



GESM131- The Health of Populations: Epidemics and Their Causes

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Lecture 22

Epidemics and Plagues—NCDs

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HEALTH AND DISEASE IN THE NEWS



Supreme Court won't pause Obama water rule case

BY TIMOTHY CAMA - 04/03/17 10:22 AM EDT



The Supreme Court will not pause a case concerning the Obama administration's Clean Water Rule in a rebuke to the Trump administration.

The justices' decision came on Monday with no explanation.

The White House opposes the Environmental Protection Agency's (EPA) and Army Corps of Engineers' rule and asked the court to hold off on the case while the agencies formally consider repealing it.

The rule asserted federal power over small waterways such as streams and wetlands to protect them from pollution. It remains on hold after a federal appeals court in 2015 put a judicial stay on the measure while it is litigated.

The Tiny Trump Budget Cut That Could Blind America to the Next Zika

The Obamacare repeal would halve a little-known fund that's vital for monitoring unexpected infectious threats

ED YONG

MAR 18, 2017

SCIENCE



“I’m very concerned about our ability to respond to H7N9 bird flu or anything else that’s emerging.”

known, unglamorous, and modest fund. But it’s also vital for America’s ability to respond to infectious diseases, and especially to unforeseen emergencies like Ebola, Zika, or whatever else is coming next. If the Republican plan to repeal and replace the Affordable Care Act goes ahead, the ELC’s budget will be cut in half. That’s a loss of \$40 million—just 0.7 percent of the cut that’s planned for the NIH. But it alone would leave the U.S sluggish and myopic when it comes to infectious diseases.

Steve Baluyot at the New York health department’s Public Health Laboratories

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PUBLIC HEALTH WEEK 2017

Our Health, Our Community, Our Future

Join Us for:

- Free Health Screenings
- Community Resources
- Family Fun



Our Health,
Our Community,
Our Future

Improve your Health and Future

The future of health is empowering communities with the knowledge, resources, and choices to make lasting change. We need to work together to create communities that make the healthy choice the easy choice for everyone.

Join the Los Angeles County Department of Public Health in celebrating National Public Health Week on April 3 - 8, 2017.

The Community Wellness Fairs will provide free health assessments, information about staying healthy, emergency preparedness, and much more. Little steps can lead to big changes.

We encourage everyone to join us at these **FREE COMMUNITY EVENTS:**

school graduation rates. Be a champion for school-based health centers in your local schools. Become a mentor — you can make a difference!

Sources: <http://publichealth.lacounty.gov/phweek/>, <http://www.nphw.org/>

AN INITIATIVE OF THE **AMERICAN PUBLIC HEALTH ASSOCIATION**

APRIL 3-9, 2017

#NPHW


 125
  95



SITUATION REPORT
ZIKA VIRUS
MICROCEPHALY
GUILLAIN-BARRÉ SYNDROME
10 MARCH 2017
 DATA AS OF 9 MARCH 2017

KEY UPDATES

- Countries, territories and subnational areas reporting vector-borne Zika virus (ZIKV) infections for the first time since 1 February:
 - None
- Countries and territories reporting microcephaly and other central nervous system malformations potentially associated with ZIKV infection for the first time since 1 February:
 - Mexico, Saint Martin
- Countries and territories reporting Guillain-Barré syndrome cases associated with ZIKV infection for the first time since 1 February:
 - Curaçao, Trinidad and Tobago
- WHO, the United States Centers for Disease Control and Prevention and the European Centre for Disease Prevention and Control have developed a new Zika virus classification scheme.¹ The classification serves to categorize the presence of and potential for vector-borne ZIKV transmission and to inform public health recommendations. Based on the defined criteria and expert review, some countries, territories and subnational areas were reclassified and some were classified for the first time.
- In line with WHO's transition to a sustained programme to address the long-term nature of the disease and its consequences, this is the final WHO Zika situation report. WHO will continue to publish the Zika classification table (Table 1) on a regular basis as well as periodic situation analyses.

ANALYSIS

- Overall, the global risk assessment has not changed. ZIKV continues to spread geographically to areas where competent vectors are present. Although a decline in cases of Zika virus infection has been reported in some countries, or in some parts of countries, vigilance needs to remain high.

SITUATION

- Eighty-four countries, territories or subnational areas with evidence of vector-borne ZIKV transmission (Table 1).

Table 1. ZIKV classification^{2,3}

	WHO Regional Office	Country / territory / subnational area	Total
Category 1: Area with new introduction or re-introduction with ongoing transmission	AFRO	Angola; Cabo Verde; Guinea-Bissau	3
	AMRO/PAHO	Anguilla; Antigua and Barbuda; Argentina; Aruba; Bahamas; Barbados; Belize; Bolivia (Plurinational State of); Bonaire, Sint Eustatius and Saba; Brazil; British Virgin Islands; Cayman Islands; Colombia; Costa Rica; Cuba; Curaçao; Dominica; Dominican Republic; Ecuador; El Salvador; French Guiana; Grenada; Guadeloupe; Guatemala; Guyana; Honduras; Jamaica; Martinique; Mexico; Montserrat; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Saint Barthélemy; Saint Kitts and Nevis; Saint Lucia; Saint Martin; Saint Vincent and the Grenadines; Sint Maarten; Suriname; Trinidad and Tobago; Turks and Caicos Islands; United States of America; United States Virgin Islands; Venezuela (Bolivarian Republic of)	47
	SEARO	Maldives	1
	WPRO	American Samoa; Fiji; Marshall Islands; Micronesia (Federated States of); Palau; Papua New Guinea; Samoa; Singapore; Solomon Islands; Tonga	10
Subtotal			61
Category 2: Area either with evidence of virus circulation before 2015 or area with ongoing transmission that is no longer in the new or re-introduction phase, but where there is no evidence of interruption	AFRO	Burkina Faso; Burundi; Cameroon; Central African Republic; Côte d'Ivoire; Gabon; Nigeria; Senegal; Uganda	9
	AMRO/PAHO	Haiti	1
	SEARO	Indonesia; Thailand; Bangladesh	3
	WPRO	Cambodia; Lao People's Democratic Republic; Malaysia; Philippines; Viet Nam	5
Subtotal			18
Category 3: Area with interrupted transmission and with potential for future transmission	AMRO/PAHO	ISLA DE PASCUA – Chile	1
	WPRO	Cook Islands; French Polynesia; New Caledonia; Vanuatu	4
Subtotal			5
Category 4: Area with established competent vector but no known documented past or current transmission	AFRO	Benin; Botswana; Chad; Comoros; Congo; Democratic Republic of the Congo; Equatorial Guinea; Eritrea; Ethiopia; Gambia; Ghana; Guinea; Kenya; Liberia; Madagascar; Malawi; Mali; Mauritius; Mayotte; Mozambique; Namibia; Niger; Réunion; Rwanda; Sao Tome and Principe; Seychelles; Sierra Leone; South Africa; South Sudan; Togo; United Republic of Tanzania; Zambia; Zimbabwe	33
	AMRO/PAHO	Uruguay	1
	EMRO	Djibouti; Egypt; Oman; Pakistan; Saudi Arabia; Somalia; Sudan; Yemen	8
	EURO	Georgia; Região Autónoma da Madeira – Portugal; Russian Federation; Turkey	4
	SEARO	Bhutan; India; Myanmar; Nepal; Sri Lanka; Timor-Leste	6
WPRO	Australia; Brunei Darussalam; China; Christmas Island; Guam; Kiribati; Nauru; Niue; Northern Mariana Islands (Commonwealth of the); Tokelau; Tuvalu; Wallis and Futuna	12	
Subtotal			64
Total			148

Category 1: Area with new introduction or re-introduction with ongoing transmission

- a. A laboratory-confirmed autochthonous,⁴ vector-borne case of ZIKV infection in a country/territory/subnational area where there is no evidence of virus circulation before 2015, whether it is detected and reported by the country/territory/subnational area where infection occurred, or by another country by diagnosis of a returning traveller; or

¹ <http://apps.who.int/iris/bitstream/10665/254619/1/WHO-ZIKV-SUR-17-1-eng.pdf>



Question:

What defines a NCD?

What are NCDs?



- NCDs refer to conditions that are not infectious
- Technical definition includes: cancer, diabetes, mental illness, blindness, deafness, and genetic diseases (even violence and injury can be included)

What are NCDs?



Infectious / Communicable	Chronic / NCDs
<ul style="list-style-type: none">• Acute onset, limited duration	<ul style="list-style-type: none">• Slow onset, long duration
<ul style="list-style-type: none">• Many linked to infectious agents	<ul style="list-style-type: none">• Linked to lifestyle and environmental factors
<ul style="list-style-type: none">• Control lies with public health measures	<ul style="list-style-type: none">• Control lies with public health and clinical measures
<ul style="list-style-type: none">• Many are curable with antibiotics	<ul style="list-style-type: none">• Many are not curable

Infectious Diseases vs. NCDs



- Diseases long grouped as *infectious*, that is caused by a microbe, or as not caused by an infection, *non-communicable*.
- NCDs have also been referred to as *chronic diseases*.
- The distinction is arbitrary, as:
 - Some infectious diseases are chronic and last for decades, like successfully treated AIDS, and
 - Some NCDs are caused by microbes, like HPV and cervical cancer.

What are NCDs?



- WHO now focuses on 4 priority NCDs:
 - Cancer
 - cardiovascular disease
 - chronic respiratory disease
 - diabetes
- Cause 60% of all deaths globally



