

## **Methodology Used to Risk-Adjust Data**

WHA Information Center, LLC (WHAIC) uses computer software (3M™ Core Grouping Software which includes 3M™ APR- DRG Software) to assign the APR-DRG to each hospitalization.

The APR-DRGs are an expansion of DRGs, a patient classification system used by the Centers for Medicare and Medicaid Services to relate hospital case mix to cost, or hospital resources consumed. The APR-DRGs were developed in response to the demand for a patient classification system with applicability beyond assessments of resource use - one that can be used to evaluate differences in outcomes such as inpatient mortality.

APR-DRGs expand basic DRGs through the addition of four subclasses that address distinct patient attributes related to severity of illness and risk of mortality.

Severity of illness denotes the extent of physiologic de-compensation or organ-system loss of function experienced by the patient, while risk of mortality refers to the likelihood of dying. The four severity-of-illness subclasses and four risk-of-mortality subclasses denote minor, moderate, major and extreme severity of illness and risk of mortality. Patients with the highest severity of illness and/or risk of mortality are characterized by the presence of multiple serious diseases.<sup>1</sup>

Assignment to APR-DRG severity-of-illness and risk-of-mortality subclasses takes into consideration principal diagnosis, secondary diagnoses and their combinations (comorbidities), patient age and sex, and the presence of certain OR (operating room) and non-OR procedures.

The 3M™ Core Grouping Software uses patient attributes to calculate a severity-of-illness score and a risk-of-mortality score for each relevant patient data record in a hospital inpatient data file. These scores are added to the record and are used as variables in the calculation of risk-adjusted mortality and utilization rates for hospitals.

To calculate the risk adjusted value the following methodology was used. The Actual Average Charge for each APR-DRG statewide is calculated using the four severity-of-illness levels. Then the Actual Average Charge and the Expected Average Charge are calculated using the four severity-of-illness levels for each APR-DRG for three groups; 1) each hospital, 2) each Analysis Area, and 3) each Volume Group. Then the Actual Average value for each APR-DRG for each of the three groups is divided by the Expected Average Charge for that APR-DRG/group, then multiplied by the Statewide Actual Average Charge for that APR-DRG. This produces a Risk Adjusted Charge for each of the APR-DRG/groups.

Comparison of these values will point out variations due to factors other than differences in patient risk. Groups of patients, such as those in different hospitals, may be compared as if they were all like the average patient in their APR-DRG.

## **Technical Notes**

The total for Firearms, Assault in Table 13 differs from the total for Firearms & Explosives in Table 24 because Table 13 includes all Assaults by Firearms including those that were due to Legal Intervention (police action). Table 24 includes Assaults by Firearms excluding those that were due to Legal Intervention and also includes Assaults by Explosion.

## U.S. Census Population

Population rates throughout this report were calculated from U.S. Census Bureau Information.

Table 1: PEPANNRES 2019 Population Estimates for Wisconsin Counties

Source: Population Division, U.S. Census Bureau <http://www.census.gov>

Release Date: May 2020

County	Analysis Area Code	Analysis Area Description	Population Census	Analysis Area Total
Columbia	1	Southern	57,532	
Dane	1	Southern	546,695	
Dodge	1	Southern	87,839	
Grant	1	Southern	51,439	
Green	1	Southern	36,960	
Iowa	1	Southern	23,678	
Jefferson	1	Southern	84,769	
Lafayette	1	Southern	16,665	
Richland	1	Southern	17,252	
Rock	1	Southern	163,354	
Sauk	1	Southern	64,442	
		<b>Southern</b>		<b>1,150,625</b>
Kenosha	2A	Southeastern	169,561	
Ozaukee	2A	Southeastern	89,221	
Racine	2A	Southeastern	196,311	
Walworth	2A	Southeastern	103,868	
Washington	2A	Southeastern	136,034	
Waukesha	2A	Southeastern	404,198	
		<b>Southeastern</b>		<b>1,099,193</b>
Milwaukee	2B	Milwaukee County	945,726	
		<b>Milwaukee County</b>		<b>945,726</b>
Calumet	3	Lake Winnebago	50,089	
Fond du Lac	3	Lake Winnebago	103,403	
Green Lake	3	Lake Winnebago	18,913	
Marquette	3	Lake Winnebago	15,574	
Outagamie	3	Lake Winnebago	187,885	
Waupaca	3	Lake Winnebago	50,990	
Waushara	3	Lake Winnebago	24,443	
Winnebago	3	Lake Winnebago	171,907	
		<b>Lake Winnebago</b>		<b>623,204</b>
Brown	4	Northeastern	264,542	
Door	4	Northeastern	27,668	
Kewaunee	4	Northeastern	20,434	
Manitowoc	4	Northeastern	78,981	
Marinette	4	Northeastern	40,350	
Menominee	4	Northeastern	4,556	
Oconto	4	Northeastern	37,930	
Shawano	4	Northeastern	40,899	
Sheboygan	4	Northeastern	115,340	
		<b>Northeastern</b>		<b>630,700</b>

