Realizing the Power of Health Data through Linkages

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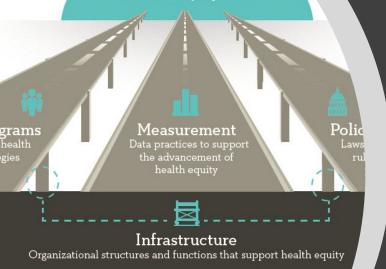
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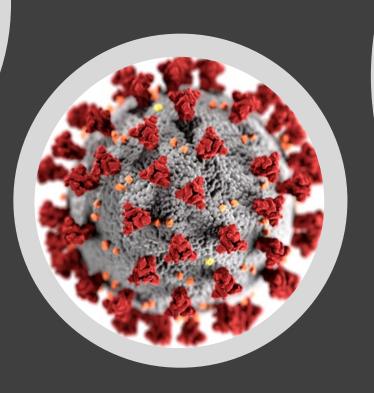


Implementing the Foundations for Evidence-Based Policymaking Act at the U.S. Department of Health & Human Services



Health Equity hen everyone has the opportunity to be as healthy as possible







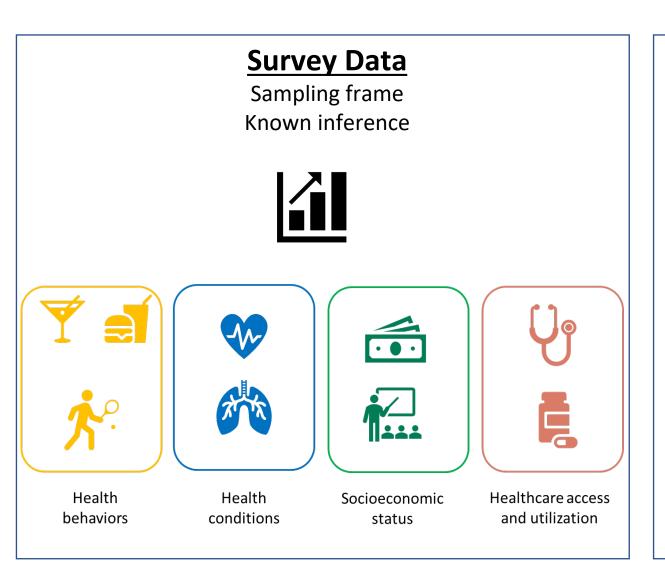
Where are we now?

Data Linkage as a Solution

- Linking data is a powerful and efficient mechanism for producing policy-relevant information
 - Brings together information about the same person or entity to create a new, richer dataset
 - Allows for the construction of longitudinal events in previously cross-sectional datasets.



NCHS Data Linkage Program: Sources



Administrative Data

Program participation/vital status
Not meant for research purposes



Housing and Urban
Development



Medicare and Medicaid





Mortality



Geocoded End Stage Renal Addresses Disease



Department of Veterans Affairs



How have linked data been used for evidence-based policy-making?

Health care finance & coverage

- Assess health insurance coverage and access to care for Social Security Disability Insurance beneficiaries during the waiting period before Medicare entitlement
- Health conditions and medical costs of Chronic Kidney Disease in the Medicare population

Evaluation of policy

- HUD policy to reduce lead exposure for children
- Effectiveness of smoking cessation medication for individuals enrolled in Medicaid

Evidence generation for public health & health care

- Assess adverse health effects associated with the mandatory folic acid fortification policy
- Assess the role of eliminating obesity and smoking (through simulation study) to reduce disparities in life expectancy

Bipartisan Policy Center



EVIDENCE WORKS

Linked Data Support Evidence-Based Policymaking

NHANES-HUD Linked Data:

- Blood lead levels among federal housing assistance recipients
 - Results: Children living in federal assisted housing had lower blood lead levels compared to comparable children not living in federal assisted housing.
 - HUD 2018-2022 Strategic Plan cited findings from the NCHS-HUD linked files to support the continued removal of lead-based paint hazards in HUD homes.
 - HUD also cited this evidence in a proposed rule to lower the threshold for elevated blood lead level determination to align with CDC standards.

