

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.¹

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.

¹ Averill RF, et al.. Development of the All Patient Refined DRGs (APR-DRGs). 3M Health Information Systems Research Report. 1997.

U.S. Census Population

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

Table 1: CO-EST2024-POP-55 2024 Population Estimates for Wisconsin Counties

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

Release Date: June 2025

County	Analysis Area Code	Analysis Area Description	Population Census	Analysis Area Total
Columbia	1	Southern	58,113	
Dane	1	Southern	588,347	
Dodge	1	Southern	88,635	
Grant	1	Southern	52,330	
Green	1	Southern	37,183	
Iowa	1	Southern	23,963	
Jefferson	1	Southern	86,245	
Lafayette	1	Southern	17,306	
Richland	1	Southern	17,123	
Rock	1	Southern	165,461	
Sauk	1	Southern	66,486	
		Southern		1,201,192
Kenosha	2A	Southeastern	168,754	
Ozaukee	2A	Southeastern	93,956	
Racine	2A	Southeastern	198,651	
Walworth	2A	Southeastern	106,029	
Washington	2A	Southeastern	138,727	
Waukesha	2A	Southeastern	417,029	
		Southeastern		1,123,146
Milwaukee	2B	Milwaukee County	924,740	
		Milwaukee County		924,740
Calumet	3	Lake Winnebago	53,602	
Fond du Lac	3	Lake Winnebago	104,269	
Green Lake	3	Lake Winnebago	19,370	
Marquette	3	Lake Winnebago	15,743	
Outagamie	3	Lake Winnebago	195,390	
Waupaca	3	Lake Winnebago	51,171	
Waushara	3	Lake Winnebago	25,079	
Winnebago	3	Lake Winnebago	173,307	
		Lake Winnebago		637,931
Brown	4	Northeastern	273,909	
Door	4	Northeastern	30,512	
Kewaunee	4	Northeastern	20,751	
Manitowoc	4	Northeastern	81,513	
Marinette	4	Northeastern	42,343	
Menominee	4	Northeastern	4,286	
Oconto	4	Northeastern	40,037	
Shawano	4	Northeastern	41,299	
Sheboygan	4	Northeastern	118,331	
		Northeastern		652,981

County	Analysis Area Code	Analysis Area Description	Population Census	Analysis Area Total
Barron	5A	West Central	46,810	
Chippewa	5A	West Central	67,323	
Clark	5A	West Central	34,801	
Dunn	5A	West Central	46,135	
Eau Claire	5A	West Central	108,830	
Pepin	5A	West Central	7,555	
Pierce	5A	West Central	43,380	
Polk	5A	West Central	45,831	
Rusk	5A	West Central	14,168	
St. Croix	5A	West Central	97,954	
		West Central		512,787
Buffalo	5B	Southwestern	13,464	
Crawford	5B	Southwestern	16,008	
Jackson	5B	Southwestern	21,027	
La Crosse	5B	Southwestern	121,060	
Monroe	5B	Southwestern	46,370	
Trempealeau	5B	Southwestern	30,801	
Vernon	5B	Southwestern	31,351	
		Southwestern		280,081
Adams	6	North Central	21,352	
Florence	6	North Central	4,673	
Forest	6	North Central	9,506	
Juneau	6	North Central	26,590	
Langlade	6	North Central	19,535	
Lincoln	6	North Central	28,461	
Marathon	6	North Central	139,091	
Oneida	6	North Central	38,175	
Portage	6	North Central	72,040	
Taylor	6	North Central	20,167	
Vilas	6	North Central	23,948	
Wood	6	North Central	73,943	
		North Central		477,481
Ashland	7	Western Lake Superior	16,196	
Bayfield	7	Western Lake Superior	16,838	
Burnett	7	Western Lake Superior	17,187	
Douglas	7	Western Lake Superior	44,276	
Iron	7	Western Lake Superior	6,235	
Price	7	Western Lake Superior	14,087	
Sawyer	7	Western Lake Superior	18,835	
Washburn	7	Western Lake Superior	16,982	
		Western Lake Superior		150,636
			5,960,975	5,960,975

Table 2: CC-EST2024-AGESEX-55 2024 Age/Sex Population Estimates for Wisconsin
Source: Population Division, U.S. Census Bureau <https://www.census.gov>
Release Date: June 2025

<u>Both Sexes</u>				
Age Group	Population Estimate	Inpatient Age Group Total	Ambulatory Surgery Data Age Group Total	Emergency Department Data Age Group Total
Under 5 years	307,868			
5 to 9 years	340,691			
10 to 14 years	357,267	1,005,826	1,005,826	1,005,826
15 to 19 years	393,411	393,411		
20 to 24 years	406,315	406,315		799,726
25 to 29 years	373,247			
30 to 34 years	381,437	754,684		
35 to 39 years	372,922			
40 to 44 years	382,082	755,004	2,309,414	1,509,688
45 to 49 years	344,851			
50 to 54 years	344,460	689,311		
55 to 59 years	372,404			
60 to 64 years	415,287	787,691	1,477,002	1,477,002
65 to 69 years	383,725			
70 to 74 years	312,908	696,633		696,633
75 to 79 years	221,312			
80 to 84 years	132,851	354,163		
85 years and over	117,937	117,937	1,168,733	472,100
	5,960,975	5,960,975	5,960,975	5,960,975

<u>Male</u>				
Age Group	Population Estimate	Inpatient Age Group Total	Ambulatory Surgery Data Age Group Total	Emergency Department Data Age Group Total
Under 5 years	157,500			
5 to 9 years	174,680			
10 to 14 years	183,144	515,324	515,324	515,324
15 to 19 years	202,038	202,038		
20 to 24 years	207,227	207,227		409,265
25 to 29 years	191,895			
30 to 34 years	194,194	386,089		
35 to 39 years	189,868			
40 to 44 years	194,297	384,165	1,179,519	770,254
45 to 49 years	175,332			
50 to 54 years	174,701	350,033		
55 to 59 years	186,762			
60 to 64 years	206,052	392,814	742,847	742,847
65 to 69 years	189,180			
70 to 74 years	151,640	340,820		340,820
75 to 79 years	104,462			
80 to 84 years	58,444	162,906		
85 years and over	44,026	44,026	547,752	206,932
	2,985,442	2,985,442	2,985,442	2,985,442

<u>Female</u>				
Age Group	Population Estimate	Inpatient Age Group Total	Ambulatory Surgery Data Age Group Total	Emergency Department Data Age Group Total
Under 5 years	150,368			
5 to 9 years	166,011			
10 to 14 years	174,123	490,502	490,502	490,502
15 to 19 years	191,373	191,373		
20 to 24 years	199,088	199,088		390,461
25 to 29 years	181,352			
30 to 34 years	187,243	368,595		
35 to 39 years	183,054			
40 to 44 years	187,785	370,839	1,129,895	739,434
45 to 49 years	169,519			
50 to 54 years	169,759	339,278		
55 to 59 years	185,642			
60 to 64 years	209,235	394,877	734,155	734,155
65 to 69 years	194,545			
70 to 74 years	161,268	355,813		355,813
75 to 79 years	116,850			
80 to 84 years	74,407	191,257		
85 years and over	73,911	73,911	620,981	265,168
	2,975,533	2,975,533	2,975,533	2,975,533

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:

Category	Subcategory
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

Category	Subcategory
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

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>