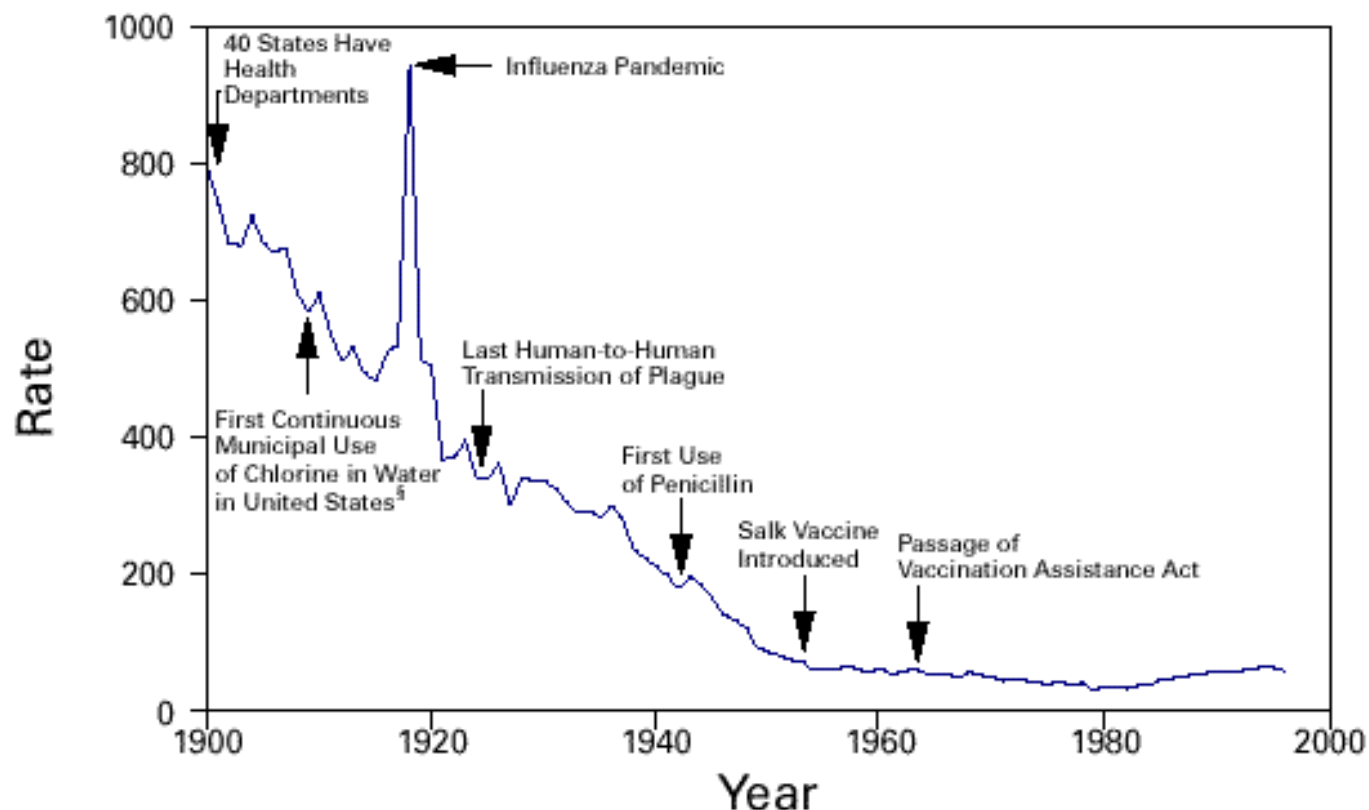
Four common risk factors

- Tobacco use
- Unhealthy diets
- Physical inactivity
- Harmful use of alcohol

Infectious disease trends: 1900 – 1996



FIGURE 1. Crude death rate* for infectious diseases — United States, 1900–1996†

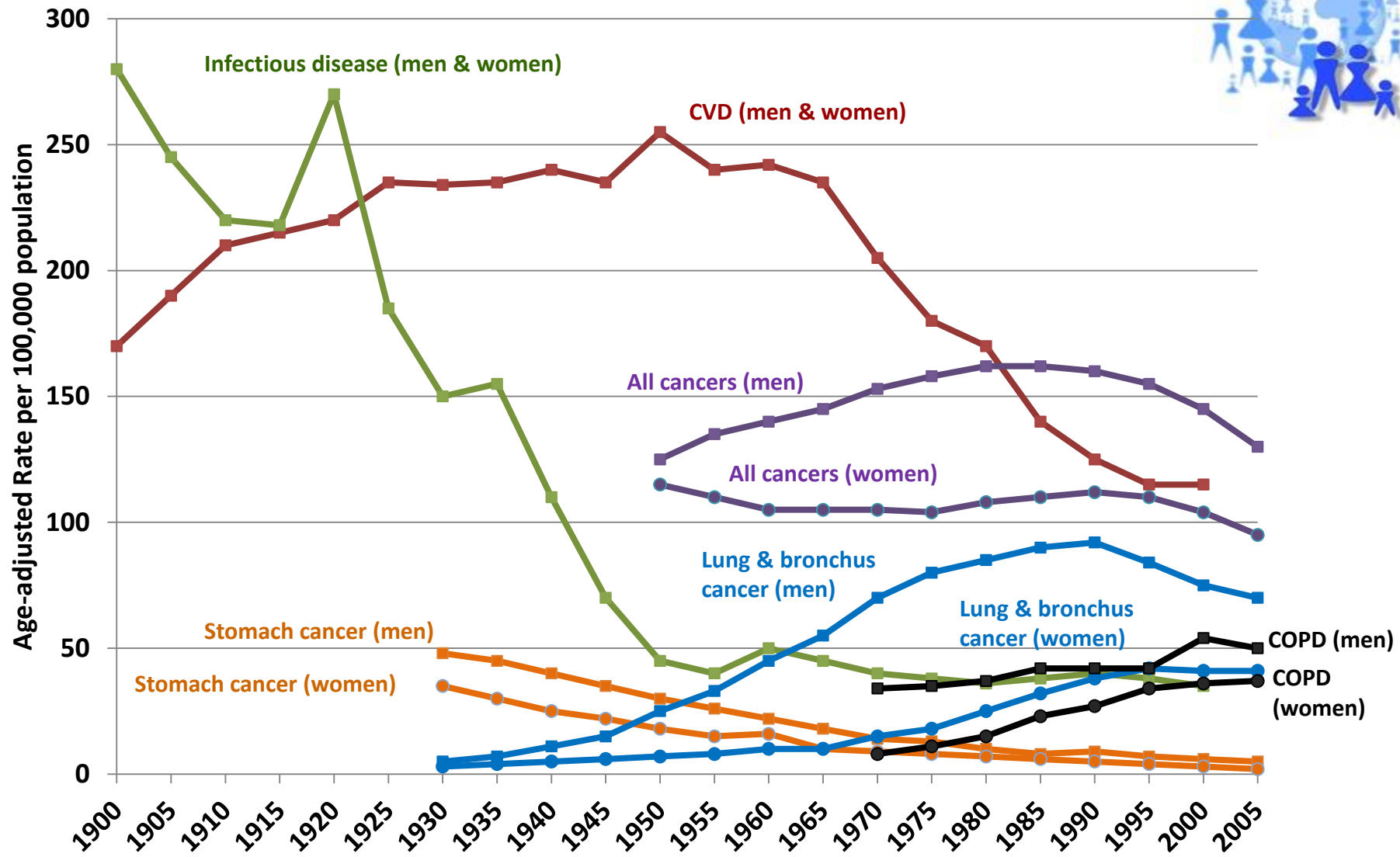


*Per 100,000 population per year.

†Adapted from Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. *JAMA* 1999;281:61–6.

‡American Water Works Association. Water chlorination principles and practices: AWWA manual M20. Denver, Colorado: American Water Works Association, 1973.

Selected mortality rates in US, 1900-2005



Sources: Infectious disease and CVD rates from Cutler et al. National Bureau of Economic Research; 2006. Age-adjusted rates for Stomach, Lung & Bronchus cancer from Cancer Facts & Figures 2009; Age-standardized rates for All Cancers from WHO Mortality Database: <http://www-dep.iarc.fr/>



NCDS—AN EXERCISE

Non-Communicable Diseases: A Warm-up



- Mayor Garcetti has appointed a task force to address Non-communicable Diseases (NCDs) in the city (and also the county) of Los Angeles. Your group has been tasked with characterizing NCDs in the county, particularly, [diabetes/ obesity/ cardiovascular disease/ cancer]. Find data that describes the impact of the disease in LA County and propose approaches to reduce the impact.
- Write the three points that you would offer to the mayor.

Background Links



Background:

- <http://publichealth.lacounty.gov/>
- http://publichealth.lacounty.gov/cardio/docs/2012-08-01%20SPA%20Map%20with%20cities_al.pdf

Mortality Reports



Mortality Reports:

- <http://publichealth.lacounty.gov/phcomm/public/reports/rptsurvdisplay.cfm?surv=Yes&unit=all&ou=ph&prog=ph>

Diabetes Links



Diabetes:

- http://www.publichealth.lacounty.gov/ha/reports/LAHealthBrief2011/Diabetes/Diabetes_2012_FinalS.pdf

Obesity Links



Obesity:

- http://publichealth.lacounty.gov/wwwfiles/p/h/hae/ha/Obesity_2012_sFinal.pdf
- http://publichealth.lacounty.gov/ha/reports/habriefs/2007/Obese_Cities/Obesity_2011Fs.pdf

Cardiovascular Disease Links



Cardiovascular Disease:

- http://lapublichealth.org/epi/docs/CHR_CVH.pdf
- <http://lapublichealth.org/ha/reports/habriefs/CardiovascularDiseas7CFEA.pdf>
- <http://publichealth.lacounty.gov/owh/docs/Healthy%20Aging%20Conference/ZenaidaFeliciano.pdf>
- http://publichealth.lacounty.gov/ha/reports/Hypertension_final.pdf

Cancer Links



Cancer:

- <http://keck.usc.edu/cancer-surveillance-program/research/>
- <http://www.cancer-rates.info/ca/index.php>

Report Template



- 1. How big is the problem?
- 2. What is the trend?
- 3. What would you tell the mayor (in 3 points)?



NCD MYTHBUSTERS

MYTH #1



- NCDs are only a problem in high-income countries.

FACTS (#1)



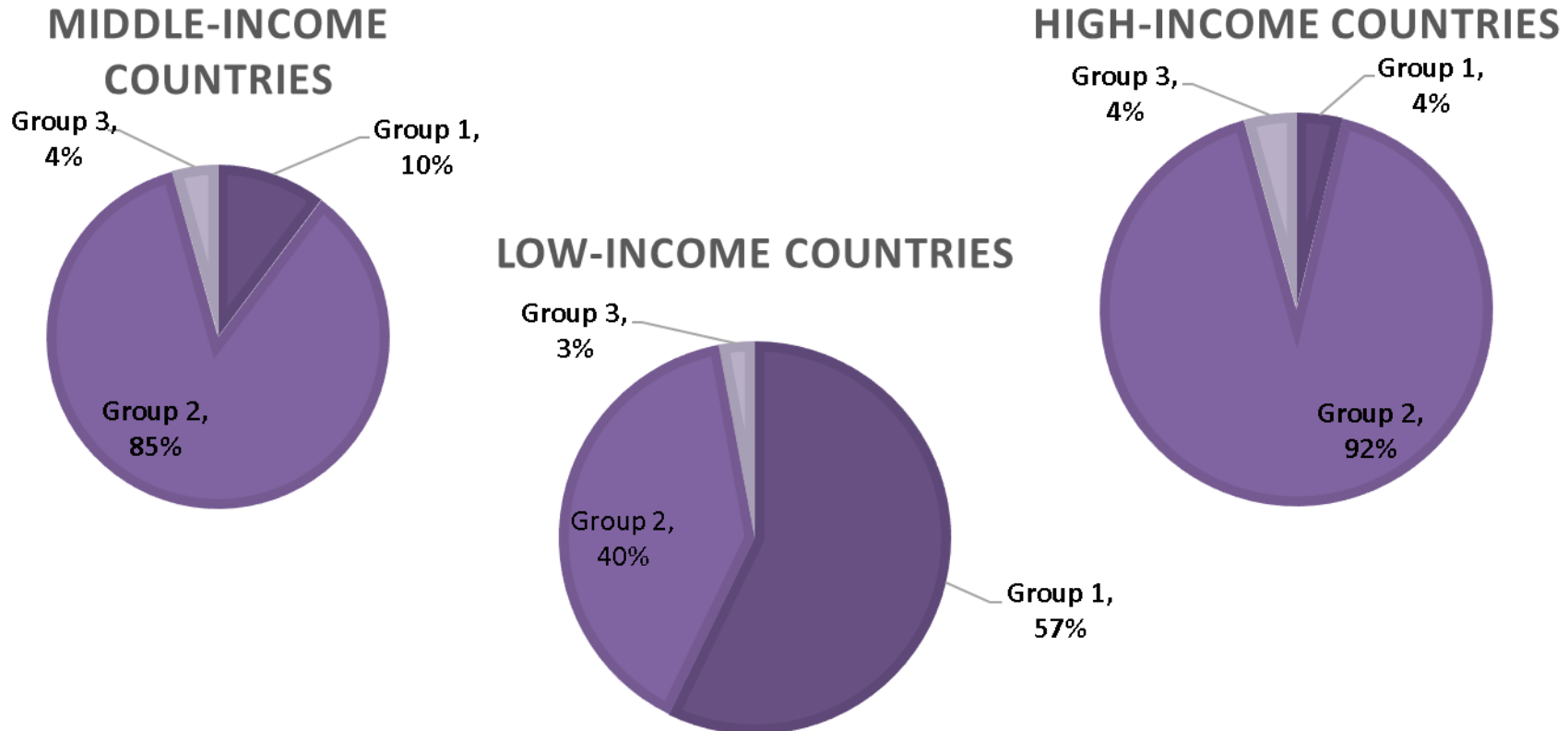
- 4 out of 5 (80% or 29 million) NCD deaths are in low and middle income countries. The large majority of those suffering from NCDs live in low- and middle-income countries.
- The estimated percentage increase in cancer incidence by 2030, compared with 2008, will be greater in low- (82%) and lower-middle-income countries (70%) compared with the upper-middle- (58%) and high-income countries (40%).
- NCDs are a key development challenge: NCDs can force many people into, or entrench them in poverty due to catastrophic expenditures for treatment. They also have a large impact on undercutting productivity.

