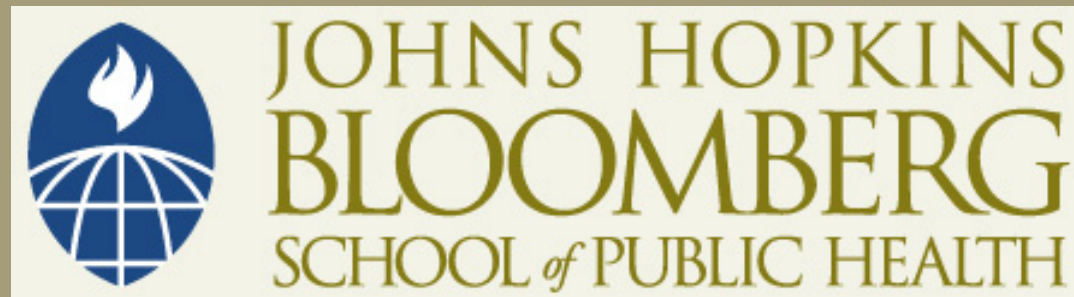


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Section B: Measuring Exposure

Maria Segui-Gomez, MD, MPH, ScD

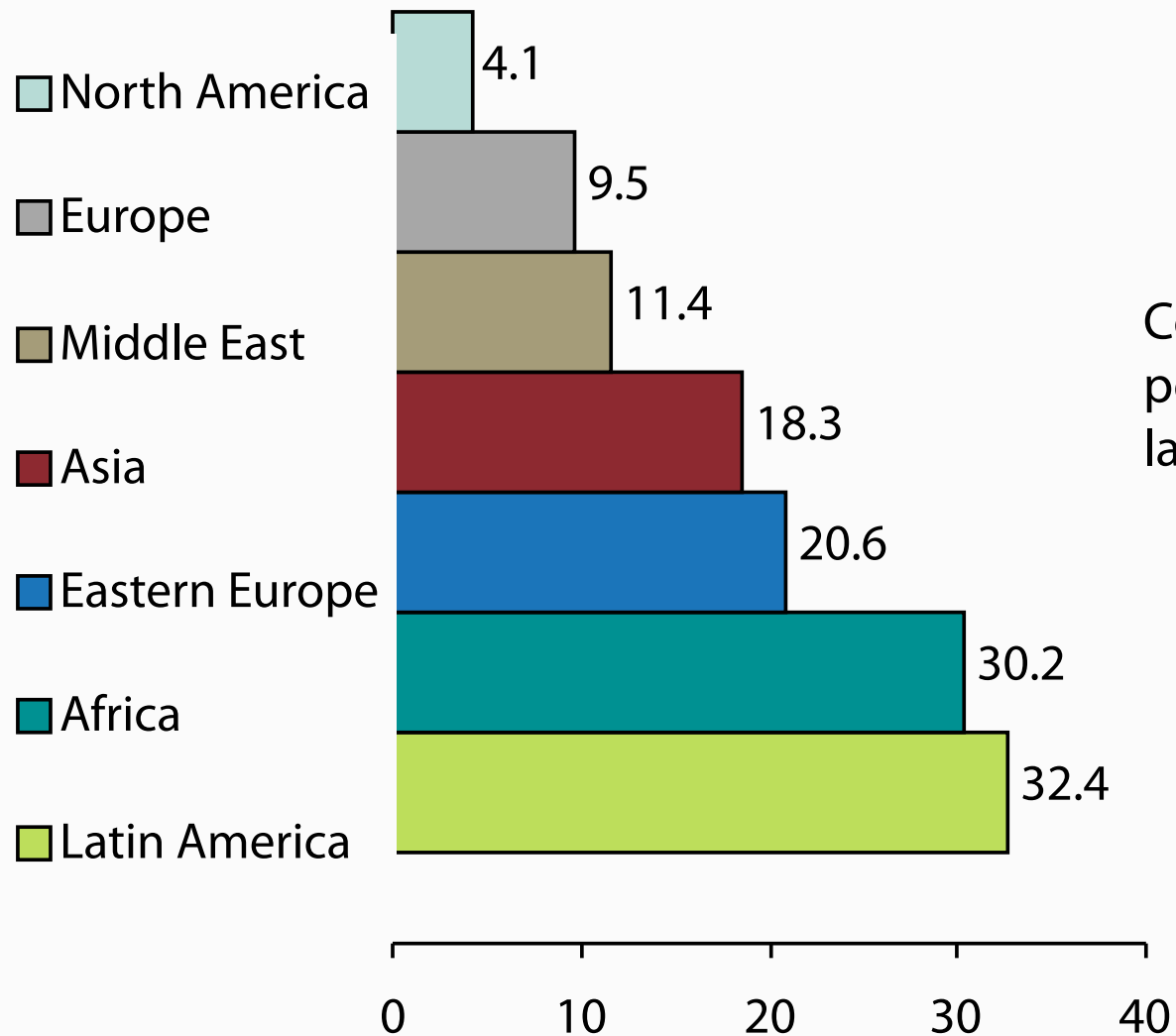
What Do We Mean by Exposure?

