

# The Race to the Bottom: Wisconsin's Long-Term Trends in Health Rankings

Odilichi Ezenwanne, MD, MPH; Rich Crawford, MD, MPH; Patrick L. Remington, MD, MPH

## ABSTRACT

**Background:** Wisconsin's health ranking dropped from 7th healthiest in 1990 to 23rd in 2018. The purpose of this paper is to identify the contributory factors to this decline.

**Methods:** Trends in Wisconsin's health rank for 1990 to 2018 were compared overall and for only identical measures used in both years.

**Results:** Of the identical measures used in both years (n=10), the median rank declined from 8.5 (range 6-21) in 1990 to 19 (range 9-43) in 2018, with the greatest declines for infectious diseases, infant mortality, and smoking. The ranks were lower in 2018 for the similar measures used and for measures used only in 2018 compared to measures used only in 1990.

**Discussion:** Wisconsin's drop in health ranking is real and calls for action to address the root causes.

## BACKGROUND

The United Health Foundation's America's Health Rankings provides an annual ranking of health determinants and outcomes for all 50 states.<sup>1</sup> These health rankings use objective measures of population health to summarize performance and enable comparisons. Complex data obtained from various surveillance systems are synthesized into an easily interpretable format for widespread dissemination. From its first benchmark edition in 1990, America's Health Rankings have provided a

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**Author Affiliations:** Preventive Medicine Residency Program, University of Wisconsin School of Medicine and Public Health (UW SMPH), Madison, Wis (Ezenwanne, Crawford, Remington).

**Corresponding Author:** Odilichi Ezenwanne, MD, MPH, University of Wisconsin-Madison, WARF Building, Rm 1032, 610 Walnut St, Madison, WI, 53726; phone 608.772.1216; email oezenwanne@wisc.edu; ORCID ID 0000-0001-7752-6519

platform for initiating a broad discourse on health among health professionals, leaders, policymakers, and the general public on the health of their communities.<sup>2</sup>

Since the first report was released in 1990, Wisconsin's overall health ranking has declined steadily from 7th healthiest in 1990 to 23rd in 2018. The purpose of this analysis is to determine the reasons for this decline.

## METHODS

The America's Health Rankings uses measures of health determinants and outcomes to assess the health of each of the 50 states.

These individual measures are weighted and then combined into a single summary measure, eg, smoking contributes 7.5% to the overall health of a state. More detailed methods are available online.<sup>1</sup>

Wisconsin's overall health ranking from 1990 to 2018 was obtained from the America's Health Ranking website.<sup>1</sup> For each of the 32 measures used in the ranking for 1990 and/or 2018, we obtained the value of that measure (eg, percent smokers), the weight that the measure contributed to the overall rankings (eg, 7.5%), and Wisconsin's rank among the 50 states. These measures varied over the period of analysis and were categorized as follows:

1. Identical and used in both years (n=10).
2. Similar and used in both years (n=3).
3. Used only in 1990 (n=4).
4. Used only in 2018 (n=15).

The change in Wisconsin's rank for the measures used in both 1990 and 2018 was calculated. In addition, Wisconsin's rank within each of these 4 categories (median and range) was deter-

mined, as well as the weights used in the models. Actual values of the measures also were included to quantify the absolute change in the health measures over this time period.

## RESULTS

Wisconsin's overall health rankings dropped from 7th in 1990 to 23rd in 2018 (see Figure), representing an average drop of about 1 place every 2 years over the 28-year period. The first report in 1990 used 17 measures categorized into 5 domains: mortality, lifestyle, access, disease, and disability. In contrast, the 2018 report used 33 measures categorized into 5 different domains: outcomes, plus 4 categories of health determinants—community and environment, policy, behaviors, and clinical care. In addition, the relative weights of some of the measures—including 3 of the 10 identical measures—changed from 1990 to 2018.

### Trends in Measures Used in Both Years

The median rank for the 10 identical measures used in both years was 8.5 (range 6-21) in 1990 and dropped to 19 (range 9-43) in 2018. Of these measures, the greatest declines were noted in infectious diseases (down 37 places), infant mortality (down 16 places), smoking (down 14 places), and violent crime (down 11 places) (see Table 1). The weights remained the same for 7 of these measures, while weights for the other 3 were reduced, with smoking being lowered from 10% to 7.5%, and infant mortality and premature deaths being reduced from 7.5% to 3.125%. The proportion of the overall health of a state represented by these 10 identical measures declined from 57.5% in 1990 to 46.25% in 2018.

The 3 measures that were similar but not identical in both years also declined overall, from a median rank of 21 (range 9-23) in 1990 to 25 (range 23-47) in 2018. Of these measures, the greatest declines were noted in public health funding (down 38 places) and cancer deaths (down 4 places). All 3 similar measures had a reduction in their individual weights, with support for public health being lowered from 5% to 2.5% and cancer deaths and heart deaths being lowered from 7.5% to 3.125%. The proportion of the overall health of a state represented by these measures decreased from 20% in 1990 to 8.75% in 2018.

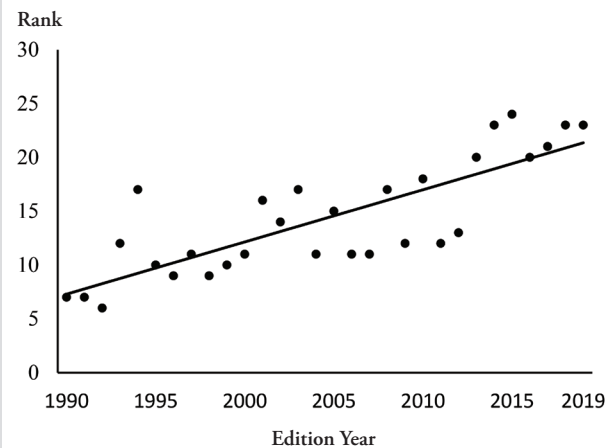
### Comparing Measures Used Only in 1990 or 2018

Wisconsin's median rank for measures used only in 2018 was 13 places lower when compared with the median rank in measures used only in 1990. Four measures were unique to 1990, accounting for 22.5% of the overall health of the state, with a median rank of 8 (range of 4-16). The 15 measures unique to 2018 had a median rank of 21 (range of 8-50) and accounted for 45% of the state's overall health ranking.