FACTS (#1)



- NCDs account for the majority of deaths in all regions with the exception of sub-Saharan Africa
 - NCD mortalities are projected to overtake infectious disease in sub-Saharan Africa by 2030
- The greatest increase in overall NCD deaths:
 - African region (27%)
 - Eastern Mediterranean region (25%)
 - Highest absolute number of deaths will occur in the Western Pacific and South-East Asia regions
- 82% of CVD deaths take place in low- and middle-income countries
- Almost 90% of COPD deaths occur in low- and middle-income countries
- More than 80% of diabetes deaths occur in low- and middle-income countries.

Facts (#1)



Group 1: Communicable, maternal and perinatal conditions, and nutritional disorders

Group 2: Non-Communicable diseases

Group 3: Injuries

MYTH #2



- NCDs mainly affect rich people.

FACTS (#2)



- In all but the least developed countries of the world, **poor people are much more likely than the wealthy to develop chronic diseases and are more likely to die** as a result.
- While NCDs are on the rise worldwide they disproportionately affect the poor and marginalized. Keeling described diabetes as “a horrific intergenerational tax on the poor,” given the human and economic cost when multiple family members suffer from the disease.
- Poverty is both a cause and a consequence of NCDs.

MYTH #3



- Low- and middle-income countries should control infectious disease before they tackle chronic disease.

FACTS (#3)



- While low- and middle-income countries continue to deal with the problems of infectious diseases, they are experiencing a rapid upsurge in chronic disease risk factors and deaths, especially in urban settings.
- The estimated percentage increase in cancer incidence by 2030, compared with 2008, will be greater in low- (82%) and lower-middle-income countries (70%) compared with the upper-middle- (58%) and high-income countries (40%).
- While infectious disease deaths are projected to decline by about 7 million over the next 20 years, cardiovascular disease and cancer deaths are expected to increase by 10 million.

MYTH #4



- NCDs are only a problem for the elderly.

FACTS (#4)



- Half of the people worldwide who are affected by NCDs are working age, not elderly.
- More than 9 million deaths of all deaths attributed to NCDs occur BEFORE the age of 60.
 - NCDs also kill at a younger age in low- and middle-income countries, where 29% of NCD deaths occur among people under the age of 60, compared to 13% in high-income countries.

MYTH #5



- NCDs are a problem for men but not women.

FACTS (#5)



- NCDs kill 18 million women per year
 - Cardiovascular disease causes 8.6 million deaths among women per year (the number one killer in women worldwide).
- 2015: Age-standardized NCD death rates in **low** income countries were 155.86 per 100,000 in males and 165.33 per 100,000 in female
- 2015: Age-standardized NCD death rates in **middle** income countries were 405.35 per 100,000 in males and 290.57 per 100,000 in females
- 2015: Age-standardized NCD death rates in **high** income countries were 532.14 per 100,000 in males and 459.34 per 100,000 in females

FACTS (#5)



TEN LEADING GLOBAL CAUSES OF DEATH IN FEMALES, 2008⁵

Rank	Cause	Number of deaths	%
1	Cardiovascular diseases	9,127,416	33.2
2	Infectious and parasitic diseases	3,811,044	13.9
3	Cancer	3,566,128	13.0
4	Respiratory diseases	2,018,967	7.3
5	Respiratory infections	1,812,342	6.6
6	Unintentional injuries	1,408,698	5.1
7	Perinatal conditions	1,379,337	5.0
8	Digestive diseases	865,847	3.1
9	Diabetes mellitus	723,273	2.6
10	Neuropsychiatric conditions	640,406	2.3
		27,501,236	

MYTH #6



- All NCDs are preventable.

FACTS (#6)



- A large percentage of NCDs are preventable through the reduction of the four main behavioral risk factors: tobacco use, physical inactivity, harmful use of alcohol, and unhealthy diet. However, some NCDs are not preventable and it is important to focus attention on **treatment** along with prevention and control.
- Improved treatment following cardiovascular events has led to dramatic declines in mortality rates. Similarly, progress in cancer treatment combined with early detection and screening interventions have improved survival rates for many cancers in high-income countries.
- Treatment requires strengthening primary health-care systems and:
 - Increased access to high-quality, low-cost medicines for people at high risk of heart disease or stroke, and for people who already have diabetes, cancer, and chronic respiratory diseases, especially as these treatments tend to be long-term or even life-long.
 - Provision of affordable vaccines, as appropriate, to people at risk of infection-related cancers
 - Provision of pain relief for end-of-life care
- Cost: Treatment for diabetes, cancer, cardiovascular diseases and chronic respiratory diseases can be protracted and therefore extremely expensive. Such costs can force families into catastrophic spending and impoverishment.

MYTH #7



- People with NCDs are at fault and to be blamed because of their unhealthy lifestyles.

FACTS (#7)



- Individual responsibility, while important, only has full effect where people have **equitable access to healthy choices**.
 - Socioeconomic status limits food choices, working conditions, and access to health care.
 - Governments have a crucial role to play in improving health by altering the social and physical environment to help make the healthy choice the easy choice.

MYTH #8



- NCDs are not as damaging to individuals, families and communities as infectious disease.

FACTS (#8)



- Cause 60% of deaths globally.
- NCDs will be responsible for three times as many disability adjusted life years (DALYs) as communicable diseases, maternal, perinatal and nutritional conditions combined, by 2030.
- Death or disability of a household income earner can impoverish an entire family. NCD treatment can be costly, especially due to its chronic nature, and cause substantial financial burden. Pushing individuals and households into poverty.

FACTS (#8) ANY UPDATE??



- Economic Burden of NCDs globally:
 - Cost-of-illness approach: estimates of direct and indirect costs of ill health for five distinct disease categories are:
 - Cancer: an estimated US\$ 290 billion in 2010 rising to US\$ 458 billion in 2030.
 - Cardiovascular disease: an estimated US\$ 863 billion in 2010 rising to US\$ 1.04 trillion in 2030.
 - COPD: an estimated US\$ 2.1 trillion in 2010 US\$ rising to US\$ 4.8 trillion in 2030.
 - Diabetes: an estimated nearly US\$ 500 billion in 2010 rising to at least US\$ 745 billion in 2030.
 - Mental illness: an estimated US\$ 2.5 trillion in 2010 rising to US\$ 6.0 trillion by 2030.
 - Value of lost output: lost output from five conditions (cancer, cardiovascular disease, chronic respiratory diseases, diabetes and mental health) over the period 2011-2030 is estimated at nearly US\$ 47 trillion.
 - Value of a statistical life: the economic burden of life lost due to all NCDs ranges from US\$ 22.8 trillion in 2010 to US\$ 43.3 trillion in 2030.

MYTH #9



- There is a clear distinction between infectious and non-communicable diseases.

FACTS (#9)



- Diseases long grouped as *infectious*, that is caused by a microbe, or as not caused by an infection, *non-communicable*. NCDs have also been referred to as *chronic diseases*.
- The distinction is arbitrary, as:
 - Some infectious diseases are chronic and last for decades, like successfully treated AIDS
 - Some NCDs are caused by microbes, like HPV and cervical cancer or Hepatitis and liver cancer

MYTH #10



- NCDs are too difficult and expensive to control effectively.

FACTS (#10)



- Cost-effective technologies **do exist** to fight NCDs and while new ones are being rolled out there's still a need for investment in treatment and prevention.
- These strategies are estimated to be able to prevent 80% of global heart disease and diabetes. Medications for high blood pressure are effective and cost a mere few cents per day, for instance, yet they remain consistently unavailable to people who need them most.

MYTH #11



- NCDs represent a health crisis for future generations, not our own.

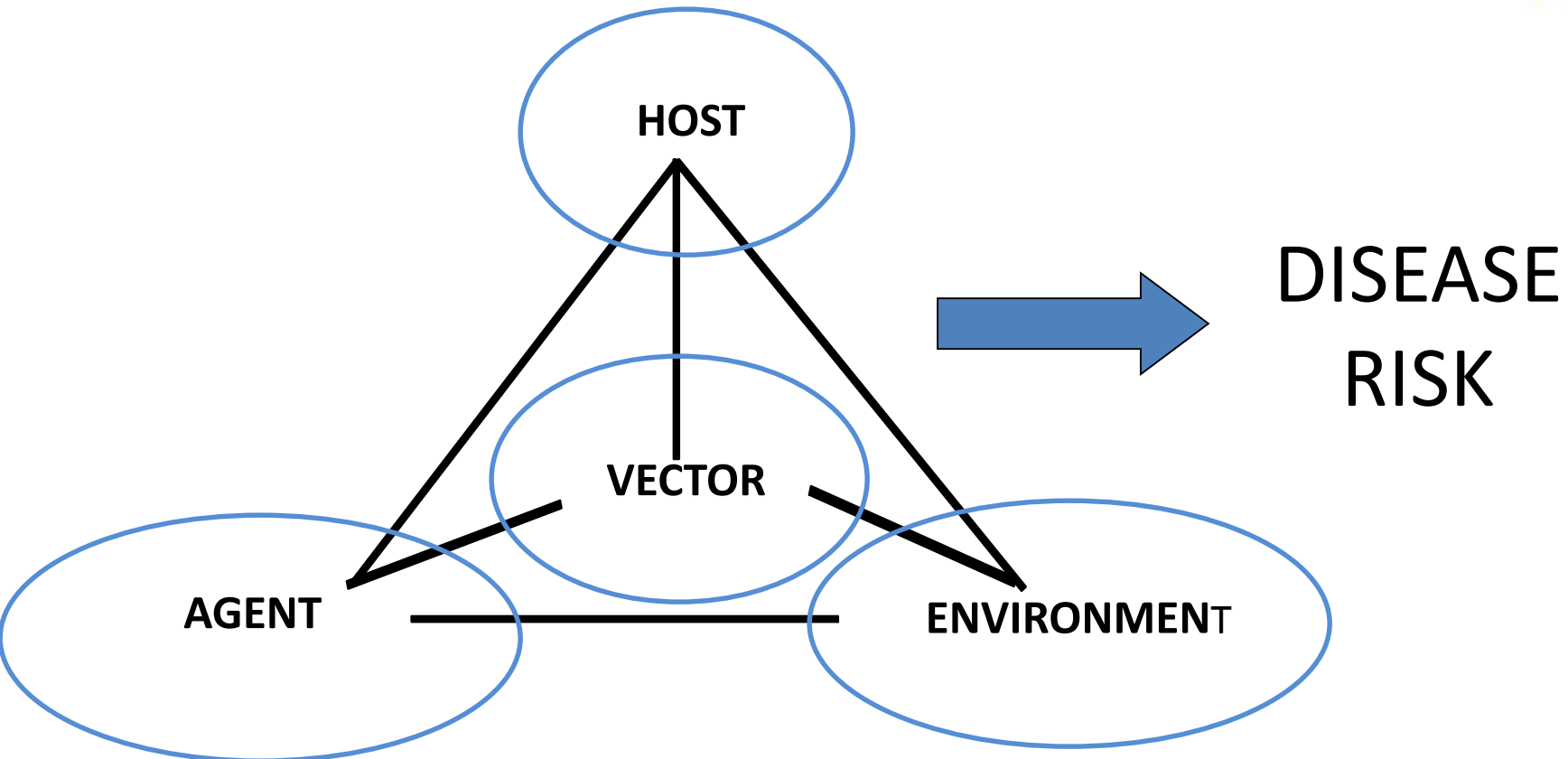
FACTS (#11)