- Practically anything we do
- That is, situations where individuals interact with an environment that can eventually generate energy that could lead to an injury
 - For example, population, distance traveled, hours traveled, intersections crossed, takeoffs/landings undergone, hours practicing soccer, minutes spent using a saw, etc. . . .

Relevance of Exposure Data

- Exposure is the denominator
- Needed for risk calculations

An Example



Commercial jet crashes
per million takeoffs/
landings

Another (Fictional) Example

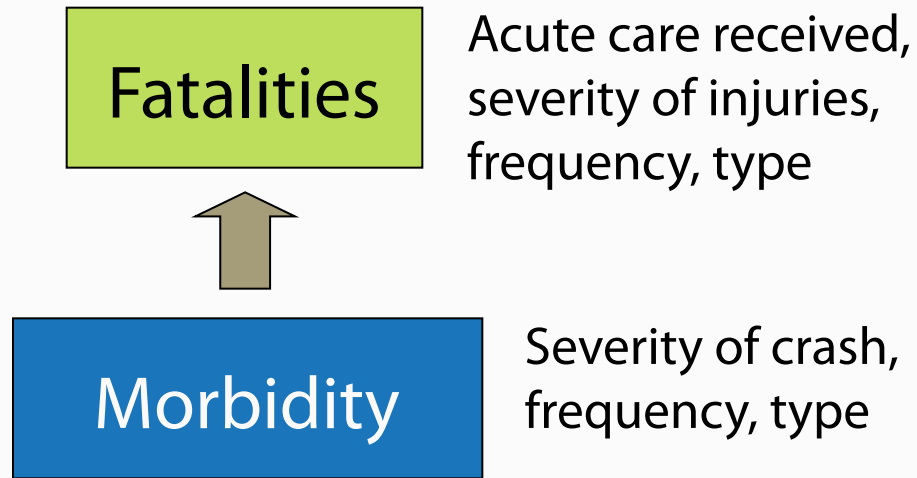
- Country A has fewer child passenger deaths per 100,000 population than country B
- Why?
- Possible explanations
 - Better child restraint use, fewer parents driving intoxicated, fewer children in cars, etc. . . .
- How to look for explanations

