Completeness of Nebraska's 2004–2005 Hospital Discharge Data — How Much Is Missing?

Bryan F. Buss, DVM, MPH[1,3], Tom Safranek, MD[1], Brett Foley, MS[2], Tom Török, MD, MPH[3]
[1]Nebraska Health and Human Services System, Lincoln, NE, USA [2]University of Nebraska-Lincoln, Lincoln, NE, USA [3]Centers for Disease Control and Prevention, Atlanta, GA, USA

Hospital Discharge Data (HDD) Public Health Importance

- Majority of states collect HDD
- HDD used in wide range of applications to track multiple public health conditions
- Studies that evaluate HDD reporting completeness are limited

Nebraska Hospital Discharge Data

- Nebraska Health and Human Services System (NHHSS) programs that use HDD
  - Injury Prevention and Control
  - Crash Outcome Data Evaluation System (CODES)
  - Family Health
  - Others
- Nebraska Hospital Association (NHA)
  - Contracts with NHHSS
  - Collects and compiles HDD
  - Provides HDD to NHHSS

NHA HDD Assessment

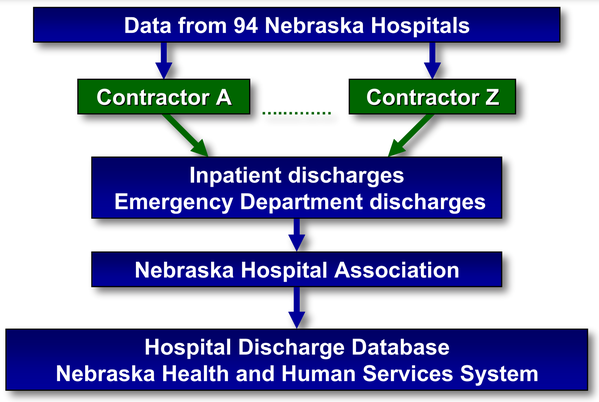
- HDD compared with Nebraska Hospital Statistical Report (NHSR)
- NHSR Report
  - Total discharges for individual hospitals
  - Presumed accurate but never audited
- State relies on the hospital association's hospital-specific estimates

Decline in HDD Completeness

Year	HDD/NHSR (%)
Pre-2003	>90
2003	92.4
2004	81.7
2005	83.9

Pre-2004 HDD Reporting Flow

2004 and 2005 HDD Reporting Flow



Objectives

- Estimate completeness of Nebraska's 2004 and 2005 HDD
- Determine if NHSR report is reliable indicator for HDD comparison

Methods

- Used Nebraska vital records and state data
- Compared HDD to
  - Birth certificates
  - Death certificates
  - Medicaid discharges
- Calculated reporting completeness each year

Data Used for Linking

- Births
  - Inpatient HDD records indicating singleton birth
  - Birth records listing Nebraska hospital
- Deaths
  - Inpatient HDD records coded as expiration
  - Death records listing Nebraska hospital
- Medicaid discharges
  - Nebraska hospital
  - Births excluded

Virtual Identifiers

- Sex and patient zip code for all
- Births
  - Birth date and type of delivery
- Deaths
  - Date of death and patient age
- Medicaid discharges
  - Patient age, discharge date, ICD-9 diagnosis codes, total charge plus admission date, source, and type

Hospital-Specific Estimates

- Hospital name not provided in HDD
- Vital records and Medicaid discharge data included hospital names and provided means for hospital-specific estimation

Individual Hospital Reporting Calculations

- 2004–2005 individual hospital reporting completeness for birth, death, and Medicaid discharges
- Pearson Correlation Coefficients to measure the strength of linear associations

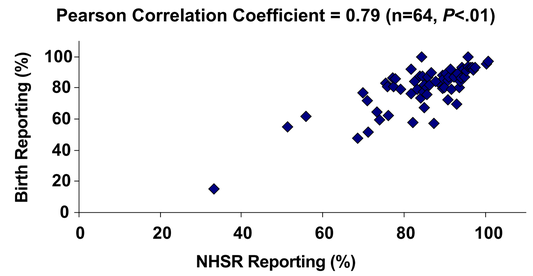
HDD Reporting Results

	2004 Reporting Completeness			2005 Reporting Completeness		
	Total	HDD	%	Total	HDD	%
NHSR	198,909	162,604	81.7	230,167	193,198	83.9
Births	24,620	19,915	80.9	25,012	21,855	87.4
Deaths	5,972	4,031	67.5	5,602	4,347	77.6
Medicaid discharges	14,531	10,758	74.0	14,397	11,915	82.8

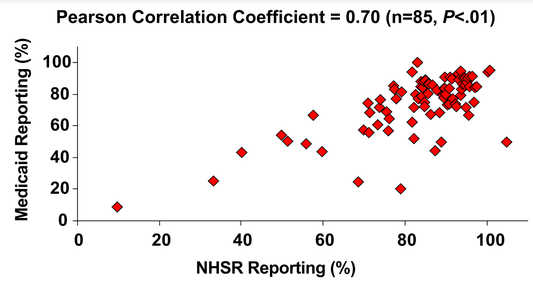
Individual Hospital Reporting 2004–2005

	Number of Hospitals	Reporting Completeness	
		Range (%)	Median (%)
NHSR	86	9.6–104.9	86.1
Births	65	15.4–100.0	83.1
Deaths	88	6.3–100.0	64.7
Medicaid discharges	87	8.9–100.0	79.0

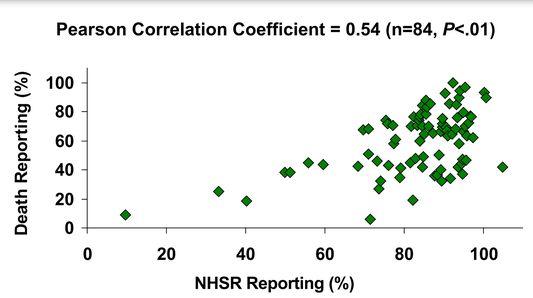
Individual Hospital Birth Reporting Completeness versus NHSR



Individual Hospital Medicaid Discharge Reporting Completeness versus NHSR



Individual Hospital Death Reporting Completeness versus NHSR



Conclusions

- Estimates for completeness demonstrate substantial underreporting
- Birth, death, and Medicaid reporting completeness estimates compare favorably with NHSR calculations
- NHSR is a reliable HDD indicator

Limitations

- Virtual identifiers not unique
  - Linking of multiple records
  - Limited accuracy of individual record links
- Coding errors and differences likely limited hospital-specific estimates

Recommendations

- Use caution with HDD analysis
- Further study needed to characterize which records are underreported and why
- Present findings of underreporting to NHA and Nebraska hospitals
- Continue comparison with NHSR to evaluate individual hospital reporting
- Hold hospitals accountable to report all discharges

Acknowledgments

Nebraska Health and Human Services System		CDC
• Tom Safranek	• Norm Nelson	• Tom Török
• Kurt Weiss	• Jane McGinnis	• Julie Magri
• Victor Filos	• Debora Barnes-Josiah	
• Kim Collins	• Ming Qu	
• Andy Scherer	• Kathy Korinek	
• Stan Cooper	• Mark Miller	
Nebraska Hospital Association		University of Nebraska-Lincoln
• Kevin Conway		• Brett Foley

CS110786