Checklist for Working With the NRD

The Nationwide Readmissions Database (NRD) is part of a family of databases and software tools developed for the Healthcare Cost and Utilization Project (HCUP).

The number of studies using the NRD has increased rapidly in recent years. HCUP databases, including the NRD, are consolidated sources of information that can be used for many types of research. Researchers, peer manuscript reviewers, and journal editors need to understand the NRD database design, its strengths and limitations, and how it has changed over time to ensure its appropriate use and interpretation of study results. This document which provides a checklist of key considerations and connects users to NRD informational resources is organized into four sections:

1. HCUP Data Use Agreement for Nationwide Databases and Acknowledgements
2. Research Design
3. Data Analysis
4. Transition from International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to the Tenth Revision, Clinical Modification/Procedure Coding System (ICD-10-CM/PCS).

The NRD Database Documentation page is the main resource for all information regarding the NRD, including the Introduction to the HCUP Nationwide Readmissions Database (NRD), which is recommended as a starting resource for new users.

1. NRD Data Use and Acknowledgments

Check, if complete	Checklist Item	Description	Checklist Resource
☐	Obtain and adhere to the HCUP Nationwide Database Data Use Agreement (DUA).[a]	The HCUP DUA governs the disclosure and use of the data, including affirmations to protect individuals, establishments, and the database itself.	For general information, review the *Responsibilities of the Data Purchaser* and the *HCUP Nationwide Database Data Use Agreement (DUA).* To access the NRD, you must complete the HCUP Data Use Agreement Training.

[a] HCUP data users acknowledge that violation of the AHRQ confidentiality statute is subject to a civil penalty of up to $14,140 under 42 U.S.C. 299c-3(d), and that deliberately making a false statement about this or any matter within the jurisdiction of any department or agency of the Federal Government violates 18 U.S.C. 1001 and is punishable by a fine, up to five years in prison, or both. Violators of this Agreement may also be subject to penalties under state confidentiality statutes that apply to these data for particular states.

Check, if complete	Checklist Item	Description	Checklist Resource
☐	Verify privacy protections for individuals and hospitals.	Individuals or hospitals cannot be identified directly or indirectly. Reporting cell sizes ≤10 increases the risk of re-identification and is discouraged, as specified in the Data Use Agreement.	For more information, review the Requirements for Publishing with HCUP Data page on the HCUP User Support (HCUP-US) website.
☐	Cite HCUP, the NRD, and other HCUP tools.	HCUP, the NRD, and other supporting tools must be correctly cited in the abstract and manuscript.	For more information, review the Suggested Citations for HCUP Databases and Tools page on HCUP-US.
☐	Acknowledge HCUP Partners.	Participating HCUP Partners should be listed in the manuscript by name or acknowledged by a hyperlink to the HCUP-US website.	For more information, review the List of HCUP Data Partners for Reference in Publications page on HCUP-US.

2. Research Design

Check, if complete	Checklist Item	Description	Checklist Resource
☐	Learn how to account for the NRD sampling design.	The Nationwide Readmissions Database (NRD) is a database of all-payer hospital inpatient stays that can be used to generate national estimates of readmissions. The NRD is a 100 percent sample from HCUP State Inpatient Databases (SID) with discharge- and hospital-level exclusions, containing verified patient linkage numbers that can be used to track a person across hospitals within a State, while adhering to strict privacy guidelines. Accounting for the sampling design is critical for accurate analyses.	For detailed information, review the *Introduction to the HCUP Nationwide Readmissions (NRD).* To learn more about the NRD sample design, view the *Nationwide Readmissions Database* tutorial on the HCUP Online Tutorial Series page on HCUP-US.
☐	Excluded Facilities	The NRD includes community hospitals, but it excludes rehabilitation or long-term acute care (LTAC) hospitals.	Additional information on hospital-level exclusions is included in the *Introduction to the HCUP Nationwide Readmissions (NRD)*.

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☐	No State-level analyses are performed.	State-level indicators are not included in the NRD data. To conduct State-level readmission analyses, you must use the SID with verified patient linkage numbers.	To learn more about the SID, review the Overview of the State Inpatient Databases (SID) page on HCUP-US. For more information on the HCUP SID that contain verified patient linkage numbers, refer to the HCUP Supplemental Variables for Revisit Analyses page on HCUP-US.
☐	Facility-level analyses are limited.	Hospital identifiers are not included in the NRD. The NRD hospital number (HOSP_NRD) can be used to determine the total number of discharges for the facility, but not to directly identify the hospital. In addition, this data element links the NRD Core file to the NRD Hospital file but does not link to other HCUP or external databases. You should not attempt to identify individual facilities, as specified in the HCUP DUA.	For more information, review the "Sampling Design of the NRD" section of the *Introduction to the NRD* on the NRD Database Documentation page on HCUP-US.
☐	No physician-level analyses are performed.	The NRD does not include physician identifiers.	For more information, review the NRD Description of Data Elements page on HCUP-US.

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☐	It is not possible to track patients across years in the NRD.	It is not possible with the NRD to track patients across years. Each year of the NRD is considered as a separate sample and so for instance two years of the NRD cannot be combined to create a 24-month database. • KEY_NRD is a unique record identifier and cannot be used to track a person over time. The values of KEY_NRD differ from year to year, except across the 2013-2014 NRD. The values of KEY_NRD in 2013-2014 are similar. • The patient linkage numbers (NRD_VisitLink) are reassigned each year and do not refer to the same person across years. The hospital identifiers in HOSP_NRD also are reassigned and do not track the same hospital across years.	For more information, review the *Introduction to the NRD* as well as the *Limitations on Using the NRD* on the NRD Database Documentation page on HCUP-US.
☐	Administrative (ICD) codes are appropriate for the outcomes of interest.	Administrative codes for the conditions or procedures of interest (ICD-9-CM and ICD-10-CM/PCS,) should be selected with care, especially over time, as codes and coding rules change annually.	For more information, review the *ICD-9-CM and ICD-10-CM/PCS Diagnosis and Procedure Codes* section of the *Introduction to the NRD* on the NRD Database Documentation page on HCUP-US. Refer to the ICD-10-CM/PCS Resources page on HCUP-US under Data Innovations for a summary of key issues for researchers using HCUP and other administrative databases that include ICD-10-CM/PCS coding. To check for year-to-year variation in administrative codes, consult with a medical coding professional.

