

# Geography of Health II

# Social, Economic and Cultural Environments



Image Source: Pan American Health Organization (2010)



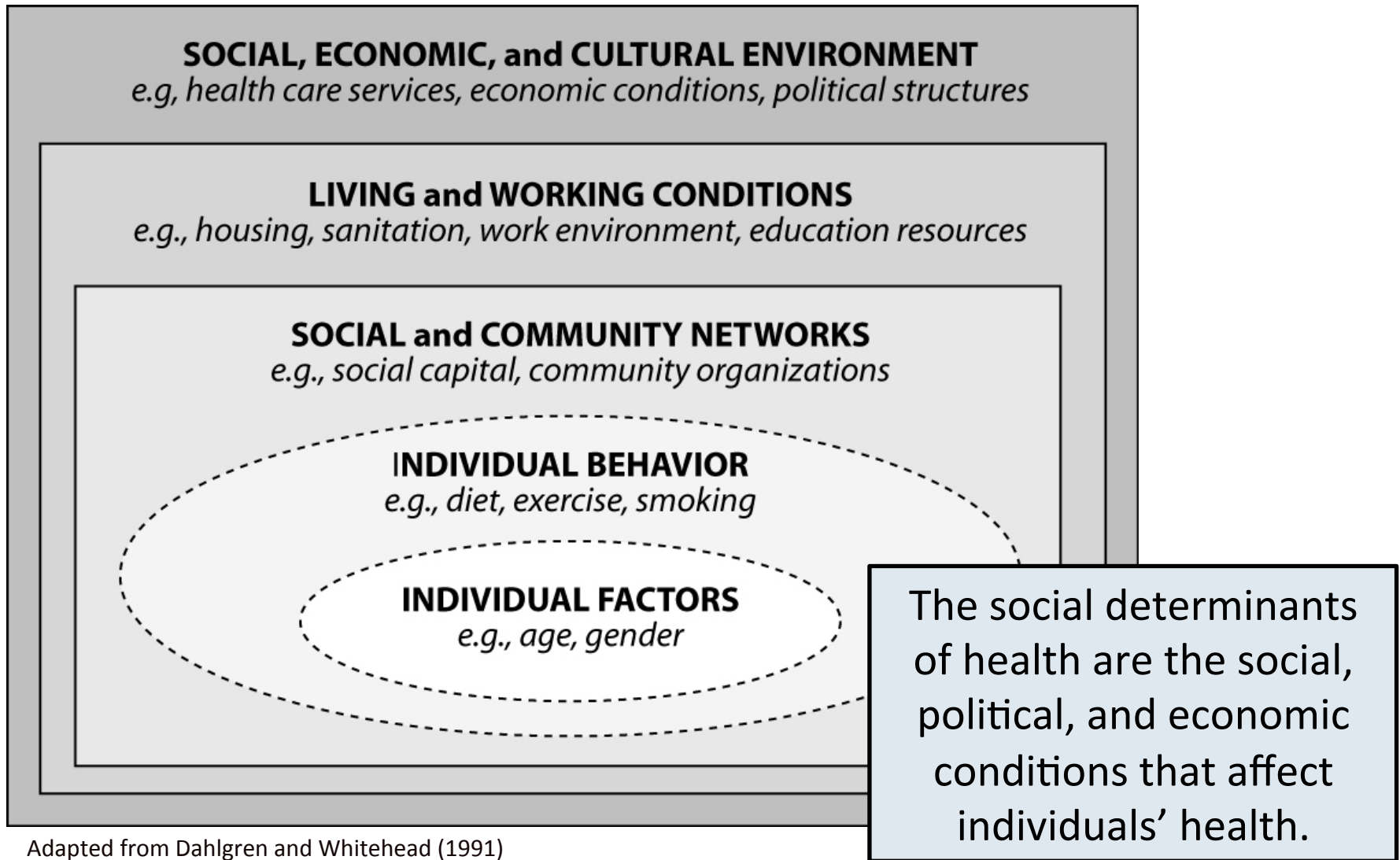
# Health and Wealth

Many scholars have found that health and wealth are often closely correlated.

Three basic explanations for this relationship are:

- 1) poor health leads to poverty;**
- 2) poverty causes poor health;**
- 3) factors from early in life affect both health and wealth.**

# The Social Determinants of Health



Adapted from Dahlgren and Whitehead (1991)

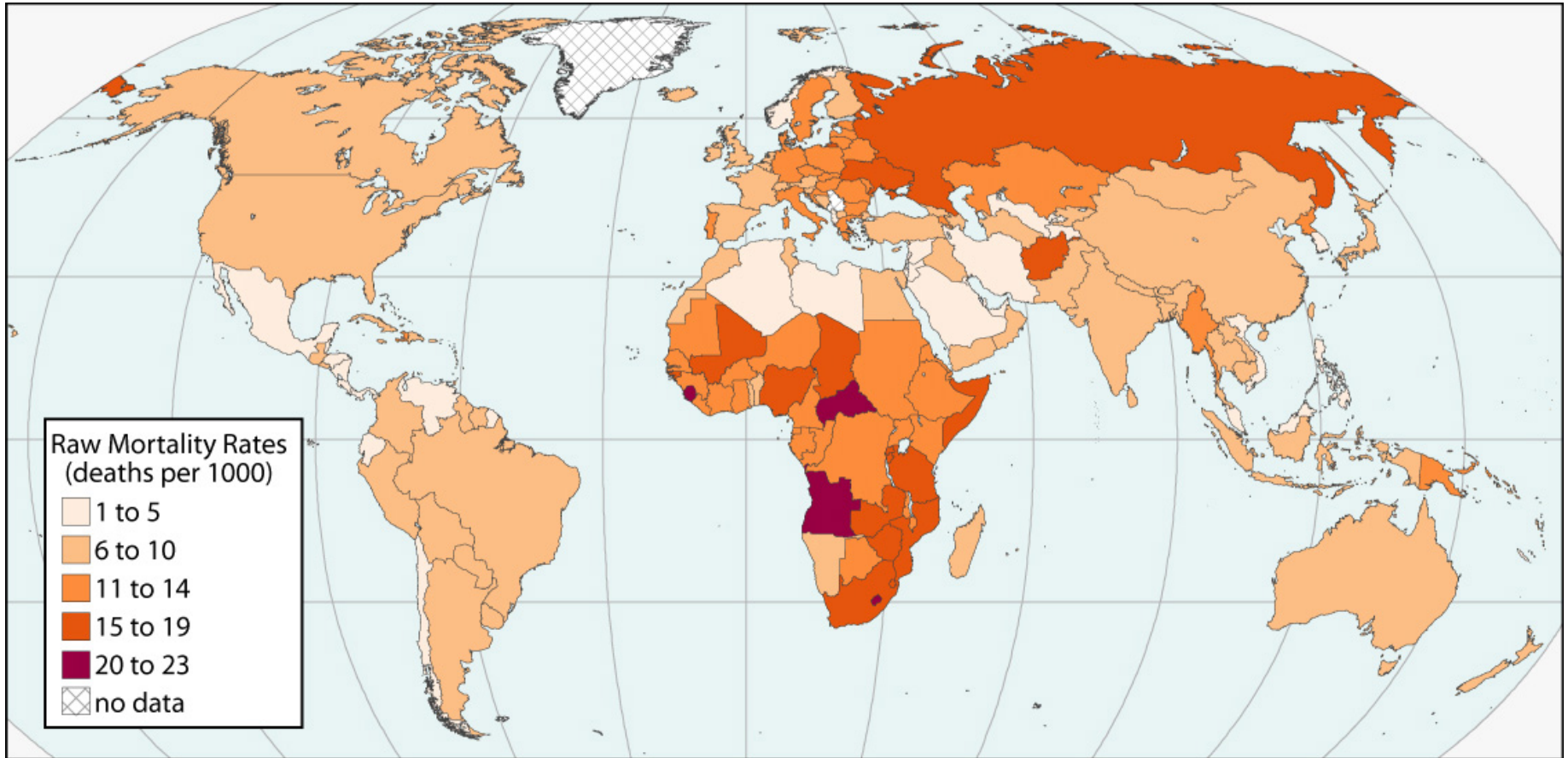


# Health Indicators

**Health indicators** are used to estimate facets of the health of an entire population.

**Rates** are the number of cases per unit of population (morbidity rates refer to disease or infirmity; mortality rates refer to deaths).

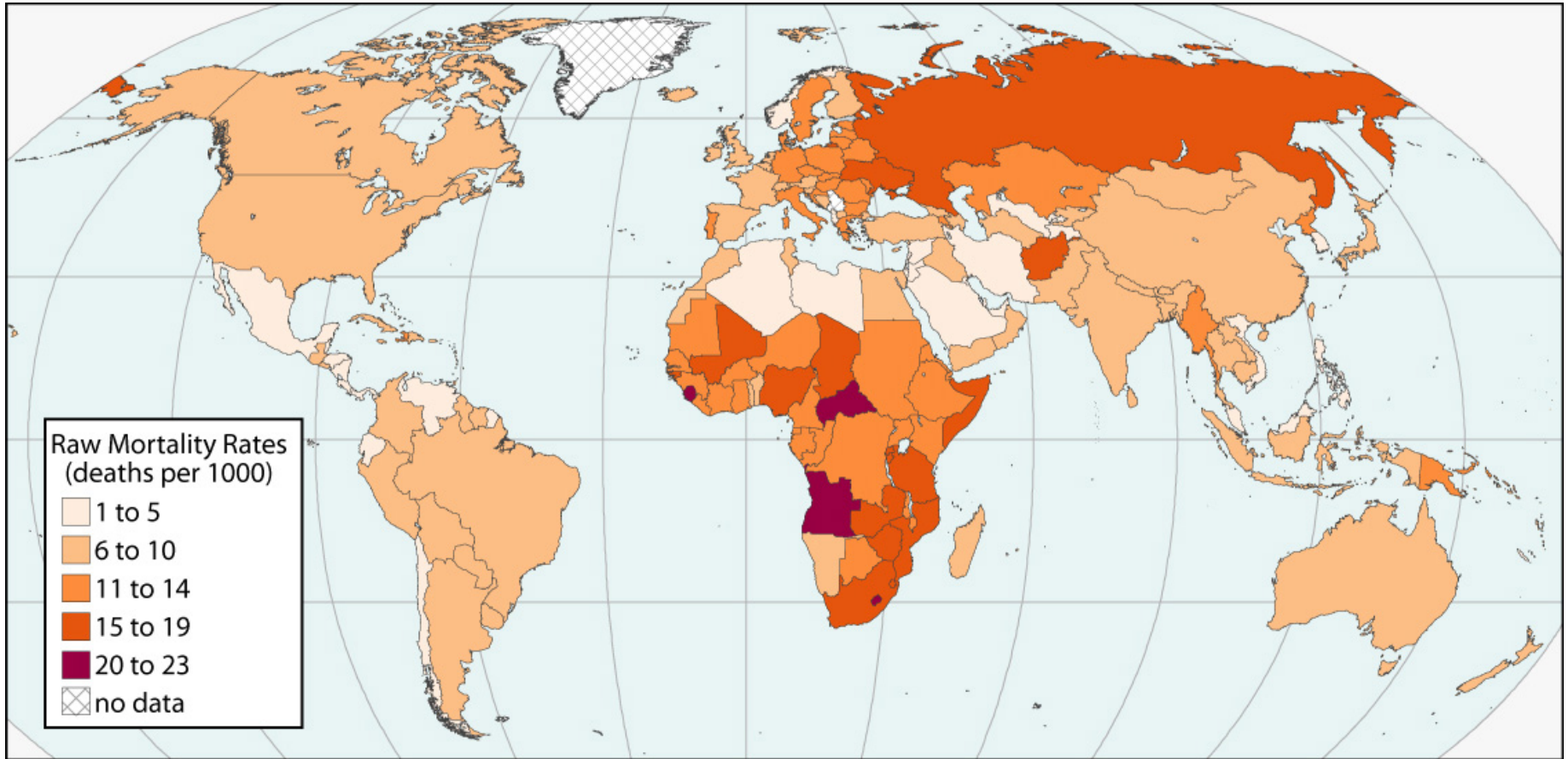
**Prevalence** refers to cases of a disease at a particular point in time; **incidence** refers to new cases of the disease over a specified period of time.



Data from PRB (2009)

This map shows raw mortality rates by country for 2010.

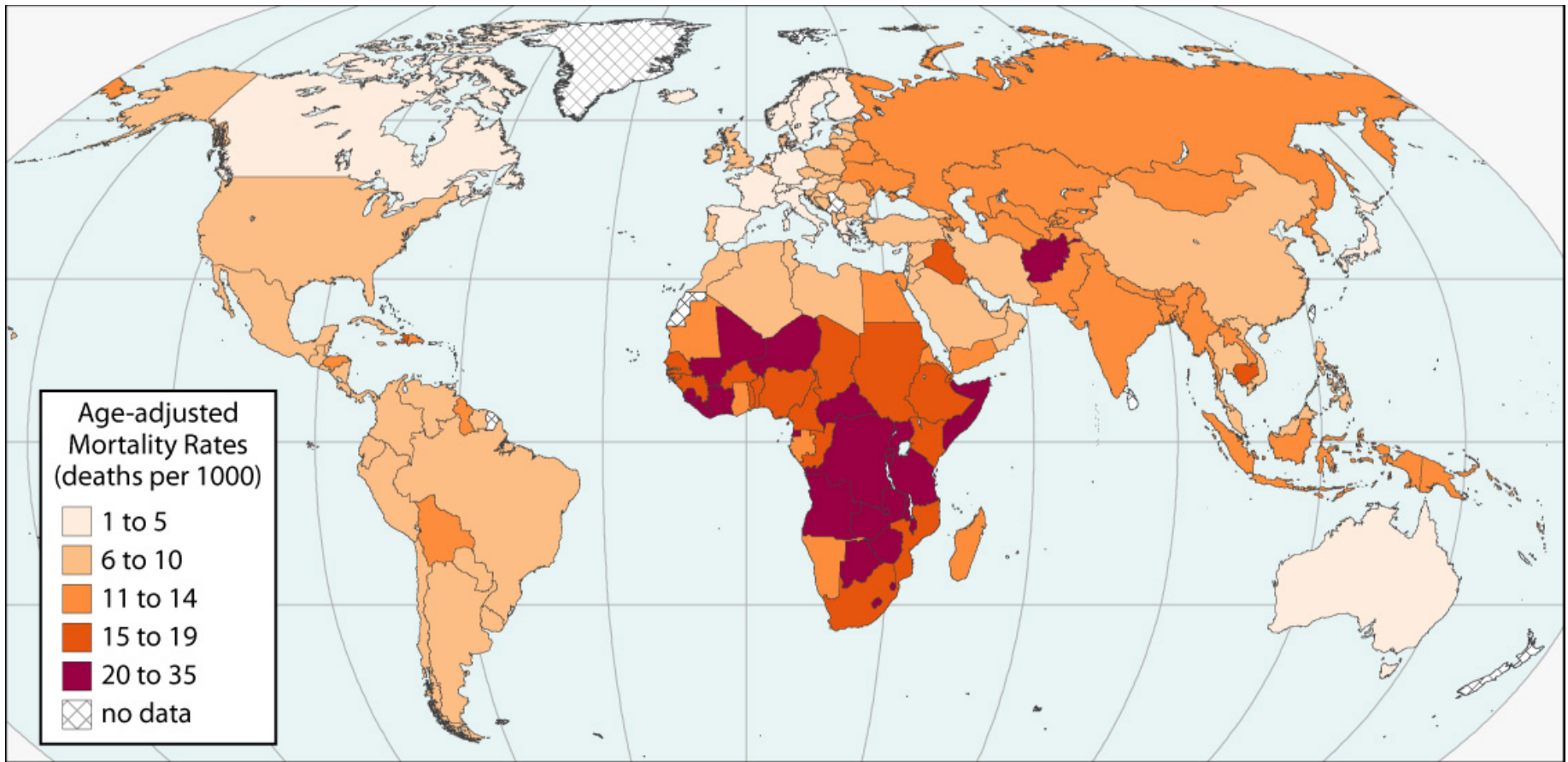
**Raw mortality rates** show the number of deaths as a proportion of the total population.



Data from PRB (2009)

**What patterns do you notice on this map?**

**Are there any problems with using raw mortality rates to estimate health?**

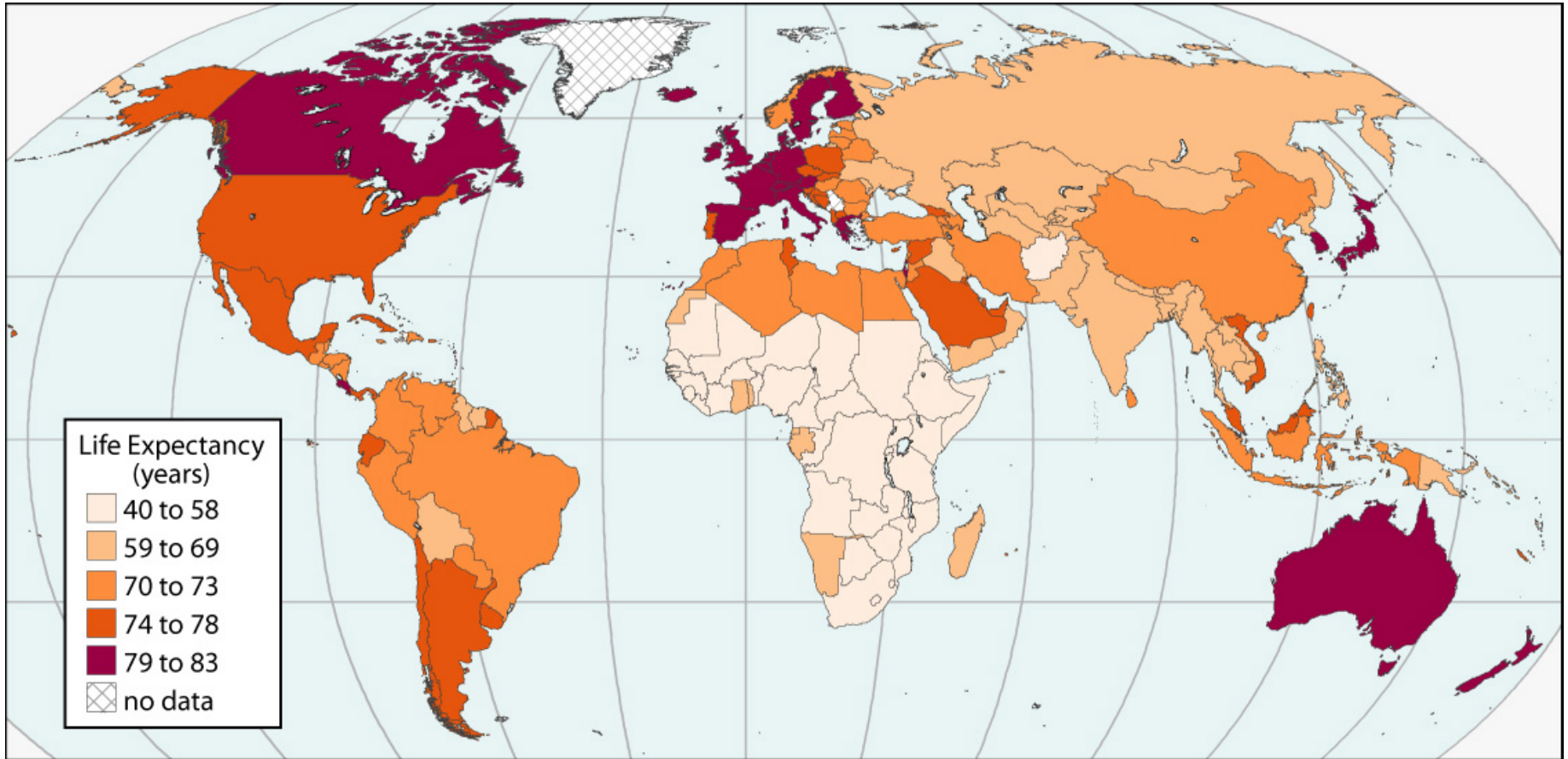


Data from PRB (2009)

Using **raw mortality rates** is often a problem because raw rates are influenced by the age structure of the population.

