

Fighting the Diseases of Poverty

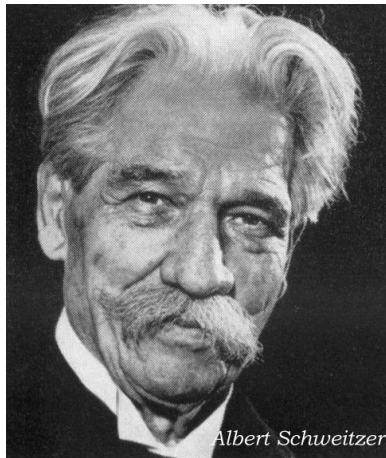


Nicholas Comninellis, MD, MPH, DIMPH
INMED President



INSTITUTE FOR
INTERNATIONAL
MEDICINE

Who Is the Most Significant Person in Healthcare for Marginalized People?



Albert
Schweitzer?
1940-50s



Tom Dooley?
1960-70s



Paul
Farmer?
1980-90s

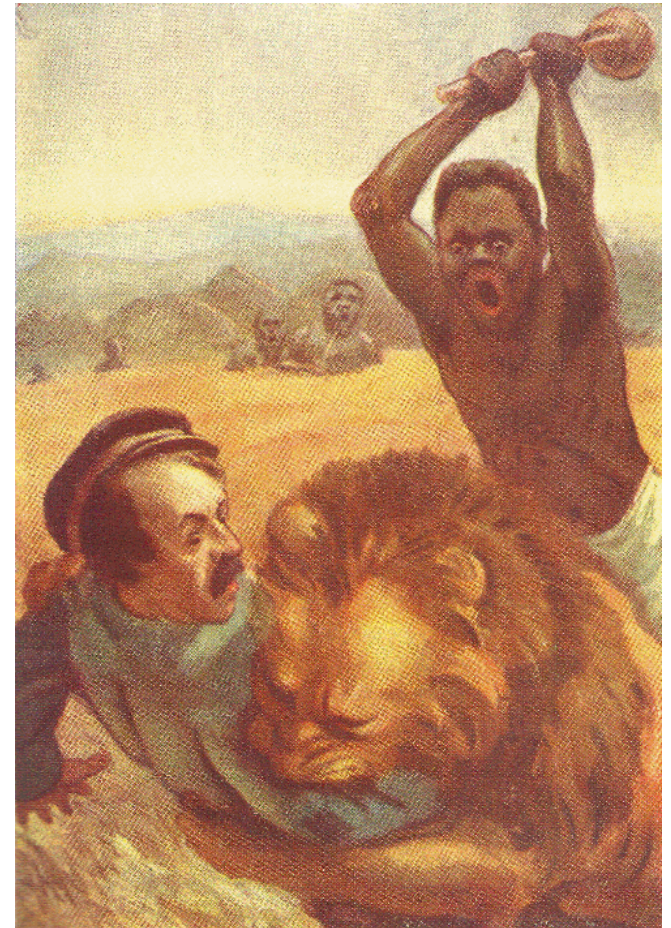
Have You Considered David Livingston?

- Born 1813 of an impoverished Scottish family
- Age 10 started working 12-hour days in a cotton mill tying broken cotton threads
- Wrote how this experience gave him persistence, endurance, and empathy
- Avid reader of the Bible & science
- A vocal opponent of slavery while at University of Glasgow



David Livingstone's Early Career

- Joined the London Missionary Society
- Arrived South Africa in 1841
- Setting up new mission in 1844 & was mauled by a lion. His arm was partially disabled the rest of his life.
- Throughout 1841-1852 he preached & cared for sick in northern South Africa



David Livingston's Later Career



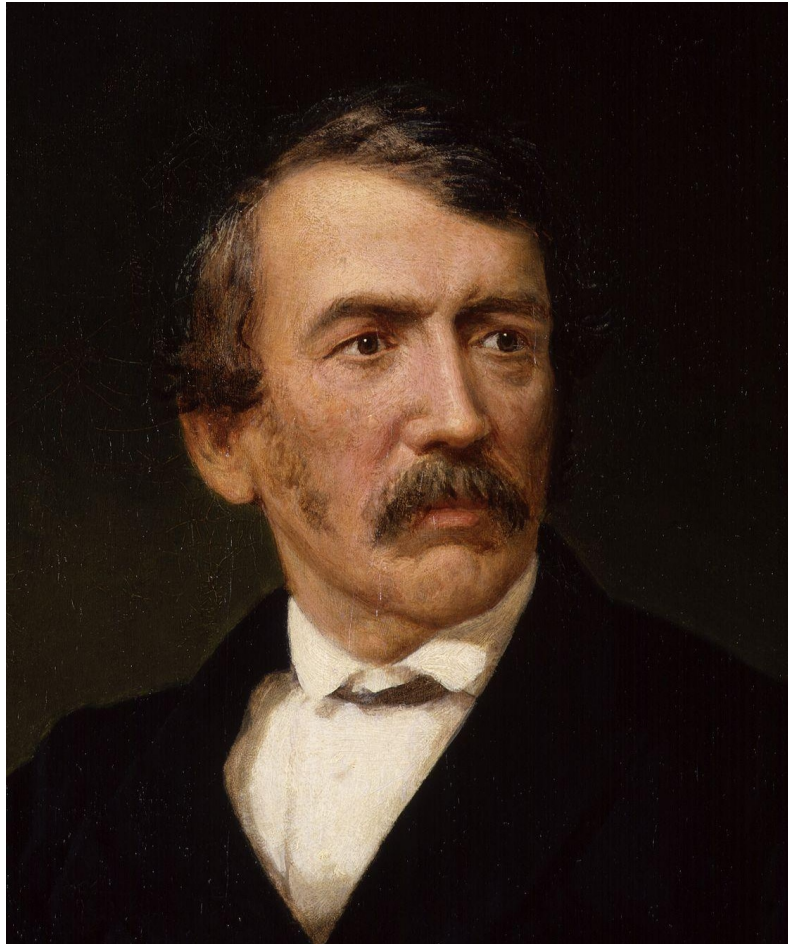
- 1852-56 explored Angola, Zambia, Zimbabwe & Victoria Falls
- As he travelled he preached the Christian message with gentleness and provided medical care
- He became known by local chiefs for his hospitality, and was received with honor

David Livingstone's Later Career

- 1858-1873 he explored source of the Nile river
- 1871 Henry Stanley of the *New York Herald* found him
- Livingstone campaigned for ethics in foreign policy which contributed to the end of slavery in the British Empire



David Livingston's Convictions



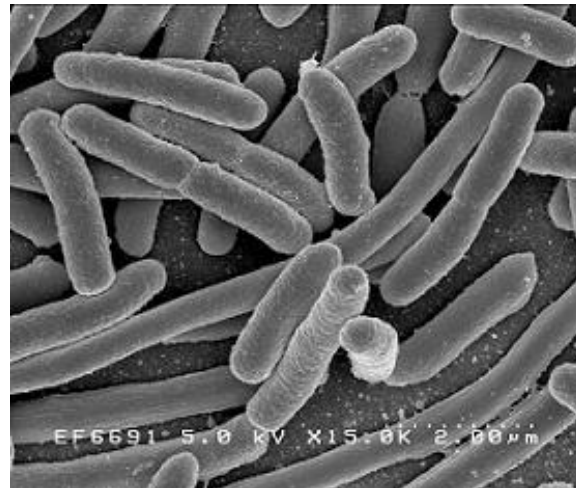
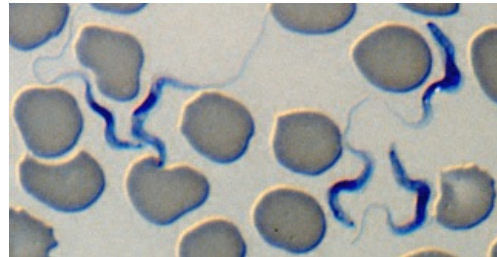
Though one of the most celebrated men of the 1800s, Livingston said “I will place no value on anything I have or may possess except in relation to the kingdom of Christ.”

Livingston's Death From Diseases of Poverty

- Livingston wrote that the Africans of his time were plagued by **pneumonia, malaria, TB, dysentery** and birth complications.
- 1873 Livingston himself died in Zambia of **malaria** and **dysentery**
- Attendants record he took his final breaths while kneeling in prayer at his bedside



Today's Diseases Of Poverty

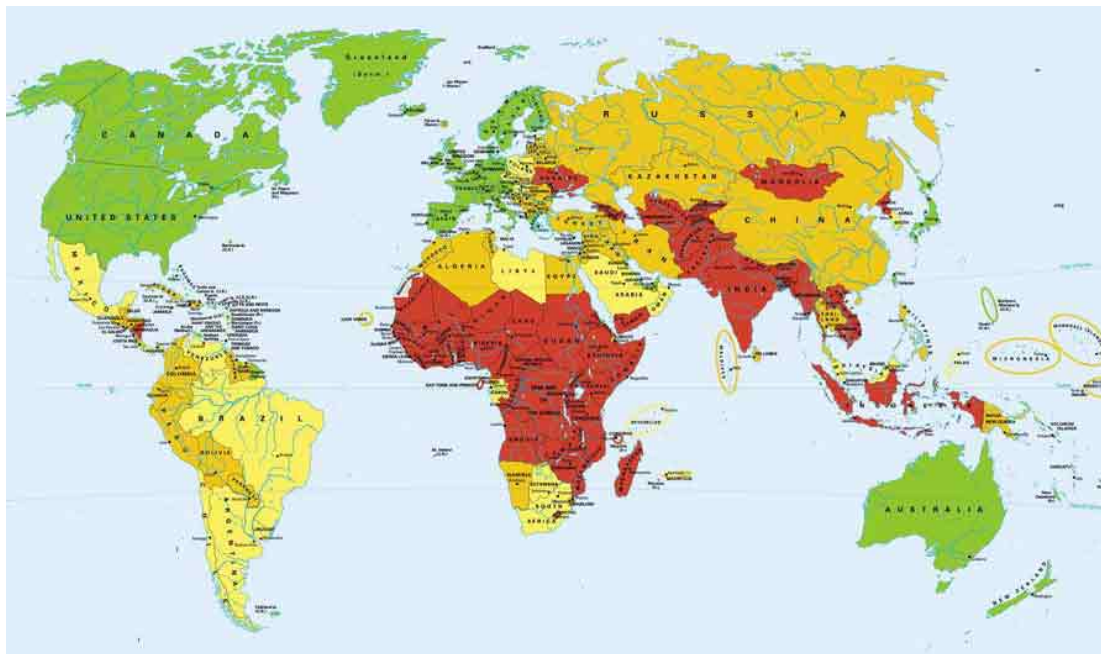


How Is Poverty Defined?



