

# ARIZONA HOSPITAL SERVICE AREAS

## Type and Capability Study

AUGUST 2020



Authored by Bryan Hannley, Tim Snyder and Elizabeth Ayarbe-Perez  
The Innova Group, Tucson, Arizona

## EXECUTIVE SUMMARY

### Introduction

Within the State of Arizona, the healthcare system is supported by the strength of hospitals in the urban setting (Phoenix metropolitan and Tucson) as well as a proliferation of hospitals in smaller communities and rural areas across the state. Understanding how the rural population vs the urban population accesses care, and how age is stratified throughout the system will make for better decisions when it comes to healthcare planning by service type. This study will answer the following questions to aid in a better decision making process:

- Should the Hospital Service Areas (HSAs), as defined by the Dartmouth Atlas Project, across Arizona be further defined or categorized?
- If so, how many of these “HSA types” should be developed?
- What data and metrics should be used to determine the breaking points or divisions for each of these HSA types (e.g., bed count, surgical volume, surgical complexity)?
- How do these new HSA types map geographically across the State of Arizona?
- What is the inpatient utilization within each HSA type and how do they differ across service lines?
- Does HSA population have any relationship to the Service Area Types?

The answers to these questions will provide health care planners and administrators insight into the overall and age-stratified Patient Utilization Rate for Inpatient Care by service line in four to five major “Hospital Service Area Types” in the state of Arizona. As a result of the study, Adult Rates (older than 17) and Pediatric Rates (17 and less) should be easily identified as well as other age groups. The study will seek to determine these rates identifiable by Medicine, Surgery, Maternity and Mental Health with further stratification into smaller service lines, e.g. Orthopedics within Surgery. Included in this study will be the examination of Dartmouth Atlas Hospital Service Areas (HSA) to define and identify each HSA type by the level of service, bed number and/or surgical capacity available to the population within each HSA. This report will present an analysis of inpatient (IP) utilization rates (bed days per thousand) by proposed hypothetical HSA type in the state of Arizona using a three-year average from 2017-2019. Utilization rates are to be analyzed for total usage regardless of location of service as well as for local usage within the HSA of residence only. Utilization rates will be further stratified by service and product line, ICU, and ED usage

### Results

Arizona’s HSAs were found to have five logical types: Tertiary, Large Community, Medium Community, Small Community, and Critical Access. Clear differentiations were found from Medium thru Tertiary based on criteria including: presence and volume of specific cardiac, neurosurgery, and orthopedic surgeries and procedures; NICU presence; ICU presence and beds, medical / surgical beds; overall IP and OP surgical volume. A clear division between Small Community Hospitals and Critical Access Hospitals was not easily found and therefore the CMS Critical Access Hospital designation was utilized.

**Total Utilization Rates** – which include all BDOC originating from residents in each HSA regardless of service location – ranged from a low of 410.2 BDOC/1,000 population in Large Community HSAs to a high of 499.9 in Critical Access HSAs.

**Local Utilization Rates** – which include BDOC originating from a resident in each HSA only where that service was provided within the local HSA – showed higher variation from a low of 76.6 BDOC per 1,000 population in Small Community HSAs to a high of 365.2 BDOC per 1,000 population in Tertiary HSAs.

The percent of total IP BDOC provided within the local HSA ranges from a low of 18.5% in Small Community HSA types to a high of 75.9% in Tertiary HSA types.

Medicine, Surgery, Mental Health & Substance Abuse, and Maternal/Child Health service line local utilization rates all trend up from Small to Tertiary HSA Types. Notably, there is almost no local utilization of IP Mental Health & Substance Abuse in Critical Access and Small Community HSAs, indicating a lack of capacity for those services.

Based on 85% occupancy rates, the number of beds needed to meet local demand ranges from a low of 0.25 beds per 1,000 population in Small Community HSA types to 1.18 for Tertiary HSA types.

## METHODS

### Demographics

Population data in this study was obtained from four sources: (1) US Census Bureau via Esri Data and Maps (2) Arizona Office of Economic Opportunity (OEO) (3) US Department of Housing and Urban Development's (HUD) and (4) Dartmouth Institute for Health Policy and Clinical Practice. These datasets represent multiple geographies such as census tracts, counties, and zip codes. These geographic boundaries do not always align. State and county boundaries form the framework for the US Census Bureau therefore census tracts never cross these boundaries (United States Department of Housing and Urban Development [HUD], 2020). Zip codes however can overlap multiple census tract boundaries. HUD provides USPS zip code crosswalk files that indicate the proportion of residential and business addresses within each of those overlaps, therefore the population can be allocated properly from census tract to zip code.

Arizona's OEO produces the official population estimates and projections for the state (2018). Their data is provided at county level by age group and is the most recent population estimates used in this study. To accurately distribute the total county population and age groupings to census tract, the 2010 census tract data was used to derive the distribution ratio of county to census tract, and the age group distribution for each census tract. Arizona's 2018 population data was then distributed by county to the census tract by applying the ratios of the county population age groupings to the census tract ratios. To aggregate the population data to Dartmouth Atlas HSAs, HUD's Census Tract to Zip Code Crosswalk files were used to allocate each census tract to zip code area. Finally, the Dartmouth Atlas HSA definition (2016) by zip code crosswalk was used to align the population to the HSA. As defined by the Dartmouth Atlas Project HSAs are local health care markets for hospital care. An HSA is a collection of ZIP codes whose residents receive most of their hospitalizations from the hospitals in that area. HSAs were defined by assigning ZIP codes to the hospital area where the greatest proportion of their Medicare residents were hospitalized.

### Service and Product Line

Initial inpatient service line and product line (sub-service line) definitions were obtained from the Advisory Board which uses 18 service line groupings and 83 product line groupings. DRG service and product line assignments were reviewed by a clinician and compared against commercial data sets for logic and consistency. Client feedback was also incorporated to ascertain the most relevant grouping methodology with the understanding that many clients use customized groupings.

Following this analysis, four meta-service lines were created:

1. Medicine
2. Surgery
3. Mental Health & Substance Abuse
4. Maternal / Child Health

New service lines were created for:

1. Mental Health & Substance Abuse, previously part of General Medicine
2. Oral & Maxillary Surgery, previously part of ENT
3. Burns

The previous service line for Rehabilitation, which has been rapidly declining in usage as a grouping, was rolled into Orthopedics. The Advisory Board's Other Trauma service line contained burns, head injuries, and body injuries. Burns became its own discrete service line, head injuries were moved to the trauma product line within Neurology, and body injuries were moved to the trauma product line within General Medicine.

Product lines were consolidated from 83 to 44 with most of the consolidation in Medicine and Surgery sub-specialties. The most significant product line additions centered around transplants with new product lines for cardiac, liver, kidney, pancreas, and bone marrow transplants.

Individual MS-DRGs and APR-DRGs were then mapped to the new product, service, and meta-service line groupings to arrive at our final listing. The Innova Group's service and product line groupings are shown in Table 1 below. A complete crosswalk of DRGs to The Innova Group's product and service lines is available upon request.

The Innova Group Services and Product Lines			
Meta-Service Line	Service Line	Product Lines	
Medicine			
General Medicine	General Medicine	General Medicine	
		Trauma (General Medicine)	
	Cardiac Services	Medical Cardiology	
		Cardiac Cath	
		Cardiac EP	
	Neurology	Neurology	
		Trauma (Neurology)	
	Oncology/Hematology	Oncology/Hematology	
		Radiation Oncology	
	Burns	Burns	
Surgery			
	General Surgery	General Surgery	
		GI	
		Bariatric/Obesity	
		Liver Transplant	
		Kidney Transplant	
		Pancreas Transplant	
		Bone Marrow Transplant	
		Trauma (General Surgery)	
	Cardiac Services	Cardiac Surgery	
		Cardiac Transplant	
	Vascular Services	Vascular Services	
		Amputation	
	Thoracic	Lung Transplant	
		Other Thoracic Surgery	
	Neurosurgery	Brain	
		Peripheral & Cranial Diseases	
		Trauma (Neurosurgery)	
	Orthopedics	Orthopedics	
		Joint Replacement	
		Sports Medicine	
		Trauma (Orthopedics)	
	Spine	Fusion	
		Medical Spine	
		Other Surgical Spine	
	Urology	Urology	
	Gynecology	Gynecology	
	Ophthalmology	Ophthalmology	
	ENT	ENT	
	Oral & Maxillary Surgery	Oral & Maxillary Surgery	
	Mental Health & Substance Abuse		
		Mental Health & Substance Abuse	Psychiatry
			Substance Abuse
	Maternal/Child Health		
		Neonatology	Special Care Nursery / Nicu (L2/L3/L4)
	Well New Born Nursery (L1)		

Table 1

## **Inpatient Utilization**

2017-2019 DRG-level bed days of care, discharge, and ED usage data were obtained from the Arizona Department of Health Services (AZDHS) Hospital Discharge Data source. This data was grouped to The Innova Group's Service Line definitions by DRG and aggregated to the specific geographic HSA study areas to determine inpatient service line volume by geography. The bed days of care per service line were divided by the population of each geography to determine utilization. The Arizona Hospital Discharge Data has some limits worth noting. Patients residing in Arizona but seeking care at a facility outside of Arizona are not included. Also, not all hospitals within Arizona are required to report to AZDHS. Data for Indian Health Service (IHS) hospitals, for example, which provides a portion of the care for Native Americans, are not available and therefore not included when calculating utilization.

## **HSA Type Development**

The main goals of this effort was to 1) classify the HSAs within the State of Arizona into "types"; and 2) to understand how utilization is different within an HSA type defined by service line capability, bed count and level of complexity. And although individual hospitals may have greater capabilities than others, the focus of the study is to analyze the aggregate services and resources within each HSA. The researchers sought to define these HSAs and categorize them into logical levels of care. The following categories were developed: Tertiary HSA type, Large Community HSA type, Medium Community HSA type, Small Community HSA type, and Critical Access Hospital HSA type. To achieve a definition of each HSA type, the team categorically classified these groups based on factors such as acuity and volume of services provided. Additionally, surgical volumes, bed count, and NICU and/or ICU capabilities were considered as potential thresholds or breaking points for our definitions. At conclusion, the research should develop a thorough understanding of the various HSAs in the state of Arizona, the level of services each provides, and what the utilization rate is for each HSA type.

## **Critical Access and Acute Care Hospitals**

For the study, the CMS Master File was used to generate a list of hospitals within Arizona (Centers for Medicare & Medicaid Data, 2019). Facilities listed throughout the CMS Master File were flagged for Acute Care Hospitals and Critical Access Hospitals, described in more detail below. This provided the means to separate out those hospitals with the Critical Access designation. Then, the Arizona Department of Health Services Hospital Discharge Data from 2017 to 2019 was used (AZDHS, 2019). The remaining hospitals flagged for Acute Care were then filtered by facilities presenting both "Thoracic Surgery Discharges" (including Cardiac Surgery) and "Neurosurgery Discharges," indicating facilities delivering a higher complexity of care.

## **Tertiary Versus Large Community HSAs**

DRG-level bed days of care data was then obtained from the AZDHS hospital discharge records, with specific focus on Cardiac Surgery, Neurosurgery, Orthopedic Surgery and Spinal Fusion. DRGs were then cross walked to the Innova Group's service and product lines. In consideration of hospitals delivering higher complexity of care (or Tertiary care), procedures specific to Cardiac Surgery (Valve Replacement and Coronary Bypass), and procedures specific to Neurosurgery (Craniotomy) were of interest. And although a hospital may have a small volume of DRGs in these categories the mere existence of a volume was not an automatic qualifier to be include as a Tertiary HSA type. The exercise of defining the Tertiary HSA type required further analysis of Medical / Surgical bed count, the total number of licensed NICU beds and the total number of licensed ICU beds. Pairing facility bed count with DRG complexity and case volume, hospitals could now be compared across hospital line and by HSA to determine possible divisions existing between Tertiary HSA type and Large Community HSA type. Following the analysis, the researchers were able to conclude the following defining elements between Tertiary HSA type and Large Community HSA type.

<b>Tertiary Hospital Service Area Type has all of the following:</b>
Cardiac Surgery > 300 Total Discharges Per Year Including Cardiac Valve & Coronary Bypass
Neuro Surgery > 200 Total Discharges Per Year Including Craniotomy & Craniotomy (Trauma)
and /or Licensed NICU Beds

<b>Large Community Hospital Service Area Type has all of the following:</b>
Cardiac Surgery > 100 Total Discharges Per Year Including Cardiac Valve & Coronary Bypass
or
Neuro Surgery > 80 Total Discharges Per Year Including Craniotomy
and
Orthopedic Surgery including Total Joint, Trauma Spine and Spinal fusion

### **Large Versus Medium and Small Community HSAs**

The DRG-level bed days of care data was further scrutinized to determine the service lines and capabilities defining a Medium Community HSA type versus a Large Community HSA type. The existence of Cardiac Services continued to be an area of emphasis, however as opposed to the higher surgical acuity found within Large Community Hospital Service Areas, lower acuity DRGs became the focal point. Cardiac Catheterizations and Cardiac Episodes such as procedural care involving defibrillator and/or pacemaker) provided the defining structure for the Medium Community HSA type. As for a recognizable breaking point between Medium Community HSA type and Small Community HSA type, both inpatient and outpatient surgical volumes, and the number of ICU beds were of significant distinction between the two.

<b>Medium Community Hospital Service Area Type has all of the following:</b>
Cardiac Catheterization > 60 Total Discharges Per Year Cardiac Episodes > 20 Total Discharges Per Year Average > 900 IP & OP Surgeries Annually Licensed ICU Beds > 10

<b>Small Community Hospital Service Area Type has all of the following:</b>
Licensed ICU Beds > 10 Limited or no IP and/or OP Surgery

### Small Community Versus Critical Access HSAs

And finally, the key qualifier between Small Community HSA type and Critical Access HSA type centered entirely upon the Critical Access Hospital designation. According to CMS a Medicare participating hospitals are eligible for Critical Access Hospital designation if the following conditions are met:

- Located in a rural area
- Located more than 35 miles from another hospital
- Furnish 24-hour emergency services 7 days a week
- Does not exceed 25 inpatient beds and reports an annual inpatient length of stay (LOS) of 96 hours or less.

**Critical Access Hospital Service Area Type has all of the following:**

Licensed as a Critical Access Hospital

### Assignment of Specific HSAs to HSA Type Categories

The state of Arizona was divided into six HSA types based on criteria discussed above: (1) Tertiary (2) Large Community (3) Medium Community (4) Small Community (5) Critical Access, and (6) Out of State (HSAs that are centered around hospitals outside of Arizona). Figure 1 below illustrates the 2018 Population by HSA, color-coded to HSA Type. Arizona hospitals are indicated with small yellow dots, clustering around the populous regions of the state.



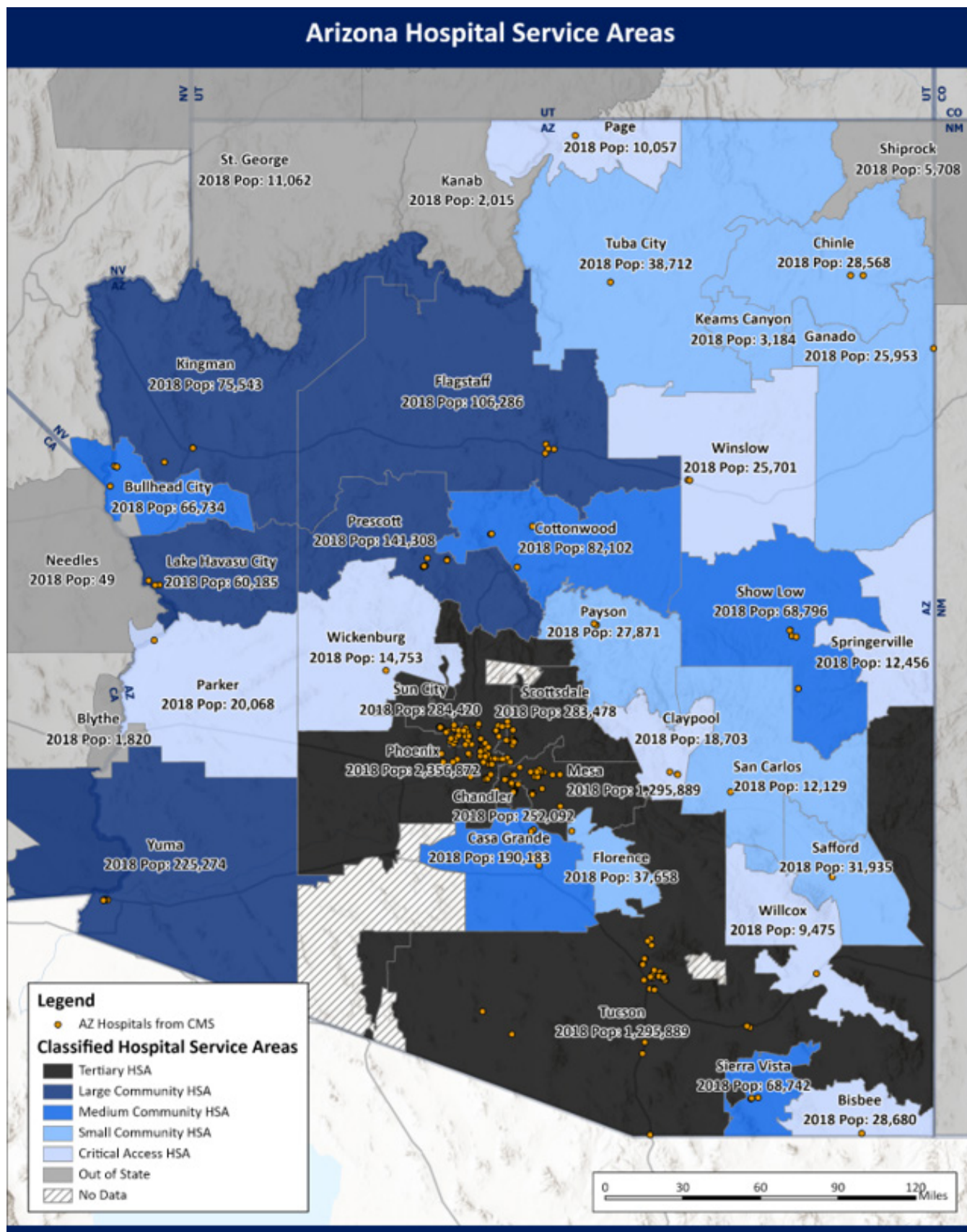


Figure 1: Map of Arizona - 2018 Census Population Aggregated to Dartmouth Atlas HSA



**FINDINGS**

**Population Distribution by HSA Type**

The 2018 total Arizona population was 7,073,173. As shown in Figure 2 below, 75.5% of the population is located in Tertiary HSAs, followed by Large Community HSAs at 12.6%, Medium Community HSAs at 6.7%, Small Community HSAs at 2.9%, Critical Access HSAs at 2.0%, and Out of State HSAs at 0.3%.