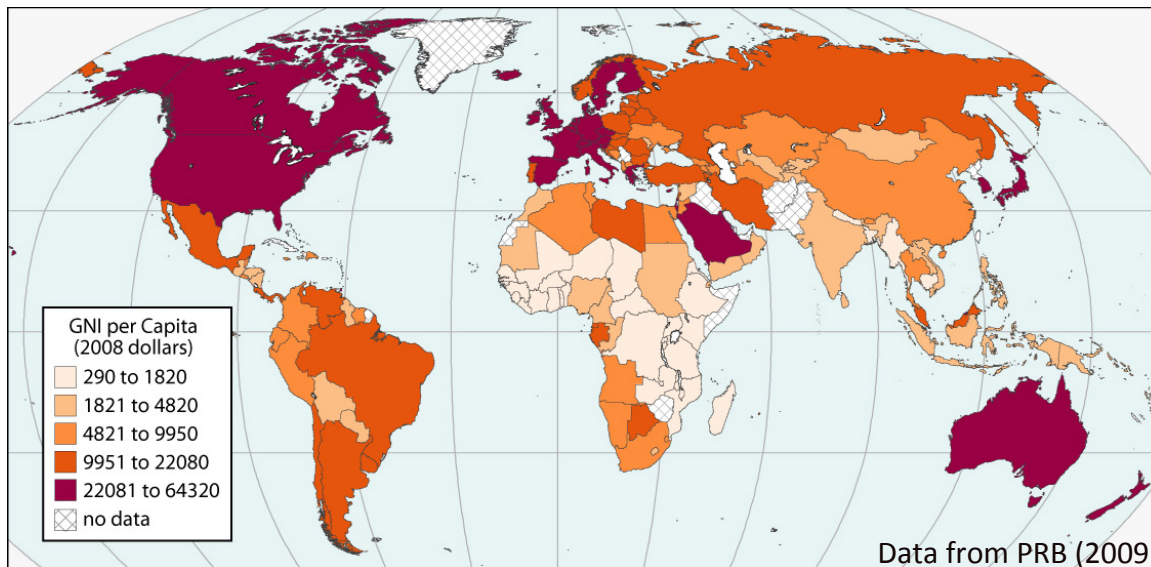
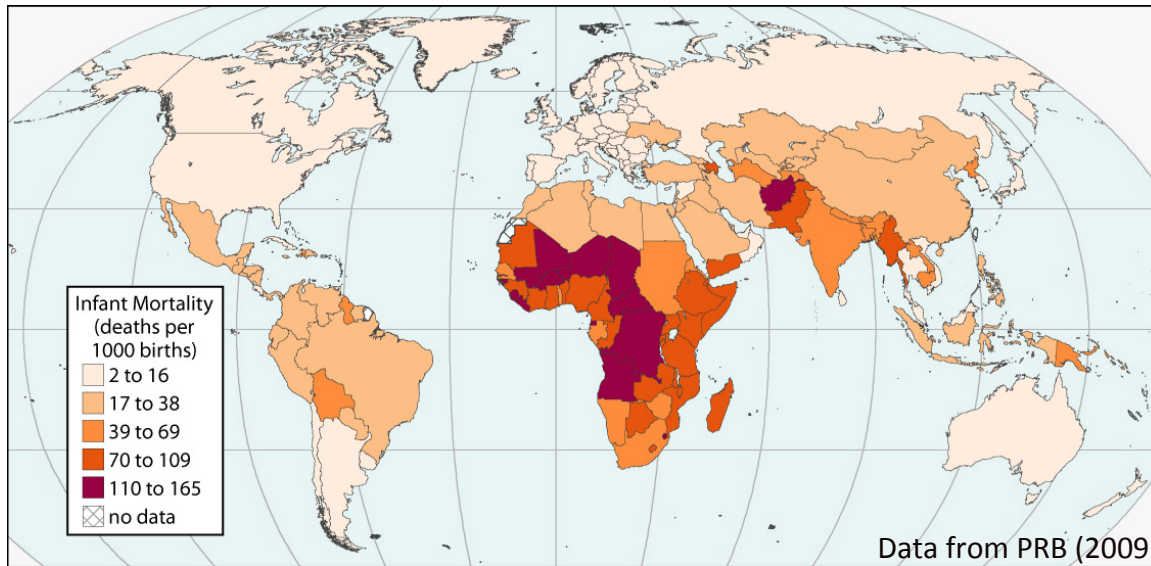
Adjusting for age enables us to compare the mortality rates of populations with different age structures.





Data from PRB (2009)

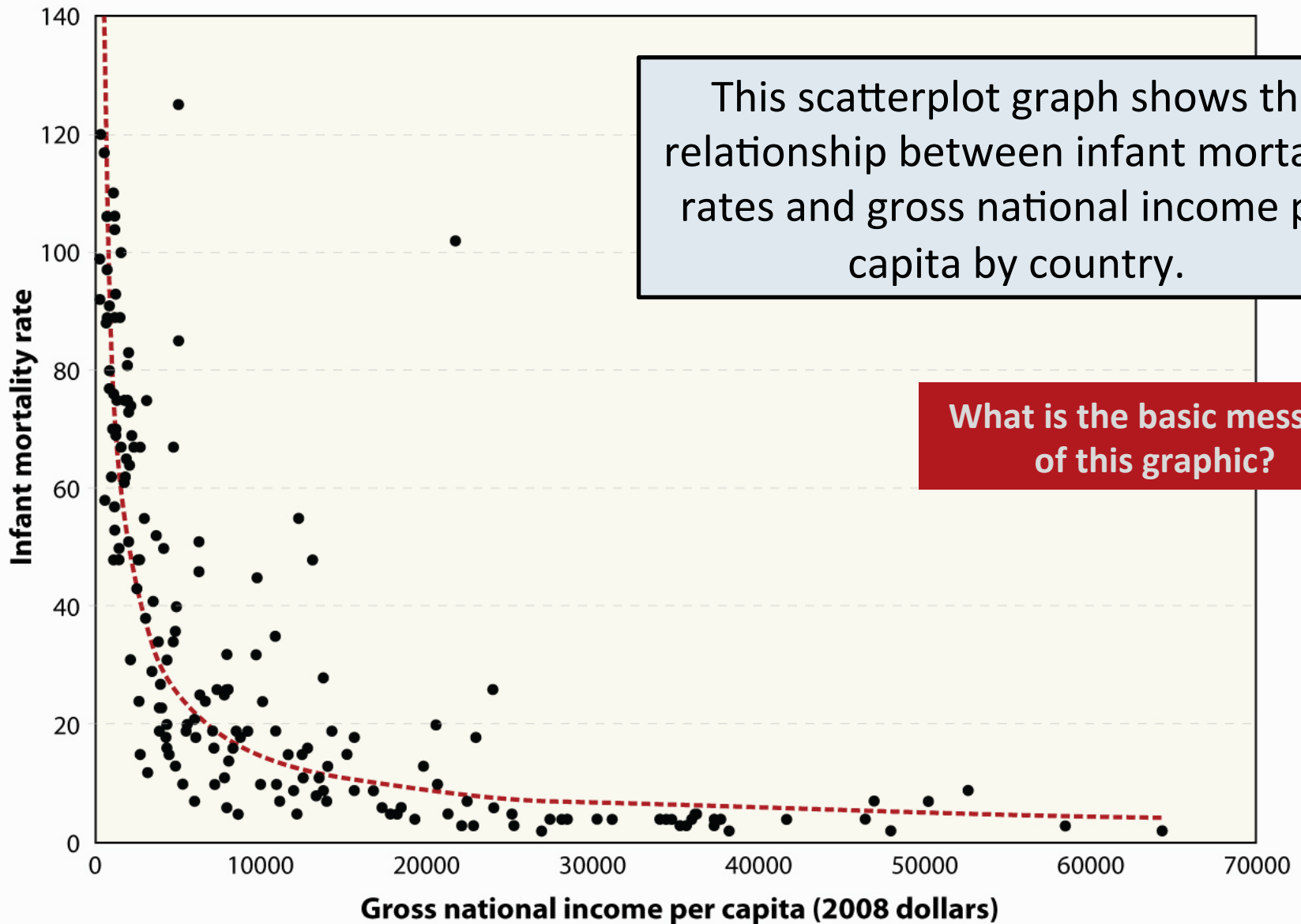
**Life expectancy** is a good general indicator of health. Life expectancy is defined as the “average number of years that a newborn is expected to live if current mortality rates continue to apply” (WHO 2009).



**Infant mortality rate** is one of the best indicators for the general health conditions of a place. Placing a map of mortality rates next to a map of gross national income (GNI) shows how closely income and infant mortality patterns are related. (Note that it is an **inverse correlation**.)

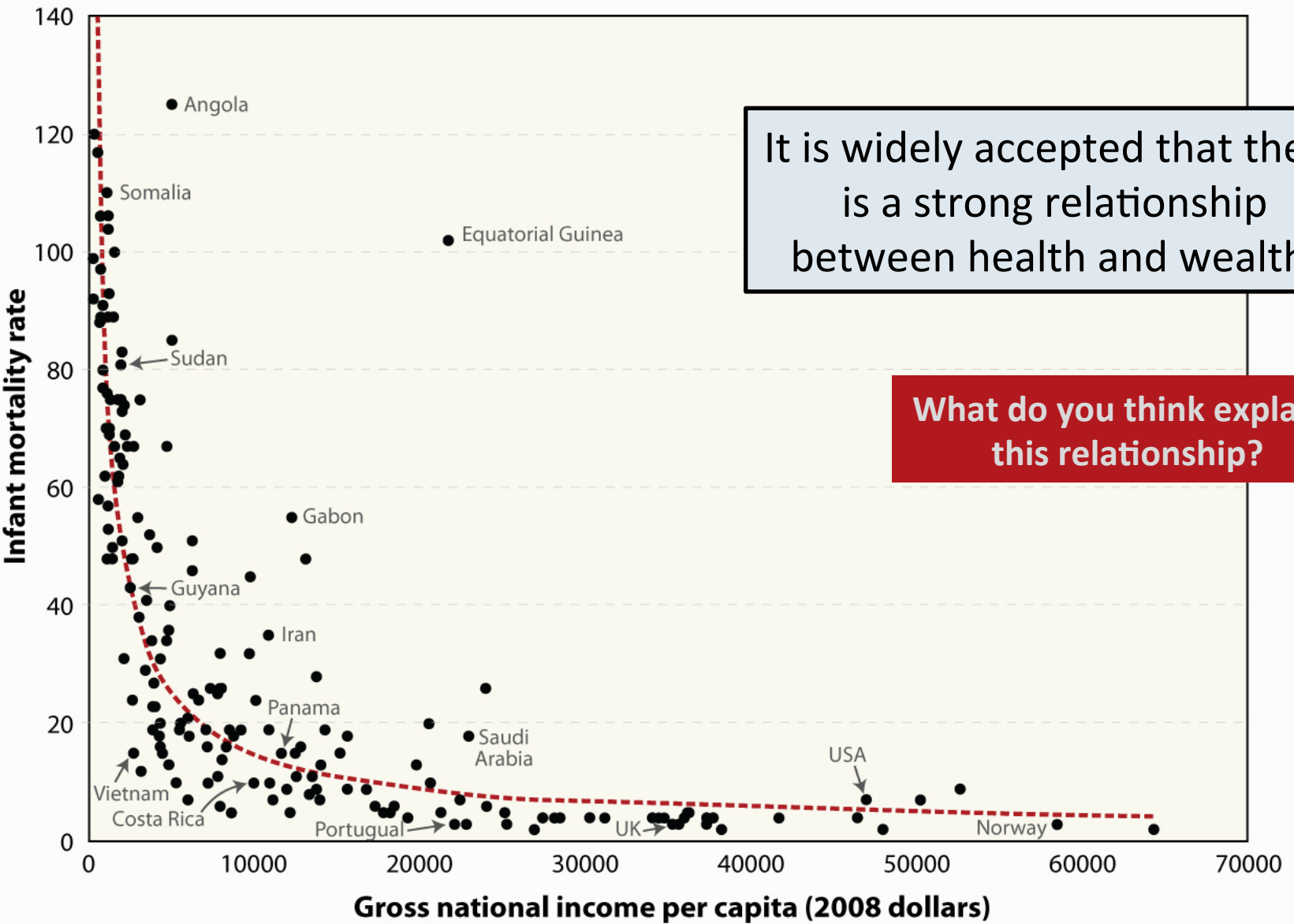
This scatterplot graph shows the relationship between infant mortality rates and gross national income per capita by country.

What is the basic message of this graphic?



Data from PRB (2009)





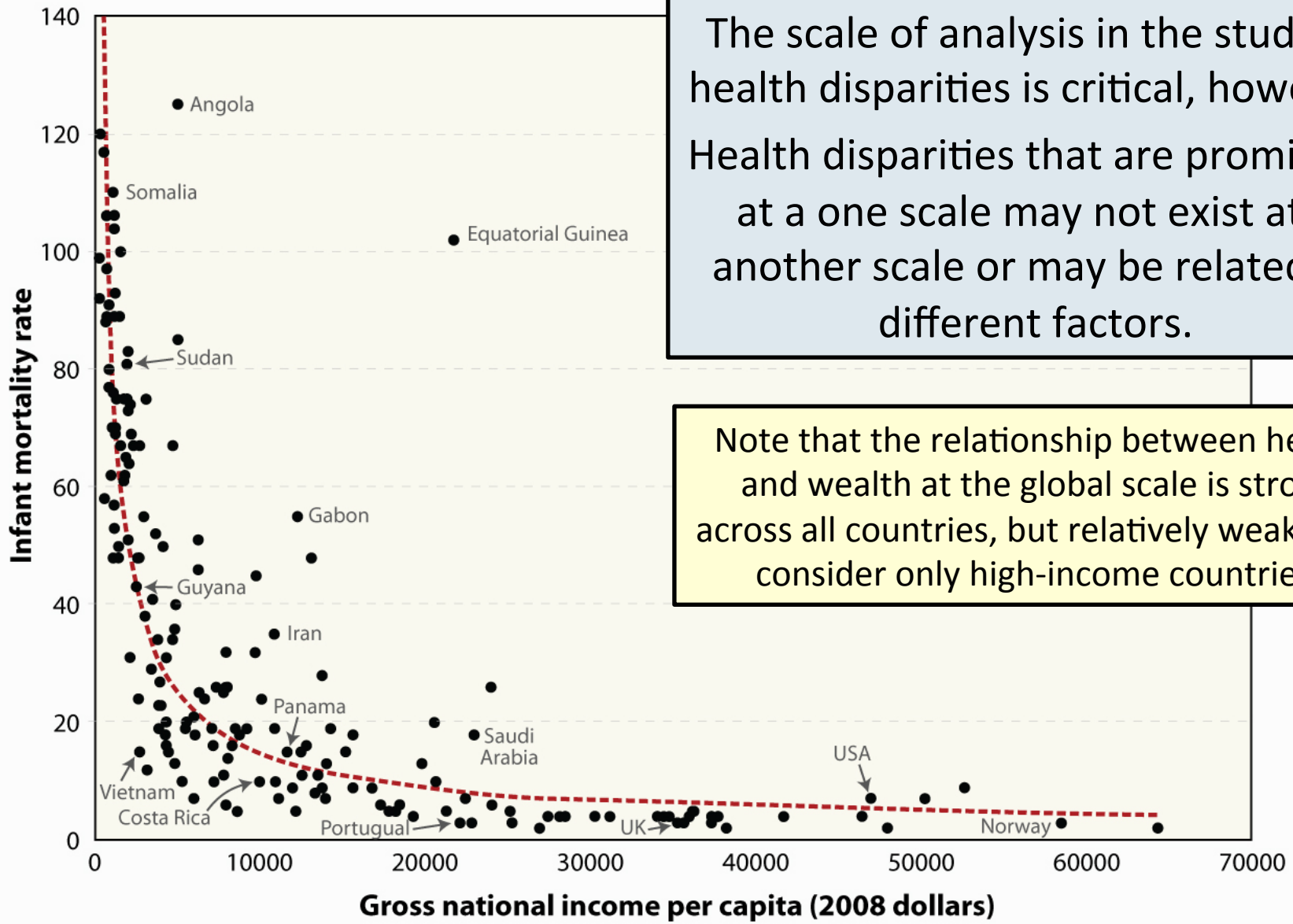
It is widely accepted that there is a strong relationship between health and wealth.

What do you think explains this relationship?