County	Analysis Area Code	Analysis Area Description	Population Census	Analysis Area Total
Barron	5A	West Central	45,244	
Chippewa	5A	West Central	64,658	
Clark	5A	West Central	34,774	
Dunn	5A	West Central	45,368	
Eau Claire	5A	West Central	104,646	
Pepin	5A	West Central	7,287	
Pierce	5A	West Central	42,754	
Polk	5A	West Central	43,783	
Rusk	5A	West Central	14,178	
St. Croix	5A	West Central	90,687	
		<b>West Central</b>		<b>493,379</b>
Buffalo	5B	Southwestern	13,031	
Crawford	5B	Southwestern	16,131	
Jackson	5B	Southwestern	20,643	
La Crosse	5B	Southwestern	118,016	
Monroe	5B	Southwestern	46,253	
Trempealeau	5B	Southwestern	29,649	
Vernon	5B	Southwestern	30,822	
		<b>Southwestern</b>		<b>274,545</b>
Adams	6	North Central	20,220	
Florence	6	North Central	4,295	
Forest	6	North Central	9,004	
Juneau	6	North Central	26,687	
Langlade	6	North Central	19,189	
Lincoln	6	North Central	27,593	
Marathon	6	North Central	135,692	
Oneida	6	North Central	35,595	
Portage	6	North Central	70,772	
Taylor	6	North Central	20,343	
Vilas	6	North Central	22,195	
Wood	6	North Central	72,999	
		<b>North Central</b>		<b>464,584</b>
Ashland	7	Western Lake Superior	15,562	
Bayfield	7	Western Lake Superior	15,036	
Burnett	7	Western Lake Superior	15,414	
Douglas	7	Western Lake Superior	43,150	
Iron	7	Western Lake Superior	5,687	
Price	7	Western Lake Superior	13,351	
Sawyer	7	Western Lake Superior	16,558	
Washburn	7	Western Lake Superior	15,720	
		<b>Western Lake Superior</b>		<b>140,478</b>
			<b>5,822,434</b>	<b>5,822,434</b>

Table 2: PEPAGESEX 2019 Age/Sex Population Estimates for Wisconsin  
Source: Population Division, U.S. Census Bureau <http://www.census.gov>  
Release Date: June 2020

<b>Both Sexes</b>				
<b>Age Group</b>	<b>Population Estimate</b>	<b>Inpatient Age Group Total</b>	<b>Ambulatory Surgery Data Age Group Total</b>	<b>Emergency Department Data Age Group Total</b>
Under 5 years	330,496			
5 to 9 years	347,240			
10 to 14 years	366,791	1,044,527	1,044,527	1,044,527
15 to 19 years	377,568	377,568		
20 to 24 years	390,572	390,572		768,140
25 to 29 years	379,644			
30 to 34 years	361,578	741,222		
35 to 39 years	373,501			
40 to 44 years	339,574	713,075	2,222,437	1,454,297
45 to 49 years	342,984			
50 to 54 years	372,225	715,209		
55 to 59 years	422,240			
60 to 64 years	400,778	823,018	1,538,227	1,538,227
65 to 69 years	338,616			
70 to 74 years	256,132	594,748		594,748
75 to 79 years	175,288			
80 to 84 years	118,898	294,186		
85 years and over	128,309	128,309	1,017,243	422,495
	5,822,434	5,822,434	5,822,434	5,822,434

