Concordance Between Self-Report of Medicaid Enrollment in the National Health Interview Survey and Medicaid Administrative Records

Jessie L. Parker, Health Statistician, Data Linkage Program

Data Linkage Methodology and Analysis Branch

Division of Analysis and Epidemiology

Co-author: Crescent B. Martin, Data Linkage Program

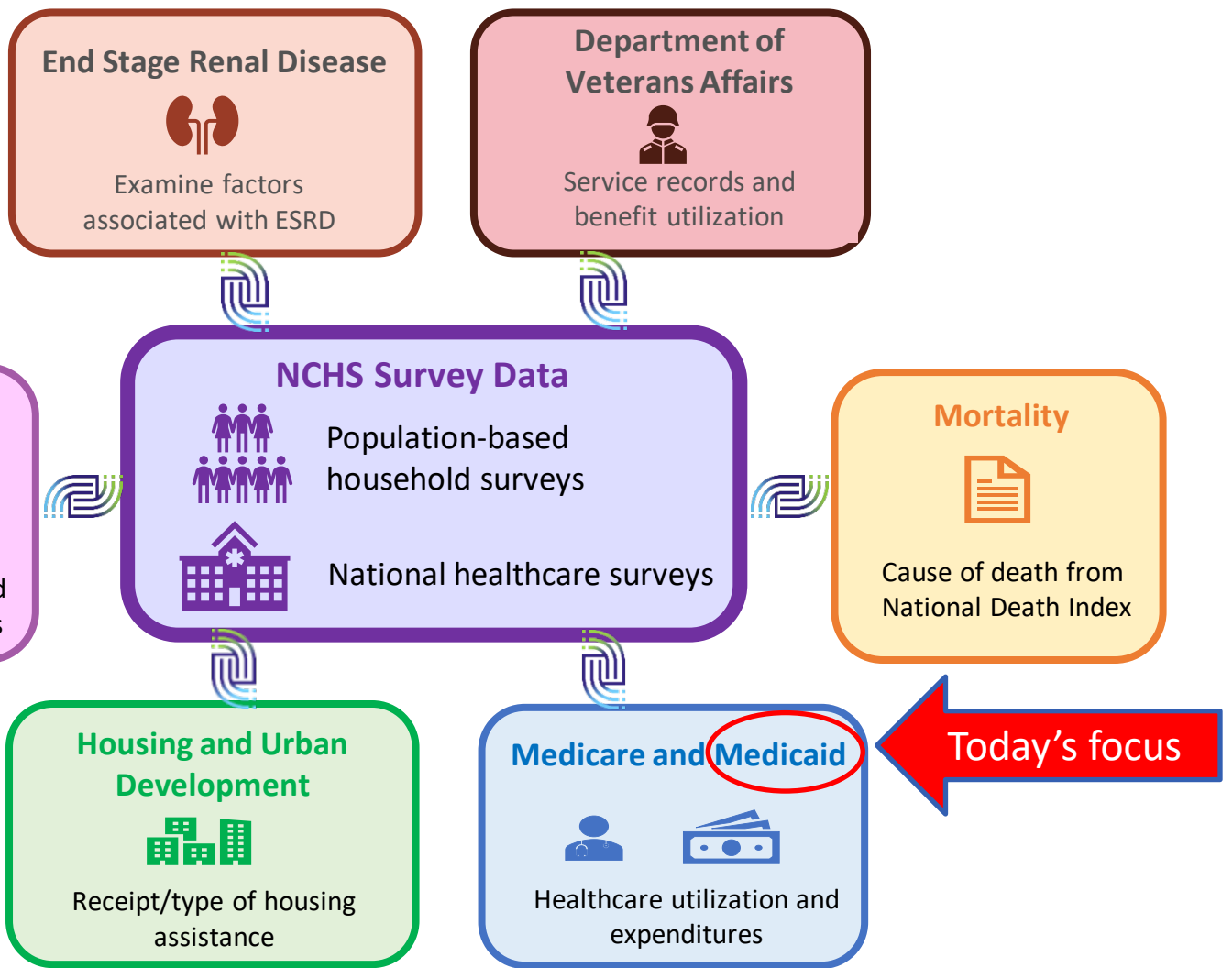FCSM Research & Policy Conference
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Background and outline

