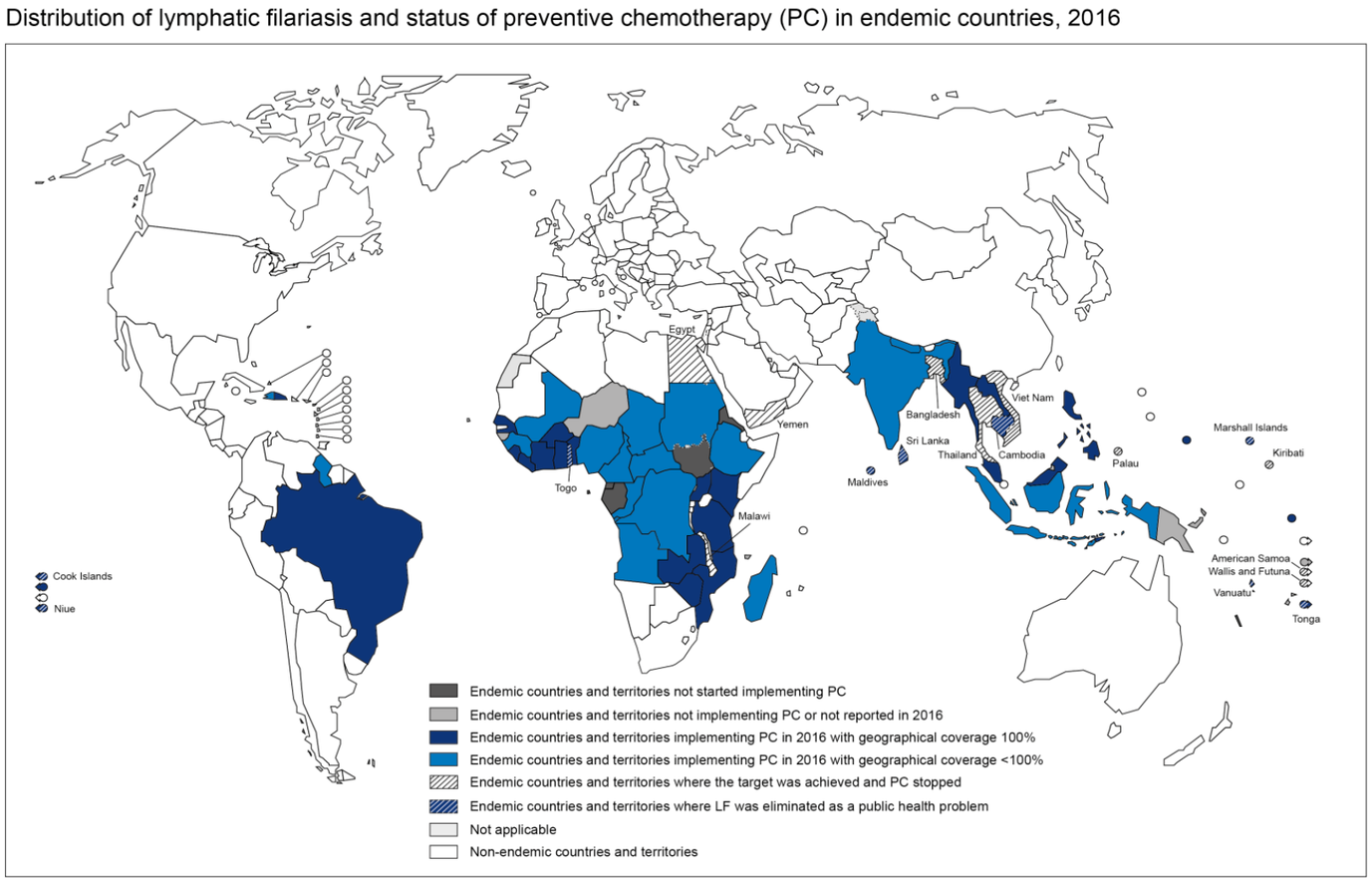
Lymphatic Filariasis

- Chronic forms of morbidity: hydrocele and lymphoedema
- Global program to eliminate LF with **Mass Drug Adminisstration (MDA) of DEC + albendazole or ivermectin+ albendazole covering at least 65% of the at-risk population for at least 5 years**
- **A key challenge for the elimination of LF is the expansion of geographic coverage of MDA programmes**
- Prior studies have not considered long terms health benefits, costs, and cost-effectiveness associated with scaling-up geographic coverage

Example: Impacts of strategies to control and eliminate Neglected Tropical Diseases

Lymphatic Filariasis

LF prevalent in poor populations in several countries (2.77 million DALYs)



Data Source: World Health Organization
Map Production: Control of Neglected Tropical Diseases (NTD)
World Health Organization

World Health Organization

Scenarios compared for elimination and eradication of Lymphatic Filariasis

Key features of the proposed scenarios for elimination and eradication of LF

	Elimination (comparator)	Eradication I	Eradication II	Eradication III
Intervention	MDA	MDA	MDA	MDA
Coverage rate	85%	85%	85%	85%
Countries considered	All LF endemic countries that have previously conducted MDA[v]	All LF endemic countries[v], including all countries co-endemic with *L. loa*	All LF endemic countries[v], including all countries co-endemic with *L. loa*	All LF endemic countries[v], including all countries co-endemic with *L. loa*
Rate of scale-up	Countries with previous MDA continue at same rate as historically	Countries with previous MDA continue at same historical rate, countries without previous progress begin at an 'average' rate of MDA scale-up (schedule II)	Schedule I: All countries add 20% of their at-risk populations to the MDA schedule annually	All countries treat 100% of their at-risk populations annually

