Wisconsin County Health Rankings
2007

environment • socioeconomics • behaviors
health care • health status • mortality

University of Wisconsin
SCHOOL OF MEDICINE AND PUBLIC HEALTH
University of Wisconsin Population Health Institute
Department of Population Health Sciences

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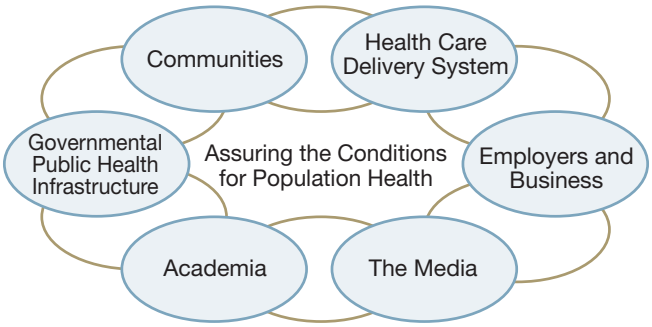
Jessica Athens is a graduate student; Bridget Booske is a senior scientist; Kyla Taylor is a graduate student; Angela Rohan is a graduate student; and Patrick Remington is director of the University of Wisconsin Population Health Institute.

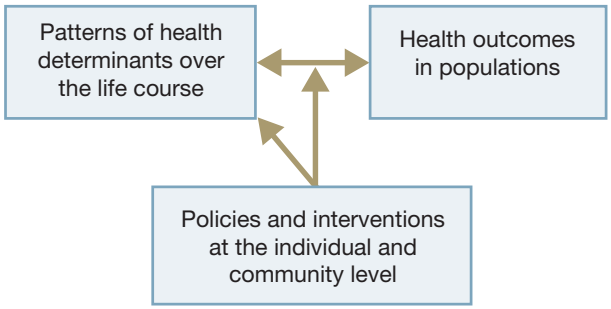
Introduction

The University of Wisconsin Population Health Institute is pleased to present the 2007 *Wisconsin County Health Rankings*. Now in its fifth year, the *Rankings* are designed to summarize the current health of the counties, as well as the distribution of key factors that determine future health. By taking a broad perspective on the factors that influence health—health care, health behaviors, socio-economic factors, and the physical environment—we hope to encourage all types of community stakeholders to work with health departments and health care providers as partners in the public health system (see image at right). We hope these new partnerships will serve to improve Wisconsin's health, as well as provide a model for others to follow in monitoring population health.



Source: IOM, 2002.[2]

The *Wisconsin County Health Rankings* is based upon the model of population health improvement shown below. In this paradigm health outcomes are considered the result of a set of health determinants and their distribution in the population. These determining factors and their outcomes may also be affected by policies or interventions designed to alter their distribution in the community. Counties and cities can play a significant role in improving health through the adoption of appropriate programs and policies.



Source: Kindig and Stoddart, 2003.[1]

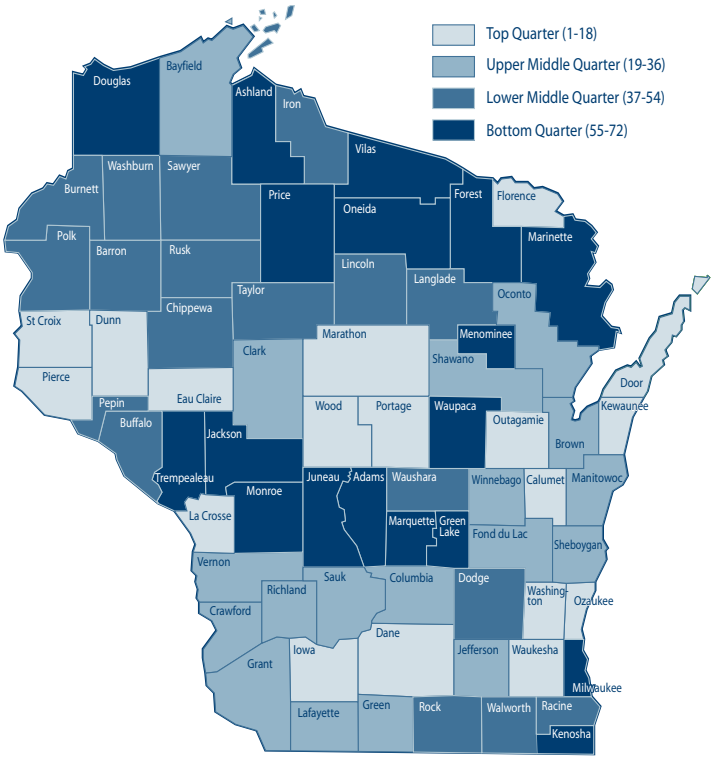
To compile the *Rankings*, we have selected a number of population health determinants based on the health priorities of the Wisconsin State Health Plan, scientific relevance, importance, and availability of data at the county and city level. For a more detailed explanation of the choice of measures, see the 2007 *Wisconsin County Health Rankings Full Report*.[3]

Two special features are included in the *Rankings* this year. The first special feature is an in-depth look at county mortality by life stage. Examining life stage mortality helps identify causes of death and indicates where it may be appropriate to focus interventions. The second feature presents measures of inpatient quality of care by county, including rates of coronary artery bypass grafts (CABG), percutaneous angioplasty (PTCA), and post-operative hemorrhage and hematoma, in an effort to expand our quality of health care measures.

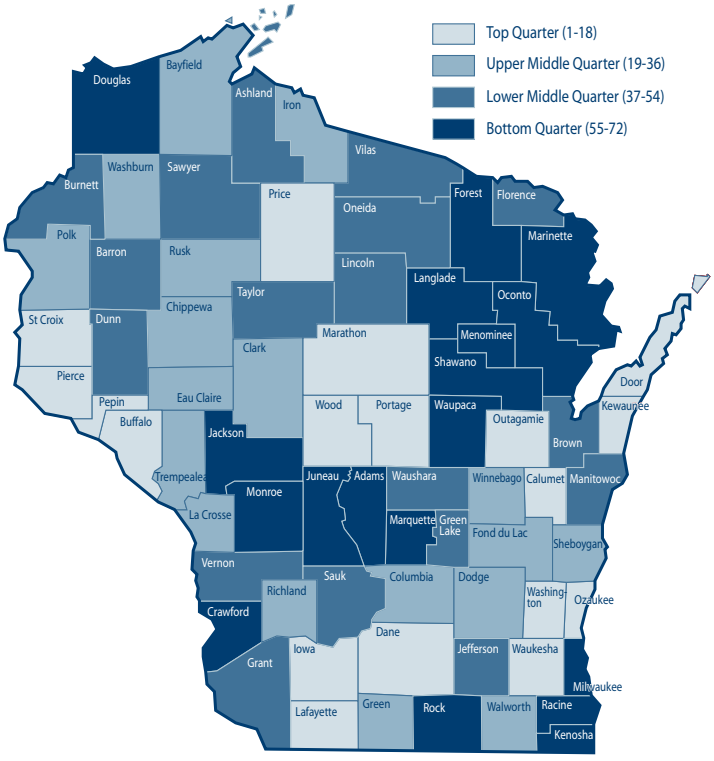
A few changes have been made this year to the *Rankings*, including:

- Instead of reporting motor vehicle crash deaths, we report motor vehicle crash occupancy, as well as motor vehicle crash-related emergency room visits for traffic and non-traffic (ATVs, snowmobiles, etc.) accidents.
- To enhance the measures we compile on the physical environment, we added data on radon risk and commuting method.