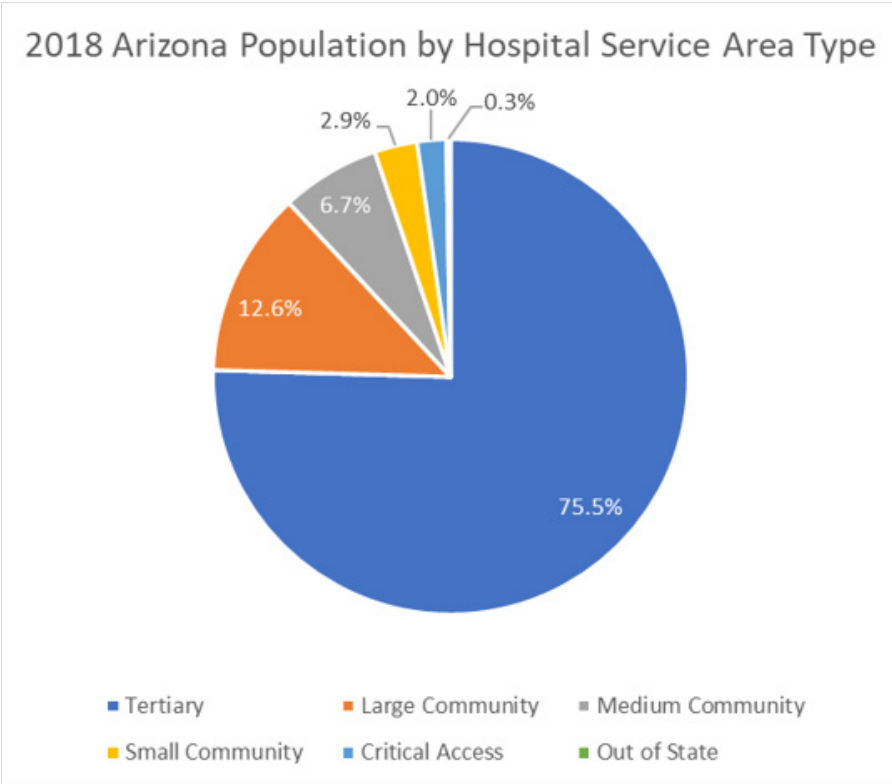


Figure 2

**Population Age Distribution by HSA Type**

The six HSA types were stratified by age into four groups: 0-17, 18-44, 45-64, and 65+ as shown in Figure 3 below. Notable highlights include that the percent of the population in the 65+ age group varies widely by HSA type, ranging from 11.6% of Tertiary HSA types to 22.9% of Large Community HSA types. This age group has the highest utilization rates across Medicine and Surgery service lines, providing a net positive influence on Large Community HSA type utilization rates relative to Tertiary HSA types. Overall, this demographic difference is not surprising as Large Community HSAs include retirement areas such as Yuma, Prescott, and Flagstaff while the Tertiary HSAs include the major metropolitan areas of Phoenix and Tucson.

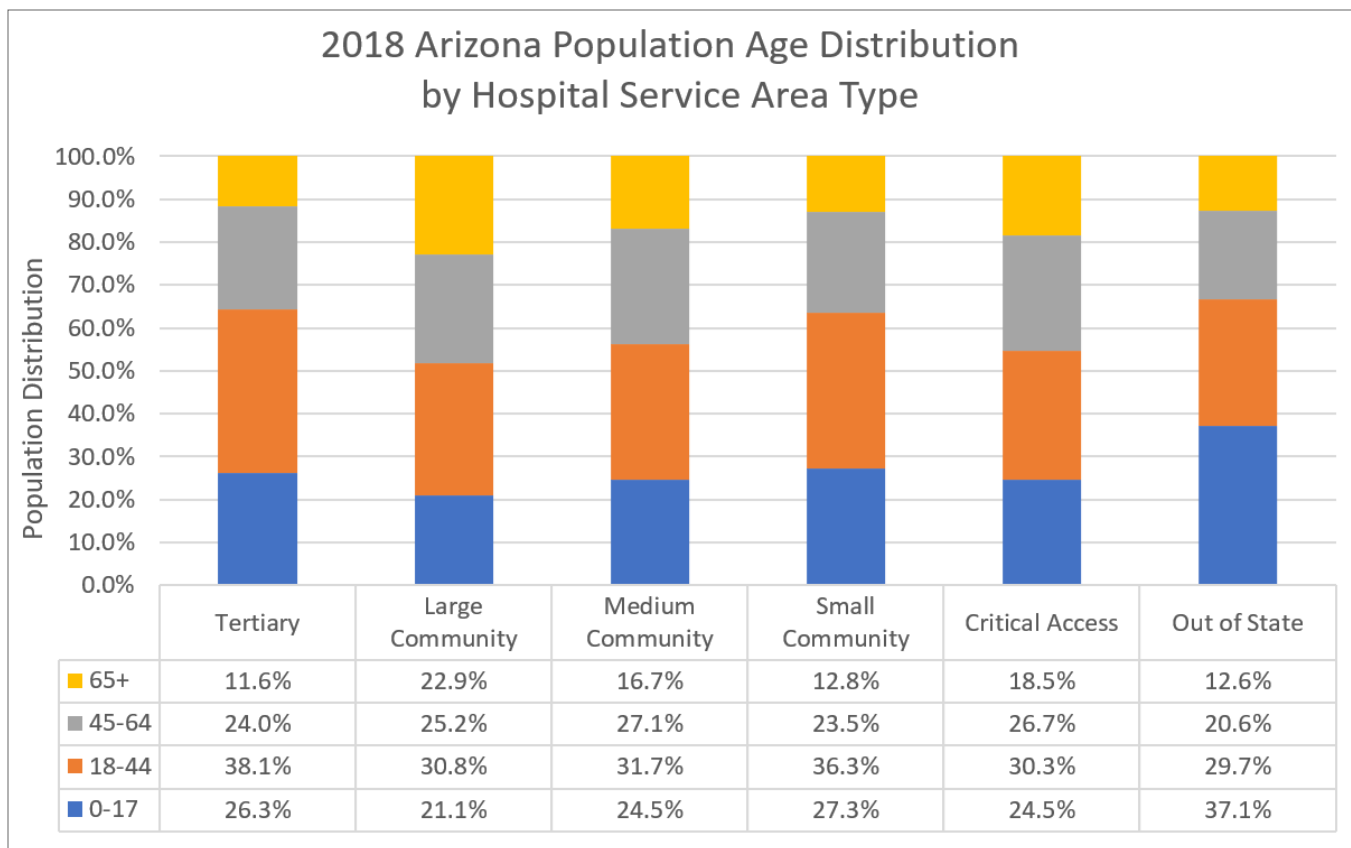


Figure 3

### Utilization Rates by HSA Type

To accurately measure inpatient utilization for each of the HSA Types, only HSAs that contain hospitals which report discharge data to AZDHS were considered. To that end, all Out of State HSAs were excluded, in addition to the following HSAs that are served by IHS hospitals which do not report to AZDHS: Chinle, Ganado, Kearns Canyon, San Carlos, and Tuba City. For a complete list of HSAs included in the study, including population, area, and population density, please refer to Appendix A.

Utilization rates were analyzed in two ways:

- *Total* utilization rates include all BDOC originating from residents in each HSA regardless of service location. For example, a resident of the Bisbee HSA discharged from a hospital within the Tucson HSA would count toward total utilization rate for the Bisbee HSA.
- *Local HSA Type* utilization rates include BDOC originating from a resident in each HSA only where that service was provided within the local HSA (e.g., a Bisbee HSA resident discharged from a hospital within the Bisbee HSA).

**Total Utilization Rates** - as shown in Table 2 below, the overall inpatient utilization rate for the state of Arizona is 471.4 BDOC per 1,000 population. There is a variance in total utilization across the HSA types of 21.9%, ranging from a low of 410.2 in Large Community HSA types to a high of 499.9 in Critical Access HSA types.

2017-2019 Average Total Patient Days per 2018 Population (Utilization per 1,000)						
TIG Service Lines	Critical Access HSA Type	Small Community HSA Type	Medium Community HSA Type	Large Community HSA Type	Tertiary HSA Type	Overall
<b>Medicine</b>	<b>232.1</b>	<b>168.4</b>	<b>194.5</b>	<b>187.3</b>	<b>192.6</b>	<b>192.7</b>
Burns	1.3	1.0	0.8	0.6	0.8	0.8
Cardiac Services	38.6	31.2	33.4	34.8	30.6	31.3
General Medicine	156.5	109.6	130.9	124.9	127.6	127.9
Neurology	23.3	17.1	18.9	16.8	21.8	21.1
Oncology/Hematology	12.4	9.6	10.4	10.3	11.9	11.6
<b>Surgery</b>	<b>164.3</b>	<b>137.6</b>	<b>126.9</b>	<b>134.6</b>	<b>133.0</b>	<b>133.4</b>
Cardiac Services	10.2	10.1	8.4	11.4	7.9	8.3
ENT	2.4	2.5	1.8	2.0	2.1	2.1
General Surgery	68.0	58.7	55.4	54.6	60.6	59.9
Gynecology	1.8	1.5	1.9	1.5	1.7	1.7
Neurosurgery	6.4	5.4	5.4	5.1	6.1	5.9
Ophthalmology	0.3	0.4	0.3	0.2	0.4	0.4
Oral & Maxillary Surgery	0.3	0.4	0.3	0.3	0.3	0.3
Orthopedics	41.6	30.5	26.3	29.3	26.3	26.9
Spine	8.6	7.9	7.6	6.9	7.7	7.6
Thoracic Surgery	5.3	5.1	4.2	7.0	5.5	5.6
Urology	7.6	5.6	6.2	6.5	5.9	6.0
Vascular Services	11.8	9.5	9.0	9.7	8.5	8.7
<b>Mental Health &amp; Substance Abuse</b>	<b>44.1</b>	<b>55.7</b>	<b>57.9</b>	<b>38.1</b>	<b>84.2</b>	<b>77.2</b>
Mental Health & Substance Abuse	44.1	55.7	57.9	38.1	84.2	77.2
<b>Maternal/Child Health</b>	<b>59.4</b>	<b>52.7</b>	<b>55.1</b>	<b>50.3</b>	<b>71.6</b>	<b>68.1</b>
Neonatology	33.0	30.7	32.2	28.7	40.8	38.8
Obstetrics	26.4	22.0	22.9	21.6	30.8	29.2
<b>Total</b>	<b>499.9</b>	<b>414.3</b>	<b>434.4</b>	<b>410.2</b>	<b>481.5</b>	<b>471.4</b>

Table 2

The cause for Critical Access utilization being the highest among the HSA Types studied requires further evaluation. It is possible that the smaller sample size (2.0% of the total population of Arizona) increases the margin of error when calculating inpatient utilization rates. Another potential factor is that Critical Access HSAs do not have the healthcare infrastructure necessary for preventative or primary care in an outpatient setting, so that residents of these areas seek care in an inpatient setting at a higher rate than the other HSA Types. It is also possible that length of stay per episode could be longer, possibly due to patients being admitted to the small local hospital first prior to having to be admitted to distant hospital due to the acuity of their condition.

**Local Utilization Rates** – There is a much larger variability for local utilization compared with total utilization rates, ranging from a low of 76.6 BDOC per 1,000 people in Small Community HSAs to a high of 365.2 BDOC per 1,000 people in Tertiary HSAs (Table 3). Interestingly, Critical Access HSA types have a higher utilization rate than Small Community HSA types, potentially indicating that Critical Access HSA types are able to offer more local services due to their licensure’s different revenue opportunity.

### **Utilization Rates by Service Line and HSA Type**

Medicine, Surgery, Mental Health & Substance Abuse, and Maternal/Child Health service lines inpatient utilization rates all trend up from Small to Tertiary HSA Types. Notably, there is almost no local HSA type utilization of IP Mental Health & Substance Abuse in Critical Access and Small Community HSAs, indicating a lack of capacity and / or sustainability for those services.

### **Percent of BDOC by Service Line and HSA Type**

A more detailed breakdown showing actual BDOC and percent of BDOC by service line and HSA type can be found in Appendix C. When viewed this way, Medicine BDOC as a percent of all local BDOC is highest in Critical Access HSA types (62.2% of Critical Access HSA type total BDOC) and is lowest in Tertiary HSA types (42.3% of BDOC). Surgery shows a more uniform distribution with percent of local BDOC within an HSA type, ranging from 21.1% in Medium Community HSA types to 27.6% in Tertiary HSA types. As noted previously, Mental Health and Substance Abuse is nearly non-existent in Critical Access and Small Community HSA types, increasing to 5.3% of BDOC in both Medium and Large Community HSA types and then nearly tripling to 14.6% of BDOC in Tertiary HSA types. Maternal / Child Health percent of BDOC ranges widely from a low of 10.8% in Critical Access HSA types to 25.5% of BDOC in Small Community HSA types, though this latter percent may be skewed by the small sample size.

### **DRGs by HSA Type**

Lists of specific DRGs seen in each HSA type can be found in Appendix D. For these lists, DRGs volumes reported in Critical Access and Small Community HSA types were combined due to their similarities. Additionally, these lists exclude DRGs with less than an average of 10 BDOC per year from 2017-2019. While the DRGs list for Critical Access and Small Community HSA types include all DRGs seen, the remaining lists show only the DRGs seen in that specific HSA type that are not seen in the type below. For example, the Large Community list only shows DRGs seen in the Large Community HSA type, but not seen in the Medium Community HSA type. In this way, it is possible to see the incremental (i.e., differentiating) services being provided at the next level of HSA type.

2017-2019 Average Local HSA Patient Days per 2018 Population (Utilization per 1,000)					
TIG Service Lines	Critical Access HSA Type	Small Community HSA Type	Medium Community HSA Type	Large Community HSA Type	Tertiary HSA Type
<b>Medicine</b>	<b>60.1</b>	<b>37.8</b>	<b>92.8</b>	<b>153.0</b>	<b>154.5</b>
Burns	0.1	0.0	0.0	0.1	0.5
Cardiac Services	7.2	4.2	19.0	30.2	25.1
General Medicine	48.8	31.4	67.2	105.7	103.3
Neurology	2.4	1.4	4.6	10.5	16.7
Oncology/Hematology	1.6	0.7	2.0	6.4	8.8
<b>Surgery</b>	<b>25.3</b>	<b>18.8</b>	<b>32.7</b>	<b>87.3</b>	<b>100.7</b>
Cardiac Services	0.1	0.0	0.1	8.6	6.0
ENT	0.2	0.2	0.2	1.0	1.5
General Surgery	9.8	10.0	16.5	34.9	46.6
Gynecology	0.3	0.4	0.4	0.7	1.3
Neurosurgery	0.0	0.0	0.1	0.8	4.1
Ophthalmology	0.0	0.0	0.0	0.1	0.3
Oral & Maxillary Surgery	0.0	0.0	0.0	0.2	0.3
Orthopedics	12.5	6.8	9.6	21.4	20.1
Spine	0.6	0.1	0.3	2.6	5.2
Thoracic Surgery	0.0	0.1	0.8	5.4	4.0
Urology	0.3	0.7	2.4	4.6	4.6
Vascular Services	1.2	0.5	2.3	7.0	6.7
<b>Mental Health &amp; Substance Abuse</b>	<b>0.8</b>	<b>0.4</b>	<b>8.2</b>	<b>15.6</b>	<b>53.3</b>
Mental Health & Substance Abuse	0.8	0.4	8.2	15.6	53.3
<b>Maternal/Child Health</b>	<b>10.5</b>	<b>19.5</b>	<b>21.3</b>	<b>39.3</b>	<b>56.7</b>
Neonatology	4.5	8.7	10.4	20.3	32.3
Obstetrics	6.0	10.8	10.9	19.1	24.4
<b>Total</b>	<b>96.7</b>	<b>76.6</b>	<b>155.1</b>	<b>295.2</b>	<b>365.2</b>

Table 3

Figure 4 below illustrates local utilization rates and populations for each of the specific HSAs in Arizona selected for the study. Appendix B contains similar HSA scatter plots by population density. Each of the HSA dots are color-coded by HSA Type and each HSA Type has its average utilization and population plotted as a triangle. The trendline demonstrates the positive correlation between population and local inpatient utilization rates. As expected, local utilization rates of inpatient services increase as population grows. The Tertiary and Large Community HSA Type averages both fall above the trendline, whereas Medium Community, Small Community, and Critical Access HSA Type averages fall below the trendline. One interesting finding is that the Tucson HSA has a higher inpatient utilization rate than the Phoenix HSA, despite being half the size in population. This may be due to a higher percentage of 65+ population in the Tucson HSA, who utilize inpatient care at a higher rate than other population groups. The Tucson HSA also has similar healthcare service capabilities compared to the Phoenix HSA, but it does not have any other Tertiary HSAs nearby in the same way that Chandler, Mesa, Scottsdale, and Sun City surround Phoenix.

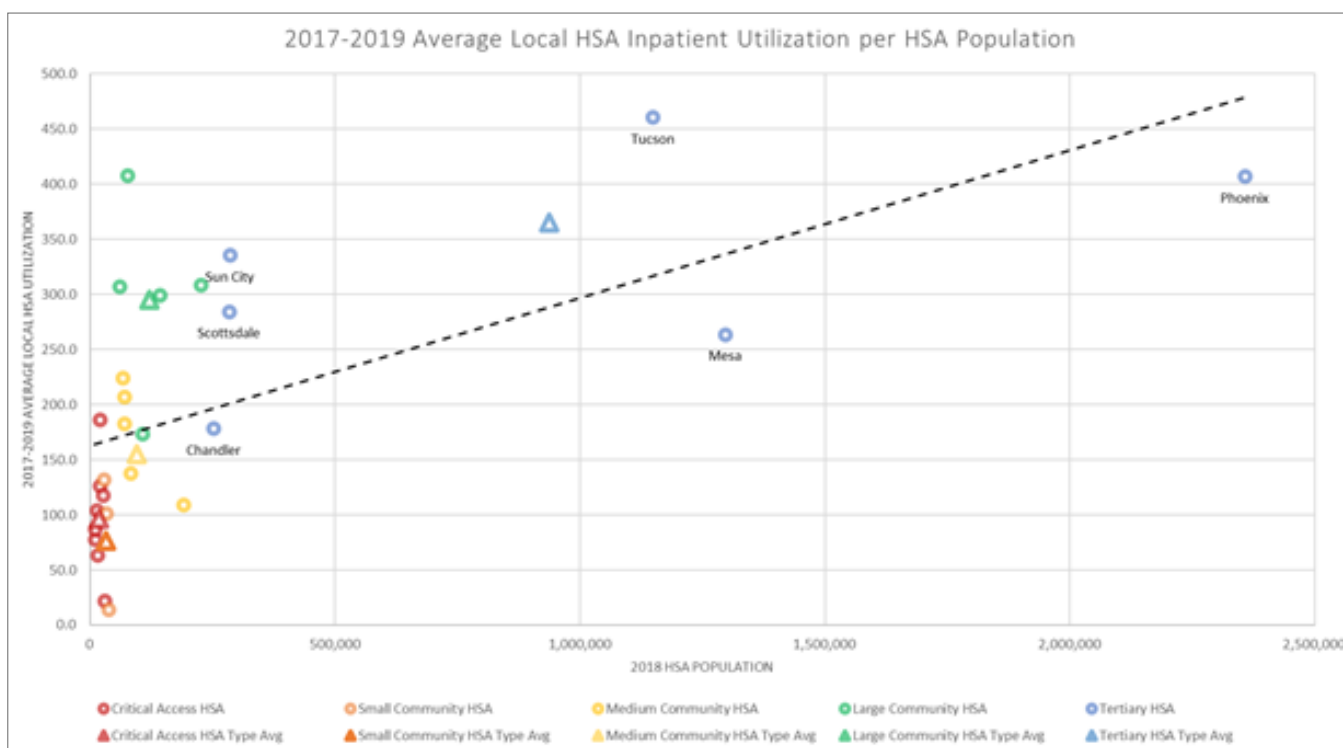


Figure 4

Understanding how healthcare infrastructure scales with population is key to demonstrating this correlation. Because Arizona contains a few outlying HSAs with large populations, Figure 5 below limits the HSA population range to 300,000 to provide greater granularity for most HSAs.

The smaller HSA population scale illustrates significant population groups among the HSA points. For example, HSAs with less than 50,000 population are grouped together and generally fall below the trendline. This demonstrates that HSA populations of less than 50,000 are unable to support inpatient services found in other HSA Types like surgery, orthopedics, or cardiac procedures. Residents in these areas must leave their local HSA to seek that care elsewhere. Of the HSA Types in this population group, Critical Access HSA Types have a higher average inpatient utilization than Small Community HSA Types, despite having a smaller average population. This finding may reflect the intended effect of the Critical Access license, which entitles hospitals to additional reimbursement from CMS and enables them to provide more services to their local population.