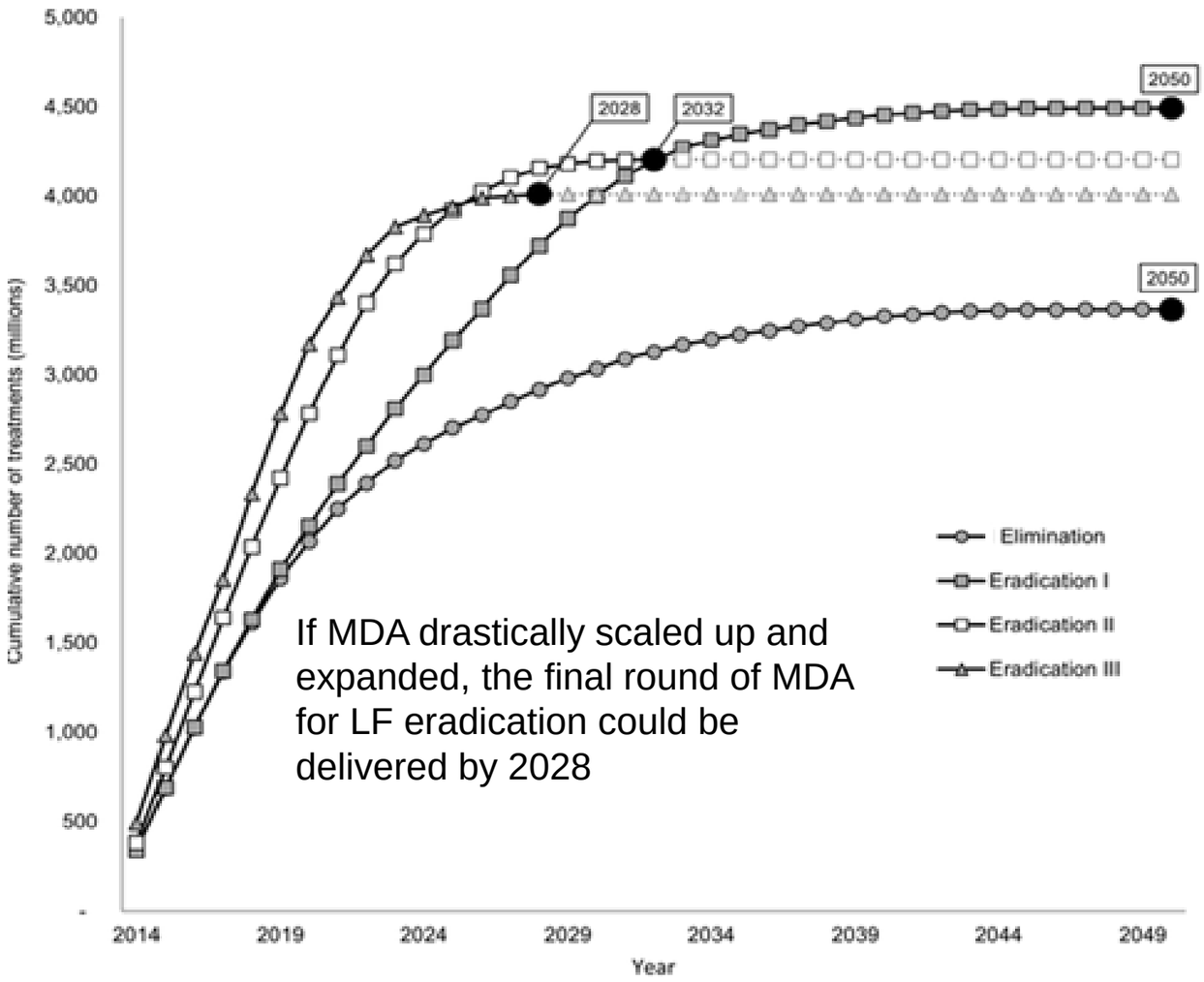
[v]Assuming country requires MDA

doi:10.1371/journal.pntd.0004147.t001

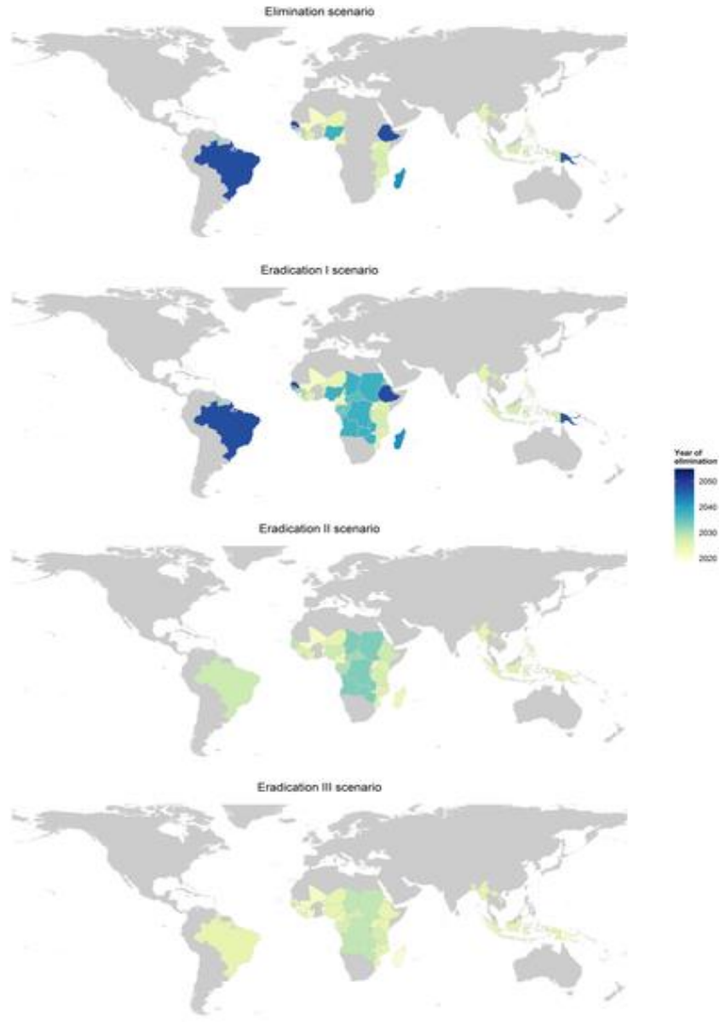
Kastner RJ, Tediosi F et al (2015) What Is Needed to Eradicate Lymphatic Filariasis? A Model-Based Assessment on the Impact of Scaling Up Mass Drug Administration Programs. PLoS Negl Trop Dis 9(10)

Impacts of LF elimination and eradication strategies

Cumulative number of treatments by year



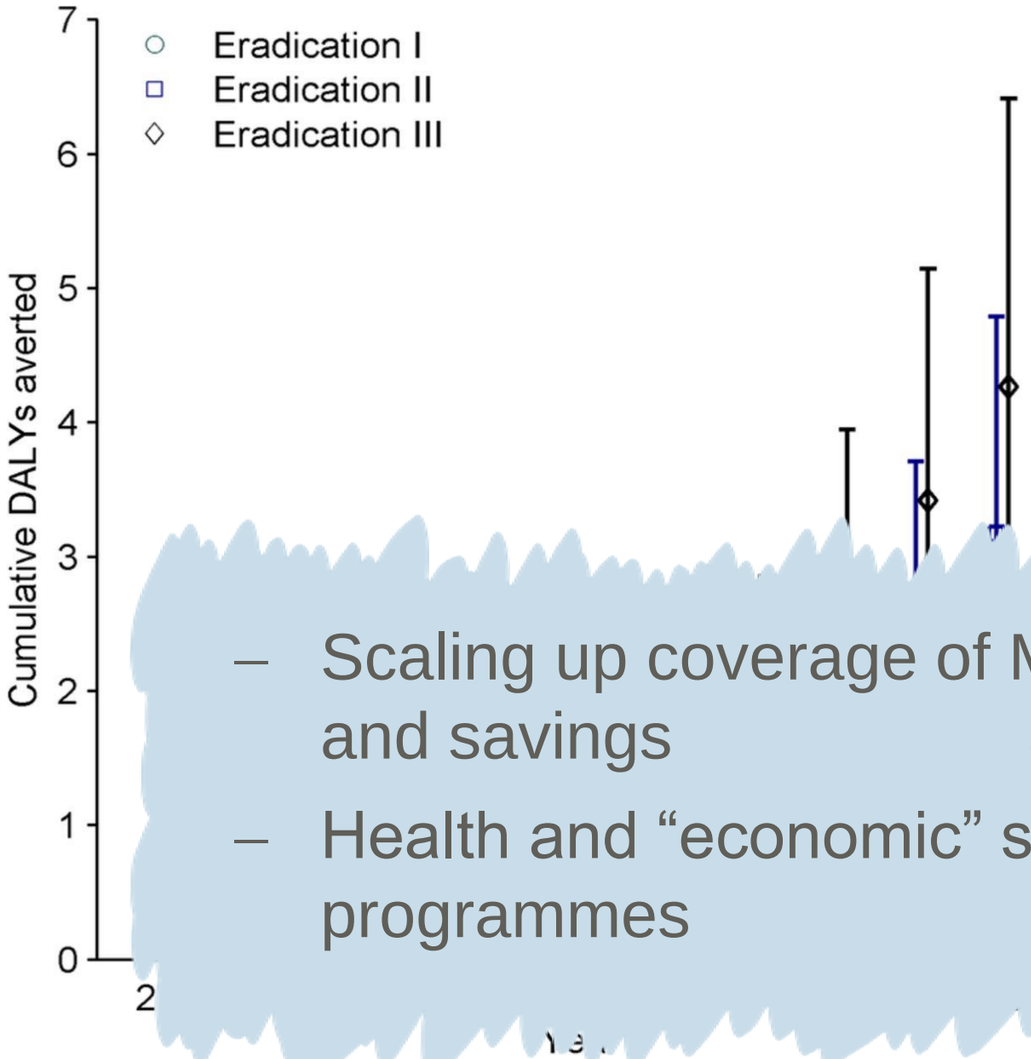
Maps of the final year of MDA per country