- Linking data sources expands the analytic utility of population and provider surveys

- The National Center for Health Statistics (NCHS) recently completed the first linkage with Transformed Medicaid Statistical Information System (T-MSIS) administrative data from the Centers for Medicare and Medicare Services (CMS)

- This presentation will cover:
  – The NCHS Data Linkage Program
  – Medicaid and CHIP (Children's Health Insurance Program) reporting in the National Health Interview Survey (NHIS)
  – The NHIS-CMS T-MSIS data linkage
  – Concordance of survey and administrative reporting of Medicaid/CHIP coverage
  – How to access NCHS linked data

NCHS Data Linkage Program: Overview

- Create linked data files that support high quality research and program evaluation

- Utilize state of the art linkage methodologies and provide documentation and support for analyzing linked data files

- Explore innovative methods for maintaining researcher access to linked data

NCHS linked data

Research question

- What is the concordance of Medicaid enrollment as reported in NHIS compared to linked T-MSIS data?
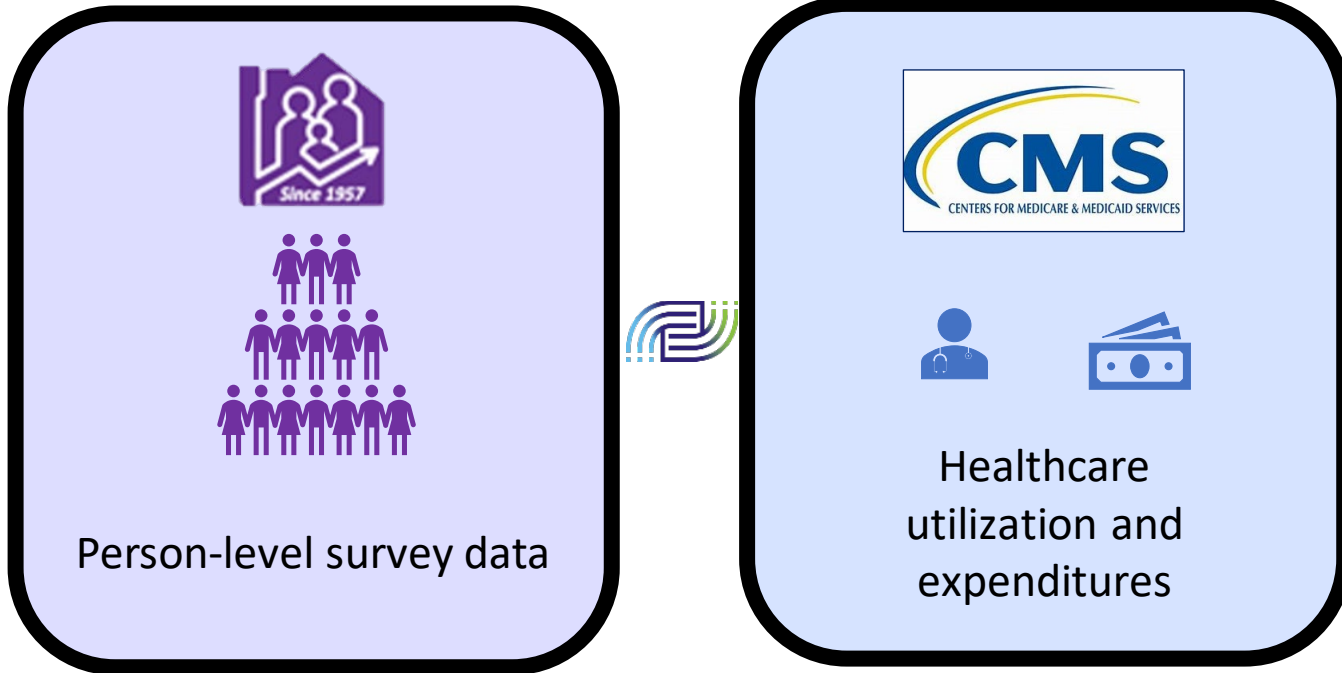
- How does this vary by age group?

