

Chronic Diseases and Disorders of Aging

Instructor: Rebecca E. Graff, ScD

Friday, February 22, 2019, 8:45am – 10:15am

Mission Hall 1105

Outline

- Definition
- General Demography
- Risk Factors for Chronic Disease
- Multimorbidity

DEFINITION

Discussion:

WHAT IS A CHRONIC DISEASE?

WHO Definition

“Noncommunicable diseases, also known as chronic diseases, tend to be of long duration & are the result of a combination of genetic, physiological, environmental & behavioral factors.”

- Leading cause of death and disability worldwide
- Heart disease, stroke, and diabetes cost low- and middle-income countries up to 5% of GDP

[https://www.who.int/en/news-room/fact-sheets/detail/noncommunicable-diseases;](https://www.who.int/en/news-room/fact-sheets/detail/noncommunicable-diseases)

<http://www.wardhealth.com/articles/chronic-diseases-claim-least-75-health-care-spending-most-developed-countries-pose-growing->

CDC Definition

“Conditions that last one year or more and require ongoing medical attention or limit activities of daily living or both”

- Leading cause of death and disability in the US
- Account for 75% of nation’s \$3.3 trillion annual health care costs

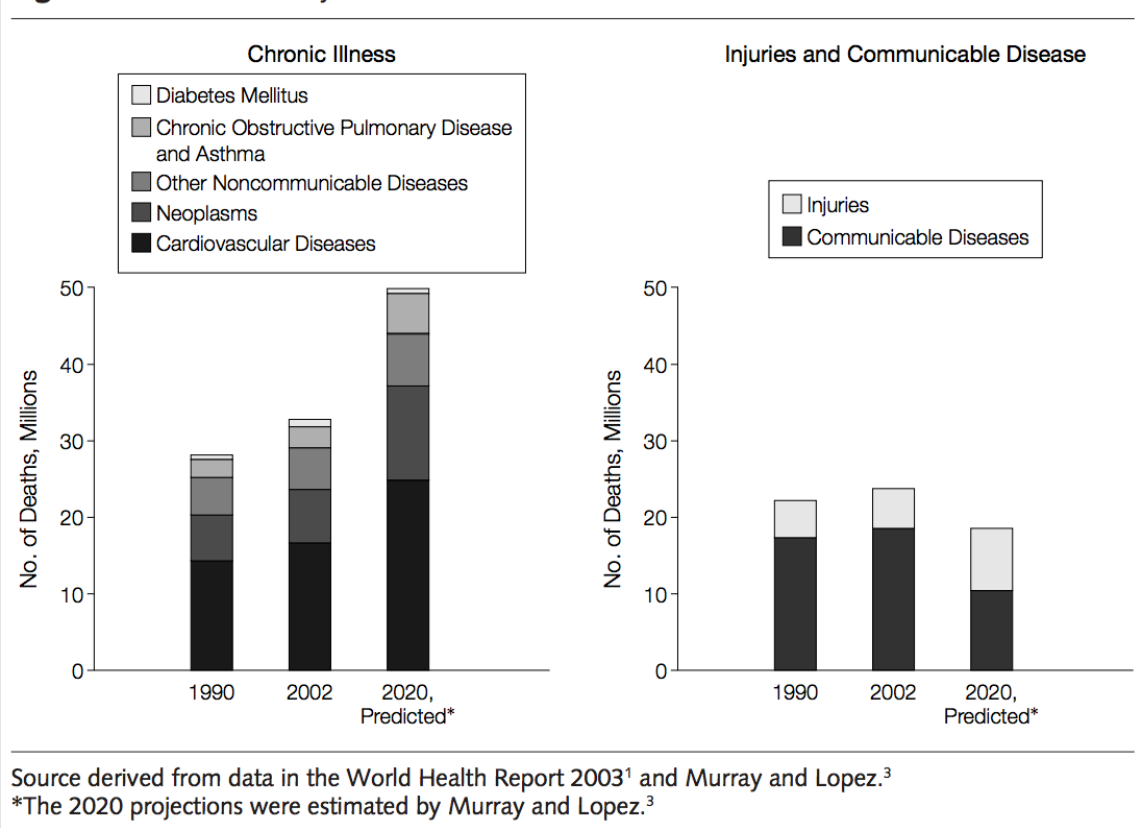
GENERAL DEMOGRAPHY

Global Burden of Chronic Disease

- Expected to account for ~60% of the global burden of disease in 2020
 - Up from 46% in 2001
- Expected to account for ~73% of all deaths in 2020
 - Up from 60% in 2001