Health Outcomes by Quartile



Health Determinants by Quartile



The maps on this page display Wisconsin's counties divided into quartiles by health rank. The lighter colors indicate better performance in the respective summary rankings. The map in the upper right corner shows the distribution of summary health outcomes. The map in the lower right corner displays the distribution of summary health determinants.

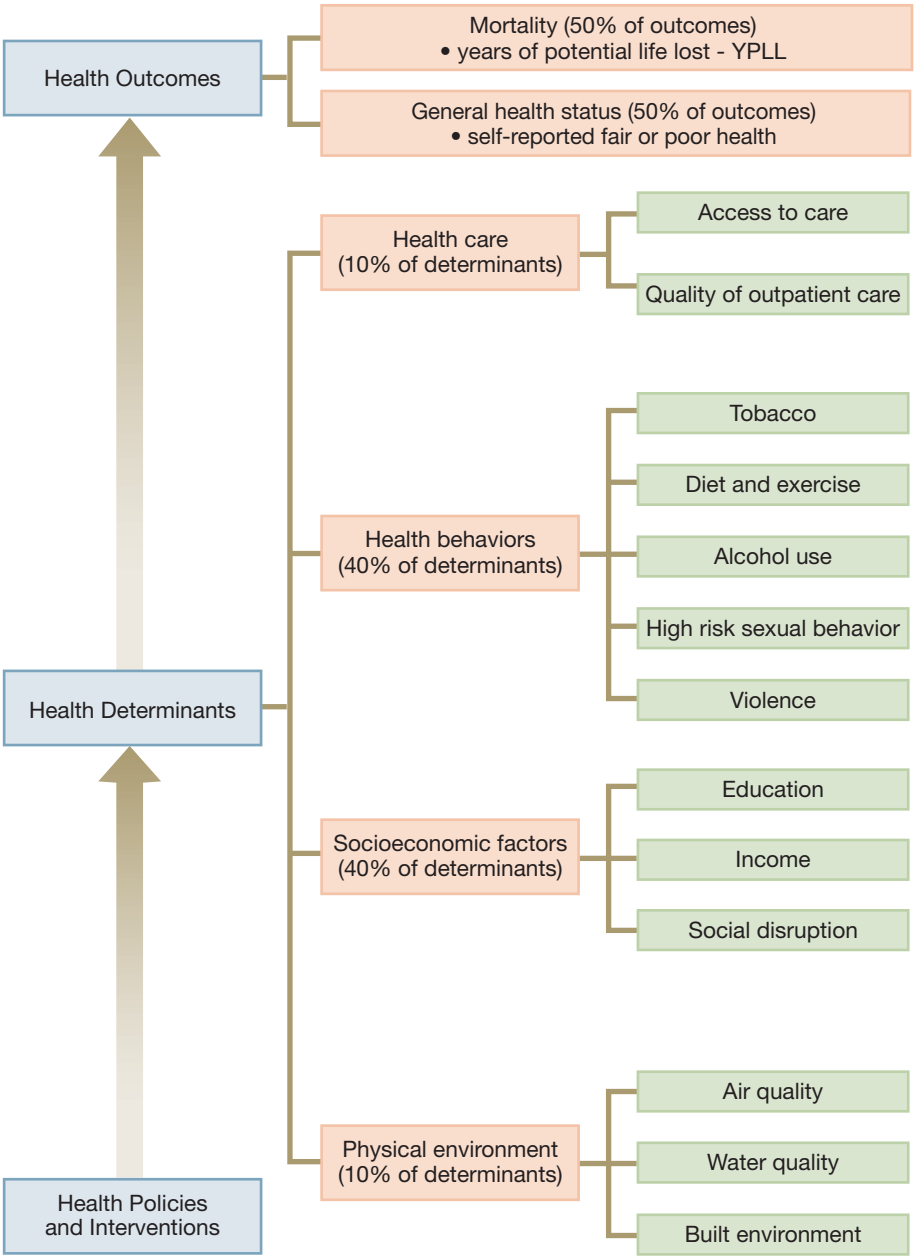
Through the visual display of the distribution of health outcomes and determinants, maps aid in identifying patterns in regional distribution. In addition, it becomes easier to visualize the relationship between determinants and outcomes, as the distribution of the two closely mirror each other.

We expect high performing counties in the health outcomes map to be currently or historically high performing counties in the health determinants map.

The Rankings

This report ranks Wisconsin's counties and the City of Milwaukee according to their summary measures of **health outcomes** and **health determinants**, as well as the components used to create each summary measure. The figure below depicts the structure of the *Rankings*. Places receive a rank for each population health component; those having high ranks (e.g., 1 or 2) are estimated to be the "healthiest."

Our summary **health outcomes** rankings are based on an equal weighting of two measures: mortality and general health status. **Health determinants** are based on weighted scores of four major components: health care, health behaviors, socioeconomic factors, and the physical environment. The weights for the components (shown in parentheses in the figure) are based upon a review of the literature and expert input, but represent just one way of combining the components.