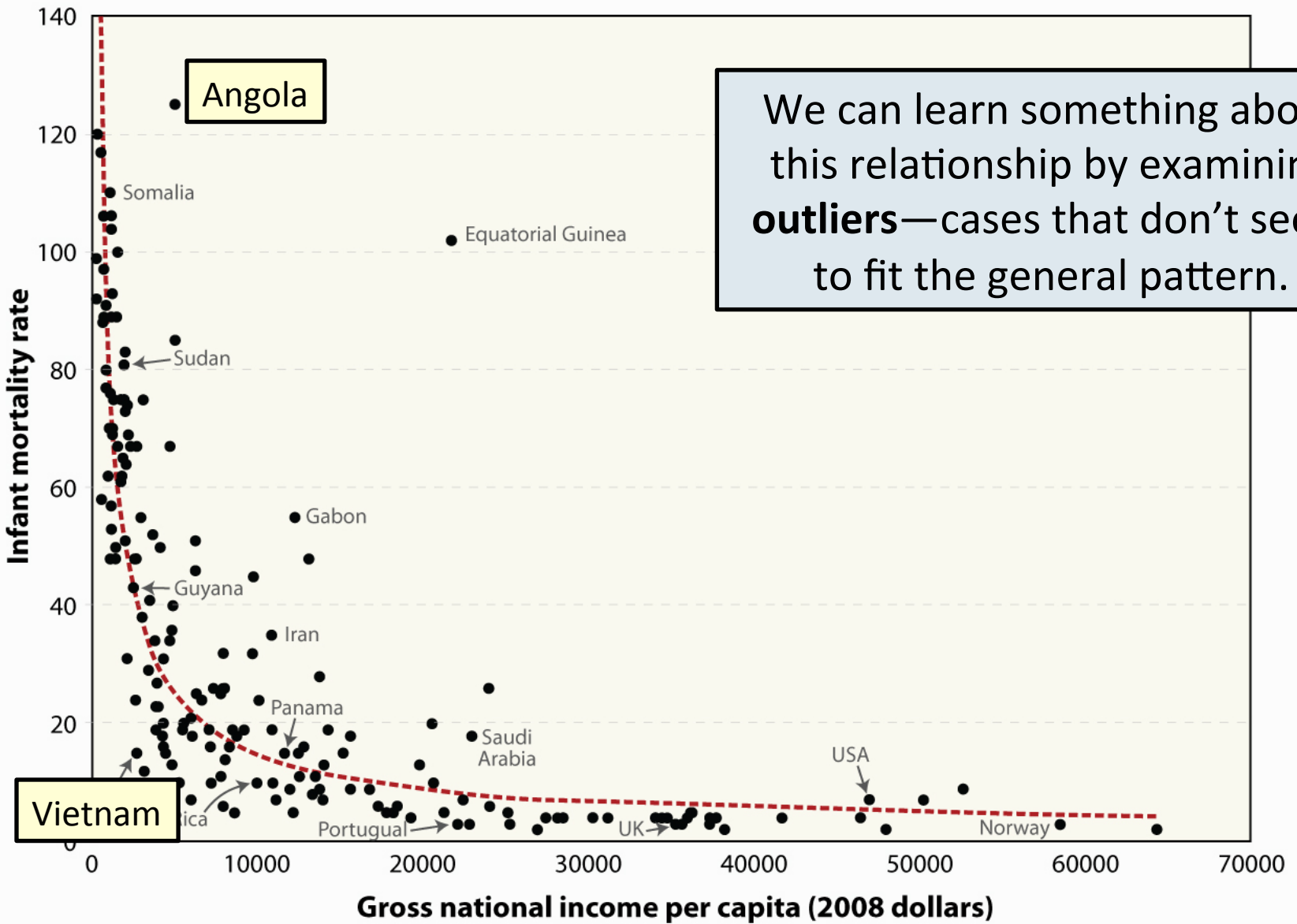
Data from PRB (2009)

The scale of analysis in the study of health disparities is critical, however. Health disparities that are prominent at a one scale may not exist at a another scale or may be related to different factors.

Note that the relationship between health and wealth at the global scale is strong across all countries, but relatively weak if we consider only high-income countries.

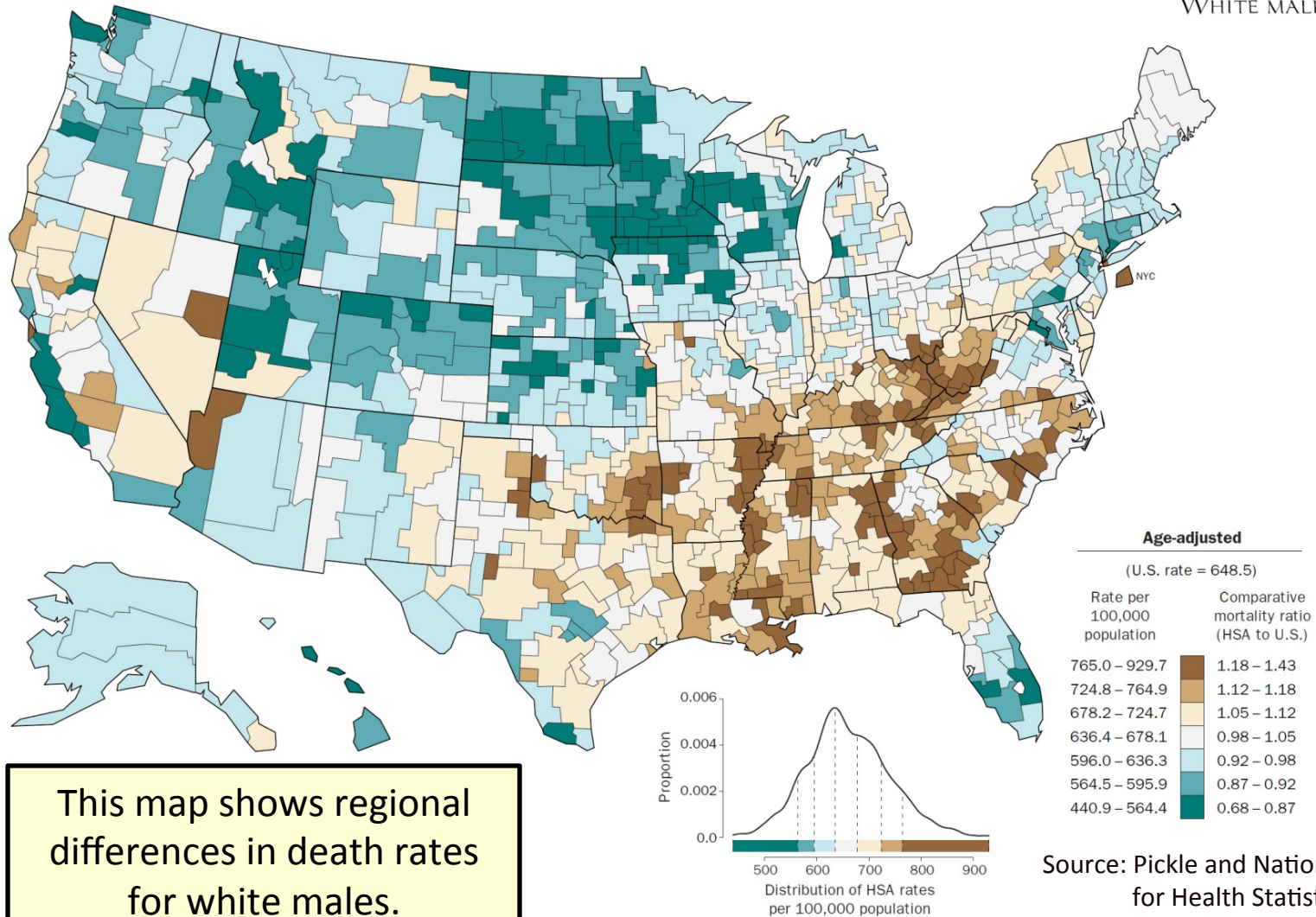


Data from PRB (2009)



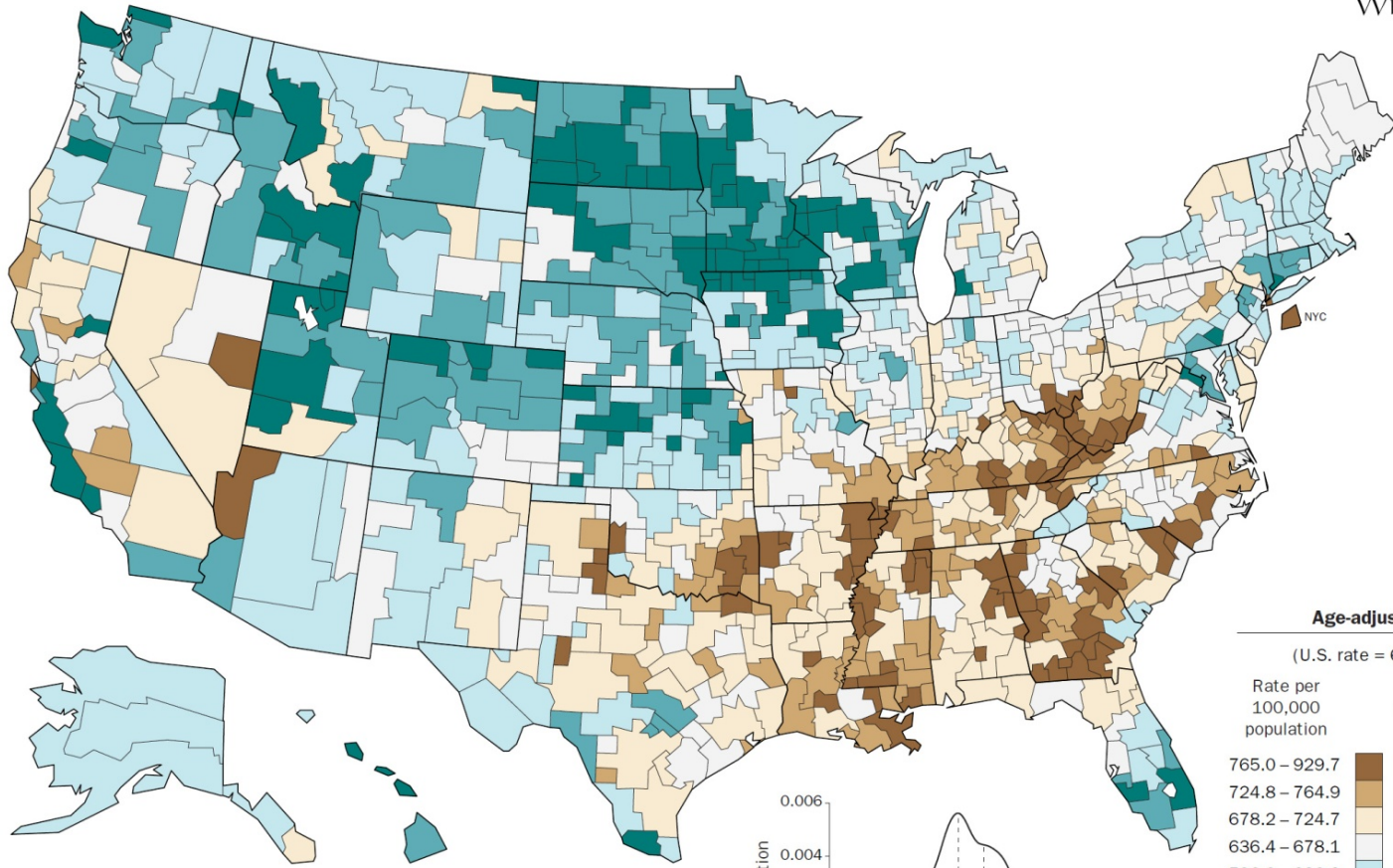
We can learn something about this relationship by examining **outliers**—cases that don't seem to fit the general pattern.

Data from PRB (2009)



Important disparities can also exist *within* countries.

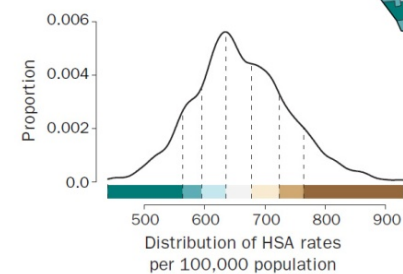




ICD-9 Categories: All

**Age-adjusted**  
(U.S. rate = 648.5)

Rate per 100,000 population	Comparative mortality ratio (HSA to U.S.)
765.0 – 929.7	1.18 – 1.43
724.8 – 764.9	1.12 – 1.18
678.2 – 724.7	1.05 – 1.12
636.4 – 678.1	0.98 – 1.05
596.0 – 636.3	0.92 – 0.98
564.5 – 595.9	0.87 – 0.92
440.9 – 564.4	0.68 – 0.87

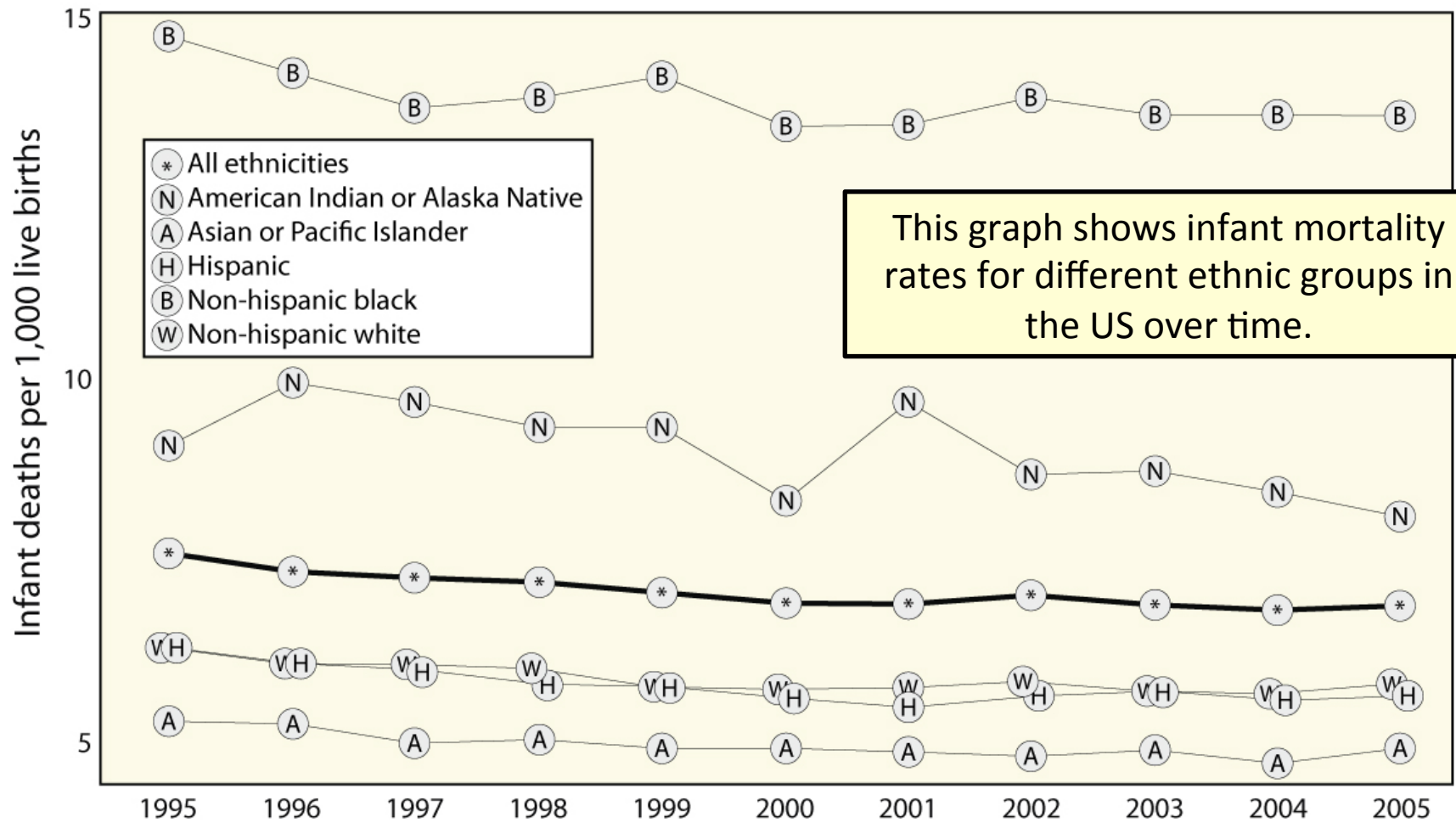


SOURCE: CDC/NCHS

Source: Pickle and National Center for Health Statistics (1996)

**What factors could explain geographic disparities in health in the**

US?



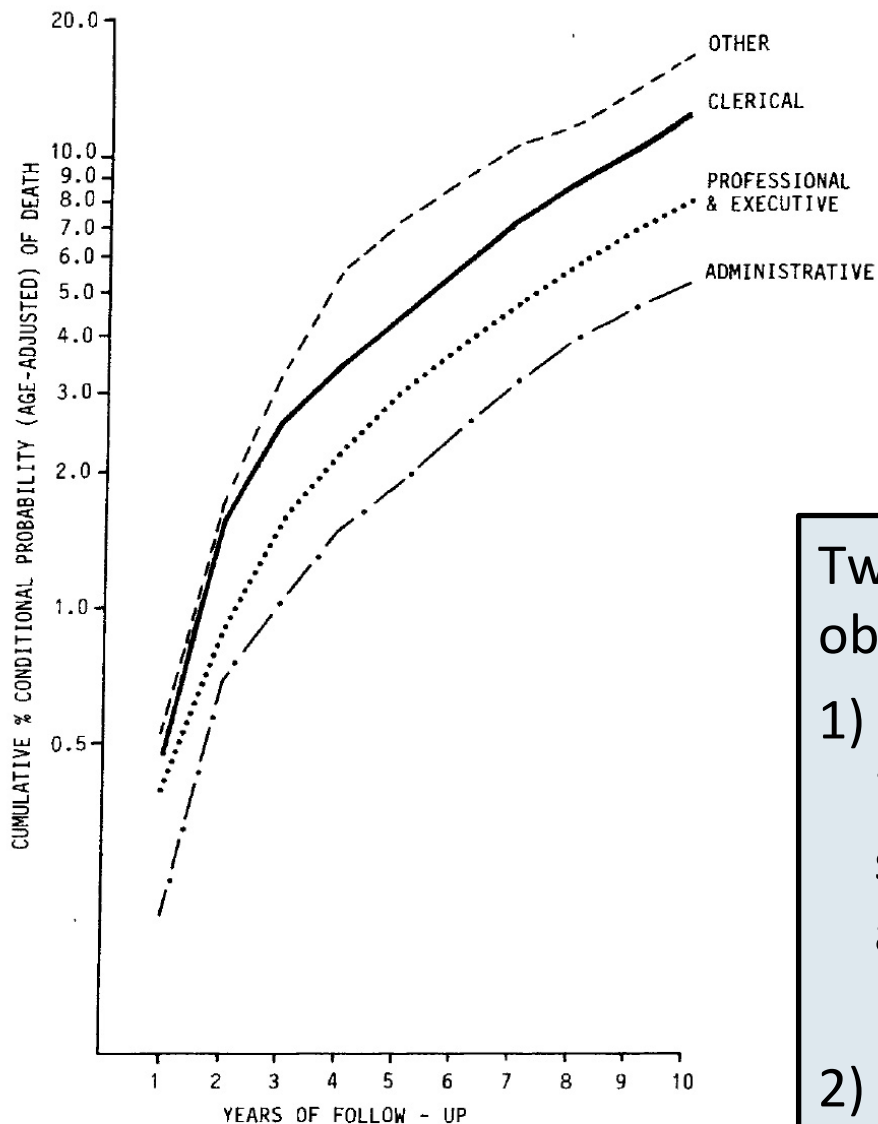
Adapted from Mathews and MacDorman (2008)

Health disparities are not only evident among regions, but also among different sub-populations, particularly ethnic groups.