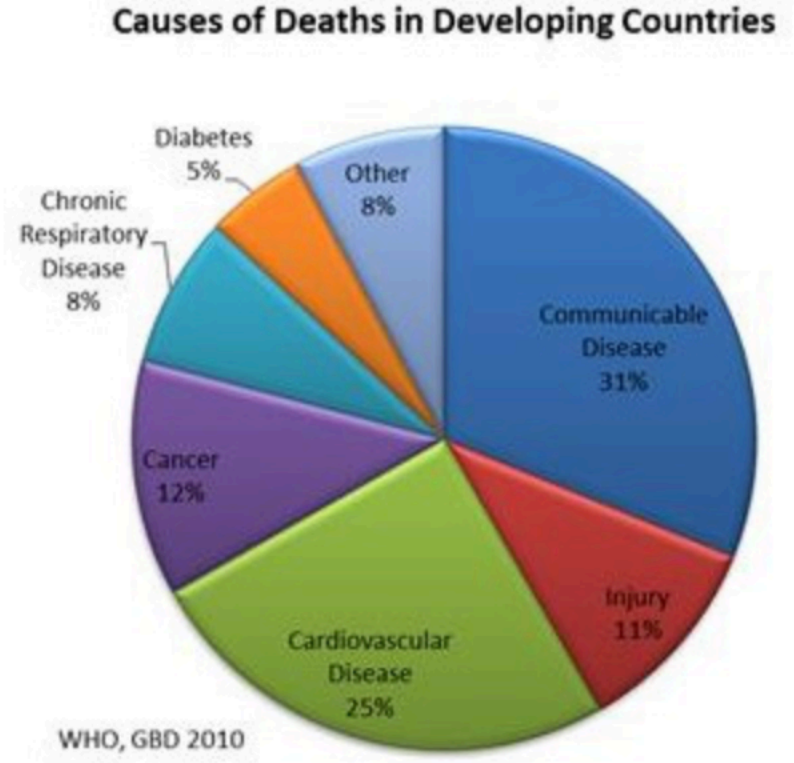
Global Distribution of Cause of Death

Figure 1. Global Mortality From Chronic Diseases

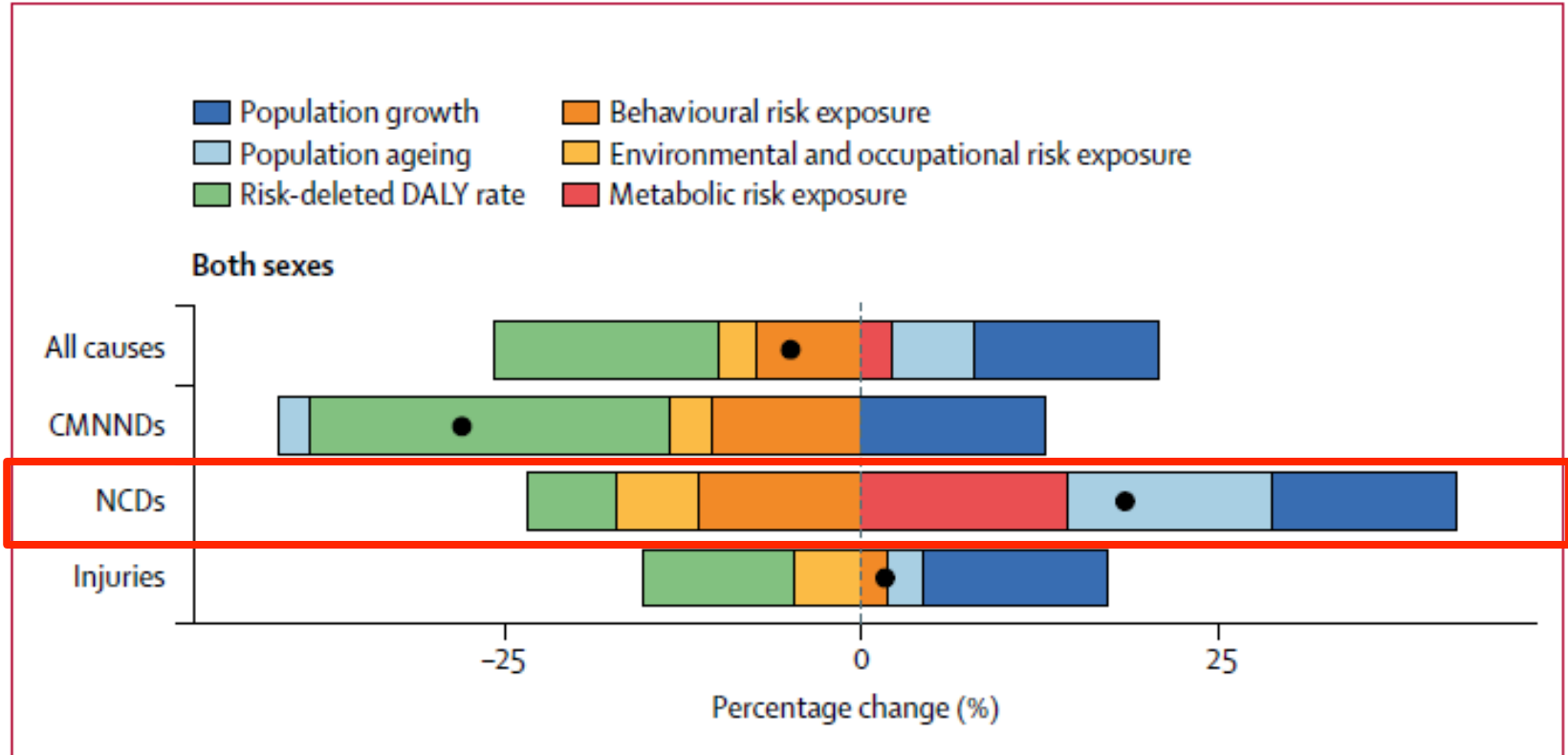


Developing Countries

- 60% of the burden of chronic disease occurs in developing countries
- 79% of deaths attributed to chronic disease occur in developing countries