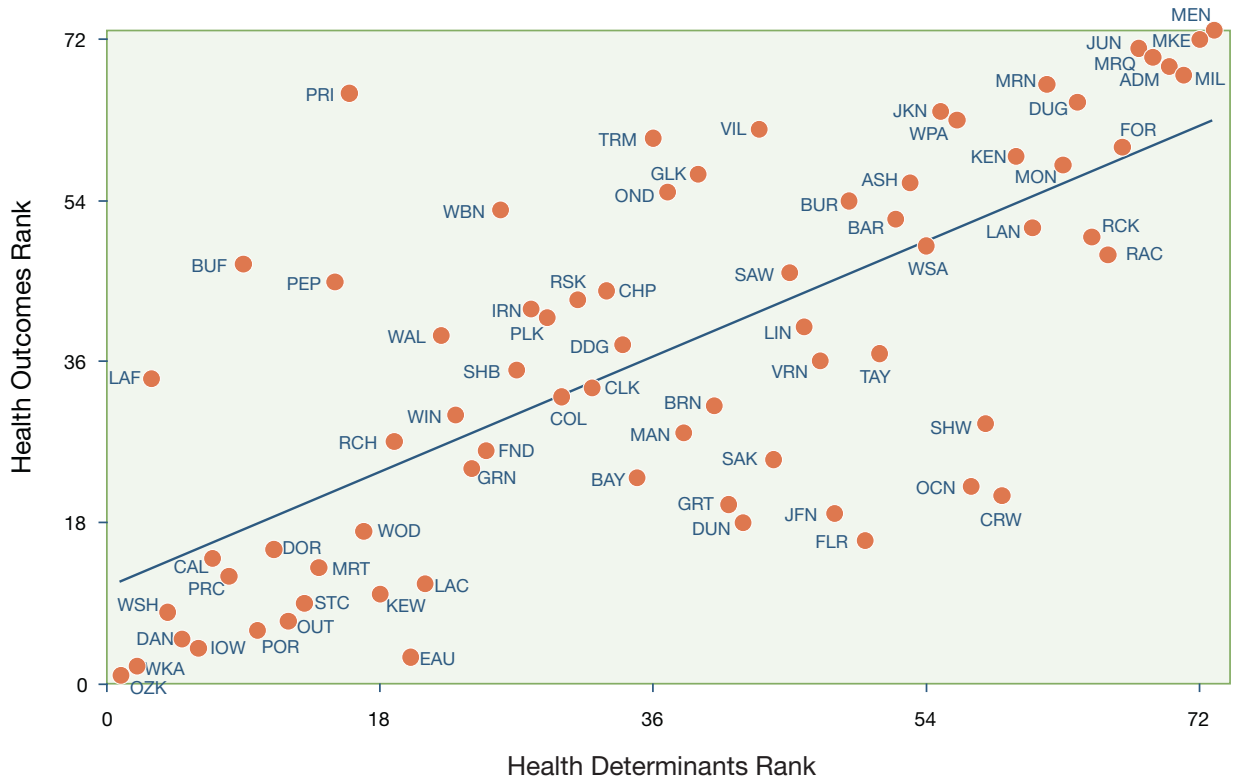


Summary Health Outcomes and Determinants Rankings

The table on the facing page presents the overall summary population health ranking for **health outcomes** and **health determinants**. Each of these rankings represents a weighted summary of a number of individual health measures.

As predicted by the model, the rankings of current health outcomes and current health determinants are closely related. This can be seen in the figure below where each county's outcomes rank is plotted against its determinants rank (each county is represented by a three letter code). The correlation between the outcomes and determinants is strong (correlation coefficient = 0.72).

No one county ranks highest in one aspect of the *Rankings* and lowest in the other, but there is some variation. Price County, for example, ranks well (16th) in determinants, but significantly lower (66th) in outcomes. Since health determinants are indicators of future health, Price County, and other counties where their determinants rank is higher than their outcomes rank, may see an improvement in future health outcomes. This lag may be a result of recently instituted policies and programs that have not yet resulted in improvements in community well-being. Likewise, counties that rank low in health determinants may experience declining population health outcomes in the future.



Summary 2007 Population Health Rankings for 73 Wisconsin Places
Ranks for Health Outcomes and Determinants

RANK	HEALTH OUTCOMES	HEALTH DETERMINANTS
1	Ozaukee	Ozaukee
2	Waukesha	Waukesha
3	Eau Claire	Lafayette
4	Iowa	Washington
5	Dane	Dane
6	Portage	Iowa
7	Outagamie	Calumet
8	Washington	Pierce
9	St. Croix	Buffalo
10	Kewaunee	Portage
11	La Crosse	Door
12	Pierce	Outagamie
13	Marathon	St. Croix
14	Calumet	Marathon
15	Door	Pepin
16	Florence	Price
17	Wood	Wood
18	Dunn	Kewaunee
19	Jefferson	Richland
20	Grant	Eau Claire
21	Crawford	La Crosse
22	Oconto	Walworth
23	Bayfield	Winnebago
24	Green	Green
25	Sauk	Fond du Lac
26	Fond du Lac	Washburn
27	Richland	Sheboygan
28	Manitowoc	Iron
29	Shawano	Polk
30	Winnebago	Columbia
31	Brown	Rusk
32	Columbia	Clark
33	Clark	Chippewa
34	Lafayette	Dodge
35	Sheboygan	Bayfield
36	Vernon	Trempealeau
37	Taylor	Oneida
38	Dodge	Manitowoc
39	Walworth	Green Lake
40	Lincoln	Brown
41	Polk	Grant
42	Iron	Dunn
43	Rusk	Vilas
44	Chippewa	Sauk
45	Pepin	Sawyer
46	Sawyer	Lincoln
47	Buffalo	Vernon
48	Racine	Jefferson
49	Waushara	Burnett
50	Rock	Florence
51	Langlade	Taylor
52	Barron	Barron
53	Washburn	Ashland
54	Burnett	Waushara
55	Oneida	Jackson
56	Ashland	Waupaca
57	Green Lake	Oconto
58	Monroe	Shawano
59	Kenosha	Crawford
60	Forest	Kenosha
61	Trempealeau	Langlade
62	Vilas	Marinette
63	Waupaca	Monroe
64	Jackson	Douglas
65	Douglas	Rock
66	Price	Racine
67	Marinette	Forest
68	Milwaukee County	Juneau
69	Adams	Marquette
70	Marquette	Adams
71	Juneau	Milwaukee County
72	Milwaukee City	Milwaukee City
73	Menominee	Menominee

Outcomes Components Ranking

The summary health outcomes rankings are based on two components: mortality and general health status. The rank and actual values for each place are displayed here.

Mortality is measured as years of potential life lost prior to age 75 (YPLL). This is an indicator of county mortality that accounts for the age at which a person dies; persons who die at a younger age are considered to have lost more "potential" years of life.[4] For example, persons who die at age 65 are considered to have lost 10 "potential" years of life. YPLL is age-adjusted and represented as a rate per 100,000 people. The average years of potential life lost from 2003-2005 for the entire state was 6,086 years per 100,000 people.