How Is Poverty Defined?

- Gross National Income (GNI) per capita of less than \$935 per year. (World Bank, 2008)
- Includes 49 of the world's 209 nations



Where Is Poverty Increasing?



Poverty Not Confined to “Poor Nations”



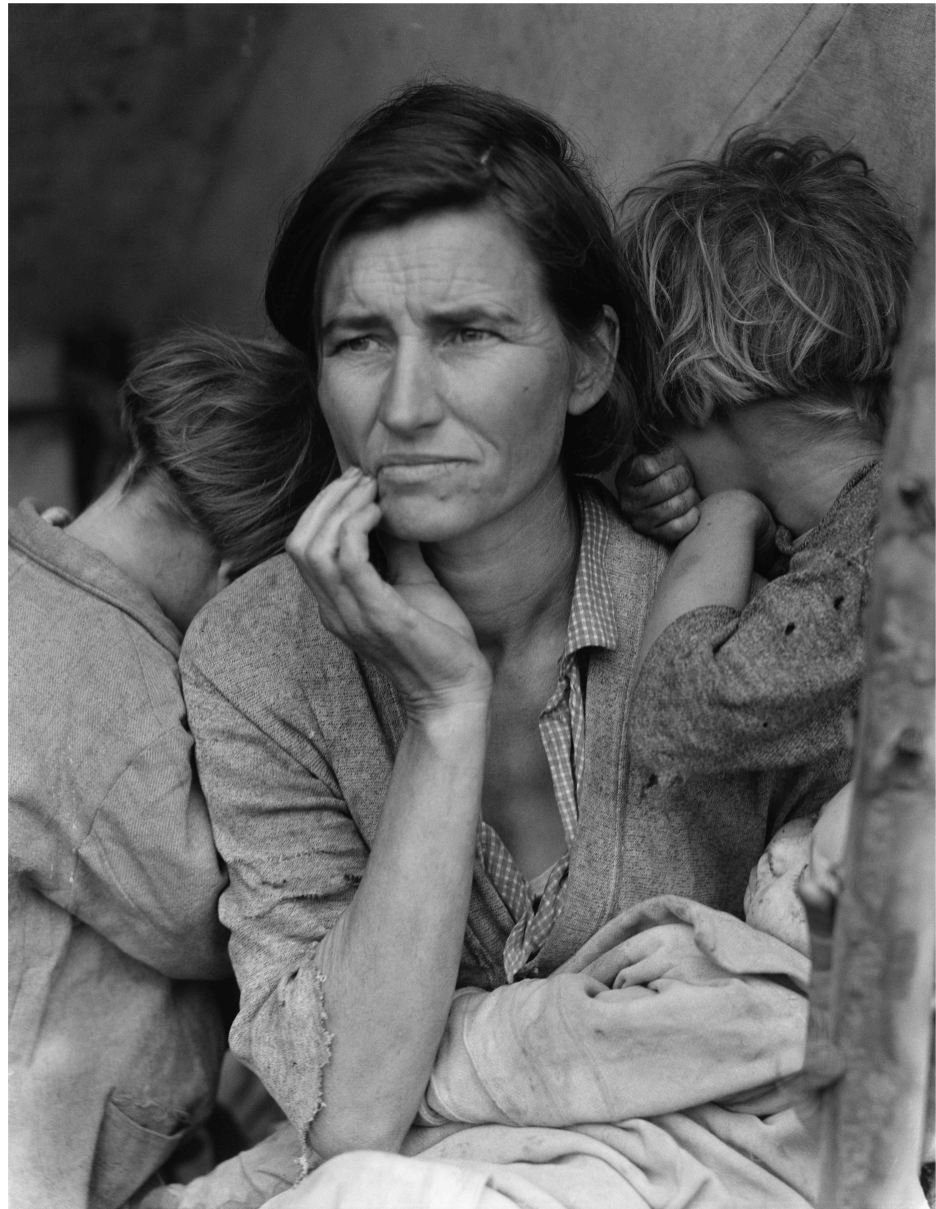
India

Poverty Not Confined to “Poor Nations”



China

**Poverty Not
Confined to
“Poor
Nations”**



United States

According to repeated nationwide surveys,

More Doctors Smoke **CAMELS** than any other cigarette!

Doctors in every branch of medicine were asked, "What cigarette do you smoke?" The brand named most was Camel!

You'll enjoy Camels for the same reasons so many doctors enjoy them. Camels have taste and substance, pack after pack, and a flavor unmatched by any other cigarette. Make this sensible test: Smoke only Camels for 30 days and see how well Camels please your taste. How well they suit your throat as your steady smoke. You'll see how enjoyable a cigarette can be!

THE DOCTORS' CHOICE IS AMERICA'S CHOICE!



HELEN FURBER, M.D., D.D.S., D.P.H.
Camels. They give me an
enjoyable, steady smoke.



DR. WALTER BROWN, D.D.S., D.P.H.
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Amazing Facts From the World of Medicine

For 30 days, test Camels in your "T-Zone" (T for Throat, T for Taste).

www.StrangeCosmos.com

Population-Based Analysis

*Women DO
Live Longer
Than Men!*



















THE NEW YORK COLLECTION

THE NEW YORK COLLECTION IS A SERIES OF 100 PHOTOS THAT CAPTURE THE SPIRIT OF THE CITY FROM THE HEART OF THE CITY TO THE EDGE.

What Are DALYs Lost?

The *Disability Adjusted Life Years* (DALYs) *lost* combines Years of Life Lost (YLL) due to premature death and Years Lived with Disability (YLD) based on severity and duration of nonfatal outcomes. One DALY lost equals one year of healthy life lost.

What Are The 10 Leading Causes Of DALYs Lost In The Lowest Income Nations?

Leading Causes of DALYs Lost Due To Disease Or Injury

Disease or Injury	Percentage of Total DALYs Lost
Lower respiratory infection	9.7
Diarrheal diseases	6.9
Malaria	5.1
Preterm birth complications	5.1
HIV/AIDS	5.0
Birth asphyxia & birth injury	4.9
Congenital anomalies	3.2
Road injury	3.0
Neonatal sepsis & infections	2.7
Tuberculosis	2.5

Health Indicators

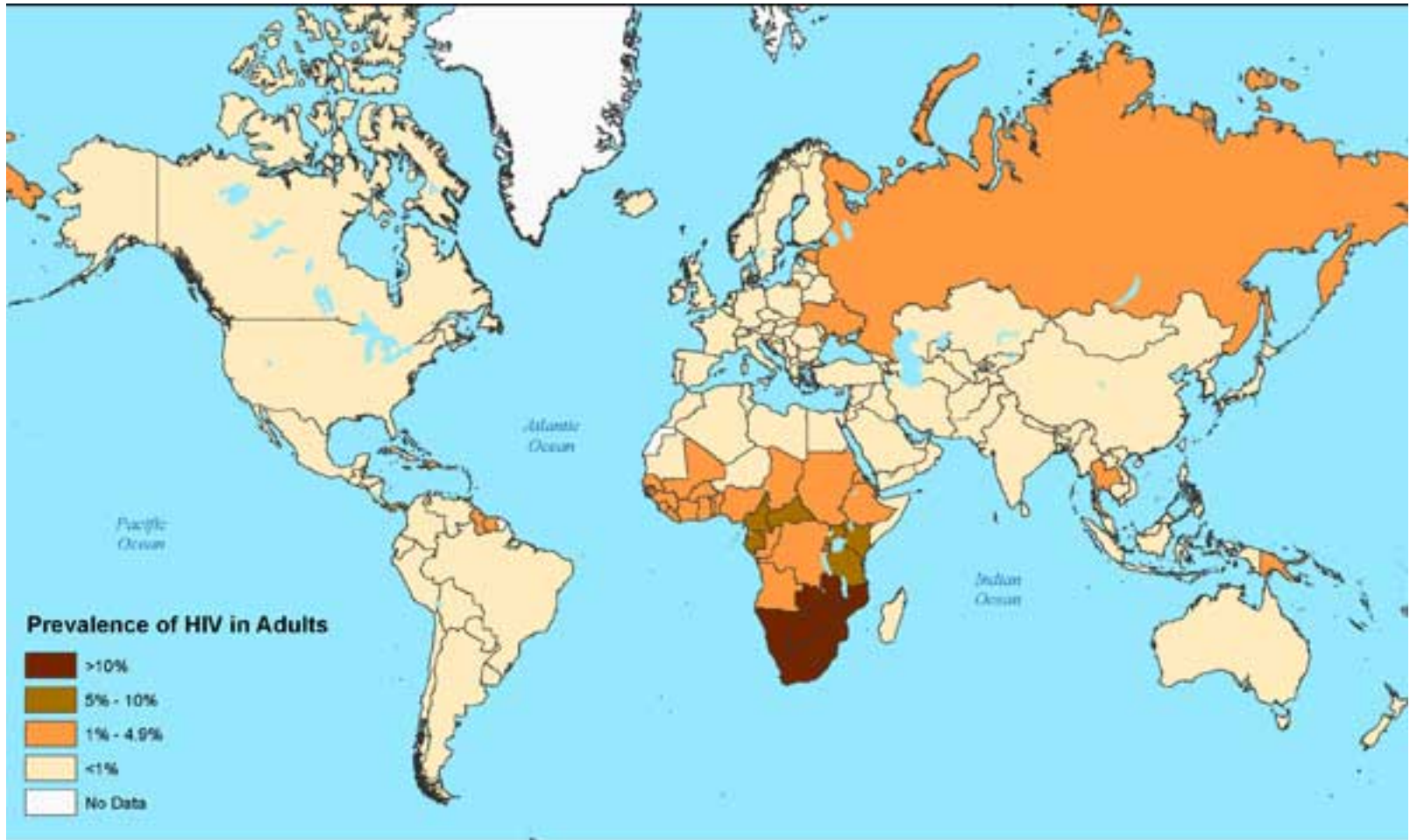
Nation	Life Expect @ Birth	Under 5 Mortality	Per Capita Health Expenditure
All Low Income	59 years (M 58/F 60)	11%	\$16
All Africa	51 (M 50/F 52)	16%	\$33
Angola	41	26%	\$16
Liberia	44	23%	\$6
Niger	42	25%	\$6
Sierra Leone	40	27%	\$6
Zambia	43	18%	\$18
Afghanistan	42	25%	\$3
Iraq	56 (M 48/F 67)	5%?	\$14
All High Income	80 (M 77/F 82)	0.7%	\$2,672