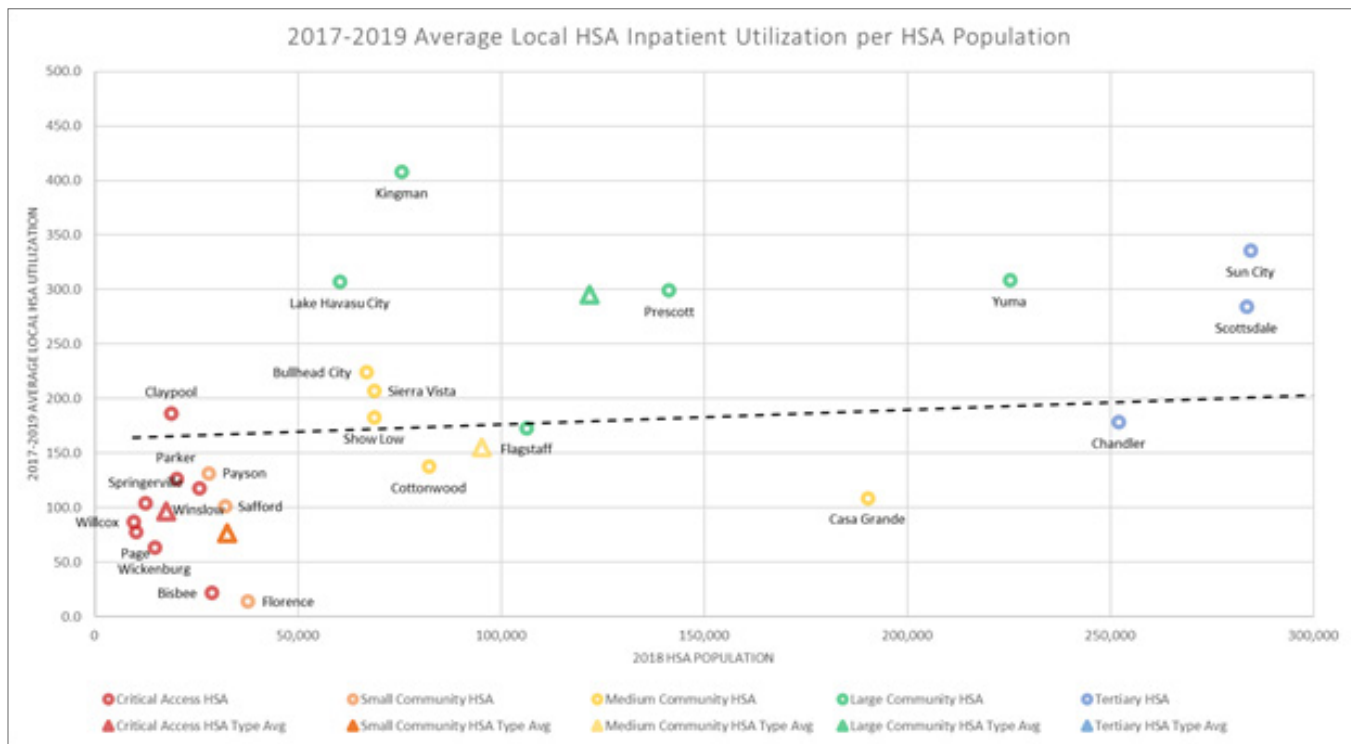


Figure 5

On the other end of the spectrum, HSAs with 250,000 population or more are all categorized as Tertiary HSA types. This demonstrates that HSA populations greater than 250,000 can support inpatient services that are considered Tertiary, such as cardiac surgery (including valve replacement and coronary bypass), neurosurgery (including craniotomy), and/or licensed NICU units.

It should be noted that there is a wide range in utilization rates within HSA types and that sample sizes are small. Therefore, while average utilization rates are a helpful metric to compare HSA types, caution should be used in applying these rates to specific HSAs.

### Total Versus Local HSA Type Utilization Rates

Comparing local utilization as a percentage of total utilization, a clear picture emerges. Critical Access and Small Community HSAs are serving 19.4% and 18.5% of total utilization within the HSA itself while Large Community and Tertiary HSAs are serving 72.0% and 75.9% of total utilization locally (Table 4). This makes sense as residents of smaller HSAs are forced to travel to larger HSAs for more acute IP services. Interestingly, it also suggests that 24.1% of patients residing in their own local Tertiary HSA travel outside of that HSA for care.

Total Versus Local HSA Type Utilization Rates					
Utilization Rates	Critical Access HSA Type	Small Community HSA Type	Medium Community HSA Type	Large Community HSA Type	Tertiary HSA Type
Total Utilization Rate	499.9	414.3	434.4	410.2	481.5
Local HSA Type Utilization	96.7	76.6	155.1	295.2	365.2
Total Percent of Total	19.4%	18.5%	35.7%	72.0%	75.9%

Table 4

## Planning Implications for Bed Requirements by HSA Type

The stratification of utilization rates into HSA types allows the creation of a bed need ratios at various occupancy rate. As shown in Table 5 below, the implied bed need per 1,000 population at 85% occupancy rate ranges from a low of 0.25 for Small Community HSA types to a high of 1.18 for Tertiary HSA types. As an example, we look at a small community located in a Small HSA type with a population of 27,871. At 85% occupancy, its calculated need within the HSA would be 7 beds ( $27,871 \times 0.25 / 1,000$ ).

Clearly, these bed-need-ratios increase with lower occupancy rates. Note these calculations use local utilization rates. Any net migration into an HSA from other areas would require additional beds.

These bed-need-ratios provide the basis to develop a range of values for hospitals within HSA types to make data-supported decisions. As written throughout the study, hospitals that are classified with the same HSA type, may serve populations of varying size and demographic. It is possible that a hospital with a deep bench of providers and supportive leadership may feel that their growth is on the upper end of the scale, justifying a higher ratio of beds in their planning decisions. Conversely a struggling hospital or impoverished community in the same hospital type may defer their planning efforts to the lower end of that same range. Understanding how local utilization rates relate to the overall utilization rate will make for better and more successful planning.

Beds Needed per 1,000 Population by HSA Type and Occupancy Rate					
Occupancy Rate	Critical Access HSA Type	Small Community HSA Type	Medium Community HSA Type	Large Community HSA Type	Tertiary HSA Type
65%	0.41	0.32	0.65	1.24	1.54
75%	0.35	0.28	0.57	1.08	1.33
85%	0.31	0.25	0.50	0.95	1.18

Table 5

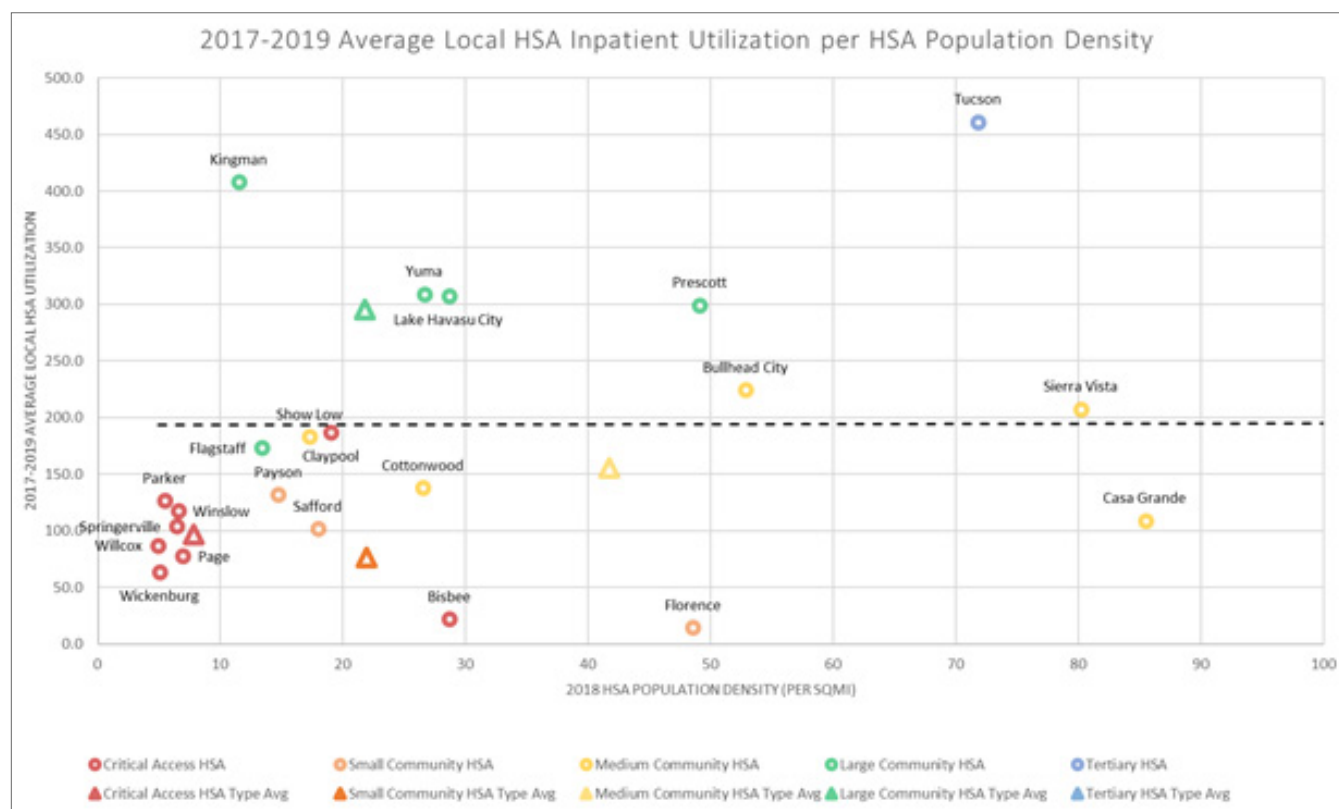
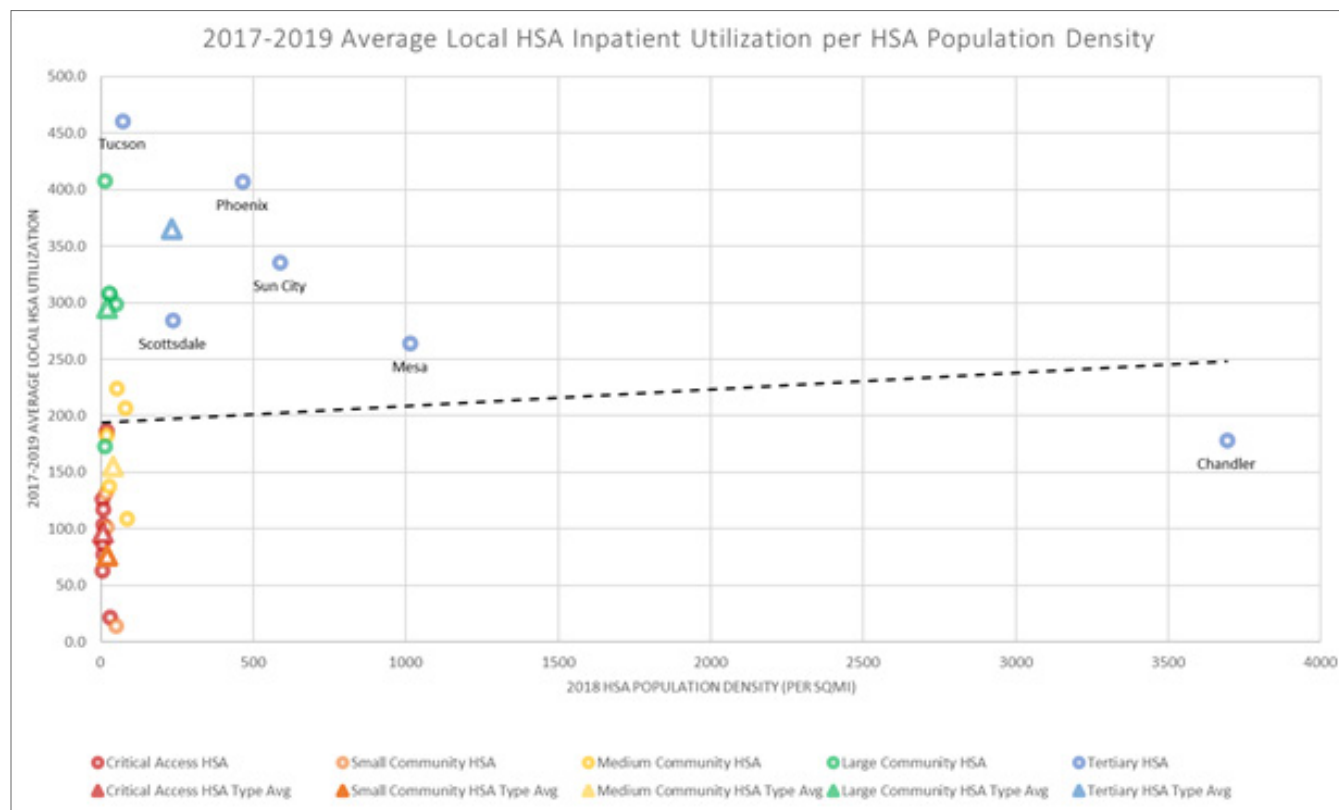
## Appendix A

### HSA Population, Area, and Population Density

HSA Type	2018 Population	Area in Square Mile	2108 Population Density Per Square Mile
<b>Critical Access</b>	<b>139,894</b>	<b>17,841</b>	<b>7.84</b>
Bisbee	28,680	1,002	28.63
Claypool	18,703	985	18.99
Page	10,057	1,462	6.88
Parker	20,068	3,682	5.45
Springerville	12,456	1,939	6.43
Wickenburg	14,753	2,921	5.05
Willcox	9,475	1,924	4.93
Winslow	25,701	3,927	6.54
<b>Small Community</b>	<b>97,464</b>	<b>4,449</b>	<b>21.90</b>
Florence	37,658	776	48.55
Payson	27,871	1,894	14.71
Safford	31,935	1,780	17.94
<b>Medium Community</b>	<b>476,557</b>	<b>11,432</b>	<b>41.69</b>
Bullhead City	66,734	1,264	52.80
Casa Grande	190,183	2,226	85.44
Cottonwood	82,102	3,100	26.49
Show Low	68,796	3,986	17.26
Sierra Vista	68,742	857	80.21
<b>Large Community</b>	<b>608,595</b>	<b>27,950</b>	<b>21.77</b>
Flagstaff	106,286	7,962	13.35
Kingman	75,543	6,561	11.51
Lake Havasu City	60,185	2,103	28.62
Prescott	141,308	2,879	49.09
Yuma	225,274	8,446	26.67
<b>Tertiary</b>	<b>5,621,461</b>	<b>24,099</b>	<b>233.27</b>
Chandler	252,092	68	3691.96
Mesa	1,295,889	1,278	1013.73
Phoenix	2,356,872	5,069	465.00
Scottsdale	283,480	1,198	236.56
Sun City	284,420	485	586.55
Tucson	1,148,707	16,000	71.79
<b>Arizona HSA Total</b>	<b>6,943,971</b>	<b>85,771</b>	<b>80.96</b>

