Global health and malaria: a primer

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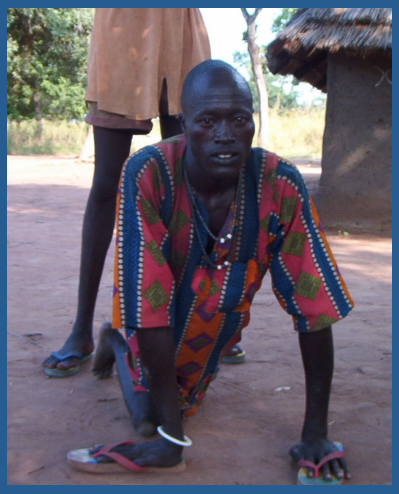
Outline

- What is global health and why does it matter?
- Malaria
  - Malaria 101
  - Overview of current prevention and control efforts
- Questions?

What is global health?

https://davidrebeccamorton.wordpress.com/

What is global health?



http://www.telegraph.co.uk/news/worldnews/ebola/11171614/Thousands-of-children-orphaned-by-Ebola-outbreak.html

From international to global health

We

Them

Credit to Hans Rosling: http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen?language=en

From international to global health

We (Western world)

Them (Third world)

Credit to Hans Rosling: http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen?language=en

From international to global health

We (Western world)

Them (Third world)

"…share a common destiny on an ever shrinking planet."
- Roger Glass, Director, Fogarty International Center, NIH

Credit to Hans Rosling: http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen?language=en

What is global health?

- Health determinants, problems, issues, and concerns that transcend national boundaries and may be best addressed through cooperative action*
- Area for study, research and practice that places a priority on improving health and achieving equity in health for all people worldwide**

*Institute of Medicine, 1998
**Koplan JM et al., *Lancet,* 2009

Health issues and determinants transcend political boundaries

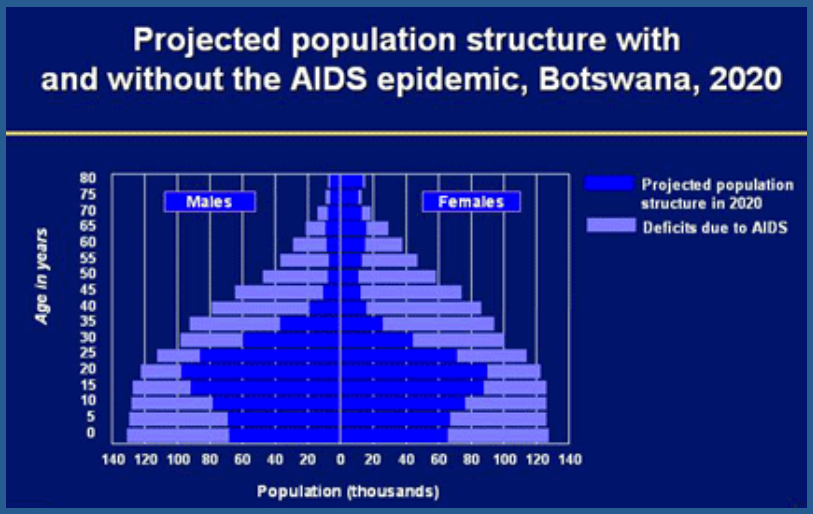
http://q13fox.com/2015/01/29/california-measles-cases-still-increasing-some-unvaccinated-students-told-to-stay-home/

http://www.rt.com/news/chinese-scientists-bird-flu-751/

http://www.csmonitor.com/World/Americas/2012/0904/Obesity-weighing-on-America-Latin-America-that-is