General Health Status is measured as the percent of the population that reports fair or poor health. The data are based on responses to the telephone survey question, "In general, would you say that your health is excellent, very good, good, fair, or poor?" The age-adjusted percentage of people reporting fair or poor health is displayed in the table. We combine responses from two random-digit dial surveys, the Wisconsin Behavioral Risk Factor Surveillance System (BRFSS) and the Family Health Survey (FHS), to provide these estimates. For the entire state, on average, 13.1% of people reported fair or poor health.

RANK	MORTALITY: YEARS OF POTENTIAL LIFE LOST (YPLL)		RANK	GENERAL HEALTH STATUS: % WITH FAIR/POOR HEALTH	
1	Ozaukee	4,039 years	1	Iowa	6.4%
2	Calumet	4,060 years	2	Ozaukee	7.9%
3	Waukesha	4,255 years	3	Florence	8.4%
4	Pepin	4,609 years	4	Waukesha	8.5%
5	Portage	4,664 years	5	Grant	9.0%
6	St. Croix	4,684 years	6	Eau Claire	9.2%
7	Washington	4,754 years	7	Sawyer	9.4%
8	Eau Claire	4,771 years	8	Outagamie	9.6%
9	Dane	4,842 years	9	Dane	9.8%
10	Manitowoc	5,042 years	10	Oconto	9.8%
11	Kewaunee	5,096 years	11	Marathon	10.1%
12	Wood	5,097 years	12	Pierce	10.1%
13	Outagamie	5,117 years	13	Kewaunee	10.3%
14	La Crosse	5,176 years	14	Washington	10.3%
15	Dunn	5,185 years	15	Portage	10.4%
16	Richland	5,217 years	16	Door	10.4%
17	Buffalo	5,273 years	17	La Crosse	10.5%
18	Shawano	5,312 years	18	Clark	10.5%
19	Pierce	5,399 years	19	Iron	10.7%
20	Marathon	5,482 years	20	Jefferson	10.8%
21	Door	5,498 years	21	St. Croix	11.0%
22	Winnebago	5,507 years	22	Bayfield	11.0%
23	Brown	5,515 years	23	Crawford	11.2%
24	Walworth	5,533 years	24	Lafayette	11.6%
25	Taylor	5,584 years	25	Sauk	11.6%
26	Green	5,614 years	26	Vernon	11.8%
27	Polk	5,622 years	27	Dunn	11.9%
28	Fond du Lac	5,714 years	28	Wood	12.0%
29	Jefferson	5,718 years	29	Green	12.0%
30	Crawford	5,724 years	30	Jackson	12.2%
31	Columbia	5,828 years	31	Fond du Lac	12.2%
32	Chippewa	5,829 years	32	Sheboygan	12.3%
33	Lincoln	5,870 years	33	Columbia	12.4%
34	Sauk	5,886 years	34	Rusk	12.9%
35	Dodge	5,951 years	35	Dodge	12.9%
36	Bayfield	5,982 years	36	Winnebago	12.9%
37	Vilas	6,053 years	37	Racine	13.0%
38	Sheboygan	6,060 years	38	Brown	13.0%
39	Green Lake	6,062 years	39	Washburn	13.0%
40	Forest	6,142 years	40	Ashland	13.1%
41	Iowa	6,329 years	41	Calumet	13.2%
42	Vernon	6,375 years	42	Lincoln	13.2%
43	Lafayette	6,391 years	43	Richland	13.3%
44	Waupaca	6,446 years	44	Shawano	13.3%
45	Oconto	6,492 years	45	Taylor	13.6%
46	Waushara	6,537 years	46	Burnett	13.6%
47	Trempealeau	6,543 years	47	Manitowoc	13.8%
48	Oneida	6,577 years	48	Waushara	13.8%
49	Florence	6,594 years	49	Walworth	13.8%
50	Barron	6,605 years	50	Rock	14.1%
51	Langlade	6,620 years	51	Polk	14.1%
52	Rock	6,640 years	52	Langlade	14.2%
53	Grant	6,701 years	53	Barron	14.4%
54	Rusk	6,713 years	54	Chippewa	14.7%
55	Monroe	6,790 years	55	Kenosha	14.9%
56	Clark	6,792 years	56	Monroe	15.0%
57	Racine	6,838 years	57	Douglas	15.2%
58	Kenosha	6,893 years	58	Oneida	15.3%
59	Burnett	7,196 years	59	Milwaukee County	15.9%
60	Marinette	7,405 years	60	Trempealeau	15.9%
61	Douglas	7,439 years	61	Buffalo	16.0%
62	Washburn	7,466 years	62	Price	16.3%
63	Iron	7,587 years	63	Green Lake	16.4%
64	Adams	7,647 years	64	Forest	16.6%
65	Ashland	7,660 years	65	Waupaca	16.6%
66	Price	7,688 years	66	Marinette	17.0%
67	Juneau	7,752 years	67	Pepin	17.2%
68	Marquette	8,082 years	68	Vilas	17.3%
69	Sawyer	8,474 years	69	Adams	17.8%
70	Milwaukee County	8,507 years	70	Marquette	19.0%
71	Jackson	8,875 years	71	Milwaukee City	19.1%
72	Milwaukee City	10,632 years	72	Juneau	20.7%
73	Menominee	14,372 years	73	Menominee	21.3%