Health Status / Economic Status



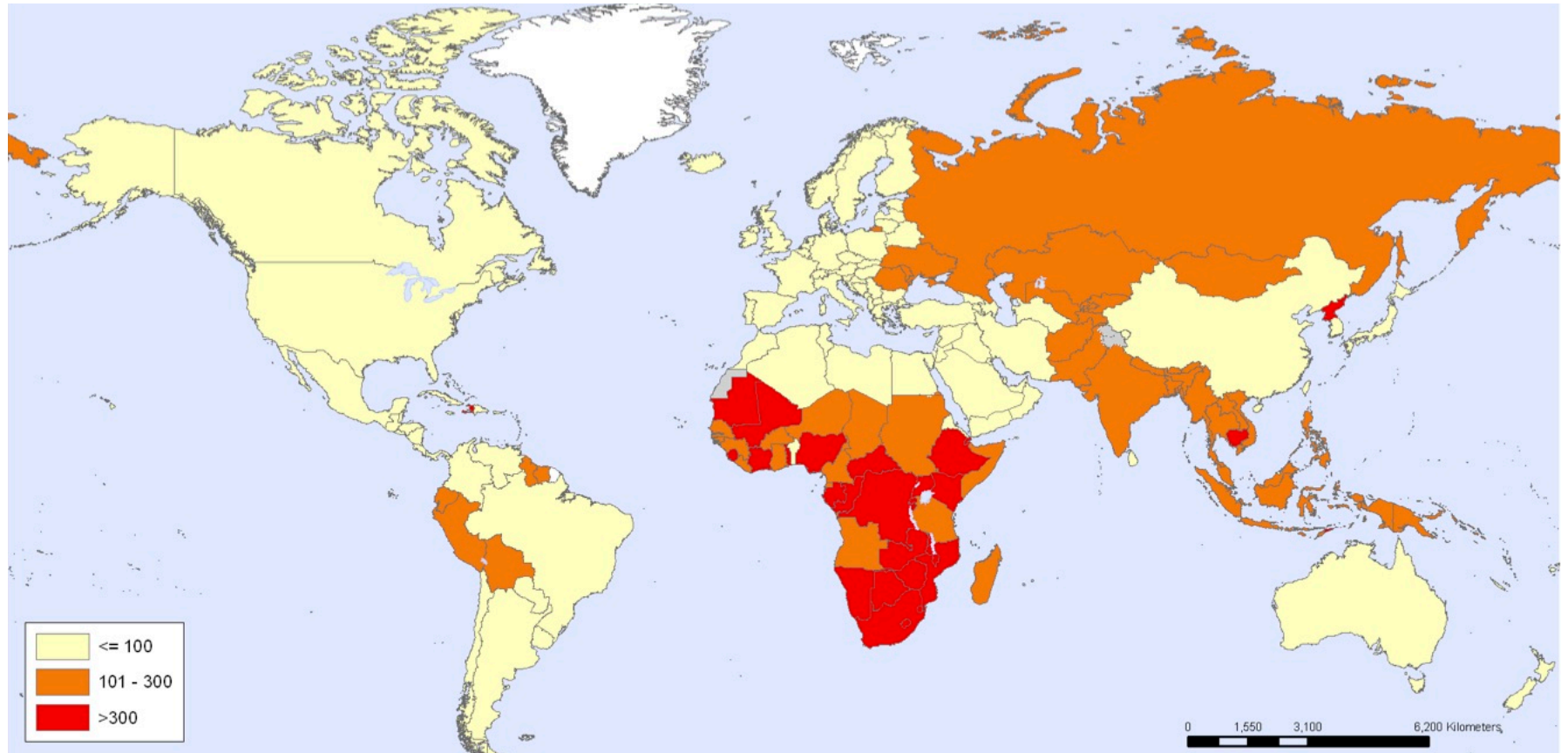
Prevalence of Poverty

Health Status / Economic Status



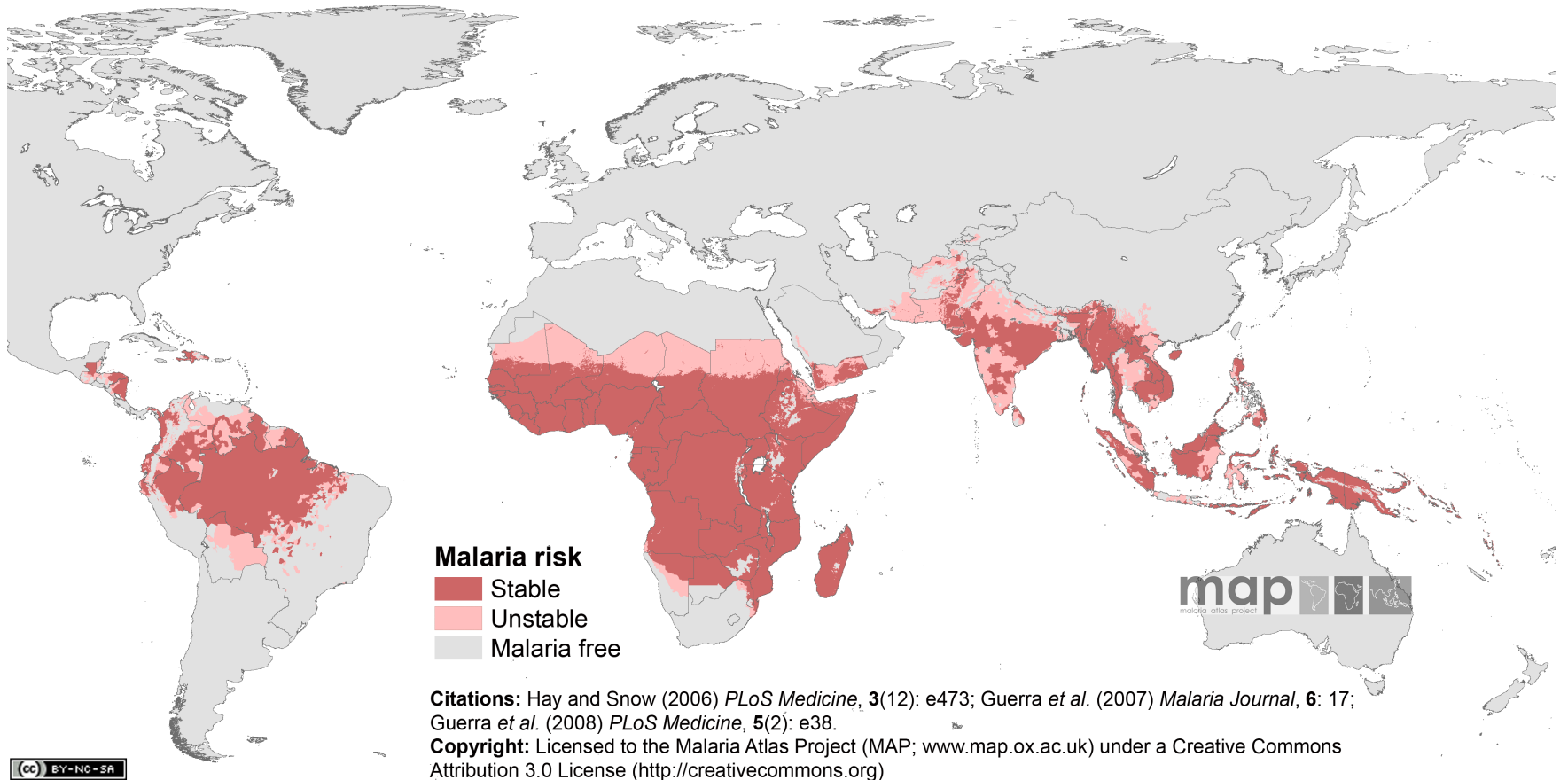
Prevalence of HIV Infection

Health Status / Economic Status



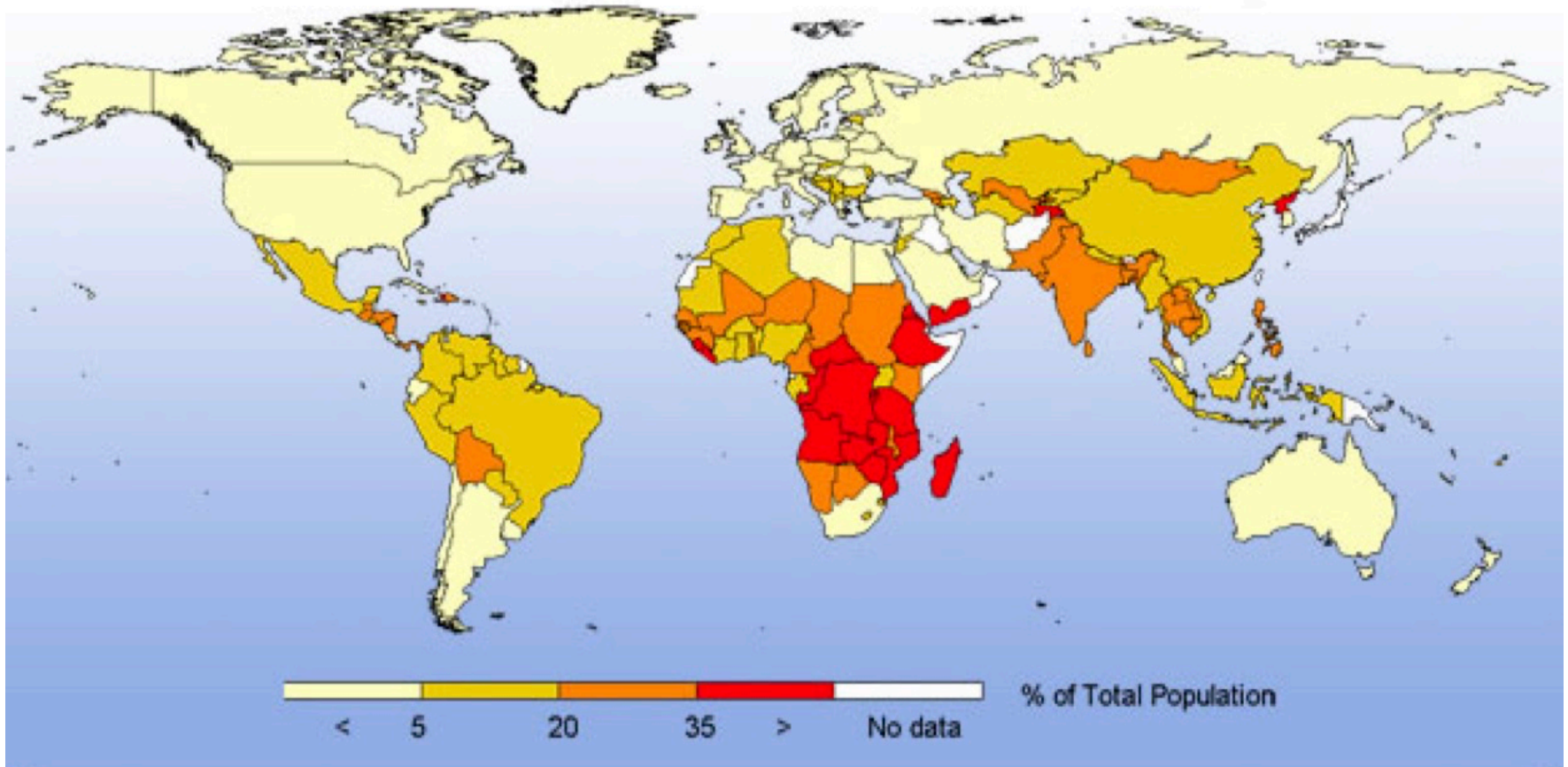
Incidence of Tuberculosis

Health Status / Economic Status



Prevalence of Malaria

Health Status / Economic Status



Prevalence of Malnutrition

Malnutrition Fast Facts



Why is malnutrition not listed as a leading cause of DALYs Lost?