## Appendix B

### 2017-2019 Average Local HSA Inpatient Utilization per HSA Population Density



## Appendix C

### BDOC and Percent of BDOC by Service Line and HSA Type

**SERVICE LINE DISTRIBUTION PER HSA TYPE**

TIG Service Lines	Critical Access		Small Community		Medium Community		Large Community		Tertiary		Total FY2017-2019 Patient Days	Total % of Total Patient Days
	FY2017-2019 Patient	% of Total	FY2017-2019	% of Total	FY2017-2019	% of Total	FY2017-2019	% of Total	FY2017-2019	% of Total		
	Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days		
<b>Medicine</b>	<b>25,236</b>	<b>62.2%</b>	<b>11,040</b>	<b>49.3%</b>	<b>132,698</b>	<b>59.9%</b>	<b>279,311</b>	<b>51.8%</b>	<b>2,605,791</b>	<b>42.3%</b>	<b>3,054,076</b>	<b>43.7%</b>
<b>Burns</b>	<b>41</b>	<b>0.1%</b>	<b>13</b>	<b>0.1%</b>	<b>16</b>	<b>0.0%</b>	<b>94</b>	<b>0.0%</b>	<b>8,590</b>	<b>0.1%</b>	<b>8,754</b>	<b>0.1%</b>
Burns	41	0.1%	13	0.1%	16	0.0%	94	0.0%	8,590	0.1%	8,754	0.1%
<b>Cardiac Services</b>	<b>3,040</b>	<b>7.5%</b>	<b>1,225</b>	<b>5.5%</b>	<b>27,185</b>	<b>12.3%</b>	<b>55,149</b>	<b>10.2%</b>	<b>423,577</b>	<b>6.9%</b>	<b>510,176</b>	<b>7.3%</b>
Cardiac Cath	173	0.4%		0.0%	3,015	1.4%	9,266	1.7%	56,498	0.9%	68,952	1.0%
Cardiac EP	82	0.2%	4	0.0%	1,362	0.6%	5,362	1.0%	44,044	0.7%	50,854	0.7%
Medical Cardiology	2,785	6.9%	1,221	5.5%	22,808	10.3%	40,521	7.5%	323,035	5.2%	390,370	5.6%
<b>General Medicine</b>	<b>20,485</b>	<b>50.5%</b>	<b>9,182</b>	<b>41.0%</b>	<b>96,044</b>	<b>43.3%</b>	<b>193,053</b>	<b>35.8%</b>	<b>1,742,787</b>	<b>28.3%</b>	<b>2,061,551</b>	<b>29.5%</b>
General Medicine	20,314	50.0%	9,083	40.6%	95,657	43.1%	191,284	35.5%	1,721,519	27.9%	2,037,857	29.2%
Trauma (General Medicine)	171	0.4%	99	0.4%	387	0.2%	1,769	0.3%	21,268	0.3%	23,694	0.3%
<b>Neurology</b>	<b>1,016</b>	<b>2.5%</b>	<b>404</b>	<b>1.8%</b>	<b>6,576</b>	<b>3.0%</b>	<b>19,242</b>	<b>3.6%</b>	<b>282,235</b>	<b>4.6%</b>	<b>309,473</b>	<b>4.4%</b>
Neurology	985	2.4%	397	1.8%	6,526	2.9%	18,425	3.4%	260,870	4.2%	287,203	4.1%
Trauma (Neurology)	31	0.1%	7	0.0%	50	0.0%	817	0.2%	21,365	0.3%	22,270	0.3%
<b>Oncology/Hematology</b>	<b>654</b>	<b>1.6%</b>	<b>216</b>	<b>1.0%</b>	<b>2,877</b>	<b>1.3%</b>	<b>11,773</b>	<b>2.2%</b>	<b>148,602</b>	<b>2.4%</b>	<b>164,122</b>	<b>2.4%</b>
Oncology/Hematology	654	1.6%	216	1.0%	2,874	1.3%	10,387	1.9%	146,069	2.4%	160,200	2.3%
Radiation Oncology		0.0%	0	0.0%	3	0.0%	1,386	0.3%	2,533	0.0%	3,922	0.1%
<b>Surgery</b>	<b>10,626</b>	<b>26.2%</b>	<b>5,507</b>	<b>24.6%</b>	<b>46,779</b>	<b>21.1%</b>	<b>159,430</b>	<b>29.6%</b>	<b>1,699,036</b>	<b>27.6%</b>	<b>1,921,378</b>	<b>27.5%</b>
<b>Cardiac Services</b>	<b>37</b>	<b>0.1%</b>		<b>0.0%</b>	<b>100</b>	<b>0.0%</b>	<b>15,672</b>	<b>2.9%</b>	<b>100,787</b>	<b>1.6%</b>	<b>116,596</b>	<b>1.7%</b>
Cardiac Surgery	37	0.1%		0.0%	100	0.0%	15,672	2.9%	95,497	1.6%	111,306	1.6%
Cardiac Transplant		0.0%		0.0%		0.0%		0.0%	5,290	0.1%	5,290	0.1%
<b>ENT</b>	<b>100</b>	<b>0.2%</b>	<b>57</b>	<b>0.3%</b>	<b>341</b>	<b>0.2%</b>	<b>1,762</b>	<b>0.3%</b>	<b>25,932</b>	<b>0.4%</b>	<b>28,192</b>	<b>0.4%</b>
ENT	100	0.2%	57	0.3%	341	0.2%	1,762	0.3%	25,932	0.4%	28,192	0.4%
<b>General Surgery</b>	<b>4,127</b>	<b>10.2%</b>	<b>2,928</b>	<b>13.1%</b>	<b>23,566</b>	<b>10.6%</b>	<b>63,652</b>	<b>11.8%</b>	<b>785,326</b>	<b>12.8%</b>	<b>879,599</b>	<b>12.6%</b>
Bariatric/Obesity		0.0%		0.0%		0.0%	419	0.1%	8,679	0.1%	9,098	0.1%
Bone Marrow Transplant		0.0%		0.0%		0.0%		0.0%	11,469	0.2%	11,469	0.2%
General Surgery	2,623	6.5%	1,729	7.7%	16,248	7.3%	47,456	8.8%	581,655	9.4%	649,711	9.3%
GI	1,423	3.5%	1,130	5.0%	6,587	3.0%	13,914	2.6%	135,129	2.2%	158,183	2.3%
Kidney Transplant		0.0%		0.0%		0.0%		0.0%	3,813	0.1%	3,813	0.1%
Liver Transplant		0.0%		0.0%		0.0%		0.0%	4,309	0.1%	4,309	0.1%
Pancreas Transplant		0.0%		0.0%		0.0%		0.0%	78	0.0%	78	0.0%
Trauma (General Surgery)	81	0.2%	69	0.3%	731	0.3%	1,863	0.3%	40,194	0.7%	42,938	0.6%
<b>Gynecology</b>	<b>137</b>	<b>0.3%</b>	<b>110</b>	<b>0.5%</b>	<b>618</b>	<b>0.3%</b>	<b>1,229</b>	<b>0.2%</b>	<b>21,897</b>	<b>0.4%</b>	<b>23,991</b>	<b>0.3%</b>
Gynecology	137	0.3%	110	0.5%	618	0.3%	1,229	0.2%	21,897	0.4%	23,991	0.3%
<b>Neurosurgery</b>	<b>15</b>	<b>0.0%</b>	<b>7</b>	<b>0.0%</b>	<b>125</b>	<b>0.1%</b>	<b>1,550</b>	<b>0.3%</b>	<b>69,734</b>	<b>1.1%</b>	<b>71,431</b>	<b>1.0%</b>
Brain		0.0%		0.0%	9	0.0%	1,002	0.2%	55,771	0.9%	56,782	0.8%
Peripheral and Cranial Diseases	15	0.0%	7	0.0%	116	0.1%	534	0.1%	9,998	0.2%	10,670	0.2%
Trauma (Neurosurgery)		0.0%		0.0%		0.0%	14	0.0%	3,965	0.1%	3,979	0.1%
<b>Ophthalmology</b>	<b>9</b>	<b>0.0%</b>	<b>8</b>	<b>0.0%</b>	<b>38</b>	<b>0.0%</b>	<b>241</b>	<b>0.0%</b>	<b>5,369</b>	<b>0.1%</b>	<b>5,665</b>	<b>0.1%</b>
Ophthalmology	9	0.0%	8	0.0%	38	0.0%	241	0.0%	5,369	0.1%	5,665	0.1%
<b>Oral &amp; Maxillary Surgery</b>	<b>20</b>	<b>0.0%</b>	<b>2</b>	<b>0.0%</b>	<b>65</b>	<b>0.0%</b>	<b>438</b>	<b>0.1%</b>	<b>4,402</b>	<b>0.1%</b>	<b>4,927</b>	<b>0.1%</b>
Oral & Maxillary Surgery	20	0.0%	2	0.0%	65	0.0%	438	0.1%	4,402	0.1%	4,927	0.1%
<b>Orthopedics</b>	<b>5,246</b>	<b>12.9%</b>	<b>1,985</b>	<b>8.9%</b>	<b>13,750</b>	<b>6.2%</b>	<b>39,049</b>	<b>7.2%</b>	<b>338,800</b>	<b>5.5%</b>	<b>398,830</b>	<b>5.7%</b>
Joint Replacement	935	2.3%	837	3.7%	6,523	2.9%	15,487	2.9%	109,330	1.8%	133,112	1.9%
Orthopedics	3,329	8.2%	463	2.1%	1,852	0.8%	8,782	1.6%	107,005	1.7%	121,431	1.7%
Sports Medicine	79	0.2%	66	0.3%	539	0.2%	1,796	0.3%	20,389	0.3%	22,869	0.3%
Trauma (Orthopedics)	903	2.2%	619	2.8%	4,836	2.2%	12,984	2.4%	102,076	1.7%	121,418	1.7%
<b>Spine</b>	<b>259</b>	<b>0.6%</b>	<b>34</b>	<b>0.2%</b>	<b>360</b>	<b>0.2%</b>	<b>4,799</b>	<b>0.9%</b>	<b>87,565</b>	<b>1.4%</b>	<b>93,017</b>	<b>1.3%</b>
Fusion		0.0%		0.0%	16	0.0%	2,730	0.5%	51,765	0.8%	54,511	0.8%
Medical Spine	259	0.6%	34	0.2%	304	0.1%	1,384	0.3%	22,239	0.4%	24,220	0.3%
Other Surgical Spine		0.0%		0.0%	40	0.0%	685	0.1%	13,561	0.2%	14,286	0.2%
<b>Thoracic Surgery</b>	<b>18</b>	<b>0.0%</b>	<b>32</b>	<b>0.1%</b>	<b>1,159</b>	<b>0.5%</b>	<b>9,874</b>	<b>1.8%</b>	<b>68,176</b>	<b>1.1%</b>	<b>79,259</b>	<b>1.1%</b>
Lung Transplant		0.0%		0.0%		0.0%		0.0%	1,458	0.0%	1,458	0.0%
Other Thoracic Surgery	18	0.0%	32	0.1%	1,159	0.5%	9,874	1.8%	66,718	1.1%	77,801	1.1%
<b>Urology</b>	<b>134</b>	<b>0.3%</b>	<b>202</b>	<b>0.9%</b>	<b>3,382</b>	<b>1.5%</b>	<b>8,472</b>	<b>1.6%</b>	<b>78,006</b>	<b>1.3%</b>	<b>90,196</b>	<b>1.3%</b>
Urology	134	0.3%	202	0.9%	3,382	1.5%	8,472	1.6%	78,006	1.3%	90,196	1.3%



**SERVICE LINE DISTRIBUTION PER HSA TYPE**

TIG Service Lines	Critical Access		Small Community		Medium Community		Large Community		Tertiary		Total FY2017-2019 Patient Days	Total % of Total Patient Days
	FY2017-2019 Patient	% of Total	FY2017-2019	% of Total	FY2017-2019	% of Total	FY2017-2019	% of Total	FY2017-2019	% of Total		
	Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days	Patient Days		
<b>Vascular Services</b>	<b>524</b>	<b>1.3%</b>	<b>142</b>	<b>0.6%</b>	<b>3,275</b>	<b>1.5%</b>	<b>12,692</b>	<b>2.4%</b>	<b>113,042</b>	<b>1.8%</b>	<b>129,675</b>	<b>1.9%</b>
Amputation	114	0.3%	48	0.2%	462	0.2%	2,423	0.4%	13,929	0.2%	16,976	0.2%
Vascular Services	410	1.0%	94	0.4%	2,813	1.3%	10,269	1.9%	99,113	1.6%	112,699	1.6%
<b>Mental Health &amp; Substance Abuse</b>	<b>340</b>	<b>0.8%</b>	<b>128</b>	<b>0.6%</b>	<b>11,732</b>	<b>5.3%</b>	<b>28,425</b>	<b>5.3%</b>	<b>898,287</b>	<b>14.6%</b>	<b>938,912</b>	<b>13.4%</b>
<b>Mental Health &amp; Substance Abuse</b>	<b>340</b>	<b>0.8%</b>	<b>128</b>	<b>0.6%</b>	<b>11,732</b>	<b>5.3%</b>	<b>28,425</b>	<b>5.3%</b>	<b>898,287</b>	<b>14.6%</b>	<b>938,912</b>	<b>13.4%</b>
Psychiatry	121	0.3%	15	0.1%	9,352	4.2%	20,010	3.7%	807,448	13.1%	836,946	12.0%
Substance Abuse	219	0.5%	113	0.5%	2,380	1.1%	8,415	1.6%	90,839	1.5%	101,966	1.5%
<b>Maternal / Child Health</b>	<b>4,398</b>	<b>10.8%</b>	<b>5,711</b>	<b>25.5%</b>	<b>30,488</b>	<b>13.8%</b>	<b>71,759</b>	<b>13.3%</b>	<b>956,301</b>	<b>15.5%</b>	<b>1,068,657</b>	<b>15.3%</b>
<b>Neonatology</b>	<b>1,885</b>	<b>4.6%</b>	<b>2,554</b>	<b>11.4%</b>	<b>14,865</b>	<b>6.7%</b>	<b>36,976</b>	<b>6.9%</b>	<b>544,157</b>	<b>8.8%</b>	<b>600,437</b>	<b>8.6%</b>
Special Care Nursery / NICU (L2/L3/L4)	559	1.4%	691	3.1%	6,600	3.0%	15,582	2.9%	353,803	5.7%	377,235	5.4%
Well Newborn Nursery (L1)	1,326	3.3%	1,863	8.3%	8,265	3.7%	21,394	4.0%	190,354	3.1%	223,202	3.2%
<b>Obstetrics</b>	<b>2,513</b>	<b>6.2%</b>	<b>3,157</b>	<b>14.1%</b>	<b>15,623</b>	<b>7.0%</b>	<b>34,783</b>	<b>6.5%</b>	<b>412,144</b>	<b>6.7%</b>	<b>468,220</b>	<b>6.7%</b>
Obstetrics	2,513	6.2%	3,157	14.1%	15,623	7.0%	34,783	6.5%	412,144	6.7%	468,220	6.7%
<b>Grand Total</b>	<b>40,600</b>	<b>100.0%</b>	<b>22,386</b>	<b>100.0%</b>	<b>221,697</b>	<b>100.0%</b>	<b>538,925</b>	<b>100.0%</b>	<b>6,159,415</b>	<b>100.0%</b>	<b>6,983,023</b>	<b>100.0%</b>

## Appendix D

### DRG Exclusion List by HSA Type

## TERTIARY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Maternal / Child Health	Obstetrics	Obstetrics	678	VAGINAL DELIVERY WITH COMPLICATING DIAGNOSES	12
Maternal / Child Health	Obstetrics	Obstetrics	777	Ectopic pregnancy	122
Maternal / Child Health	Obstetrics	Obstetrics	779	Abortion w/o D&C	270
Maternal / Child Health	Obstetrics	Obstetrics	783	CESAREAN SECTION WITH STERILIZATION WITH MCC	798
Maternal / Child Health	Obstetrics	Obstetrics	796	VAGINAL DELIVERY WITH STERILIZATION/D&C WITH MCC	65
Maternal / Child Health	Obstetrics	Obstetrics	797	VAGINAL DELIVERY WITH STERILIZATION/D&C WITH CC	100
Maternal / Child Health	Obstetrics	Obstetrics	798	VAGINAL DELIVERY WITH STERILIZATION/D&C WITHOUT MCC/CC	196
Maternal / Child Health	Obstetrics	Obstetrics	817	OTHER ANTEPARTUM DIAGNOSES WITH O.R. PROCEDURE WITH MCC	157
Medicine	Burns	Burns	927	Extensive burns or full thickness burns w MV 96+ hrs w skin graft	651
Medicine	Burns	Burns	928	Full thickness burn w skin graft or inhal inj w CC/MCC	3,118
Medicine	Burns	Burns	929	Full thickness burn w skin graft or inhal inj w/o CC/MCC	512
Medicine	Burns	Burns	933	Extensive burns or full thickness burns w MV 96+ hrs w/o skin graft	80
Medicine	Cardiac Services	Cardiac EP	259	Cardiac pacemaker device replacement w/o MCC	98
Medicine	Cardiac Services	Cardiac EP	262	Cardiac pacemaker revision except device replacement w/o CC/MCC	174
Medicine	Cardiac Services	Cardiac EP	265	AICD Lead Procedures	100
Medicine	Cardiac Services	Medical Cardiology	284	Acute myocardial infarction, expired w CC	40
Medicine	Cardiac Services	Medical Cardiology	290	Acute & subacute endocarditis w/o CC/MCC	23
Medicine	Cardiac Services	Medical Cardiology	297	Cardiac arrest, unexplained w CC	14
Medicine	General Medicine	General Medicine	600	Non-malignant breast disorders w CC/MCC	199
Medicine	General Medicine	General Medicine	601	Non-malignant breast disorders w/o CC/MCC	174
Medicine	General Medicine	General Medicine	685	Admit for renal dialysis	59
Medicine	General Medicine	General Medicine	773	CALCENEAL SPUR	21
Medicine	Neurology	Neurology	079	Hypertensive encephalopathy w/o CC/MCC	48
Medicine	Neurology	Neurology	081	Nontraumatic stupor & coma w/o MCC	128
Medicine	Neurology	Trauma (Neurology)	090	Concussion w/o CC/MCC	149
Medicine	Oncology/Hematology	Oncology/Hematology	148	Ear, nose, mouth & throat malignancy w/o CC/MCC	36
Medicine	Oncology/Hematology	Oncology/Hematology	182	Respiratory neoplasms w/o CC/MCC	80
Medicine	Oncology/Hematology	Oncology/Hematology	688	Kidney & urinary tract neoplasms w/o CC/MCC	30
Medicine	Oncology/Hematology	Oncology/Hematology	724	Malignancy, male reproductive system w/o CC/MCC	13
Medicine	Oncology/Hematology	Oncology/Hematology	754	Malignancy, female reproductive system w MCC	461
Medicine	Oncology/Hematology	Oncology/Hematology	836	Acute leukemia w/o major O.R. procedure w/o CC/MCC	180
Medicine	Oncology/Hematology	Oncology/Hematology	837	Chemo w acute leukemia as sdx or w high dose chemo agent w MCC	4,469
Medicine	Oncology/Hematology	Oncology/Hematology	845	Other myeloprolif dis or poorly diff neopl diag w/o CC/MCC	52
Medicine	Oncology/Hematology	Oncology/Hematology	848	Chemotherapy w/o acute leukemia as secondary diagnosis w/o CC/MCC	102
Surgery	Cardiac Services	Cardiac Surgery	230	Other cardiothoracic procedures w/o CC/MCC	61
Surgery	Cardiac Services	Cardiac Transplant	001	Heart transplant or implant of heart assist system w MCC	4,071
Surgery	Cardiac Services	Cardiac Transplant	002	Heart transplant or implant of heart assist system w/o MCC	94
Surgery	ENT	ENT	130	Major head & neck procedures w/o CC/MCC	183
Surgery	ENT	ENT	150	Epistaxis w MCC	152
Surgery	General Surgery	Bariatric/Obesity	619	O.R. procedures for obesity w MCC	221
Surgery	General Surgery	Bone Marrow Transplant	014	Allogenic bone marrow transplant	6,960
Surgery	General Surgery	Bone Marrow Transplant	016	AUTOLOGOUS BONE MARROW TRANSPLANT W CC-MCC	5,229
Surgery	General Surgery	Bone Marrow Transplant	017	AUTOLOGOUS BONE MARROW TRANSPLANT W-O CC-MCC	115
Surgery	General Surgery	General Surgery	407	Pancreas, liver & shunt procedures w/o CC/MCC	570
Surgery	General Surgery	General Surgery	413	Cholecystectomy w c.d.e. w/o CC/MCC	43
Surgery	General Surgery	General Surgery	421	Hepatobiliary diagnostic procedures w CC	271
Surgery	General Surgery	General Surgery	422	Hepatobiliary diagnostic procedures w/o CC/MCC	62
Surgery	General Surgery	General Surgery	583	Mastectomy for malignancy w/o CC/MCC	76
Surgery	General Surgery	General Surgery	584	Breast biopsy, local excision & other breast procedures w CC/MCC	252
Surgery	General Surgery	General Surgery	618	Amputat of lower limb for endocrine,nutrit.& metabol dis w/o CC/MCC	36
Surgery	General Surgery	General Surgery	630	Other endocrine, nutrit & metab O.R. proc w/o CC/MCC	79
Surgery	General Surgery	General Surgery	799	Splenectomy w MCC	330
Surgery	General Surgery	General Surgery	801	Splenectomy w/o CC/MCC	65
Surgery	General Surgery	General Surgery	804	Other O.R. proc of the blood & blood forming organs w/o CC/MCC	161
Surgery	General Surgery	General Surgery	822	Lymphoma & leukemia w major O.R. procedure w/o CC/MCC	120
Surgery	General Surgery	General Surgery	828	Myeloprolif disord or poorly diff neopl w maj O.R. proc w/o CC/MCC	157

## TERTIARY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Surgery	General Surgery	General Surgery	830	Myeloprolif disord or poorly diff neopl w other O.R. proc w/o CC/MCC	51
Surgery	General Surgery	General Surgery	876	O.R. procedure w principal diagnoses of mental illness	2,318
Surgery	General Surgery	General Surgery	939	O.R. proc w diagnoses of other contact w health services w MCC	634
Surgery	General Surgery	General Surgery	941	O.R. proc w diagnoses of other contact w health services w/o CC/MCC	193
Surgery	General Surgery	General Surgery	969	HIV w extensive O.R. procedure w MCC	528
Surgery	General Surgery	General Surgery	970	HIV w extensive O.R. procedure w/o MCC	40
Surgery	General Surgery	GI	332	Rectal resection w MCC	41
Surgery	General Surgery	GI	333	Rectal resection w CC	138
Surgery	General Surgery	GI	334	Rectal resection w/o CC/MCC	121
Surgery	General Surgery	Kidney Transplant	008	Simultaneous pancreas/kidney transplant	226
Surgery	General Surgery	Kidney Transplant	652	Kidney transplant	2,650
Surgery	General Surgery	Liver Transplant	005	Liver transplant w MCC or intestinal transplant	3,021
Surgery	General Surgery	Liver Transplant	006	Liver transplant w/o MCC	773
Surgery	General Surgery	Pancreas Transplant	010	Pancreas transplant	36
Surgery	General Surgery	Trauma (General Surgery)	959	Other O.R. procedures for multiple significant trauma w/o CC/MCC	176
Surgery	Gynecology	Gynecology	734	Pelvic evisceration, rad hysterectomy & rad vulvectomy w CC/MCC	282
Surgery	Gynecology	Gynecology	735	Pelvic evisceration, rad hysterectomy & rad vulvectomy w/o CC/MCC	82
Surgery	Gynecology	Gynecology	736	Uterine & adnexa proc for ovarian or adnexal malignancy w MCC	572
Surgery	Gynecology	Gynecology	737	Uterine & adnexa proc for ovarian or adnexal malignancy w CC	1,022
Surgery	Gynecology	Gynecology	738	Uterine & adnexa proc for ovarian or adnexal malignancy w/o CC/MCC	160
Surgery	Gynecology	Gynecology	739	Uterine,adnexa proc for non-ovarian/adnexal malig w MCC	306
Surgery	Gynecology	Gynecology	740	Uterine,adnexa proc for non-ovarian/adnexal malig w CC	509
Surgery	Gynecology	Gynecology	741	Uterine,adnexa proc for non-ovarian/adnexal malig w/o CC/MCC	243
Surgery	Gynecology	Gynecology	745	D&C, conization, laparoscopy & tubal interruption w/o CC/MCC	66
Surgery	Gynecology	Gynecology	747	Vagina, cervix & vulva procedures w/o CC/MCC	190
Surgery	Gynecology	Gynecology	748	Female reproductive system reconstructive procedures	234
Surgery	Neurosurgery	Brain	021	Intracranial vascular procedures w PDX hemorrhage w CC	509
Surgery	Neurosurgery	Brain	022	Intracranial vascular procedures w PDX hemorrhage w/o CC/MCC	59
Surgery	Neurosurgery	Brain	024	Cranio w major dev impl/acute complex CNS PDX w/o MCC	1,147
Surgery	Neurosurgery	Brain	615	Adrenal & pituitary procedures w/o CC/MCC	336
Surgery	Ophthalmology	Ophthalmology	113	Orbital procedures w CC/MCC	294
Surgery	Ophthalmology	Ophthalmology	114	Orbital procedures w/o CC/MCC	150
Surgery	Ophthalmology	Ophthalmology	115	Extraocular procedures except orbit	322
Surgery	Ophthalmology	Ophthalmology	116	Intraocular procedures w CC/MCC	117
Surgery	Ophthalmology	Ophthalmology	117	Intraocular procedures w/o CC/MCC	46
Surgery	Ophthalmology	Ophthalmology	122	Acute major eye infections w/o CC/MCC	131
Surgery	Ophthalmology	Ophthalmology	124	Other disorders of the eye w MCC	190
Surgery	Oral & Maxillary Surgery	Oral & Maxillary Surgery	138	Mouth procedures w/o CC/MCC	122
Surgery	Orthopedics	Joint Replacement	461	Bilateral or multiple major joint procs of lower extremity w MCC	48
Surgery	Orthopedics	Sports Medicine	507	Major shoulder or elbow joint procedures w CC/MCC	120
Surgery	Orthopedics	Sports Medicine	508	Major shoulder or elbow joint procedures w/o CC/MCC	25
Surgery	Orthopedics	Sports Medicine	509	Arthroscopy	23
Surgery	Orthopedics	Trauma (Orthopedics)	499	Local excision & removal int fix devices of hip & femur w/o CC/MCC	45
Surgery	Orthopedics	Trauma (Orthopedics)	537	Sprains, strains, & dislocations of hip, pelvis & thigh w CC/MCC	56
Surgery	Orthopedics	Trauma (Orthopedics)	538	Sprains, strains, & dislocations of hip, pelvis & thigh w/o CC/MCC	47
Surgery	Spine	Medical Spine	053	Spinal disorders & injuries w/o CC/MCC	165
Surgery	Spine	Other Surgical Spine	490	Back & neck proc exc spinal fusion w CC/MCC or disc device/neurostim	52
Surgery	Thoracic Surgery	Lung Transplant	007	Lung transplant	1,639
Surgery	Urology	Urology	655	Major bladder procedures w/o CC/MCC	286
Surgery	Urology	Urology	662	Minor bladder procedures w MCC	242
Surgery	Urology	Urology	664	Minor bladder procedures w/o CC/MCC	64
Surgery	Urology	Urology	667	Prostatectomy w/o CC/MCC	45
Surgery	Urology	Urology	671	Urethral procedures w CC/MCC	101
Surgery	Urology	Urology	672	Urethral procedures w/o CC/MCC	57
Surgery	Urology	Urology	675	Other kidney & urinary tract procedures w/o CC/MCC	76
Surgery	Urology	Urology	691	Urinary stones w esw lithotripsy w CC/MCC	187

