HCUP Hospital Market Structure File:
2009 Central Distributor SID, NIS, and KID User Guide

1.   Purpose

The purpose of the Hospital Market Structure (HMS) File is to provide Healthcare Cost and Utilization Project (HCUP) data users with measures that characterize the market structure of hospitals in HCUP databases. These measures provide estimates of the intensity of competition that hospitals may be facing under various definitions of market area, including markets defined by geopolitical boundaries, fixed radius, variable radius, and patient flow.

The HMS file provides a supplemental set of hospital-level measures for individual hospitals in most states that participated in HCUP for the 2009 data year. Users can merge the HMS measures to the corresponding hospitals on the NIS, KID, or SID[1] by using the HCUP hospital identification number (HOSPID). Hospital market structure measures can then be included in analyses using the NIS, KID, or SID available through the HCUP Central Distributor.

2.   States

The Hospital Market Structure File includes 40 of the 44 states that participated in HCUP for the 2009 data year: AR, AZ, CA, CO, FL, GA, HI, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MT, NE, NH, NJ, NM, NV, OH, OK, OR, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, and WY. Four HCUP states are not included in the file (CT, NC, NY, and PA).

States with linkages to their Central Distributor SID include: AR, AZ, CA, CO, FL, HI, IA, KY, MA, MD, ME, MI, NE, NJ, NM, NV, OR, RI, SC, SD, UT, VT, WA, WI, and WV.

3.   File Format

The data set contains hospital-level records for individual hospitals in the NIS, KID, and Central Distributor SID for states that agreed to release the Hospital Market Structure measures with their data. This includes 935 of the 1,050 NIS hospitals; 3,641 of the 4,121 KID hospitals; and 2,100 of the 2,786 Central Distributor SID hospitals in 2009 (unduplicated HOSPIDs).

All HCUP hospitals in this file are also contained in the 2009 American Hospital Association (AHA) Annual Survey Database. However, the identities of some hospitals are masked. In addition, in seventeen states (GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, and WY), some measures were *set to missing* to protect the identity of the hospitals.

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[1] Nationwide Inpatient Sample (NIS), Kids' Inpatient Database (KID), and Central Distributor State Inpatient Databases (CD-SID) in participating states.

4.   Linking to HCUP Inpatient Databases

The HMS File includes flags that indicate whether a hospital is available in the HCUP NIS, KID, or Central Distributor SID. These data elements aid in linking the file to the HCUP inpatient databases.

NIS and KID: Each of the 40 states in the Hospital Market Structure File participated in the 2009 NIS and KID and a sample of their hospitals is included in each of these HCUP nationwide databases.

For the NIS, users should first select hospitals from the Hospital Market Structure File where NIS=1 and then link the resulting Hospital Market Structure measures to the NIS by HOSPID.

For the KID, users should first select hospitals from the Hospital Market Structure File where KID=1 and then link the resulting Hospital Market Structure measures to the KID by HOSPID.

SID: Twenty-seven states participated in the 2009 Central Distributor SID at the time the files were created, and 25 of these states agreed to release the market structure measures with their Central Distributor SID data. The complete enumeration of hospitals from each of the 25 states is included in the Hospital Market Structure File.

For the Central Distributor SID, users should first select hospitals from the Hospital Market Structure File where CD_SID=1 and STATE=pc, where "pc" is the state postal code for the corresponding Central Distributor SID. Users should then link the resulting Hospital Market Structure file to the Central Distributor SID by HOSPID.

5.   Internal Validation

The HCUP Hospital Market Structure measures are based on the methods of Wong, Zhan, and Mutter (2005). More information can be found in the peer-reviewed article: Wong HS, Zhan C, and Mutter R. "Do Different Measures of Hospital Competition Matter in Empirical Investigations of Hospital Behavior?" *Review of Industrial Organization* 26: 61-87, 2005. A copy of the article may be obtained through AHRQ's online publication request service at http://www.ahrq.gov/news/pubcat/pubcat.htm by providing the AHRQ Publication Number, 05-R050.

Refinements to the methods employed by Wong, Zhan, and Mutter (2005) are noted below. The measures developed for 2003 were compared with the corresponding measures developed when 1997 data was used in the study noted previously. Measures across the two time periods are consistent.

Users of the HCUP Hospital Market Structure measures should cite Wong, Zhan, and Mutter (2005) in their work.

