

Essentials of Global Health:

Global Tuberculosis Epidemiology

Prof. Hsien-Ho Lin

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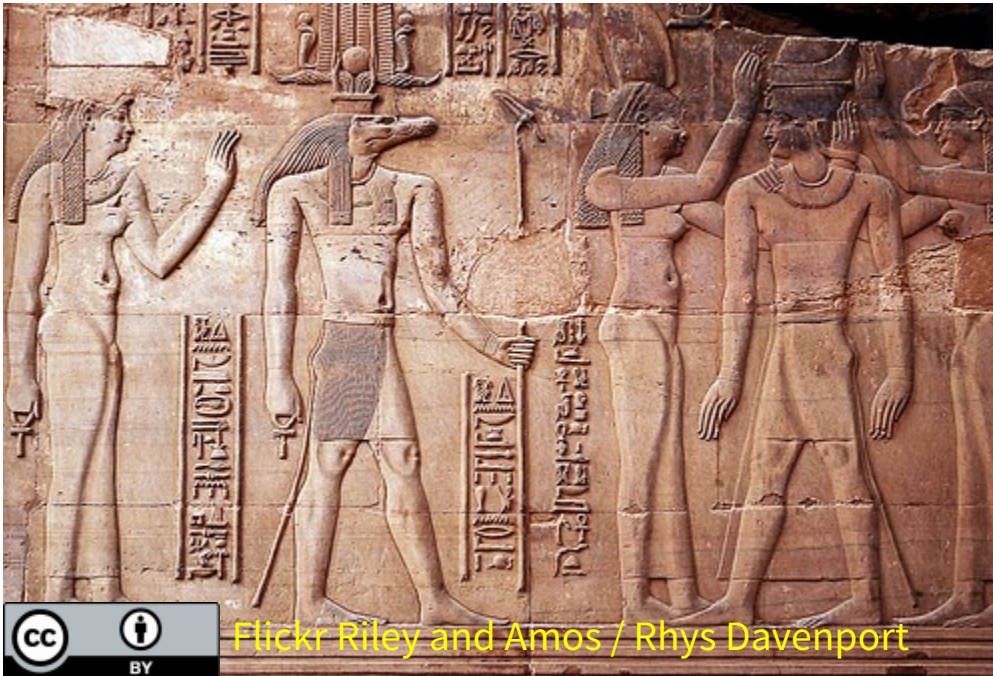
Video

<RX FOR SURVIVAL - A GLOBAL HEALTH CHALLENGE>

SCENE <Rise of the superbugs>

--Tuberculosis Stalks Peru (12:35)--
15:25~28:00 of DVD

Tuberculosis – an ancient disease



Flickr Riley and Amos / Rhys Davenport



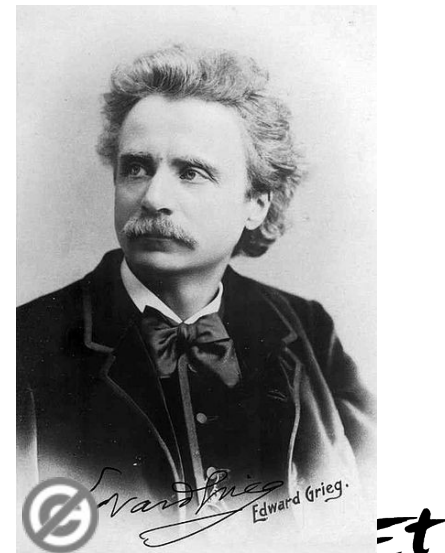
Trivia

Famous musician who contracted TB:

1. Frederic Chopin
2. Edvard Grieg
3. Richard Wagner

Trivia

- Death certificate of Chopin: TB
- Grieg contracted TB while studying in the conservatory and was left with only one functioning lung



Trivia

Famous Chinese writer who contracted TB:

1. Hu Shih (胡適)
2. Lu Xun (魯迅)
3. Liang Qichao (梁啟超)



Trend of TB mortality, England and Wales

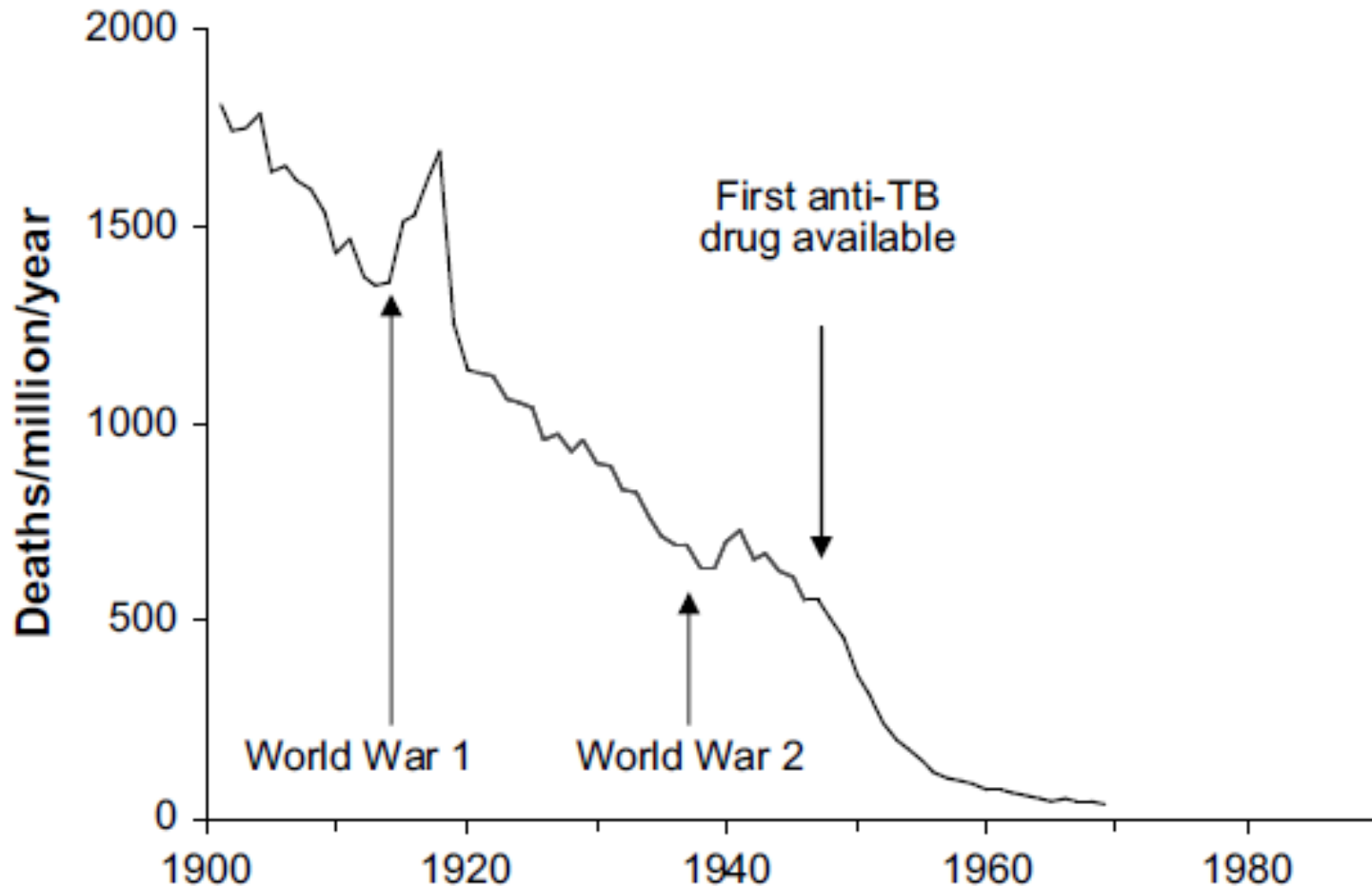


Fig. 2. Decline in TB mortality in England and Wales, and its association in time with the two World Wars, and the introduction of chemotherapy against TB.



Lönnroth et al

Global burden of TB, 2009

- 9.4 million incident cases in a year
- 14 million prevalent cases
- 1.7 million deaths
 - 1.3 million among HIV (-)
 - 0.4 million among HIV (+)
- About 1/3 of the world's population latently infected

Terminology

- **Incidence:** a measure of frequency of disease onset (i.e., new cases) over a period of time
- **Prevalence:** a measure of disease status at a snapshot



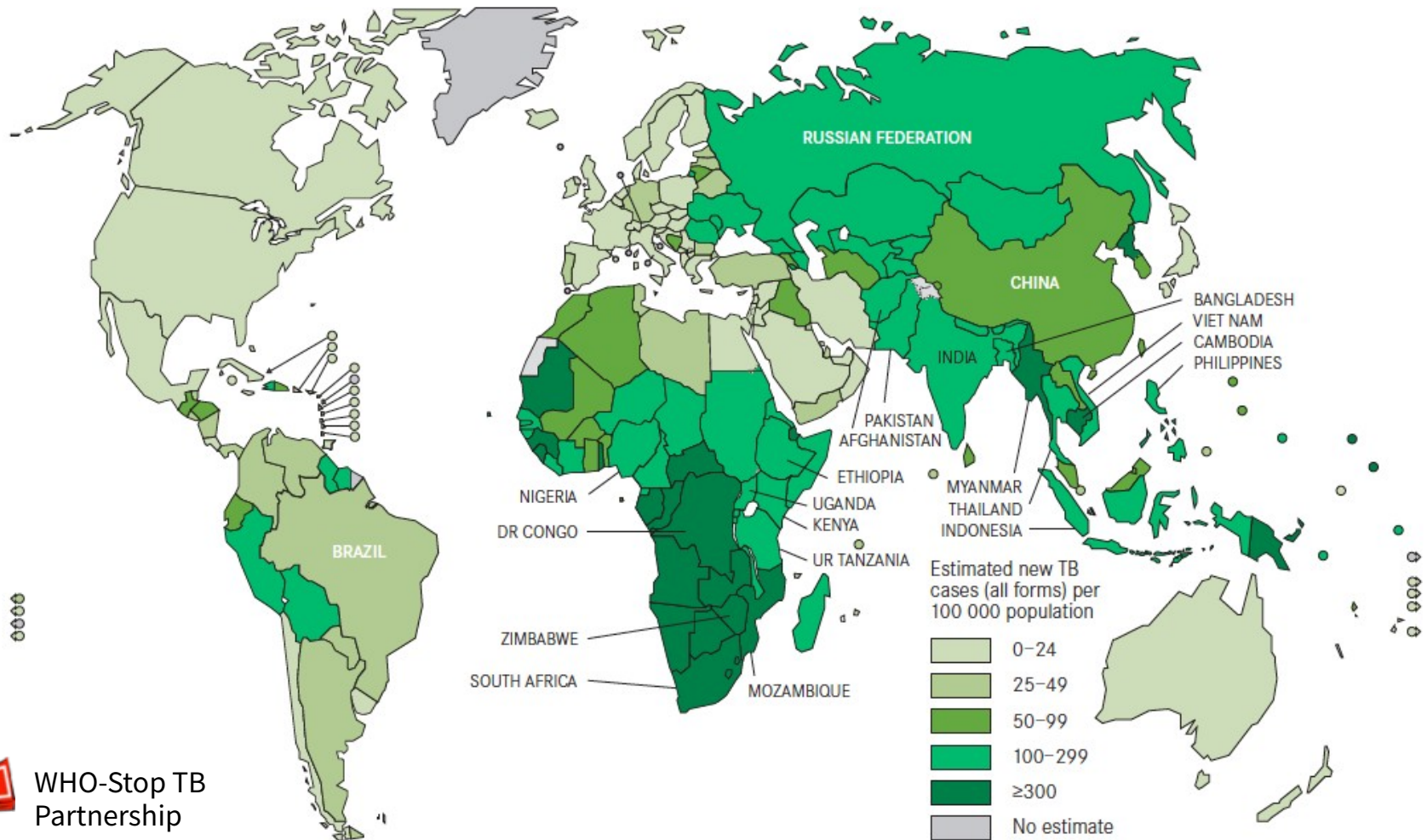
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Global distribution of TB incidence,

