

Comparative Health System Performance Initiative: Compendium of U.S. Health Systems, 2021, Nursing Home Linkage File, Technical Documentation

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I. Introduction

In 2015, the Agency for Healthcare Research and Quality (AHRQ) created the Comparative Health System Performance (CHSP) Initiative to study how healthcare systems promote evidence-based practices in delivering care.ⁱ AHRQ's goal is to understand the factors that affect health systems' use of patient-centered outcomes research (PCOR) and identify best practices in disseminating and using PCOR.

AHRQ supports the ongoing work of the CHSP Initiative by providing this Compendium of U.S. Health Systems, a list of health systems in the United States, with details about their structure, staffing, and program participation. The Compendium is available on the AHRQ website: <https://www.ahrq.gov/chsp/index.html>.

As part of the CHSP Initiative, AHRQ and Mathematica developed a series of publicly available data resources for researchers, policymakers, and other stakeholders who want to understand how health systems can improve the value of healthcare. These data resources include the 2016, 2018, 2020, 2021, and 2022 Compendium of U.S. Health Systems and hospital linkage files, along with the 2016 and 2018 group practice linkage files.

AHRQ developed the health system data files (referred to as the systems list in this document) using information from several data sources that identify systems and their members. In addition to the names and locations, the systems list includes characteristics such as the number of physicians, hospitals, and nursing homes in the system and the number of hospital discharges from system hospitals.

AHRQ also created files linking health systems with their member nursing homes (referred to as the "nursing home linkage files" in this document). These linkage files include identifying information for nursing homes, such as their name, street address, city, state, and ZIP Code. In addition, the files include the Centers for Medicare & Medicaid Services (CMS) Certification Number (CCN). For nursing homes linked to health systems in the systems list, the files include the health system name and Compendium health system ID.

The nursing home linkage files are publicly available so users can identify nursing homes within health systems and then link to other data sources to examine aspects of their performance, such as cost and quality of care.

This document summarizes the approach taken to create the 2021 nursing home linkage file. In Section II, we summarize the data sources used to create the file. Section III describes the methodology used to create the file. In Section IV, we describe the variables contained in the linkage file. Finally, Section V describes caveats that should be considered when using the nursing home linkage file.

ⁱ Additional information on the CHSP Initiative can be found at <https://www.ahrq.gov/chsp/index.html>.

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II. Data Sources

We use the IQVIA OneKey data to identify nursing homes in the United States and their links to health systems in the systems list. The OneKey data include frequent updates of information on health systems, physicians, advanced practice clinicians, and healthcare facilities nationwide, including hospitals, clinical practice sites, nursing homes, and home health care organizations.

The data come from a combination of telephone surveys and administrative sources. They contain system- and facility-level identifying information such as name, location, unique OneKey identifiers to link records over time, and other unique external identifiers such as CCN, which can be used to link facilities to external data sources.

Most importantly for the purposes of creating the nursing home linkage file, the OneKey data also describe relationships between healthcare providers and other organizations via ownership, management, leasing, purchasing, and contracting mechanisms. In particular, the data indicate relationships between health systems included in the systems list and nursing homes. We use this information to identify the links between the nursing homes and health systems to create the nursing home linkage file.ⁱⁱ

ⁱⁱ An overview of the OneKey data collection methods is available in the Compendium of U.S. Health Systems, 2021, Technical Documentation at <https://www.ahrq.gov/chsp/data-resources/compendium.html>.

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III. Methodology

We use the OneKey data to identify nursing homes and their links to health systems and other corporate parents. In addition, to provide a relatively well-defined and consistent set of nursing homes that can be linked to external data sources and linked internally across these files over time, we restrict the OneKey data to records with a CCN.ⁱⁱⁱ

According to the OneKey documentation, a nursing home (COT 94) is “an extended-care facility that provides medical nursing or custodial care to people who cannot care for themselves, but who do not require hospitalizations.” The 2021 OneKey data contain 15,001 nursing homes with CCNs.