<b>Male</b>				
<b>Age Group</b>	<b>Population Estimate</b>	<b>Inpatient Age Group Total</b>	<b>Ambulatory Surgery Data Age Group Total</b>	<b>Emergency Department Data Age Group Total</b>
Under 5 years	168,701			
5 to 9 years	177,736			
10 to 14 years	187,556	533,993	533,993	533,993
15 to 19 years	192,751	192,751		
20 to 24 years	198,773	198,773		391,524
25 to 29 years	195,545			
30 to 34 years	184,962	380,507		
35 to 39 years	188,602			
40 to 44 years	172,101	360,703	1,132,734	741,210
45 to 49 years	172,582			
50 to 54 years	186,105	358,687		
55 to 59 years	208,601			
60 to 64 years	197,840	406,441	765,128	765,128
65 to 69 years	165,387			
70 to 74 years	123,090	288,477		288,477
75 to 79 years	80,196			
80 to 84 years	51,385	131,581		
85 years and over	45,296	45,296	465,354	176,877
	2,897,209	2,897,209	2,897,209	2,897,209

<b>Female</b>				
<b>Age Group</b>	<b>Population Estimate</b>	<b>Inpatient Age Group Total</b>	<b>Ambulatory Surgery Data Age Group Total</b>	<b>Emergency Department Data Age Group Total</b>
Under 5 years	161,795			
5 to 9 years	169,504			
10 to 14 years	179,235	510,534	510,534	510,534
15 to 19 years	184,817	184,817		
20 to 24 years	191,799	191,799		376,616
25 to 29 years	184,099			
30 to 34 years	176,616	360,715		
35 to 39 years	184,899			
40 to 44 years	167,473	352,372	1,089,703	713,087
45 to 49 years	170,402			
50 to 54 years	186,120	356,522		
55 to 59 years	213,639			
60 to 64 years	202,938	416,577	773,099	773,099
65 to 69 years	173,229			
70 to 74 years	133,042	306,271		306,271
75 to 79 years	95,092			
80 to 84 years	67,513	162,605		
85 years and over	83,013	83,013	551,889	245,618
	2,925,225	2,925,225	2,925,225	2,925,225

## External Cause Code Category Assignment

Categories and subcategories were assigned in the following manner:

1. The code ranges used in prior years were evaluated for additions, changes and deletions.
2. The descriptions of the external cause codes currently in use were scrutinized at the category grouping levels to verify accurate grouping.
3. Subcategories were assigned to delineate the differences in intent: Accidental, Self-Inflicted, Assault, or Undetermined.
4. Category assignment of external cause codes fell into the following categories/subcategories for purposes of this report:

<b>Category</b>	<b>Subcategory</b>
Assault, not elsewhere classified	Assault
Caught/Crush, not elsewhere classified	Accidental
Cut/Pierce	Accidental Self-Inflicted Assault Undetermined
Drown/Submersion	Accidental Self-Inflicted Assault Undetermined
Electric Current	Accidental Undetermined
Explosion	Accidental Self-Inflicted Assault
Falls	Accidental Self-Inflicted Assault Undetermined
Fire/Flames	Accidental Self-inflicted Assault Undetermined
Firearms	Accidental Self-Inflicted Assault Undetermined
Hot Objects/Scalds	Accidental Self-Inflicted Assault Undetermined
Jumping	Undetermined
Legal Intervention	Legal
Machinery	Accidental

<b>Category</b>	<b>Subcategory</b>
Motor Vehicle Traffic	Accidental Self-Inflicted Assault Undetermined
Natural/Environmental	Accidental Self-Inflicted Undetermined
Other Motor Vehicle Non-traffic	Accidental
Other Pedal Cycle	Accidental
Other Transport	Accidental Self-inflicted Undetermined
Other Injury, not elsewhere classified	Undetermined
Overexertion	Accidental
Poisoning	Accidental Self-Inflicted Assault Undetermined
Radiation	Accidental
Self-Inflicted, not elsewhere classified	Self-Inflicted
Striking/Struck by	Accidental Assault
Terrorism	Terrorism
War	War

## Payer Code Assignment

Payer Codes for the primary and secondary payers who are expected to pay for the inpatient stay, ambulatory surgery, or emergency department visit. Only primary payer codes are utilized for this report. The primary payer data element has a field length of 5 characters and consists of two components – the payer identifier and the payer type. The primary payer is required and compatibility between the payer identifier and the payer type components is verified.