NCHS Linked Data Used in >1,000 Public Health Research Studies

Linked Mortality Data

- Deaths Associated with Underweight, Overweight, and Obesity
- Air Pollution Exposure and Heart Disease Mortality
- Educational Differentials in US Adult Mortality



Linked NCHS-CMS Data

- Characteristics of those who chose Medicare Advantage upon Medicare enrollment
- Health service use among the previously uninsured
- Concordance between survey reported childhood asthma and linked Medicaid



Linked NCHS-HUD Data

- Housing assistance and blood lead levels
- Cigarette smoking and adverse health outcomes among adults receiving federal housing assistance
- Housing assistance associated with insurance rates and unmet medical need



Emerging Data Needs: Linked Health Data

COVID-19

- Prevalence of risk factors for key population subgroups and subsequent COVID-19 mortality
- Assess population disparities in vaccination trends, acute care utilization, and hospitalization

Opioids

- Assess risk factors to reduce re-admissions and deaths due to opioids
- Following hospitalization for opioid overdose, assess treatment protocols on subsequent readmission or mortality

Social determinants of health/health equity

- Assess how federal support programs (such as those providing housing or food assistance support) mitigate health related outcomes
- Assess disparities that increase potential exposure to infectious disease (such as large households and occupational exposures)

Emerging Data Needs: Enhancing Patient Data with Health outcomes

- Linked Inpatient and Emergency Department records with death certificate data to assess 30, 60, 90-day post-hospitalization mortality
- Linked electronic health records and claims with Medicare and Medicaid data to provide new resources for patient outcomes research, including evaluating treatment effectiveness and post-acute care utilization

National Health Statistics Reports

umber 141 ■ June 16, 2020

National Hospital Care Survey Demonstration Projects: Opioid-involved Emergency Department Visits, Hospitalizations, and Deaths

by Merianne Rose Spencer, M.P.H., Lee Anne Flagg, Ph.D., Geoff Jackson, M.S., Carol DeFrances, Ph.D., and Holly Hedegaard, M.D., M.S.P.H.

Abstract

Objective—This report demonstrates the unlity of linking the restricted-use 2014. National Hospital Core Survey (SRCS), 2014–2015 National Death Index (CDD), and 2014–2015 Drug-Involved Mortality (DBD) data to value openid-unvolved emergency deportment (ED) visits, hospitalizations, and mortality within 1 year post-discharge. Example research questions and unweighted results are presented. Results are not nationally representative.

Mericoli—Patient records from the 2014 NHCS with refficient identifying information were inked to the 2014-2015 NDI and DDI data. Visits were considered openid-aerosisved if they had Janonamican Classification of Discussor. Nucle Existing. Clinical Modification (ICD-9-CM) diagnosis codes 304:00-304:02, 304:70-304.72, 305:50-305.52, 765:72, 965:00-965.02, 965:00, 970.1, or E55:00-E55:02 in any diagnosis or enternal classes of injury code field. Openid-involved darp revealess deaths were deaths with an International Classification of Discussors, 10th Existing (ICD-30) underlying cause-of-death code of X40-44, X60-64, X35, or Y10-Y14 and a multiple cause code of T400-T40 4 or T40.6.

Results—In the 2014 NBCS, there were 15,485 patients with an opicid-involved ZD-only visit and 24,059 patients with an opicid-involved hospitalization. Of the 20,962 patients with an opicid-involved hospitalization eligible to be liabled to NDI, 1,895 died (9%) within 1 year of discharge. Of these deaths, 241 (15%) resulted from a drug oversion. Of drug oversione deaths, 245 (17%) involved an opicid, where 1.2% died within 30 days post-discharge, 19% within 31–90 days, and 69% within 91–365 days. Opicids most frequently mentioned included heroin (46%), featured (20%), oxycolonic (15%), methodone (12%), and mosphine (17%). These strappersis are not materially exclusive because a death may involve more than one dung. For approximately 22% of potents who died of an opicid-involved drug overdore in 2014, their last ED-only visit or hospitalization was opicid-involved drug overdore in 2014.