Determinants Components Ranking

RANK	HEALTH CARE	HEALTH BEHAVIORS	SOCIOECONOMIC FACTORS	PHYSICAL ENVIRONMENT
1	Outagamie	Ozaukee	Ozaukee	Bayfield
2	Eau Claire	Waukesha	Waukesha	Sawyer
3	Wood	Lafayette	Calumet	Menominee
4	Ozaukee	Iron	Washington	Vilas
5	Portage	Rusk	Kewaunee	Iron
6	Washington	Price	Pierce	Ashland
7	Marathon	Dane	St. Croix	Washburn
8	Winnebago	Iowa	Dane	Price
9	Door	Washington	Outagamie	Burnett
10	Waukesha	Richland	Iowa	Oconto
11	Manitowoc	Washburn	Portage	Forest
12	Jefferson	Buffalo	La Crosse	Rusk
13	Brown	Door	Buffalo	Oneida
14	Calumet	Sawyer	Lafayette	Marinette
15	Bayfield	Walworth	Eau Claire	Taylor
16	Trempealeau	Bayfield	Pepin	Florence
17	Fond du Lac	Clark	Grant	Juneau
18	La Crosse	Wood	Marathon	Vernon
19	Dane	Portage	Sheboygan	Jackson
20	Sheboygan	Florence	Door	Douglas
21	Pepin	Polk	Dunn	Lafayette
22	Sauk	Marathon	Manitowoc	Pepin
23	Vilas	Green	Columbia	Barron
24	St. Croix	Burnett	Winnebago	Richland
25	Oneida	Calumet	Fond du Lac	Buffalo
26	Lincoln	Chippewa	Wood	Polk
27	Chippewa	Pierce	Green	Marquette
28	Douglas	Oneida	Dodge	Adams
29	Kewaunee	Vernon	Walworth	Grant
30	Rusk	Fond du Lac	Jefferson	Iowa
31	Green	Pepin	Green Lake	Trempealeau
32	Walworth	La Crosse	Sauk	Crawford
33	Dodge	Winnebago	Lincoln	Waushara
34	Rock	Ashland	Richland	Green Lake
35	Green Lake	Columbia	Taylor	Dunn
36	Lafayette	Vilas	Chippewa	Clark
37	Columbia	Sheboygan	Trempealeau	Kewaunee
38	Barron	St. Croix	Waupaca	Pierce
39	Waupaca	Trempealeau	Brown	Brown
40	Langlade	Outagamie	Polk	Eau Claire
41	Polk	Dodge	Price	Walworth
42	Marinette	Barron	Clark	Dodge
43	Clark	Eau Claire	Shawano	Outagamie
44	Racine	Brown	Jackson	Langlade
45	Washburn	Green Lake	Crawford	Manitowoc
46	Pierce	Waushara	Waushara	Green
47	Price	Kenosha	Vernon	Shawano
48	Grant	Milwaukee County	Washburn	Monroe
49	Iowa	Lincoln	Oconto	Milwaukee City
50	Kenosha	Forest	Langlade	Winnebago
51	Sawyer	Sauk	Barron	Jefferson
52	Richland	Racine	Monroe	Fond du Lac
53	Burnett	Crawford	Oneida	Ozaukee
54	Dunn	Kewaunee	Vilas	Sauk
55	Shawano	Rock	Marquette	Columbia
56	Oconto	Taylor	Ashland	St. Croix
57	Florence	Jackson	Marinette	Sheboygan
58	Buffalo	Shawano	Kenosha	Door
59	Milwaukee County	Dunn	Iron	Kenosha
60	Jackson	Oconto	Burnett	Wood
61	Monroe	Juneau	Florence	Milwaukee County
62	Waushara	Waupaca	Rock	Racine
63	Forest	Jefferson	Bayfield	Lincoln
64	Taylor	Manitowoc	Rusk	Waupaca
65	Milwaukee City	Grant	Sawyer	Chippewa
66	Ashland	Langlade	Douglas	Waukesha
67	Vernon	Adams	Juneau	La Crosse
68	Adams	Douglas	Racine	Marathon
69	Iron	Monroe	Adams	Calumet
70	Marquette	Marinette	Forest	Washington
71	Crawford	Milwaukee City	Milwaukee County	Portage
72	Juneau	Marquette	Milwaukee City	Dane
73	Menominee	Menominee	Menominee	Rock

Places are ranked in the table to the left, according to measures representing four major categories of health determinants.

Each of these categories reflects a composite of multiple health measures that are summarized to create the component-level rankings (see the figure on page 3 for a list of the health constructs corresponding to the major components ranked here). For example, the health care rank is calculated from data on health insurance coverage, forgoing needed care, recent dental visits, diabetic care quality, and biennial mammography rates.

Comparisons to previous years' rankings for each component should be made with caution. Each year we re-evaluate the measures within each component to ensure that we incorporate the most valid and reliable measures available. Although we have kept most measures the same over the years, we have changed some measures in order to represent more accurately the health of Wisconsin's communities. Information about the details of each measure is included in the *Full Report*.

Special Feature: County Mortality Rates by Life Stage in Wisconsin

The *Rankings* examines premature mortality at the county level, but within each county, mortality rates for different age groups can vary considerably. Furthermore, a county's mortality rate for a specific age group may compare more or less favorably with other counties than its overall mortality rate. Low overall county mortality rates can mask higher than average mortality rates among select age groups. In the same way, high overall county mortality rates may hide lower than average mortality rates of some age groups. Looking at county health outcomes for various age groups can provide additional information regarding where the greatest need for health improvement programs might be within counties.

When looking at county mortality by age group, it is helpful to look for patterns that emerge. Some counties may have consistently high rank, such as Calumet, Ozaukee, and Wood counties. However, some other high-ranking counties may have lower ranks for certain age groups. Conversely, some counties with lower rank for overall mortality may rank high in select age groups. Variations in ranks across age groups warrant further investigation. A caveat that accompanies the use of mortality data by age group is that age-specific mortality rates result in more error in point estimates because of smaller population sizes. (We used 10 years of mortality in this analysis to minimize the potential for this error.) As a result, we recommend using such information only as a screening tool to identify new areas for additional research and potential interventions.

Examining health outcomes and determinants data, when possible, for smaller subgroups of a county's population defined by characteristics such as age, gender, race, or income can be helpful for program planning and targeting resources.

Source: All data are from WISH for 1996-2005 and are age-adjusted (except for infants).

County	Infants	Age 1-14	Age 15-24	Age 25-64	Age 65+
Adams	68	25	67	58	38
Ashland	20	10	24	68	69
Barron	28	56	43	46	35
Bayfield	71	1	64	51	36
Brown	51	36	20	15	17
Buffalo	15	68	57	37	6
Burnett	50	48	69	66	41
Calumet	5	8	14	1	3
Chippewa	34	38	36	23	34
Clark	45	69	41	29	11
Columbia	40	44	56	31	63
Crawford	2	52	13	30	60
Dane	27	27	5	9	14
Dodge	43	33	30	43	65
Door	47	46	54	18	24
Douglas	41	26	32	65	70
Dunn	9	55	2	21	2
Eau Claire	13	20	1	11	10
Florence	1	70	19	28	37
Fond du Lac	37	30	21	22	33
Forest	58	60	68	67	16
Grant	54	54	39	19	55
Green	23	5	55	27	29
Green Lake	8	3	9	48	54
Iowa	17	34	59	34	39
Iron	72	72	10	64	31
Jackson	70	31	52	59	64
Jefferson	12	16	29	36	26
Juneau	39	57	45	70	58
Kenosha	35	43	27	56	66
Kewaunee	3	45	46	12	8
La Crosse	32	40	3	33	51
Lafayette	56	66	58	25	19
Langlade	36	65	50	45	9
Lincoln	61	63	34	38	52
Manitowoc	59	29	18	14	28
Marathon	29	47	26	5	1
Marinette	62	39	63	55	53
Marquette	65	2	44	69	56
Menominee	64	67	72	72	72
Milwaukee	69	50	40	71	67
Monroe	67	32	38	61	68
Oconto	22	24	65	49	22
Oneida	21	61	47	39	40
Outagamie	30	18	22	8	32
Ozaukee	18	4	11	3	20
Pepin	31	22	12	26	12
Pierce	19	11	7	6	43
Polk	48	49	53	35	30
Portage	10	35	4	10	21
Price	57	58	23	47	62
Racine	66	13	33	53	44
Richland	53	59	42	24	4
Rock	46	42	35	54	59
Rusk	60	41	70	50	42
Sauk	16	17	28	42	13
Sawyer	42	51	71	63	46
Shawano	26	37	49	41	50
Sheboygan	55	21	17	20	49
St. Croix	25	9	37	7	45
Taylor	38	64	48	16	15
Trempealeau	14	23	66	40	27
Vernon	4	53	60	44	47
Vilas	52	14	62	57	5
Walworth	24	12	16	32	57
Washburn	63	28	31	60	48
Washington	7	19	25	4	25
Waukesha	11	6	6	2	61
Waupaca	49	62	51	52	71
Waushara	33	71	61	62	18
Winnebago	44	7	8	17	23
Wood	6	15	15	13	7