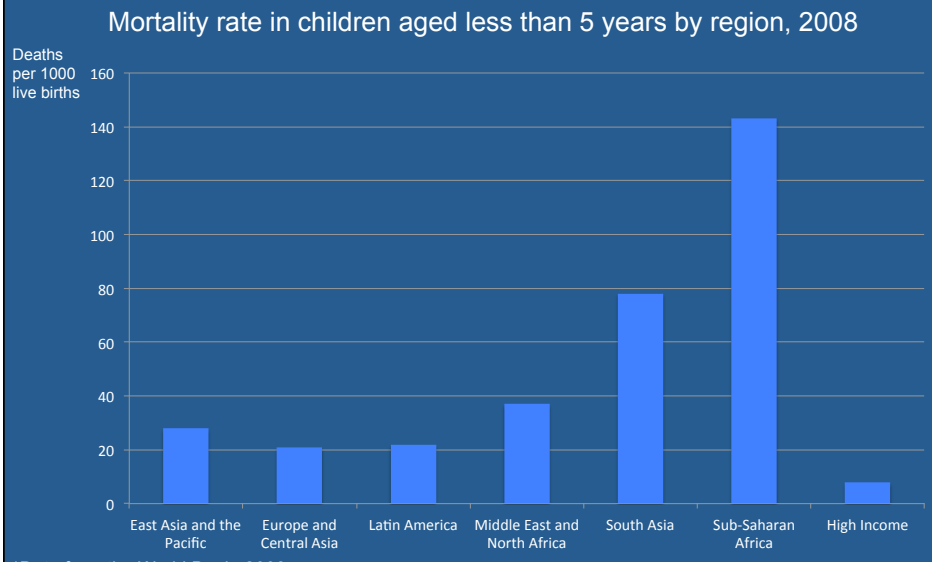
www.epa.gov

Health is associated with political, social, and economic stability



http://www.microbiologybook.org/lecture/Sub-SaharanAfrica29.gif

There is an ethical dimension to health



*Data from the World Bank, 2008

"The idea that some lives matter less is the root of all that's wrong with the world."

—DR. PAUL FARMER
Chief Strategist & Co-founder

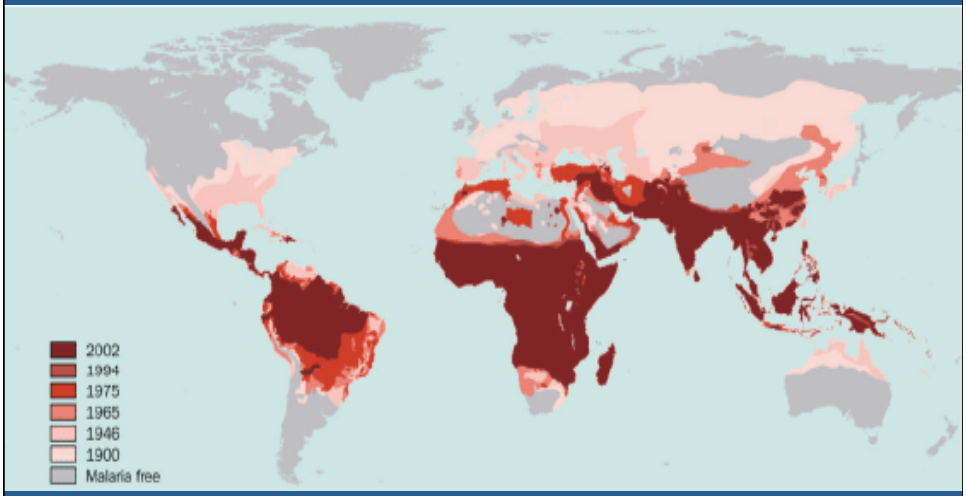
The 10 leading causes of death by country income category, 2011

High income countries (rate*)	Low income countries (rate*)
1. Heart disease (119)	1. Lower resp. tract infections (98)
2. Stroke (69)	2. HIV/AIDS (70)
3. Cancer, lung and associated (51)	3. Diarrheal diseases (69)
4. Dementia (48)	4. Stroke (56)
5. COPD (32)	5. Ischemic heart disease (47)
6. Lower resp. tract infections (32)	6. Prematurity (43)
7. Cancer, colon and associated (27)	7. Malaria (38)
8. Diabetes mellitus (21)	8. Tuberculosis (32)
9. Hypertensive heart disease (20)	9. Malnutrition (32)
10. Cancer, breast (16)	10. Birth complications (30)