Background: Medicaid reporting in survey data

- The Medicaid undercount in survey research is well-established

- Previous studies have found Medicaid misreporting ranges from 10-30 percent

- Linked data provides a unique opportunity to assess Medicaid undercount at the person-level

  - Earlier work assessed concordance when linking NHIS report of Medicaid coverage to previous Medicaid administrative files

  - This is the first study of the Medicaid undercount using the newly linked NHIS-CMS T-MSIS data

NCHS survey data linked to CMS T-MSIS data

- First linkage of NCHS survey data to T-MSIS data

- T-MSIS replaces and improves Medicaid Analytic eXtract (MAX)
  - Broader set of beneficiaries
  - More claim types and claim lines
  - More information on beneficiary demographics, enrollment, benefits

- NCHS surveys included in recent linkage with 2014-2019 T-MSIS data:
  - 1994-2018 National Health Interview Survey
  - 1999-2018 National Health and Nutrition Examination Survey (NHANES) and NHANES III (1988-1994)
  - 2004 National Nursing Home Survey
  - 2016 National Hospital Care Survey *linked 2015-2017 T-MSIS only*

NHIS-CMS T-MSIS data linkage

Person-level survey data

Healthcare utilization and expenditures

National Health Interview Survey (NHIS)

- NHIS is a nationally representative, cross-sectional sample of the US civilian noninstitutionalized population

- NHIS household interview is important source of information on nation's health

- Type of health care coverage is assessed for each individual in household
  - Parents are proxy responders for children
  - If no coverage is reported and the survey participant is under 65, additional Medicaid probe is asked that provides name of state program (below)

Question ID: FHI.073_00.000   Instrument Variable Name: MCAIDPRB

Final Documentation Name: MCAIDPRB

There is a program called Medicaid that pays for health care for persons in need. In this state it is also called [state name]. {Are/Is} {person} covered by Medicaid?

Medicaid administrative data: T-MSIS Analytic Files

Match Status file: identifies which survey participants were eligible for linkage and linked to T-MSIS
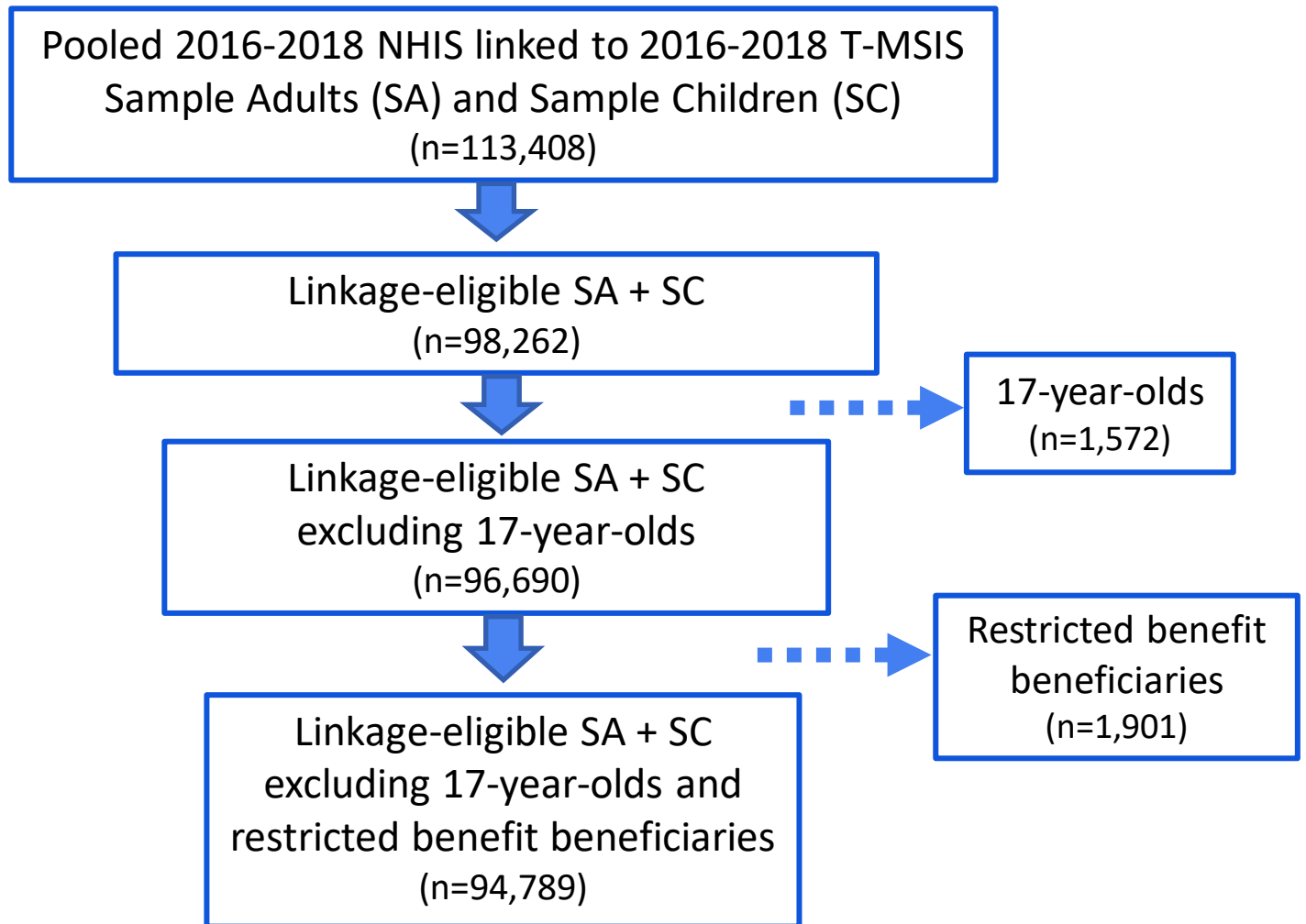
Demographic and Eligibility (DE) file: Medicaid or Children's Health Insurance Program (CHIP) enrollment, including enrollment periods, eligibility, managed care enrollment, and more