Conclusion—While the NHCS data are not nationally representative, these unlinked and indeed National Center for Health Statistics data allow for exploratory analyses of ED visits. Nonpitalizations, and accordant metality outcomes.

Keywords: health care * mortality * drug overdoos * National Hospital Care Survey

Introduction

Decision-makers such as clinicians, policymakers, and researchers need comprehensive data on operad-myslowed emergency department (ED) visits, hospitalizations, and deaths to identify and examine strongies to reduce morbidity and mortality from opicid-involved overdoors and other related harms. However, namenal utotations on opicid-arvolved hospital encounters and subsequent enterones among the same individual potient are limited.

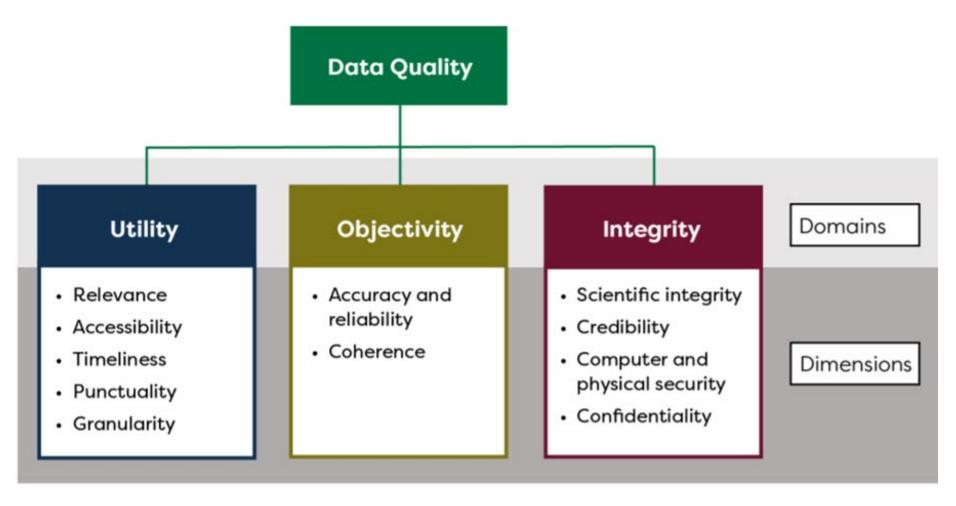
The National Center for Health Statistics (NCHS) received support from the Department of Health and Human Services' Office of the Secretary Patient-Centered Outcomer Research Tour Fund (PCORTF) (1) to link several data sources. The first data source, the National Hospital Care Survey (NBCS). collect: ED, uspatient, and outpatient department administrative claims or electronic health records (EMR) data from a sample of participating hospitals (2). These data are not nationally representative. The second source, the National Death Index (NDI), is a centralized database of death records on file in jurisdictional vital records offices for all deaths occurring in the United States, as well as the U.S.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics



Linked Data Quality Transparency is Essential For Proper Inference



Federal Committee on Statistical Methodology. 2020. A Framework for Data Quality. FCSM 20-04. Federal Committee on Statistical Methodology. September 2020.

Utility: User Documentation and Analytic Support



- Linkage Methodology and Analytic Considerations document available on the website
- Match rate and sample size tables
- Web tutorial on how to utilize public use feasibility files

NHANES-CMS Linked Data Tutorial

Welcome to the NHANES-CMS Linked Data Web Tutorial! The National Center for Health Statistics (NCHS) developed this tutorial to meet the growing needs of NHANES-CMS linked data users.

This tutorial is one of several <u>NHANES Tutorials</u> that have been developed to promote broader and more proficient use of NHANES data.