Malnutrition Fast Facts



Malnutrition especially places children at risk for death from common diseases like pneumonia or diarrhea.

Common Knowledge: 70% of childhood deaths are due to vaccine-preventable diseases, diarrheal illness, acute respiratory infection, and malaria.

But: 56% of child deaths are *also* attributable to malnutrition's potentiating effects



Health Status <-> Economic Status

Health Status is closely associated with economic status. Why is this so?

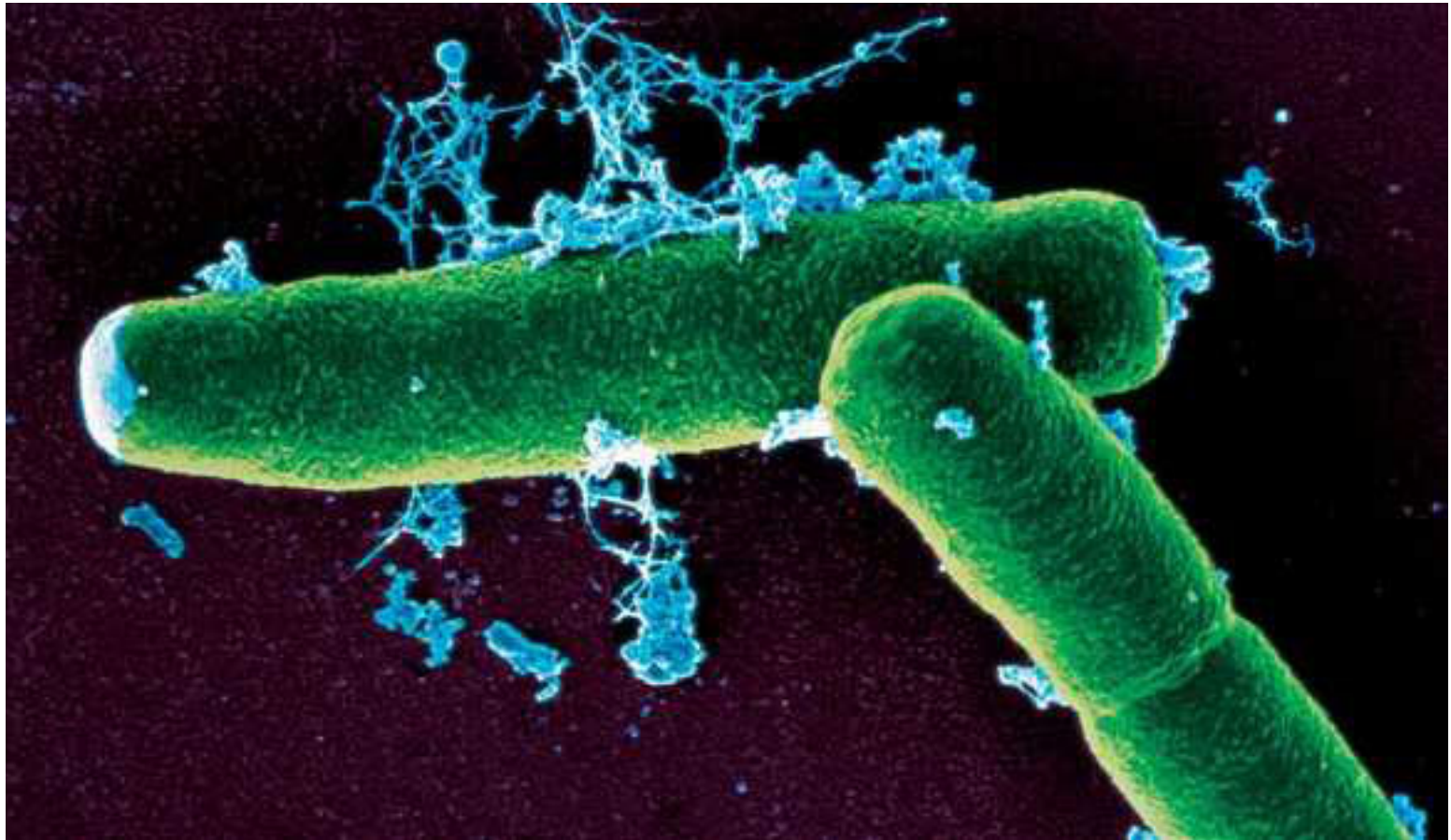


Voices of the world's most poor

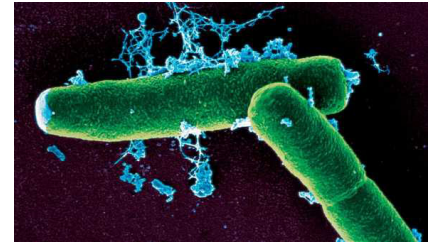
**"For we, the poor,
our 'body' is our
only asset and so
health is vital to our
survival. If we don't
work, we don't eat,
and our children
starve"**



How Are Poverty & Infectious Diseases Connected?



Poverty & Infectious Diseases



- Unsafe drinking water and improper disposal of human waste contribute to *E. coli*, typhoid, cholera, hepatitis, and helminthic disease.
- Crowded living conditions promote infectious respiratory diseases, including influenza and TB.
- Lack of medical care for ID is a greater problem in impoverished communities
- Control of insect vectors, for example mosquitoes and flies, is often lacking in poorer communities
- Programs that provide vaccination are also often lacking

Question

Conventional methods of quantifying causes of death indicate that about 70% of childhood deaths in low-resource nations are due to which one of the following factors?

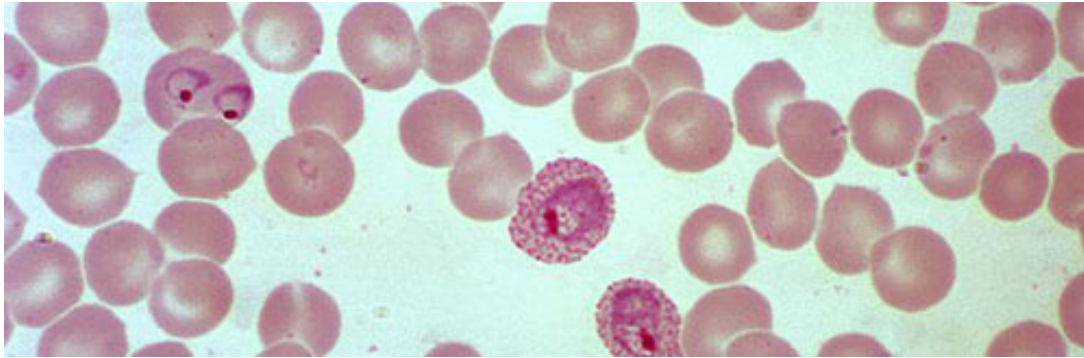
- A. Malnutrition
- B. Infectious diseases
- C. Vaccine-preventable diseases
- D. Respiratory diseases
- E. Injuries

Answer

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- A. Malnutrition
- B. **Infectious diseases**
- C. Vaccine-preventable diseases
- D. Respiratory diseases
- E. Injuries

Poor Health Inhibits Economic Growth



- **Poor health decreases economic production.**
Example: Iron deficiency anemia is associated with decreased productivity and earnings
- **Good health increases economic production.**
Example: Iron supplementation & deworming meds are associated with increased productivity and earnings

How Does Improved Health Generate Economic Growth?



Improved Health Generates Economic Growth



Healthier citizens make for a more stable
workforce & more secure markets

How Does Economic Growth Improve Health?



Economic Growth Improves Health Via Better:

- Water & sanitation
- Housing
- Medical services
- Industrial safety
- Incentives for reduced fertility
- General and health education
- Modern agriculture technology improves nutrition