2010

FIGURE 2.3

Estimated TB incidence rates, 2010



WHO-Stop TB
Partnership

What is NOT the route of TB transmission?

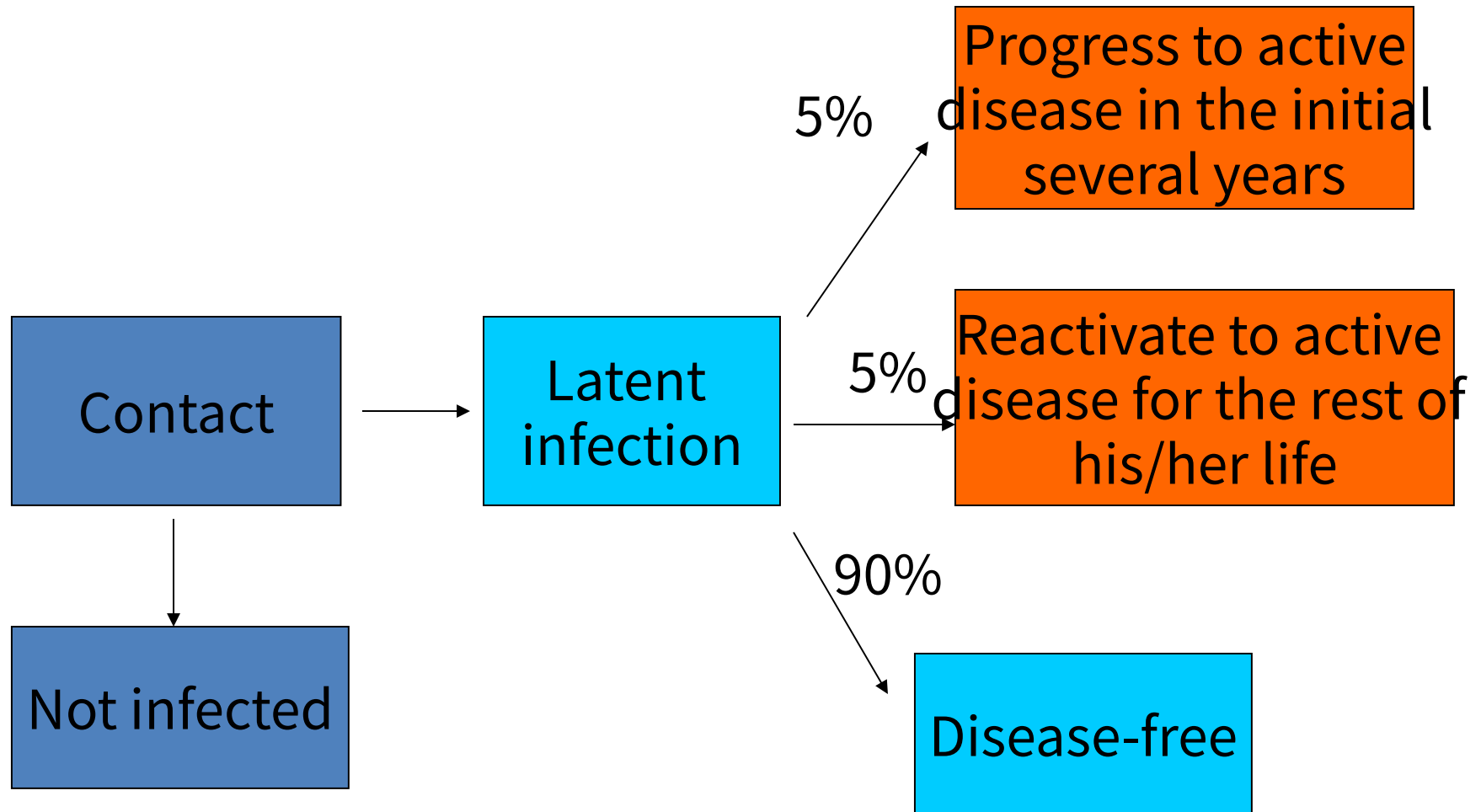
1. Spitting
2. Coughing
3. Sneezing
4. Sharing food
5. Touching
6. Singing
7. Talking loud