NCHS-CMS Medicare Linkage (2014-2018)

- The Linkage of National Center for Health Statistics Surveys to Medicare Enrollment,
 Claims/Encounters and Assessment Data (2014-2018): Methodology and Analytic
 Considerations
 [PDF 777 KB]
- Contains an overview of the data sources, the methods used for linkage, descriptions of the resulting linked data files, and analytic considerations
- Match Rate Table for NCHS-CMS Medicare Files (2014-2018)
 Table providing NCHS-CMS Medicare linked file sample sizes and percentage linked, by survey and age at interview
- Sample Sizes for Restricted-Use NCHS-CMS Medicare Files (2014-2018). ☐ [PDF 457 KB]
 Tables providing sample sizes for each NCHS-CMS Medicare linked files by NCHS survey,
 type of Medicare file and Medicare enrollment/claims/encounter/assessment year
- Medicare Advantage Enrollment Table for NCHS-CMS Medicare Files (2014-2018)
 [PDF 1 MB]
 - Table providing unweighted percentage of NCHS-CMS Medicare linked sample aged 65 and over at time of interview enrolled in a Medicare Advantage plan (for at least 1 month during year)

https://www.cdc.gov/nchs/tutorials/NHANES-CMS/index.htm

https://www.cdc.gov/nchs/data-linkage/medicare.htm

Objectivity/Integrity: Concordance Analyses



National Health Statistics Reports

Number 72 ■ January 6, 2014

Concordance Between Survey Report of Medicaid Enrollment and Linked Medicaid Administrative Records in Two National Studies

by Lisa B. Mirel, M.S., Agency for Healthcare Research and Quality; Alan E. Simon, M.D., Cordell Golden, B.A., Catherine R. Duran, B.S., and Kenneth C. Schoendorf, M.D., M.P.H., National Center for Health Statistics

National Health Statistics Reports

Number 69 ■ November 1, 2013

Self-report of Diabetes and Claims-based Identification of Diabetes Among Medicare Beneficiaries

by Hannah R. Day, Ph.D., and Jennifer D. Parker, Ph.D., Office of Analysis and Epidemiology

Abstract

The National Health and Nutrition Examination Survey (NHANES) and National Health Interview Survey (NHIS) are population-based surveys that heach been linked to administrative data from the Centers for Medicare & Medicaid Services (CMS): the Medicaid Analytic eXtract (MAX) files. These linked data were used to examine, among children under age 18 years, respondent-level concordance between Medicaid or the Children's Health Insurance Program (CHIP) enrollment as reported in each survey (NHANES NHIS) and as indicated by administrative data from the MAX files. Concorda was defined as having Medicaid/CHIP reported as a health insurance source in the survey questionnaire and having a CMS Medicaid/CHIP administrative re in the same month and year as the interview. Records were also considered

National Health Statistics Reports

Number 131 ■ November 4, 2019

Evaluating Survey Report of Social Security Disability Benefit Receipt Using Linked National Health Interview Survey and Social Security Administration Data

by Lisa B. Mirel, Cordell Golden, Jessica M. Keralis, Yeats Ye, Patricia C. Lloyd, and Julie D. Weeks

Abstract

Linking nationally representative population health survey data with Social Security Administration (SSA) disability program data provides a rich source of information on program recipients. Survey participant data from the 1998–2005 National Health Interview Survey (NHIS) were linked to SSA administrative records from 1997 through 2005. The goal of this study was to assess agreement between the actual benefit receipt based on the SSA administrative records and the survey report of benefit receipt in the linked NHIS and SSA file for the U.S. civilian noninstitutionalized population. This evaluation provides information on the expected accuracy of survey report of Social Security Disability Insurance (SSDI) and Sunplemental Security Income (SSDI) benefit receipt, including how participant

Administration (SSA) disability program data to provide a rich source of information about Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) program recipients. Survey participant data from the 1998–2005 National Health Interview Survey (NHIS) were linked to SSA administrative records from 1997 through 2005. The resulting linked data provide key information