# Inequality and Health

While income itself is related to health, there is also evidence that social and economic *inequality* may play a significant role.





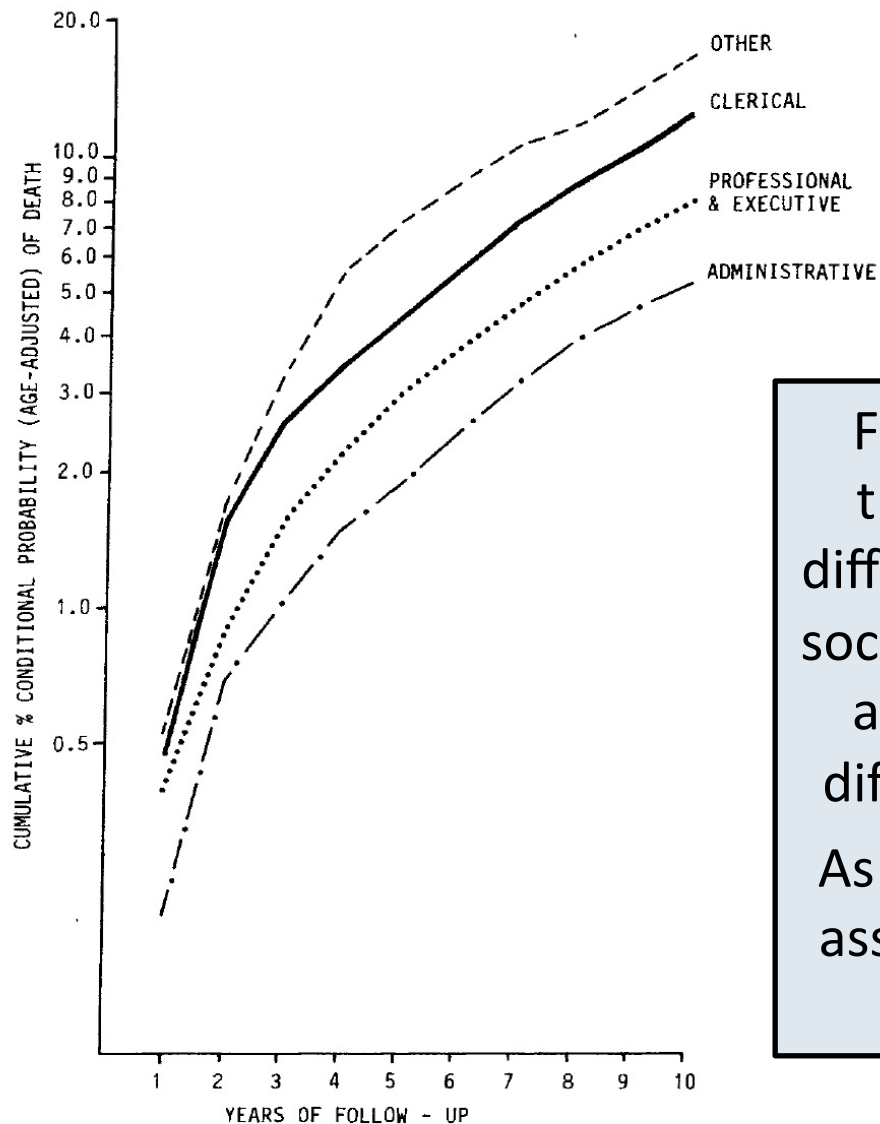
**Cumulative conditional probability of death from all causes (age-adjusted) in ten years according to civil service grade.**

The *Whitehall Studies* in the UK found that people working in high grade jobs were more likely to live longer and healthier lives than people in lower grade jobs.

Two hypotheses could explain these observations:

- 1) The status groups differ systematically in their health behaviors. In this situation, status could then confound a genuine causal relationship, e.g., between smoking and poor health.
- 2) There is something inherent to having low status that leads to poor health.

Source: Reprinted from *Lancet*, vol. 1, Marmot, M., Shipley, M., and Rose, G., 'Inequalities in death - specific explanations of a general pattern', 1003-6, Copyright 1984, with permission from Elsevier.



Further investigation has suggested that, although there are systematic differences between groups of different socioeconomic status, these differences are not sufficient to account for the differences in health outcomes noted. As such, it appears that low status and associated inequalities are themselves also detrimental to health.

**Cumulative conditional probability of death from all causes (age-adjusted) in ten years according to civil service grade.**

Source: Reprinted from *Lancet*, vol. 1, Marmot, M., Shipley, M., and Rose, G., 'Inequalities in death - specific explanations of a general pattern', 1003-6, Copyright 1984, with permission from Elsevier.

## Area (or Neighborhood) Effects

Social disparities can also have an impact on health at small geographic scales, such as neighborhoods.

**Area effects** (or neighborhood effects) consider the “net change in the contribution to life-chances made by living in one area rather than another” (Atkinson and Kintrea 2001: 2278).

Although communities living in different areas are likely to have differing health owing to differences in socioeconomic status among neighborhoods, the concept of **area effects** refers specifically to the impact of the social and physical environment on health and wellbeing.

How might the physical environment of a neighborhood have an impact on health?

What aspects of the social environment do you think could be significant?

Social cohesion, social capital, and collective efficacy are factors that have been identified as contributing to a healthful social environment.



Image Source: CDC and Arlotta (2009)

The notion of the **risk environment** posits that certain places encourage behaviors that pose a high risk to health, such as drug use or promiscuous sexual activity.

**Landscapes of deprivation**, such as inner cities, pose a particular risk.



Image Source: CDC and Ewing (2009)



# Vulnerability and Environmental Hazards

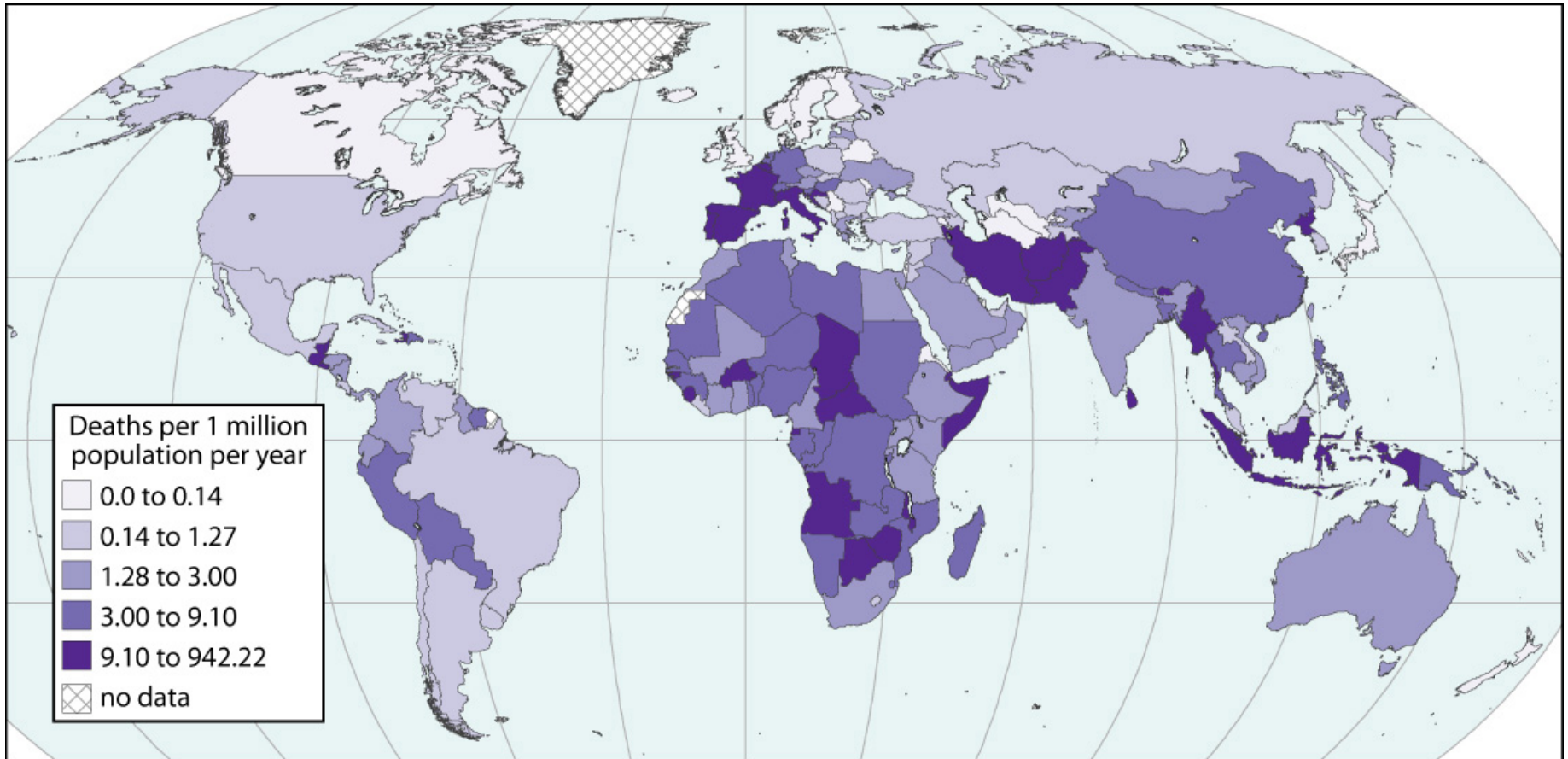
**Environmental hazards** are risks posed to human health through natural events such as earthquakes, tsunamis, or hurricanes. While the event itself may be seen as “natural,” the way that it affects people is mediated through social factors.

These satellite images show a 10 kilometer square area before (above) and after (below) the tsunami that struck Southeast Asia in late 2004.



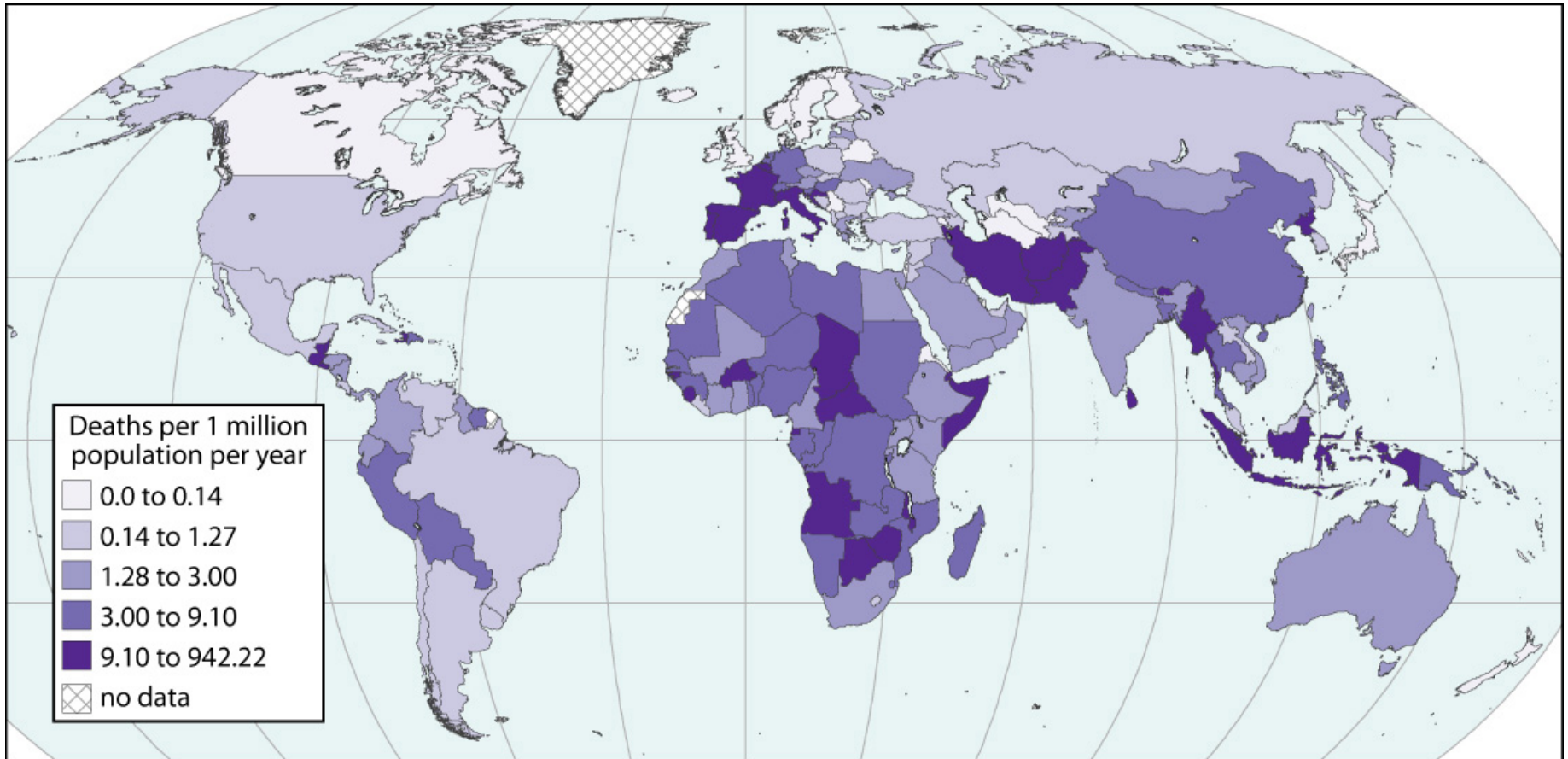
Image Source: NASA (2004)





Data from Centre for Research on the Epidemiology of Disasters (2010)

This map shows the raw death rate from natural hazards from 1959 to 2009. High rates in Western Europe reflect deaths from heat waves in recent years.



Data from Centre for Research on the Epidemiology of Disasters (2010)

**Why are poorer individuals and communities often especially vulnerable to environmental hazards?**



Photo by Heike Alberts (2003)

Steep slopes and poorly constructed housing in this shantytown on the outskirts of Lima, Peru put its residents at particular risk from hazards such as earthquakes and landslides.





In 2005, Hurricane Katrina hit the Gulf Coast of the US, and highlighted how social status and ethnicity can intersect to increase vulnerability.

Communities located in low-lying areas, and thus most seriously affected by flooding, were primarily poor and African American.

Photo courtesy of U.S. Department of Defense

# Vulnerability and Chicago's 1995 Heat Wave

A 1995 heat wave in Chicago led to several hundred fatalities, predominantly from low-income, inner-city neighborhoods.

**What specific factors do you think influences who dies among the urban poor during heat waves?**

# Socioeconomic Environments and Obesity



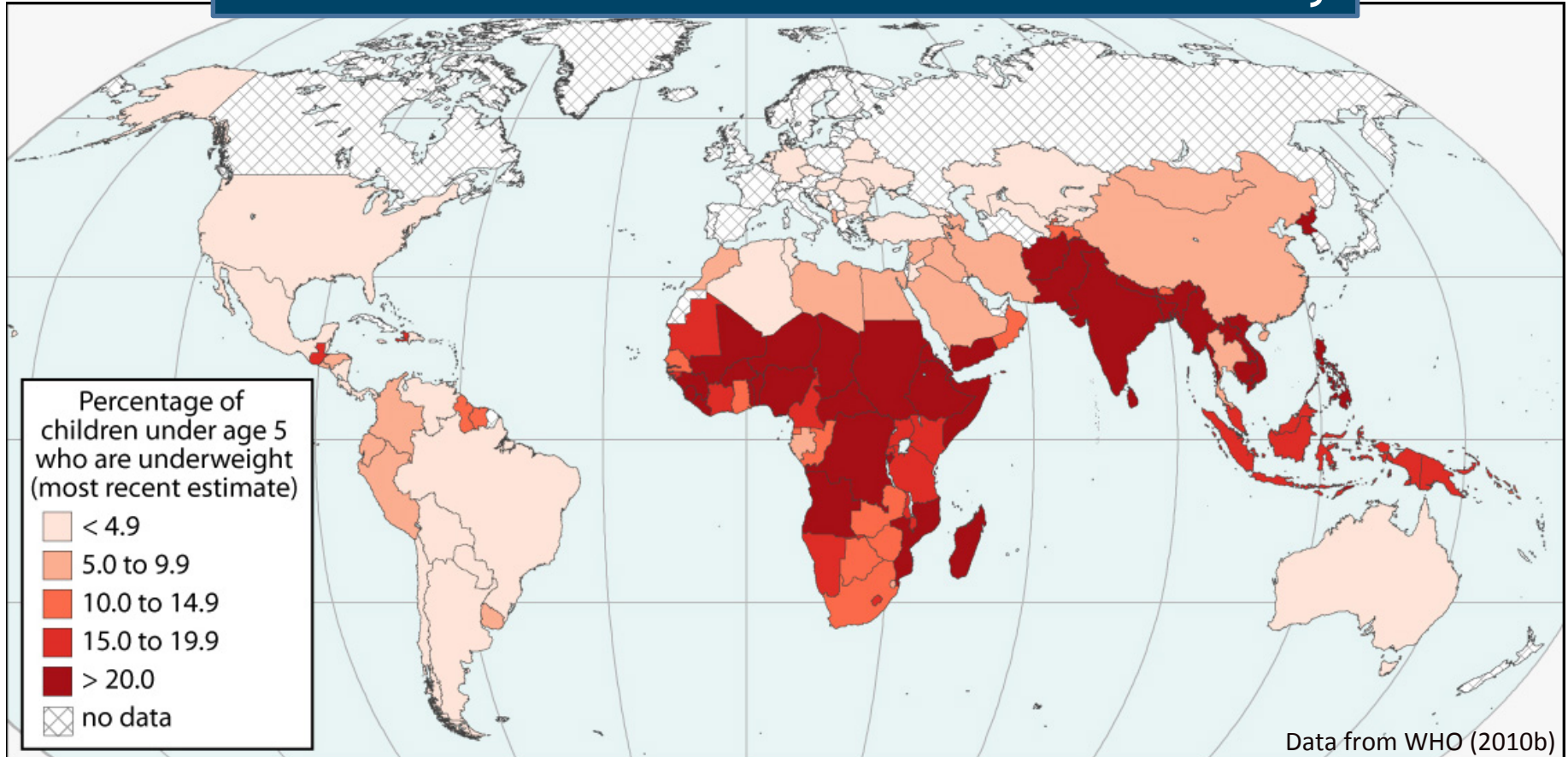
Photo by Peter Anthamatten

Nutrition efforts have traditionally focused on ensuring that children get adequate nutrition.