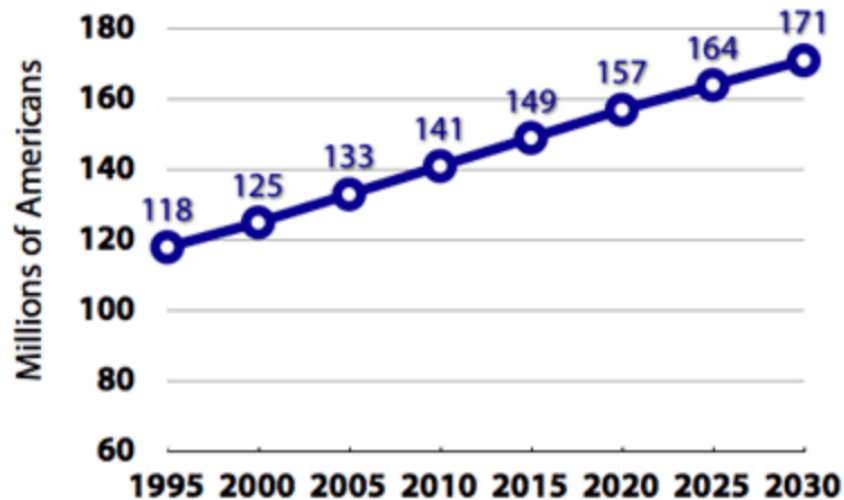


Impact of Population Growth and Aging

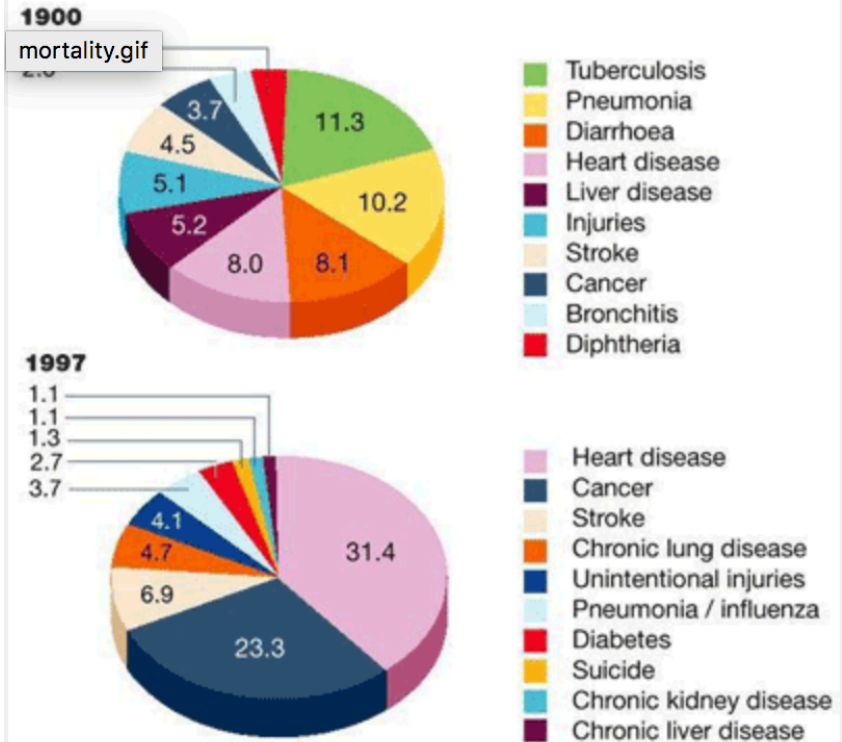


US Burden of Chronic Disease

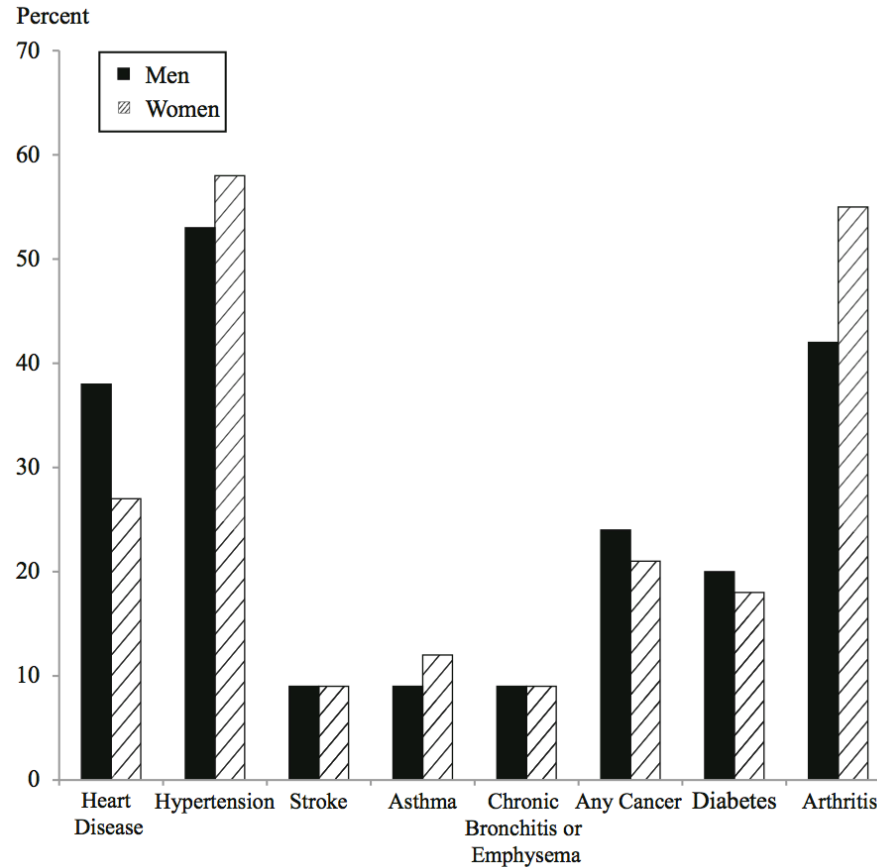
Prevalence of Chronic Disease in the U.S.



Source: Wu, Shin-Yi *et al.* 2000. Projection of Chronic Illness Prevalence and Cost Inflation. RAND Corporation.