## TERTIARY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Surgery	Urology	Urology	692	Urinary stones w esw lithotripsy w/o CC/MCC	32
Surgery	Urology	Urology	697	Urethral stricture	54
Surgery	Urology	Urology	710	Penis procedures w/o CC/MCC	81
Surgery	Urology	Urology	714	Transurethral prostatectomy w/o CC/MCC	119
Surgery	Urology	Urology	715	Other male reproductive system O.R. proc for malignancy w CC/MCC	138
Surgery	Urology	Urology	716	Other male reproductive system O.R. proc for malignancy w/o CC/MCC	19
Surgery	Urology	Urology	725	Benign prostatic hypertrophy w MCC	79
Surgery	Urology	Urology	729	Other male reproductive system diagnoses w CC/MCC	134
Surgery	Urology	Urology	730	Other male reproductive system diagnoses w/o CC/MCC	17
Surgery	Vascular Services	Amputation	241	Amputation for circ sys disorders exc upper limb & toe w/o CC/MCC	123
Surgery	Vascular Services	Amputation	257	Upper limb & toe amputation for circ system disorders w/o CC/MCC	16
Surgery	Vascular Services	Vascular Services	263	Vein ligation & stripping	71
Surgery	Vascular Services	Vascular Services	294	Deep vein thrombophlebitis w CC/MCC	56

## LARGE COMMUNITY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Maternal / Child Health	Obstetrics	Obstetrics	780	False labor	20
Maternal / Child Health	Obstetrics	Obstetrics	818	OTHER ANTEPARTUM DIAGNOSES WITH O.R. PROCEDURE WITH CC	13
Maternal / Child Health	Obstetrics	Obstetrics	819	OTHER ANTEPARTUM DIAGNOSES WITH O.R. PROCEDURE WITHOUT CC/MCC	20
Medicine	Burns	Burns	934	Full thickness burn w/o skin grft or inhal inj	14
Medicine	Burns	Burns	935	Non-extensive burns	20
Medicine	Cardiac Services	Cardiac Cath	266	ENDOVASCULAR CARDIAC VALVE REPLACEMENT W MCC	206
Medicine	Cardiac Services	Cardiac Cath	267	ENDOVASCULAR CARDIAC VALVE REPLACEMENT W/O MCC	118
Medicine	Cardiac Services	Cardiac EP	223	Cardiac defib implant w cardiac cath w AMI/HF/shock w/o MCC	172
Medicine	Cardiac Services	Cardiac EP	258	Cardiac pacemaker device replacement w MCC	30
Medicine	Cardiac Services	Cardiac EP	260	Cardiac pacemaker revision except device replacement w MCC	37
Medicine	Cardiac Services	Cardiac EP	261	Cardiac pacemaker revision except device replacement w CC	47
Medicine	Cardiac Services	Cardiac EP	273	PERCUTANEOUS INTRACARDIAC PROCEDURES W MCC	130
Medicine	Cardiac Services	Cardiac EP	274	PERCUTANEOUS INTRACARDIAC PROCEDURES W/O MCC	117
Medicine	Cardiac Services	Medical Cardiology	289	Acute & subacute endocarditis w CC	33
Medicine	Cardiac Services	Medical Cardiology	307	Cardiac congenital & valvular disorders w/o MCC	41
Medicine	General Medicine	General Medicine	188	Pleural effusion w/o CC/MCC	14
Medicine	General Medicine	General Medicine	198	Interstitial lung disease w/o CC/MCC	13
Medicine	General Medicine	General Medicine	370	Major esophageal disorders w/o CC/MCC	11
Medicine	General Medicine	General Medicine	383	Uncomplicated peptic ulcer w MCC	113
Medicine	General Medicine	General Medicine	434	Cirrhosis & alcoholic hepatitis w/o CC/MCC	16
Medicine	General Medicine	General Medicine	545	Connective tissue disorders w MCC	78
Medicine	General Medicine	General Medicine	547	Connective tissue disorders w/o CC/MCC	18
Medicine	General Medicine	General Medicine	548	Septic arthritis w MCC	150
Medicine	General Medicine	General Medicine	550	Septic arthritis w/o CC/MCC	37
Medicine	General Medicine	General Medicine	553	Bone diseases & arthropathies w MCC	17
Medicine	General Medicine	General Medicine	594	Skin ulcers w/o CC/MCC	15
Medicine	General Medicine	General Medicine	595	Major skin disorders w MCC	10
Medicine	General Medicine	General Medicine	596	Major skin disorders w/o MCC	62
Medicine	General Medicine	General Medicine	642	Inborn errors of metabolism	41
Medicine	General Medicine	General Medicine	869	Other infectious & parasitic diseases diagnoses w/o CC/MCC	29
Medicine	General Medicine	General Medicine	921	Complications of treatment w/o CC/MCC	50
Medicine	General Medicine	General Medicine	949	Aftercare w CC/MCC	110
Medicine	General Medicine	General Medicine	950	Aftercare w/o CC/MCC	43
Medicine	General Medicine	General Medicine	975	HIV w major related condition w CC	32
Medicine	General Medicine	General Medicine	976	HIV w major related condition w/o CC/MCC	16
Medicine	General Medicine	General Medicine	977	HIV w or w/o other related condition	26
Medicine	General Medicine	Trauma (General Medicine)	185	Major chest trauma w/o CC/MCC	48
Medicine	General Medicine	Trauma (General Medicine)	913	Traumatic injury w MCC	17
Medicine	General Medicine	Trauma (General Medicine)	965	Other multiple significant trauma w/o CC/MCC	16
Medicine	Neurology	Neurology	067	Nonspecific cva & precerebral occlusion w/o infarct w MCC	13
Medicine	Neurology	Neurology	068	Nonspecific cva & precerebral occlusion w/o infarct w/o MCC	24
Medicine	Neurology	Neurology	075	Viral meningitis w CC/MCC	28
Medicine	Neurology	Neurology	094	Bacterial & tuberculous infections of nervous system w MCC	79
Medicine	Neurology	Neurology	096	Bacterial & tuberculous infections of nervous system w/o CC/MCC	18
Medicine	Neurology	Neurology	098	Non-bacterial infect of nervous sys exc viral meningitis w CC	40
Medicine	Neurology	Neurology	099	Non-bacterial infect of nervous sys exc viral meningitis w/o CC/MCC	14
Medicine	Neurology	Neurology	102	Headaches w MCC	24
Medicine	Neurology	Trauma (Neurology)	082	Traumatic stupor & coma, coma >1 hr w MCC	182
Medicine	Neurology	Trauma (Neurology)	083	Traumatic stupor & coma, coma >1 hr w CC	83
Medicine	Neurology	Trauma (Neurology)	084	Traumatic stupor & coma, coma >1 hr w/o CC/MCC	57
Medicine	Neurology	Trauma (Neurology)	085	Traumatic stupor & coma, coma <1 hr w MCC	150
Medicine	Neurology	Trauma (Neurology)	086	Traumatic stupor & coma, coma <1 hr w CC	126
Medicine	Neurology	Trauma (Neurology)	087	Traumatic stupor & coma, coma <1 hr w/o CC/MCC	59
Medicine	Neurology	Trauma (Neurology)	088	Concussion w MCC	21
Medicine	Neurology	Trauma (Neurology)	089	Concussion w CC	38
Medicine	Oncology/Hematology	Oncology/Hematology	055	Nervous system neoplasms w/o MCC	44



## LARGE COMMUNITY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Medicine	Oncology/Hematology	Oncology/Hematology	146	Ear, nose, mouth & throat malignancy w MCC	35
Medicine	Oncology/Hematology	Oncology/Hematology	147	Ear, nose, mouth & throat malignancy w CC	11
Medicine	Oncology/Hematology	Oncology/Hematology	376	Digestive malignancy w/o CC/MCC	11
Medicine	Oncology/Hematology	Oncology/Hematology	437	Malignancy of hepatobiliary system or pancreas w/o CC/MCC	17
Medicine	Oncology/Hematology	Oncology/Hematology	597	Malignant breast disorders w MCC	19
Medicine	Oncology/Hematology	Oncology/Hematology	598	Malignant breast disorders w CC	11
Medicine	Oncology/Hematology	Oncology/Hematology	687	Kidney & urinary tract neoplasms w CC	33
Medicine	Oncology/Hematology	Oncology/Hematology	722	Malignancy, male reproductive system w MCC	17
Medicine	Oncology/Hematology	Oncology/Hematology	755	Malignancy, female reproductive system w CC	14
Medicine	Oncology/Hematology	Oncology/Hematology	816	Reticuloendothelial & immunity disorders w/o CC/MCC	50
Medicine	Oncology/Hematology	Oncology/Hematology	834	Acute leukemia w/o major O.R. procedure w MCC	104
Medicine	Oncology/Hematology	Oncology/Hematology	835	Acute leukemia w/o major O.R. procedure w CC	23
Medicine	Oncology/Hematology	Oncology/Hematology	838	Chemo w acute leukemia as sdx w CC or high dose chemo agent	35
Medicine	Oncology/Hematology	Oncology/Hematology	839	Chemo w acute leukemia as sdx w/o CC/MCC	44
Medicine	Oncology/Hematology	Oncology/Hematology	841	Lymphoma & non-acute leukemia w CC	72
Medicine	Oncology/Hematology	Oncology/Hematology	842	Lymphoma & non-acute leukemia w/o CC/MCC	12
Medicine	Oncology/Hematology	Oncology/Hematology	844	Other myeloprolif dis or poorly diff neopl diag w CC	24
Medicine	Oncology/Hematology	Oncology/Hematology	846	Chemotherapy w/o acute leukemia as secondary diagnosis w MCC	69
Medicine	Oncology/Hematology	Oncology/Hematology	847	Chemotherapy w/o acute leukemia as secondary diagnosis w CC	48
Medicine	Oncology/Hematology	Radiation Oncology	849	Radiotherapy	512
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	887	Other mental disorder diagnoses	12
Surgery	Cardiac Services	Cardiac Surgery	215	Other heart assist system implant	144
Surgery	Cardiac Services	Cardiac Surgery	216	Cardiac valve & oth maj cardiothoracic proc w card cath w MCC	698
Surgery	Cardiac Services	Cardiac Surgery	219	Cardiac valve & oth maj cardiothoracic proc w/o card cath w MCC	639
Surgery	Cardiac Services	Cardiac Surgery	220	Cardiac valve & oth maj cardiothoracic proc w/o card cath w CC	465
Surgery	Cardiac Services	Cardiac Surgery	221	Cardiac valve & oth maj cardiothoracic proc w/o card cath w/o CC/MCC	119
Surgery	Cardiac Services	Cardiac Surgery	228	Other cardiothoracic procedures w MCC	232
Surgery	Cardiac Services	Cardiac Surgery	229	Other cardiothoracic procedures w CC	116
Surgery	Cardiac Services	Cardiac Surgery	231	Coronary bypass w PTCA w MCC	410
Surgery	Cardiac Services	Cardiac Surgery	232	Coronary bypass w PTCA w/o MCC	190
Surgery	Cardiac Services	Cardiac Surgery	233	Coronary bypass w cardiac cath w MCC	1,058
Surgery	Cardiac Services	Cardiac Surgery	234	Coronary bypass w cardiac cath w/o MCC	1,097
Surgery	Cardiac Services	Cardiac Surgery	235	Coronary bypass w/o cardiac cath w MCC	650
Surgery	Cardiac Services	Cardiac Surgery	236	Coronary bypass w/o cardiac cath w/o MCC	800
Surgery	ENT	ENT	011	Tracheostomy for face,mouth & neck diagnoses w MCC	34
Surgery	ENT	ENT	012	Tracheostomy for face,mouth & neck diagnoses w CC	27
Surgery	ENT	ENT	013	Tracheostomy for face,mouth & neck diagnoses w/o CC/MCC	20
Surgery	ENT	ENT	129	Major head & neck procedures w CC/MCC or major device	31
Surgery	ENT	ENT	131	Cranial/facial procedures w CC/MCC	42
Surgery	ENT	ENT	132	Cranial/facial procedures w/o CC/MCC	14
Surgery	ENT	ENT	133	Other ear, nose, mouth & throat O.R. procedures w CC/MCC	78
Surgery	ENT	ENT	134	Other ear, nose, mouth & throat O.R. procedures w/o CC/MCC	32
Surgery	ENT	ENT	135	Sinus & mastoid procedures w CC/MCC	16
Surgery	ENT	ENT	136	Sinus & mastoid procedures w/o CC/MCC	15
Surgery	ENT	ENT	151	Epistaxis w/o MCC	20
Surgery	ENT	ENT	154	Nasal trauma & deformity w MCC	60
Surgery	ENT	ENT	156	Nasal trauma & deformity w/o CC/MCC	30
Surgery	ENT	ENT	625	Thyroid, parathyroid & thyroglossal procedures w MCC	128
Surgery	ENT	ENT	626	Thyroid, parathyroid & thyroglossal procedures w CC	11
Surgery	ENT	ENT	627	Thyroid, parathyroid & thyroglossal procedures w/o CC/MCC	27
Surgery	General Surgery	Bariatric/Obesity	620	O.R. procedures for obesity w CC	22
Surgery	General Surgery	Bariatric/Obesity	621	O.R. procedures for obesity w/o CC/MCC	150
Surgery	General Surgery	General Surgery	406	Pancreas, liver & shunt procedures w CC	47
Surgery	General Surgery	General Surgery	408	Biliary tract proc except only cholecyst w or w/o c.d.e. w MCC	61
Surgery	General Surgery	General Surgery	409	Biliary tract proc except only cholecyst w or w/o c.d.e. w CC	42
Surgery	General Surgery	General Surgery	410	Biliary tract proc except only cholecyst w or w/o c.d.e. w/o CC/MCC	10

## LARGE COMMUNITY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Surgery	General Surgery	General Surgery	411	Cholecystectomy w c.d.e. w MCC	15
Surgery	General Surgery	General Surgery	412	Cholecystectomy w c.d.e. w CC	12
Surgery	General Surgery	General Surgery	420	Hepatobiliary diagnostic procedures w MCC	17
Surgery	General Surgery	General Surgery	424	Other hepatobiliary or pancreas O.R. procedures w CC	41
Surgery	General Surgery	General Surgery	425	Other hepatobiliary or pancreas O.R. procedures w/o CC/MCC	10
Surgery	General Surgery	General Surgery	573	Skin graft &/or debrid for skn ulcer or cellulitis w MCC	100
Surgery	General Surgery	General Surgery	574	Skin graft &/or debrid for skn ulcer or cellulitis w CC	62
Surgery	General Surgery	General Surgery	578	Skin graft &/or debrid exc for skin ulcer or cellulitis w/o CC/MCC	10
Surgery	General Surgery	General Surgery	582	Mastectomy for malignancy w CC/MCC	11
Surgery	General Surgery	General Surgery	585	Breast biopsy, local excision & other breast procedures w/o CC/MCC	20
Surgery	General Surgery	General Surgery	624	Skin grafts & wound debrid for endoc, nutrit & metab dis w/o CC/MCC	38
Surgery	General Surgery	General Surgery	802	Other O.R. proc of the blood & blood forming organs w MCC	27
Surgery	General Surgery	General Surgery	803	Other O.R. proc of the blood & blood forming organs w CC	25
Surgery	General Surgery	General Surgery	821	Lymphoma & leukemia w major O.R. procedure w CC	26
Surgery	General Surgery	General Surgery	824	Lymphoma & non-acute leukemia w other O.R. proc w CC	53
Surgery	General Surgery	General Surgery	825	Lymphoma & non-acute leukemia w other O.R. proc w/o CC/MCC	14
Surgery	General Surgery	General Surgery	826	Myeloprolif disord or poorly diff neopl w maj O.R. proc w MCC	23
Surgery	General Surgery	General Surgery	827	Myeloprolif disord or poorly diff neopl w maj O.R. proc w CC	14
Surgery	General Surgery	General Surgery	829	Myeloprolif disord or poorly diff neopl w other O.R. proc w CC/MCC	33
Surgery	General Surgery	General Surgery	855	Infectious & parasitic diseases w O.R. procedure w/o CC/MCC	49
Surgery	General Surgery	General Surgery	858	Postoperative or post-traumatic infections w O.R. proc w/o CC/MCC	36
Surgery	General Surgery	GI	349	Anal & stomal procedures w/o CC/MCC	13
Surgery	General Surgery	Trauma (General Surgery)	901	Wound debridements for injuries w MCC	29
Surgery	General Surgery	Trauma (General Surgery)	903	Wound debridements for injuries w/o CC/MCC	10
Surgery	General Surgery	Trauma (General Surgery)	904	Skin grafts for injuries w CC/MCC	17
Surgery	General Surgery	Trauma (General Surgery)	905	Skin grafts for injuries w/o CC/MCC	12
Surgery	General Surgery	Trauma (General Surgery)	906	Hand procedures for injuries	19
Surgery	General Surgery	Trauma (General Surgery)	957	Other O.R. procedures for multiple significant trauma w MCC	247
Surgery	General Surgery	Trauma (General Surgery)	958	Other O.R. procedures for multiple significant trauma w CC	268
Surgery	Gynecology	Gynecology	744	D&C, conization, laparoscopy & tubal interruption w CC/MCC	45
Surgery	Gynecology	Gynecology	749	Other female reproductive system O.R. procedures w CC/MCC	11
Surgery	Gynecology	Gynecology	750	Other female reproductive system O.R. procedures w/o CC/MCC	11
Surgery	Gynecology	Gynecology	757	Infections, female reproductive system w MCC	14
Surgery	Gynecology	Gynecology	760	Menstrual & other female reproductive system disorders w CC/MCC	24
Surgery	Gynecology	Gynecology	761	Menstrual & other female reproductive system disorders w/o CC/MCC	11
Surgery	Neurosurgery	Brain	020	Intracranial vascular procedures w PDX hemorrhage w MCC	20
Surgery	Neurosurgery	Brain	023	Cranio w major dev impl/acute complex CNS PDX w MCC or chemo implant	61
Surgery	Neurosurgery	Brain	025	Craniotomy & endovascular intracranial procedures w MCC	339
Surgery	Neurosurgery	Brain	026	Craniotomy & endovascular intracranial procedures w CC	99
Surgery	Neurosurgery	Brain	027	Craniotomy & endovascular intracranial procedures w/o CC/MCC	117
Surgery	Neurosurgery	Brain	031	Ventricular shunt procedures w MCC	32
Surgery	Neurosurgery	Brain	032	Ventricular shunt procedures w CC	22
Surgery	Neurosurgery	Brain	033	Ventricular shunt procedures w/o CC/MCC	14
Surgery	Neurosurgery	Brain	614	Adrenal & pituitary procedures w CC/MCC	21
Surgery	Neurosurgery	Peripheral and Cranial Diseases	042	Periph & cranial nerve & other nerv syst proc w/o CC/MCC	30
Surgery	Neurosurgery	Trauma (Neurosurgery)	955	Craniotomy for multiple significant trauma	112
Surgery	Ophthalmology	Ophthalmology	121	Acute major eye infections w CC/MCC	16
Surgery	Ophthalmology	Ophthalmology	123	Neurological eye disorders	20
Surgery	Ophthalmology	Ophthalmology	125	Other disorders of the eye w/o MCC	31
Surgery	Oral & Maxillary Surgery	Oral & Maxillary Surgery	137	Mouth procedures w CC/MCC	29
Surgery	Oral & Maxillary Surgery	Oral & Maxillary Surgery	139	Salivary gland procedures	13
Surgery	Oral & Maxillary Surgery	Oral & Maxillary Surgery	157	Dental & Oral Diseases w MCC	42
Surgery	Oral & Maxillary Surgery	Oral & Maxillary Surgery	158	Dental & Oral Diseases w CC	66
Surgery	Oral & Maxillary Surgery	Oral & Maxillary Surgery	159	Dental & Oral Diseases w/o CC/MCC	38
Surgery	Orthopedics	Orthopedics	476	Amputation for musculoskeletal sys & conn tissue dis w/o CC/MCC	21
Surgery	Orthopedics	Orthopedics	479	Biopsies of musculoskeletal system & connective tissue w/o CC/MCC	21