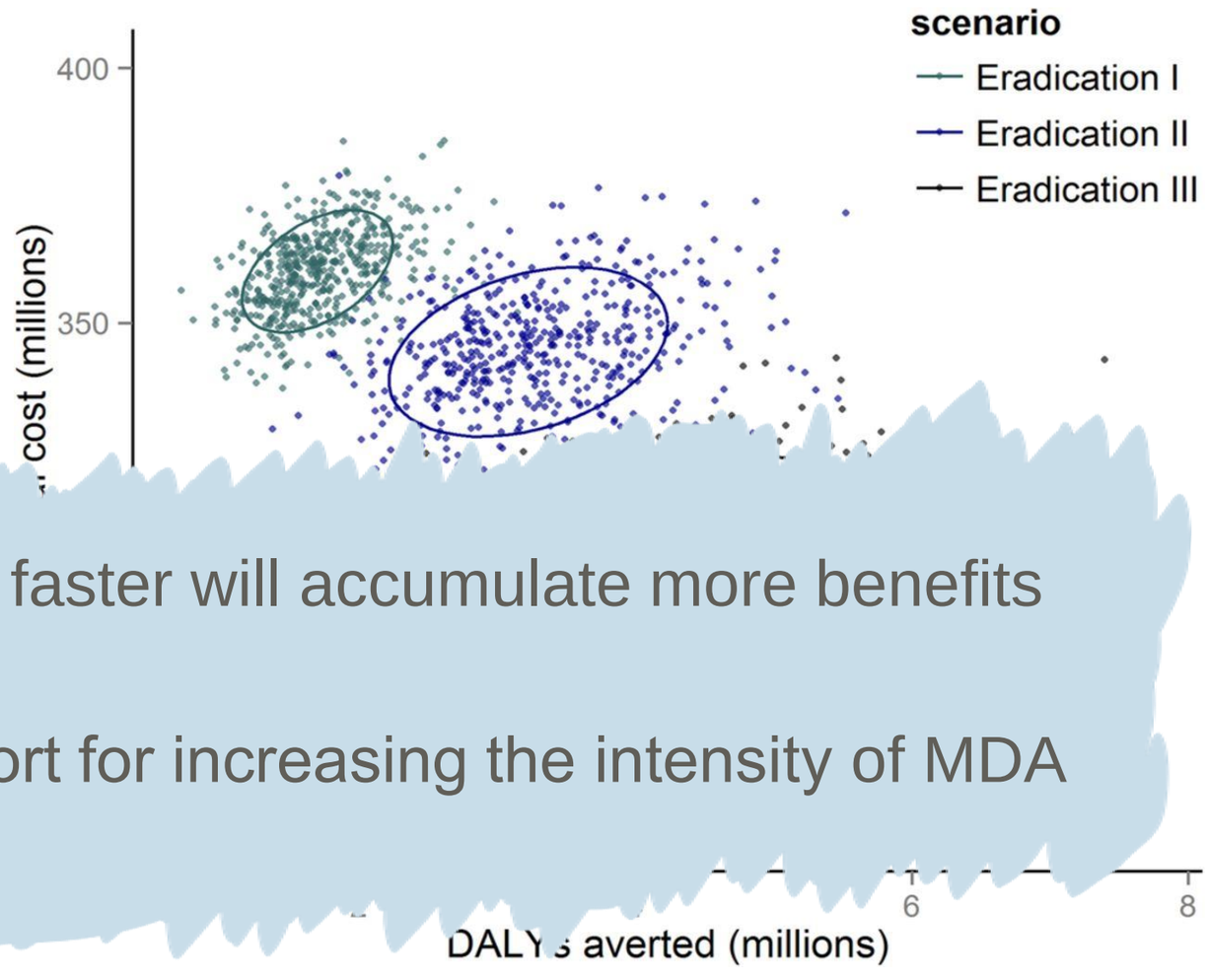
Kastner RJ, Tediosi F et al (2015) What Is Needed to Eradicate Lymphatic Filariasis? A Model-Based Assessment on the Impact of Scaling Up Mass Drug Administration Programs. PLoS Negl Trop Dis 9(10)

Impacts of LF elimination and eradication strategies

Cumulative N of DALYs averted



Incremental cost-effectiveness plane and 95% CI ellipses



- Scaling up coverage of MDA faster will accumulate more benefits and savings
- Health and “economic” support for increasing the intensity of MDA programmes

Stone CM, Tediosi F et al. *Modelling the health impact and cost-effectiveness of lymphatic filariasis eradication under varying levels of mass drug administration scale-up and geographic coverage.* BMJ Global Health 2016;1

Challenge 2: Shift in the disease burden towards non communicable diseases

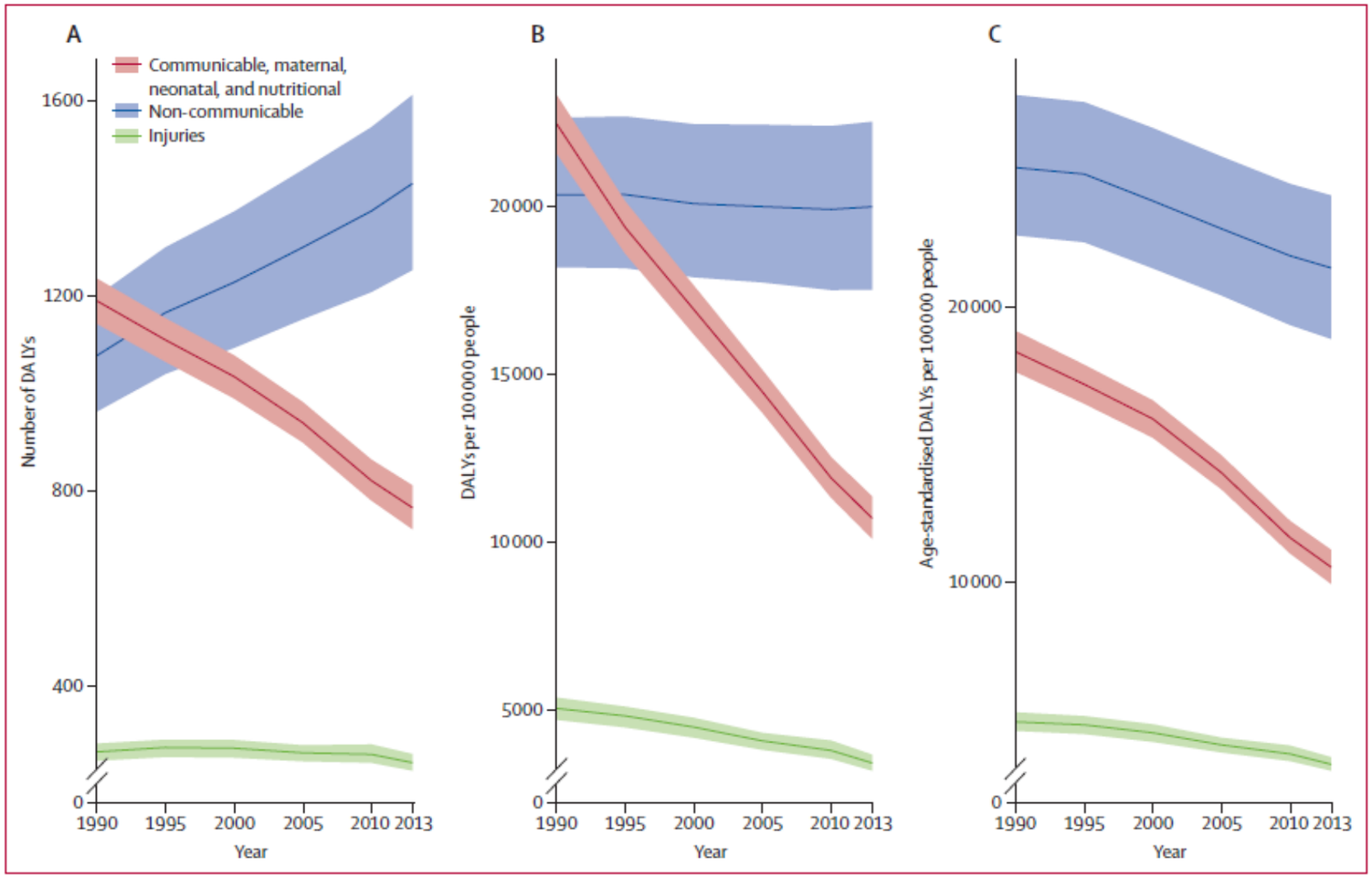


Figure 2: **Total DALYs, crude DALY rates, and age-standardised DALY rates from 1990 to 2013**
Changes in global DALYs caused by communicable, maternal, neonatal, and nutritional disorders, non- communicable diseases, and injuries shown in terms of numbers of DALYs (A), DALY rates per 100 000 people (B), and age-standardised DALY rates per 100 000 people (C). The difference in trends between A and B is caused by population growth and the difference between B and C because of changes in the percentage distribution of the population by age. Shaded areas show 95% uncertainty intervals. DALY=disability-adjusted life-years.

Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990-2013: quantifying the epidemiological transition. Lancet. 2015 Aug 27.

Challenge 2: Shift in the disease burden towards non communicable diseases

Example: Ghana burden of disease profile

http://www.healthdata.org/ghana

Ghana.pptx

Challenge 2: Shift in the disease burden towards non communicable diseases

- High social burden – prolonged disability, less resources within families, reduced productivity

- More complex ways to deliver services – e.g. coordination of care, integration of different levels of care, integration of health and social care

- The "***medical-industrial complex"*** response to NCDs is expensive

NCDs WHO Global Health Observatory

- **Policy: Existence of operational policy/strategy/action plan for cardiovascular diseases**

http://gamapserver.who.int/gho/interactive_charts/ncd/health_systems/policy/atlas.html

- **Surveillance: Existence of an NCD surveillance and monitoring system in place to enable reporting against the nine global NCD targets**

http://gamapserver.who.int/gho/interactive_charts/ncd/health_systems/surveillance/atlas.html

Medical technologies is a driver of health expenditure

Innovation in health care does not necessarily lead to increase in productivity as in other sectors

Table 3 Contributions of selected factors to growth in health care spending

	Di Matteo[15]	Jones[16]	Pricewaterhouse Coopers[7]	Smith et al[19]	Peden and Freeland[17]	Cutler[9]	Newhouse[10]
Life expectancy/aging	~9%	*	15%**	2%	6%–7%	2%	2%
Administrative costs	*	*	15%***	3%–10%	*	13%	*
Changes in financing	*	*	*	10%	4%–5%	10%	10%
Personal income growth	9%–20%	*	*	11%–18%	14%–18%	5%	<23%
Health care prices	*	*	18%	11%–22%	*	19%	*
Technology	~65%	50%–75%	25%	38%–62%	70%–75%	49%	>65%

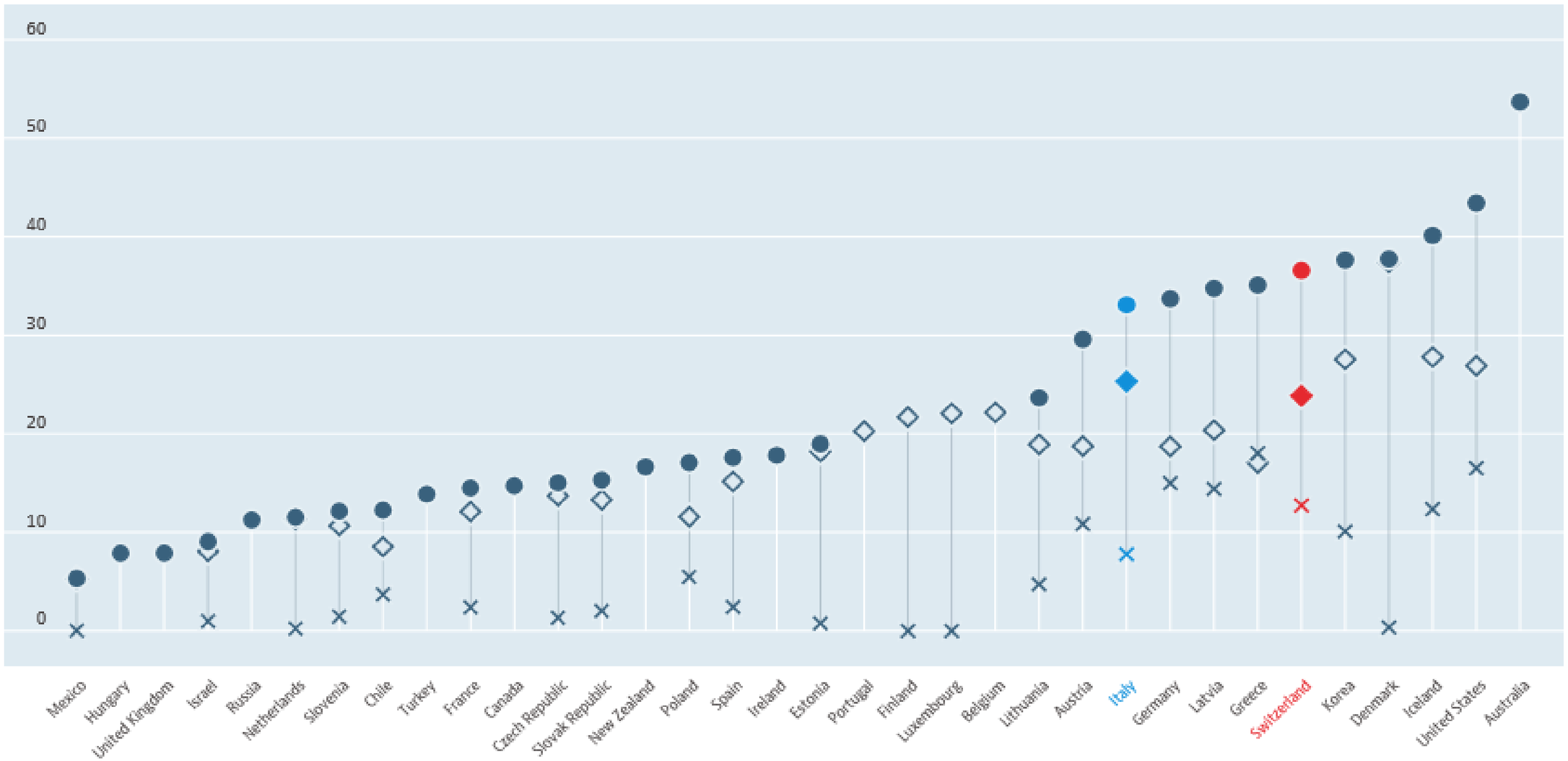
Notes: *Not estimated; **included aging, but also "front page treatments" (ie, media coverage drives demand for expensive treatment), increased preventive and diagnostic activity, and consumers moving away from less expensive managed care products; ***included government mandates (including new mandated benefits) and federal and state regulatory requirements.

Key to sustainability: «governing» use of medical technologies to improve population health

Physical resources for health in OECD countries

Computed tomography (CT) scanners - / In hospitals / In ambulatory care providers