### Code Structure for Payer Identifier

Code	Description
MED/T18	Medicare
T19	Wisconsin Medical Assistance (Medicaid)
nnn/BCS	3-digit plan code – Non-Medicaid Blue Cross/Blue Shield
CHA	CHAMPUS or CHAMPVA
BGR	Badger Care
OTH	Payer not identified above

### Code Structure for Payer Type for use with MED, T19, nnn (Blue Cross/Blue Shield), CHA, or BGR

Code	Description
01	Fee-for-service, non-HMO Medicare, or non-HMO Medicaid
02	Alternative Health Care Insurance Plans (HMO, PPO)
03	CHAMPUS or CHAMPVA
09	Unable to determine insurance type.

### Code Structure for Payer Type for use with OTH

Code	Description
11	Commercial or private insurance - fee-for-service
12	Commercial or private insurance - alternative health care insurance plan (HMO/PPO)
19	Commercial or private insurance - unable to determine insurance type
21	Employer self-funded - fee-for-service
22	Employer self-funded - alternative health care insurance plan (HMO/PPO)
29	Employer self-funded - unable to determine insurance type
31	Other organization self-funded - fee-for-service
32	Other organization self-funded - alternative health care insurance plan (HMO/PPO)
39	Other organization self-funded - unable to determine insurance type
41	Workers' Compensation
51	Non-Wisconsin Medicaid
52	51.42/ 51.437/ 46.23 County Board
54	WisconCare
55	TRICARE (CHAMPUS) supplement
59	Other government agency or program
61	Self-pay
71	Research Grant
98	Other
99	Unknown

Primary payer data submitted are converted to payer groups prior to release of data, which are included in the purchased data rather than original data submitted. The following payer groups were utilized in this report for the inpatient data individual hospital tables:



### Code Structure for Payer Code Assignment

Payer Identifier	Payer Type	Payer Group	Description
MED/T18	01	1	Medicare
MED/T18	02	1	Medicare
MED/T18	09	1	Medicare
BGR	01	2	Medicaid/BadgerCare
BGR	02	2	Medicaid/BadgerCare
BGR	09	2	Medicaid/BadgerCare
T19	01	2	Medicaid/BadgerCare
T19	02	2	Medicaid/BadgerCare
T19	09	2	Medicaid/BadgerCare
nnn <sup>1</sup> /BCS	01	4	Commercial or Private Insurance
nnn/BCS	02	4	Commercial or Private Insurance
nnn/BCS	09	4	Commercial or Private Insurance
OTH	11	4	Commercial or Private Insurance
OTH	12	4	Commercial or Private Insurance
OTH	19	4	Commercial or Private Insurance
OTH	21	4	Commercial or Private Insurance
OTH	22	4	Commercial or Private Insurance
OTH	29	4	Commercial or Private Insurance
OTH	31	4	Commercial or Private Insurance
OTH	32	4	Commercial or Private Insurance
OTH	39	4	Commercial or Private Insurance
OTH	41	4	Commercial or Private Insurance
CHA	03	3	Other Government
OTH	51	2	Medicaid, Other State
OTH	52	3	Other Government
OTH	54	3	Other Government
OTH	55	3	Other Government
OTH	56	3	Other Government
OTH	59	3	Other Government
OTH	61	5	Self-Pay
OTH	71	6	Other or Unknown
OTH	98	6	Other or Unknown
OTH	99	6	Other or Unknown

<sup>1</sup> nnn represents Blue Cross/Blue Shield plan number

## **Diagnostic Category Assignment – Rehabilitation Services**

Source: Department of Health & Human Services (DHHS), Centers for Medicare & Medicaid Services (CMS).

<https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/InpatientRehabFacPPS/index.html>