A health worker measures a child's height during a nutrition survey in Costa Rica. Height and weight are easily-collected indicators of children's nutritional status.



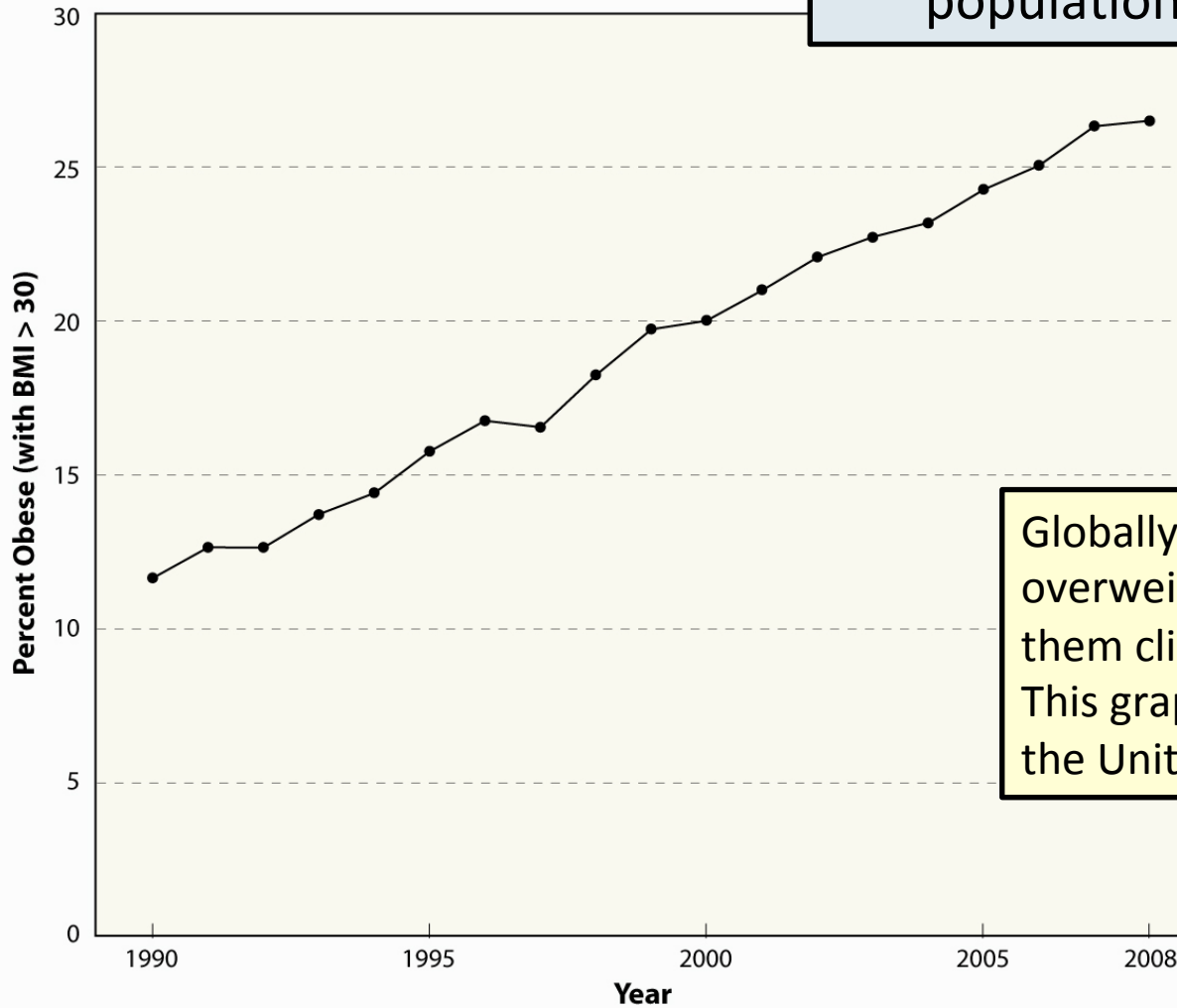
# The Socioeconomic Environment and Obesity



Undernutrition and malnourishment are usually problems associated with an inability to procure or grow sufficient food, a problem of poverty.

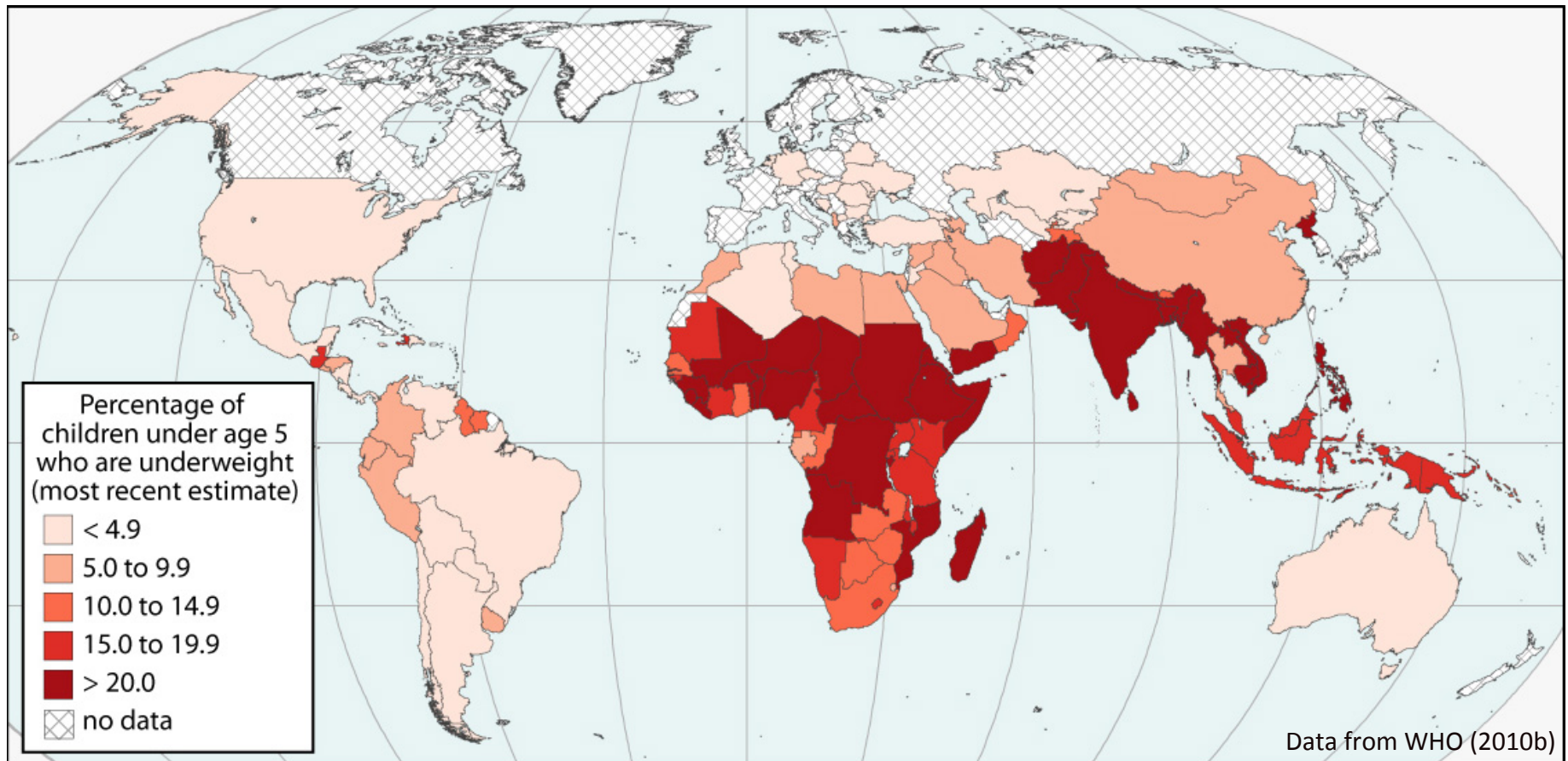


Today, obesity and overnutrition affect a larger proportion of the world's population than undernutrition.

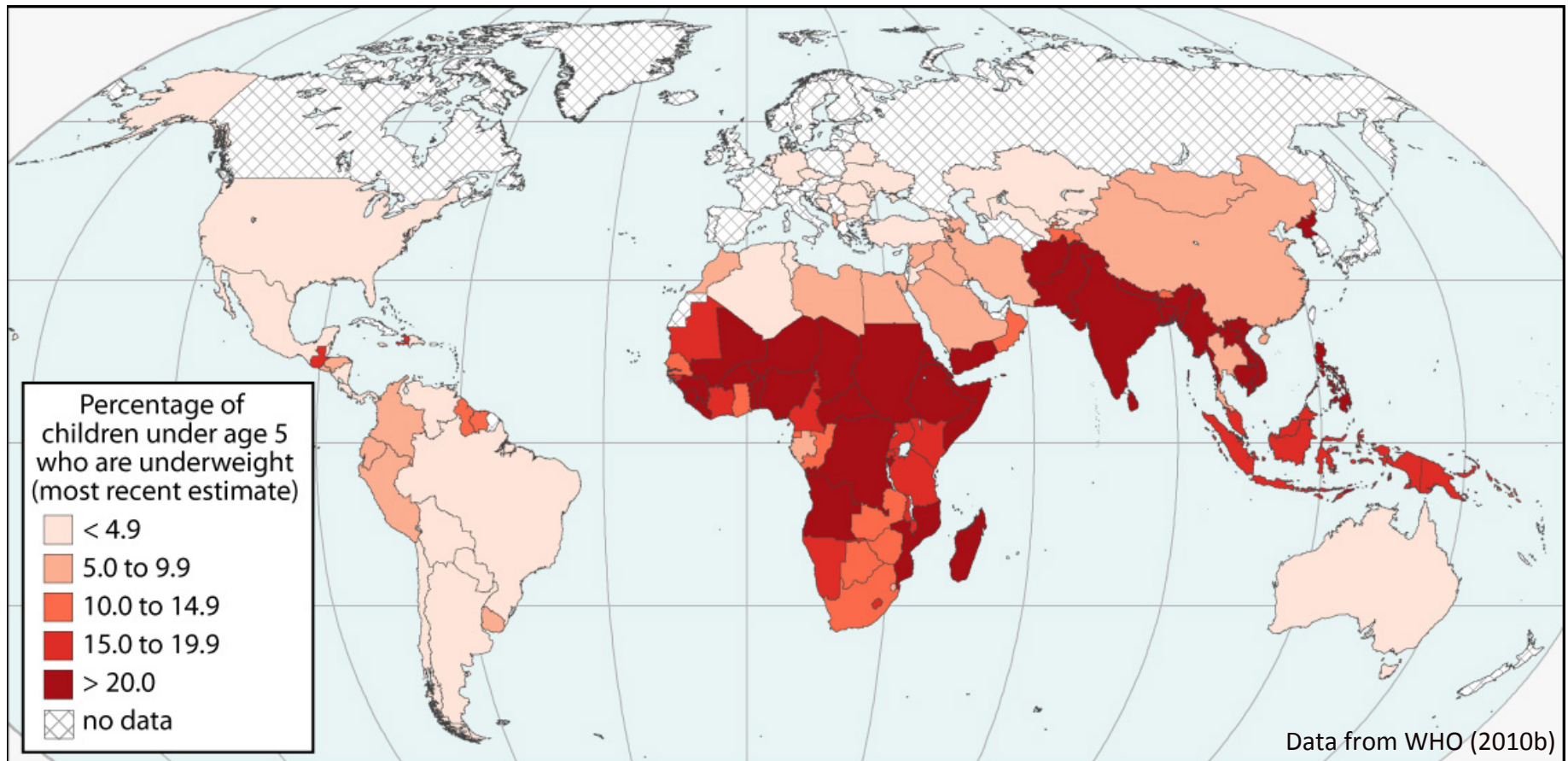


Globally, more than 1 billion adults are overweight; at least 300 million of them clinically obese (WHO 2010a). This graph shows the obesity rate in the United States from 1990 to 2008.

Data from CDC (2008)



Obesity is most prevalent in affluent, industrialized countries, although rates are rapidly increasing in many middle-income and even low-income countries.



Obesity is an example of a “multi-factoral” disease—one that has a variety of different causes.

What do you think are some of the causes behind the rise in obesity rates?

How might causes of obesity differ between countries or communities?

Obesity is the consequence of both **direct causes** (an imbalance in the body's energy intake and consumption) and **indirect causes** (the social, political, and economic factors that influence energy intake and consumption).

### **Direct Causes**

- Diet
- Behavior (physical activity)

### **Indirect Causes**

- Social change
- Behavioral change
- Modernization
- Urbanization
- Globalization of food markets



Geographers, with their interest in place, have been particularly interested in studying **obesogenic environments**, places that are characterized by “environments that promote increased food intake, non-healthy foods, and physical inactivity” (CDC 2009).



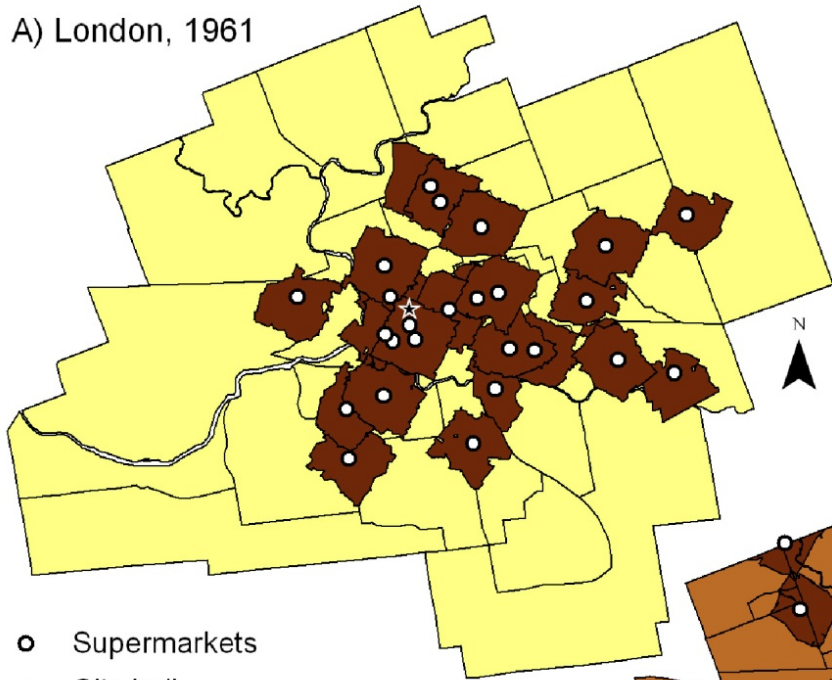
Photo by Erin Korris



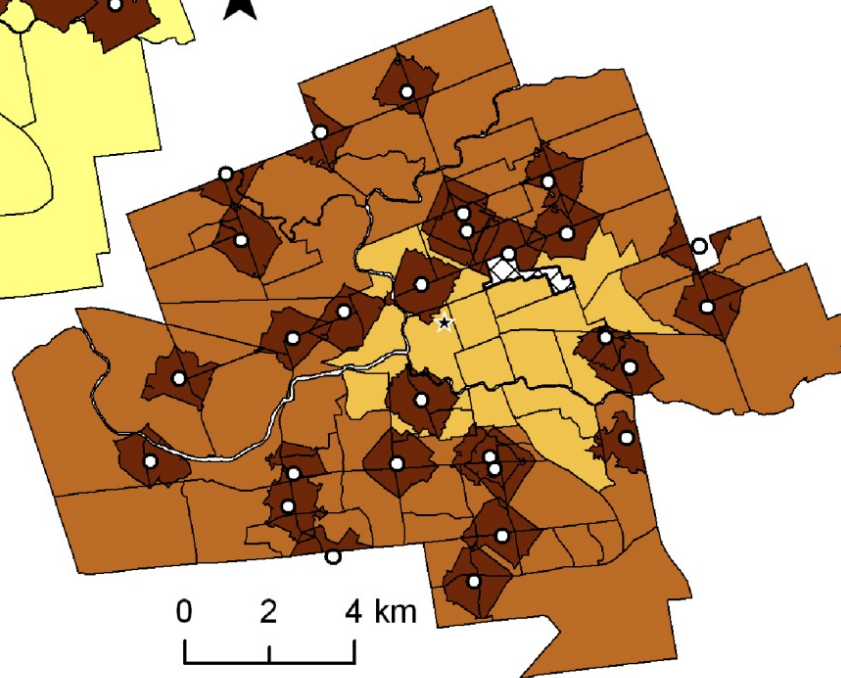
These maps show changes in the distribution of supermarkets in London, Canada, over a 44-year period.

The maps show how supermarkets have become increasingly suburbanized, potentially leaving inner-city residents with poorer access to healthy foods from supermarkets.

A) London, 1961



B) London, 2005



- Supermarkets
- ★ City hall
- Service area
- London, 1961
- Urban neighbourhoods, 2005
- Suburban neighbourhoods, 2005
- ▨ Non residential

Source: Larsen and Gilliland (2008)

## Conclusion

Wealth affects health both *directly*, through enabling access to resources such as high quality healthcare and nutritious foods, and *indirectly*, through the influence of aspects of the built and social landscape on health behaviors.

## Discussion Questions

1. Why are crude death rates not considered to be a good indicator of the overall “healthiness” of a particular community? What other health indicators might give a better idea of a community’s health?
2. What kinds of natural hazards affect the region in which you live and what makes people vulnerable to their effects?
3. What aspects of the social and economic environment could be considered obesogenic in your community? Are different sub-populations within your community (e.g., the poor, minority groups, or children) affected in different ways or to different degrees?
4. Has “sense of place” influenced your health or wellbeing? In what ways?

