Comparing Health Events in Populations: A Framework for Analysis

Eric Delmelle August 28 and September 2 2025

Introduction

- **Definition of Health Events**: Disease outbreaks, chronic conditions, injuries, and health behaviors.
- **Importance of Comparisons**: Understanding disparities, identifying risk factors, guiding public health interventions.
- **Key Concepts**: Population health, epidemiology, and biostatistics.

Objectives of Population Health

Four Key Objectives:

1. **Describe**: Understand population-level health outcomes.

2. **Explain**: Identify determinants and drivers of health outcomes.

3. **Predict**: Anticipate future health trends and patterns.

4. **Control**: Implement interventions to improve outcomes.

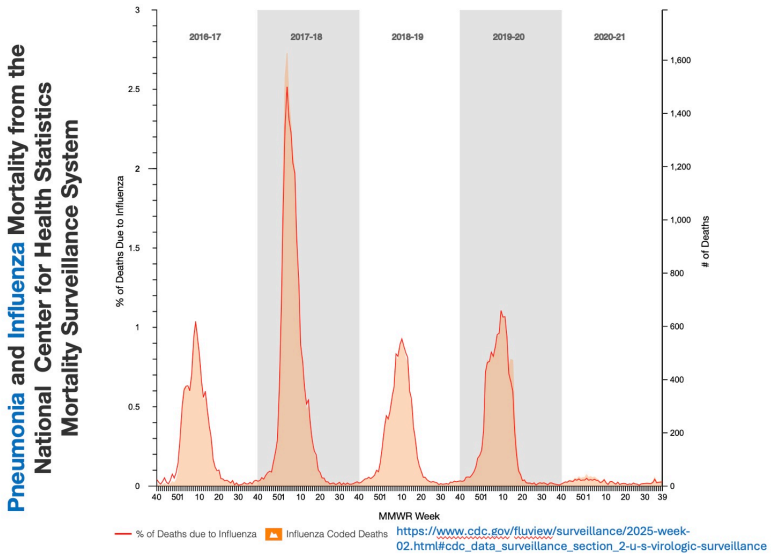
Historical Context

Key Figures:

- **John Snow**: Cholera outbreak mapping.
- **Ignaz Semmelweis**: Importance of handwashing.
- **Joseph Goldberger**: Nutritional causes of pellagra.

Type of Comparisons

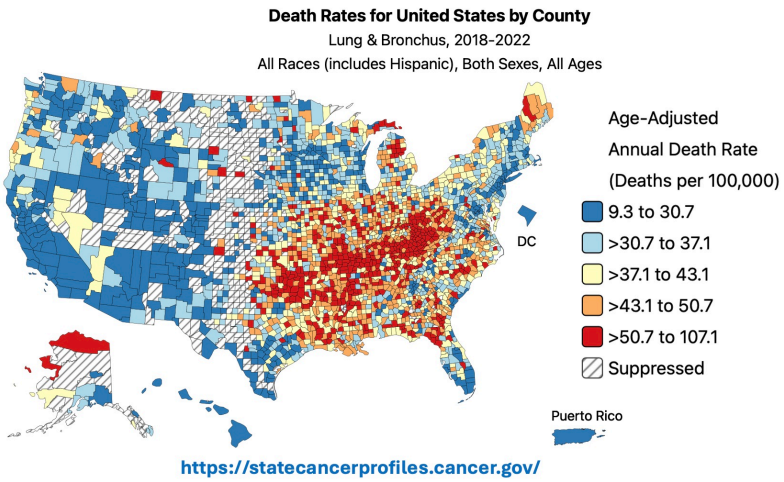
Time-Based



Key Metrics:

- **Incidence**: New cases over time.
- **Prevalence**: Existing cases at a given time.

Place-Based

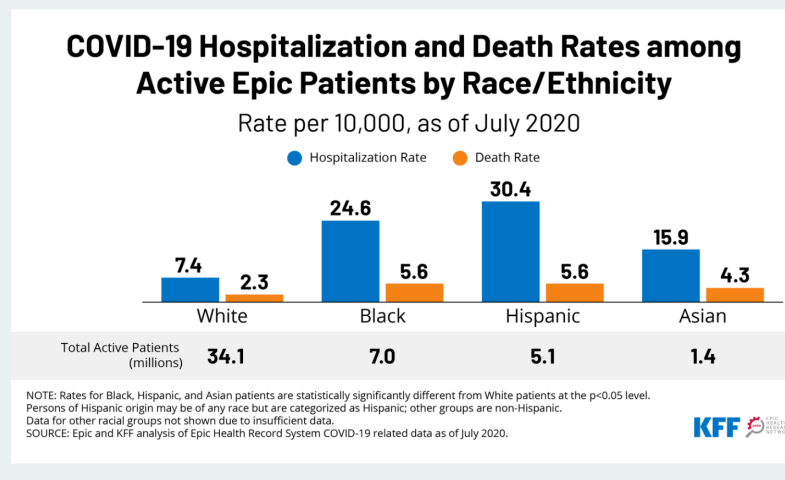


Example:

- **Urban vs. Rural Heart Disease Mortality**:
  - Urban: 50 per 100,000.
  - Rural: 75 per 100,000.