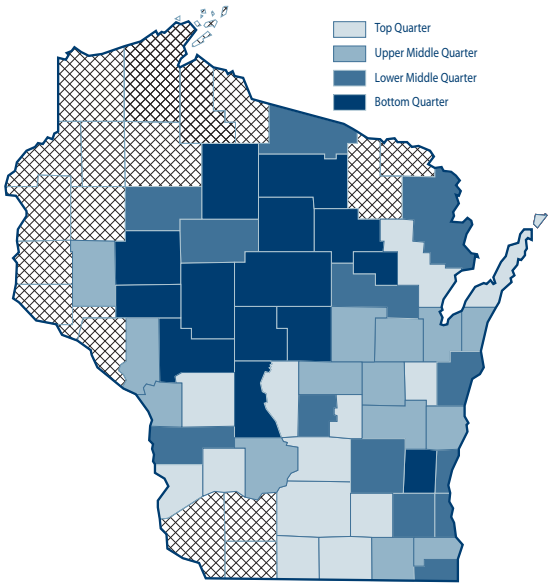
Top Quartile Bottom Quartile

Special Feature: Inpatient Care Quality Measures

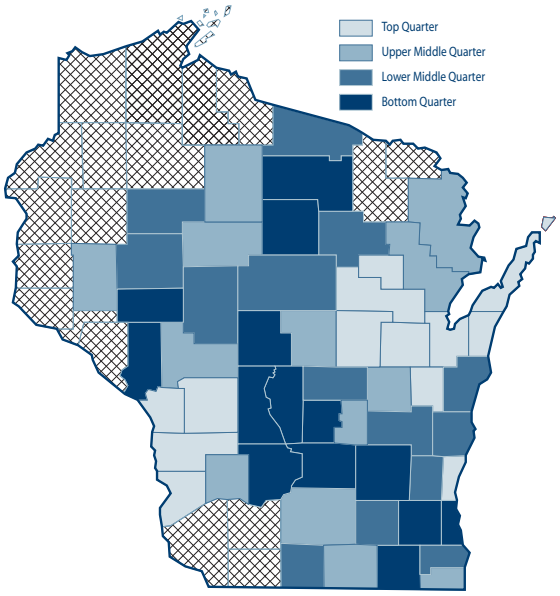
The health care component of the *Rankings* is currently based on measures of access and outpatient quality of care. In an effort to expand the measures of quality of care to include the inpatient hospital setting, we examined a limited set of county-based inpatient quality indicators (IQIs) from the Wisconsin Hospital Association (WHA) Information Center.

Two of these indicators are utilization indicators: coronary artery bypass graft (CABG) and percutaneous transluminal coronary angioplasty (PTCA) area rates. The third indicator is an area-level patient safety indicator that "captures all cases of potentially preventable complications that occur in a given area (county) during hospitalization"[5]: postoperative hemorrhage or hematoma.

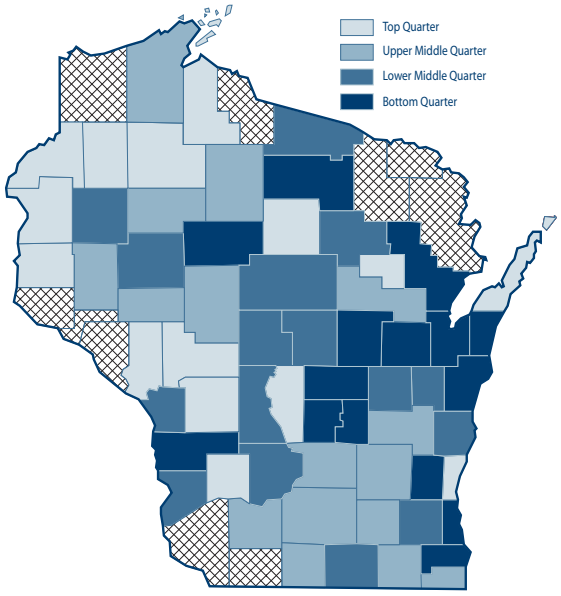
Coronary Artery Bypass Graft (CABG) Rates by Quartile



Percutaneous Transluminal Coronary Angioplasty (PTCA) Rates by Quartile



Postoperative Hemorrhage or Hematoma Rates by Quartile



The maps show Wisconsin's counties divided into quartiles for each of these indicators. The darker shaded counties are the counties that appeared to experience higher rates. Counties with hatch marks are border counties that, according to the Dartmouth Atlas for Health Care, are within the hospital service area (post-operative hemorrhage) or hospital referral region (cardiac procedures) of a non-Wisconsin hospital.

As the three maps show, there appears to be significant variation among counties in their rates of CABG and PTCA utilization and post-operative hemorrhage or hematoma rates. The maps also show that residents in border counties frequently get their care in neighboring states. Because we are unable to calculate reliable rates for these counties, these indicators are not sufficiently valid for inclusion in the *Rankings*. The other measures of quality of care in the *Rankings* do not include this border effect since they are based on Medicare data that includes all care provided to Wisconsin residents, regardless of the location of the care.

Health Outcomes Ranks Sorted by Place

This table lists the health outcomes presented on previous pages, but in a format that provides summaries by place.