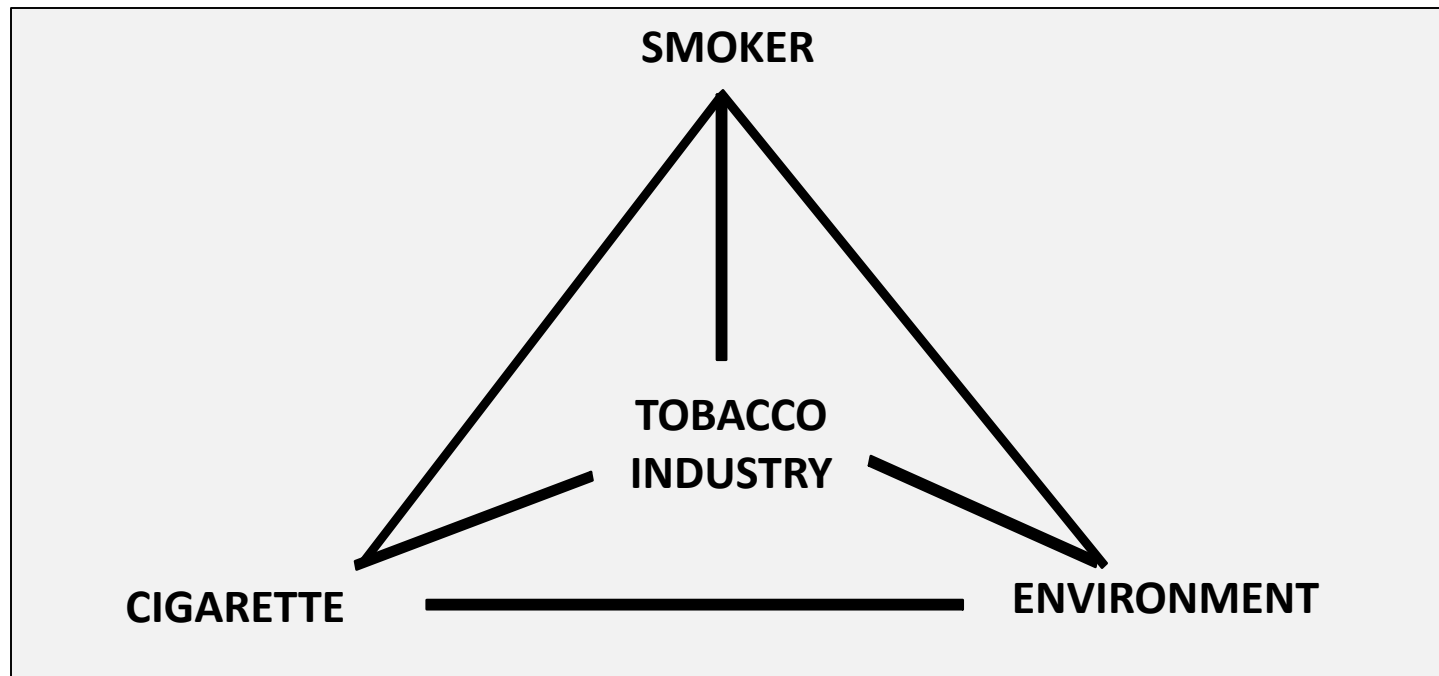
- NCDs are often seen as a problem society will face in coming decades, when, in fact, the global community is already in the midst of a chronic disease epidemic, and their mitigation is something we cannot afford to postpone.
- NCDs are identified as the second biggest threat to the global economy in terms of probability and potential economic loss
- The WHO estimates that between 2005 and 2015 income loss due to NCDs could rise to as much as US\$ 558 billion in China, US\$ 237 billion in India, US\$ 303 million in Russia and US\$ 33 billion in the United Kingdom
- The losses in productivity associated with NCDs, through disability, unplanned absences and increased accidents, are as much as 400% more than the cost of treatment



The epidemiologic triangle



The epidemiologic triangle and the tobacco epidemic



An addicting agent; a successful vector, and a supporting environment

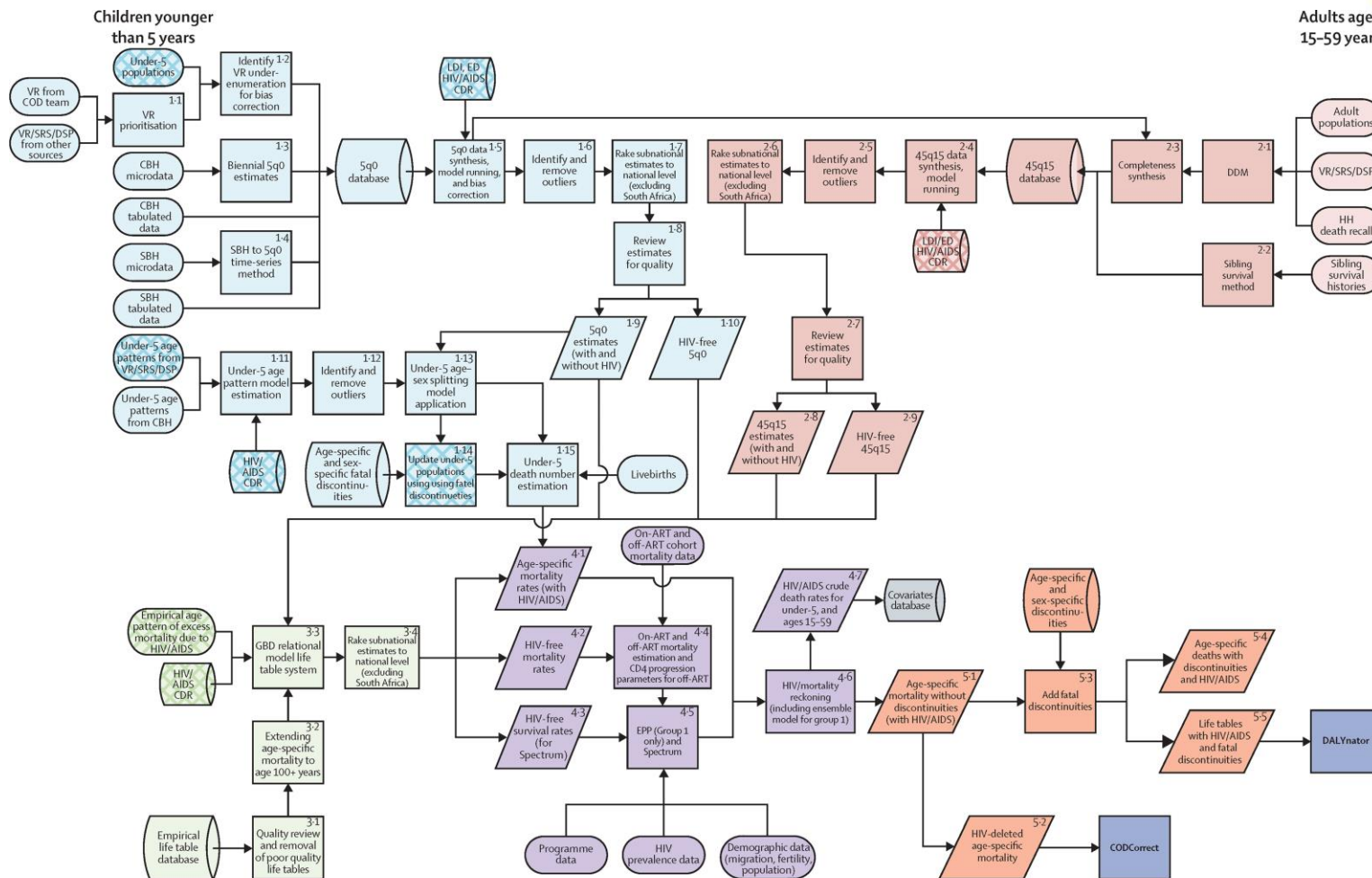
An issue of globalization, rights, and development