Lessons From American History

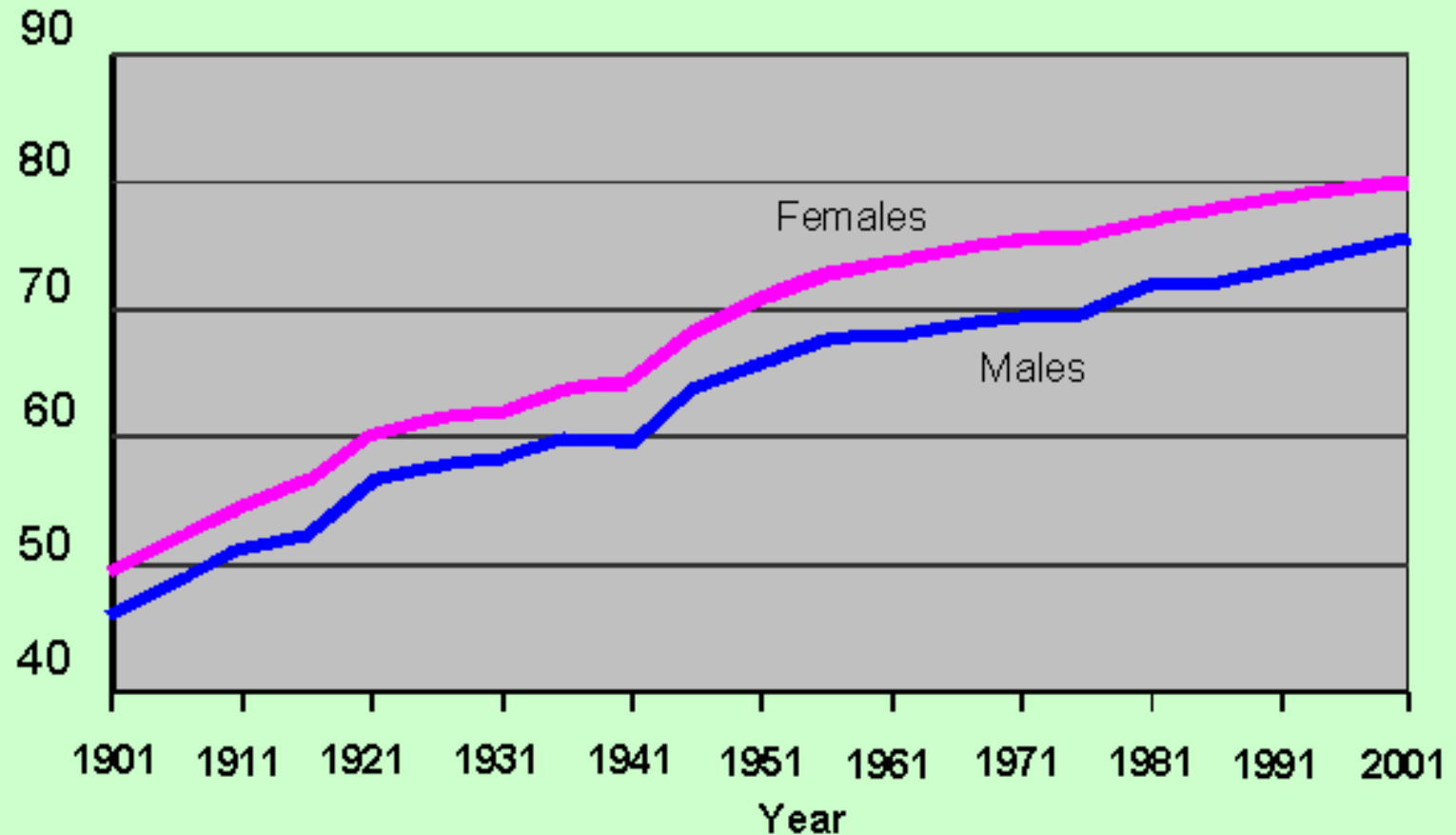
Health in many developing nations today is similar to health in the US in 1900. What can be learned?



Lessons From American History

Years
from
birth

Life Expectancy



1900 Life Expectancy

- White Males: 48, White Females: 53
- Black Males: 32, Black Females: 35



In 1900 What Were The Leading Causes Of Death?



1900 Leading Causes Of Death:

1. Tuberculosis
2. Pneumonia/Influenza
3. Diarrhea
4. Rheumatic heart Ds
5. Rheumatic renal Ds
6. Trauma
7. CVA



First Public Health Revolution

1920s health status increased rapidly due to potable drinking water, modern sewage, improved nutrition and safer housing

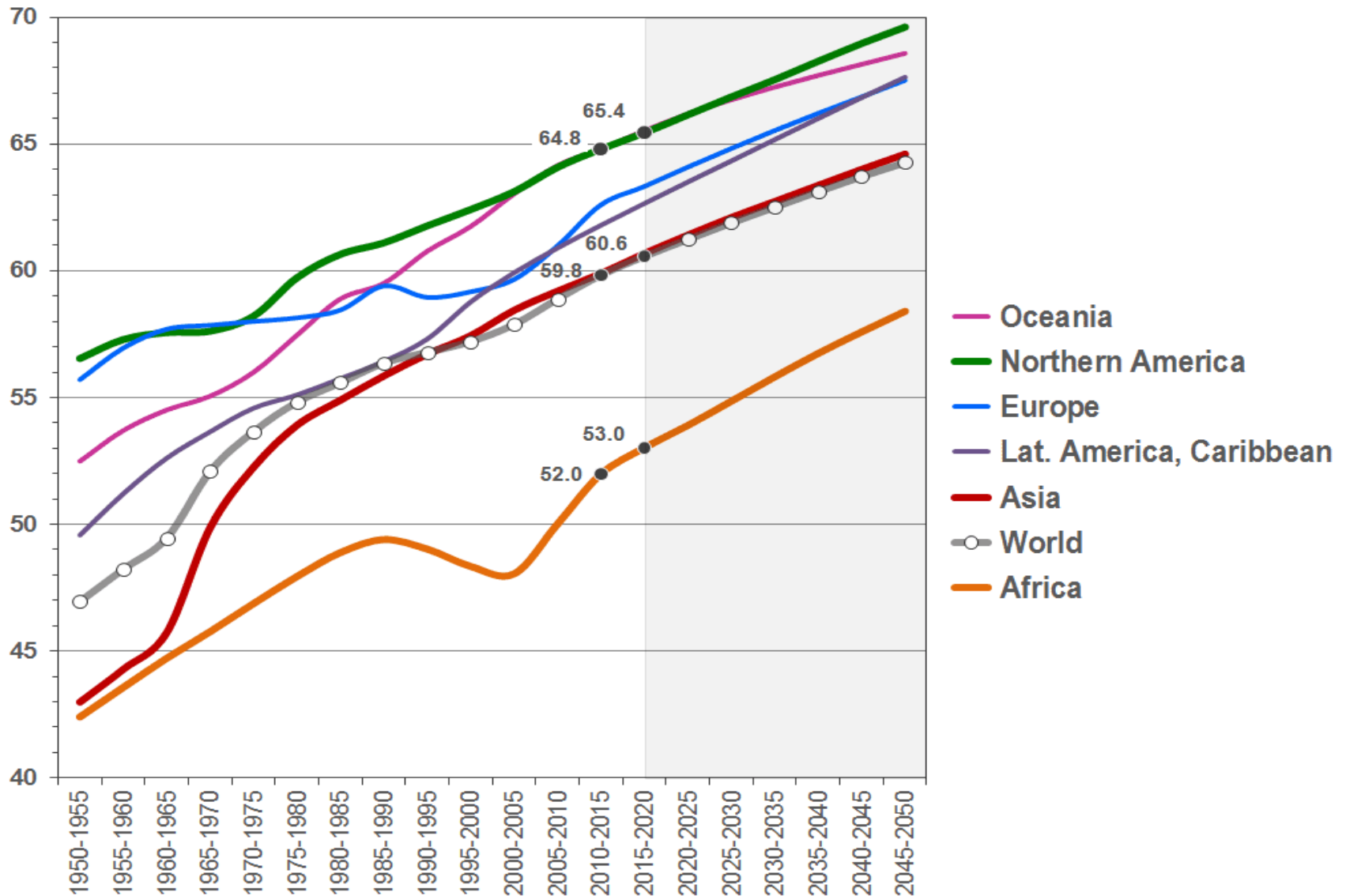


1940 Life Expectancy

- White Males: 62, White Females: 67
- Black Males: 52, Black Females: 55



Trends in Life Expectancy



What Is Your Definition Of Health?



WHAT IS HEALTH?

“A state of complete physical, emotional and social well being, not just the absence of disease” - WHO

- Based on the observation that economics, education, agriculture, housing, transportation, family stability and political systems all have a profound effect upon physical health.



Conclusion Number One

- Healthcare professionals must *advocate for economic development*



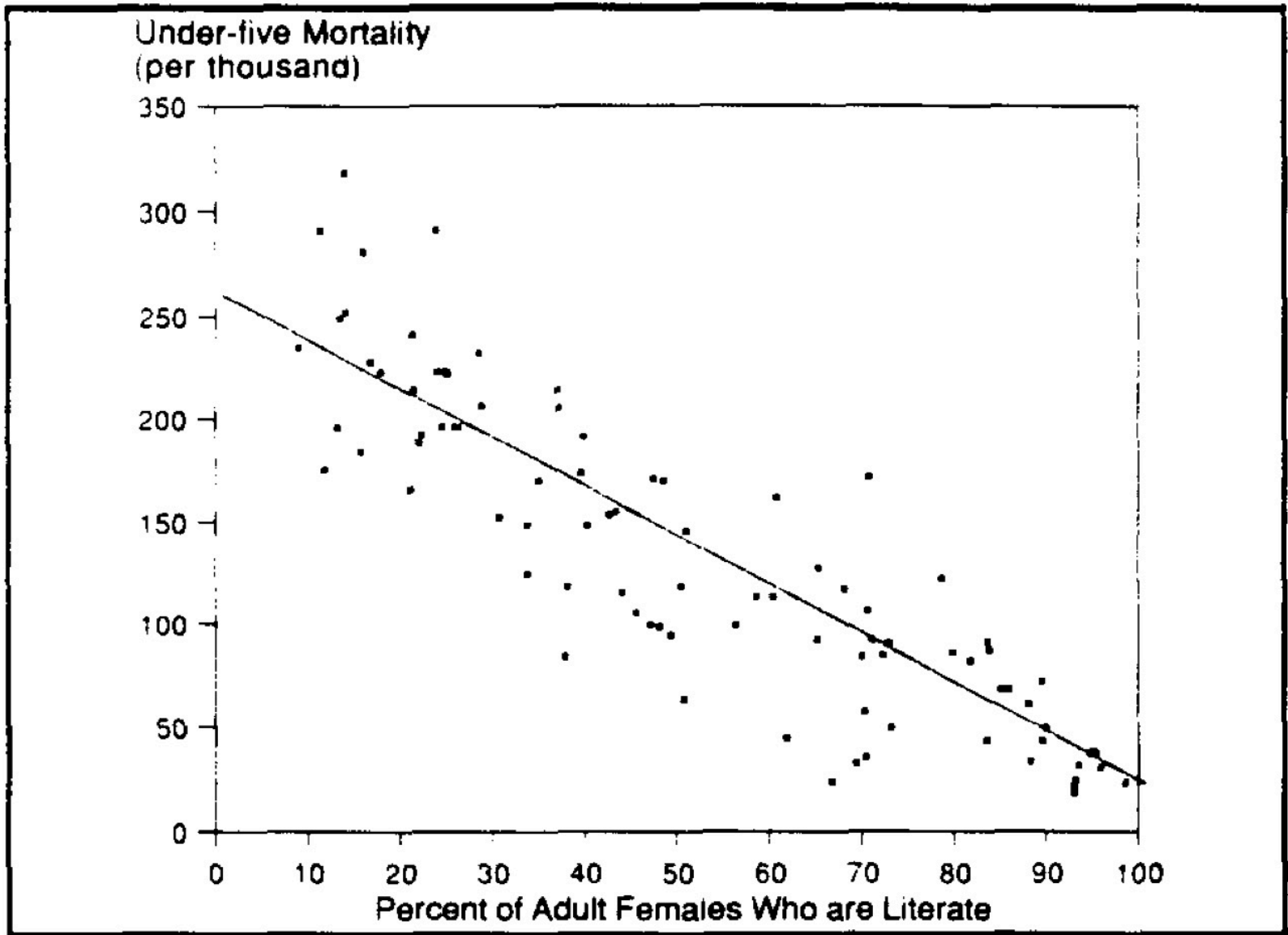
What Are Some Widely Effective Economic Development Strategies?



