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JOHNS HOPKINS
BLOOMBERG
SCHOOL *of* PUBLIC HEALTH

Mortality

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Lecture Topics

- Mortality data systems
- Mortality coding systems
- Data-poor environments
- Case study #1:
 - Motor vehicle fatalities in Germany



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Section A: Data and Data Sources

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Death

- Unambiguous fact

Relevance of Injury Death Data

- Deaths per se
 - Counts
 - Rates
- Deaths in relation to life lost
 - Age at death compared with some fixed age* = years of potential life lost (YPLL)

*For example, 65, 75, life expectancy at birth, life expectancy at time of event, etc.

Leading Causes of Global Mortality, 2001

Ranking	Disease or injury	Thousands of deaths
1	Ischemic heart disease	6,880
2	Cerebrovascular disease	5,096
3	Lower respiratory infections	3,863
4	HIV/AIDS	2,943
5	COPD	2,520
6	Perinatal conditions	2,438
7	Diarrheal disease	2,124
8	TB	1,660
9	Road traffic accidents	1,259
...
13	Self-inflicted injuries	814
...

What to Know about Injury-Related Deaths

- Victim characteristics
 - Age, gender, ethnicity, etc.
- Injury characteristics
 - Where (location), what (nature)
- Event characteristics
 - When (time and day), where (location), while doing what (activity)

What to Know about Injury-Related Deaths

- Comparison of mortality data across settings allows for testing of different hypotheses regarding risk factors and effectiveness of interventions

Data Sources

Systems

- Vital statistics →
- Registries →
- Surveillance
- Surveys →
 - Government
 - Others (e.g., community-based)
- Mortality interviews

Documents

- Death certificates
- Autopsy/hospital/police/crash reports
- Medical reports

Death Certificates

- Single most important source of mortality data
- Oldest health information system in place
- Established standardized protocols
- Completed by physicians, police, or medical examiners (or coroners) who are also involved in assessing the circumstances
- Centralized depository
- Available and population-based in North and Central America, Europe, and Australia

The U.S. Death Certificate

U.S. STANDARD CERTIFICATE OF DEATH			
LOCAL FILE NO.	STATE FILE NO.	FEDERAL FILE NO.	
1. DECEASED (Last, first, middle initial or full name)		2. SOCIAL SECURITY NUMBER	
3. MARRIAGE (Last, first, middle initial or full name)	4. BIRTH (Month, day, year)	5. BIRTH PLACE (City and State or Foreign Country)	
6. PRESENT RESIDENCE (Street and number, city, state, ZIP code)	7. DATE OF DEATH (Month, day, year)		
8. DATE OF INJURY (Mo/Day/Yr) (Spell Month)	9. TIME OF INJURY	10. PLACE OF INJURY (e.g., Decedent's home; construction site; restaurant; wooded area)	
11. LOCATION OF INJURY: State: _____ City or Town: _____		12. INJURY AT WORK? * Yes * No	
13. STREET & NUMBER: _____		14. APARTMENT NO.: _____ ZIP CODE: _____	
15. DESCRIBE HOW INJURY OCCURRED:		16. IF TRANSPORTATION INJURY, SPECIFY: * Driver/Operator * Passenger * Pedestrian * Other (Specify) _____	
<p align="center">CAUSE OF DEATH (See instructions and examples)</p> <p>32. PART I. Enter the chain of events--diseases, injuries, or complications--that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.</p> <p>IMMEDIATE CAUSE (Final disease or condition) -----> a. _____ Due to (or as a consequence of): _____</p> <p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST b. _____ Due to (or as a consequence of): _____</p> <p>c. _____ Due to (or as a consequence of): _____</p> <p>d. _____</p> <p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p> <p>33. WAS AN AUTOPSY PERFORMED? * Yes * No</p> <p>34. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? * Yes * No</p> <p>35. DID TOBACCO USE CONTRIBUTE TO DEATH? * Yes * Probably * No * Unknown</p> <p>36. IF FEMALE: * Not pregnant within past year * Pregnant at time of death * Not pregnant, but pregnant within 42 days of death * Not pregnant, but pregnant 43 days to 1 year before death * Unknown if pregnant within the past year</p> <p>37. MANNER OF DEATH * Natural * Homicide * Accident * Pending Investigation * Suicide * Could not be determined</p>			
17. APPROXIMATE INTERVAL: Onset to death			

REV. 10/02

Death Certificates

- Information on age, gender, and cause(s) of death
- Limited information on injury, event, and other factors (e.g., blood alcohol level)
- Need to investigate beyond immediate cause for accurate death
- Validity?
 - Incomplete counts
 - Biased sources
 - No investigation
 - Erroneous coding
- Need to correct after findings
- Computerized data, but delay in availability
 - Need to investigate beyond immediate cause (or accurate counts)