# Culture and Identity



Photo by Melissa Gould

# Health and Culture

**Culture** refers to the beliefs and practices acquired from society that are lived by a particular group of people.

Gesler and Kearns (2002: 13) warn, “culture should not be used as a source of explanation; rather it is something to be explained as it is continually being socially produced by people as they struggle to achieve power and meaning.”

**Can you think of an example of how health and culture are related in your life?**



Health geographers focus on both how culture influences health and how health influences culture. Culture may influence health via health policies, social norms, or even cultural understandings of what constitutes health or disease.

For example, different governments have issued different guidelines about diet for women during pregnancy.

# Government-issued Pregnancy Recommendations

## France

**Avoid:** soft cheeses with white rind (e.g., Brie), especially if made with raw milk; industrially-grated cheese; cheese rinds; cooked pork; potted meat, pâté, foie gras, and gelatinous products; raw or rare meat; raw fish and shellfish; smoked fish; alcohol; liver

**Consume in moderation:** caffeine, carbonated drinks and energy drinks; soy-based foods

Source: Program National Nutrition Santé (2007)

## United States:

**Avoid:** alcohol; certain types of fish

**Consume in moderation:** certain types of fish

US Department of Health and Human Services (2006)

## Hong Kong

**Avoid:** foods high in calories but low in nutritional value such as soft drinks

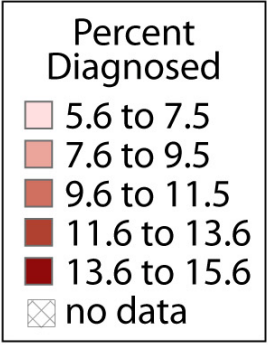
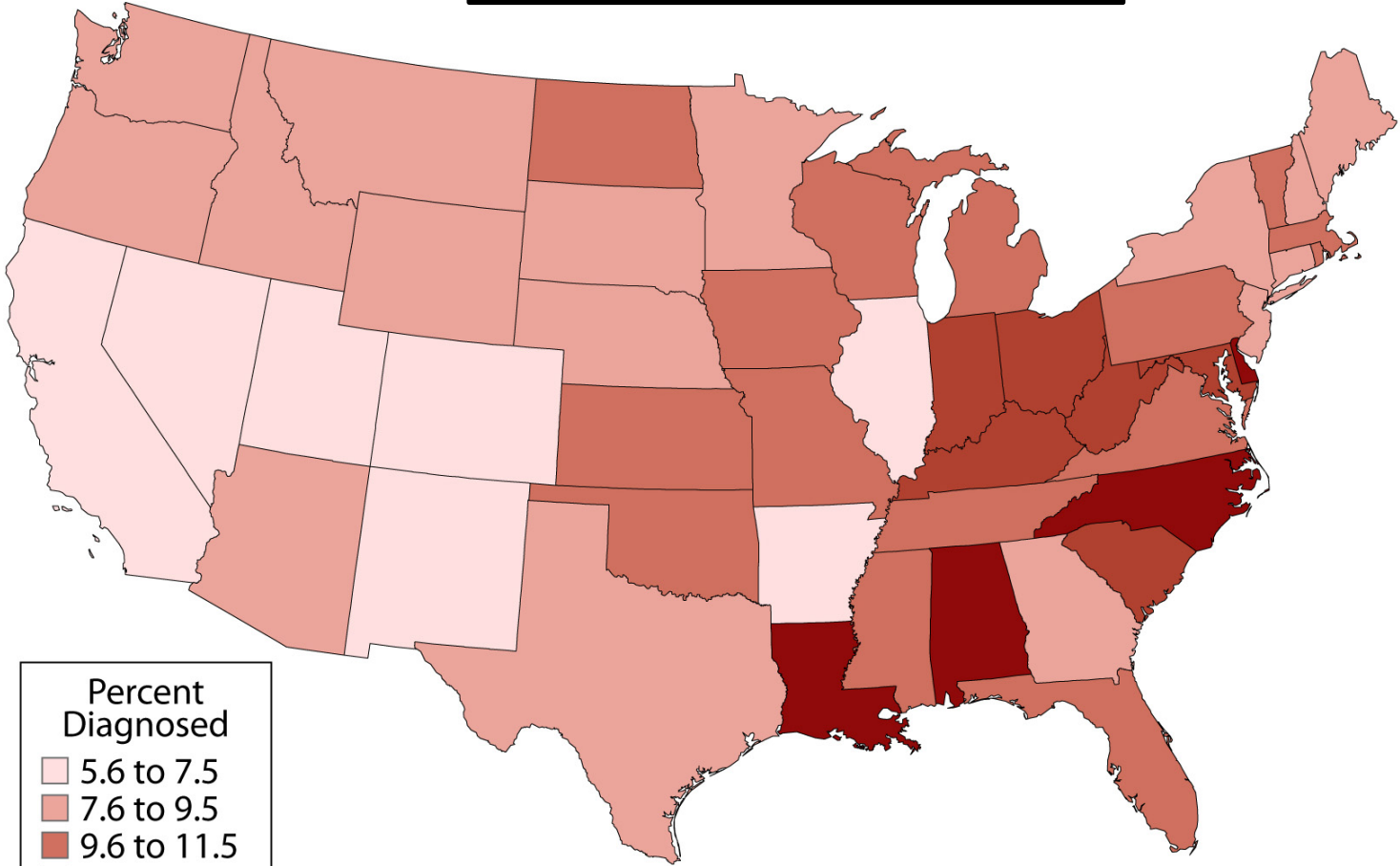
**Consume in moderation:** salty and preserved foods; strong spices such as chili

Source: Government of Hong Kong Department of Health (2004)

Perceptions of what is considered to be disease can be rooted in culture.

For example, many behavioral disorders are dependent on an understanding of “normal” behavior, which may have a different meaning in different societies.

# ADHD Diagnoses by State, 2007

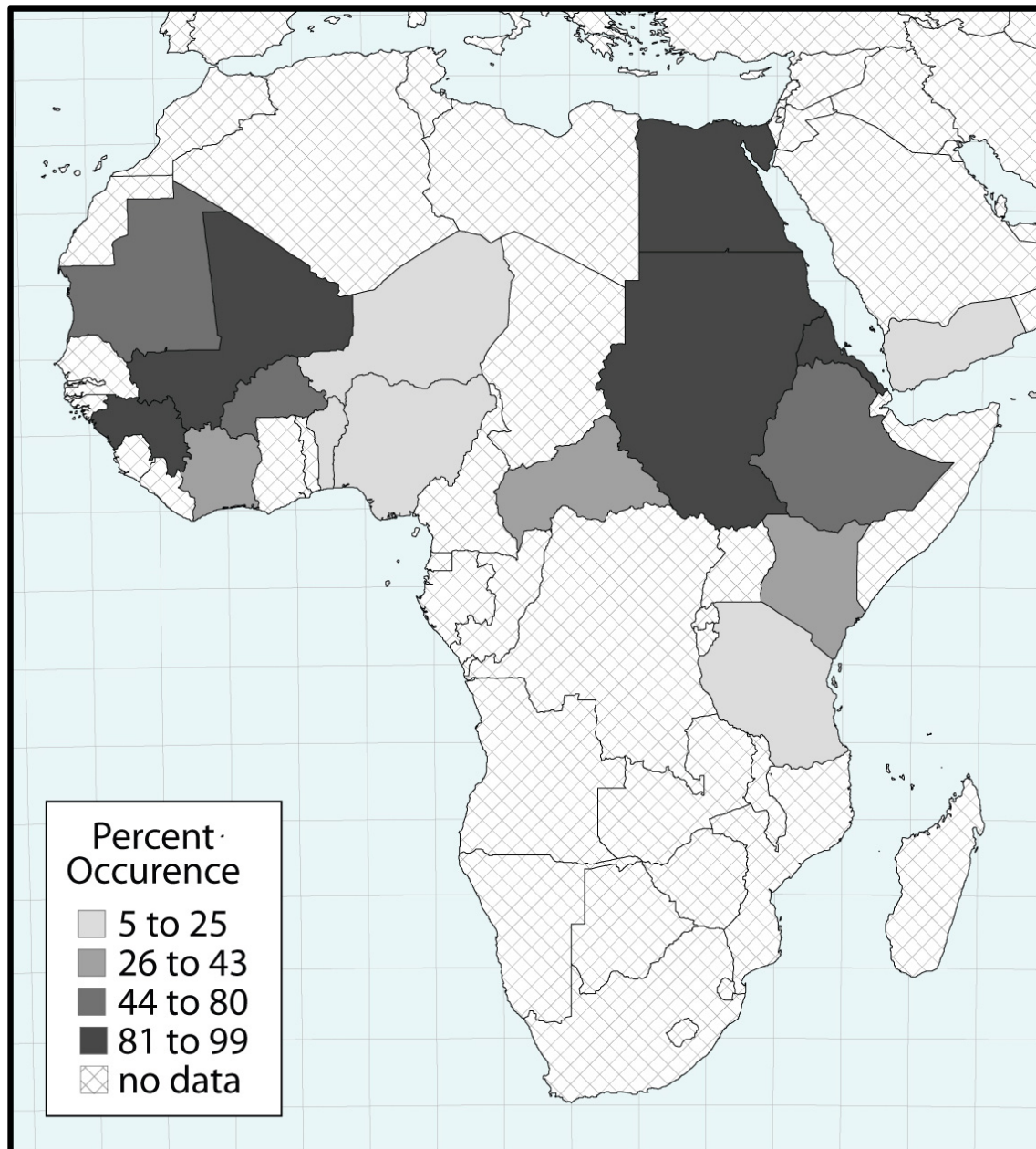


Data Source: CDC 2007

In the case of ADHD, a rapid increase in diagnoses in the 1990s and regional differences in incidence rates have led some to suggest that the diagnosis of ADHD may be influenced by culture.

Sometimes cultural conceptualization of health are highly contentious. The surgical removal of female genital parts is considered inhumane in many parts of the world, yet is common practice in some communities in Africa.

This map shows the percentage of girls who receive a clitoridectomy—one form of genital cutting.



Data from Yoder et al. (2004)



Cultural beliefs can also contradict biomedical practice. In the West, for example, there has recently been a backlash against vaccination programs, related to concerns over the safety of vaccines.

# Health and Identity

Important aspects of identity include gender, class, race, ethnicity, and sexuality, with people's identities evolving out of a complex layering of these factors.

Facets of identity intersect with culture to produce expectations and behaviors that affect health.



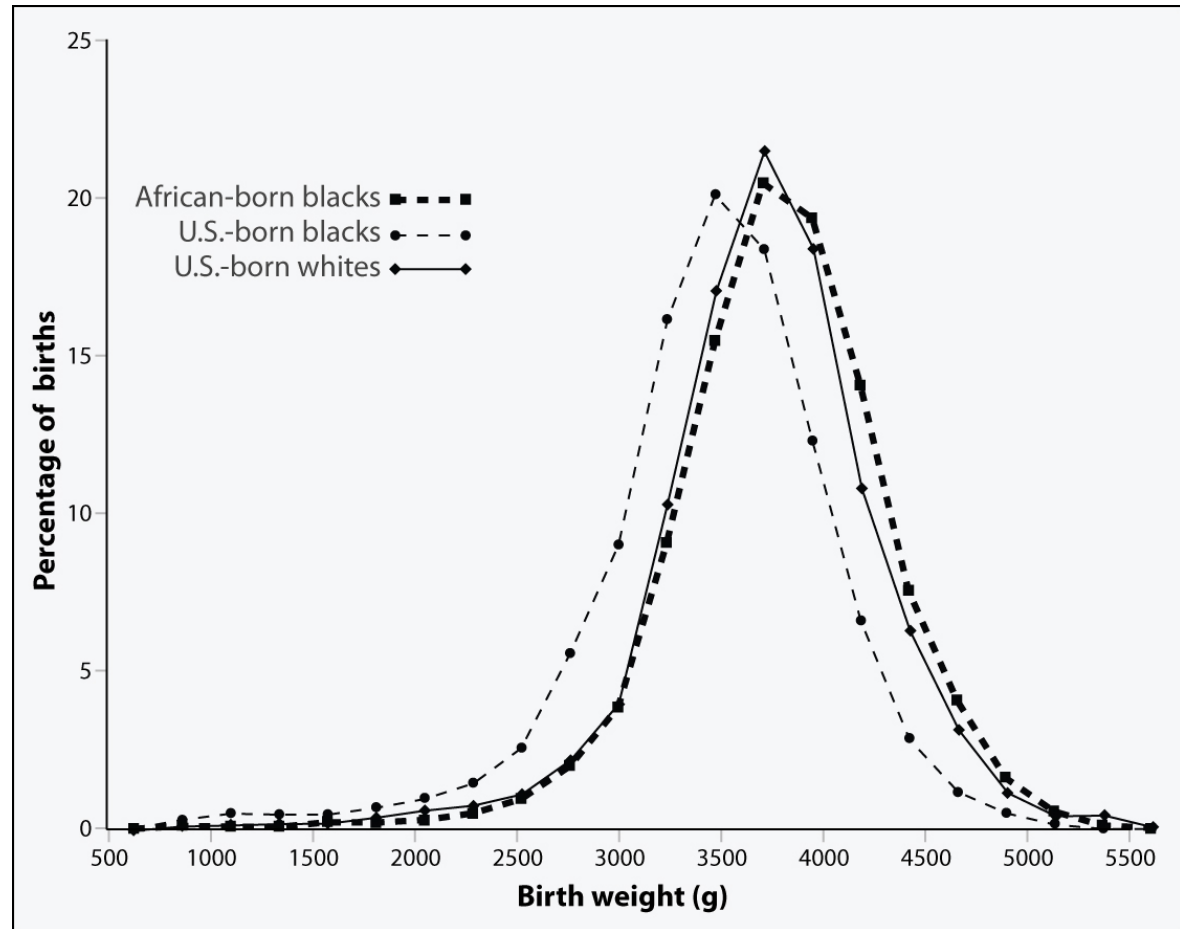
Photo by Helen Hazen

**How do you think your identity might have affected your health?**

Incan symbols and clothing remain important for this community in Andean Peru.

Sometimes the health impacts of social identities can be measured. For instance, African American women are more likely to have low birth weight babies than are mothers from white or African-born populations in the US.

This graph shows the birth weight distributions of three populations in Illinois.



Source: David and Collins (1997)  
Copyright © [1997] Massachusetts Medical Society. All rights reserved.

# Gender

Although biological distinctions may appear to be the main difference between men and women, social theorists have argued that much of what gives women and men different experiences is how masculinity and femininity are socially constructed.

In this context, there is an important distinction between **sex** (the biological reality of being male or female) and **gender** (the socially-constructed aspects of being male or female).

**How could social constructions of gender influence health?**

The notion of **structural violence** is used to refer to the ways in which social structures and institutions prevent people from meeting their basic health needs, and is often considered to be gendered.

For example, women are more likely than men to be the victims of sexual violence. In some places, women and girls may be less likely to receive healthcare when they are sick.



## Race

Traditionally, studies of the influence of race on health have focused on seeking genetic differences among racial groups. These studies have typically identified few genetic distinctions among races.

More recently, studies have focused on how the impact of race on health is frequently confounded by socioeconomic status.

Researchers have also begun to investigate the ways in which race-based identities may have health implications.

**How might a person's ethnic or racial identity have an impact on their health?**

## Life-worlds

Some scholars have argued that the key to understanding these geographies of difference is to appreciate the lived experiences of individuals, rather than groups of people.

This perspective suggests that individual “**life-worlds**” —the sum of one’s lived experiences—are important in understanding the uniqueness of health outcomes and responses to them.



Photos by Helen Hazen

**How do you think the life-worlds of these people differ?  
How could these differences influence their health?**

# Identity and Disability

As identity can influence health, so too can health influence identity. In particular, ill-health can act as a significant facet of an individual's identity.

**What diseases or conditions can you think of where individuals may actively seek, or avoid, being labeled as having the disease?**

# Geographies of Disability

**Geographies of disability** consider how the bodily and social experiences of people with disabilities are unique. Social and spatial exclusions are a particular focus.



Source: NPS 2006



## Conclusion

Culture and identity are powerful influences on our everyday lives—this influence extends to the realm of health.

Our beliefs about ourselves and others and about our relative positions in society are integral to our health, how we think about improving it, and how we perceive people who are not in good health.

# Infectious Diseases



Cairo, Egypt

Photo by Heike Alberts

# Epidemiologic Transition

In low-income countries, infectious diseases cause a large proportion of deaths.

<u>Low-Income Countries</u>	
<b>Cause of death</b>	<b>Proportion (%)</b>
Lower respiratory infections	11.2
Coronary heart disease	9.4
Diarrheal diseases	6.9
HIV/AIDS	5.7
Stroke/cerebrovascular diseases	5.6
Chronic obstructive pulmonary disease	3.6
Tuberculosis	3.5
Neonatal infections	3.4
Malaria	3.3
Prematurity and low birth weight	3.2

Data Source: WHO 2008

With industrialization and greater wealth, the major causes of death shift from infectious to non-infectious diseases.

This shift is known as the **epidemiologic transition**.

What are some of the factors that stimulate this health transition?

<u>High-Income Countries</u>	
<b>Cause of death</b>	<b>Proportion (%)</b>
Coronary heart disease	16.3
Stroke/cerebrovascular diseases	9.3
Trachea, bronchus, lung cancers	5.9
Lower respiratory infections	3.8
Chronic obstructive pulmonary disease	3.5
Alzheimer and other dementias	3.4
Colon and rectum cancers	3.3
Diabetes mellitus	2.8
Breast cancer	2.0
Stomach cancer	1.8

Data Source: WHO 2008

Many middle-income countries now face a “**double burden of disease**” in the face of rapid industrialization, as they cope with both infectious disease and diseases of affluence.

<u>Middle-Income Countries</u>	
<b>Cause of death</b>	<b>Proportion (%)</b>
Stroke/cerebrovascular diseases	14.2
Coronary heart disease	13.9
Chronic obstructive pulmonary disease	7.4
Lower respiratory infections	3.8
Trachea, bronchus, lung cancers	2.9
Road traffic accidents	2.8
Hypertensive heart disease	2.5
Stomach cancer	2.2
Tuberculosis	2.2
Diabetes mellitus	2.1

Data Source: WHO 2008



# Pathogen and Vector Populations

It is not only characteristics of the host population that are important for understanding trends in human infectious diseases.