The OneKey data identify relationships between nursing homes and corporate parents (for those that have a corporate parent). Health systems (referred to as integrated delivery networks [IDNs] in the OneKey data) are one type of corporate parent identified in the data, and each health system has a unique OneKey ID. Because the systems list was developed using the OneKey data, it also includes this unique OneKey ID. Thus, we link the nursing homes and their health systems to the systems list using the unique OneKey IDs.

Some smaller, geographically defined health systems (subsystems) are nested within larger systems (parent systems). In the systems list, we aggregate the information for subsystems under their parent systems and only report the information for the parent systems. Similarly, in the nursing home linkage file, we report the parent system information for nursing homes linked to subsystems.

ⁱⁱⁱ We excluded 447 nursing homes from the linkage file that did not have a CCN in the OneKey data.

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IV. Nursing Home Linkage File Contents

The nursing home linkage file contains 15,001 nursing homes. Of those, 1,066 nursing homes (7%) were affiliated with 257 Compendium health systems.

The nursing home linkage file contains 15 variables, including each nursing home's name, location (address, city, state, and ZIP Code), and a unique nursing home ID assigned as part of the development of the Compendium. The unique nursing home IDs are assigned to organizations based on their CCN. These IDs can be used to track nursing homes in the nursing home linkage files across years.

The nursing home linkage file contains three linking variables. Medicare CCN (ccn) can be used to link nursing homes to external data sources such as nursing home provider data from CMS Care Compare.^{iv} The OneKey ID (onekey_id) can be used to link nursing homes to OneKey data. The unique health system identifier (health_sys_id) can be used to link nursing homes to the systems in the Compendium of U.S. Health Systems.^v If applicable, the linked Compendium health system ID, name, city, and state are also included in the file.

The nursing home linkage file also contains variables that identify the corporate parents of nursing homes. These variables include the corporate parent name (corp_parent_name), corporate parent OneKey ID (corp_parent_id), and corporate parent type (corp_parent_type). Two types of corporate parents are noted: health systems (IDNs) and corporate owners.^{vi} When a nursing home has corporate parent information reported in the linkage file but does not report a Compendium health system, it means the corporate parent is a corporate owner or an IDN that was determined to not meet the definition of a health system for the Compendium.

Section V.A includes the definition of a health system for the Compendium and summarizes the exclusion criteria used to identify systems meeting this definition. More detailed information on how we use the definition to identify Compendium systems is available in the Compendium of U.S. Health Systems, 2021, Technical Documentation at <https://www.ahrq.gov/chsp/data-resources/compendium.html>.

^{iv} The CMS data can be downloaded at <https://data.cms.gov/provider-data/archived-data/nursing-homes>.

^v The 2021 Compendium of U.S. Health Systems file includes the count of affiliated nursing homes for each system in the nh_cnt variable. This variable counts all system-affiliated nursing homes in the OneKey data, regardless of whether the record has a CCN, which causes the number of affiliated nursing homes in the Compendium of U.S. Health Systems file to differ from the number of nursing homes linked to health systems in this linkage file for 31 systems.

^{vi} According to OneKey documentation, a corporate owner is “an organization that owns, leases, manages, or establishes strictly a purchasing affiliation with two or more healthcare delivery sites, but does not offer a continuum of healthcare. This is because the organization does not include at least one acute care hospital and one nonacute organization.”

Differences between (nonmissing) information provided for the corporate parent and Compendium health system information may exist because:

- The corporate parent identified in the OneKey data is determined to be a subsystem of a Compendium health system. In these cases, the corporate parent information reflects the subsystem, and the Compendium system information reflects the parent system.
- Slight differences appear in the corporate parent name and the Compendium health system name. In these cases, the corporate parent information reflects the health system name from the OneKey data. The Compendium health system name reflects a slight cleaning of the system name, or it is based on other data sources used to develop the systems list.