The U.S. Death Certificate

LOCAL FILE NO.		U.S. STANDARD CERTIFICATE OF DEATH		STATE FILE NO.	
1. DECEASED (Print Name) (Include Maiden and Other Names, Last)		2. SEX		3. RACE (Specify if Hispanic)	
4. DOB (Print)		5. DECEASED (Print)		6. DATE OF DEATH (Print)	
7. DECEASED (Print) (Include Maiden and Other Names, Last)		8. DECEASED (Print) (Include Maiden and Other Names, Last)		9. DECEASED (Print) (Include Maiden and Other Names, Last)	
10. DECEASED (Print) (Include Maiden and Other Names, Last)		11. DECEASED (Print) (Include Maiden and Other Names, Last)		12. DECEASED (Print) (Include Maiden and Other Names, Last)	
13. DECEASED (Print) (Include Maiden and Other Names, Last)		14. DECEASED (Print) (Include Maiden and Other Names, Last)		15. DECEASED (Print) (Include Maiden and Other Names, Last)	
16. DECEASED (Print) (Include Maiden and Other Names, Last)		17. DECEASED (Print) (Include Maiden and Other Names, Last)		18. DECEASED (Print) (Include Maiden and Other Names, Last)	
19. DECEASED (Print) (Include Maiden and Other Names, Last)		20. DECEASED (Print) (Include Maiden and Other Names, Last)		21. DECEASED (Print) (Include Maiden and Other Names, Last)	
22. DECEASED (Print) (Include Maiden and Other Names, Last)		23. DECEASED (Print) (Include Maiden and Other Names, Last)		24. DECEASED (Print) (Include Maiden and Other Names, Last)	
25. DECEASED (Print) (Include Maiden and Other Names, Last)		26. DECEASED (Print) (Include Maiden and Other Names, Last)		27. DECEASED (Print) (Include Maiden and Other Names, Last)	
28. DECEASED (Print) (Include Maiden and Other Names, Last)		29. DECEASED (Print) (Include Maiden and Other Names, Last)		30. DECEASED (Print) (Include Maiden and Other Names, Last)	
31. DECEASED (Print) (Include Maiden and Other Names, Last)		32. PART I. Enter the chain of events--diseases, injuries, or complications--that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.		Approximate interval: Onset to death	
IMMEDIATE CAUSE (Final disease or condition) -----> resulting in death		a. _____ Due to (or as a consequence of):		_____	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		b. _____ Due to (or as a consequence of):		_____	
		c. _____ Due to (or as a consequence of):		_____	
		d. _____ Due to (or as a consequence of):		_____	
PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.		33. WAS AN AUTOPSY PERFORMED? • Yes • No		34. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? • Yes • No	
5. DID TOBACCO USE CONTRIBUTE TO DEATH? • Yes • Probably • No • Unknown		36. IF FEMALE: • Not pregnant within past year • Pregnant at time of death • Not pregnant, but pregnant within 42 days of death • Not pregnant, but pregnant 43 days to 1 year before death • Unknown if pregnant within the past year		37. MANNER OF DEATH • Natural • Homicide • Accident • Pending Investigation • Suicide • Could not be determined	
8. DATE OF INJURY (Mo/Day/Yr) (Spell Month)		39. TIME OF INJURY		40. PLACE OF INJURY (e.g., Decedent's home; construction site; restaurant; wooded area)	
2. LOCATION OF INJURY: State:		City or Town:		41. INJURY AT WORK? • Yes • No	
Street & Number:		Apartment No.:		Zip Code:	
43. DESCRIBE HOW INJURY OCCURRED:		44. IF TRANSPORTATION INJURY, SPECIFY: • Driver/Operator • Passenger • Pedestrian • Other (Specify)			
15. CERTIFIED (Check one):					

REV. 1/2012

Autopsy Reports

- Completed by medical examiners
- Most detailed information on injury characteristics and other factors
- Standardization?
- Often not computerized
- Variable availability
- Variable level of detail and quality

Police Reports

- Not standardized
- Not computerized
- Not centralized
- Not easily available
- In motor vehicle crashes
 - Undercount (on the road vs. 24 hrs. vs. 30 days)
 - Underreporting of pedestrian, motorcyclist, bicyclist

Other Data Sources

- Occupational reports
- Some transportation entities
- Insurance companies
- Newspaper reports

Mortality Data Comparability?

- Variability in
 - Complete rates (e.g., hospital based?)
 - Accuracy of diagnoses
 - Sequencing of diagnoses
 - Classification systems
 - Definition of injury
 - Inclusion criteria regarding time between event and death

When Comparing Mortality Data

- Check for definition of death
- Check for validity of data sources
- Age- and gender-adjust
- Other adjustments (e.g., exposure? population?)

When Comparing Mortality Data

- Statistical significance?
- Other
 - Check for definition of location (site of death vs. site of residence)