PLACE	SUMMARY	MORTALITY (YPLL)		HEALTH STATUS (% REPORTING FAIR/POOR HEALTH)	
	RANK	RANK	VALUE	RANK	VALUE
Adams	69	64	7,647 years	69	17.8%
Ashland	56	65	7,660 years	40	13.1%
Barron	52	50	6,605 years	53	14.4%
Bayfield	23	36	5,982 years	22	11.0%
Brown	31	23	5,515 years	38	13.0%
Buffalo	47	17	5,273 years	61	16.0%
Burnett	54	59	7,196 years	46	13.6%
Calumet	14	2	4,060 years	41	13.2%
Chippewa	44	32	5,829 years	54	14.7%
Clark	33	56	6,792 years	18	10.5%
Columbia	32	31	5,828 years	33	12.4%
Crawford	21	30	5,724 years	23	11.2%
Dane	5	9	4,842 years	9	9.8%
Dodge	38	35	5,951 years	35	12.9%
Door	15	21	5,498 years	16	10.4%
Douglas	65	61	7,439 years	57	15.2%
Dunn	18	15	5,185 years	27	11.9%
Eau Claire	3	8	4,771 years	6	9.2%
Florence	16	49	6,594 years	3	8.4%
Fond du Lac	26	28	5,714 years	31	12.2%
Forest	60	40	6,142 years	64	16.6%
Grant	20	53	6,701 years	5	9.0%
Green	24	26	5,614 years	29	12.0%
Green Lake	57	39	6,062 years	63	16.4%
Iowa	4	41	6,329 years	1	6.4%
Iron	42	63	7,587 years	19	10.7%
Jackson	64	71	8,875 years	30	12.2%
Jefferson	19	29	5,718 years	20	10.8%
Juneau	71	67	7,752 years	72	20.7%
Kenosha	59	58	6,893 years	55	14.9%
Kewaunee	10	11	5,096 years	13	10.3%
La Crosse	11	14	5,176 years	17	10.5%
Lafayette	34	43	6,391 years	24	11.6%
Langlade	51	51	6,620 years	52	14.2%
Lincoln	40	33	5,870 years	42	13.2%
Manitowoc	28	10	5,042 years	47	13.8%
Marathon	13	20	5,482 years	11	10.1%
Marinette	67	60	7,405 years	66	17.0%
Marquette	70	68	8,082 years	70	19.0%
Menominee	73	73	14,372 years	73	21.3%
Milwaukee City	72	72	10,632 years	71	19.1%
Milwaukee County	68	70	8,507 years	59	15.9%
Monroe	58	55	6,790 years	56	15.0%
Oconto	22	45	6,492 years	10	9.8%
Oneida	55	48	6,577 years	58	15.3%
Outagamie	7	13	5,117 years	8	9.6%
Ozaukee	1	1	4,039 years	2	7.9%
Pepin	45	4	4,609 years	67	17.2%
Pierce	12	19	5,399 years	12	10.1%
Polk	41	27	5,622 years	51	14.1%
Portage	6	5	4,664 years	15	10.4%
Price	66	66	7,688 years	62	16.3%
Racine	48	57	6,838 years	37	13.0%
Richland	27	16	5,217 years	43	13.3%
Rock	50	52	6,640 years	50	14.1%
Rusk	43	54	6,713 years	34	12.9%
Sauk	25	34	5,886 years	25	11.6%
Sawyer	46	69	8,474 years	7	9.4%
Shawano	29	18	5,312 years	44	13.3%
Sheboygan	35	38	6,060 years	32	12.3%
St. Croix	9	6	4,684 years	21	11.0%
Taylor	37	25	5,584 years	45	13.6%
Trempealeau	61	47	6,543 years	60	15.9%
Vernon	36	42	6,375 years	26	11.8%
Vilas	62	37	6,053 years	68	17.3%
Walworth	39	24	5,533 years	49	13.8%
Washburn	53	62	7,466 years	39	13.0%
Washington	8	7	4,754 years	14	10.3%
Waukesha	2	3	4,255 years	4	8.5%
Waupaca	63	44	6,446 years	65	16.6%
Waushara	49	46	6,537 years	48	13.8%
Winnebago	30	22	5,507 years	36	12.9%
Wood	17	12	5,097 years	28	12.0%

Health Determinants Ranks Sorted by Place

PLACE	SUMMARY	HEALTH CARE	HEALTH BEHAVIORS	SOCIOECONOMIC FACTORS	PHYSICAL ENVIRONMENT
Adams	70	68	67	69	28
Ashland	53	66	34	56	6
Barron	52	38	42	51	23
Bayfield	35	15	16	63	1
Brown	40	13	44	39	39
Buffalo	9	58	12	13	25
Burnett	49	53	24	60	9
Calumet	7	14	25	3	69
Chippewa	33	27	26	36	65
Clark	32	43	17	42	36
Columbia	30	37	35	23	55
Crawford	59	71	53	45	32
Dane	5	19	7	8	72
Dodge	34	33	41	28	42
Door	11	9	13	20	58
Douglas	64	28	68	66	20
Dunn	42	54	59	21	35
Eau Claire	20	2	43	15	40
Florence	50	57	20	61	16
Fond du Lac	25	17	30	25	52
Forest	67	63	50	70	11
Grant	41	48	65	17	29
Green	24	31	23	27	46
Green Lake	39	35	45	31	34
Iowa	6	49	8	10	30
Iron	28	69	4	59	5
Jackson	55	60	57	44	19
Jefferson	48	12	63	30	51
Juneau	68	72	61	67	17
Kenosha	60	50	47	58	59
Kewaunee	18	29	54	5	37
La Crosse	21	18	32	12	67
Lafayette	3	36	3	14	21
Langlade	61	40	66	50	44
Lincoln	46	26	49	33	63
Manitowoc	38	11	64	22	45
Marathon	14	7	22	18	68
Marinette	62	42	70	57	14
Marquette	69	70	72	55	27
Menominee	73	73	73	73	3
Milwaukee City	72	65	71	72	49
Milwaukee County	71	59	48	71	61
Monroe	63	61	69	52	48
Oconto	57	56	60	49	10
Oneida	37	25	28	53	13
Outagamie	12	1	40	9	43
Ozaukee	1	4	1	1	53
Pepin	15	21	31	16	22
Pierce	8	46	27	6	38
Polk	29	41	21	40	26
Portage	10	5	19	11	71
Price	16	47	6	41	8
Racine	66	44	52	68	62
Richland	19	52	10	34	24
Rock	65	34	55	62	73
Rusk	31	30	5	64	12
Sauk	44	22	51	32	54
Sawyer	45	51	14	65	2
Shawano	58	55	58	43	47
Sheboygan	27	20	37	19	57
St. Croix	13	24	38	7	56
Taylor	51	64	56	35	15
Trempealeau	36	16	39	37	31
Vernon	47	67	29	47	18
Vilas	43	23	36	54	4
Walworth	22	32	15	29	41
Washburn	26	45	11	48	7
Washington	4	6	9	4	70
Waukesha	2	10	2	2	66
Waupaca	56	39	62	38	64
Waushara	54	62	46	46	33
Winnebago	23	8	33	24	50
Wood	17	3	18	26	60

This table lists the health determinants presented on previous pages, but in a format that provides summaries by place.