Mode of transmission

- Airborne transmission
- Speaking, coughing, sneezing, singing
- One cough : 3000 infectious droplet nuclei
(equivalent to loud talking for 5 minutes),
half of them will stay in the air for 30 minutes



Natural history of TB



(Some) Challenges in TB control

- HIV epidemic
- Drug resistance
- Emerging risk factors

Effective antibiotic treatment could cure most of the patients



But...patients often need to take a
“handful” of drugs daily for months



Flickr RambergMediaImages / Keith Ramsey

Directly observed therapy



Mobile Direct Observation Treatment (MDOT) of Tuberculosis Patients Pilot Feasibility Study in Nairobi, Kenya

Jeffrey Hoffman, Ph.D., Principal Investigator; Debra Dekker, Ph.D., Evaluator; Andrew Juma Suleh, M.D.; Aaron Sundsmo, M.A.; Janice Cunningham, B.B.A.; Fred Vago, M.H.A.; Kelly Munly, M.A.; Emmy Kageha Igonya, M.A.; and Jonathan Hunt - Glassman, B.A.

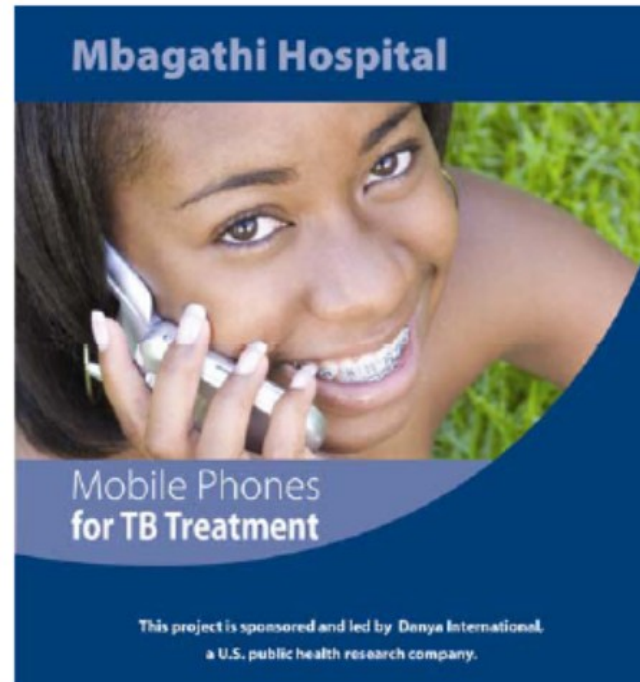


Figure 1. Patient Recruitment Brochure



Hoffman et al, AJPM 2010

Trend of TB mortality, England and Wales

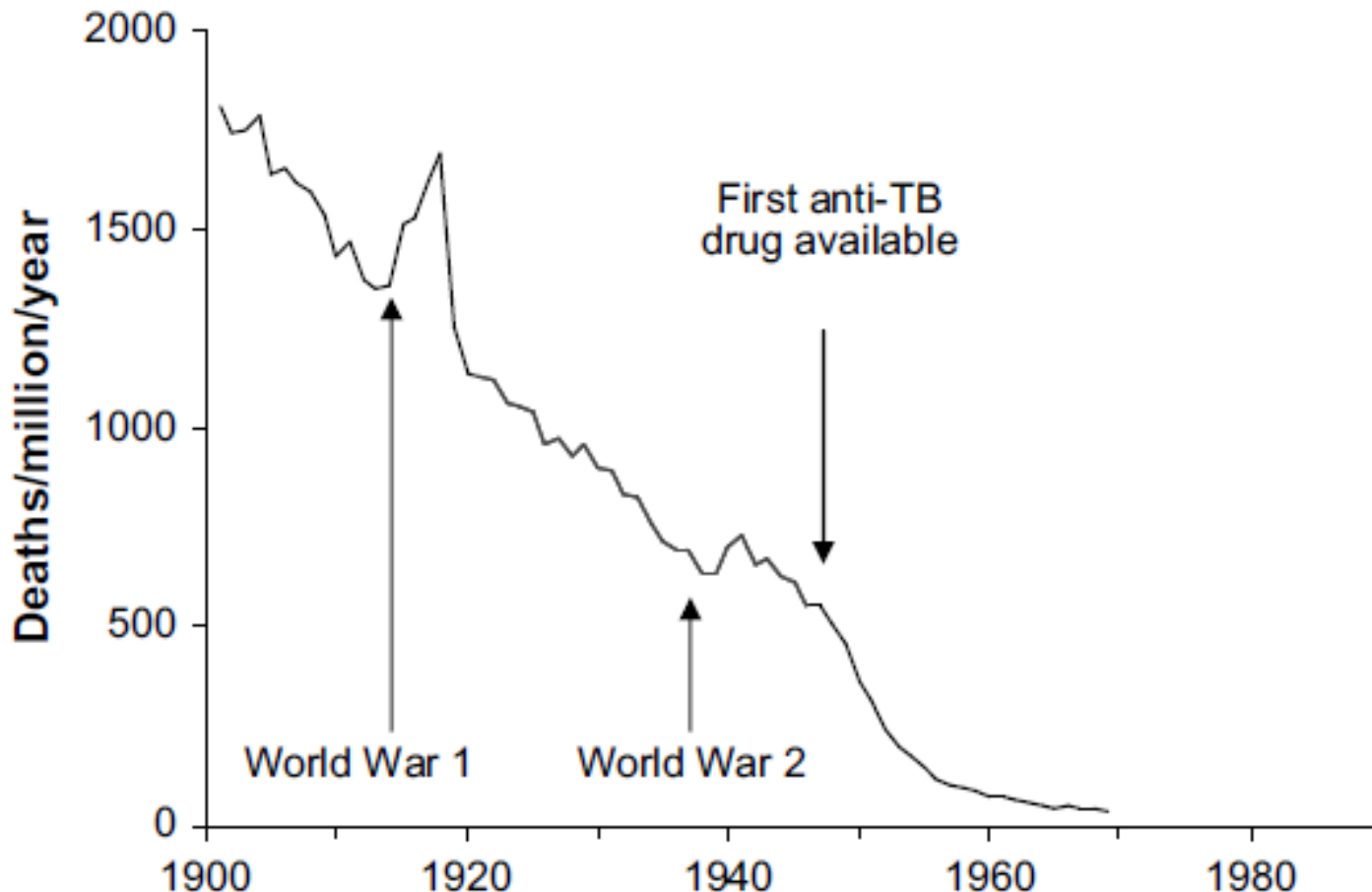


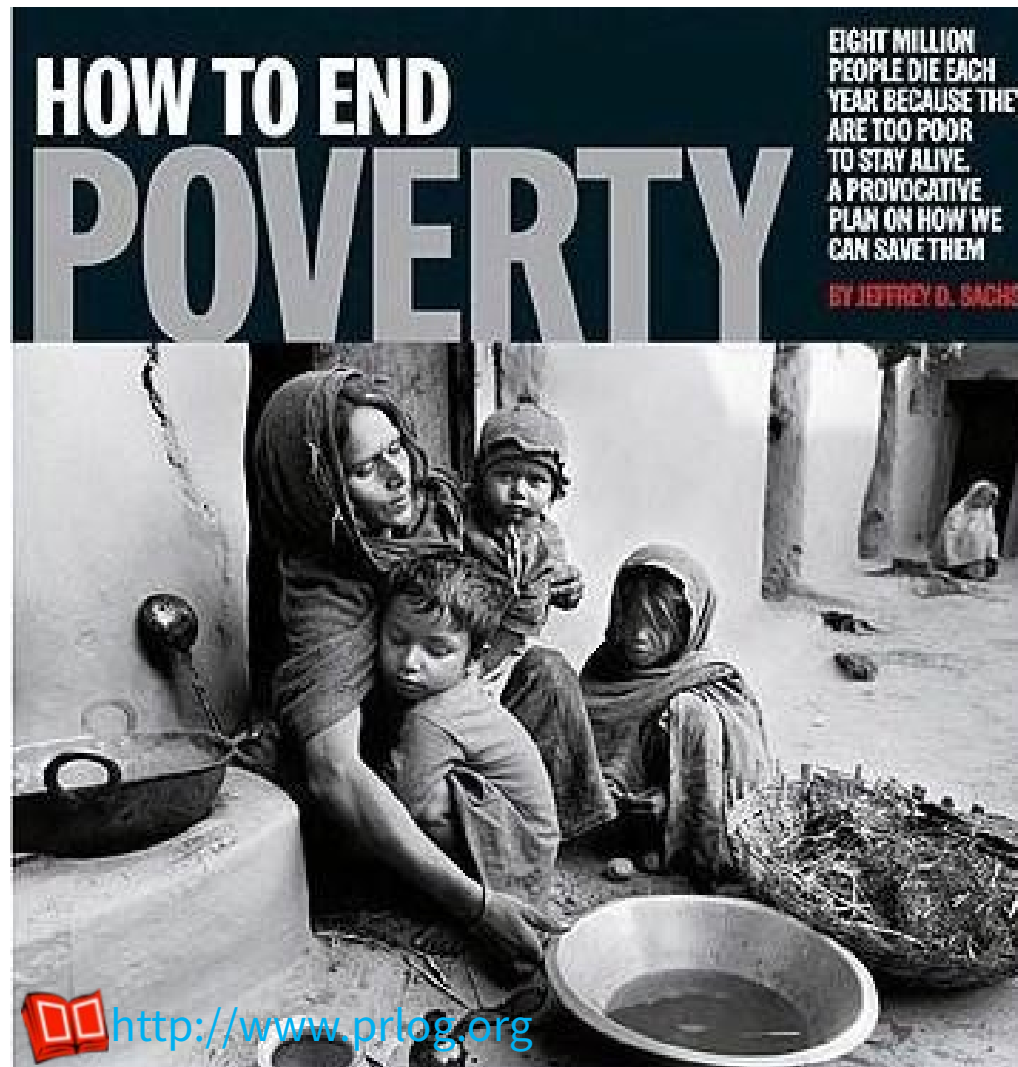
Fig. 2. Decline in TB mortality in England and Wales, and its association in time with the two World Wars, and the introduction of chemotherapy against TB.