Pathogens and vectors can evolve rapidly, making them a challenging target for drug and vaccine manufacturers.

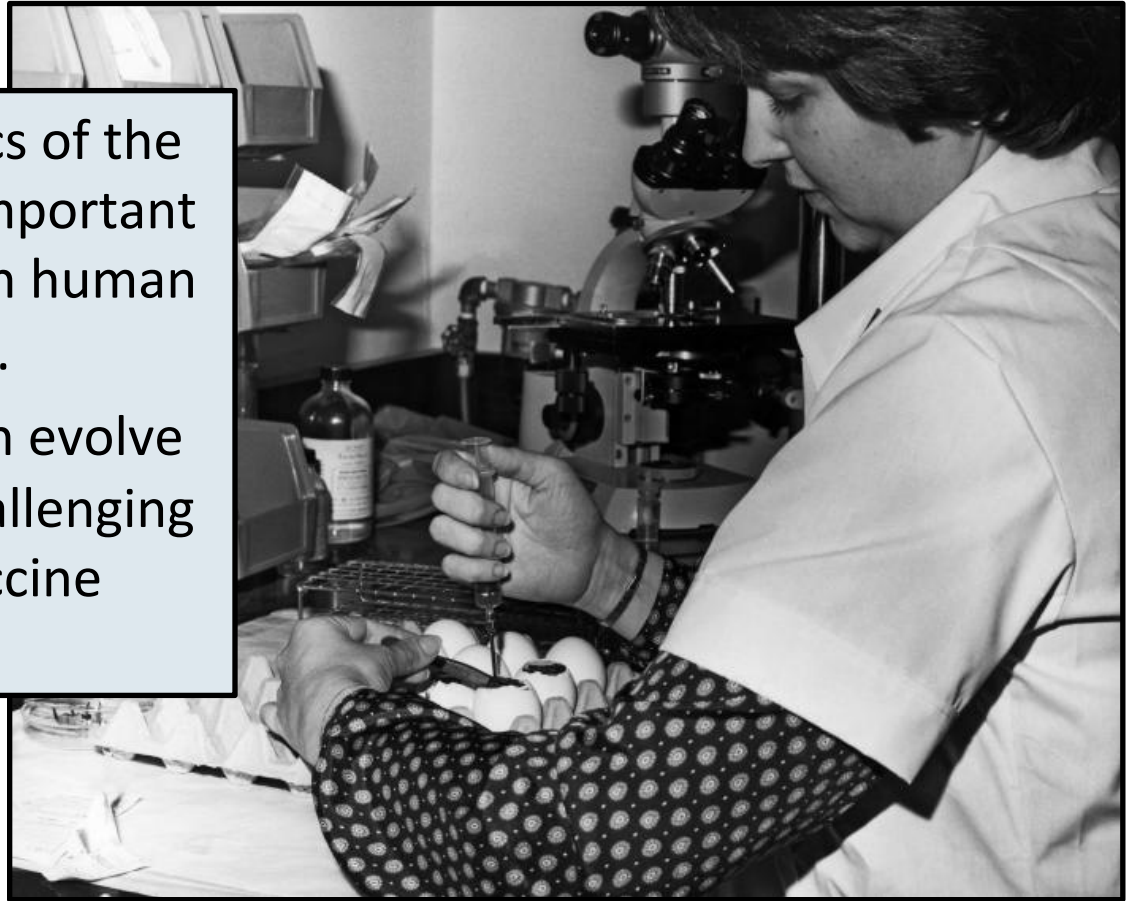


Image source: CDC (1968)

A CDC worker working with an influenza virus in 1968.

# Antibiotic Resistance

Antibiotic resistance emerges when antibiotics kill the most susceptible bacteria in a population. The remaining individuals, with higher levels of resistance to the antibiotic, are able to breed rapidly, thereby increasing the proportion of antibiotic-resistant bacteria in the population.

Although pathogens evolve in this way naturally, humans have unwittingly facilitated the development of antibiotic-resistant pathogens.

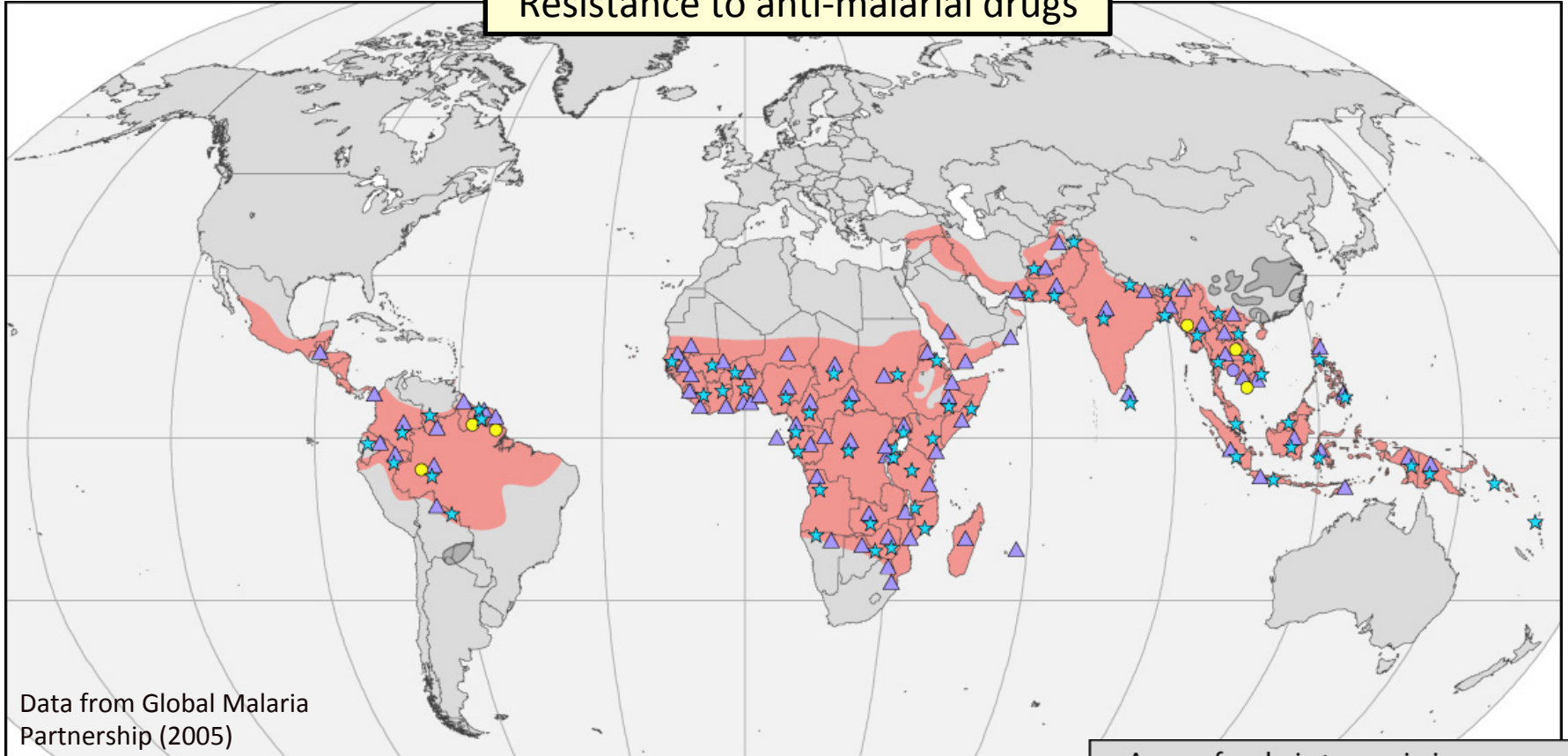
**How have human activities encouraged the development of antibiotic resistance?**



Image source: CDC (1976)

A vaccination is administered as part of the US swine flu vaccination campaign in 1976.

## Resistance to anti-malarial drugs



In vector-borne diseases, resistance is becoming a problem in both pathogen and vector populations; vectors are increasingly resistant to pesticides.

# Emergent and Resurgent Infectious Disease

Infectious disease continue to be responsible for more than one-third of deaths worldwide.

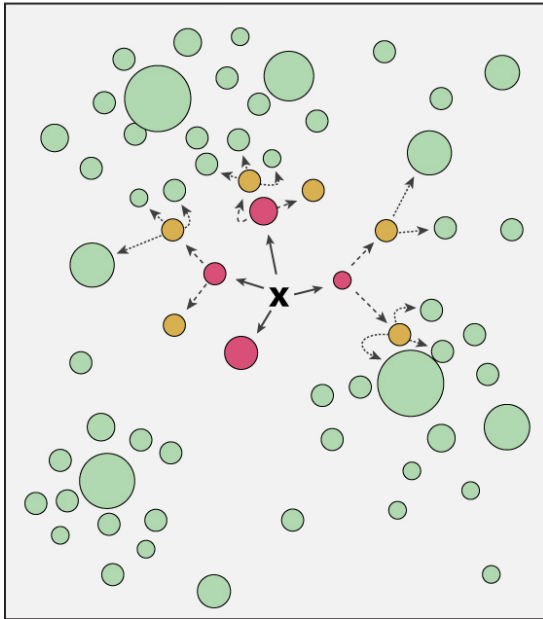
Additionally, a large number of new infectious diseases have emerged since the 1940s.



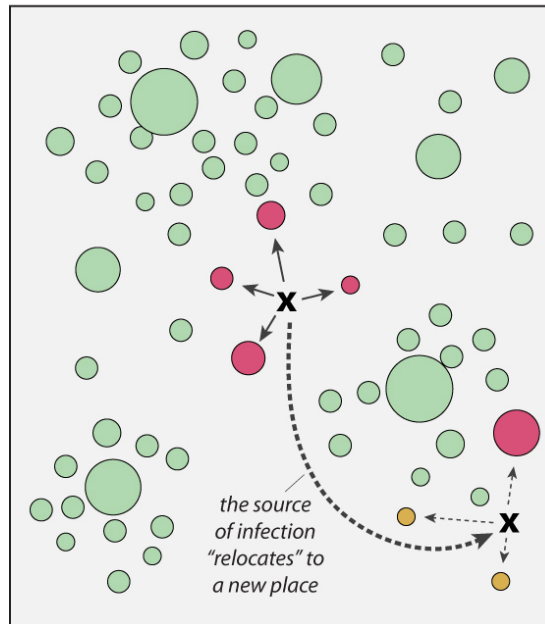
# Diffusion

Infectious diseases can be modeled geographically by considering how they spread across space. The spread of something through space is called **diffusion**.

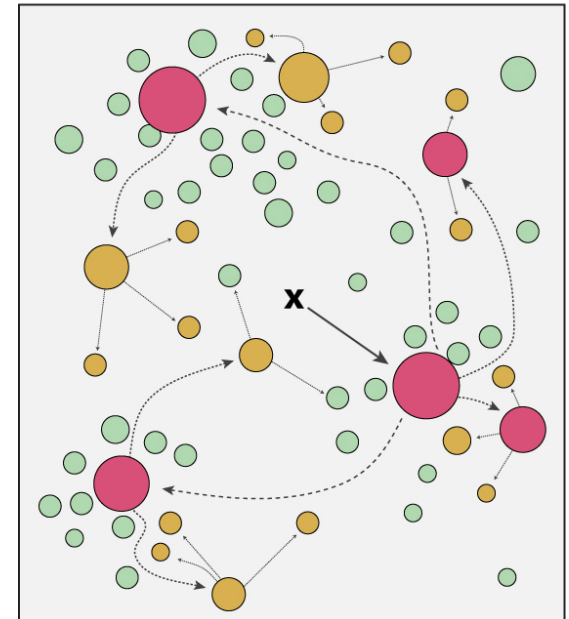
Expansion diffusion



Relocation diffusion



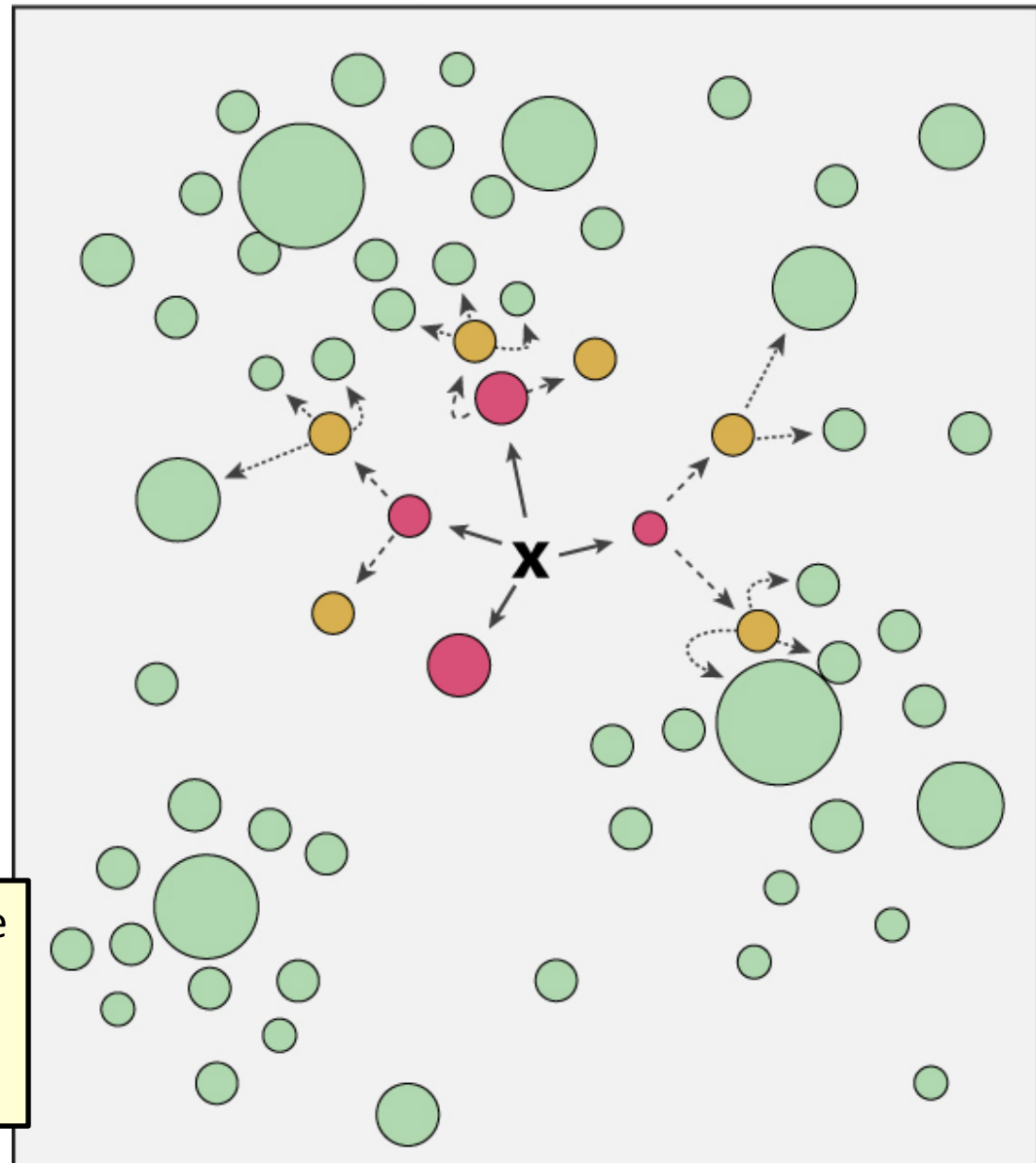
Hierarchical diffusion



## Expansion diffusion

The spread of a phenomenon across space, passed through interactions between one person and his or her neighbor is called **expansion diffusion**.

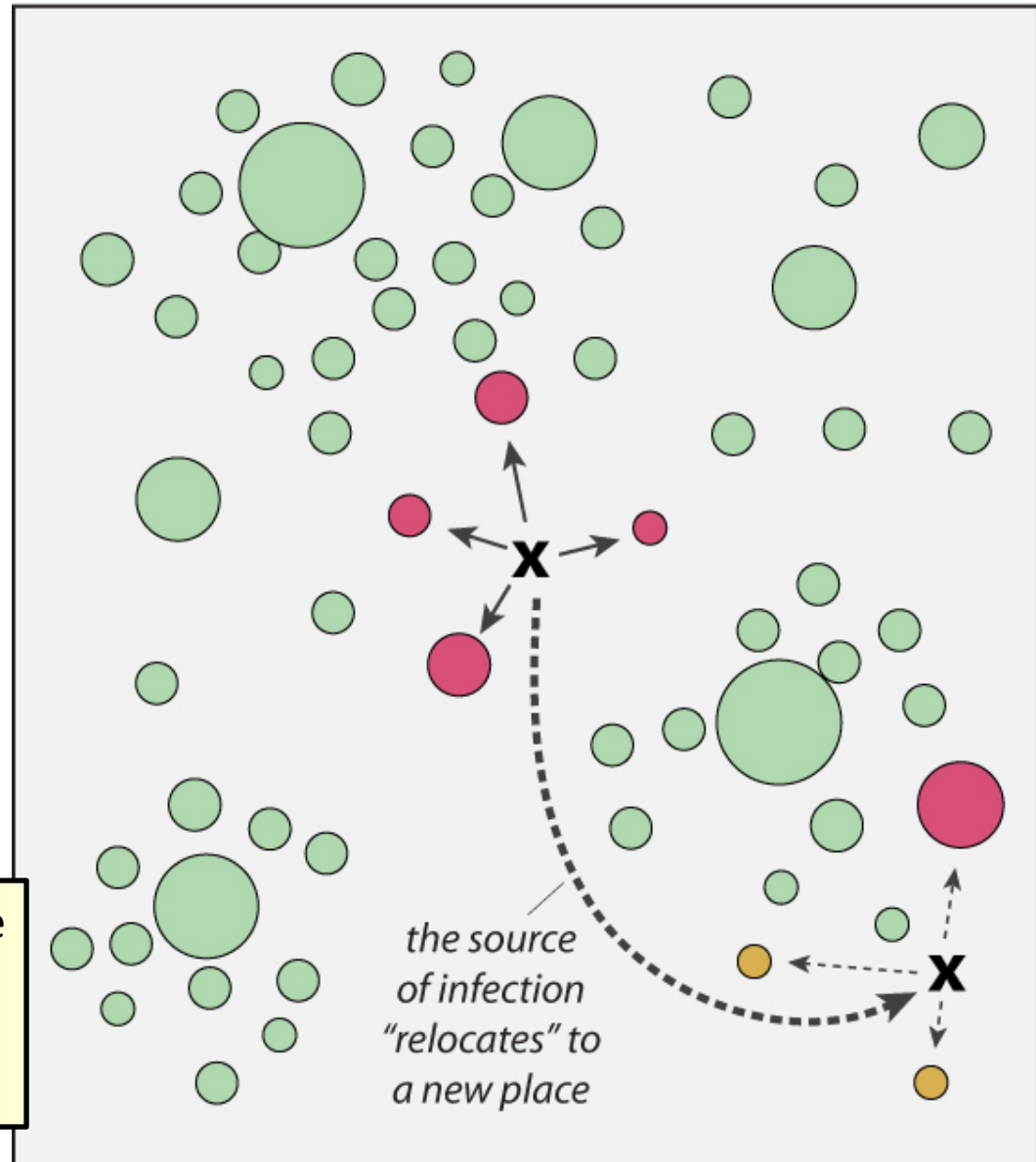
The "x" symbolizes the original source of the phenomenon; the circles symbolize settlements—larger circles represent larger settlements.