Country A vs. Country B

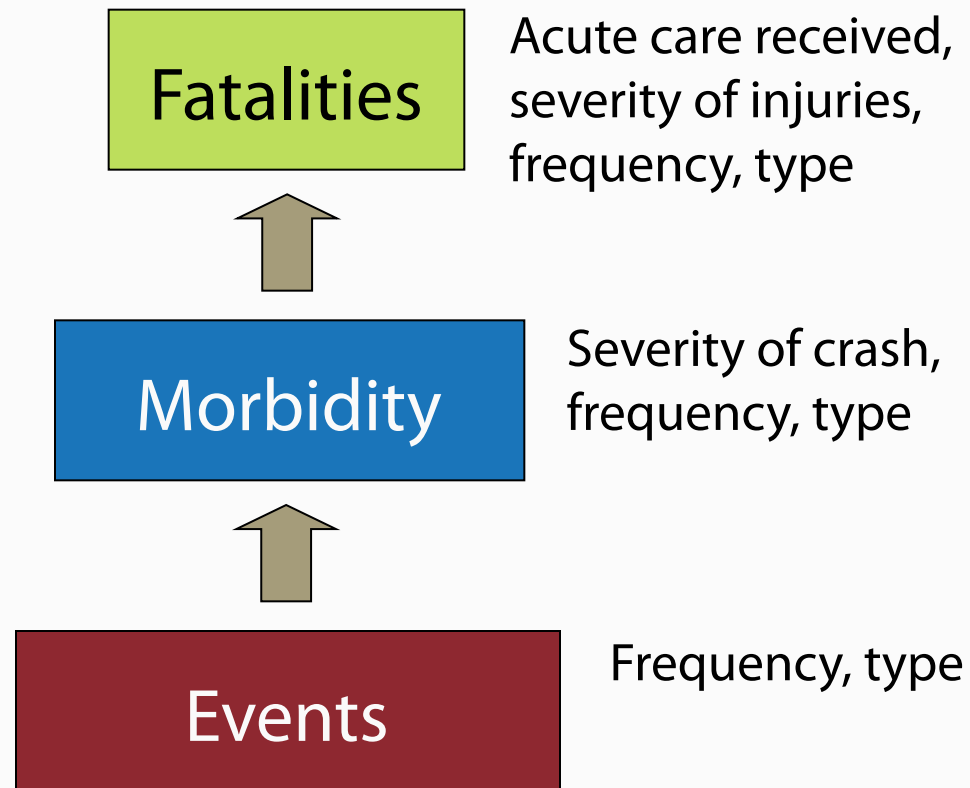
Fatalities

Acute care received,
severity of injuries,
frequency, type

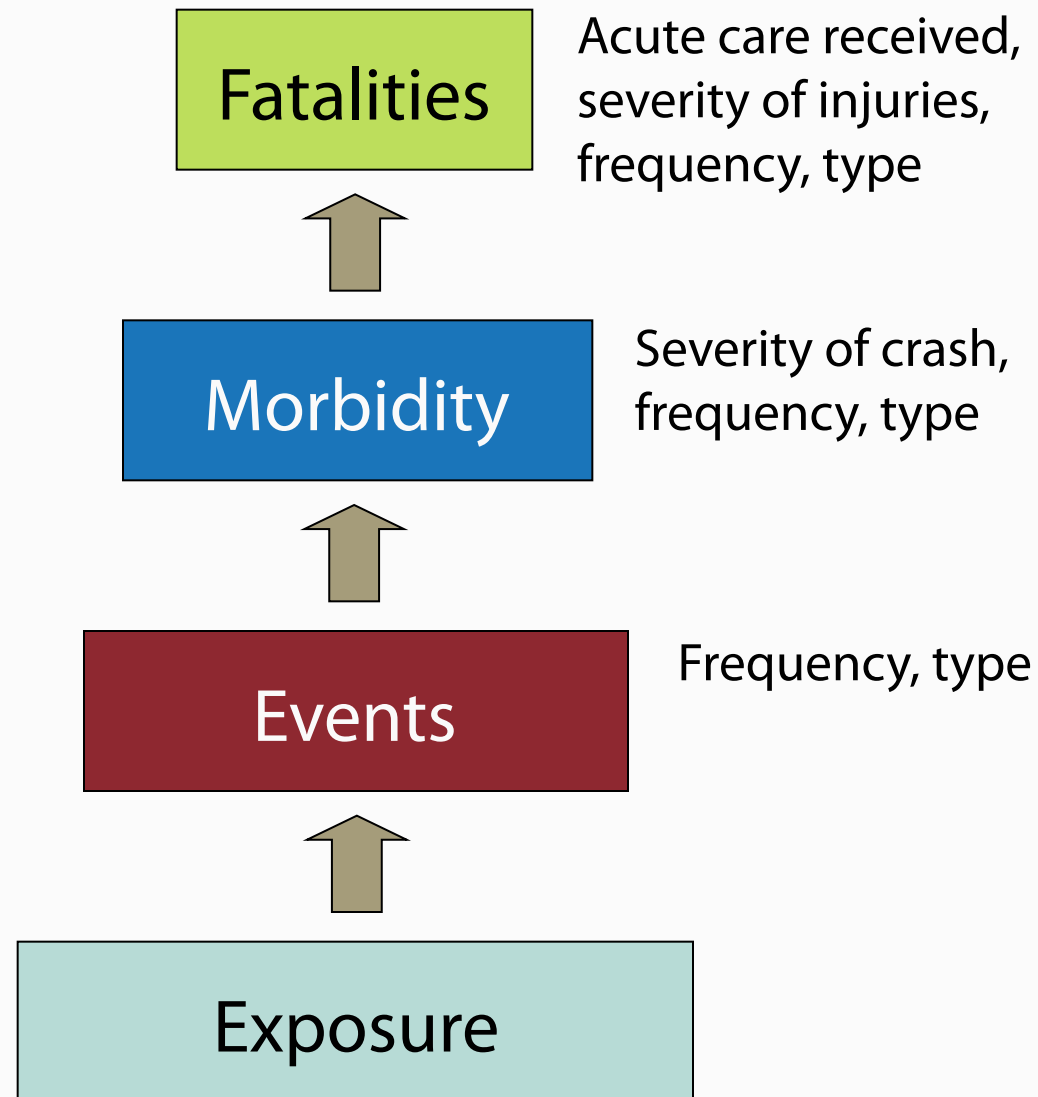
Country A vs. Country B



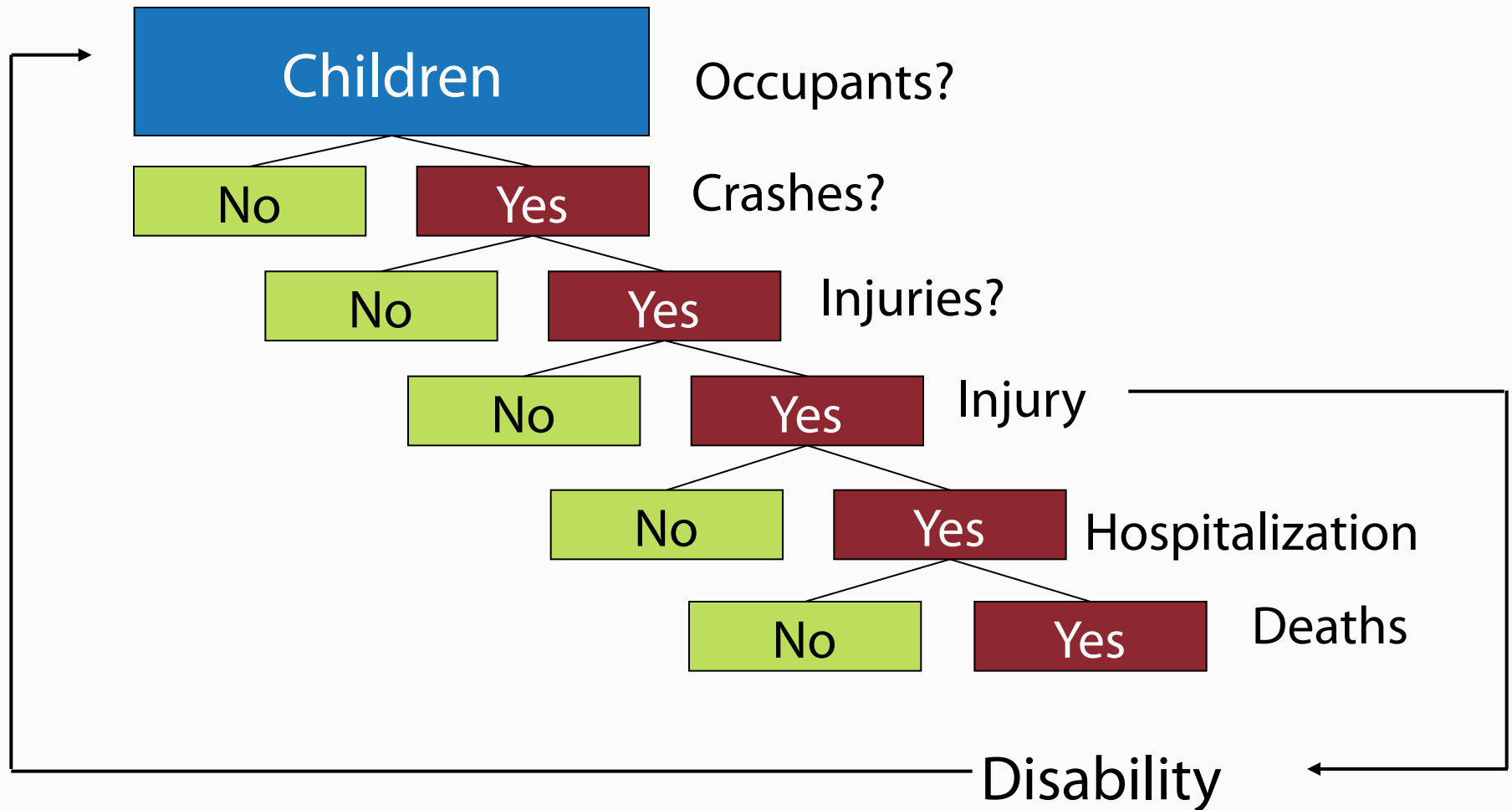
Country A vs. Country B



Country A vs. Country B



How Does It All Come Together? An Example



Data Sources

- When population—census
- For all other exposure units—multiple data sources specific to injury problem and location
- In general
 - Personal surveys
 - Observational studies
 - Estimates from goods bought (and average usage)