Advocate for Economic Development

- Literacy
- Micro-enterprise
- Infrastructure
- Education
- International trade





Under-Five Mortality per Maternal Literacy

Advocate Economic Development

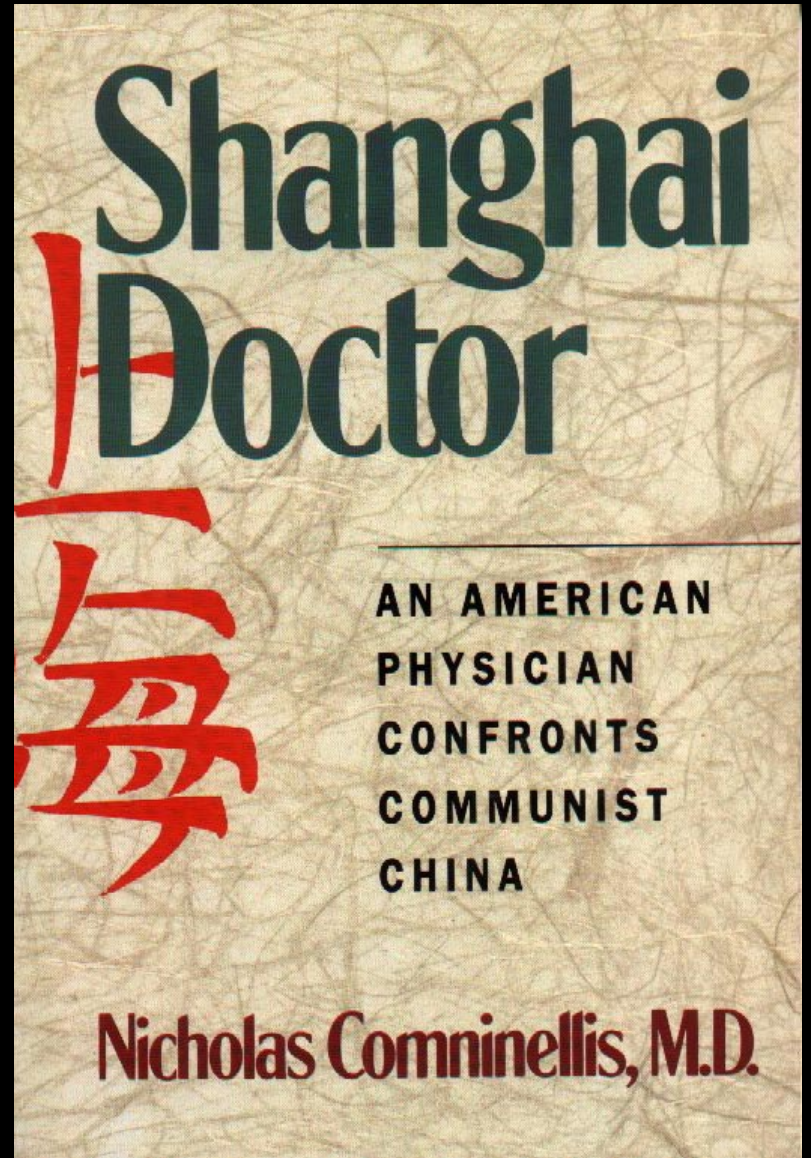
Heifer International: Alleviating hunger
and poverty through gifts of livestock



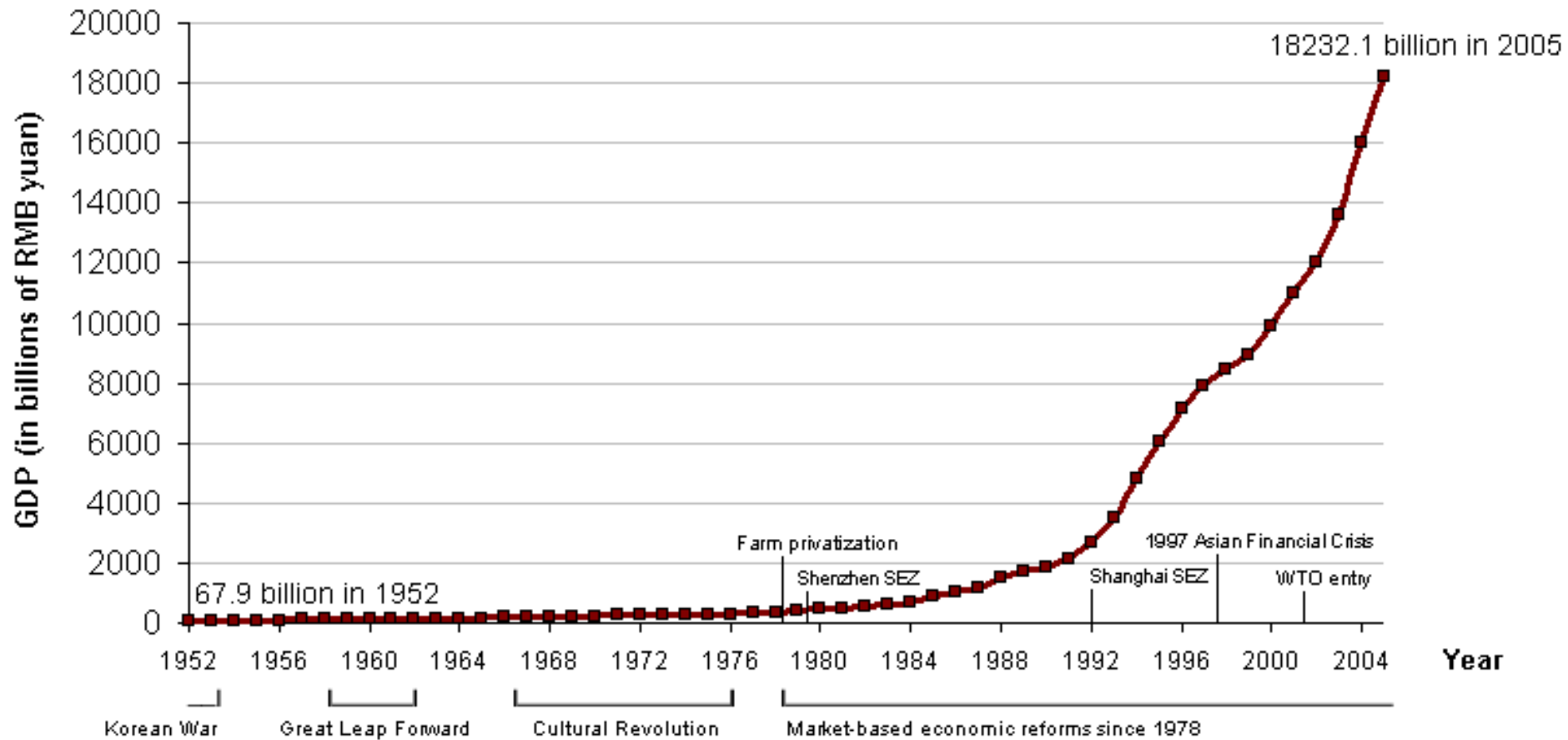
Comninellis 2 years in Shanghai



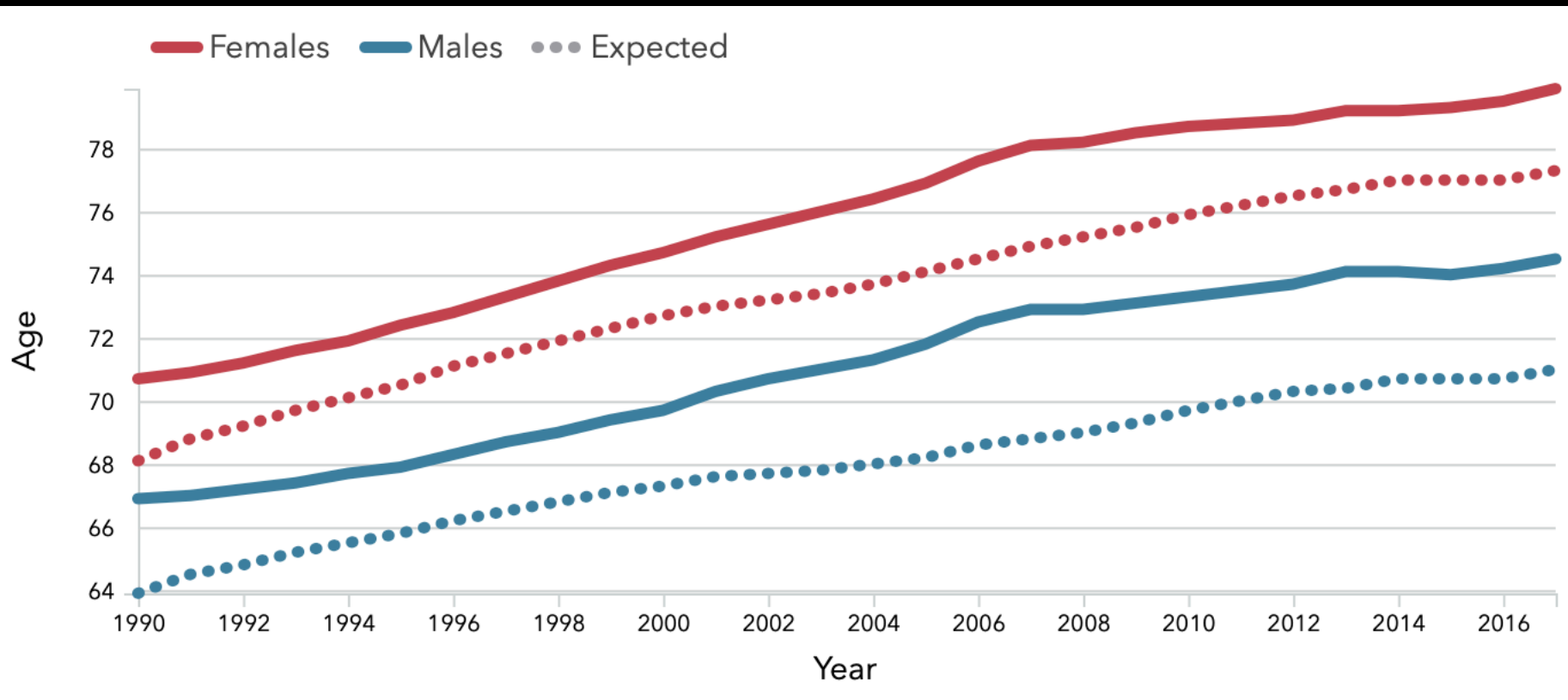




People's Republic of China's Nominal Gross Domestic Product (GDP) Between 1952 to 2005



Life Expectancy in China



Question

Physical health and economic development are inextricably linked. Stronger economic conditions foster greater health in all of the following ways, except which one?