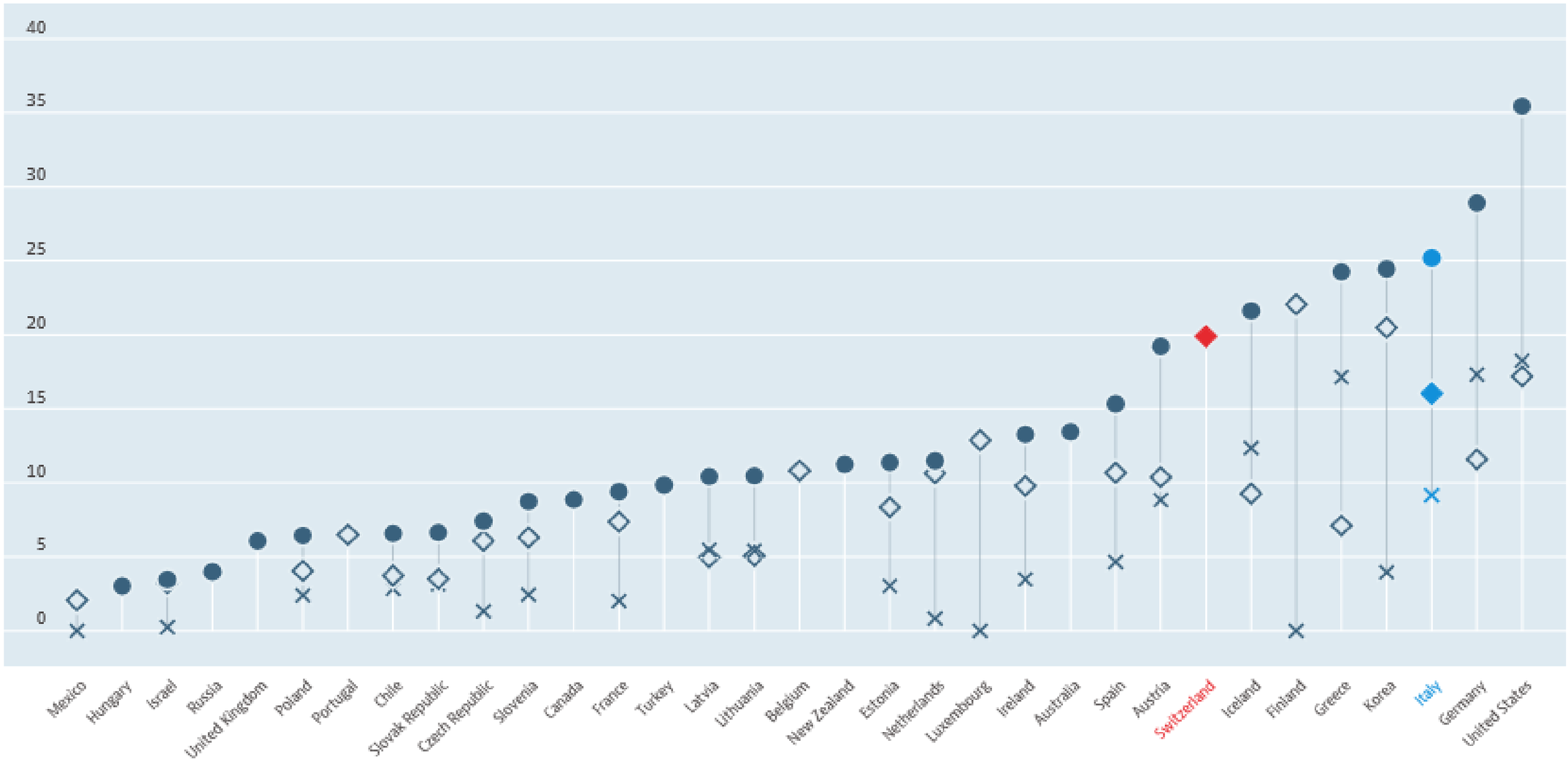
Per 1,000,000 inhabitants, 2013



Source: OECD Health care resources

Physical resources for health in OECD countries

Magnetic resonance imaging (MRI) units. Total / In hospitals / In ambulatory care providers, Per 1 000 000 inhabitants, 2013



Source: OECD Health care resources

Example: Differences in All-Cause Mortality and Length of Stay for Patients with Hip Fracture

- Assessment of outcomes, use of services and costs for **Hip fracture** in 7 countries: Finland, Hungary, Italy, the Netherlands, Norway, Scotland, and Sweden

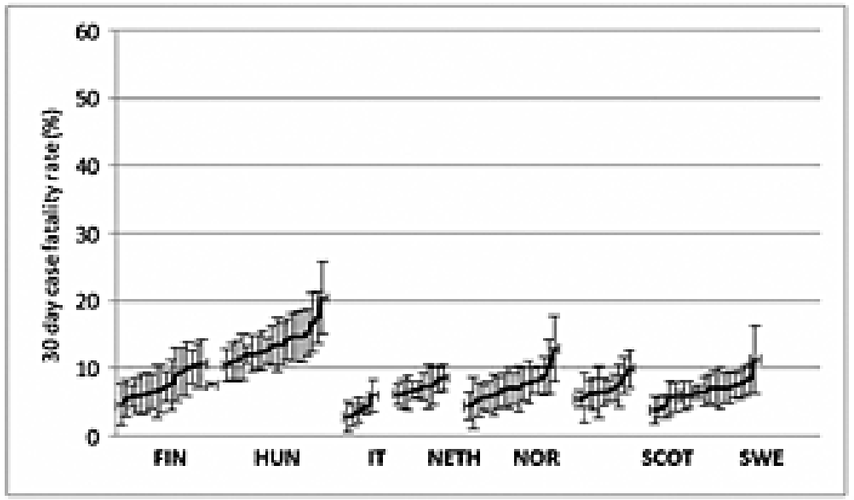
- Administrative datasets (registers) of use of services and medicines linked at indivdual level with mortality registers

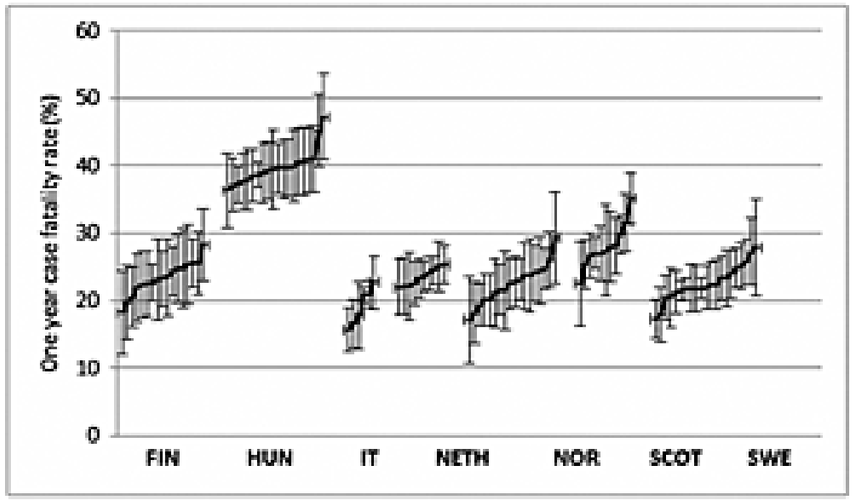
- **All-Cause Mortality and Length of Stay for Patients with Hip Fracture and association of them with selected country and regional level factors**

Medin E, Tediosi F et al. 2015. European regional differences in all-cause mortality and length of stay for hip fracture patients. Health Economics 24 (Suppl. 1): 53-64.

Example: European Regional Differences in All-Cause Mortality and Length of Stay for Patients with Hip Fracture

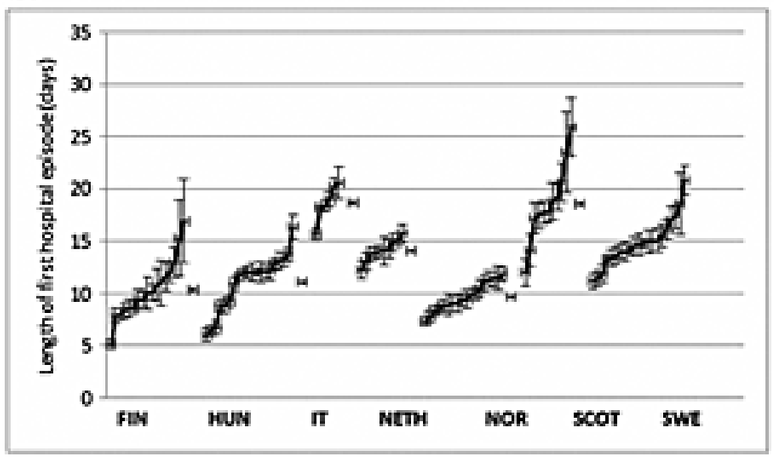
a.

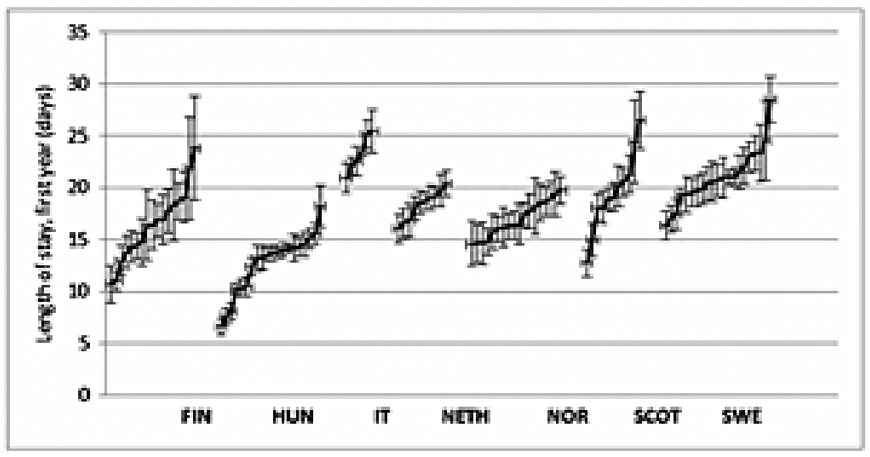




a: National and regional variation in 30-day and one-year mortality rate (%), age and sex-standardised **mortality rates**

b.





b: National and regional variation **in length of first hospital episode and during one-year** (days), age-and sex-standardised rates

Medin E, Tediosi F et al. 2015. European regional differences in all-cause mortality and length of stay for hip fracture patients. Health Economics 24 (Suppl. 1): 53-64.