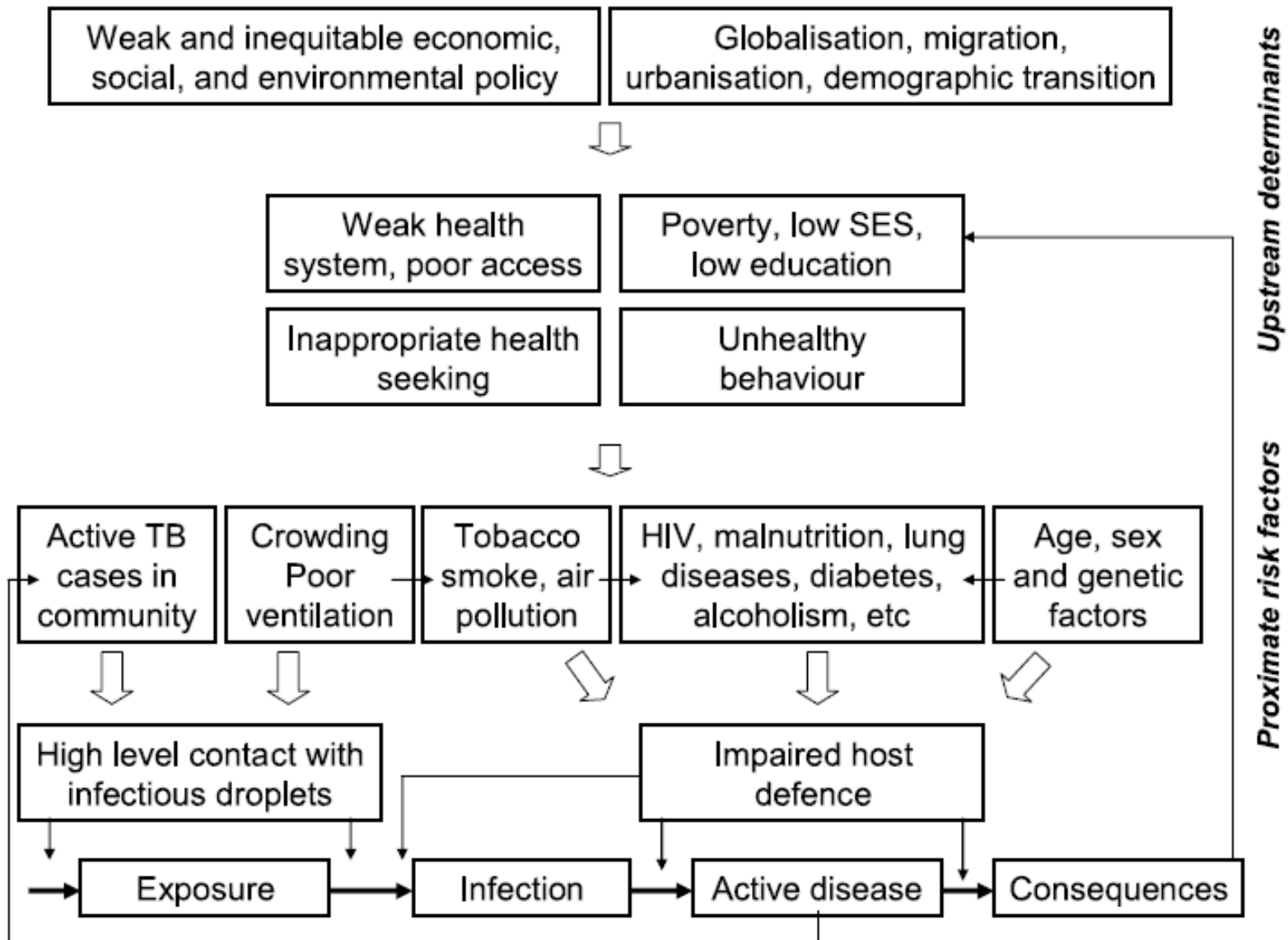
Lönnroth et al

The McKeown Thesis

- The so-called epidemiologic (or health) transition from approximately 1700-present was due to "improvements in overall standards of living, especially diet and nutritional status, resulting from better economic conditions."
(Colgrove 2002)