Overview of Methods

I. Selection of Population Health Measures

We focus on two categories of health measures: health outcomes and health determinants. Outcomes are intended to measure the current state of health, while determinants are viewed as predictors of future health outcomes.

Health Outcomes: Two components were used to represent health outcomes: mortality and morbidity. Death and health status are each assessed with a single measure. Mortality is measured in years of potential life lost and morbidity is measured by self-reported health status.

Health Determinants: The selection of determinant measures was guided largely by priorities established in the Wisconsin State Health Plan. Within the four major components (health care, health behaviors, socioeconomic factors related to health, and the physical environment), we include a total of 32 individual health determinant measures.

II. Data Sources

The figure on page 3 lists the outcomes and determinants components and their associated health constructs. The data used for this report came from the following sources:

- **Complete Population (non-sample):** These annually available data include vital statistics such as mortality, teen births, and smoking during pregnancy, obtained from the Bureau of Health Information and Policy, Division of Public Health, Wisconsin Department of Health and Family Services.
- **Census Data:** These data, based on nearly complete population data or large-sample decennial surveys, include measures such as divorce, no high school diploma, and children in poverty. These were obtained online from the U.S. Census Bureau.
- **Sample Survey Data:** These data are based on moderate-sized annual samples primarily from the CDC's Behavioral Risk Factor Surveillance System (e.g., cigarette smoking, physical inactivity, and obesity) or the Wisconsin Department of Health and Family Service's Family Health Survey (no health insurance, did not receive needed health care, and no recent dentist visit). These data were obtained from the Bureau of Health Information and Policy. Multiple years of data were combined to provide more robust sample sizes.
- **Other Data:** Additional measures were obtained from the Wisconsin Department of Health and Family Services, Wisconsin Department of Natural Resources, Wisconsin Department of Public Instruction, Wisconsin Office of Justice Assistance, the U.S. Environmental Protection Agency, Metastar, Inc., the City of Milwaukee Health Department, and the Center for Health Systems Research and Analysis at the University of Wisconsin–Madison.

The complete list of health measures, specific time periods, data sources, and more detailed information by measure are available in the *Full Report*.[3]

County-specific data for each measure are also available in the 2007 *County Snapshots*.[6]

III. Rankings

Estimates for health measures were calculated from the most recently available data. For the majority of the measures, an average of several years of recent data was used to obtain more stable estimates. However, estimates of population health are not measured perfectly, and minor differences in the rankings among the 73 places should be interpreted cautiously. For example, the data used for these rankings are not precise enough to indicate that a place ranked 40th is meaningfully healthier than a place ranked 45th.

The mean and standard deviation of each of the health measures were calculated across the 72 counties, and then the 73 places were given a z-score for each measure. This score was the number of standard deviation units that the place was from the mean of all the counties. To avoid one place's rank being strongly influenced by one score, we truncated the score at -3.0 or 3.0 if the actual score fell outside of this range. Weighted averages of these scores were used to calculate the summary outcomes and determinants rankings and the rankings for the four categories of determinants. The weights used to calculate summary outcome and determinant rankings are given in the figure on page 3.

Overview of Methods (continued)

IV. Special Feature Methodology

County Mortality by Life Stage in Wisconsin:
In this special feature we used mortality rates from the Wisconsin Interactive Statistics on Health (WISH) online database for years 1996-2005. Data for all age groups except infants were age adjusted. We then ranked the counties on their mortality rates for each age group.

Inpatient Care Quality Measures:
We purchased a dataset of three indicators from the Wisconsin Hospital Association (WHA) to analyze for inpatient quality of care. Two of these indicators are utilization measures—area rates of coronary artery bypass graft (CABG) and percutaneous transluminal coronary angioplasty (PTCA). The third indicator is an area-level patient safety indicator— postoperative hemorrhage or hematoma rates. The first two indicators are adjusted for age, sex, and case-mix in each county. To examine the geographic distribution of these indicators, we ranked the counties on their rates of CABG, PTCA and post-operative hemorrhage and hematoma and mapped them by quartile, with better performing counties shaded in light blue and worse performing counties in dark blue. Counties that are within the hospital service area (post-operative hemorrhage) or hospital referral region (cardiac procedures) of a non-Wisconsin hospital according to the Dartmouth Atlas for Health Care were excluded.

V. Changes from the *Wisconsin County Health Rankings, 2006*

In this year's report, we changed our methods for four existing indicators: no health insurance, no recent dentist visit, violent crime, and percent of population exposed to nitrates in excess of 2 mg/L. In 2006, our no health insurance rate was calculated for the entire population. In 2007, we exclude the population 65+ to remove those covered by Medicare from the denominator. For no recent dentist visit, in 2005 the Family Health Survey re-coded responses to the question, "How long ago did you last visit a dentist?" The 2004 FHS included a response category for visits within the past six months. In 2005, this category was excluded. As a result, the figures reported in the 2007 *Rankings* represent the proportion of the population who visited a dentist within the past year. For violent crime, we corrected our numerator by using the number of violent crime events reported by the Office of Justice Assistance, rather than calculating the events manually. Our nitrates measure is calculated to represent the percent of the population that has ever been exposed to nitrates in excess of 2 mg/L throughout the calendar year. The previous years' measure represented the percent of the population that on average was exposed to nitrates in excess of 2 mg/L.

The 2007 report also includes new measures. We replaced motor vehicle crash deaths with three measures— motor vehicle crash occupancy and motor vehicle crash-related emergency room visits (traffic and non-traffic)—to provide a better proxy for dangerous alcohol use. In the Physical Environment category of determinants, we changed the construct "Lead Risk" to "Built Environment" and included measures of radon risk and method of commuting.

VI. References

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UNIVERSITY OF WISCONSIN

Population Health Institute

Translating Research into Policy and Practice

Contact Information

University of Wisconsin Population Health Institute
Department of Population Health Sciences
University of Wisconsin School of Medicine and Public Health
760 WARF Building
610 Walnut Street
Madison, WI 53726-2397

Phone: (608) 263-6294
Fax: (608) 262-6404

http://www.pophealth.wisc.edu/uwphi