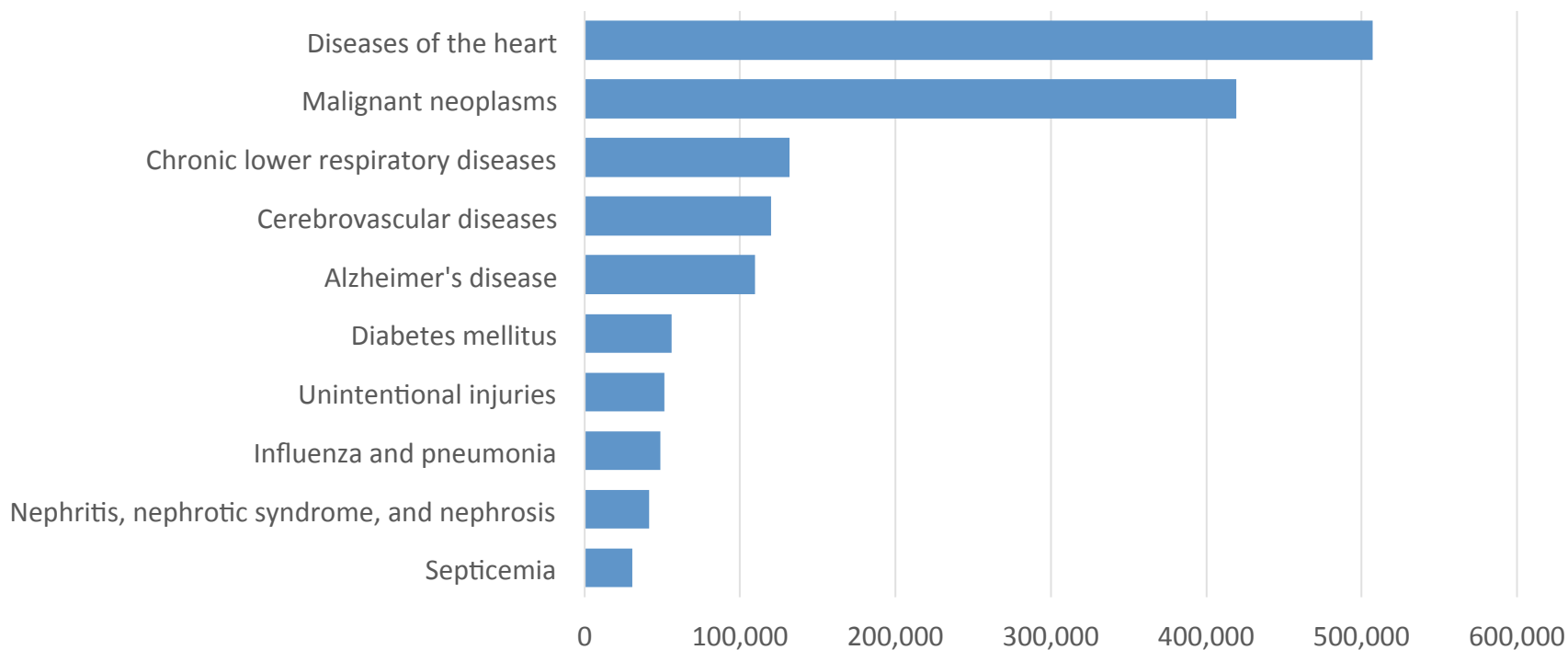


Chronic Disease Among Older Adults



Cause of Death Among Older Adults

Leading Causes of Death Among Individuals 65+: United States, 2015



RISK FACTORS FOR CHRONIC DISEASE

Discussion:

**WHAT RISK BEHAVIORS ARE MOST
STRONGLY IMPLICATED IN THE RISK
OF CHRONIC DISEASES?**

Tobacco Use

- Accounted for ~8.1 million deaths in 2017
 - Including exposure to secondhand smoke
- Cigarette smoking accounts for nearly one in five deaths in the United States
 - \$170 billion is spent each year to treat smoking-related diseases