## LARGE COMMUNITY DIFFERENTIATING DRGS

TIG META SERVICE LINE	TIG SERVICE LINE	TIG PRODUCT LINE	MS-DRG CODE	MS-DRG NAME	2017-2019 Average BDOC
Surgery	Orthopedics	Orthopedics	505	Foot procedures w/o CC/MCC	54
Surgery	Orthopedics	Orthopedics	506	Major thumb or joint procedures	20
Surgery	Orthopedics	Orthopedics	514	Hand or wrist proc, except major thumb or joint proc w/o CC/MCC	59
Surgery	Orthopedics	Orthopedics	515	Other musculoskelet sys & conn tiss O.R. proc w MCC	104
Surgery	Orthopedics	Orthopedics	517	Other musculoskelet sys & conn tiss O.R. proc w/o CC/MCC	126
Surgery	Orthopedics	Orthopedics	541	Osteomyelitis w/o CC/MCC	15
Surgery	Orthopedics	Orthopedics	945	Rehabilitation w CC/MCC	72
Surgery	Orthopedics	Orthopedics	946	Rehabilitation w/o CC/MCC	50
Surgery	Orthopedics	Sports Medicine	487	Knee procedures w pdx of infection w/o CC/MCC	12
Surgery	Orthopedics	Sports Medicine	489	Knee procedures w/o pdx of infection w/o CC/MCC	40
Surgery	Orthopedics	Sports Medicine	502	Soft tissue procedures w/o CC/MCC	69
Surgery	Orthopedics	Trauma (Orthopedics)	495	Local excision & removal int fix devices exc hip & femur w MCC	17
Surgery	Orthopedics	Trauma (Orthopedics)	496	Local excision & removal int fix devices exc hip & femur w CC	49
Surgery	Orthopedics	Trauma (Orthopedics)	497	Local excision & removal int fix devices exc hip & femur w/o CC/MCC	13
Surgery	Orthopedics	Trauma (Orthopedics)	498	Local excision & removal int fix devices of hip & femur w CC/MCC	23
Surgery	Orthopedics	Trauma (Orthopedics)	533	Fractures of femur w MCC	24
Surgery	Orthopedics	Trauma (Orthopedics)	534	Fractures of femur w/o MCC	43
Surgery	Spine	Fusion	453	Combined anterior/posterior spinal fusion w MCC	57
Surgery	Spine	Fusion	454	Combined anterior/posterior spinal fusion w CC	292
Surgery	Spine	Fusion	455	Combined anterior/posterior spinal fusion w/o CC/MCC	258
Surgery	Spine	Fusion	456	Spinal fus exc cerv w spinal curv/malig/infec or 9+ fus w MCC	44
Surgery	Spine	Fusion	457	Spinal fus exc cerv w spinal curv/malig/infec or 9+ fus w CC	125
Surgery	Spine	Fusion	458	Spinal fus exc cerv w spinal curv/malig/infec or 9+ fus w/o CC/MCC	19
Surgery	Spine	Fusion	459	Spinal fusion except cervical w MCC	149
Surgery	Spine	Fusion	460	Spinal fusion except cervical w/o MCC	1,169
Surgery	Spine	Fusion	471	Cervical spinal fusion w MCC	54
Surgery	Spine	Fusion	472	Cervical spinal fusion w CC	207
Surgery	Spine	Fusion	473	Cervical spinal fusion w/o CC/MCC	162
Surgery	Spine	Medical Spine	052	Spinal disorders & injuries w CC/MCC	20
Surgery	Spine	Other Surgical Spine	029	Spinal procedures w CC or spinal neurostimulators	80
Surgery	Spine	Other Surgical Spine	030	Spinal procedures w/o CC/MCC	23
Surgery	Spine	Other Surgical Spine	491	BACK & NECK PROC EXC SPINAL FUSION W/O CC/MCC	25
Surgery	Spine	Other Surgical Spine	518	BACK & NECK PROC EXC SPINAL FUSION W MCC OR DISC DEVICE/NEUROSTIM	52
Surgery	Spine	Other Surgical Spine	519	BACK & NECK PROC EXC SPINAL FUSION W CC	120
Surgery	Spine	Other Surgical Spine	520	BACK & NECK PROC EXC SPINAL FUSION W/O CC/MCC	68
Surgery	Urology	Urology	665	Prostatectomy w MCC	27
Surgery	Urology	Urology	693	Urinary stones w/o esw lithotripsy w MCC	63
Surgery	Urology	Urology	708	Major male pelvic procedures w/o CC/MCC	52
Surgery	Urology	Urology	709	Penis procedures w CC/MCC	23
Surgery	Urology	Urology	712	Testes procedures w/o CC/MCC	13
Surgery	Urology	Urology	718	Other male reproductive system O.R. proc exc malignancy w/o CC/MCC	42
Surgery	Urology	Urology	985	Prostatic O.R. procedure unrelated to principal diagnosis w CC	81
Surgery	Urology	Urology	986	Prostatic O.R. procedure unrelated to principal diagnosis w/o CC/MCC	19
Surgery	Vascular Services	Vascular Services	034	Carotid artery stent procedure w MCC	41
Surgery	Vascular Services	Vascular Services	035	Carotid artery stent procedure w CC	34
Surgery	Vascular Services	Vascular Services	036	Carotid artery stent procedure w/o CC/MCC	33
Surgery	Vascular Services	Vascular Services	237	Major cardiovasc procedures w MCC or thoracic aortic aneuysm repair	73
Surgery	Vascular Services	Vascular Services	238	Major cardiovascular procedures w/o MCC	15
Surgery	Vascular Services	Vascular Services	268	AORTIC AND HEART ASSIST PROCEDURES EXCEPT PULSATION BALLOON W MCC	57
Surgery	Vascular Services	Vascular Services	272	OTHER MAJOR CARDIOVASCULAR PROCEDURES W/O CC/MCC	43

**MEDIUM COMMUNITY DIFFERENTIATING DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Maternal / Child Health	Neonatology	Special Care Nursery / NICU (L2/L3/L4)	789	Neonates, died or transferred to another acute care facility	94
Maternal / Child Health	Neonatology	Special Care Nursery / NICU (L2/L3/L4)	791	Prematurity w major problems	379
Maternal / Child Health	Obstetrics	Obstetrics	769	Postpartum & post abortion diagnoses w O.R. procedure	20
Maternal / Child Health	Obstetrics	Obstetrics	770	Abortion w D&C, aspiration curettage or hysterotomy	16
Maternal / Child Health	Obstetrics	Obstetrics	776	Postpartum & post abortion diagnoses w/o O.R. procedure	77
Maternal / Child Health	Obstetrics	Obstetrics	778	Threatened abortion	23
Maternal / Child Health	Obstetrics	Obstetrics	782	Other antepartum diagnoses w/o medical complications	27
Maternal / Child Health	Obstetrics	Obstetrics	783	CESAREAN SECTION WITH STERILIZATION WITH MCC	10
Maternal / Child Health	Obstetrics	Obstetrics	784	CESAREAN SECTION WITH STERILIZATION WITH CC	22
Maternal / Child Health	Obstetrics	Obstetrics	785	CESAREAN SECTION WITH STERILIZATION WITHOUT CC/MCC	103
Maternal / Child Health	Obstetrics	Obstetrics	786	CESAREAN SECTION WITHOUT STERILIZATION WITH MCC	52
Maternal / Child Health	Obstetrics	Obstetrics	798	VAGINAL DELIVERY WITH STERILIZATION/D&C WITHOUT MCC/CC	28
Maternal / Child Health	Obstetrics	Obstetrics	805	VAGINAL DELIVERY WITHOUT STERILIZATION/D&C WITH MCC	48
Maternal / Child Health	Obstetrics	Obstetrics	831	OTHER ANTEPARTUM DIAGNOSES WITHOUT O.R. PROCEDURE WITH MCC	21
Maternal / Child Health	Obstetrics	Obstetrics	832	OTHER ANTEPARTUM DIAGNOSES WITHOUT O.R. PROCEDURE WITH CC	16
Maternal / Child Health	Obstetrics	Obstetrics	833	OTHER ANTEPARTUM DIAGNOSES WITHOUT O.R. PROCEDURE WITHOUT CC/MCC	29
Medicine	Cardiac Services	Cardiac Cath	246	Perc cardiovasc proc w drug-eluting stent w MCC or 4+ vessels/stents	460
Medicine	Cardiac Services	Cardiac Cath	248	Perc cardiovasc proc w non-drug-eluting stent w MCC or 4+ ves/stents	32
Medicine	Cardiac Services	Cardiac Cath	249	Perc cardiovasc proc w non-drug-eluting stent w/o MCC	25
Medicine	Cardiac Services	Cardiac Cath	250	Perc cardiovasc proc w/o coronary artery stent or AMI w MCC	47
Medicine	Cardiac Services	Cardiac Cath	251	Perc cardiovasc proc w/o coronary artery stent or AMI w/o MCC	43
Medicine	Cardiac Services	Cardiac EP	222	Cardiac defib implant w cardiac cath w AMI/HF/shock w MCC	37
Medicine	Cardiac Services	Cardiac EP	224	Cardiac defib implant w cardiac cath w/o AMI/HF/shock w MCC	16
Medicine	Cardiac Services	Cardiac EP	225	Cardiac defib implant w cardiac cath w/o AMI/HF/shock w/o MCC	14
Medicine	Cardiac Services	Cardiac EP	226	Cardiac defibrillator implant w/o cardiac cath w MCC	27
Medicine	Cardiac Services	Cardiac EP	227	Cardiac defibrillator implant w/o cardiac cath w/o MCC	15
Medicine	Cardiac Services	Cardiac EP	242	Permanent cardiac pacemaker implant w MCC	160
Medicine	Cardiac Services	Cardiac EP	243	Permanent cardiac pacemaker implant w CC	140
Medicine	Cardiac Services	Cardiac EP	244	Permanent cardiac pacemaker implant w/o CC/MCC	94
Medicine	Cardiac Services	Cardiac EP	245	AICD lead & generator procedures	19
Medicine	Cardiac Services	Medical Cardiology	283	Acute myocardial infarction, expired w MCC	49
Medicine	Cardiac Services	Medical Cardiology	286	Circulatory disorders except AMI, w card cath w MCC	299
Medicine	Cardiac Services	Medical Cardiology	288	Acute & subacute endocarditis w MCC	14
Medicine	Cardiac Services	Medical Cardiology	296	Cardiac arrest, unexplained w MCC	13
Medicine	Cardiac Services	Medical Cardiology	302	Atherosclerosis w MCC	25
Medicine	Cardiac Services	Medical Cardiology	303	Atherosclerosis w/o MCC	35
Medicine	Cardiac Services	Medical Cardiology	304	Hypertension w MCC	88
Medicine	Cardiac Services	Medical Cardiology	306	Cardiac congenital & valvular disorders w MCC	41
Medicine	Cardiac Services	Medical Cardiology	311	Angina pectoris	37
Medicine	Cardiac Services	Medical Cardiology	313	Chest pain	159
Medicine	Cardiac Services	Medical Cardiology	314	Other circulatory system diagnoses w MCC	277
Medicine	Cardiac Services	Medical Cardiology	315	Other circulatory system diagnoses w CC	65
Medicine	Cardiac Services	Medical Cardiology	316	Other circulatory system diagnoses w/o CC/MCC	17
Medicine	General Medicine	General Medicine	186	Pleural effusion w MCC	105
Medicine	General Medicine	General Medicine	187	Pleural effusion w CC	31
Medicine	General Medicine	General Medicine	196	Interstitial lung disease w MCC	83
Medicine	General Medicine	General Medicine	197	Interstitial lung disease w CC	21
Medicine	General Medicine	General Medicine	201	Pneumothorax w/o CC/MCC	45
Medicine	General Medicine	General Medicine	205	Other respiratory system diagnoses w MCC	39
Medicine	General Medicine	General Medicine	368	Major esophageal disorders w MCC	21
Medicine	General Medicine	General Medicine	369	Major esophageal disorders w CC	18
Medicine	General Medicine	General Medicine	380	Complicated peptic ulcer w MCC	37
Medicine	General Medicine	General Medicine	381	Complicated peptic ulcer w CC	26
Medicine	General Medicine	General Medicine	382	Complicated peptic ulcer w/o CC/MCC	10
Medicine	General Medicine	General Medicine	384	Uncomplicated peptic ulcer w/o MCC	20
Medicine	General Medicine	General Medicine	385	Inflammatory bowel disease w MCC	17

**MEDIUM COMMUNITY DIFFERENTIATING DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Medicine	General Medicine	General Medicine	386	Inflammatory bowel disease w CC	67
Medicine	General Medicine	General Medicine	387	Inflammatory bowel disease w/o CC/MCC	14
Medicine	General Medicine	General Medicine	395	Other digestive system diagnoses w/o CC/MCC	45
Medicine	General Medicine	General Medicine	444	Disorders of the biliary tract w MCC	63
Medicine	General Medicine	General Medicine	445	Disorders of the biliary tract w CC	64
Medicine	General Medicine	General Medicine	446	Disorders of the biliary tract w/o CC/MCC	19
Medicine	General Medicine	General Medicine	546	Connective tissue disorders w CC	11
Medicine	General Medicine	General Medicine	549	Septic arthritis w CC	27
Medicine	General Medicine	General Medicine	592	Skin ulcers w MCC	55
Medicine	General Medicine	General Medicine	600	Non-malignant breast disorders w CC/MCC	12
Medicine	General Medicine	General Medicine	606	Minor skin disorders w MCC	15
Medicine	General Medicine	General Medicine	607	Minor skin disorders w/o MCC	28
Medicine	General Medicine	General Medicine	643	Endocrine disorders w MCC	100
Medicine	General Medicine	General Medicine	644	Endocrine disorders w CC	86
Medicine	General Medicine	General Medicine	645	Endocrine disorders w/o CC/MCC	35
Medicine	General Medicine	General Medicine	684	Renal failure w/o CC/MCC	90
Medicine	General Medicine	General Medicine	696	Kidney & urinary tract signs & symptoms w/o MCC	60
Medicine	General Medicine	General Medicine	700	Other kidney & urinary tract diagnoses w/o CC/MCC	12
Medicine	General Medicine	General Medicine	864	Fever of unknown origin	40
Medicine	General Medicine	General Medicine	865	Viral illness w MCC	13
Medicine	General Medicine	General Medicine	866	Viral illness w/o MCC	29
Medicine	General Medicine	General Medicine	867	Other infectious & parasitic diseases diagnoses w MCC	32
Medicine	General Medicine	General Medicine	868	Other infectious & parasitic diseases diagnoses w CC	11
Medicine	General Medicine	General Medicine	915	Allergic reactions w MCC	34
Medicine	General Medicine	General Medicine	916	Allergic reactions w/o MCC	16
Medicine	General Medicine	General Medicine	919	Complications of treatment w MCC	83
Medicine	General Medicine	General Medicine	922	Other injury, poisoning & toxic effect diag w MCC	70
Medicine	General Medicine	General Medicine	923	Other injury, poisoning & toxic effect diag w/o MCC	50
Medicine	General Medicine	General Medicine	974	HIV w major related condition w MCC	80
Medicine	General Medicine	Trauma (General Medicine)	183	Major chest trauma w MCC	32
Medicine	General Medicine	Trauma (General Medicine)	184	Major chest trauma w CC	21
Medicine	General Medicine	Trauma (General Medicine)	604	Trauma to the skin, subcut tiss & breast w MCC	12
Medicine	General Medicine	Trauma (General Medicine)	914	Traumatic injury w/o MCC	13
Medicine	General Medicine	Trauma (General Medicine)	963	Other multiple significant trauma w MCC	10
Medicine	General Medicine	Trauma (General Medicine)	964	Other multiple significant trauma w CC	23
Medicine	Neurology	Neurology	056	Degenerative nervous system disorders w MCC	29
Medicine	Neurology	Neurology	058	Multiple sclerosis & cerebellar ataxia w MCC	18
Medicine	Neurology	Neurology	059	Multiple sclerosis & cerebellar ataxia w CC	18
Medicine	Neurology	Neurology	060	Multiple sclerosis & cerebellar ataxia w/o CC/MCC	17
Medicine	Neurology	Neurology	061	Acute ischemic stroke w use of thrombolytic agent w MCC	40
Medicine	Neurology	Neurology	062	Acute ischemic stroke w use of thrombolytic agent w CC	54
Medicine	Neurology	Neurology	063	Acute ischemic stroke w use of thrombolytic agent w/o CC/MCC	10
Medicine	Neurology	Neurology	069	Transient ischemia	172
Medicine	Neurology	Neurology	072	Nonspecific cerebrovascular disorders w/o CC/MCC	12
Medicine	Neurology	Neurology	073	Cranial & peripheral nerve disorders w MCC	23
Medicine	Neurology	Neurology	074	Cranial & peripheral nerve disorders w/o MCC	52
Medicine	Neurology	Neurology	076	Viral meningitis w/o CC/MCC	10
Medicine	Neurology	Neurology	077	Hypertensive encephalopathy w MCC	37
Medicine	Neurology	Neurology	078	Hypertensive encephalopathy w CC	17
Medicine	Neurology	Neurology	080	Nontraumatic stupor & coma w MCC	23
Medicine	Neurology	Neurology	091	Other disorders of nervous system w MCC	82
Medicine	Neurology	Neurology	092	Other disorders of nervous system w CC	80
Medicine	Neurology	Neurology	093	Other disorders of nervous system w/o CC/MCC	29
Medicine	Neurology	Neurology	095	Bacterial & tuberculous infections of nervous system w CC	12
Medicine	Neurology	Neurology	097	Non-bacterial infect of nervous sys exc viral meningitis w MCC	11
Medicine	Neurology	Neurology	100	Seizures w MCC	126

