

Comparative Health System Performance Initiative: Compendium of U.S. Health Systems, 2016, Hospital Linkage File, Technical Documentation

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Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
5600 Fishers Lane
Rockville, MD 20857
www.ahrq.gov

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Prepared by:

Mathematica Policy Research, Washington, DC
Kirsten Barrett
Ken Peckham
David Jones
Rachel Machta
Jessica Heeringa
Eugene Rich

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Appendix A. Non-Federal General Acute Care Flag

In the Compendium of U.S. Health Systems, 2016, all health systems were required to have at least one non-Federal general acute care hospital. The hospital linkage file includes a flag that identifies non-Federal general acute care hospitals—those in Compendium systems and single hospitals that are not part of a system. In this appendix, we provide additional details about the construction of the non-Federal general acute care hospital flag and present analyses of how the designation varied across data sources.

A. General Acute Care Hospital Definition

The non-Federal general acute care hospital flag in the hospital linkage file denotes hospitals that were identified as non-Federal general acute care hospitals in one or more of the three data sources (AHA, HCOS, and SK&A) used to develop the Compendium of U.S. Health Systems, 2016. Table A.1 describes how non-Federal general acute care hospitals were identified in each data source.

Table A.1. Definitions of non-Federal general acute care hospitals

Data Source	Description of Non-Federal General Acute Care Hospitals
AHA	(1) Not Air Force, Army, Navy, Public Health Service, Veterans Affairs, Federal other, Indian Health Service, or Department of Justice facilities and (2) the hospital provides one or more of the following services: general medical and surgical or children's general medical and surgical care or is a critical access hospital or a major or minor teaching hospital based on resident to bed ratio.
HCOS	(1) Not a government or Veterans Affairs-owned/run facility and (2) flagged as an acute care general hospital, critical access hospital, or children's hospital.
SK&A	(1) Not military or Veterans Affairs-owned/run facility and (2) flagged as a general hospital, critical access hospital, or children's hospital.

If a hospital was considered a general acute care hospital in at least one of the three data sources, we flagged it as such in the hospital linkage file.

B. General Acute Care Hospitals Within Compendium Systems

We examined the differences in the non-Federal general acute care flags across the three data sources and considered alternative approaches to defining the overarching flag reported in the hospital linkage file. Using the approach described above, we identified 3,513 non-Federal general acute care hospitals in the AHA, HCOS, and SK&A data that are linked to Compendium health systems. We also added a non-Federal general acute care hospital flag from a fourth data source—Healthcare Cost Report Information System—to assess its alignment with the three data sources used to create the hospital linkage file.

For each hospital, we calculated the percentage of the four flags indicating it is a general acute care hospital (percentages are calculated only among nonmissing flags; for example, if three of the four flags are nonmissing, and two of the three nonmissing flags indicate a general acute care hospital, the percentage is 66.7 [2/3]). Among hospitals in Compendium health systems flagged as general acute care hospitals (n=3,513), only 25 hospitals have less than 50 percent agreement (Table A.2), which reflects less than 1 percent of all hospitals in Compendium health systems.

Among the remaining 3,488 hospitals, the vast majority (96.1 percent) had 75 percent or greater agreement with regard to their general acute care hospital flags across data sources.

Table A.2. Percentage agreement for the non-Federal general acute care hospital flag

Percentage Agreement on General Acute Care Hospital Flag Across Data Sources	Frequency	Percent
25.0	19	0.54
33.3	6	0.17
50.0	97	2.76
66.7	16	0.46
75.0	250	7.12
100.0	3,125	88.96
Total	3,513	100.00

C. Differences in the General Acute Care Hospital Flags

Because the AHA data include the most detail on hospital types, we examined the extent to which the general acute care hospital flags aligned with that data source. There are 117 hospitals for which the flag in the hospital linkage file indicates that a hospital is a non-Federal general acute care hospital but the AHA flag does not (Table A.3). These are the only 117 hospitals for which the Compendium and AHA flags disagree (apart from the 419 hospitals in the hospital linkage file that do not appear in the AHA data). There were no instances in which the AHA data flagged a hospital as a general acute care hospital while the Compendium did not.

Table A.3. Comparison of Compendium and AHA general acute care hospital flag

Compendium General Acute Care Hospital Flag	AHA General Acute Care Hospital Flag			Total
	0	1	Missing	
0	290	0	146	436
1	117	3,123	273	3,513
Total	407	3,123	419	3,949

A further look at the 122 hospitals with 50 percent or less agreement among general acute care hospital flags reported in Table A.2 shows that 94 are listed as non-general acute care hospitals in the AHA data (Table A.4). Of the remaining 28 hospitals, 13 are listed as general acute care hospitals in the AHA data and 15 are not found in the AHA data.