Example: European Regional Differences in All-Cause Mortality and Length of Stay for Patients with Hip Fracture

- Remarkable variations in mortality and LoS, across countries and within countries
- Regression models showed variation in mortality & LoS weakly associated only with some **country-level factors -e.g. clinical guidelines**
- **Variation probably due to broader health systems and societal factors - e.g. role of homecare, how societies deal with care of elderly people, etc.**

The “medical-industrial complex” response to NCDs

Seeking sickness in contemporary health systems

- New diagnostic technologies continuously developed
- Culture that more diagnosis=more treatment=better health

*“In the past, people sought health care because they were sick. **Now the medical-industrial complex seeks patients.** It encourages those with minor symptoms to be evaluated and urges those who feel well to get “checked” — just to make sure nothing is wrong” (H. Gilbert Welch, 2009)*

Paradigm of Early Diagnosis

The “medical-industrial complex” response to NCDs

Opportunities to prevent symptomatic disease in some people, at the cost of maximizing the diagnosis in others who are not destined ever to develop symptoms or die

Overdiagnosis

Occurs when people without symptoms are diagnosed with a disease that ultimately will not cause them to experience symptoms or early death (Welch G, et al, 2011.)

Pathways to overdiagnosis

Expanding disease definitions – new categories, lowering thresholds, changing diagnostic methods

Examples of changes disease definitions

Condition	Disease prevalence		New cases	Increase (%)
	Old definition	New definition		
Change in threshold				
Diabetes				
Fasting sugar 140 to 126	11'697'000	13'378'000	1'681'000	**14%**
Hypertesion				
Systolic BP 160 to 140	38'690'000	52'180'000	13'490'000	**35%**
Diastolic BP 100 to 90				
Hyperlipidemia				
Total cholesterol 240 to 200	49'480'000	92'127'000	42'647'000	**86%**
Osteoporosis				
T score -2.5 to -2.0	8'010'000	14'791'000	6'781'000	**85%**

H. Gilbert Welch et al (2012). *Overdiagnosed: Making People Sick in the Pursuit of Health*

Balancing benefits and harms of overdiagnosis

Example: Chance benefit of cholesterol medicines for near normal cholesterol

If 100 patients are diagnosed with near normal cholesterol and treated for a lifetime, how many will be:

Winners: Tratment saved them from first major heart event	**8**
Treated for Naught: Had first major heart events despite treatment	14
Losers: Overdiagnosed – treatment couldn't help them because they were never going to have heart events	78

H. Gilbert Welch et al (2012). *Overdiagnosed: Making People Sick in the Pursuit of Health*

Example of overdiagnosis – Breast cancer

Gøtzsche PC, Jørgensen KJ. **Screening for breast cancer with mammography.** Cochrane Database Syst Jun 4;

THE COCHRANE COLLABORATION®

For every 2000 women (50 years old) invited for mammography screening throughout 10 years

Benefits:

- 1 women will avoid dying of breast cancer

Harms:

- 10 healthy women will be treated unnecessarily
- More than 200 women will experience psychological distress for years because of false positive findings

Pathways to overdiagnosis

Overdiagnosis made incidentally—“incidentalomas”

- In 1000 people with no symptoms who elected to undergo total-body CT screening:
  - **86% had at least one abnormality detected**
  - **The average individual had 2.8 abnormalities**

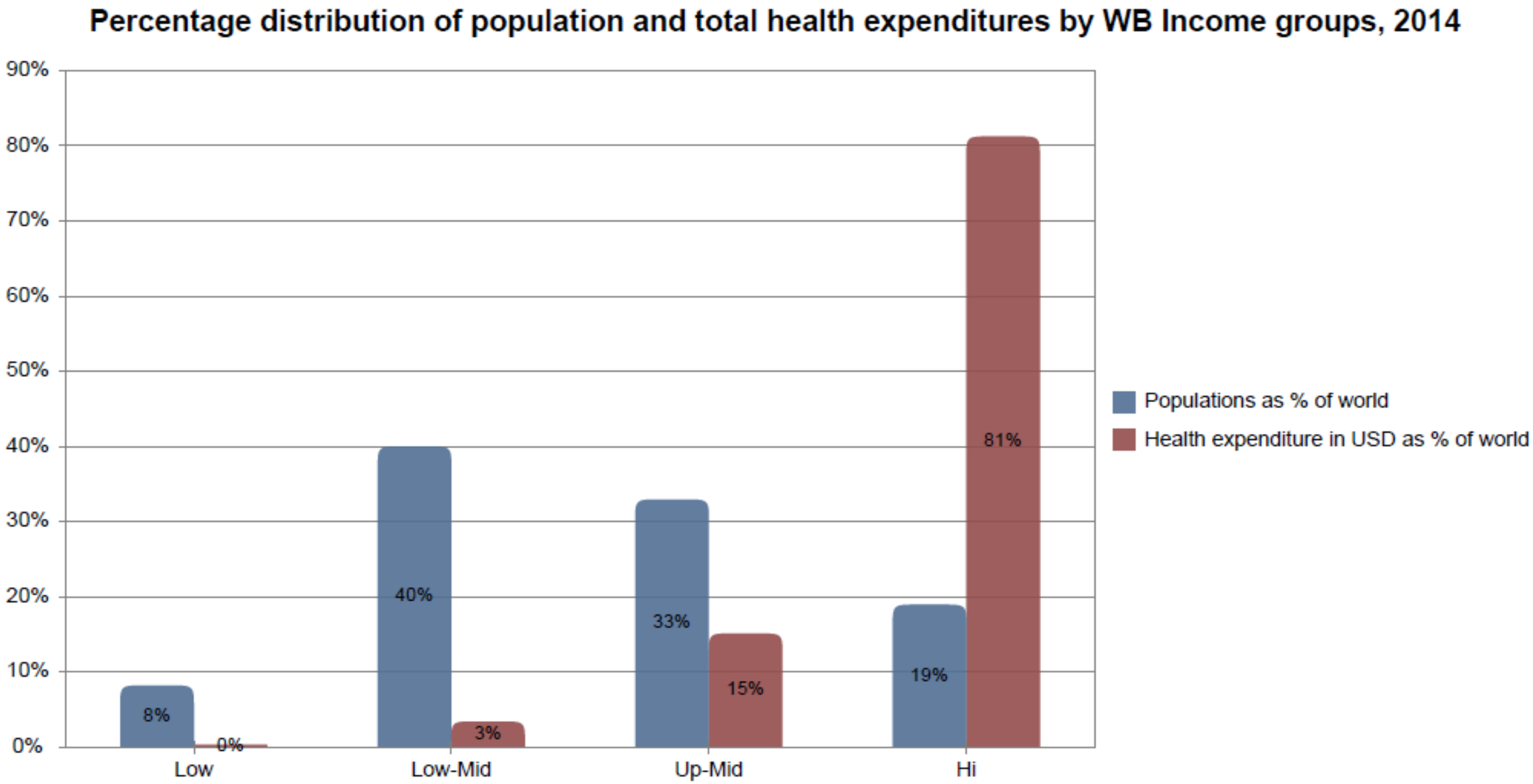
(Frtado CT et al. Radiology 237 (2005):385-94)