**MEDIUM COMMUNITY DIFFERENTIATING DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Medicine	Neurology	Neurology	103	Headaches w/o MCC	23
Medicine	Oncology/Hematology	Oncology/Hematology	054	Nervous system neoplasms w MCC	16
Medicine	Oncology/Hematology	Oncology/Hematology	180	Respiratory neoplasms w MCC	140
Medicine	Oncology/Hematology	Oncology/Hematology	181	Respiratory neoplasms w CC	42
Medicine	Oncology/Hematology	Oncology/Hematology	374	Digestive malignancy w MCC	37
Medicine	Oncology/Hematology	Oncology/Hematology	375	Digestive malignancy w CC	40
Medicine	Oncology/Hematology	Oncology/Hematology	435	Malignancy of hepatobiliary system or pancreas w MCC	35
Medicine	Oncology/Hematology	Oncology/Hematology	436	Malignancy of hepatobiliary system or pancreas w CC	32
Medicine	Oncology/Hematology	Oncology/Hematology	542	Pathological fractures & musculoskelet & conn tiss malig w MCC	16
Medicine	Oncology/Hematology	Oncology/Hematology	543	Pathological fractures & musculoskelet & conn tiss malig w CC	26
Medicine	Oncology/Hematology	Oncology/Hematology	544	Pathological fractures & musculoskelet & conn tiss malig w/o CC/MCC	10
Medicine	Oncology/Hematology	Oncology/Hematology	686	Kidney & urinary tract neoplasms w MCC	15
Medicine	Oncology/Hematology	Oncology/Hematology	723	Malignancy, male reproductive system w CC	11
Medicine	Oncology/Hematology	Oncology/Hematology	808	Major hematomol/immun diag exc sickle cell crisis & coagul w MCC	46
Medicine	Oncology/Hematology	Oncology/Hematology	809	Major hematomol/immun diag exc sickle cell crisis & coagul w CC	52
Medicine	Oncology/Hematology	Oncology/Hematology	810	Major hematomol/immun diag exc sickle cell crisis & coagul w/o CC/MCC	18
Medicine	Oncology/Hematology	Oncology/Hematology	813	Coagulation disorders	117
Medicine	Oncology/Hematology	Oncology/Hematology	814	Reticuloendothelial & immunity disorders w MCC	23
Medicine	Oncology/Hematology	Oncology/Hematology	815	Reticuloendothelial & immunity disorders w CC	12
Medicine	Oncology/Hematology	Oncology/Hematology	840	Lymphoma & non-acute leukemia w MCC	41
Medicine	Oncology/Hematology	Oncology/Hematology	843	Other myeloprolif dis or poorly diff neopl diag w MCC	11
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	880	Acute adjustment reaction & psychosocial dysfunction	1,044
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	881	Depressive neuroses	886
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	882	Neuroses except depressive	325
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	883	Disorders of personality & impulse control	27
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	885	Psychoses	2,624
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	886	Behavioral & developmental disorders	85
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Substance Abuse	894	Alcohol/drug abuse or dependence, left ama	78
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Substance Abuse	895	Alcohol/drug abuse or dependence w rehabilitation therapy	244
Surgery	Cardiac Services	Cardiac Surgery	217	Cardiac valve & oth maj cardiothoracic proc w card cath w CC	12
Surgery	Cardiac Services	Cardiac Surgery	218	Cardiac valve & oth maj cardiothoracic proc w card cath w/o CC/MCC	10
Surgery	ENT	ENT	149	Dysequilibrium	25
Surgery	ENT	ENT	152	Otitis media & URI w MCC	14
Surgery	ENT	ENT	155	Nasal trauma & deformity w CC	11
Surgery	General Surgery	General Surgery	003	ECMO or trach w MV 96+ hrs or PDX exc face, mouth & neck w maj O.R.	73
Surgery	General Surgery	General Surgery	004	Trach w MV 96+ hrs or PDX exc face, mouth & neck w/o maj O.R.	135
Surgery	General Surgery	General Surgery	337	Peritoneal adhesiolysis w/o CC/MCC	74
Surgery	General Surgery	General Surgery	341	Appendectomy w/o complicated principal diag w MCC	19
Surgery	General Surgery	General Surgery	342	Appendectomy w/o complicated principal diag w CC	30
Surgery	General Surgery	General Surgery	343	Appendectomy w/o complicated principal diag w/o CC/MCC	40
Surgery	General Surgery	General Surgery	350	Inguinal & femoral hernia procedures w MCC	17
Surgery	General Surgery	General Surgery	351	Inguinal & femoral hernia procedures w CC	14
Surgery	General Surgery	General Surgery	352	Inguinal & femoral hernia procedures w/o CC/MCC	20
Surgery	General Surgery	General Surgery	353	Hernia procedures except inguinal & femoral w MCC	64
Surgery	General Surgery	General Surgery	405	Pancreas, liver & shunt procedures w MCC	16
Surgery	General Surgery	General Surgery	414	Cholecystectomy except by laparoscope w/o c.d.e. w MCC	16
Surgery	General Surgery	General Surgery	415	Cholecystectomy except by laparoscope w/o c.d.e. w CC	28
Surgery	General Surgery	General Surgery	416	Cholecystectomy except by laparoscope w/o c.d.e. w/o CC/MCC	12
Surgery	General Surgery	General Surgery	423	Other hepatobiliary or pancreas O.R. procedures w MCC	32
Surgery	General Surgery	General Surgery	576	Skin graft &/or debrid exc for skin ulcer or cellulitis w MCC	50
Surgery	General Surgery	General Surgery	577	Skin graft &/or debrid exc for skin ulcer or cellulitis w CC	18
Surgery	General Surgery	General Surgery	579	Other skin, subcut tiss & breast proc w MCC	75
Surgery	General Surgery	General Surgery	616	Amputat of lower limb for endocrine,nutrit,& metabol dis w MCC	56
Surgery	General Surgery	General Surgery	622	Skin grafts & wound debrid for endoc, nutrit & metab dis w MCC	38
Surgery	General Surgery	General Surgery	628	Other endocrine, nutrit & metab O.R. proc w MCC	36
Surgery	General Surgery	General Surgery	800	Splenectomy w CC	10



**MEDIUM COMMUNITY DIFFERENTIATING DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Surgery	General Surgery	General Surgery	820	Lymphoma & leukemia w major O.R. procedure w MCC	19
Surgery	General Surgery	General Surgery	823	Lymphoma & non-acute leukemia w other O.R. proc w MCC	12
Surgery	General Surgery	General Surgery	857	Postoperative or post-traumatic infections w O.R. proc w CC	92
Surgery	General Surgery	General Surgery	876	O.R. procedure w principal diagnoses of mental illness	12
Surgery	General Surgery	General Surgery	939	O.R. proc w diagnoses of other contact w health services w MCC	10
Surgery	General Surgery	General Surgery	940	O.R. proc w diagnoses of other contact w health services w CC	13
Surgery	General Surgery	General Surgery	981	Extensive O.R. procedure unrelated to principal diagnosis w MCC	343
Surgery	General Surgery	General Surgery	983	Extensive O.R. procedure unrelated to principal diagnosis w/o CC/MCC	15
Surgery	General Surgery	General Surgery	987	Non-extensive O.R. proc unrelated to principal diagnosis w MCC	142
Surgery	General Surgery	General Surgery	988	Non-extensive O.R. proc unrelated to principal diagnosis w CC	109
Surgery	General Surgery	General Surgery	989	Non-extensive O.R. proc unrelated to principal diagnosis w/o CC/MCC	13
Surgery	General Surgery	GI	328	Stomach, esophageal & duodenal proc w/o CC/MCC	39
Surgery	General Surgery	GI	344	Minor small & large bowel procedures w MCC	25
Surgery	General Surgery	GI	345	Minor small & large bowel procedures w CC	28
Surgery	General Surgery	GI	346	Minor small & large bowel procedures w/o CC/MCC	31
Surgery	General Surgery	GI	347	Anal & stomal procedures w MCC	20
Surgery	General Surgery	GI	348	Anal & stomal procedures w CC	16
Surgery	General Surgery	GI	356	Other digestive system O.R. procedures w MCC	40
Surgery	General Surgery	GI	357	Other digestive system O.R. procedures w CC	39
Surgery	General Surgery	GI	358	Other digestive system O.R. procedures w/o CC/MCC	29
Surgery	General Surgery	Trauma (General Surgery)	902	Wound debridements for injuries w CC	11
Surgery	General Surgery	Trauma (General Surgery)	907	Other O.R. procedures for injuries w MCC	135
Surgery	General Surgery	Trauma (General Surgery)	909	Other O.R. procedures for injuries w/o CC/MCC	23
Surgery	Gynecology	Gynecology	746	Vagina, cervix & vulva procedures w CC/MCC	20
Surgery	Gynecology	Gynecology	758	Infections, female reproductive system w CC	16
Surgery	Gynecology	Gynecology	759	Infections, female reproductive system w/o CC/MCC	10
Surgery	Neurosurgery	Peripheral and Cranial Diseases	040	Periph & cranial nerve & other nerv syst proc w MCC	26
Surgery	Neurosurgery	Peripheral and Cranial Diseases	041	Periph/cranial nerve & other nerv syst proc w CC or periph neurostim	22
Surgery	Orthopedics	Joint Replacement	462	Bilateral or multiple major joint procs of lower extremity w/o MCC	34
Surgery	Orthopedics	Joint Replacement	466	Revision of hip or knee replacement w MCC	28
Surgery	Orthopedics	Joint Replacement	467	Revision of hip or knee replacement w CC	58
Surgery	Orthopedics	Joint Replacement	468	Revision of hip or knee replacement w/o CC/MCC	67
Surgery	Orthopedics	Orthopedics	463	Wnd debrid & skn grft exc hand, for musculo-conn tiss dis w MCC	71
Surgery	Orthopedics	Orthopedics	465	Wnd debrid & skn grft exc hand, for musculo-conn tiss dis w/o CC/MCC	13
Surgery	Orthopedics	Orthopedics	474	Amputation for musculoskeletal sys & conn tissue dis w MCC	40
Surgery	Orthopedics	Orthopedics	475	Amputation for musculoskeletal sys & conn tissue dis w CC	20
Surgery	Orthopedics	Orthopedics	477	Biopsies of musculoskeletal system & connective tissue w MCC	17
Surgery	Orthopedics	Orthopedics	478	Biopsies of musculoskeletal system & connective tissue w CC	20
Surgery	Orthopedics	Orthopedics	503	Foot procedures w MCC	60
Surgery	Orthopedics	Orthopedics	513	Hand or wrist proc, except major thumb or joint proc w CC/MCC	18
Surgery	Orthopedics	Orthopedics	516	Other musculoskelet sys & conn tiss O.R. proc w CC	32
Surgery	Orthopedics	Orthopedics	539	Osteomyelitis w MCC	16
Surgery	Orthopedics	Orthopedics	557	Tendonitis, myositis & bursitis w MCC	42
Surgery	Orthopedics	Orthopedics	564	Other musculoskeletal sys & connective tissue diagnoses w MCC	24
Surgery	Orthopedics	Sports Medicine	485	Knee procedures w pdx of infection w MCC	24
Surgery	Orthopedics	Sports Medicine	486	Knee procedures w pdx of infection w CC	18
Surgery	Orthopedics	Sports Medicine	488	Knee procedures w/o pdx of infection w CC/MCC	11
Surgery	Orthopedics	Sports Medicine	500	Soft tissue procedures w MCC	42
Surgery	Orthopedics	Sports Medicine	501	Soft tissue procedures w CC	55
Surgery	Orthopedics	Sports Medicine	510	Shoulder,elbow or forearm proc,exc major joint proc w MCC	13
Surgery	Orthopedics	Sports Medicine	511	Shoulder,elbow or forearm proc,exc major joint proc w CC	28
Surgery	Orthopedics	Sports Medicine	512	Shoulder,elbow or forearm proc,exc major joint proc w/o CC/MCC	19
Surgery	Orthopedics	Trauma (Orthopedics)	480	Hip & femur procedures except major joint w MCC	371
Surgery	Orthopedics	Trauma (Orthopedics)	492	Lower extrem & humer proc except hip,foot,femur w MCC	82
Surgery	Orthopedics	Trauma (Orthopedics)	493	Lower extrem & humer proc except hip,foot,femur w CC	134
Surgery	Orthopedics	Trauma (Orthopedics)	494	Lower extrem & humer proc except hip,foot,femur w/o CC/MCC	91

**MEDIUM COMMUNITY DIFFERENTIATING DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Surgery	Orthopedics	Trauma (Orthopedics)	535	Fractures of hip & pelvis w MCC	51
Surgery	Orthopedics	Trauma (Orthopedics)	562	Fx, sprn, strn & disl except femur, hip, pelvis & thigh w MCC	46
Surgery	Orthopedics	Trauma (Orthopedics)	956	Limb reattachment, hip & femur proc for multiple significant trauma	71
Surgery	Spine	Medical Spine	551	Medical back problems w MCC	35
Surgery	Spine	Other Surgical Spine	028	Spinal procedures w MCC	11
Surgery	Thoracic Surgery	Other Thoracic Surgery	163	Major chest procedures w MCC	95
Surgery	Thoracic Surgery	Other Thoracic Surgery	164	Major chest procedures w CC	38
Surgery	Thoracic Surgery	Other Thoracic Surgery	165	Major chest procedures w/o CC/MCC	16
Surgery	Thoracic Surgery	Other Thoracic Surgery	166	Other resp system O.R. procedures w MCC	269
Surgery	Thoracic Surgery	Other Thoracic Surgery	167	Other resp system O.R. procedures w CC	55
Surgery	Thoracic Surgery	Other Thoracic Surgery	168	Other resp system O.R. procedures w/o CC/MCC	20
Surgery	Urology	Urology	653	Major bladder procedures w MCC	19
Surgery	Urology	Urology	654	Major bladder procedures w CC	30
Surgery	Urology	Urology	656	Kidney & ureter procedures for neoplasm w MCC	44
Surgery	Urology	Urology	657	Kidney & ureter procedures for neoplasm w CC	70
Surgery	Urology	Urology	658	Kidney & ureter procedures for neoplasm w/o CC/MCC	27
Surgery	Urology	Urology	659	Kidney & ureter procedures for non-neoplasm w MCC	122
Surgery	Urology	Urology	660	Kidney & ureter procedures for non-neoplasm w CC	149
Surgery	Urology	Urology	661	Kidney & ureter procedures for non-neoplasm w/o CC/MCC	95
Surgery	Urology	Urology	663	Minor bladder procedures w CC	28
Surgery	Urology	Urology	666	Prostatectomy w CC	25
Surgery	Urology	Urology	668	Transurethral procedures w MCC	56
Surgery	Urology	Urology	669	Transurethral procedures w CC	103
Surgery	Urology	Urology	670	Transurethral procedures w/o CC/MCC	21
Surgery	Urology	Urology	673	Other kidney & urinary tract procedures w MCC	146
Surgery	Urology	Urology	674	Other kidney & urinary tract procedures w CC	70
Surgery	Urology	Urology	707	Major male pelvic procedures w CC/MCC	15
Surgery	Urology	Urology	711	Testes procedures w CC/MCC	13
Surgery	Urology	Urology	713	Transurethral prostatectomy w CC/MCC	52
Surgery	Urology	Urology	715	Other male reproductive system O.R. proc for malignancy w CC/MCC	11
Surgery	Urology	Urology	717	Other male reproductive system O.R. proc exc malignancy w CC/MCC	16
Surgery	Urology	Urology	726	Benign prostatic hypertrophy w/o MCC	15
Surgery	Urology	Urology	727	Inflammation of the male reproductive system w MCC	11
Surgery	Urology	Urology	728	Inflammation of the male reproductive system w/o MCC	60
Surgery	Urology	Urology	984	Prostatic O.R. procedure unrelated to principal diagnosis w MCC	27
Surgery	Vascular Services	Amputation	240	Amputation for circ sys disorders exc upper limb & toe w CC	56
Surgery	Vascular Services	Amputation	255	Upper limb & toe amputation for circ system disorders w MCC	31
Surgery	Vascular Services	Amputation	256	Upper limb & toe amputation for circ system disorders w CC	35
Surgery	Vascular Services	Vascular Services	037	Extracranial procedures w MCC	19
Surgery	Vascular Services	Vascular Services	038	Extracranial procedures w CC	33
Surgery	Vascular Services	Vascular Services	039	Extracranial procedures w/o CC/MCC	44
Surgery	Vascular Services	Vascular Services	252	Other vascular procedures w MCC	121
Surgery	Vascular Services	Vascular Services	253	Other vascular procedures w CC	141
Surgery	Vascular Services	Vascular Services	254	Other vascular procedures w/o CC/MCC	27
Surgery	Vascular Services	Vascular Services	269	AORTIC AND HEART ASSIST PROCEDURES EXCEPT PULSATION BALLOON W/O MCC	38
Surgery	Vascular Services	Vascular Services	270	OTHER MAJOR CARDIOVASCULAR PROCEDURES W MCC	163
Surgery	Vascular Services	Vascular Services	271	OTHER MAJOR CARDIOVASCULAR PROCEDURES W CC	76