Proximate risk factors and social determinants of

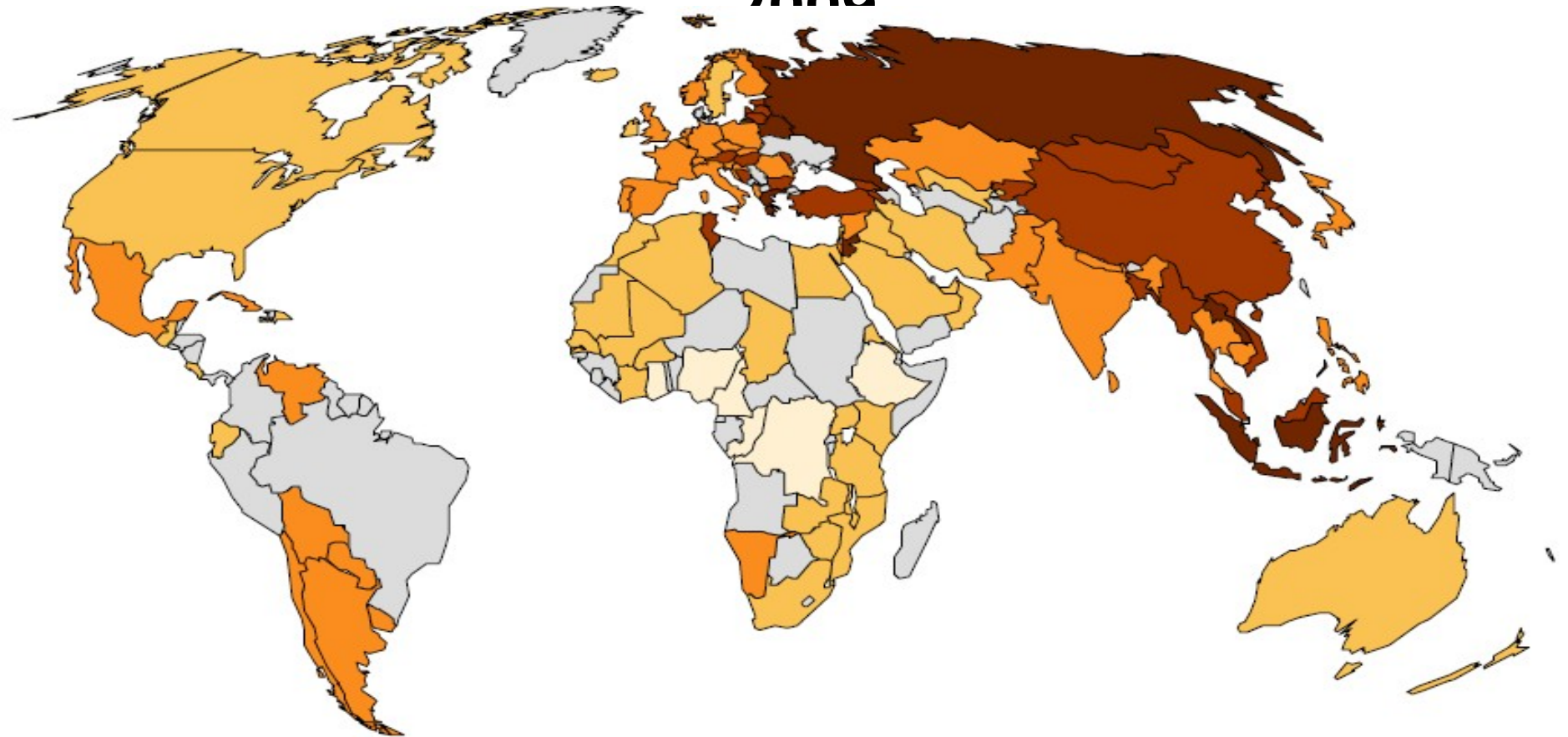


Proximate risk factors of TB

- Smoking
- Indoor air pollution from solid fuels
- Alcohol use
- Diabetes
- Undernutrition
- HIV/AIDS

Male Prevalence of Smoking (Percent of Adults)