Challenge 3: Burden of medical expenditure on households and societies

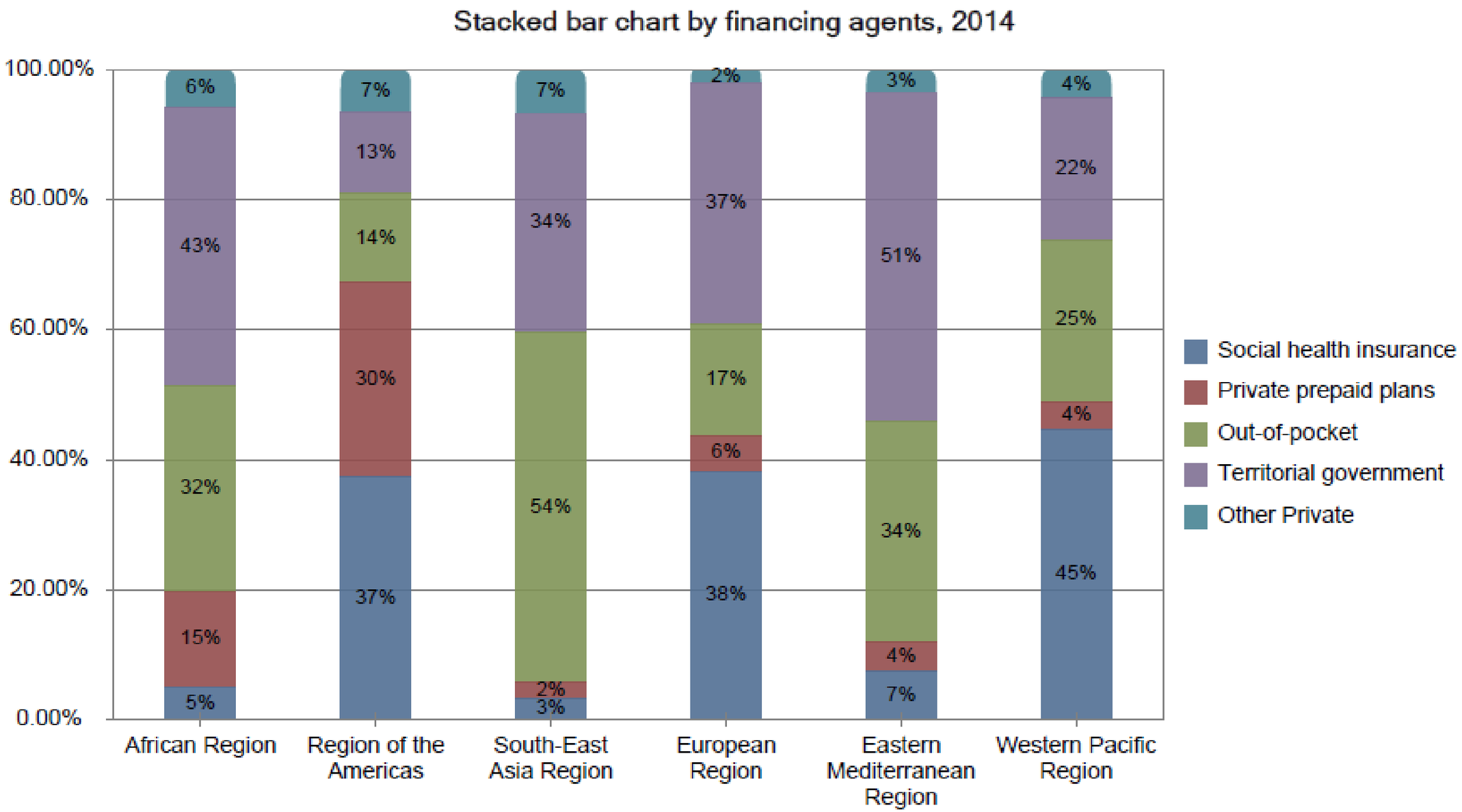
1. **Micro- households level:** Impoverishing effects of medical expenditures:
   - Every year 100 million are pushed into poverty and 150 million people suffer financial catastrophe because of out-of-pocket expenditure on health services - Xu K, Evans DB, et al (2007)
   - **About a quarter of households in low income and middle-income countries borrow money or sell items to pay for health care** - Kruk ME et al (2009)

2. **Macro level:** Global Health Expenditure 10% of global GDP – huge differences across countries unrelated to burden of disease

Burden of medical expenditure on households and societies

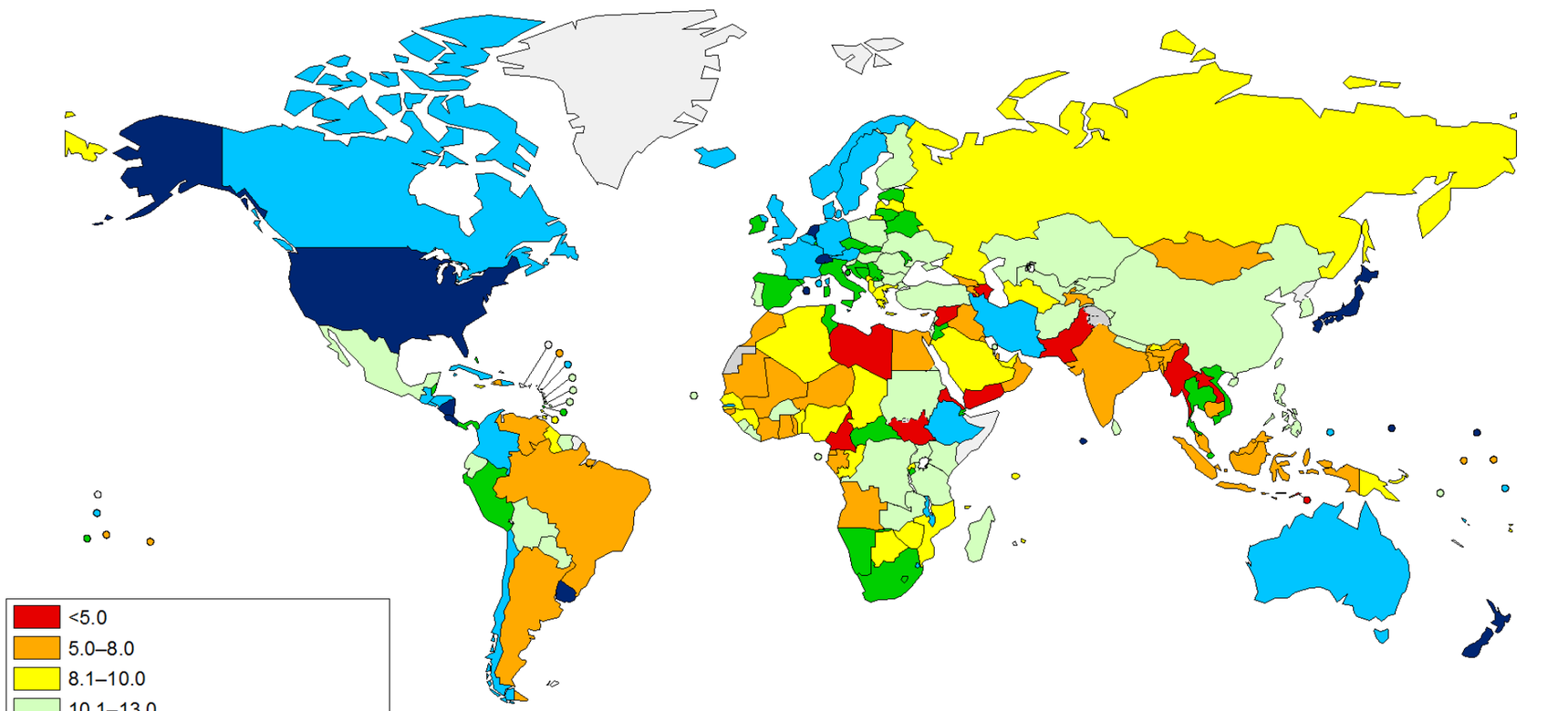


Burden of medical expenditure on households and societies



Burden of medical expenditure on households and societies

General government expenditure on health as a percentage of total government expenditure, 2014 *