* Deaths per 100,000 population

http://www.who.int/mediacentre/factsheets/fs310/en/index1.html

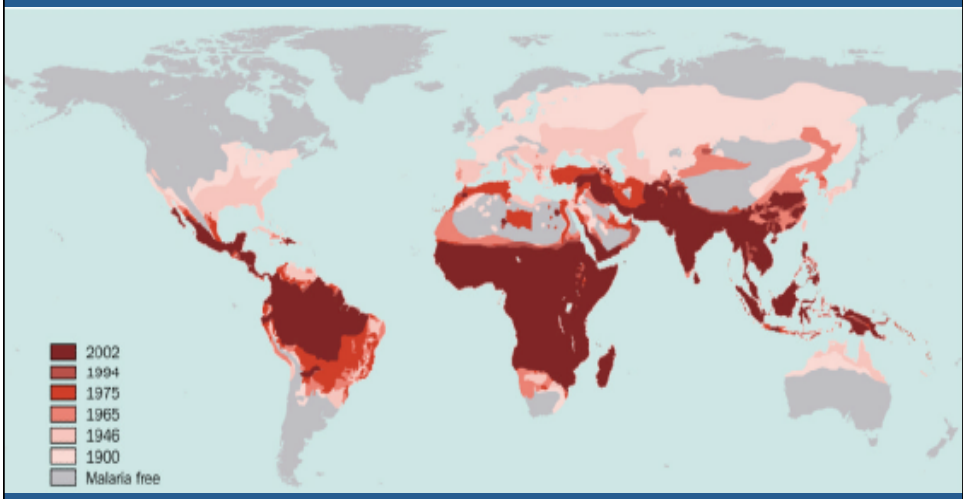
Malaria is a common illness



Hay SI, Lancet Infectious Diseases, 2004

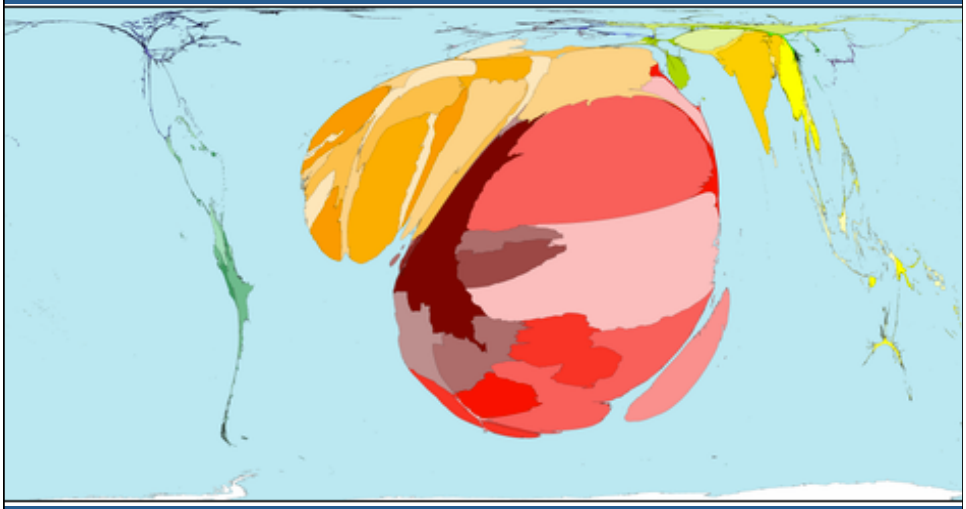
Malaria is a common illness

150 million acute illnesses annually
600 thousand deaths annually



Hay SI, Lancet Infectious Diseases, 2004

Equating territory size to proportion of worldwide malaria deaths that occur

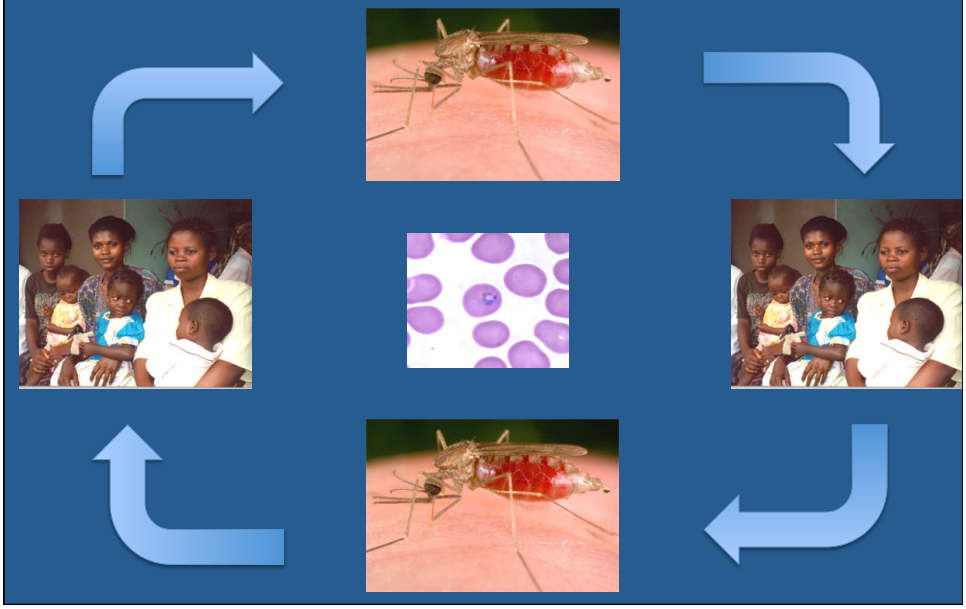


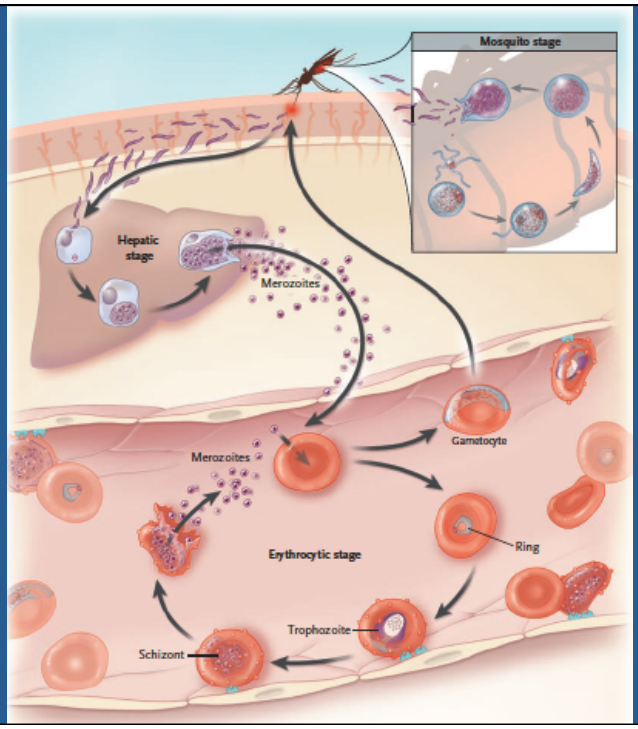
http://www.worldmapper.org/display.php?selected=230

Applying the impact of malaria in sub-Saharan Africa to the US

- Endemic in most parts of the U.S.
- Approximately 50 million cases/year
  - Nationally notifiable diseases
    - Chlamydia (1.4 million cases/year)
    - HIV (35,000 cases/year)
    - West Nile Virus (700 cases/year)
- Approximately 200,000 deaths/year
  - Current US mortality for children <5 yrs: ~5,000 deaths

Malaria





Rosenthal, NEJM, 2008

Insecticide treated bednets

- Intend for users to sleep under
  - 1 net for every 2 persons
- Treated with insecticide
- Distribution
  - Mass campaigns
  - Continuous (e.g., health clinics)
- Durability
  - Last 18 months – 3 years

Indoor residual spraying

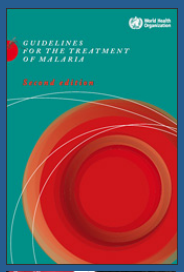
- Spray interior walls of homes
- Individual and community benefit
- Protection lasts 3-9 months
- Costly: training and environmental monitoring

Intermittent preventive treatment in pregnancy

- Chemoprophylaxis against infection

Case management

- Diagnosis
  - Rapid diagnostic tests
  - Parasitological confirmation for ALL suspected cases of malaria.
- Good antimalarial treatments
  - artemisinin-based combination therapies (ACTs)



Vaccine

- A number of candidate vaccines being developed
- RTS,S (Mosquirix) most advanced phase of development
  - Phase 3 safety and efficacy trial in 7 countries
    - ~30% efficacy
  - European Medical Association given a positive scientific opinion
  - Next step is further review by WHO