2000



NA

15 - 30

45 - 60

0 - 15

30 - 45

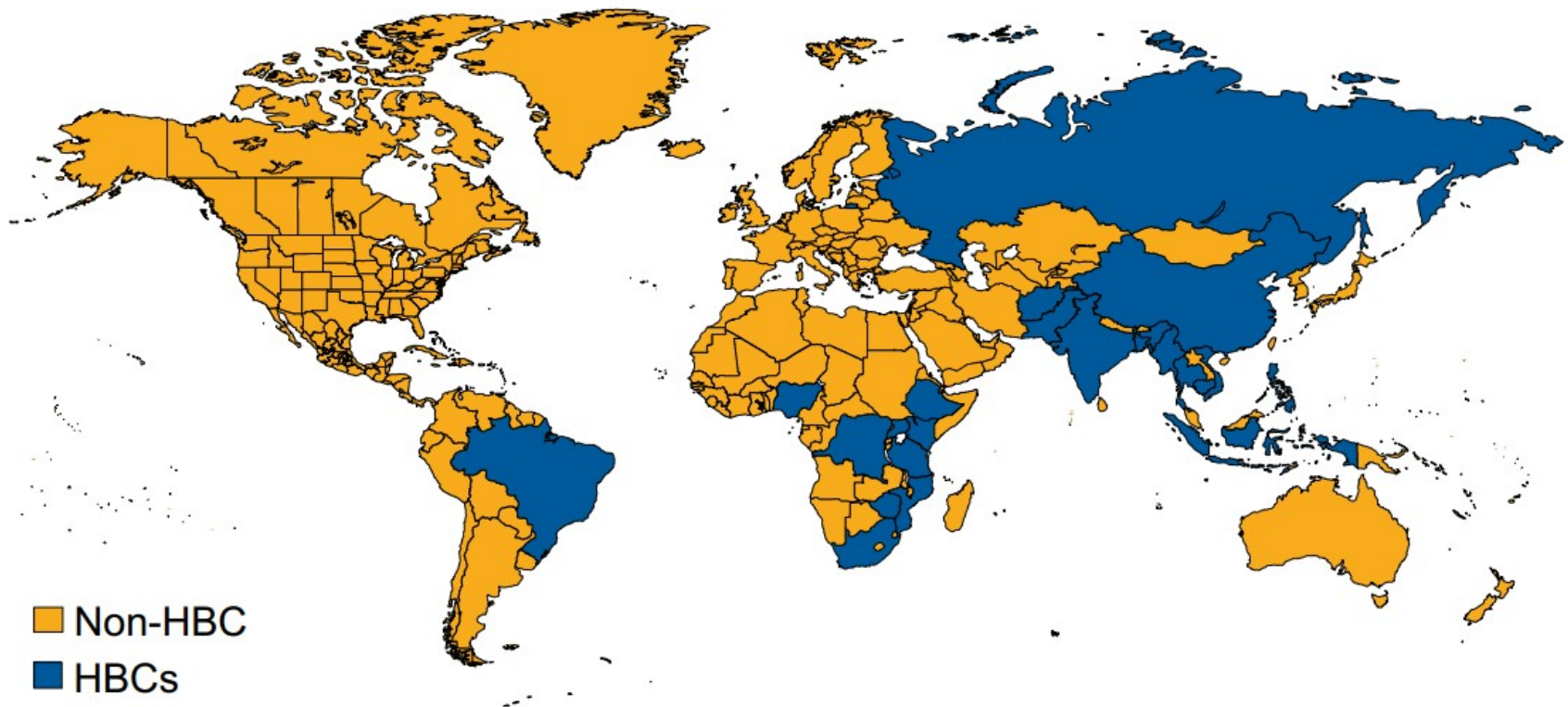
60 - 75



The Henry J. Kaiser Family Foundation, April

The U.S. Government and Global Tuberculosis”, (#7883), 2009

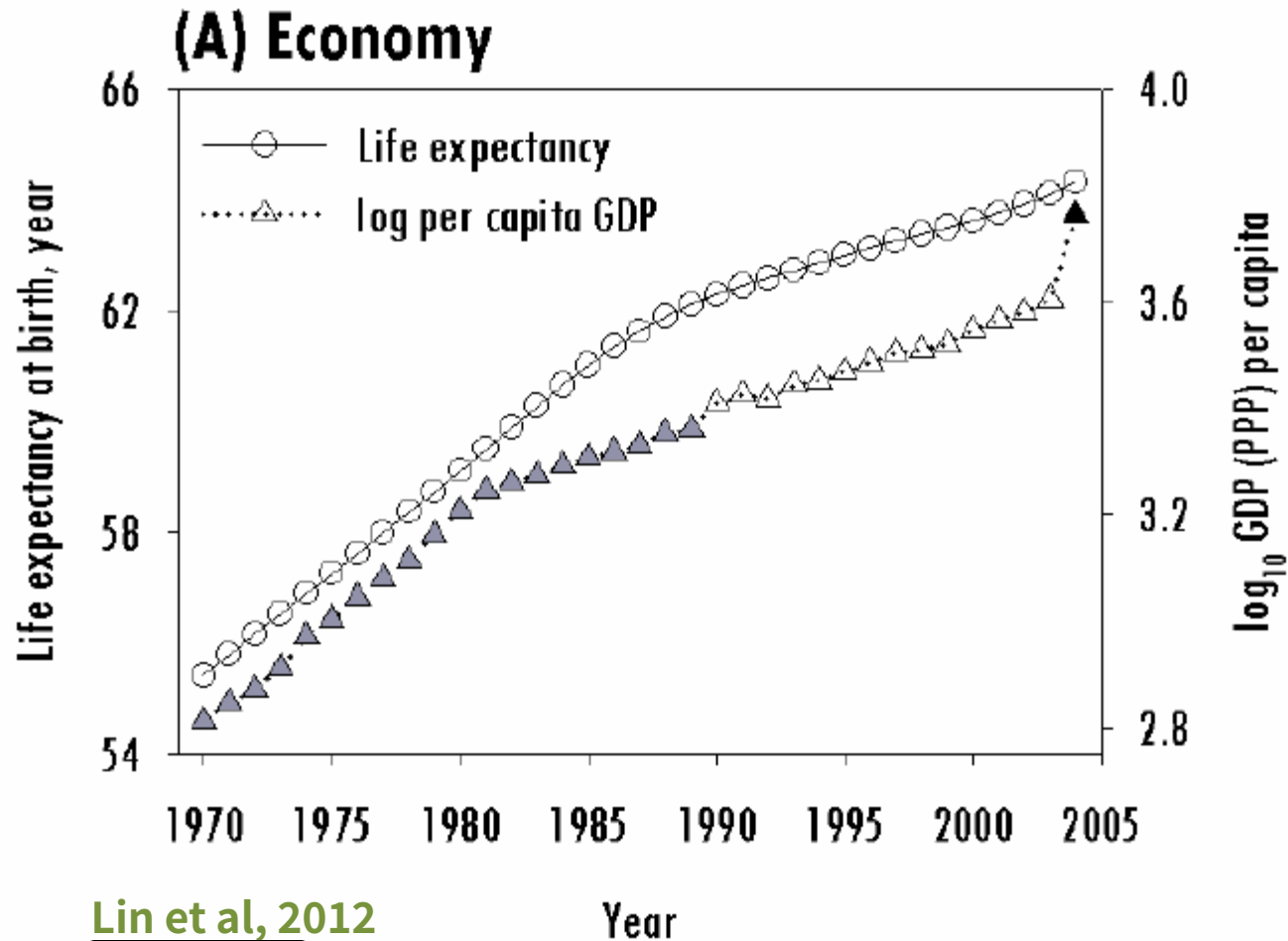
Figure 1: The 22 High Burden TB Countries (HBCs)



Homework I

- Pick one health indicator of interest
- Pick two countries in your region, one with high and one with low value of the indicator
- Propose possible determinant(s) of the indicator by plotting the time trend of the indicator and the determinant
- Write a short essay (A4 one page)

Example



Lin et al, 2012



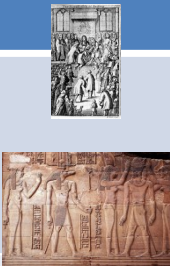
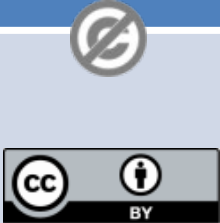
Obesity example

- http://www5.imperial.ac.uk/medicine/metabolic_risks/bmi/

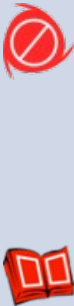
Quasimodo: a (very possible) victim of Pott's disease (TB in the spine)



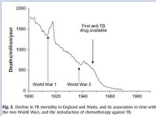
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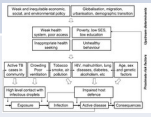
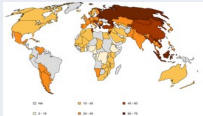
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