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☐	Comorbidities must be distinguished from complications.	Secondary diagnosis codes in the NRD do not differentiate comorbidities from complications, unless they are specific to in-hospital events captured by a specific ICD code that indicates a complication. Select comorbidities are identified by the Elixhauser Comorbidity Software for ICD-9-CM or Elixhauser Comorbidity Software Refined for ICD-10-CM. Data elements derived from these tools are included on the NRD Severity File through quarter 3 of data year 2015 and the NRD Diagnosis and Procedure Groups File beginning data year 2019.	For more information, review the HCUP Methods Series Report # 2004-01, *Comorbidity Software Documentation* and the Elixhauser Comorbidity Software for ICD-9-CM or Elixhauser Comorbidity Software Refined for ICD-10-CM pages on the HCUP-US website.
☐	Account for year-based differences in data element availability in the NRD.	The study design should account for differences in data element availability across data years. For example, the number of diagnosis codes present can vary by year.	For more information about data element availability in the NRD, review the NRD Description of Data Elements page on HCUP-US.

3. Data Analysis

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☐	Using the NRD for readmission analyses	While the NRD is designed to be flexible to allow for various types of analyses of readmissions, data elements are not provided that directly identify readmissions. Criteria to determine the relationship between multiple hospital admissions for an individual patient in a calendar year are left to the analyst using the NRD. Analysts can use the information contained in the NRD to define the index event and readmission specific to their topic of interest.	For detailed information on using the NRD for readmission analyses, review the "How to Use the NRD For Readmission Analyses" section of the *Introduction to the HCUP Nationwide Readmissions (NRD).* Additional information on readmission analyses is included in the *NRD Tutorial* on the Tutorial Series page on HCUP-US. For more information on data elements in the NRD, review the NRD Description of Data Elements page on HCUP-US.

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☐	Use weights for national estimates.	To generate national estimates using the NRD, use the discharge-level weight (DISCWT) to estimate discharges treated at community hospitals (excluding rehabilitation and LTAC facilities) in the United States.	To learn how to apply NRD weights, view the *Producing National HCUP Estimates Online Tutorial* on the Tutorial Series page on HCUP-US.
☐	Account for the design of the NRD when calculating standard errors.	Standard error calculations should take into account the stratification (data element NRD_STRATUM) and hospitals defining the clusters (data element HOSP_NRD).	To learn how to calculate standard errors, view the *HCUP Calculating Standard Errors Online Tutorial* on the Tutorial Series page on HCUP-US. Review the HCUP Method Series Report on Calculating *Nationwide Readmissions Database (NRD) Variances*. The Nationwide Readmissions Database Tutorial page on HCUP-US provides a description of the NRD database design and a detailed example on how to use the NRD to estimate national readmission rates with standard errors.
☐	Calculate rates of hospital care events per population when you need to control for differences in the underlying populations.	There are several sources of population data that can be used with the HCUP databases to calculate rates of hospital care events per population to improve comparisons between subgroups (e.g., patient age group).	More information is available under *Population Denominator Data for Use with the HCUP Databases* (multiple documents; updated annually) on the HCUP Methods Series Reports by Topic page on HCUP-US.
☐	Estimate incidence or prevalence.	The NRD can be used to estimate incidence or prevalence of both common and rare conditions in some, but not all scenarios.	For information on estimating incidence and prevalence, review the HCUP Methods Series Report # 2016-06, *Using the HCUP Databases to Study Incidence and Prevalence.*

4. ICD-9-CM to ICD-10-CM/PCS Transition

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☐	Account for changes in the NRD related to ICD-10-CM/PCS.	The transition to ICD-10-CM/PCS has had a direct impact on the reporting of medical services, and these changes affect research using administrative data. The structure of and data elements included in the NRD are affected by the transition to ICD-10-CM/PCS.	For more information, refer to the ICD-10-CM/PCS Resources page on HCUP-US that summarizes key issues for researchers using HCUP and other administrative databases that include ICD-9-CM and ICD-10-CM/PCS coding. For additional information about these changes, review the *2015 NRD Revised File Structure and New Data Elements* and *NRD Changes Beginning Data Year 2016* documents on the NRD Database Documentation page on HCUP-US.
☐	Follow HCUP recommendations for reporting trends with data that include both ICD-9-CM and ICD-10-CM/PCS coding.	Recommendations for reporting trends based on HCUP data that span the October 1, 2015, transition date (before and after the introduction of ICD-10-CM/PCS) have been developed to help researchers design studies.	For more information, review the *Recommendations for Reporting Trends Using ICD-9-CM and ICD-10-CM/PCS Data*.
☐	Use current versions of HCUP Tools for ICD-10-CM/PCS-coded data.	ICD-10-CM/PCS coding guidance is continuing to evolve. HCUP software tools for ICD-10-CM/PCS will be updated annually and should be reapplied throughout the research process. For this reason, it is important to always use the most current version of these tools.	Consult the Research Tools section on HCUP-US regularly for the most current versions of the HCUP software tools.