GLOBAL BURDEN OF DISEASE 2015

Components of GBD 2013 and their relations

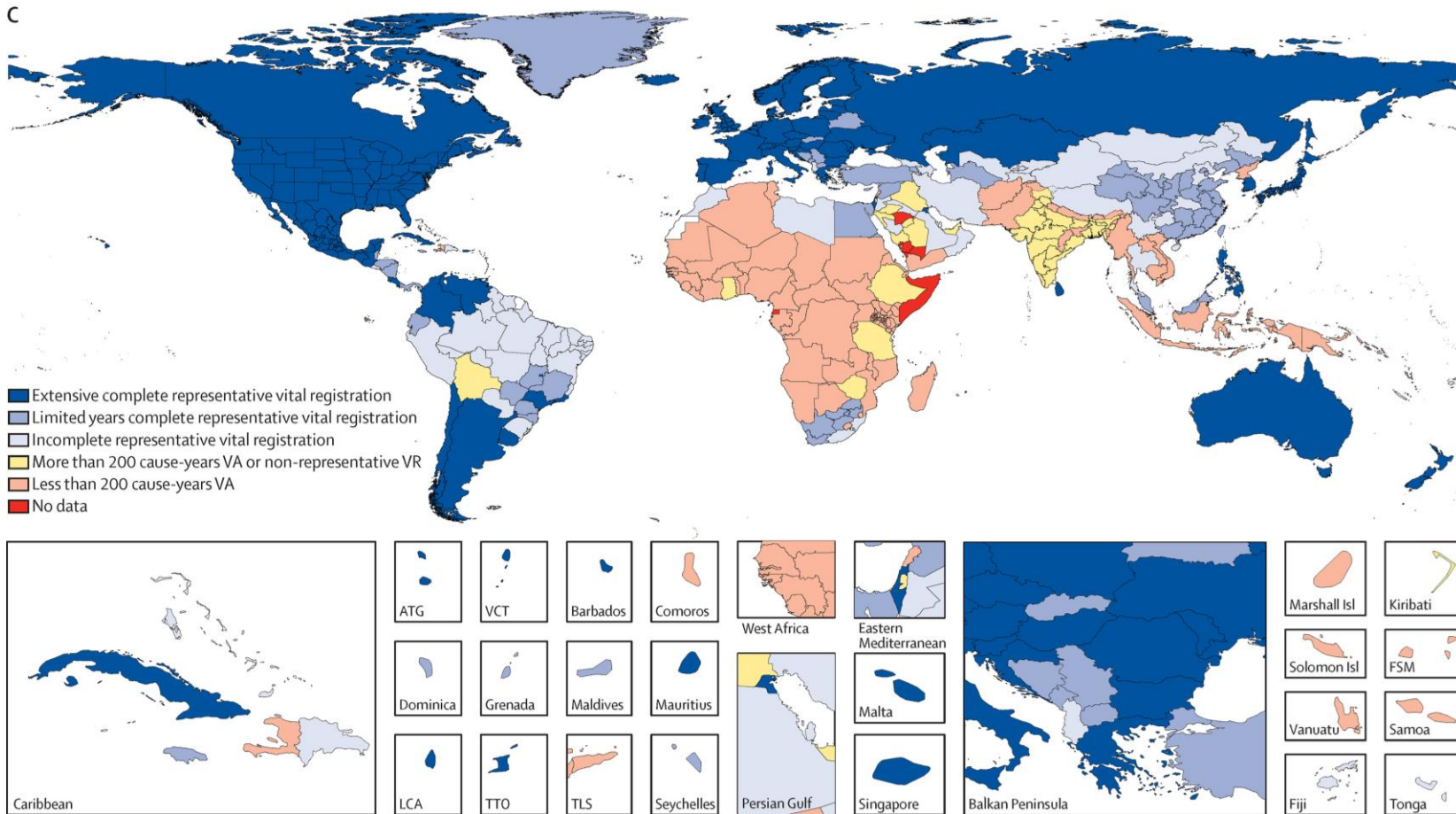
The Global Burden of Disease Study 2015



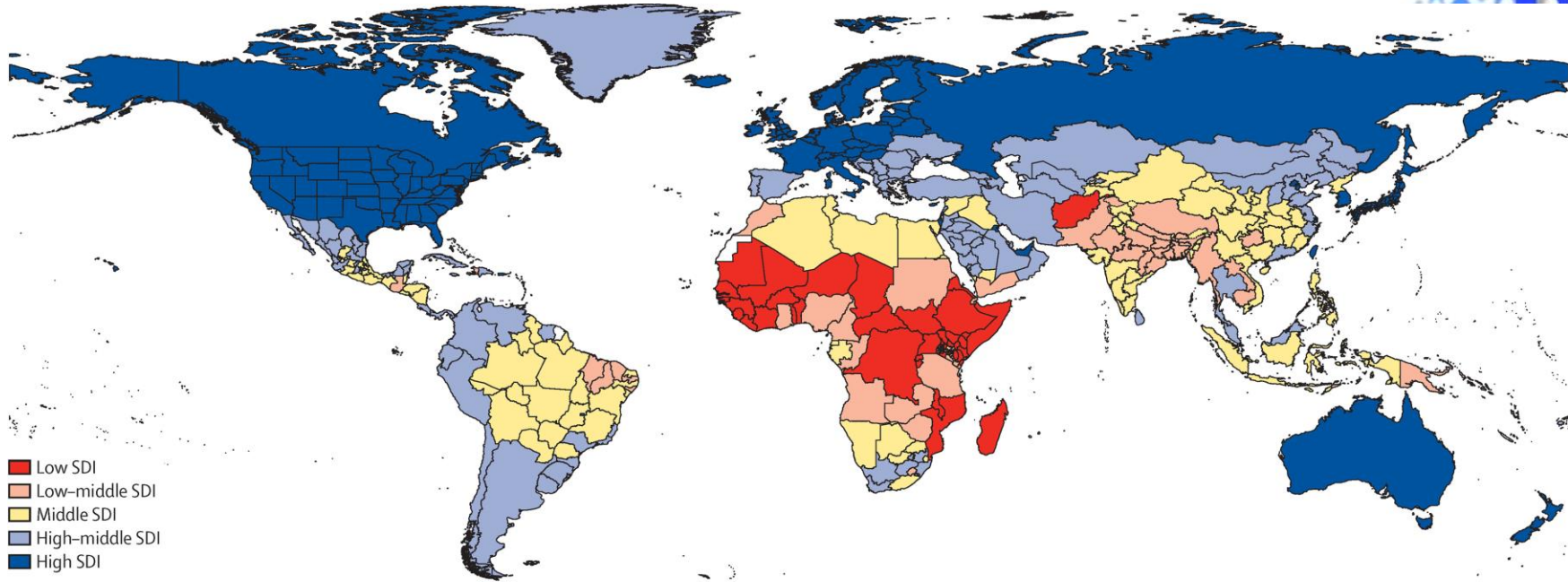
Shapes
 ○ Input ▱ Results
 □ Process ▭ Database

Colours and patterns
 ■ Under-5 mortality estimation ■ HIV/AIDS estimation ■ Final estimates
 ■ Adult mortality estimation ■ Re-estimating all-cause mortality with HIV/AIDS and fatal discontinuities
 ■ Age-specific and sex-specific all-cause mortality generation ■ Input updated when process repeats

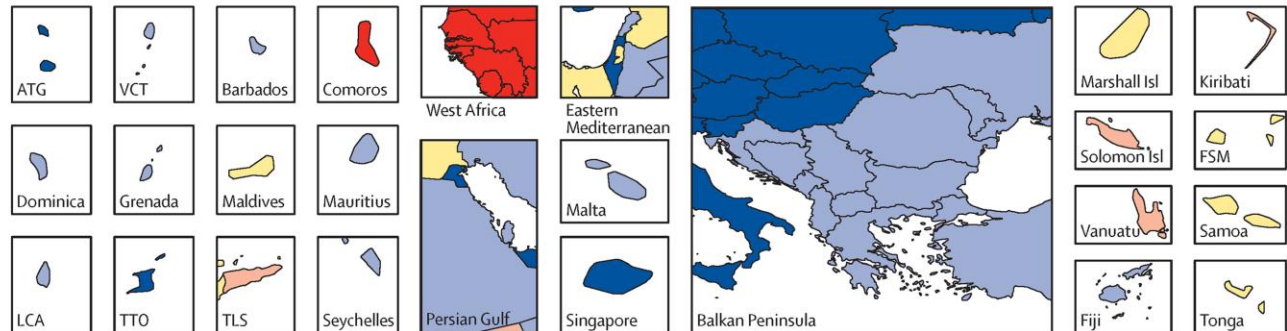
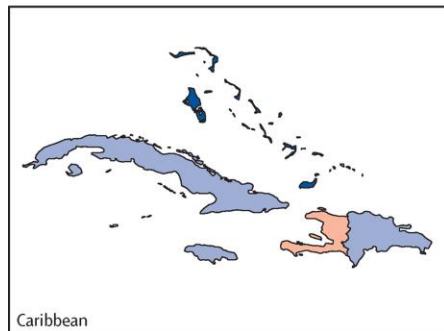
Site-years for all causes of death by country, 1980-2014



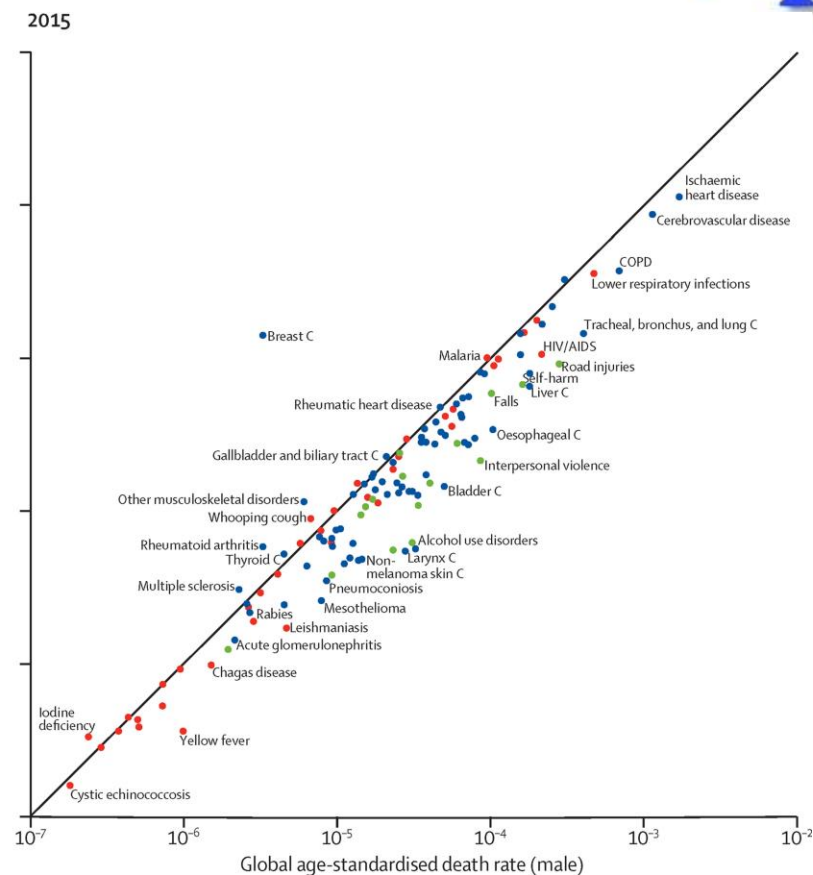
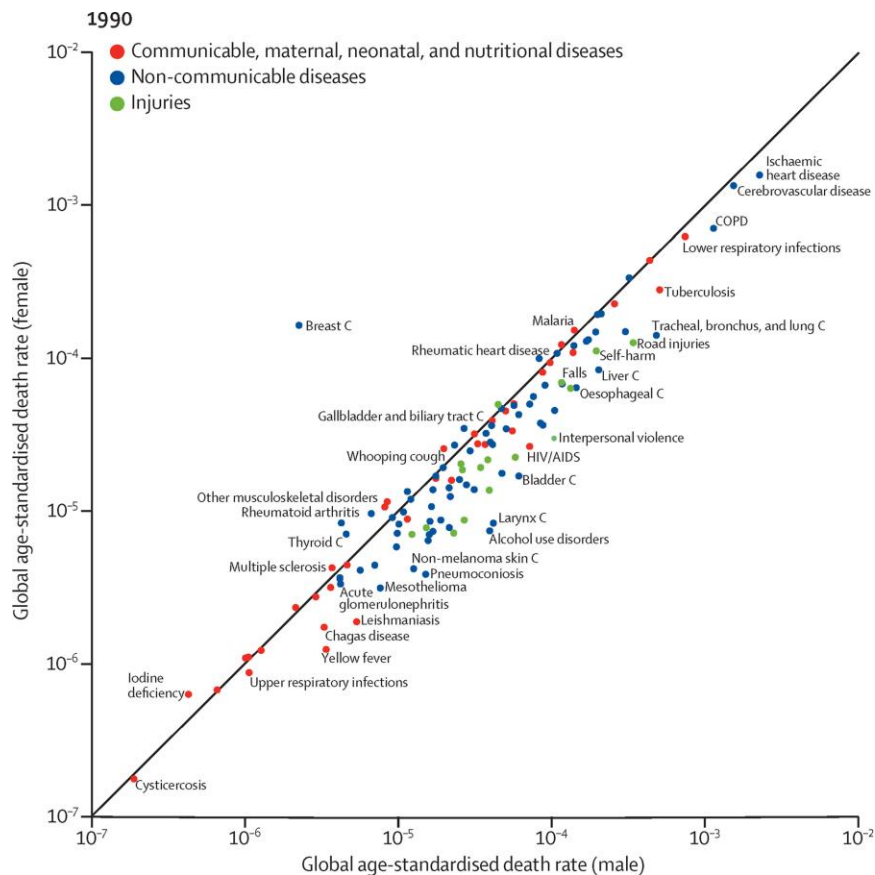
SDI quintiles by GBD subnational Level 1 geography for all cause mortality, 1980-2014