Table A.4. Differences in the general acute care hospital flags between the Compendium and AHA, by AHA hospital type

AHA Hospital Type: Non-General Acute Care (N=94)	N	Percent
Surgical	25	20.49
Orthopedic	14	11.48
Children's orthopedic	14	11.48
Heart	11	9.02
Cancer	7	5.74
Rehabilitation	6	4.92
Acute long-term care hospital	4	3.28
Eye, ear, nose, and throat	3	2.46
Children's rehabilitation	3	2.46
Psychiatric	3	2.46
Children's chronic disease	1	0.82
Children's other specialty	1	0.82
Other specialty treatment	1	0.82
Obstetrics and gynecology	1	0.82
AHA Hospital Type: General Acute Care Hospital	N	Percent
General medical and surgical	13	10.66
Not found within AHA data source	15	12.30
Total	122	100.00

Note: Compendium hospitals with ≤ 50 percent match on general acute care hospital flag.

There are an additional 23 hospitals in which the percentage agreement is above 50, but the AHA flag differs from the current Compendium general acute care hospital flag. The hospitals are identified as different types in the AHA data, with the most common being surgical, obstetrics and gynecology, other specialty treatment, and children's other specialty (Table A.5).

Table A.5. AHA hospital types (non-general acute care) among general acute care Compendium hospitals with >50 percent match rate on general acute care hospital flag across data sources

Hospital Type	N	Percent
Surgical	5	21.74
Tuberculosis and other respiratory diseases	1	4.35
Heart	1	4.35
Obstetrics and gynecology	7	30.43
Orthopedic	1	4.35
Other specialty treatment	4	17.39
Children's other specialty	3	13.04
Acute long-term care hospital	1	4.35
Total	23	100.00

D. Alternative General Acute Care Hospital Flag

We examined alternative approaches to defining the general acute care hospital flag based on the extent to which the flags agreed across two or more data sources. If we defined general acute care hospitals as those in which 50 percent or more of the nonmissing flags indicated that the hospital was a general acute care hospital, 25 Compendium hospitals would no longer be

identified as general acute care hospitals (see Table A.2). This change would result in the loss of one Compendium health system because the only hospital would no longer be identified as a general acute care hospital and thus would no longer meet the Compendium definition of a health system.

Alternatively, if we changed the current flag to be consistent with the AHA general acute care hospital flag whenever it was available, 117 Compendium general acute care hospitals would have their general acute care hospital flag removed (Table A.3). This removal would result in the loss of two Compendium health systems because their only hospitals would no longer be identified as general acute care hospitals.

If we used the AHA flag when available, and when it was not available, identified general acute care hospitals as those for which 50 percent or more of the nonmissing flags indicated it was a general acute care hospital, we would change the flag for 132 hospitals. Therefore, we would lose the same two systems.

In summary, there are a small number of hospitals in Compendium systems and in the hospital linkage file for which the data sources do not agree on whether they are non-Federal general acute care hospitals. While the hospital linkage file includes the flag for non-Federal general acute care hospitals, users of the Compendium can link the file to the data sources discussed in this document or others (for example, CMS's Provider of Services file^{xiv}) to define their own flag and other hospital characteristics.

E. General Acute Care Hospitals Not in Compendium Systems

Our analysis identified 1,528 non-Federal general acute care hospitals that are not linked with Compendium health systems. Among these hospitals, 59 (3.9 percent) have less than 50 percent agreement across their general acute care hospital flags (Table A.6). Among the remaining 1,469 hospitals, nearly 90 percent had 75 percent or greater agreement with regard to their general acute care hospital flags across data sources.

^{xiv} Available at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Provider-of-Services/index.html>.

Table A.6. Percentage agreement on general acute care hospital flags across data sources (hospitals not in Compendium systems)

Percentage Agreement on General Acute Care Hospital Flags	Frequency	Percentage
25.0	36	2.4
33.3	23	1.5
50.0	48	3.1
66.7	86	5.6
75.0	131	8.6
100.0	1,204	78.8
Total	1,528	100.0

Among hospitals not in Compendium health systems that are currently flagged as general acute care hospitals, 135 are not flagged as such in the AHA data. Furthermore, 164 additional hospitals (29 general acute care hospitals and 135 non-Federal general acute care hospitals) are not found in the AHA data.