6.   Market Definitions for HMS Measures

For each market definition, the HCUP Hospital Market Structure File contains two broad measures of the intensity of hospital competition: the number of hospitals in the market (N) and the Herfindahl-Hirschman Index (HHI). HHI is the sum of squared market shares for all of the hospitals in the market. A hospital's market share is calculated as the

number of discharges from that hospital divided by the total number of discharges from all hospitals in the market.

Hospital markets are defined by four different approaches: geopolitical boundaries, fixed radius, variable radius, and patient flow. A brief description of each approach follows. For further details, please see Wong, Zhan, and Mutter (2005).

A.   Geopolitical Boundaries

Markets defined by geopolitical boundaries are based on counties, Metropolitan Statistical Areas (MSA), Health Service Areas (HSA), and Core-Based Statistical Areas (CBSA). The county for each hospital was obtained from the AHA 2009 Annual Survey Database. HSA values were obtained from the 2009 Area Resource File (ARF). The MSA values and CBSA codes were obtained from the HCUP 2009 Historical Urban-/Rural – County (HUR-C) file.

B.   Fixed Radius

Under the fixed radius market definition, every hospital is assigned a unique market area, which is the region enclosed by a circle centered on the hospital and defined by a 15-mile radius. Hospital coordinates (i.e., longitude and latitude information) were obtained from the ArcView GIS.

C.   Variable Radius

The variable radius market definition allows the radius to vary for each hospital so that it captures 75% of the hospital's discharges (or 90%, depending on the market definition used). For each hospital, we calculated the distance between the hospital and the patient ZIP Codes that it served, and ranked patient ZIP Codes according to the distance, in ascending order. Patient ZIP Codes were obtained from the HCUP SID data. We then aggregated the discharges in each ZIP Code until 75% (or 90%) of the hospital's discharges were captured. The distance between the hospital and the last ZIP Code to achieve this cutoff was the *variable radius*. Under each market definition, the number of hospitals and the HHI are reported.

D.   Patient Flow

The patient flow approach defines a hospital's market as the collection of ZIP Codes that send a nontrivial amount of patients to the hospital, and that collectively account for 75%, 90%, or 95% of a hospital's discharges. For each patient ZIP Code, we first obtained the number of unique hospitals that served that ZIP Code and then ranked these hospitals in descending order of discharges in that ZIP Code. Next, we aggregated the discharges of hospitals until 75% (or 90% or 95%) of the ZIP Code's discharges were captured. The corresponding number of hospitals needed to achieve this level was the market structure measure for the ZIP Code. Third, for each hospital, we calculated the proportion of this hospital's discharges that came from each ZIP Code. That hospital's measure was the sum of ZIP-level measures weighted by the proportion of the hospital's discharges to that ZIP Code. HHI did not vary materially by 75%, 90%, or 95% of a hospital's discharges. Therefore, although we report separate measures for N, we only report one HHI measure.

7.   Data Element List

There are 24 data elements in the HCUP Hospital Market Structure File. The following list summarizes the data elements (and their respective labels) included in this file.

Data Element	Label
HOSPID	HCUP hospital identification number
state	Hospital state postal code
year	Year for linking to HCUP records
CBSA_HHI	HHI in market defined by CBSA
cbsa_n	N of hospitals in market defined by CBSA
County_HHI	HHI in market defined by county
county_n	N of hospitals in market defined by county
HSA_HHI	HHI in market defined by HSA
hsa_n	N of hospitals in market defined by HSA
MSA_HHI	HHI in market defined by MSA
msa_n	N of hospitals in market defined by MSA
fixedradius_hhi	HHI in market defined by 15-mile radius
fixedradius_n	N of hospitals in market defined by 15-mile radius
patflow_hhi	HHI in market defined by patient flow
patflow_75pct_ n	N of hospitals in market defined by patient flow (75%)
patflow_90pct_ n	N of hospitals in market defined by patient flow (90%)
patflow_95pct_n	N of hospitals in market defined by patient flow (95%)
radius_75pct_hhi	HHI in market defined by variable radius (75%)
radius_75pct_n	N of hospitals in market defined by variable radius (75%)
radius_90pct_hhi	HHI in market defined by variable radius (90%)
radius_90pct_ n	N of hospitals in market defined by variable radius (90%)
NIS	Hospital is in NIS (1 = in NIS; 0 = not present)
KID	Hospital is in KID (1 = in KID; 0 = not present)
CD-SID	Hospital is in Central Distributor SID (1 = in SID; 0 = not present)