**CRITICAL ACCESS AND SMALL COMMUNITY COMBINED DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Maternal / Child Health	Neonatology	Special Care Nursery / NICU (L2/L3/L4)	790	Extreme immaturity or respiratory distress syndrome, neonate	77
Maternal / Child Health	Neonatology	Special Care Nursery / NICU (L2/L3/L4)	792	Prematurity w/o major problems	50
Maternal / Child Health	Neonatology	Special Care Nursery / NICU (L2/L3/L4)	793	Full term neonate w major problems	75
Maternal / Child Health	Neonatology	Special Care Nursery / NICU (L2/L3/L4)	794	Neonate w other significant problems	351
Maternal / Child Health	Neonatology	Well Newborn Nursery (L1)	795	Normal newborn	1,625
Maternal / Child Health	Obstetrics	Obstetrics	765	Cesarean section w CC/MCC	107
Maternal / Child Health	Obstetrics	Obstetrics	766	Cesarean section w/o CC/MCC	157
Maternal / Child Health	Obstetrics	Obstetrics	767	Vaginal delivery w sterilization &/or D&C	68
Maternal / Child Health	Obstetrics	Obstetrics	768	Vaginal delivery w O.R. proc except steril &/or D&C	219
Maternal / Child Health	Obstetrics	Obstetrics	774	Vaginal delivery w complicating diagnoses	143
Maternal / Child Health	Obstetrics	Obstetrics	775	Vaginal delivery w/o complicating diagnoses	1,313
Maternal / Child Health	Obstetrics	Obstetrics	781	Other antepartum diagnoses w medical complications	34
Maternal / Child Health	Obstetrics	Obstetrics	787	CESAREAN SECTION WITHOUT STERILIZATION WITH CC	36
Maternal / Child Health	Obstetrics	Obstetrics	788	CESAREAN SECTION WITHOUT STERILIZATION WITHOUT CC/MCC	66
Maternal / Child Health	Obstetrics	Obstetrics	806	VAGINAL DELIVERY WITHOUT STERILIZATION/D&C WITH CC	132
Maternal / Child Health	Obstetrics	Obstetrics	807	VAGINAL DELIVERY WITHOUT STERILIZATION/D&C WITHOUT MCC/CC	399
Medicine	Cardiac Services	Cardiac Cath	247	Perc cardiovasc proc w drug-eluting stent w/o MCC	38
Medicine	Cardiac Services	Medical Cardiology	280	Acute myocardial infarction, discharged alive w MCC	123
Medicine	Cardiac Services	Medical Cardiology	281	Acute myocardial infarction, discharged alive w CC	87
Medicine	Cardiac Services	Medical Cardiology	282	Acute myocardia infarction, discharged alive w/o CC/MCC	39
Medicine	Cardiac Services	Medical Cardiology	287	Circulatory disorders except AMI, w card cath w/o MCC	46
Medicine	Cardiac Services	Medical Cardiology	291	Heart failure & shock w MCC	470
Medicine	Cardiac Services	Medical Cardiology	292	Heart failure & shock w CC	265
Medicine	Cardiac Services	Medical Cardiology	293	Heart failure & shock w/o CC/MCC	89
Medicine	Cardiac Services	Medical Cardiology	305	Hypertension w/o MCC	41
Medicine	Cardiac Services	Medical Cardiology	308	Cardiac arrhythmia & conduction disorders w MCC	142
Medicine	Cardiac Services	Medical Cardiology	309	Cardiac arrhythmia & conduction disorders w CC	134
Medicine	Cardiac Services	Medical Cardiology	310	Cardiac arrhythmia & conduction disorders w/o CC/MCC	105
Medicine	Cardiac Services	Medical Cardiology	312	Syncope & collapse	58
Medicine	General Medicine	General Medicine	175	Pulmonary embolism w MCC	95
Medicine	General Medicine	General Medicine	176	Pulmonary embolism w/o MCC	89
Medicine	General Medicine	General Medicine	177	Respiratory infections & inflammations w MCC	163
Medicine	General Medicine	General Medicine	178	Respiratory infections & inflammations w CC	93
Medicine	General Medicine	General Medicine	179	Respiratory infections & inflammations w/o CC/MCC	46
Medicine	General Medicine	General Medicine	189	Pulmonary edema & respiratory failure	552
Medicine	General Medicine	General Medicine	190	Chronic obstructive pulmonary disease w MCC	640
Medicine	General Medicine	General Medicine	191	Chronic obstructive pulmonary disease w CC	180
Medicine	General Medicine	General Medicine	192	Chronic obstructive pulmonary disease w/o CC/MCC	227
Medicine	General Medicine	General Medicine	193	Simple pneumonia & pleurisy w MCC	739
Medicine	General Medicine	General Medicine	194	Simple pneumonia & pleurisy w CC	745
Medicine	General Medicine	General Medicine	195	Simple pneumonia & pleurisy w/o CC/MCC	400
Medicine	General Medicine	General Medicine	199	Pneumothorax w MCC	30
Medicine	General Medicine	General Medicine	200	Pneumothorax w CC	40
Medicine	General Medicine	General Medicine	202	Bronchitis & asthma w CC/MCC	147
Medicine	General Medicine	General Medicine	203	Bronchitis & asthma w/o CC/MCC	134
Medicine	General Medicine	General Medicine	204	Respiratory signs & symptoms	30
Medicine	General Medicine	General Medicine	206	Other respiratory system diagnoses w/o MCC	40
Medicine	General Medicine	General Medicine	207	Respiratory system diagnosis w ventilator support 96+ hours	34
Medicine	General Medicine	General Medicine	208	Respiratory system diagnosis w ventilator support <96 hours	130
Medicine	General Medicine	General Medicine	371	Major gastrointestinal disorders & peritoneal infections w MCC	46
Medicine	General Medicine	General Medicine	372	Major gastrointestinal disorders & peritoneal infections w CC	113
Medicine	General Medicine	General Medicine	373	Major gastrointestinal disorders & peritoneal infections w/o CC/MCC	41
Medicine	General Medicine	General Medicine	377	G.I. hemorrhage w MCC	75
Medicine	General Medicine	General Medicine	378	G.I. hemorrhage w CC	174
Medicine	General Medicine	General Medicine	379	G.I. hemorrhage w/o CC/MCC	56
Medicine	General Medicine	General Medicine	388	G.I. obstruction w MCC	52

**CRITICAL ACCESS AND SMALL COMMUNITY COMBINED DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Medicine	General Medicine	General Medicine	389	G.I. obstruction w CC	125
Medicine	General Medicine	General Medicine	390	G.I. obstruction w/o CC/MCC	169
Medicine	General Medicine	General Medicine	391	Esophagitis, gastroent & misc digest disorders w MCC	108
Medicine	General Medicine	General Medicine	392	Esophagitis, gastroent & misc digest disorders w/o MCC	511
Medicine	General Medicine	General Medicine	393	Other digestive system diagnoses w MCC	45
Medicine	General Medicine	General Medicine	394	Other digestive system diagnoses w CC	57
Medicine	General Medicine	General Medicine	432	Cirrhosis & alcoholic hepatitis w MCC	32
Medicine	General Medicine	General Medicine	433	Cirrhosis & alcoholic hepatitis w CC	44
Medicine	General Medicine	General Medicine	438	Disorders of pancreas except malignancy w MCC	66
Medicine	General Medicine	General Medicine	439	Disorders of pancreas except malignancy w CC	215
Medicine	General Medicine	General Medicine	440	Disorders of pancreas except malignancy w/o CC/MCC	179
Medicine	General Medicine	General Medicine	441	Disorders of liver except malig,cirr,alc hepa w MCC	72
Medicine	General Medicine	General Medicine	442	Disorders of liver except malig,cirr,alc hepa w CC	115
Medicine	General Medicine	General Medicine	443	Disorders of liver except malig,cirr,alc hepa w/o CC/MCC	39
Medicine	General Medicine	General Medicine	554	Bone diseases & arthropathies w/o MCC	37
Medicine	General Medicine	General Medicine	555	Signs & symptoms of musculoskeletal system & conn tissue w MCC	153
Medicine	General Medicine	General Medicine	556	Signs & symptoms of musculoskeletal system & conn tissue w/o MCC	149
Medicine	General Medicine	General Medicine	593	Skin ulcers w CC	45
Medicine	General Medicine	General Medicine	602	Cellulitis w MCC	103
Medicine	General Medicine	General Medicine	603	Cellulitis w/o MCC	863
Medicine	General Medicine	General Medicine	637	Diabetes w MCC	159
Medicine	General Medicine	General Medicine	638	Diabetes w CC	301
Medicine	General Medicine	General Medicine	639	Diabetes w/o CC/MCC	136
Medicine	General Medicine	General Medicine	640	Nutritional & misc metabolic disorders w MCC	120
Medicine	General Medicine	General Medicine	641	Nutritional & misc metabolic disorders w/o MCC	432
Medicine	General Medicine	General Medicine	682	Renal failure w MCC	155
Medicine	General Medicine	General Medicine	683	Renal failure w CC	185
Medicine	General Medicine	General Medicine	689	Kidney & urinary tract infections w MCC	195
Medicine	General Medicine	General Medicine	690	Kidney & urinary tract infections w/o MCC	585
Medicine	General Medicine	General Medicine	695	Kidney & urinary tract signs & symptoms w MCC	40
Medicine	General Medicine	General Medicine	698	Other kidney & urinary tract diagnoses w MCC	34
Medicine	General Medicine	General Medicine	699	Other kidney & urinary tract diagnoses w CC	36
Medicine	General Medicine	General Medicine	862	Postoperative & post-traumatic infections w MCC	46
Medicine	General Medicine	General Medicine	863	Postoperative & post-traumatic infections w/o MCC	33
Medicine	General Medicine	General Medicine	870	Septicemia w MV 96+ hours	84
Medicine	General Medicine	General Medicine	871	Septicemia w/o MV 96+ hours w MCC	962
Medicine	General Medicine	General Medicine	872	Septicemia w/o MV 96+ hours w/o MCC	566
Medicine	General Medicine	General Medicine	917	Poisoning & toxic effects of drugs w MCC	58
Medicine	General Medicine	General Medicine	918	Poisoning & toxic effects of drugs w/o MCC	46
Medicine	General Medicine	General Medicine	920	Complications of treatment w CC	45
Medicine	General Medicine	General Medicine	947	Signs & symptoms w MCC	48
Medicine	General Medicine	General Medicine	948	Signs & symptoms w/o MCC	180
Medicine	General Medicine	General Medicine	949	Aftercare w CC/MCC	157
Medicine	General Medicine	General Medicine	950	Aftercare w/o CC/MCC	41
Medicine	General Medicine	General Medicine	951	Other factors influencing health status	48
Medicine	General Medicine	Trauma (General Medicine)	605	Trauma to the skin, subcut tiss & breast w/o MCC	63
Medicine	Neurology	Neurology	057	Degenerative nervous system disorders w/o MCC	59
Medicine	Neurology	Neurology	064	Intracranial hemorrhage or cerebral infarction w MCC	45
Medicine	Neurology	Neurology	065	Intracranial hemorrhage or cerebral infarction w CC	105
Medicine	Neurology	Neurology	066	Intracranial hemorrhage or cerebral infarction w/o CC/MCC	33
Medicine	Neurology	Neurology	070	Nonspecific cerebrovascular disorders w MCC	51
Medicine	Neurology	Neurology	071	Nonspecific cerebrovascular disorders w CC	64
Medicine	Neurology	Neurology	101	Seizures w/o MCC	30
Medicine	Oncology/Hematology	Oncology/Hematology	811	Red blood cell disorders w MCC	35
Medicine	Oncology/Hematology	Oncology/Hematology	812	Red blood cell disorders w/o MCC	104
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Psychiatry	884	Organic disturbances & mental retardation	46

**CRITICAL ACCESS AND SMALL COMMUNITY COMBINED DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Substance Abuse	896	Alcohol/drug abuse or dependence w/o rehabilitation therapy w MCC	51
Mental Health & Substance Abuse	Mental Health & Substance Abuse	Substance Abuse	897	Alcohol/drug abuse or dependence w/o rehabilitation therapy w/o MCC	144
Surgery	ENT	ENT	153	Otitis media & URI w/o MCC	49
Surgery	General Surgery	General Surgery	335	Peritoneal adhesiolysis w MCC	31
Surgery	General Surgery	General Surgery	336	Peritoneal adhesiolysis w CC	43
Surgery	General Surgery	General Surgery	338	Appendectomy w complicated principal diag w MCC	39
Surgery	General Surgery	General Surgery	339	Appendectomy w complicated principal diag w CC	47
Surgery	General Surgery	General Surgery	340	Appendectomy w complicated principal diag w/o CC/MCC	34
Surgery	General Surgery	General Surgery	354	Hernia procedures except inguinal & femoral w CC	33
Surgery	General Surgery	General Surgery	355	Hernia procedures except inguinal & femoral w/o CC/MCC	33
Surgery	General Surgery	General Surgery	417	Laparoscopic cholecystectomy w/o c.d.e. w MCC	94
Surgery	General Surgery	General Surgery	418	Laparoscopic cholecystectomy w/o c.d.e. w CC	109
Surgery	General Surgery	General Surgery	419	Laparoscopic cholecystectomy w/o c.d.e. w/o CC/MCC	126
Surgery	General Surgery	General Surgery	570	SKIN DEBRIDEMENT W MCC	30
Surgery	General Surgery	General Surgery	571	SKIN DEBRIDEMENT W CC	88
Surgery	General Surgery	General Surgery	572	SKIN DEBRIDEMENT W-O CC-MCC	49
Surgery	General Surgery	General Surgery	575	Skin graft &/or debrid for skn ulcer or cellulitis w/o CC/MCC	73
Surgery	General Surgery	General Surgery	580	Other skin, subcut tiss & breast proc w CC	80
Surgery	General Surgery	General Surgery	581	Other skin, subcut tiss & breast proc w/o CC/MCC	48
Surgery	General Surgery	General Surgery	617	Amputat of lower limb for endocrine,nutrit,& metabol dis w CC	124
Surgery	General Surgery	General Surgery	623	Skin grafts & wound debrid for endoc, nutrit & metab dis w CC	47
Surgery	General Surgery	General Surgery	629	Other endocrine, nutrit & metab O.R. proc w CC	31
Surgery	General Surgery	General Surgery	853	Infectious & parasitic diseases w O.R. procedure w MCC	160
Surgery	General Surgery	General Surgery	854	Infectious & parasitic diseases w O.R. procedure w CC	66
Surgery	General Surgery	General Surgery	856	Postoperative or post-traumatic infections w O.R. proc w MCC	45
Surgery	General Surgery	General Surgery	982	Extensive O.R. procedure unrelated to principal diagnosis w CC	34
Surgery	General Surgery	GI	326	Stomach, esophageal & duodenal proc w MCC	49
Surgery	General Surgery	GI	327	Stomach, esophageal & duodenal proc w CC	40
Surgery	General Surgery	GI	329	Major small & large bowel procedures w MCC	362
Surgery	General Surgery	GI	330	Major small & large bowel procedures w CC	396
Surgery	General Surgery	GI	331	Major small & large bowel procedures w/o CC/MCC	126
Surgery	General Surgery	Trauma (General Surgery)	908	Other O.R. procedures for injuries w CC	31
Surgery	Gynecology	Gynecology	742	Uterine & adnexa proc for non-malignancy w CC/MCC	32
Surgery	Gynecology	Gynecology	743	Uterine & adnexa proc for non-malignancy w/o CC/MCC	45
Surgery	Orthopedics	Joint Replacement	469	Major joint replacement or reattachment of lower extremity w MCC	53
Surgery	Orthopedics	Joint Replacement	470	Major joint replacement or reattachment of lower extremity w/o MCC	705
Surgery	Orthopedics	Joint Replacement	483	Major joint & limb reattachment proc of upper extremity w CC/MCC	35
Surgery	Orthopedics	Orthopedics	464	Wnd debrid & skn grft exc hand, for musculo-conn tiss dis w CC	44
Surgery	Orthopedics	Orthopedics	504	Foot procedures w CC	31
Surgery	Orthopedics	Orthopedics	540	Osteomyelitis w CC	104
Surgery	Orthopedics	Orthopedics	541	Osteomyelitis w/o CC/MCC	104
Surgery	Orthopedics	Orthopedics	558	Tendonitis, myositis & bursitis w/o MCC	62
Surgery	Orthopedics	Orthopedics	559	Aftercare, musculoskeletal system & connective tissue w MCC	137
Surgery	Orthopedics	Orthopedics	560	Aftercare, musculoskeletal system & connective tissue w CC	616
Surgery	Orthopedics	Orthopedics	561	Aftercare, musculoskeletal system & connective tissue w/o CC/MCC	443
Surgery	Orthopedics	Orthopedics	565	Other musculoskeletal sys & connective tissue diagnoses w CC	51
Surgery	Orthopedics	Orthopedics	566	Other musculoskeletal sys & connective tissue diagnoses w/o CC/MCC	35
Surgery	Orthopedics	Orthopedics	945	Rehabilitation w CC/MCC	108
Surgery	Orthopedics	Orthopedics	946	Rehabilitation w/o CC/MCC	31
Surgery	Orthopedics	Trauma (Orthopedics)	481	Hip & femur procedures except major joint w CC	160
Surgery	Orthopedics	Trauma (Orthopedics)	482	Hip & femur procedures except major joint w/o CC/MCC	106
Surgery	Orthopedics	Trauma (Orthopedics)	536	Fractures of hip & pelvis w/o MCC	154
Surgery	Orthopedics	Trauma (Orthopedics)	563	Fx, sprn, strn & disl except femur, hip, pelvis & thigh w/o MCC	92
Surgery	Spine	Medical Spine	552	Medical back problems w/o MCC	94
Surgery	Urology	Urology	694	Urinary stones w/o esw lithotripsy w/o MCC	44
Surgery	Vascular Services	Amputation	239	Amputation for circ sys disorders exc upper limb & toe w MCC	37

**CRITICAL ACCESS AND SMALL COMMUNITY COMBINED DRGS**

<b>TIG META SERVICE LINE</b>	<b>TIG SERVICE LINE</b>	<b>TIG PRODUCT LINE</b>	<b>MS-DRG CODE</b>	<b>MS-DRG NAME</b>	<b>2017-2019 Average BDOC</b>
Surgery	Vascular Services	Vascular Services	264	Other circulatory system O.R. procedures	56
Surgery	Vascular Services	Vascular Services	299	Peripheral vascular disorders w MCC	43
Surgery	Vascular Services	Vascular Services	300	Peripheral vascular disorders w CC	63
Surgery	Vascular Services	Vascular Services	301	Peripheral vascular disorders w/o CC/MCC	32

## References

- Advisory Board. (2020). Demographic Profiler: Arizona 2019 Demographics by Zip Code. [Data File]. Retrieved May 26, 2020, from <https://www.advisory.com/solutions/planning-2020/tools/demographics-profiler>
- Arizona Office of Economic Opportunity. (2019). 2018 Population Projections: All Tables Zip File. [Data File]. Retrieved May 26, 2020, from <https://www.azcommerce.com/oeo/population/population-projections/>
- Arizona Department of Health Services. Public Health Statistics - Hospital Discharge Data. [Data File]. Retrieved May 26, 2020, from <https://www.azdhs.gov/preparedness/public-health-statistics/hospital-discharge-data/index.php>
- Centers for Medicare & Medicaid Services, Hospital Compare Datasets: Data.Medicare.gov. (2020). Retrieved from <https://data.medicare.gov/data/hospital-compare>
- Dartmouth Institute for Health Policy and Clinical Practice. (2018). Dartmouth Atlas 2018 Zip Code Crosswalks. [Data File]. Retrieved May 26, 2020, from [https://atlasdata.dartmouth.edu/static/supp\\_research\\_data](https://atlasdata.dartmouth.edu/static/supp_research_data)
- Esri. (2019). Data and Maps for ArcGIS: 2010 US Census Bureau Tract Boundaries. [Data File]. Retrieved May 26, 2020, from <https://my.esri.com/#/downloads>
- United States Department of Housing and Urban Development. (2020). USPS Zip Code Crosswalk Files: Zip-Tract 4th Quarter 2019. [Data File]. Retrieved May 26, 2020, from [https://www.huduser.gov/portal/datasets/usps\\_crosswalk.html](https://www.huduser.gov/portal/datasets/usps_crosswalk.html)

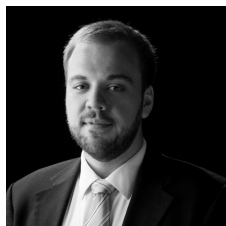
## Study Authors



**Bryan Hannley, PT, ATP**

bryan.hannley@theinnovagroup.com

Bryan has over 20 years experience as a Physical Therapist, Clinic Manager and Complex Rehabilitation Technology salesman. He has skillfully evaluated and treated patients, developed strategies and staffing models to enhance clinical outcomes and provided equipment and technology solutions for clients with devastating injuries and progressive diseases.



**Tim Snyder**

tim.snyder@theinnovagroup.com

Tim has over 7 years of experience as a healthcare analyst and in this role he supports a vast spectrum of strategic planning, service delivery planning, and facility master planning projects for a variety of healthcare clients. Tim specializes in creative problem-solving in healthcare analytics, employing his technical skills to produce data-driven solutions for hospitals, hospital networks, and regional health networks.



**Elizabeth Ayarbe-Perez**

elizabeth.perez@theinnovagroup.com

Elizabeth has over 20 years of professional experience in a broad range of GIS applications and specializes in solving healthcare analytics utilizing GIS to produce data-driven planning solutions. Elizabeth's GIS-based maps and visualizations greatly assist her clients in understanding situations and improving their decision making.

For more information about our services, please contact The Innova Group at 520.886.8650.



#### **Tucson Office**

3196 North Swan Road  
Tucson, Arizona 85712  
Phone 520.886.8650  
Fax 520.886.8706

#### **Atlanta Office**

84 Peachtree Street NW  
Atlanta, Georgia 30303  
Phone 678.488.6199

#### **Austin Office**

9442 North Capital of Texas Hwy  
Arboretum Plaza 1, Suite 325  
Austin, Texas 78759  
Phone 512.346.8700  
Fax 512.346.8750

#### **Boston Office**

980 Washington Street  
Suite 114  
Dedham, MA 02026  
Phone 781.326.6100  
Fax 781.326.6102

#### **Dallas Office**

15851 North Dallas Parkway  
Suite 1240  
Addison, Texas 75001  
Phone 972.331.3553  
Fax 972.331.0733

#### **Denver Office**

1630 Welton Street  
Suite 918  
Denver, Colorado 80202  
Phone 303.263.4050

#### **Minneapolis Office**

225 South 6th Street  
Suite 3900  
Minneapolis, Minnesota 55402  
Phone 612.325.6184