Claims files: **Inpatient, Long-Term Care, Pharmacy,** and **Other Services**, includes billing information on prescription drugs, supplies, and healthcare services

Analytic Sample

Pooled 2016-2018 NHIS linked to 2016-2018 T-MSIS Sample Adults (SA) and Sample Children (SC) (n=113,408)

Linkage-eligible SA + SC (n=98,262)

17-year-olds (n=1,572)

Linkage-eligible SA + SC excluding 17-year-olds (n=96,690)

Restricted benefit beneficiaries (n=1,901)

Linkage-eligible SA + SC excluding 17-year-olds and restricted benefit beneficiaries (n=94,789)

Approach to assessing concordance

- **Analysis:** explore concordance of NHIS report of Medicaid enrollment and linked T-MSIS administrative data

  - Concordance defined as agreement between T-MSIS and NHIS in same month and year of survey interview

  - Medicaid/CHIP enrollment was defined using the monthly CHIP_CD and ELGBLTY_GRP_CD variables

  - Calculated overall percent agreement, sensitivity, specificity, positive predictive value, negative predictive value (unweighted)

  - Examined overall population, as well as by age groups:

    - Under 17 years old

    - 18-64 years old

    - 65+ years old

Results: Overall

Table 1. Comparison of National Health Interview Survey report to T-MSIS record of Medicaid/CHIP coverage, 2016-2018*

NHIS report of Medicaid/CHIP coverage	T-MSIS record of full-scope or comprehensive Medicaid/CHIP coverage in same month of NHIS interview		
	Yes	No	Total
Yes	14,177	2,187	16,364
No	4,216	74,209	78,425
Total	18,393	76,396	94,789

Overall agreement: 93.2%

Sensitivity: 77.1%

Specificity: 97.1%

Positive predictive value: 86.6%

Negative predictive value: 94.6%

NOTES: NHIS is National Health Interview Survey. T-MSIS is Transformed Medicaid Statistical Information System.
SOURCE: Linked National Health Interview Survey and CMS Medicaid data
*Results do not include 17-year-olds

Results: Overall

Table 1. Comparison of National Health Interview Survey report to T-MSIS record of Medicaid/CHIP coverage, 2016-2018*

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SOURCE: Linked National Health Interview Survey and CMS Medicaid data
*Results do not include 17-year-olds