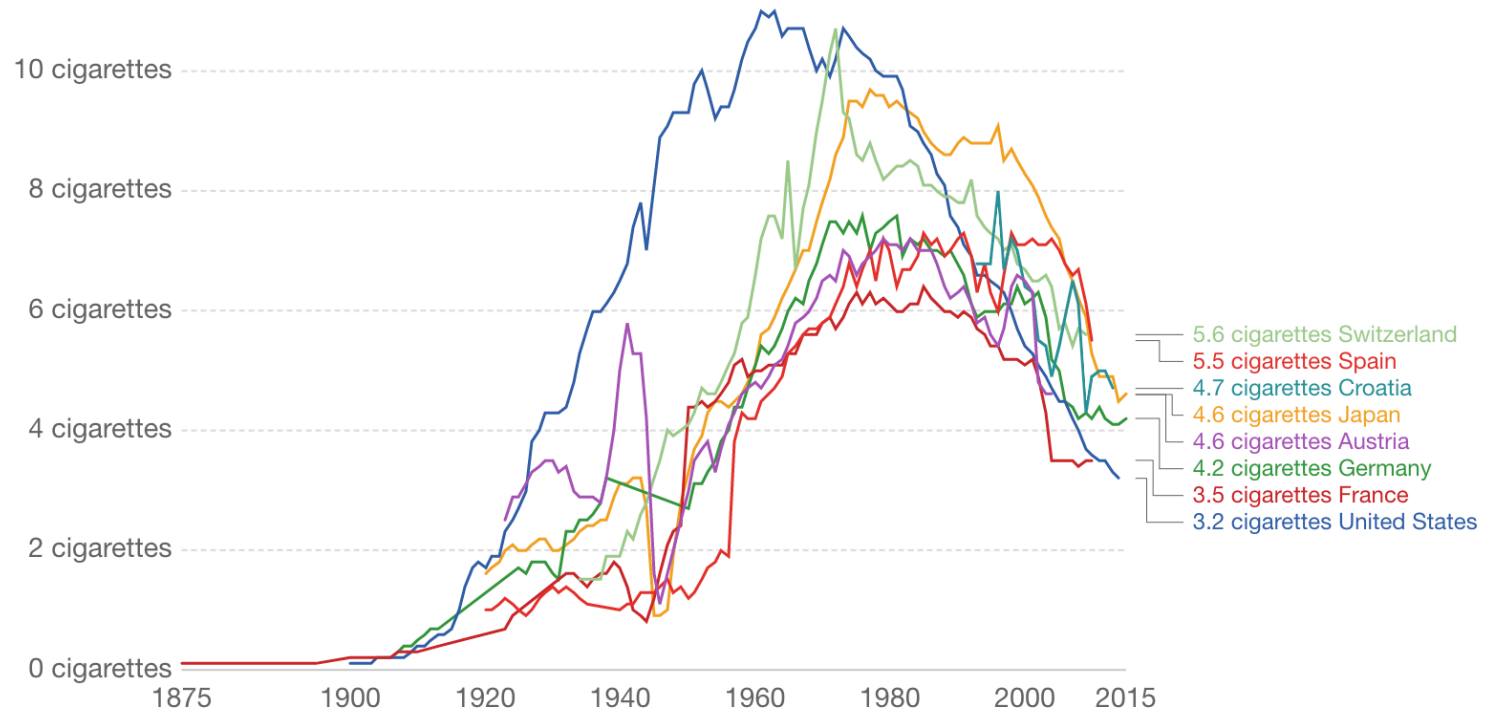
Tobacco Use and Disease Risk

- 2-4x risk of CVD
- 25x risk of lung cancer
 - 90% of deaths
- 80% of COPD deaths

Tobacco Use Over Time

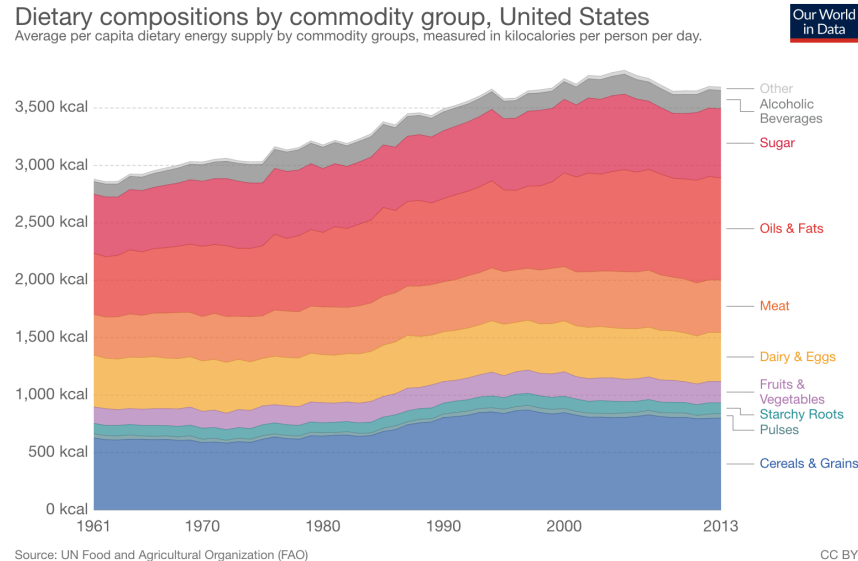
Sales of cigarettes per adult per day

Figures include manufactured cigarettes, as well as estimated number of hand-rolled cigarettes, per adult (ages 15+) per day.