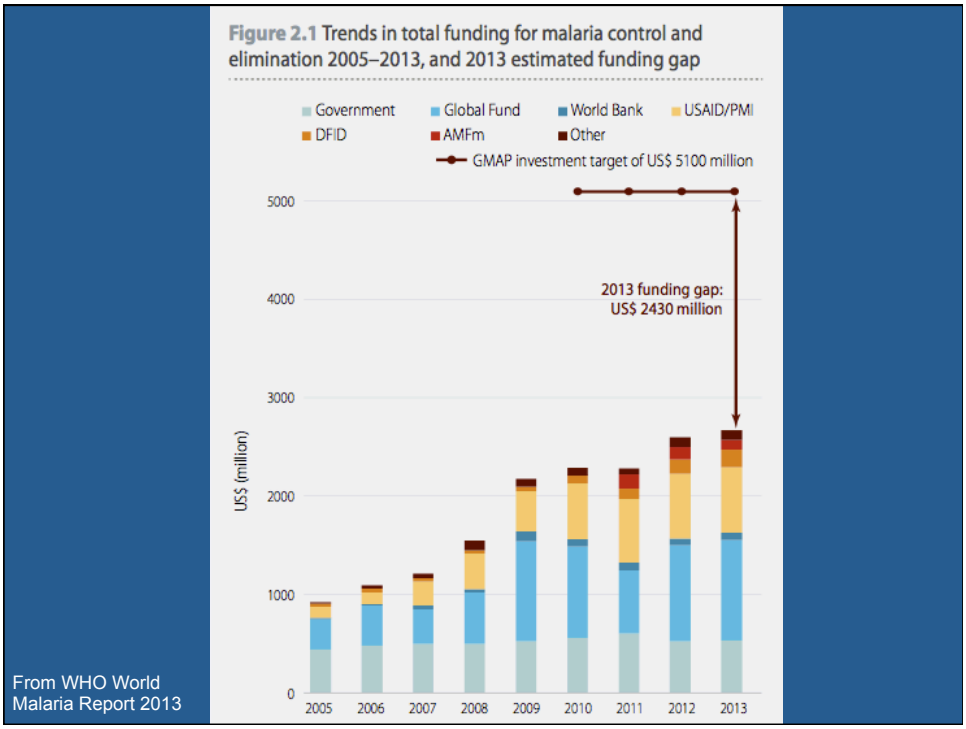
http://www.newvision.co.ug/news/18526-first-malaria-vaccine-works-in-major-trial.html

Malaria prevention and control today

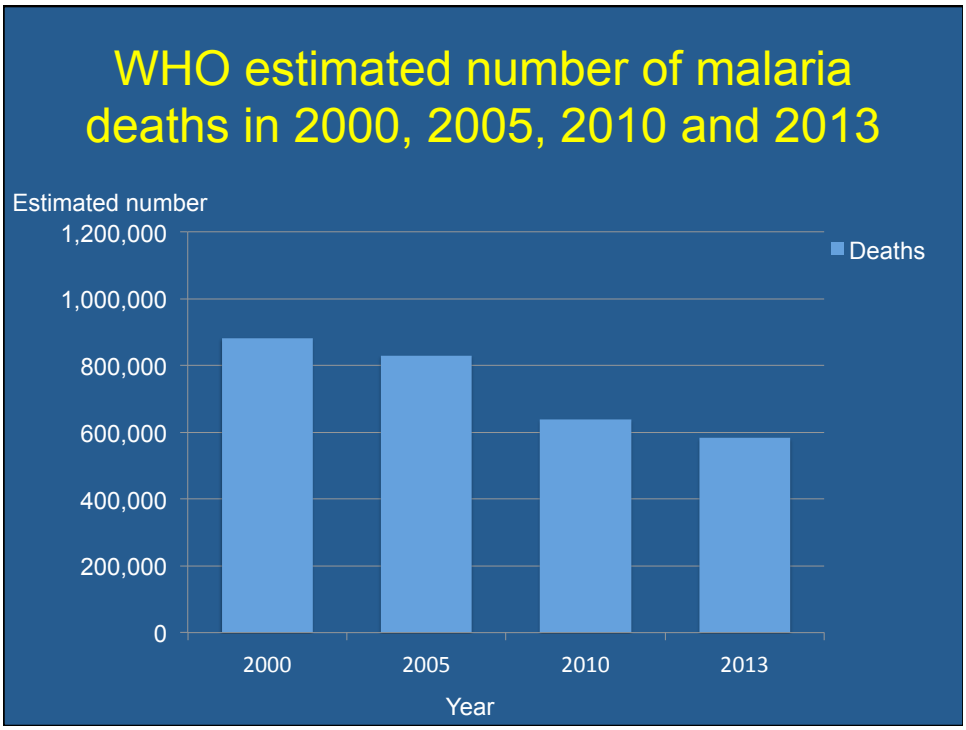
- Failed elimination and eradication efforts of the 1950's-1960's
  - shift focus to control
- Prevention and control efforts known but not well funded or employed at the turn of 20th century
- Along with HIV, and other infectious diseases, renewed focus on malaria
  - Global Fund to Fight HIV, TB and Malaria
  - US President's Malaria Initiative