Group-Based

Example:

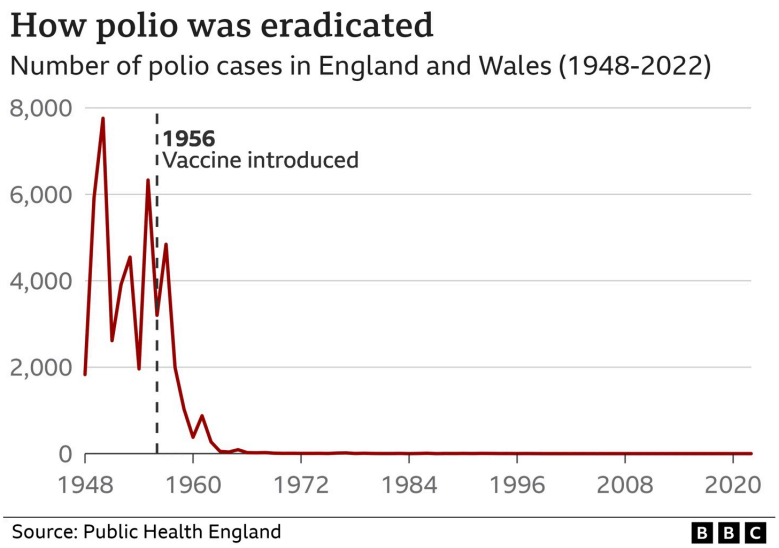


- Health disparities by race, age, and income.

Event-Based

Key Concept:

- Natural experiments: Before vs. after policy changes or interventions.



Additional Event-Based Example

Measures of Comparison

Key Metrics:

- **Age-Standardized Rates**: Adjusted to eliminate age structure differences.
- **Attributable Risk**: Measures the impact of specific risk factors on outcomes.

Levels of Analysis

Frameworks:

- **Individual-Level**: Biostatistical and clinical trials.
- **Population-Level**: Geographic and demographic patterns.

Determinants of Health

Categories:

1. **Social and Economic Factors**
2. **Environmental Conditions**
3. **Behavioral and Genetic Influences**

Challenges in Comparisons

Key Challenges:

- **Data Quality**: Inaccuracies or incomplete datasets.
- **Ethical Considerations**: Privacy and fair comparisons.

Population vs. Community Health Assessments

Key Differences:

- **Community Health Assessments**:
  - Focus on local needs/resources.
  - Qualitative methods (e.g., interviews).
- **Population Health Assessments**:
  - Broad, systemic focus.
  - Quantitative data (e.g., chronic disease rates).

Population vs. Community Health Assessments

Example:

- Community: Identifying food deserts.
- Population: Obesity prevalence across counties.

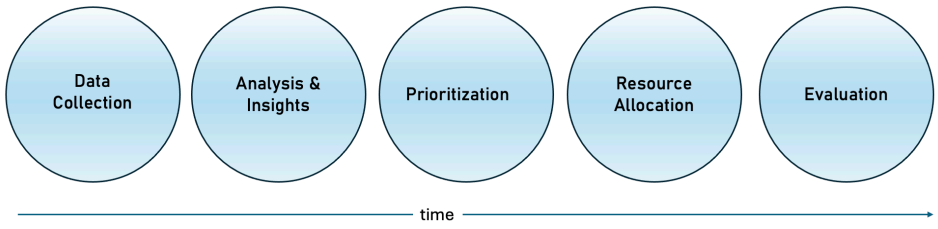
Policy Implications

Using Comparisons to Drive Change:

1. **Set Priorities**: Identify at-risk groups (e.g., elderly, low-income communities).
2. **Develop Interventions**: Targeted programs (e.g., tobacco cessation).
3. **Advocate for Policy Change**: Use data for systemic reforms.

Policy Implications

Visual:



Interactive Example

Dataset Example:

Population	Cases	Rate (per 100,000)
Urban	200	50
Rural	300	75

Prompt:

- "What does this suggest about resource allocation?"

Recap and Transition

Key Takeaways:

- Importance of describing, explaining, predicting, and controlling health events.
- Tools and methods to compare health outcomes.
- Practical implications for population health strategies.

Next:

- Group activity: Apply concepts to a real-world health disparity.

Group Activity: Population Health Comparison

Objective:

Apply Chapter 1 metrics to analyze health disparities.

Instructions:

1. Form groups of 3–5.

Instructions:

2. Analyze the provided dataset on coursesite
    - Calculate rates (e.g., incidence, prevalence).
    - Identify disparities (e.g., geographic, demographic).
    - Propose targeted interventions.
3. Prepare to present findings in 3 minutes.

Materials:

- Preloaded Excel on course sites

Group Assignments and Analysis Instructions

- **Group A**: Kayla H., Sammie C., Chloe L., Henry S., Vedanth V.
- **Group B**: Prashant K., Lillian L., Ashley P., Cate M., Emily T.
- **Group C**: Shriya P., Evy W., Caithlyn C., Grace S.
- **Group D**: Chris C., Olivia N., Aaron C., Lola S., Alicia A.
- **Group E**: Elmira S., Sebastian S., Mina C., Hudson K., Marwa A.
- **Group F**: Abena A., Xiomara G., Natalie W., Neves H.
- **Group G**: Sophie P., Jessica L.,Joy L., , Vladimir V.

Analysis Instructions

- **Analyze the provided dataset on coursesite**:
    - Calculate rates (e.g., incidence, prevalence).

  - Identify disparities (e.g., geographic, demographic).
  - Propose targeted interventions.
- **Presentation Guidelines**:
  - Prepare findings for a **3-minute presentation**.
  - Include key calculations, identified disparities, and proposed interventions.