- Low SDI
- Low-middle SDI
- Middle SDI
- High-middle SDI
- High SDI

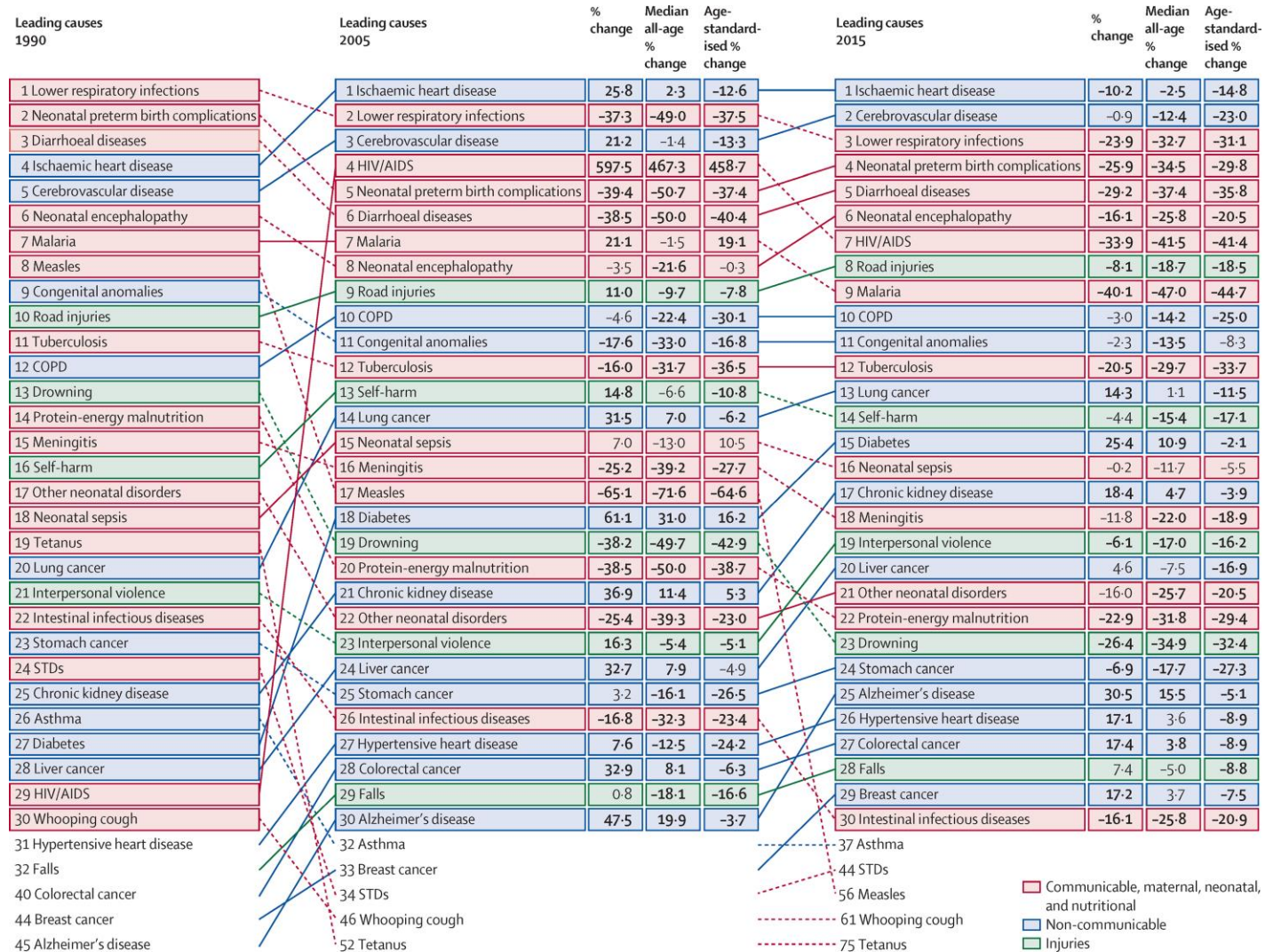


Global age-standardized death rates for males vs females, 1990 and 2015



*Level 3 causes

Leading 30 causes of global years of life lost in 1990, 2005, and 2015



*Level 3 causes of global YLLs for both sexes combined



Question:

Why Do Epidemiologic
Research?



Answer:

To reduce morbidity and mortality
with the goal of

**PREVENTION OF DEATH AND
DISABILITY**



Prevention

Primary:

Find and remove causes

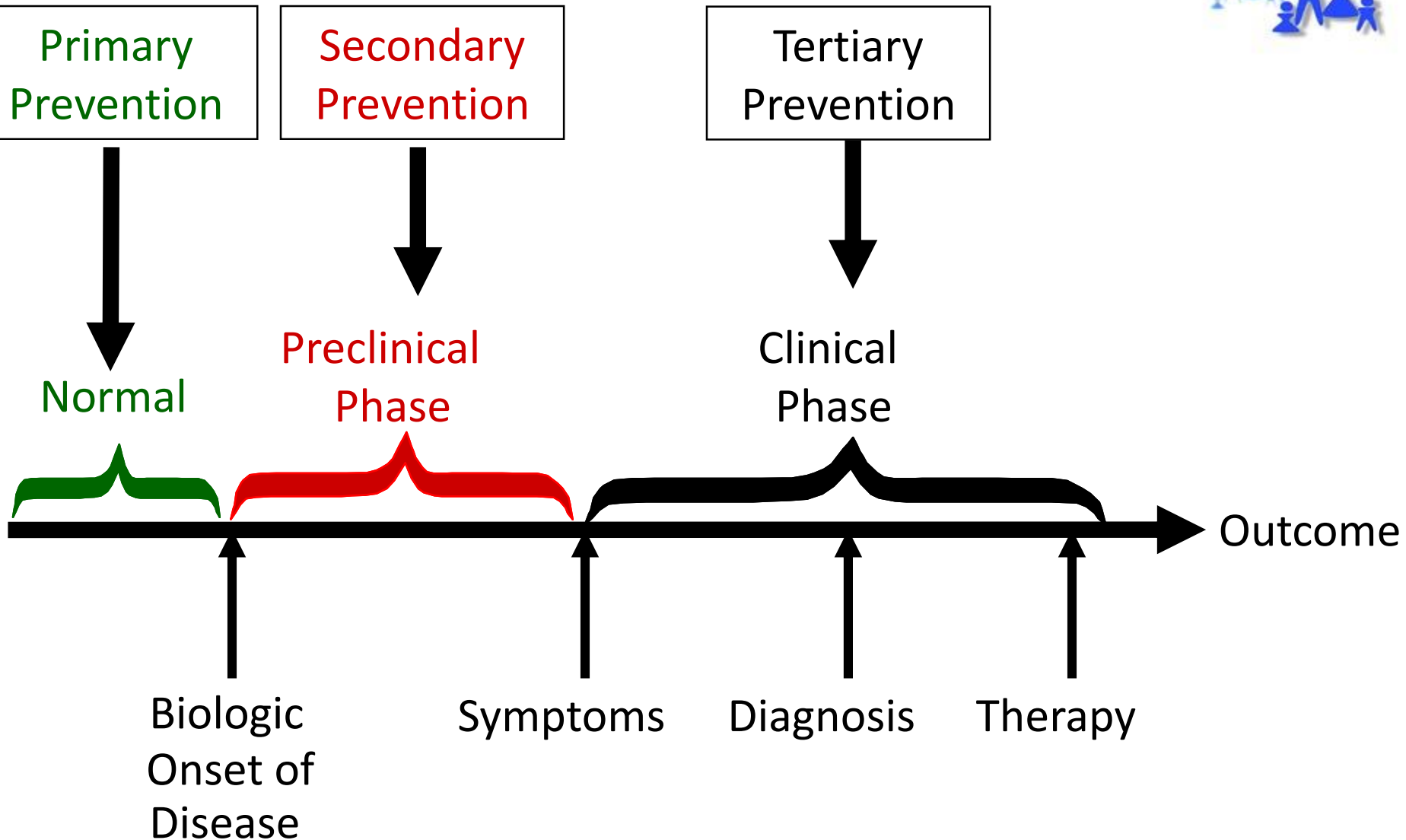
Secondary:

Find early disease and treat it

Tertiary:

Treat disease clinically

Preventing Disease



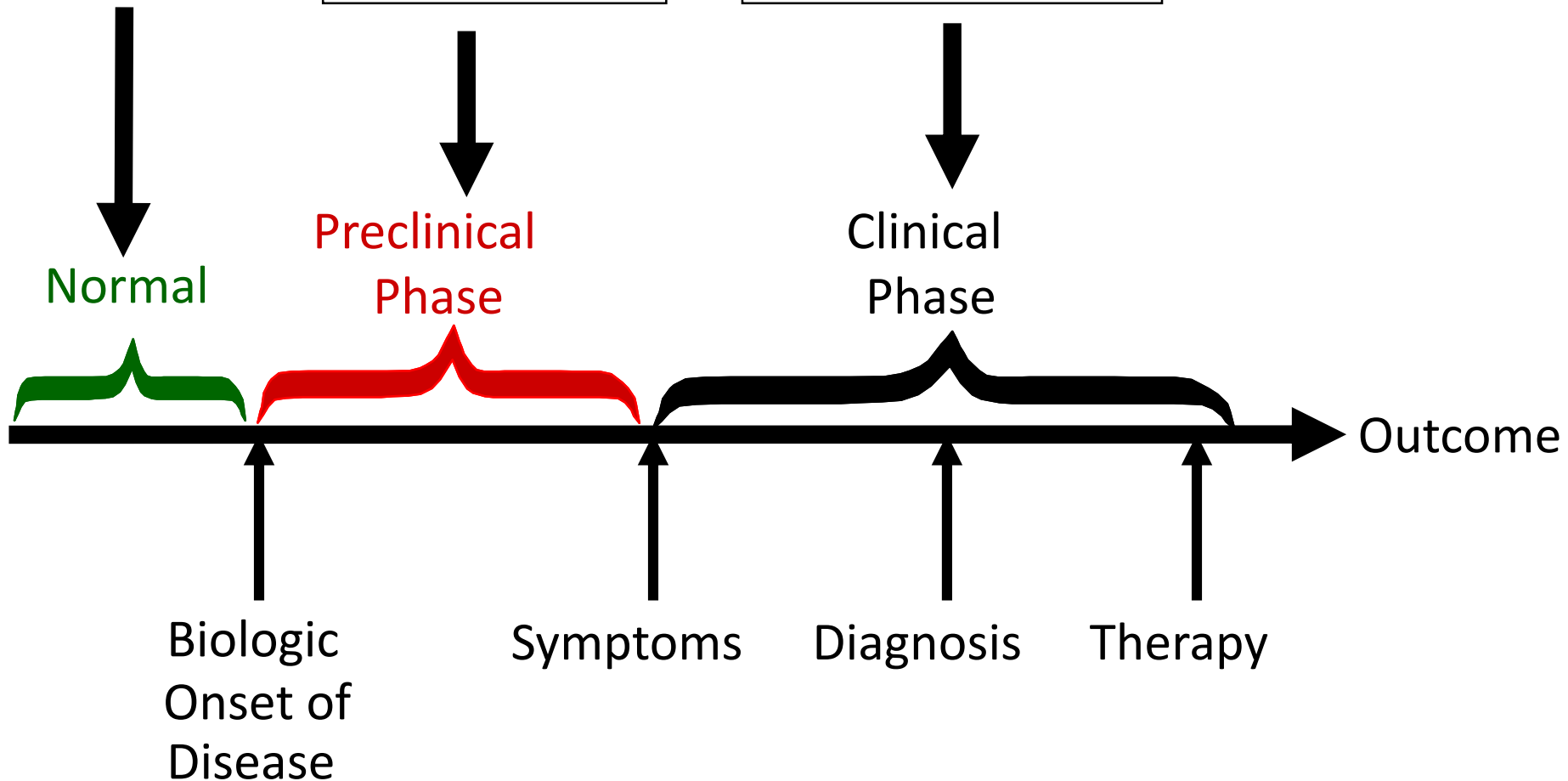
Preventing Disease



Remove
causes

Screen & treat
disease early

Treat disease
clinically

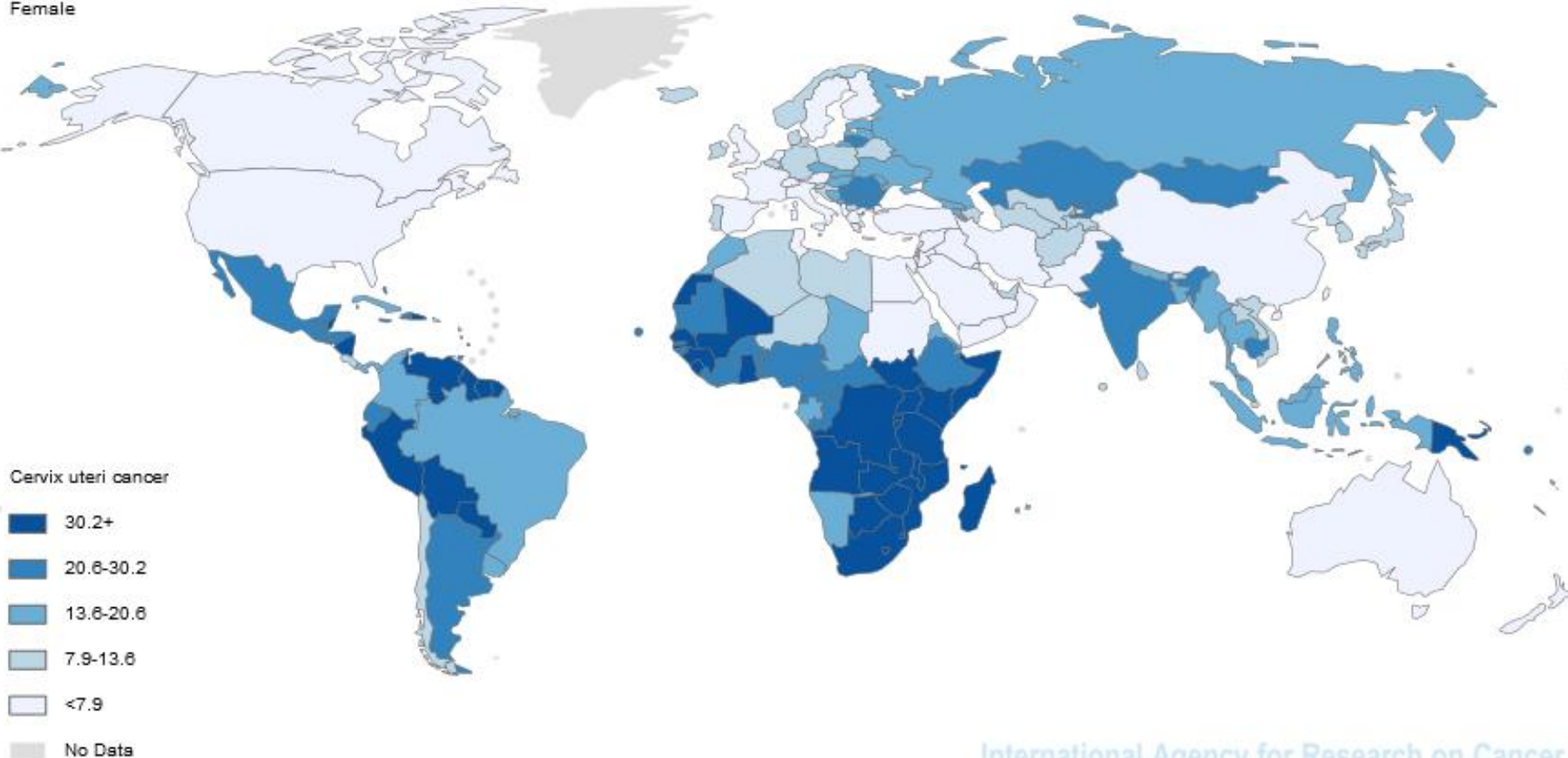


Global Incidence of Cervical Cancer (GLOBOCAN 2012)



Incidence ASR

Female



Source: GLOBOCAN 2012 (IARC)

International Agency for Research on Cancer



Source: International Agency for Research on Cancer, World Health Organization

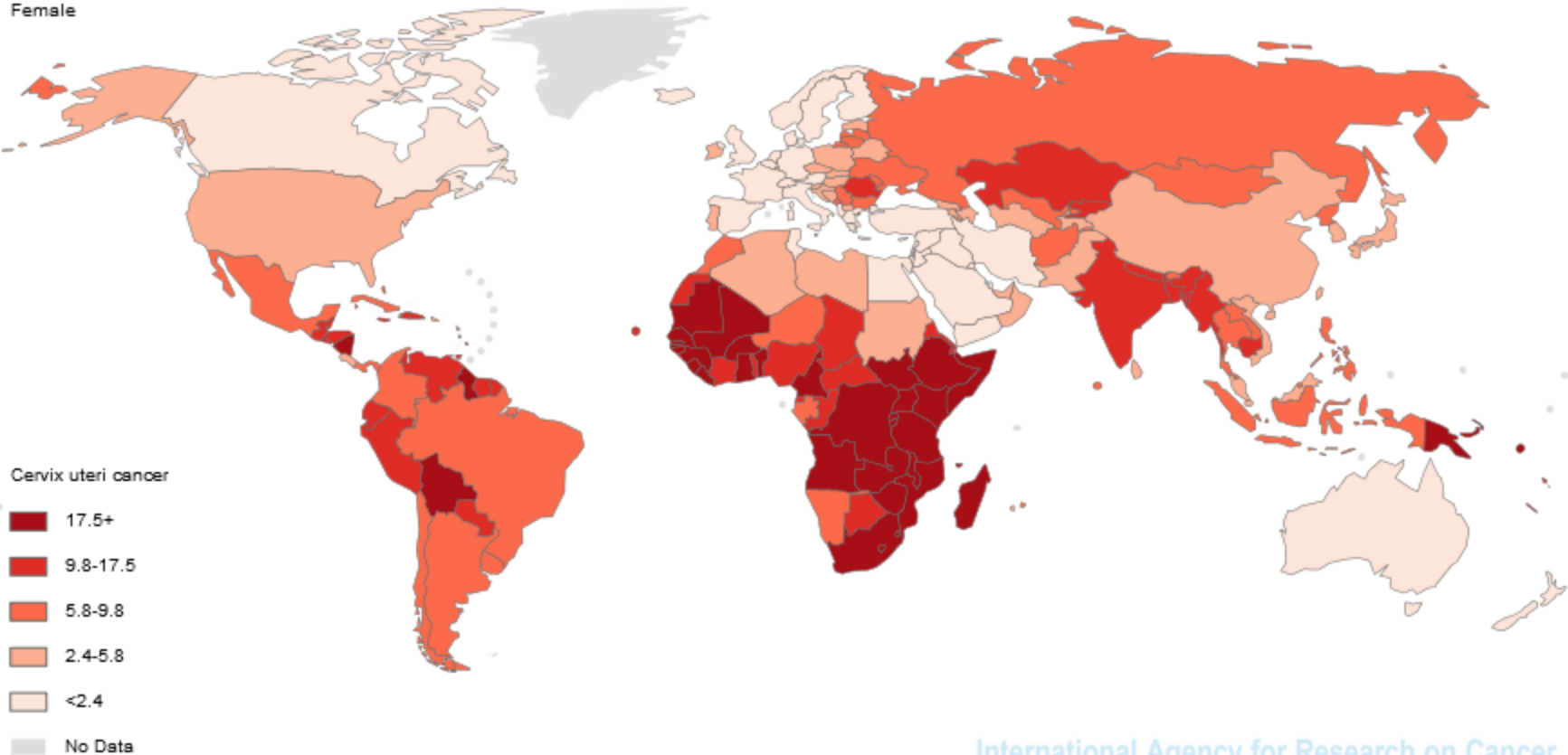
<http://globocan.iarc.fr/>

Global Mortality due to Cervical Cancer



Mortality ASR

Female



International Agency for Research on Cancer



Source: GLOBOCAN 2012 (IARC)

Source: International Agency for Research on Cancer, World Health Organization

<http://globocan.iarc.fr/>

Prevention: An Example

Cervical Cancer



Primary:

Reduce HPV infection

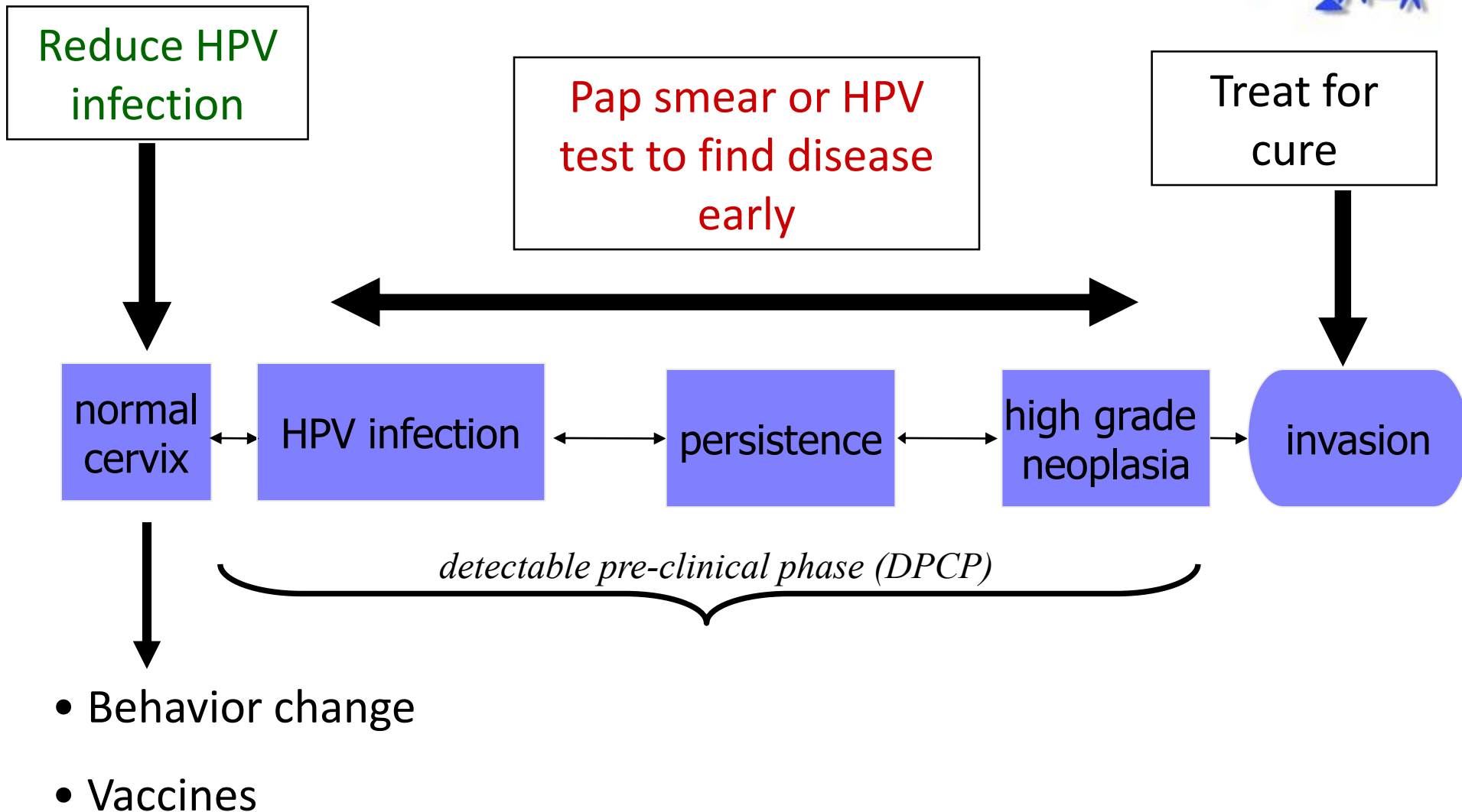
Secondary:

Pap smear

Tertiary:

Treat for cure

Example: Cervical Cancer



Definition of Health



“A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”

— World Health Organization

What's in the words?

- Public Health
- Health of the Public
- The Public's Health



Are you healthy?

- What do you do that makes you healthy?
- What do you do that makes you unhealthy?
- What are you doing now that might affect your health as an adult?



Peter Menzel and Faith D'Aluisio

TIME: HUNGRY PLANT- WHAT THE WORLD EATS

Italy



Chad



Kuwait



United States, North Carolina



Mexico



China



Poland



Egypt



Mali



France



Ecuador





HEATHCARE COSTS

THE STAGGERING COST OF DIABETES

Today, **4,660**
AMERICANS WILL BE DIAGNOSED
WITH **DIABETES**

NEARLY **30**
MILLION AMERICANS
HAVE DIABETES



86 million
Americans have prediabetes

More than the population of the east coast
from Connecticut to Georgia



DIABETES AND
PREDIABETES COST AMERICA
\$322 BILLION
PER YEAR



**1 in 5 health
care dollars**

is spent caring for
people with diabetes



**1 in 3 Medicare
dollars** is spent

caring for people
with diabetes



People with diagnosed
diabetes have health
care costs **2.3 times
higher** than if they
didn't have the disease



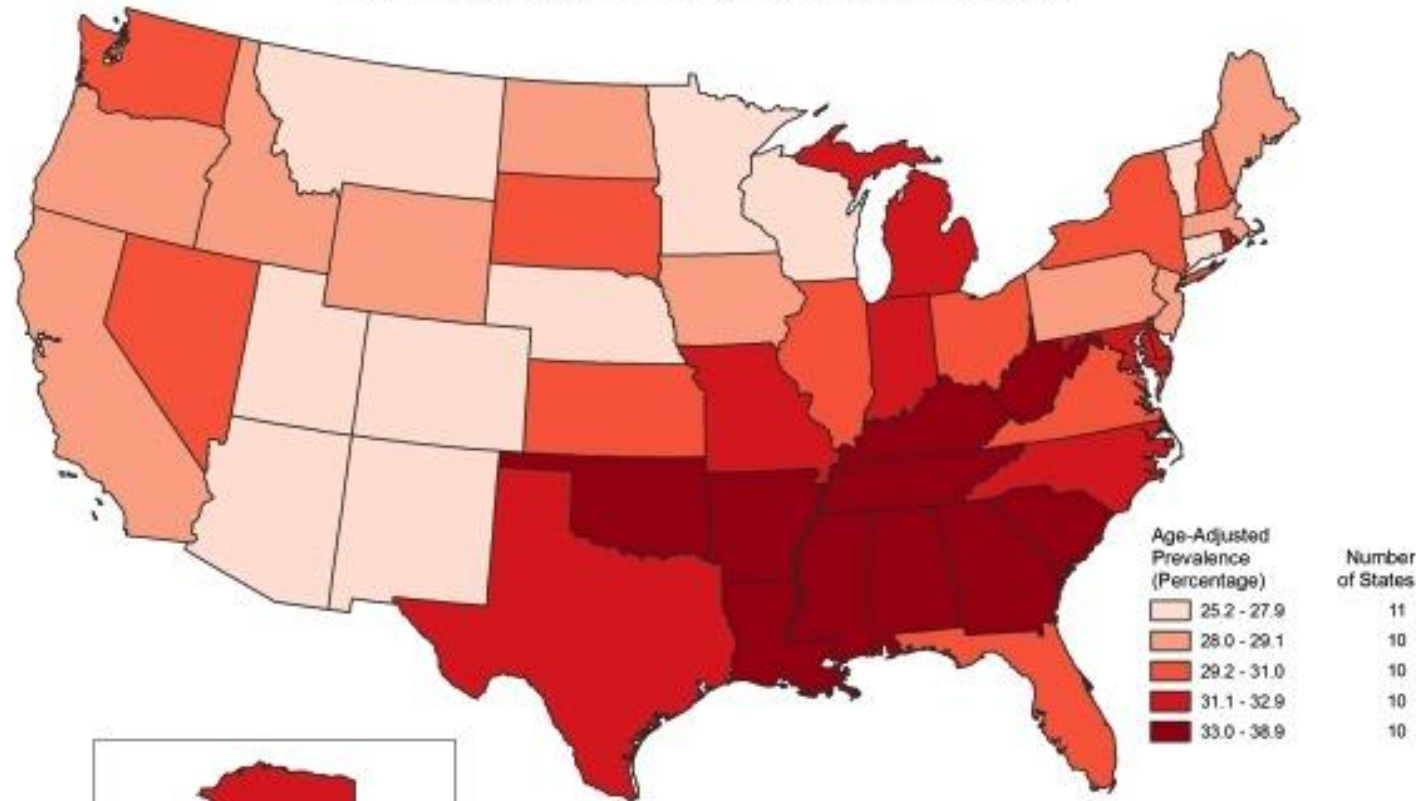
Learn how to combat this costly disease at
diabetes.org/congress



Hypertension costs \$46 billion each year in the U.S., 2011



**Prevalence of Hypertension, 2011
U.S. Adults Ages 20 and Older (Percentage)**



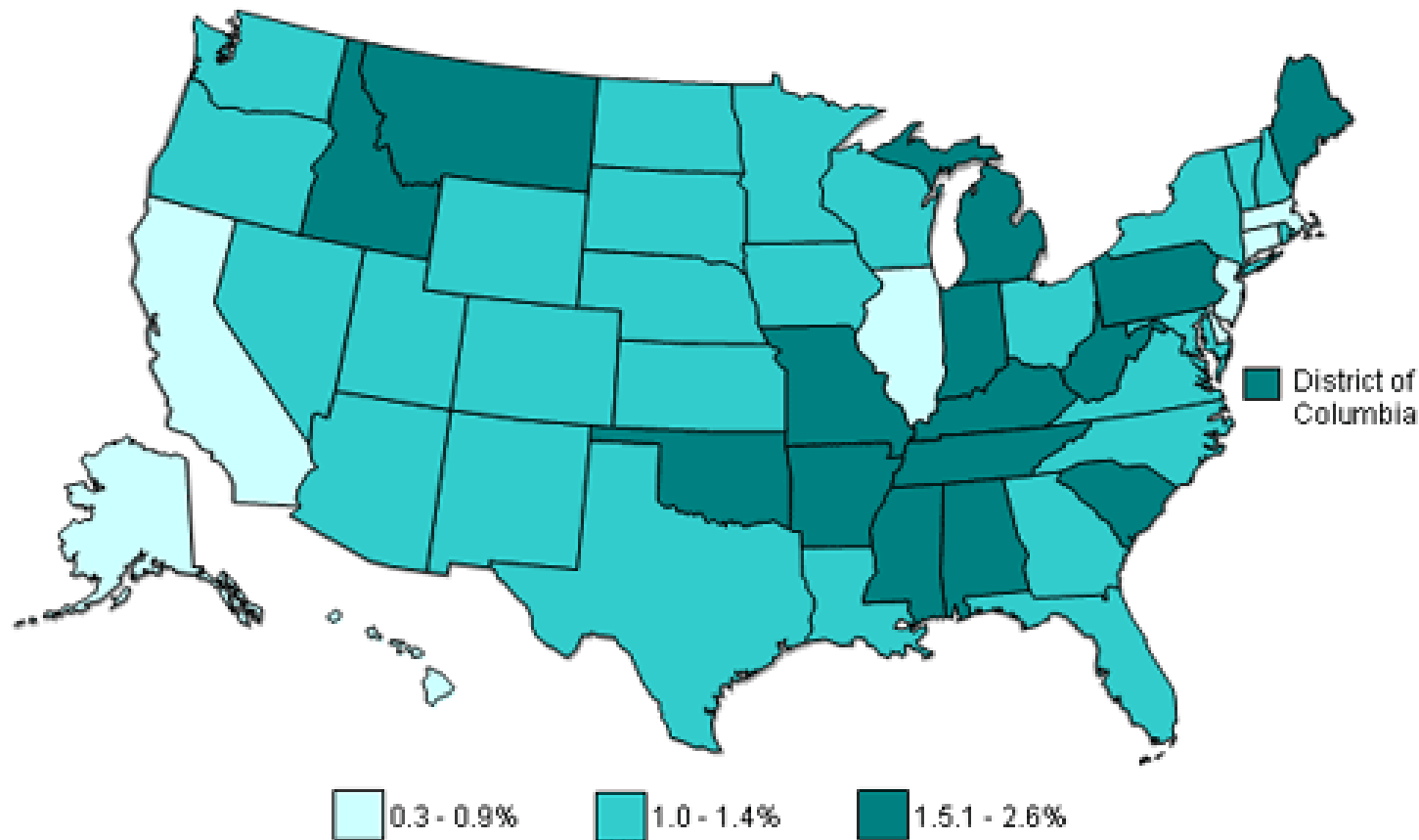
Data Source: BRFSS - Behavioral Risk Factor Surveillance System; CDC.

Self-report: "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?" Excludes women who reported being told only during pregnancy and respondents who reported they had been told that their blood pressure was borderline high or pre-hypertensive.



Arthritis costs roughly \$128 billion in the U.S., 2003

For most U.S. states, the annual cost of arthritis is more than 1% of the gross domestic product (GDP).



President Obama Fitness Life Style