US President's Malaria Initiative

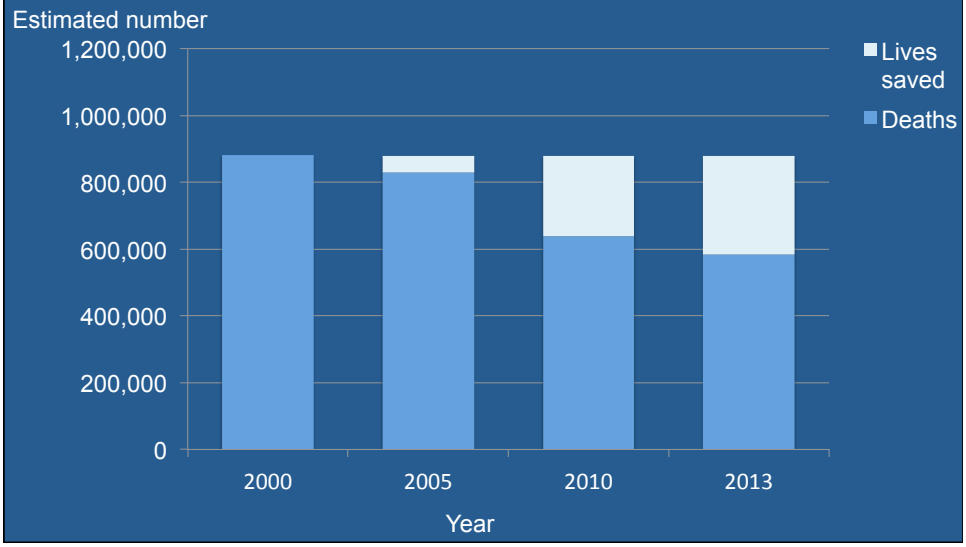
- President George W. Bush (2005)
- Goal to reduce malaria mortality by 50%
  - Target the children aged <5 years and pregnant women
- Partnership with host government key component
  - FY 2006: 3 countries, $ 30 million
  - FY 2015: 22 countries, $608 million



From WHO World Malaria Report 2013



WHO estimated number of malaria deaths in 2000, 2005, 2010 and 2013



Above all nations is humanity

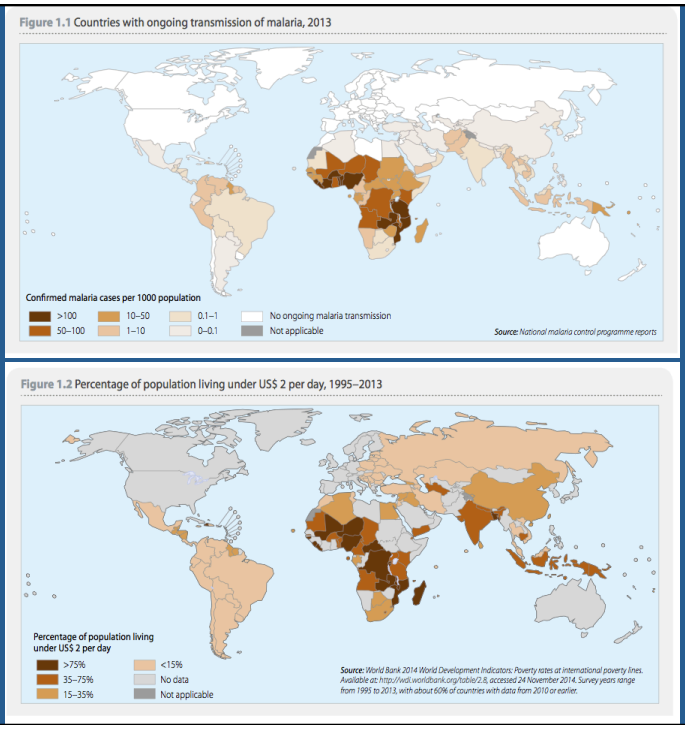
- Goldwin Smith

www.pmi.gov; Source: Maggie Hallahan

Additional resources

- Paul Farmer, Jim Kim: Reimagining Global Health
- Hans Rosling

  http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen?language=en
- www.cdc.gov/malaria
- www.pmi.gov
- http://www.usnews.com/news/articles/2015/02/25/steph-curry-experts-come-to-washington-for-malaria-fight
- Malaria:

https://www.youtube.com/watch?v=LR3t4gWp9-E

World Malaria Report, 2014