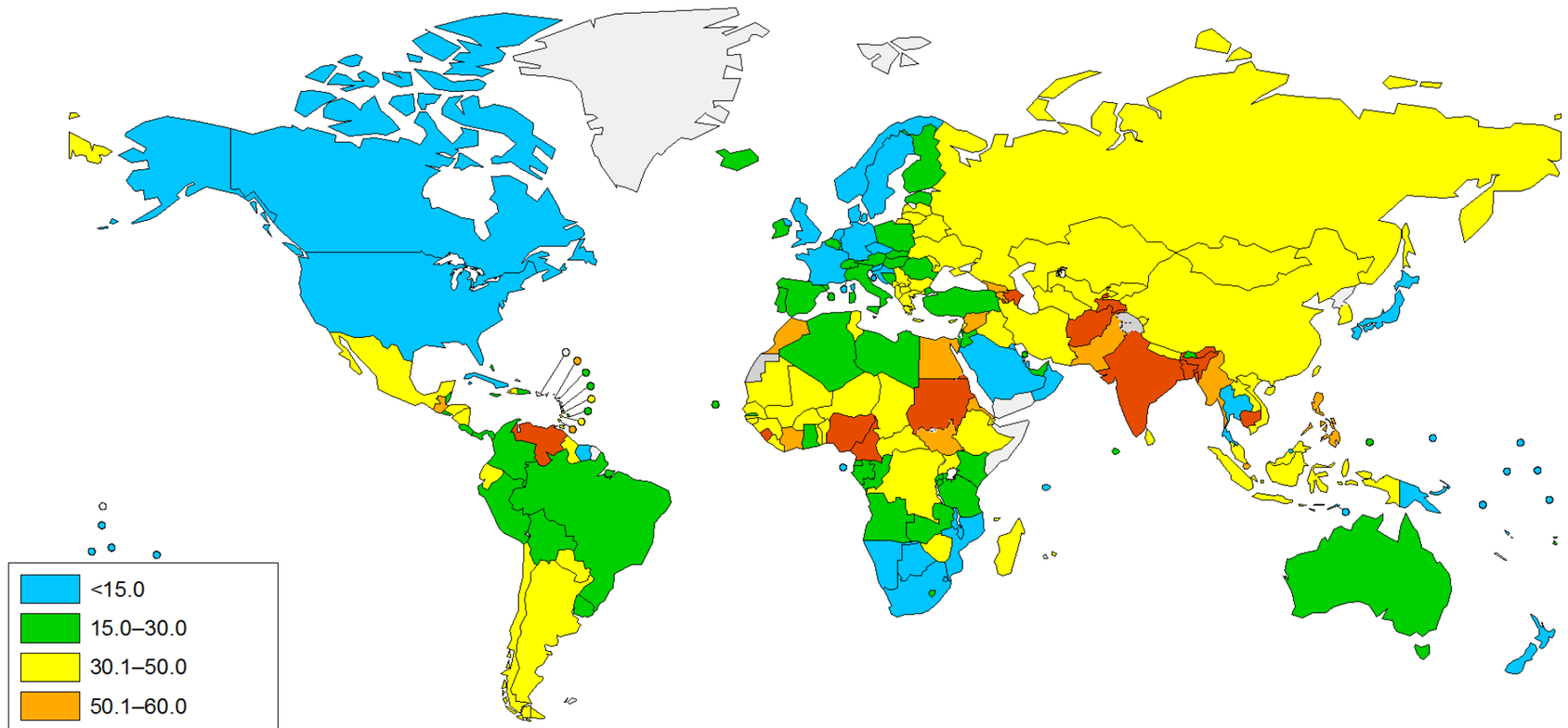


* Based on data updated on 13 February 2017.

Data Source: Global Health Observatory, WHO
Map Production: Information Evidence and Research (IER)
World Health Organization

Burden of medical expenditure on households and societies

Out-of-pocket expenditure on health
as a percentage of total expenditure on health (%), 2014 *



* Based on data updated on 13 February 2017.

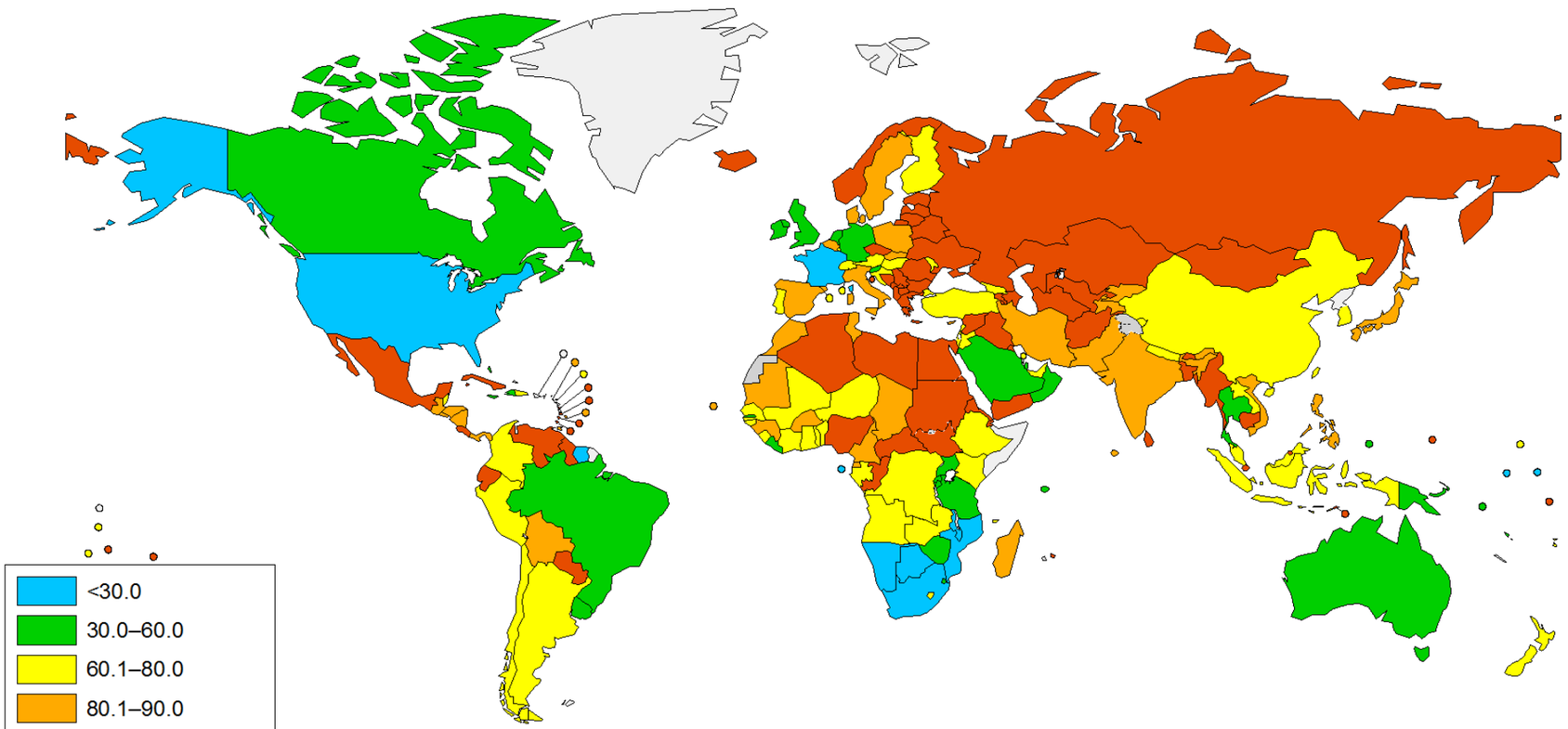
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers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

Data Source: Global Health Observatory, WHO
Map Production: Information Evidence and Research (IER)
World Health Organization

World Health Organization

Burden of medical expenditure on households and societies

Out-of-pocket expenditure on health
as a percentage of private expenditure on health (%), 2014 *



* Based on data updated on 13 February 2017.

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World Health Organization

Burden of medical expenditure on households and societies

Figure 3.5. No health spending by expenditure quintile (Q), median values of 37 countries (headcount ratio, percentage)

Challenge 3: Burden of medical expenditure on households and societies

US Institute of Medicine (2010):

- *"**The growth rate of health care expenditures is unsustainable**, with waste that diverts major resources from necessary care and other priorities ..". **Sources of inefficiencies include:***
  - ***Scientific uncertainty about effectiveness and cost, especially of newer test and treatments***
  - ***Cultural predisposition to believe that more care is better***
- Innovations in health sector do not necessarily lead to increase in productivity as in other sectors – **medical technologies major driver of health expenditure growth**

Sources of data

National Health Accounts
http://apps.who.int/nha/database

Global Health Observatory
http://who.int/gho/database/en/

WHO Global Health Expenditure Database:
http://apps.who.int/nha/database/ViewData/Indicators/en