## Relocation diffusion

The introduction of a phenomenon to a new location, completely outside the current range of that phenomenon, is called **relocation diffusion**.

The "x" symbolizes the original source of the phenomenon; the circles symbolize settlements—larger circles represent larger settlements.

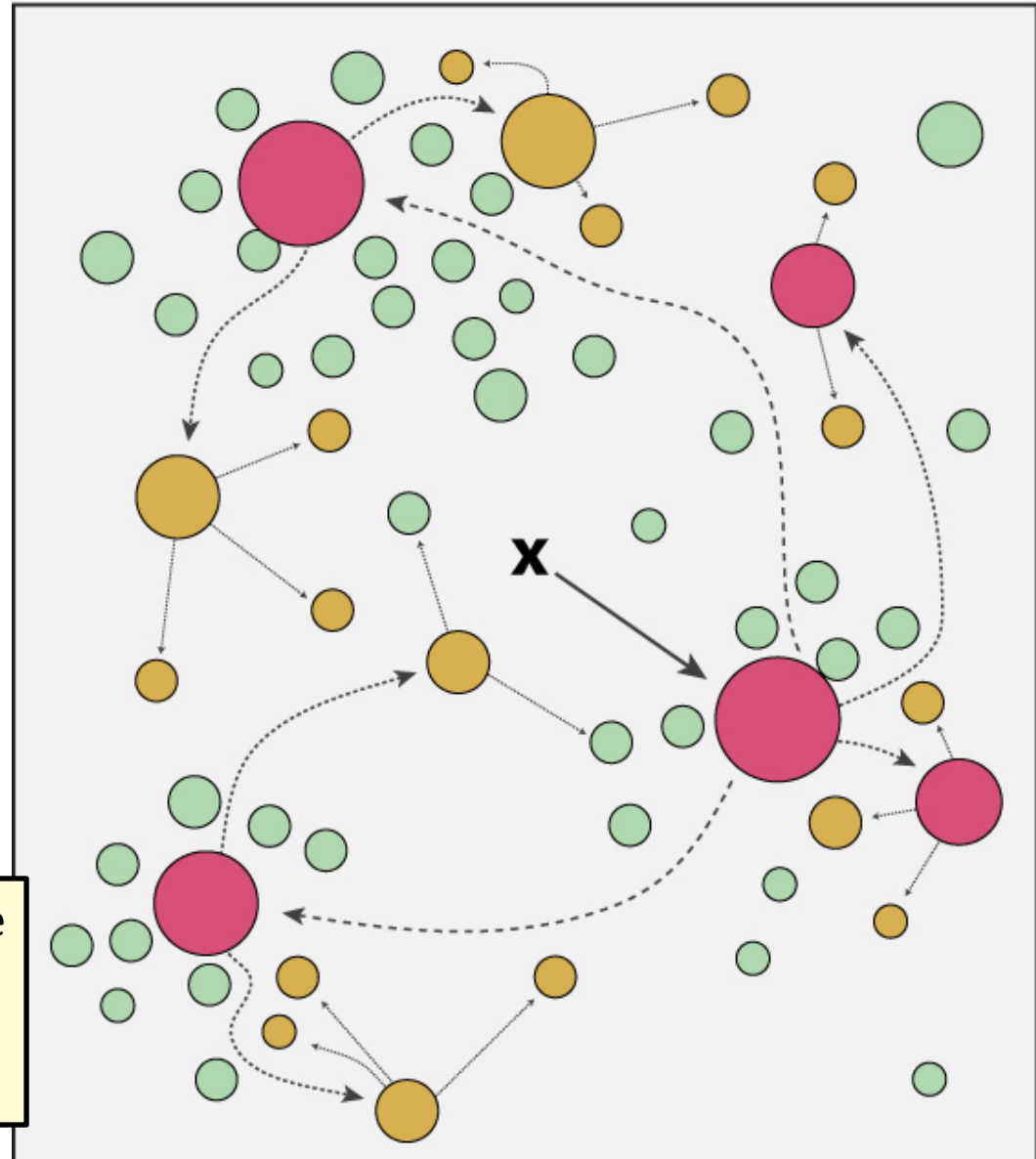


**Hierarchical diffusion** is the spread of a phenomenon along hierarchical settlement patterns.

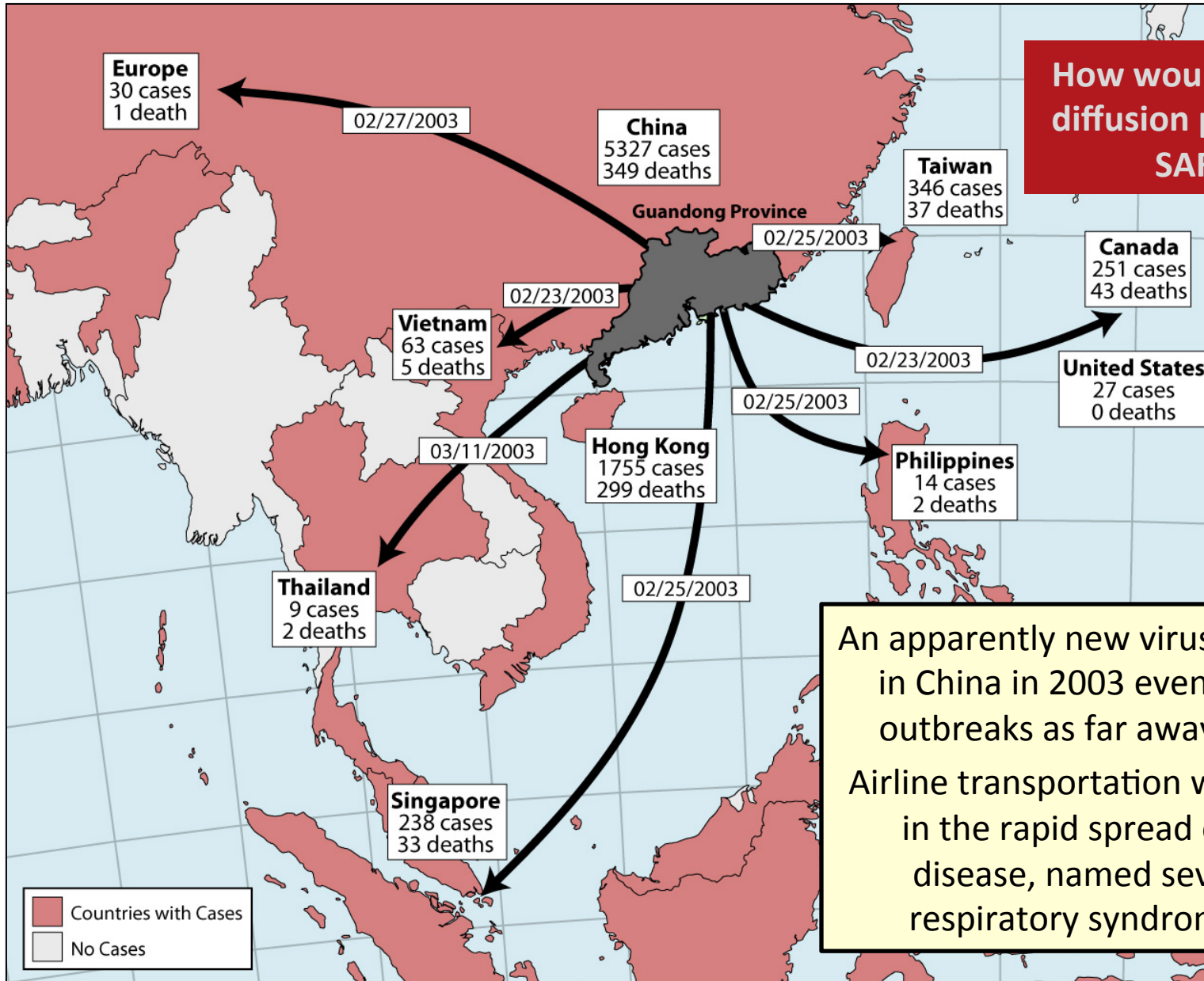
The phenomenon is more likely to move into large cities before small villages.

The "x" symbolizes the original source of the phenomenon; the circles symbolize settlements—larger circles represent larger settlements.

## Hierarchical diffusion



How would you describe diffusion patterns of the SARS virus?

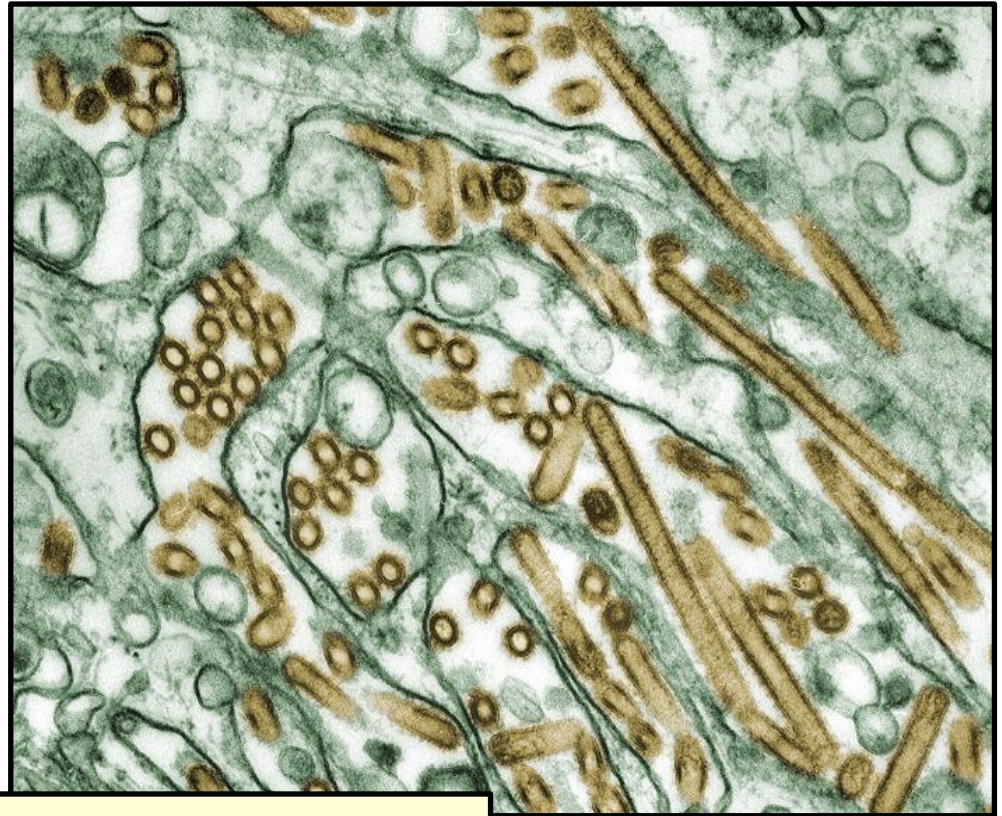


An apparently new virus that emerged in China in 2003 eventually led to outbreaks as far away as Canada. Airline transportation was implicated in the rapid spread of the new disease, named severe acute respiratory syndrome (SARS).



# Influenza

Human influenza strains are believed to have originated from pathogens that infect birds and pigs.



The H5N1 (avian flu) virus is shown in gold.

Image source: CDC (1997)

Periodic outbreaks of new strains of influenza can devastate human populations. An influenza pandemic in 1918 may have killed 50 to 100 million people.



Image Source: United States Navy (1918b)

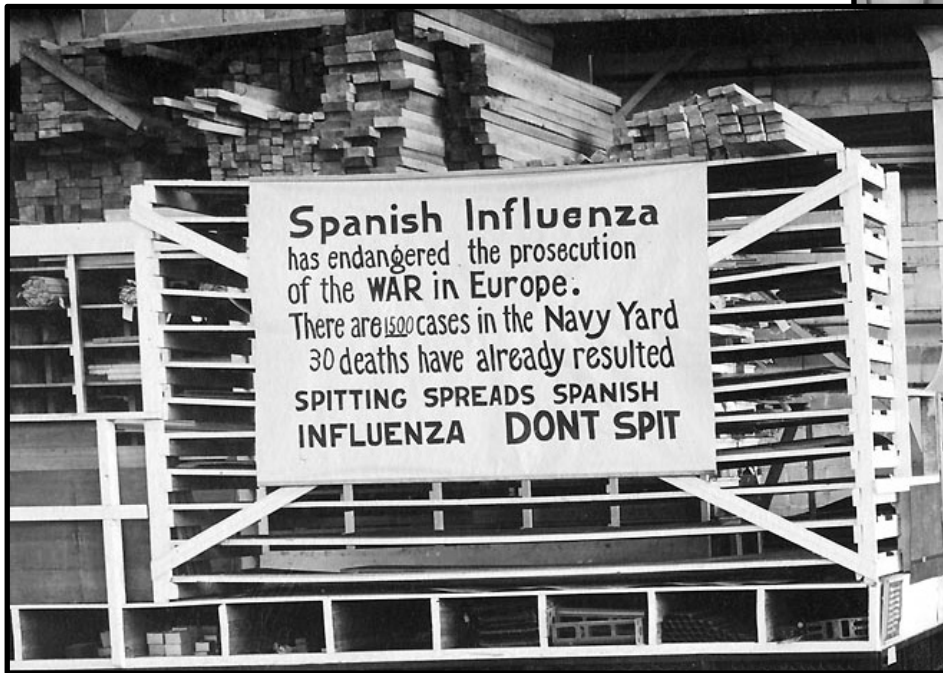


Image Source: United States Navy (1918a)

Both of these images were taken during World War I. Sneeze screens were erected to prevent the spread of influenza in barracks (above). Soldiers were asked not to spit (left).



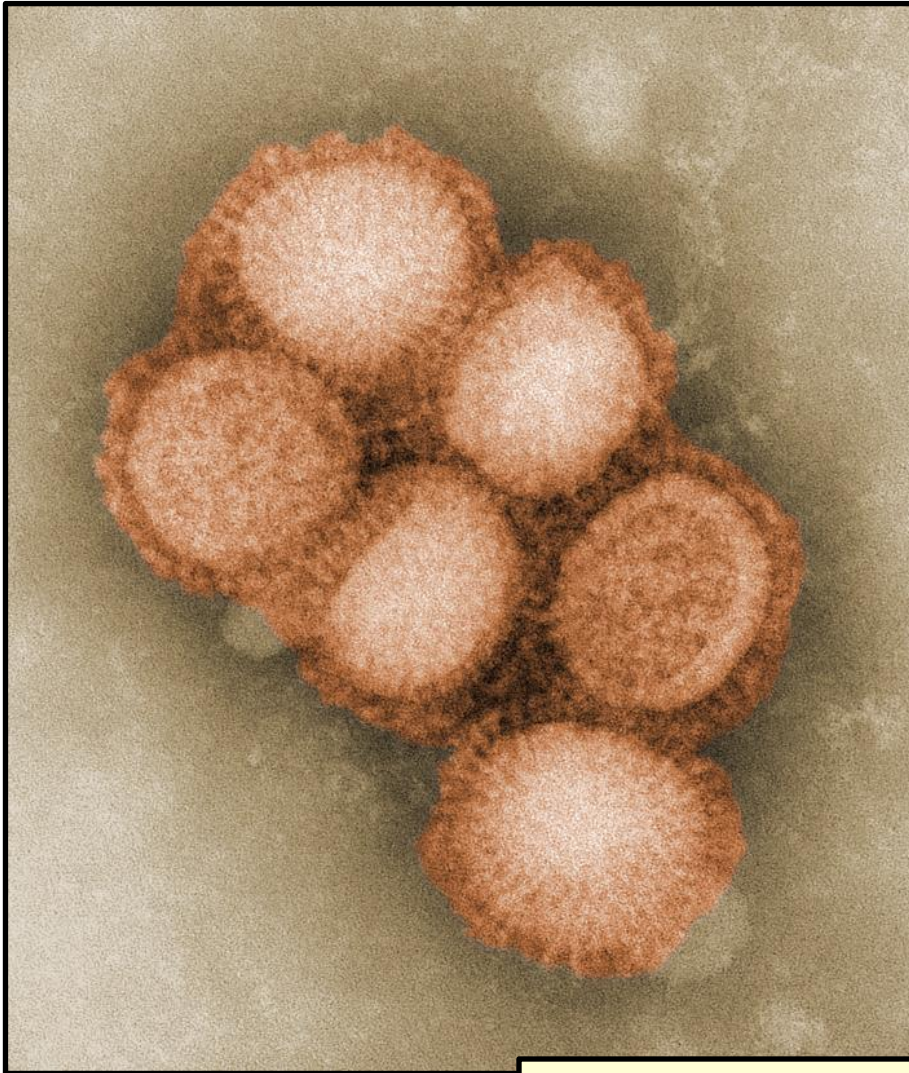


Image source: CDC (2009)

The H1N1 (swine flu) virus

In March 2009, an influenza outbreak began in Mexico. Popularly referred to as “swine flu,” the influenza strain responsible (H1N1) was capable of infecting humans, causing concern that a pandemic might follow, although this never transpired.

# Readings

1. Geography in health inequality (<http://www.gis.ttu.edu/geog3340/documents/readings/geography-health-inequality.pdf>)
2. Obesity Epidemic in the United States (<http://www.gis.ttu.edu/geog3340/documents/readings/obesity-geography.pdf>)

Please write a critical review of these two papers, starting from a summary of the papers including the problems the authors need to address, the data been collected, analysis been done to support the argument, and conclusions the authors drew, then please include your thoughts and critics about these work (e.g., what you think innovative and what you think is missing) (**2 pages, font 12, single space**).

Due Oct. 26th. 5:00pm.