- A. Water and sanitation
- B. Nutrition
- C. Medical services
- D. Incentives for increased fertility
- E. General and health education

Answer

Physical health and economic development are inextricably linked. Stronger economic conditions foster greater health through improvements in all of the following mechanisms, except which one?

- A. Water and sanitation
- B. Nutrition
- C. Medical services
- D. Incentives for increased fertility**
- E. General and health education

Conclusion Number Two

- Healthcare professionals must *advocate for ending military conflict*



Health Indicators

Nation	Life Expect @ Birth	Under 5 Mortality	Per Capita Health Expenditure
All Low Income	59 years (M 58/F 60)	11%	\$16
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In red: Nations at war or recently at war

Impact of War on Health

British Medical Journal: "In many war zones, violent deaths are often only a tiny proportion of overall deaths. Populations face a deterioration of their already poor health status, and excess deaths from infectious diseases will usually outnumber deaths due to direct violence." Regarding Congo.. "Of an excess mortality of 2.5 million, only 350,000 were because of direct violence; most died from malnutrition and infectious disease."

Comninellis 2 years in Angola



Angolan Civil War 1961-2002



War -> Fatherless, Husbandless

No functioning schools, businesses, phones,
roads, or law enforcement.
And landmines were everywhere.



Fighting the Deadliest Diseases of War



- Measles
- Malaria
- Malnutrition





Feeding 500 people - 20 At A Time

Angola Today



Samaritan's Purse



Conclusion Number Three

- Healthcare professionals must *advocate for effective disease interventions*

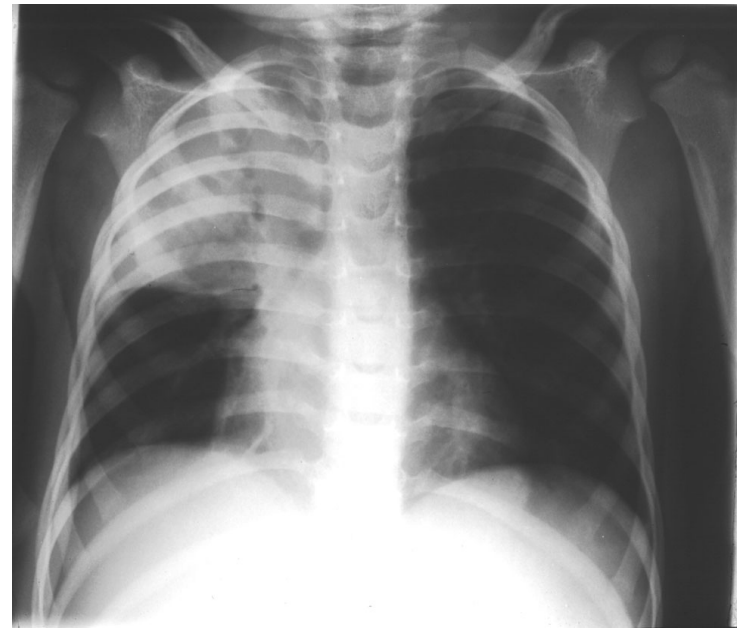


What Are the Leading Disease Interventions Against the Leading Causes of DALYs Lost?

We will now explore these
interventions one by one.

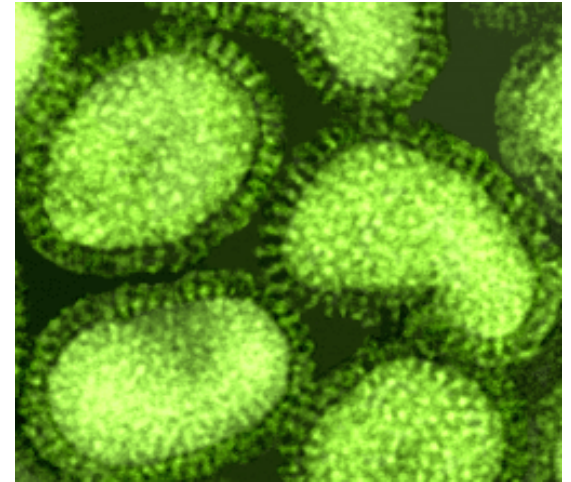
Pneumonia/Lower Respiratory Infection

Lower respiratory tract infections (LRTI), especially pneumonia, are a leading cause of death for children up to age 5 years.



Causes Of Pneumonia

- Leading Viral Causes:
Influenza, parainfluenza,
respiratory syncytial virus,
and adenovirus
- Leading Bacterial Causes:
Streptococcus pneumoniae,
Haemophilus influenzae,
and *Staphylococcus aureus*



Intervention Against Pneumonia

What is the lead strategy today for reducing deaths from pneumonia?



Intervention Against Pneumonia

- Primary prevention of pneumonia depends largely upon improved living conditions.
- *H. influenzae* and pneumococcal vaccines are cost-prohibitive and against serotypes found in wealthy nations
- Today's main intervention: Train parents to recognize early signs of pneumonia and to seek medical attention



Question

To provide basic medical care to all persons, many developing nations rely upon community health workers (CHWs). Though the skill sets differ, CHWs are typically expected to perform all of the following, except which one?

- A. Vaccination and well child care
- B. Midwifery
- C. Nutrition counseling
- D. Pursuit of higher medical training
- E. Treatment of common diseases

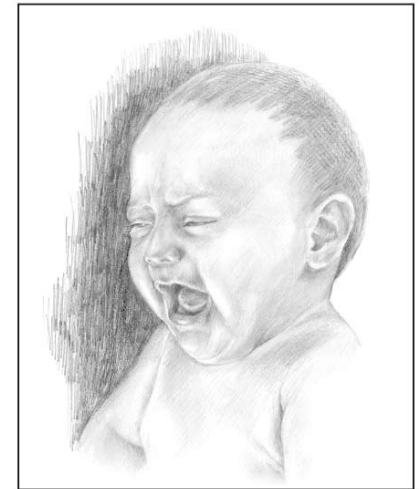
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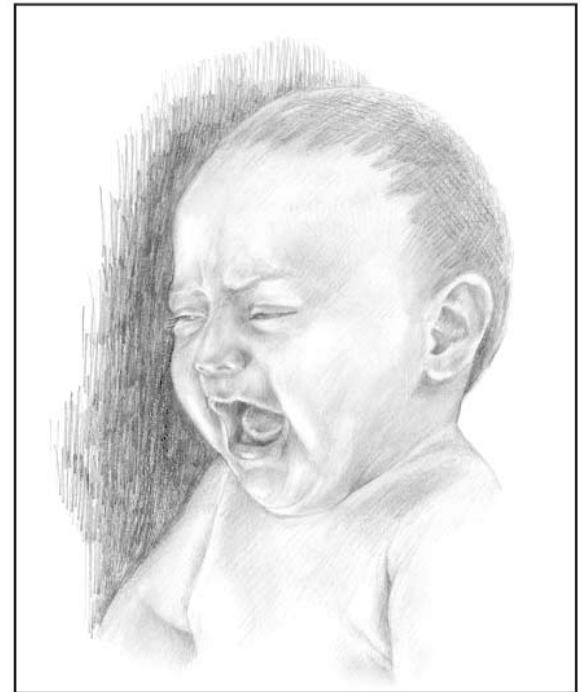
Diarrheal Diseases

- Children under 5 in developing countries have 2-3 diarrheal diseases a year.
- 3.3 million deaths result each year, accounting for roughly 25 percent of all childhood deaths.
- Diarrheal disease makes a more negative impact on growth of children than any other infectious disease.



Intervention Against Diarrheal Diseases

What are the leading interventions today against diarrheal diseases?

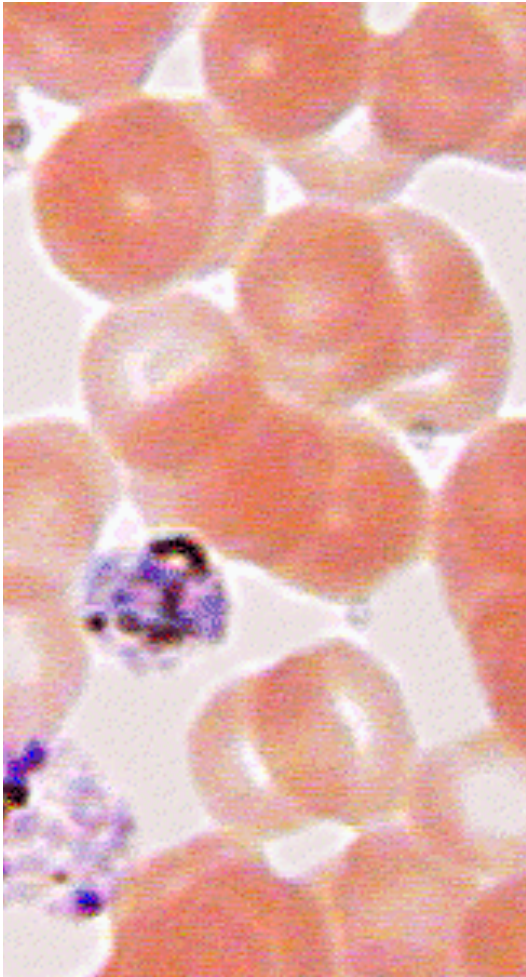


Interventions Against Diarrheal Diseases

- Provide safe drinking water
- Improve sanitation through latrines and sewers
- Promote hand washing and personal hygiene
- Reduce fly population
- Promote breastfeeding and proper weaning practices



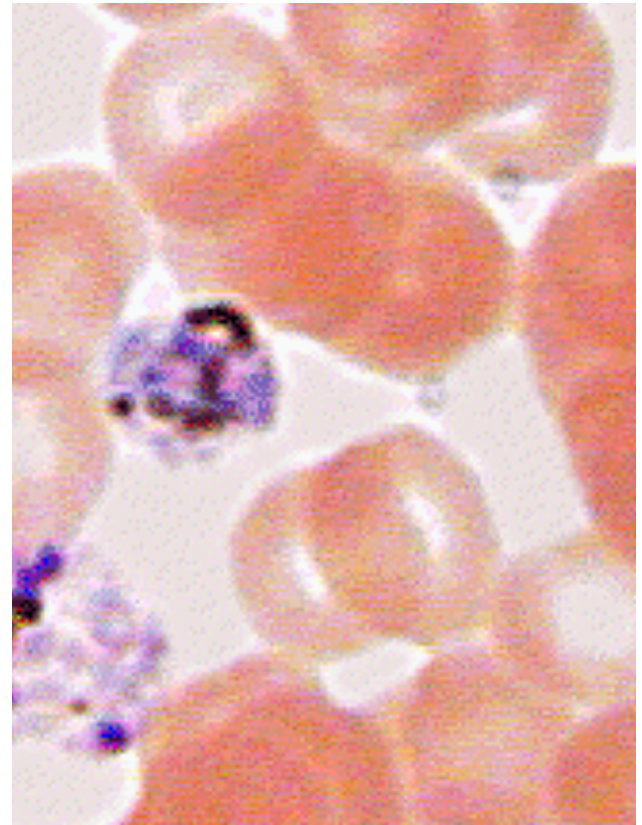
Malaria



- Most who die are African children < 5 years old.
- 2.3 billion people, 40% of the world population, are at risk.
- 300-500 million persons become infected each year.