Results: Under 17

Table 2. Comparison of National Health Interview Survey report to T-MSIS record of Medicaid/CHIP coverage, 2016-2018, Under 17

NHIS report of Medicaid/CHIP coverage	T-MSIS record of full-scope or comprehensive Medicaid/CHIP coverage in same month of NHIS interview		
	Yes	No	Total
Yes	7,033	929	7,962
No	1,645	12,621	14,266
Total	8,678	13,550	22,228

Overall agreement: 88.4%

Sensitivity: 81.0%

Specificity: 93.1%

Positive predictive value: 88.3%

Negative predictive value: 88.5%

NOTES: NHIS is National Health Interview Survey. T-MSIS is Transformed Medicaid Statistical Information System.
SOURCE: Linked National Health Interview Survey and CMS Medicaid data

Results: 18-64

Table 3. Comparison of National Health Interview Survey report to T-MSIS record of Medicaid/CHIP coverage, 2016-2018, 18-64 years old

NHIS report of Medicaid/CHIP coverage	T-MSIS record of full-scope or comprehensive Medicaid/CHIP coverage in same month of NHIS interview		
	Yes	No	Total
Yes	6,004	949	6,953
No	2,046	44,162	46,208
Total	8,050	45,111	53,161

Overall agreement: 94.4%

Sensitivity: 74.6%

Specificity: 97.9%

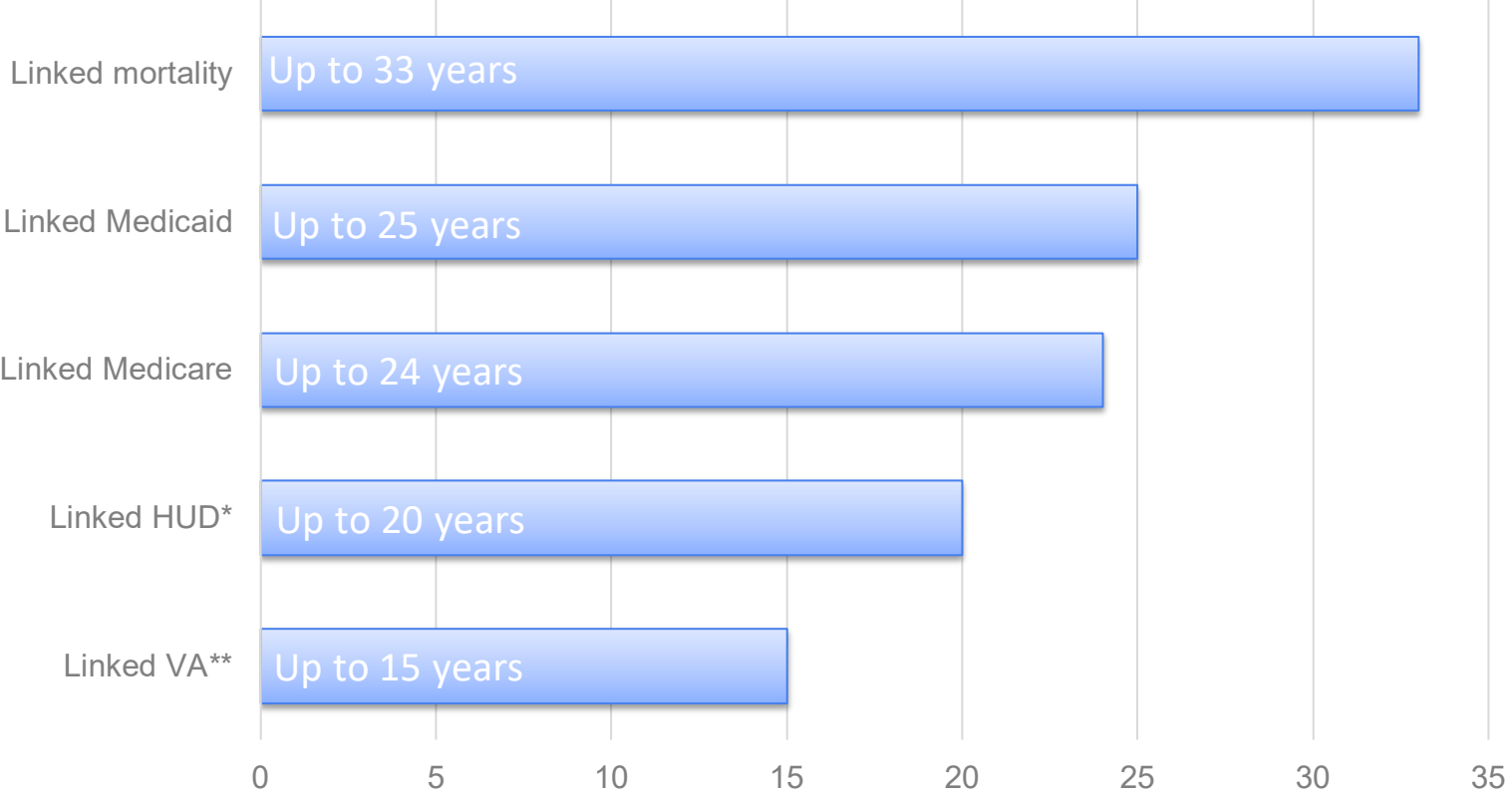Positive predictive value: 86.4%

Negative predictive value: 95.6%

NOTES: NHIS is National Health Interview Survey. T-MSIS is Transformed Medicaid Statistical Information System.
SOURCE: Linked National Health Interview Survey and CMS Medicaid data

Results: 65+

Table 4. Comparison of National Health Interview Survey report to T-MSIS record of Medicaid/CHIP coverage, 2016-2018, 65 years or older

NHIS report of Medicaid/CHIP coverage	T-MSIS record of full-scope or comprehensive Medicaid/CHIP coverage in same month of NHIS interview		
	Yes	No	Total
Yes	1,140	309	1,449
No	525	17,426	17,951
Total	1,665	17,735	19,400

Overall agreement: 95.7%

Sensitivity: 68.5%

Specificity: 98.3%

Positive predictive value: 78.7%

Negative predictive value: 97.1%

NOTES: NHIS is National Health Interview Survey. T-MSIS is Transformed Medicaid Statistical Information System.
SOURCE: Linked National Health Interview Survey and CMS Medicaid data

Conclusions