National Medicare

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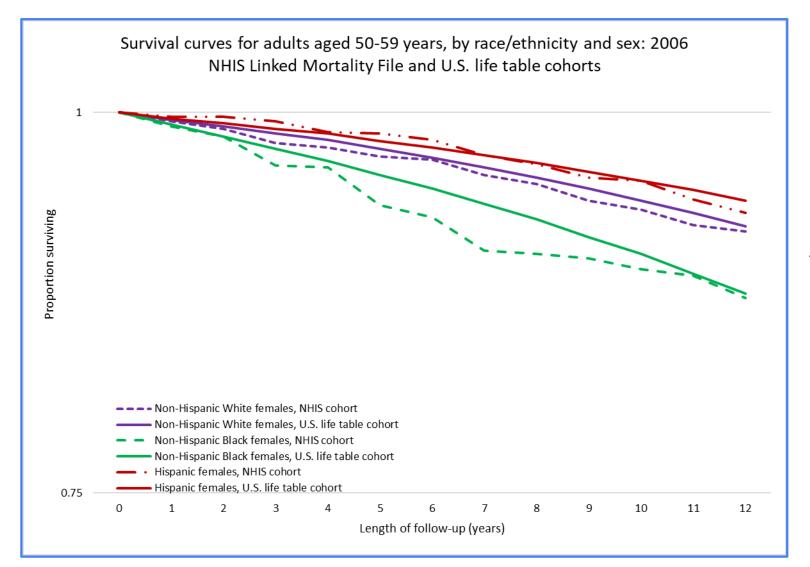
Introduction

Diabetes is an endocrine disorder characterized by impaired insulin production or insulin resistance, which leads to increased blood glucose levels (1). In adults aged 65 and over, diabetes can be classified as Type 1 (previously called juvenile diabetes), or Type 2 (previously called adult-onset diabetes) (1). Type 1 diabetes is an autoimmune disorder with a strong genetic

Integrity:

Comparing Linked Mortality to National Estimates



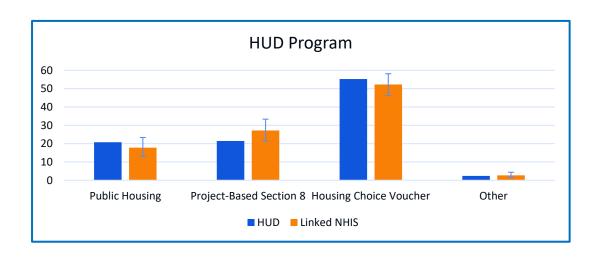


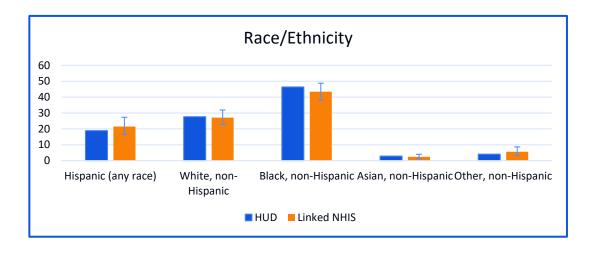
Compared life expectancy models for national and linked data populations

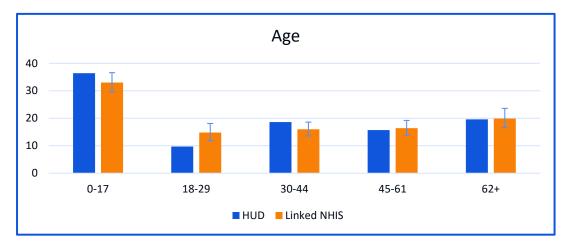
Alignment of estimates support robust analyses using the linked data

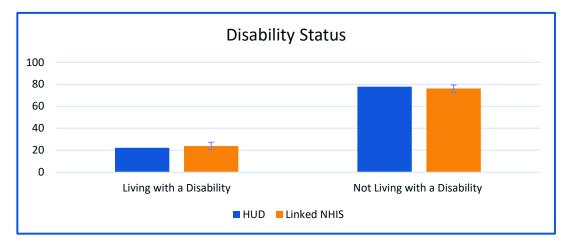
Integrity: Comparison to HUD population Linked Housing and Urban Development Files











Looking to the Future

- Continue to identify and integrate the data needed to answer key public health and policy questions
- Incorporate innovative technologies
- Embrace alternative data sources
- Expand use of geocoded data for public health and health equity research

More Information



NCHS Data Linkage Program:

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www.cdc.gov/nchs/data-linkage



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