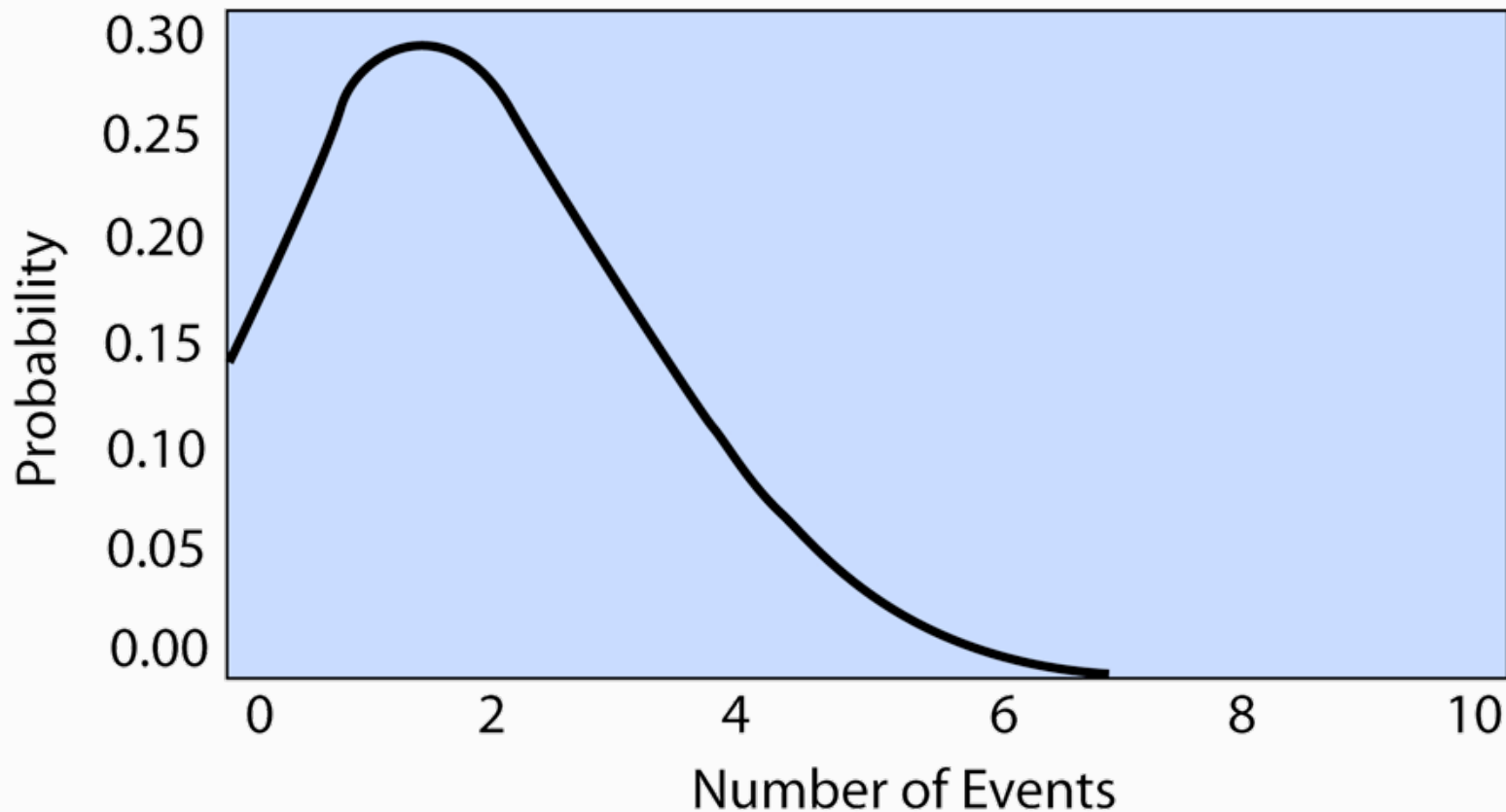
Data Coding

- Fragmented
- Among the most commonly used are vehicle miles (kilometers) traveled, derived from either
 - Personal diaries/surveys
 - National estimates of fuel used and average fuel consumption per mile

Data Coding

- Units tend to be big since injuries follow a Poisson distribution (that is, their frequency is rare)

Poisson Distribution with Mean = 2



Exposure Data Comparability

- Beware of
 - Data source variability
 - Case inclusion criteria
 - Coding system variability