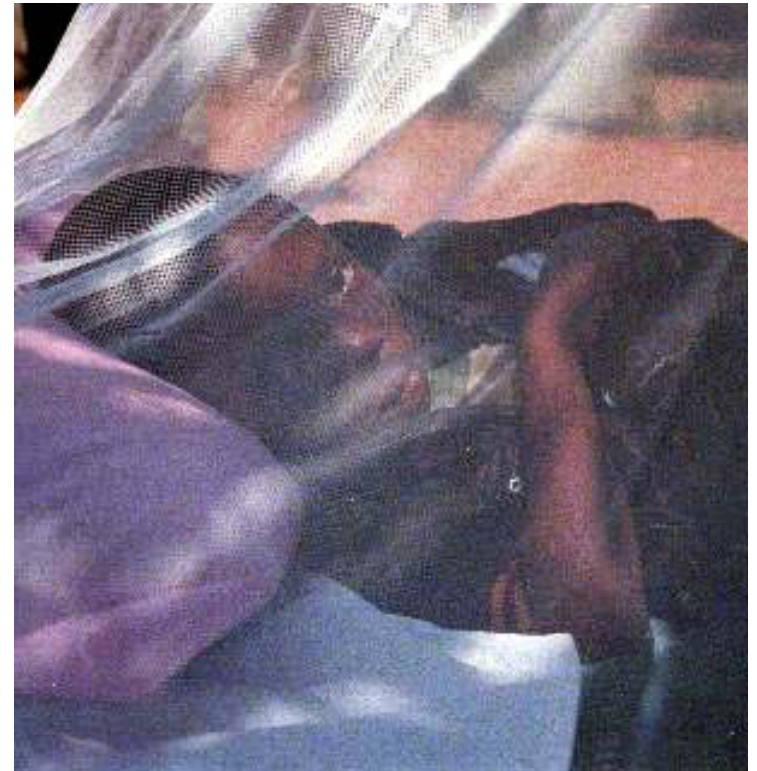
Interventions to Reduce Malaria

What is today's
lead strategy to
reduce deaths
from malaria?



Interventions To Reduce Malaria

- Case detection and treatment
- Personal repellents, indoor insecticide spraying, reducing standing water
- Insecticide-impregnated bed-nets
- Vaccine?



Question

Which of the following is *not* a mechanism by which malaria control is being pursued today?

- A. Drug chemoprophylaxis during rainy seasons
- B. Detection and treatment of malaria cases
- C. Personal measures like repellents and protective clothing
- D. Development of an effective malaria vaccine
- E. Disease surveillance and control

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Premature Birth & Obstetric Complications

- Most serious complications of pregnancy occur at the time of delivery.
- Beyond contraception, the greatest potential to improve maternal and neonatal outcomes lies in improving obstetrical care.



What are the most effective strategies to reduce prematurity and OB complications?



Interventions to Improve OB Outcomes

- Modern OB care
- Monitoring labor
- Treatment for infection, bleeding, pre-eclampsia, failure to progress, etc.
- Basic neonatal resuscitation and newborn care



Haiti's Maison de Naissance

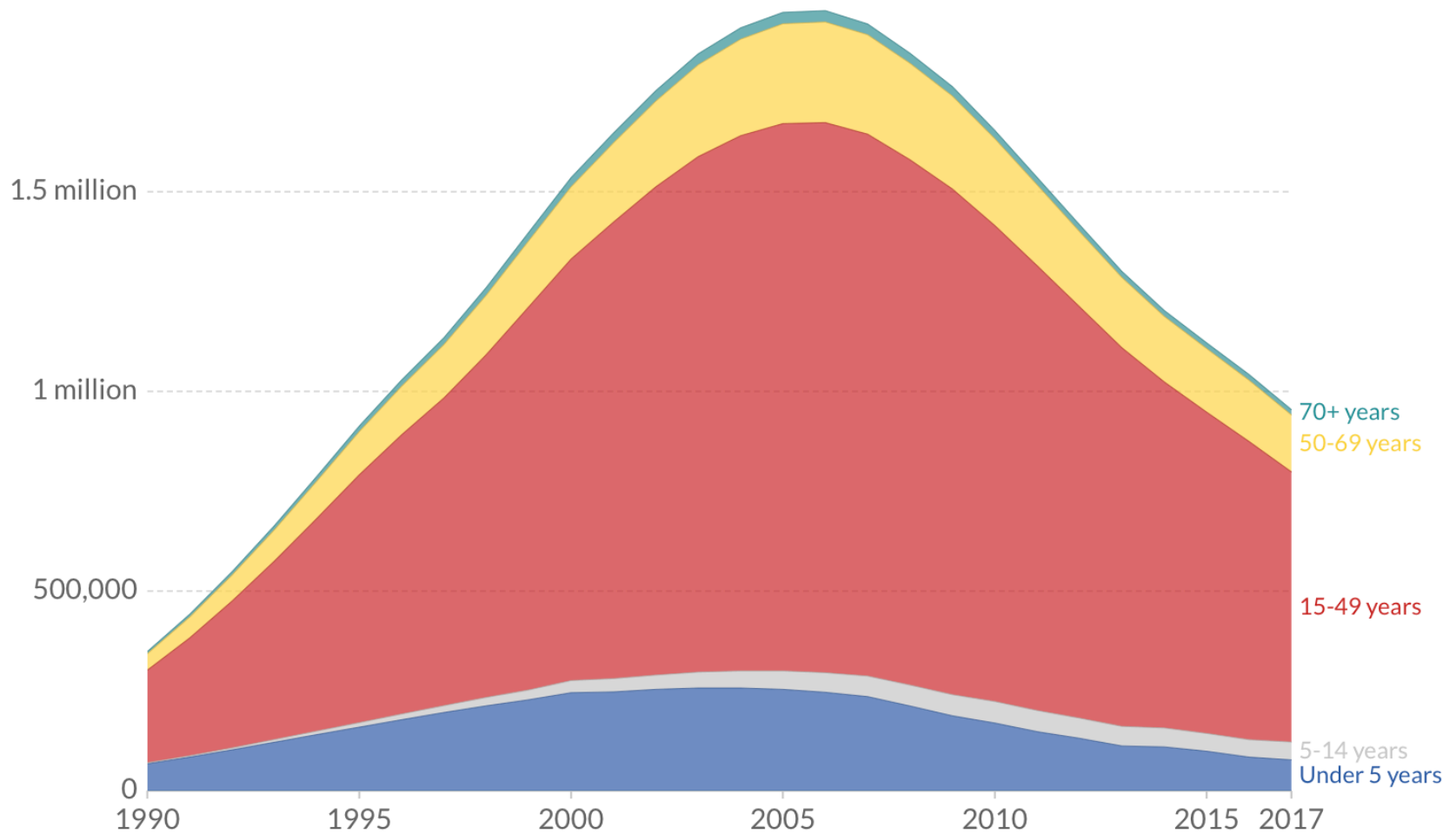
- A birthing home lead and staffed by Haitians
- Proving that even small health intervention can profoundly help mothers and their newborns



HIV/AIDS

Deaths from HIV/AIDS, by age, World, 1990 to 2017

Our World
in Data



What are
today's most
effective
interventions
against
HIV/AIDS?





WELCOME TO MWANDI

WE ARE CONCERNED ABOUT AIDS

A = ABSTAIN

B = BE FAITHFUL

C = CONDOMISE

OR YOU WILL

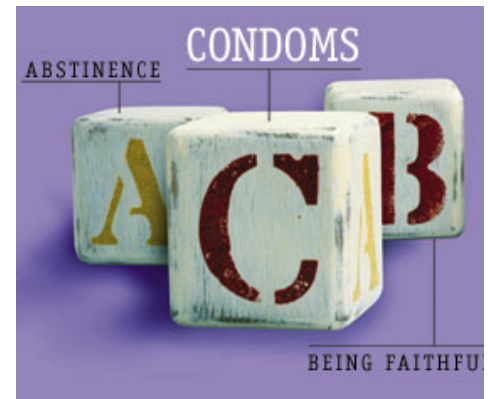
D = DIE

PROTECT YOURSELF AGAINST AIDS

Saint Augustine University of Tanzania

Uganda's ABC Results

- HIV prevalence declined from 21% to 6% between 1991 and 2000
- Males >1 sexual partner 41% to 21%
- Females >1 sexual partner 23% to 9%
- Males >3 sexual partners 15% to 3%
- Premarital sex in 15-24 males 60% to 23%
- Premarital sex in 15-24 females 53% to 16%



Prevention of Mother to Child Transmission (PMTCT)

- HIV pos mother has 20% chance of passing HIV to infant at delivery; 40% if she breast feeds her infant
- Detection and treatment at 28 weeks gestation can reduce transmission risk to as low as 2%!



Question

The transmission of HIV is particularly increased by which one of the following factors?

- A. Mothers who exclusively formula feed their infants
- B. Ready availability inexpensive HIV diagnostic tests
- C. Anti-Retroviral Therapy (ART)
- D. Social stigmata associated with the disease
- E. The symptomatic nature of early HIV infection

Answer

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- E. The symptomatic nature of early HIV infection

- Advocate economic development
- Advocate for ending military conflict
- Advocate for effective disease interventions



Continue A Distinguished Legacy



David
Livingston
Would Be
Proud Of
You