- Among NHIS participants, there is evidence for a Medicaid undercount
  - Varies by age group, from 19% for those under 17 to 31.5% for 65+

- Using linked NHIS-CMS T-MSIS data increases analytic utility of the survey data by supplementing the survey data with additional Medicaid and CHIP beneficiaries that may have been missed with survey report alone

- Assessing concordance can help inform public health researchers and survey methodologists in design decisions

- Augmenting survey data with linked administrative data can help provide a more complete picture of health care utilization and expenditures

Augmenting survey data with other administrative sources

Linked mortality — Up to 33 years
Linked Medicaid — Up to 25 years
Linked Medicare — Up to 24 years
Linked HUD* — Up to 20 years
Linked VA** — Up to 15 years

*HUD, Department of Housing and Urban Development; **VA, Department of Veteran Affairs

How to access restricted-use NCHS linked data

- Linked data are available through the NCHS Research Data Center (RDC) and Federal Statistical RDCs managed by the Census Bureau

https://www.cdc.gov/rdc/index.htm
Email: rdca@cdc.gov

NCHS Data Linkage Program

Subscribe to the NCHS Data Linkage Program LISTSERV to receive updates! Email a message to list@cdc.gov.   Leave the subject line blank.   In the body of the message, type:

- SUBSCRIBE NCHS-DATA-LINKAGE-PROGRAM lastname, firstname

Contact me at: Jessie.Parker@cdc.hhs.gov

Contact the Data Linkage Program: datalinkage@cdc.gov

Visit our website: www.cdc.gov/nchs/data-linkage

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Appendix: Estimated linkage error rates

- Type I (false positive) and Type II (false negative) errors were calculated using the truth source in order to assess quality of matches developed

- Results: Highly accurate linkage results (low type I and type II errors)
  - Deterministic matches represent the majority of total matches
  - Assume a zero-error rate with deterministic approach

Survey	Estimated Type I	Estimated Type II
NHIS and NHANES	0.06%	1.80%

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348   www.cdc.gov