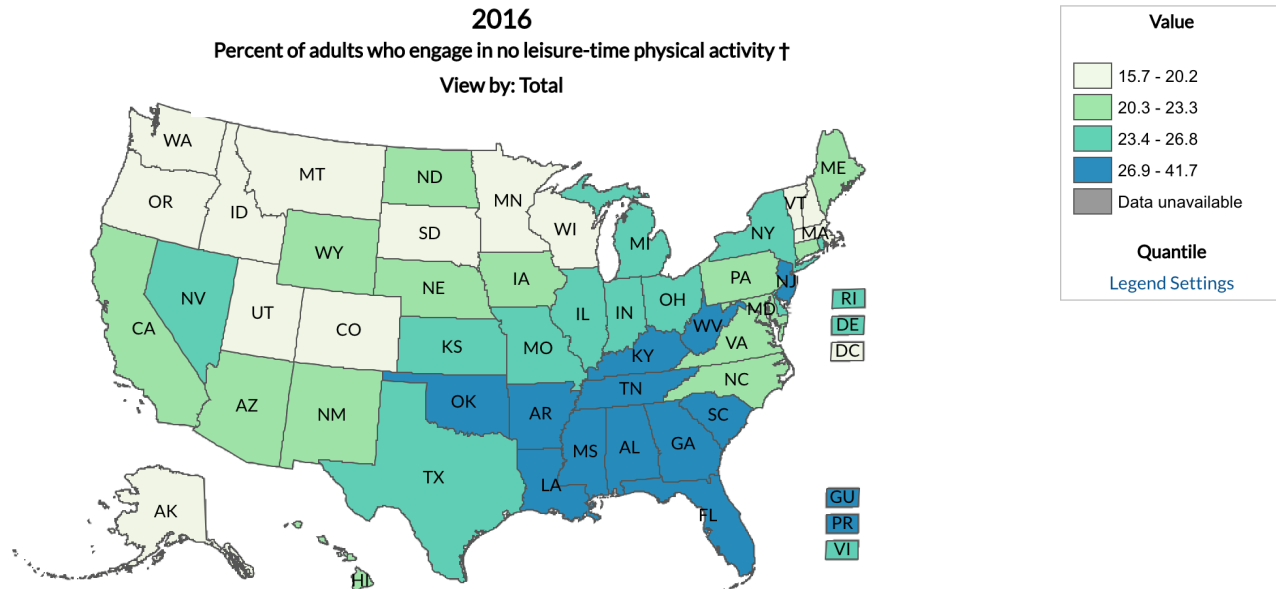
Unhealthy Diet

- Accounted for ~10.9 million deaths in 2017
 - Largely chronic disease



Insufficient Physical Activity

- Accounted for ~1.3 million deaths in 2017
 - Largely chronic disease

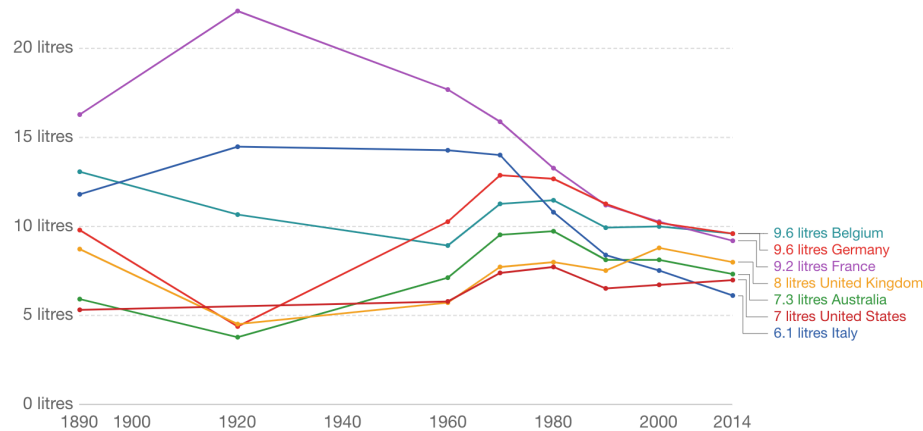


Excessive Alcohol Use

- Accounted for ~2.8 million deaths in 2017
 - >1/2 of which were a result of chronic disease

Per capita alcohol consumption in high-income countries

Average per capita alcohol consumption across select high-income countries where long-term data is available. This is measured in litres per person per year. Note figures are presented as the per capita average of the total population (not restricted to adults).



Source: Holmes, A. J., & Anderson, K. (2017). Convergence in national alcohol consumption patterns: New global indicators.

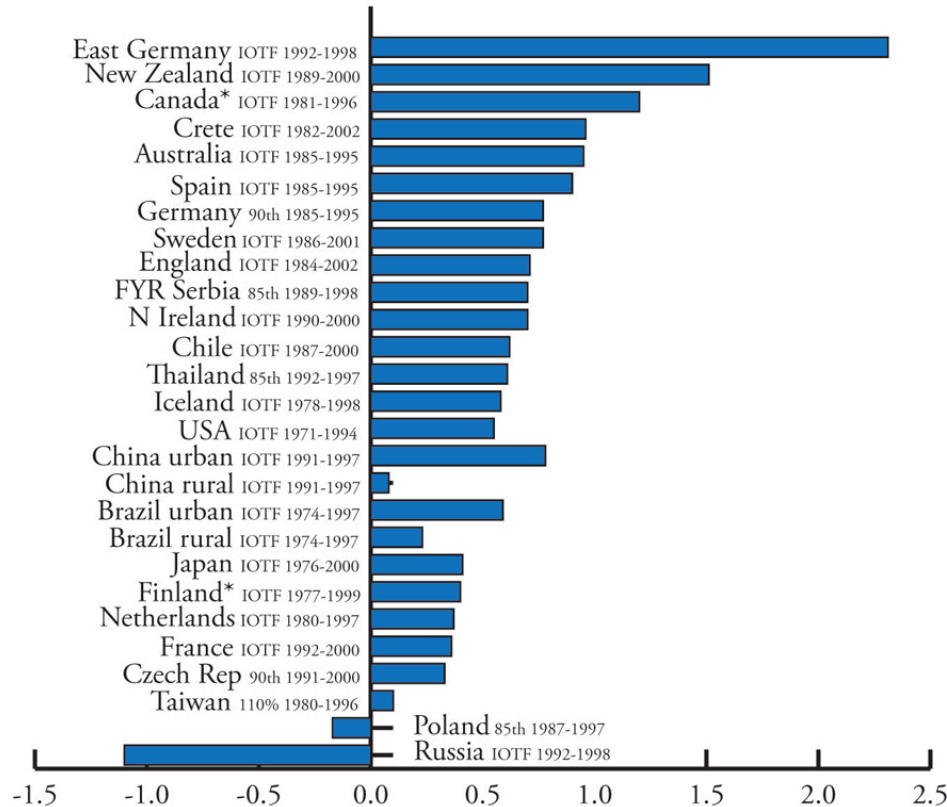
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Discussion:

**WHAT METABOLIC FACTORS ARE
MOST STRONGLY IMPLICATED IN
THE RISK OF CHRONIC DISEASES?**

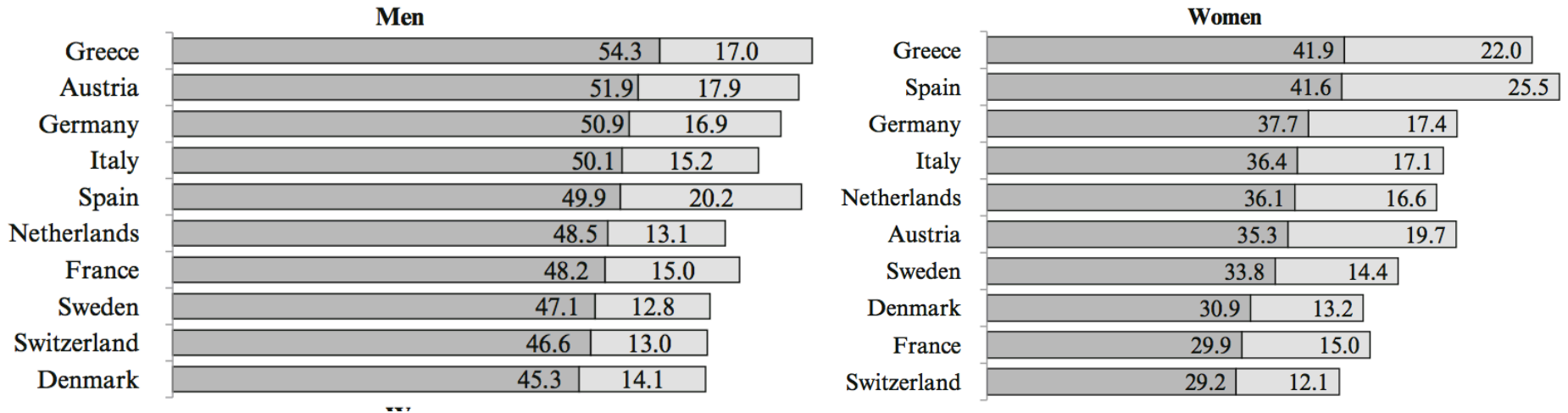
Pediatric Obesity

Annualized Change in Prevalence of Overweight and Obesity in School-age Children in Survey since 1970 (Percentage Points)



Adult Obesity

■ Overweight, BMI* 25-29.9 ■ Obese, BMI* ≥ 30



Attributable Deaths in 2017

- High systolic blood pressure: ~10.4 million
- High fasting plasma glucose: ~6.5 million
- High body mass index: ~4.7 million
- High LDL cholesterol: ~4.3 million

Discussion:

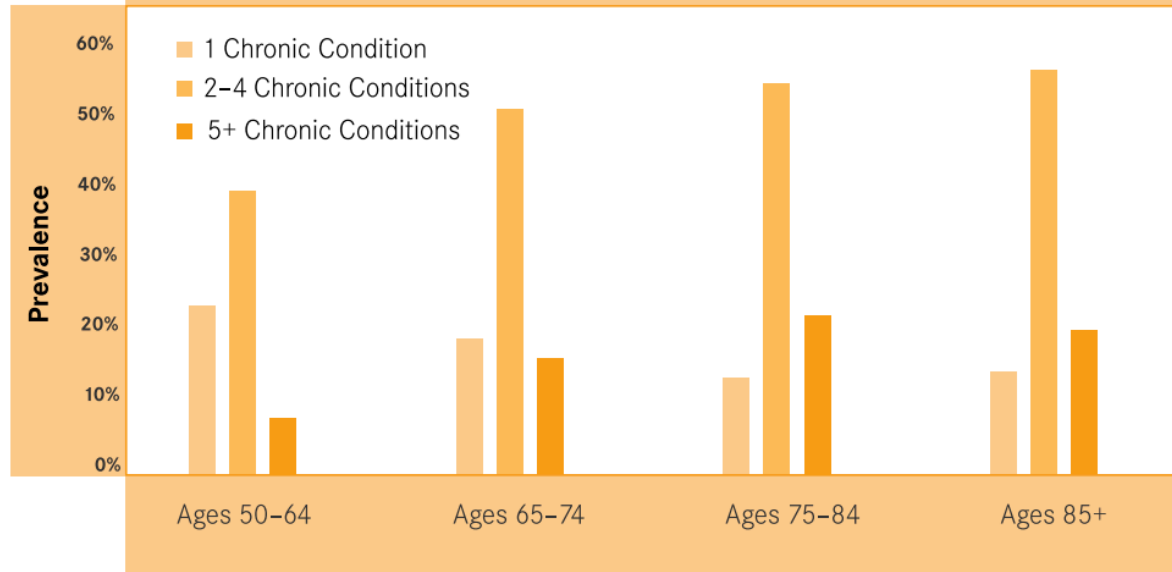
**WHAT NON-MODIFIABLE RISK
FACTORS ARE MOST STRONGLY
IMPLICATED IN THE RISK OF
CHRONIC DISEASES?**

MULTIMORBIDITY

Burden

Figure 1.7

Many Older Americans Have Multiple Chronic Conditions



Source: Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

Note: Data do not include people who live in institutions.

Multimorbidity Patterns by Age

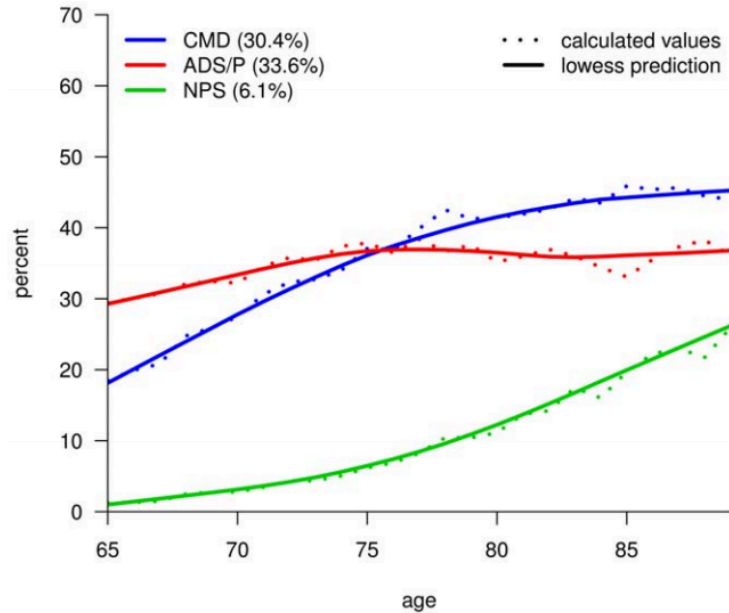


Figure 1. Prevalence by age for multimorbidity patterns of female patients. CMD: cardiovascular and metabolic disorders; ADS/P: anxiety, depression, somatoform disorders and pain; NPS: neuropsychiatric disorders.