Appendix A contains a data dictionary for all variables included in the nursing home linkage file.

V. Caveats and Limitations

This nursing home linkage file enables users to link Compendium health systems with their member nursing homes. When using the file, users should bear in mind a few caveats and limitations to the current methods for assigning nursing homes to health systems.

A. Definition of a Health System

The Compendium definition of a health system follows:

A health system includes at least one hospital and at least one group of physicians that provides comprehensive care (including primary and specialty care) who are connected with each other and with the hospital through common ownership or joint management.^{vii}

This definition is further operationalized as requiring that a health system:

1. Include at least one non-Federal acute care hospital,
2. Include, in total, at least 50 physicians, and
3. Include at least 10 primary care physicians.

If an organization does not meet the definition of a Compendium system, then affiliated nursing homes are not identified in the nursing home linkage file as part of a Compendium system. In addition, the Compendium systems linked to nursing homes in the linkage file are parent systems; relationships between nursing homes and subsystems are not directly identified in the Compendium system variables. Relationships with organizations not considered Compendium health systems may be identified in the corporate parent variable, as discussed in Section IV.

B. Reliance on IQVIA OneKey Data

Two health systems in the Compendium systems list are not found in the OneKey data and therefore have missing data for nursing homes (Table V.1). In addition, the nursing home linkage file relies on the set of nursing homes and relationships to health systems identified in the OneKey data. These may not capture all nursing homes or all relationships between nursing homes and health systems nationwide. This linkage file includes 15,001 nursing homes, compared with the 15,264 nursing homes CMS reported in 2021.^{viii}

^{vii} Foundation models of health system organization are considered a form of joint management. Joint participation in an accountable care organization does not by itself indicate joint management. In addition, “group” is not synonymous with a separately organized medical group. A hospital that employs community-based physicians who provide comprehensive care (but are not organized as a medical group) would be considered a health system.

^{viii} Of the 15,264 nursing homes in the 2021 CMS data, 14,682 (96%) had CCNs with matches in the 2021 OneKey data. Of the 15,001 nursing homes in the 2021 OneKey data with a CCN, 14,682 (98%) had CCNs with matches in the 2021 CMS data.

Table V.1. Compendium systems with no OneKey data and no affiliated nursing homes in the linkage file

Compendium System ID	System Name
HSI00000116	Blanchard Valley Health System
HSI00000715	Munson Healthcare

C. Mergers and Acquisitions

The linkage file reflects nursing homes in the United States at the end of 2021. However, lags may occur in updating changes to systems and their nursing homes. Some mergers, acquisitions, and name changes that occurred before the end of 2021 may not be represented.

Appendix A. Data Dictionary – Nursing Home Linkage File

Variable Name	Variable Type	Description
compendium_nh_id	Character	Unique nursing home ID (assigned as part of the development of the linkage file; links to other years of the nursing home linkage file)
onekey_id	Character	OneKey nursing home ID
ccn	Character	CMS certification number
nursing_home_name	Character	Nursing home name
nursing_home_street	Character	Nursing home street address
nursing_home_city	Character	Nursing home city
nursing_home_state	Character	Nursing home state
nursing_home_zip	Character	Nursing home ZIP Code
health_sys_id	Character	Unique Compendium health system ID (assigned by the CHSP Initiative) of the system linked to the nursing home (same variable as in the Compendium of U.S. Health Systems)
health_sys_name	Character	Health system name (same variable as in the Compendium of U.S. Health Systems)
health_sys_city	Character	Health system city (same variable as in the Compendium of U.S. Health Systems)
health_sys_state	Character	Health system state (same variable as in the Compendium of U.S. Health Systems)
corp_parent_id	Character	OneKey ID for the corporate parent linked to the nursing home
corp_parent_name	Character	Corporate parent name
corp_parent_type	Character	Corporate parent type (health system or corporate owner)