doi:10.1371/journal.pone.0015941.g001

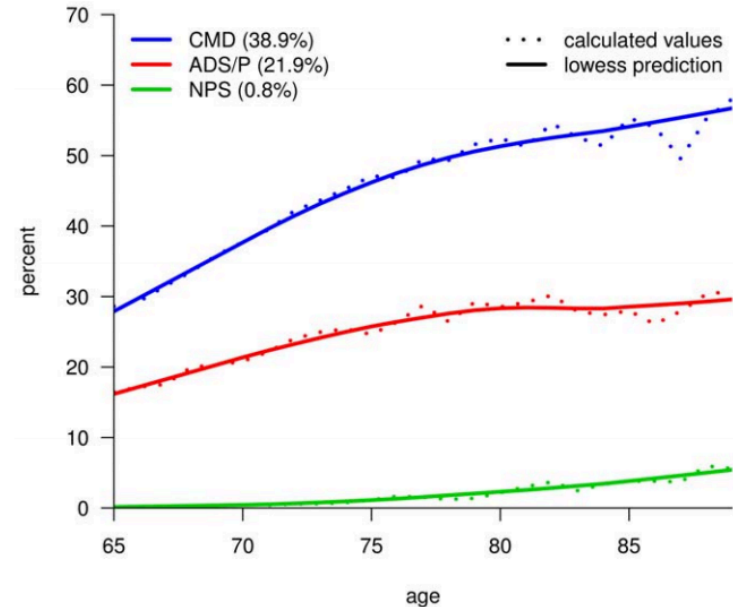


Figure 4. Prevalence by age for multimorbidity patterns of male patients. CMD: cardiovascular and metabolic disorders; ADS/P: anxiety, depression, somatoform disorders and pain; NPS: neuropsychiatric disorders.

doi:10.1371/journal.pone.0015941.g004

Overlapping of Multimorbidity Patterns

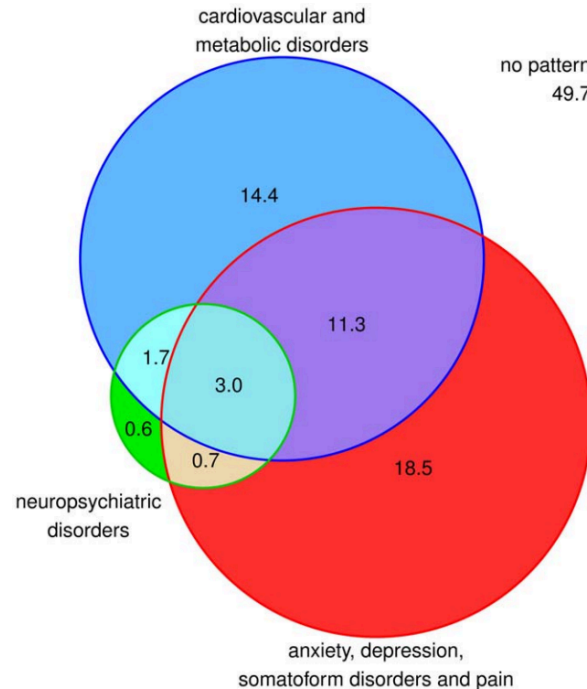


Figure 2. Overlapping of multimorbidity patterns (in %) related to the total female population.
doi:10.1371/journal.pone.0015941.g002

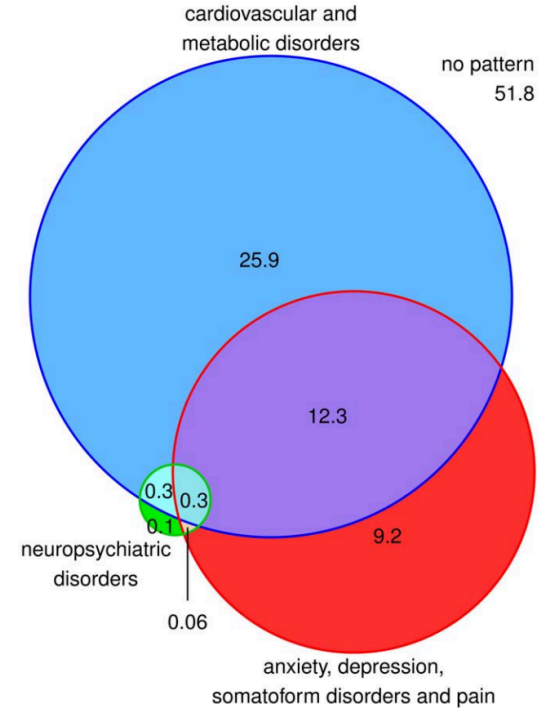


Figure 5. Overlapping of multimorbidity patterns (in %) related to the total male population.
doi:10.1371/journal.pone.0015941.g005

Discussion:

**WHY DO COMORBID DISEASE
CLUSTERS OCCUR?**

Explanations

- Causal: one condition causes another
- Shared susceptibility: common underlying mechanisms / risk factors
- Cyclic reinforcement

Next Week:

LECTURE: PHYSICAL FUNCTION

HOMEWORK: READING, DEBATE

OUTLINE, (PRESENTATION SLIDES)