## DISCUSSION

Our analysis demonstrates that Wisconsin's national health rank-

**Figure.** Trends in Wisconsin's Overall Health Ranking, 1990-2018



The line is a linear regression, where  $y = 0.48x + 6.8$  and  $R^2 = 0.65$ .  
Source: America's Health Ranking.<sup>1</sup>

ing is dropping as a result of declines in the ranking for a broad spectrum of health outcomes, such as infant mortality, infectious diseases, violent crime, occupational fatalities, and premature mortality, as well as health determinants including smoking, obesity, percentage of uninsured, and children in poverty. A previous analysis of this trend was conducted in 2002 by the University of Wisconsin's Population Health Institute. It concluded that Wisconsin's decline was largely a result of not keeping pace with reductions in tobacco use and infant mortality seen in the United States as a whole.<sup>3</sup>

The drop in Wisconsin's overall health ranking must be interpreted with caution. The specific measures and weights used in the America's Health Rankings model have changed over time. The decision to change the measures used in the rankings may reflect a better understanding of the determinants of health or increasing availability of data. The decreases in the weights for the 3 measures that were used in both years (smoking, infant mortality, and premature deaths) is most likely a consequence of the addition of 16 measures in 2018.

Regardless of the rationale for these changes, it makes it difficult to evaluate changes in the overall state health rankings. For example, although "public health funding" fell from a rank of 9th to 47th, the definitions of this measure changed substantially. It is also difficult to interpret the impact of dropping some of the measures from 1990 and adding others in 2018. The fact that the average rank of these measures was lower in 2018 compared with 1990—21 versus 8—certainly contributed to the drop in Wisconsin's overall health ranking. More research is needed to determine the trends for each of these measures to identify their impact on Wisconsin's overall decline in health rankings. Erwin et al also noted the changes in measures used over time and reported that a greater proportion of the measures

**Table 1.** Trends in Wisconsin's Health Rankings, 1990 to 2018

	Value			Rank			Weight		
	1990	2018	Change	1990	2018	Change	1990	2018	Change
<b>Measure (identical)</b>									
Infectious disease (z-score)	-1.25	0.52	1.77	6	43	-37	5.00%	5.00%	0
Infant death rate/1000 births	8.9	6	-2.9	8	24	-16	7.50%	3.25%	-4.25%
Smoking (%)	26.3	16	-10.3	6	20	-14	10.00%	7.50%	-2.50%
Violent crime rate <sup>a</sup>	250	320	70	11	22	-11	5.00%	5.00%	0
Premature death rate <sup>a</sup>	7143	6821	-322	7	17	-10	7.50%	3.25%	-4.25%
Children with poverty (%)	12.6	14.5	1.9	9	18	-9	5.00%	5.00%	0
Obesity (%)	11.3	32	20.7	21	30	-9	5.00%	5.00%	0
Uninsured (%)	8.3	5.4	-2.9	6	10	-4	5.00%	5.00%	0
Occupational fatality rate <sup>a</sup>	7.8	4.3	-3.5	14	17	-3	2.50%	2.50%	0
High school graduation (%)	83.7	88.2	4.5	9	9	0*	5.00%	5.00%	0
<b>Median</b>				<b>8.5</b>	<b>19</b>				
<b>Range</b>				<b>(6-21)</b>	<b>(9-43)</b>				
<b>Measure (similar)</b>									
Support for public health	0.89 <sup>b</sup>	52 <sup>c</sup>		9	47	-38	5.00%	2.50%	-2.50%
Cancer death rate <sup>a</sup>	196	191	5	21	25	-4	7.50%	3.25%	-4.25%
Heart death rate <sup>a</sup>	306	239	67	23	23	0*	7.50%	3.25%	-4.25%
<b>Median</b>				<b>21</b>	<b>25</b>				
<b>Range</b>				<b>(9-23)</b>	<b>(23-47)</b>				

Favorable

Not favorable

\* No change

<sup>a</sup> Per 100,000 population.  
<sup>b</sup> Ratio of state health care expenditures to low-income population.  
<sup>c</sup> State and federal dollars directed to public health per person.

used in the initial edition were related to health outcomes, while more recent editions had a predominance of measures associated with health determinants.<sup>2</sup>

Despite Wisconsin's decline in ranking for many health factors, most of the comparable, individual, measures improved in absolute terms. This discordance indicates greater overall improvement in the United States compared to Wisconsin. Similar findings were noted in the 2002 analysis report.<sup>3</sup> In contrast, 3 measures showed concomitant worsening absolute trends, including the rate of obesity, the percentage of children living in poverty, and violent crimes.

Over the past 3 decades, America's Health Rankings have been shown to be useful by state health policymakers. A study carried out to evaluate the utility of the America's Health Rankings among various state health agencies using key informant interviews of state health workers reported that the rankings were used as a resource for problem identification (54%), as a source for data (47%), and to track annual changes in health (59%).<sup>2</sup> The model of population health used in the America's Health Ranking was adapted in 2003 by the University of Wisconsin Population Health Institute to rank the counties in Wisconsin, highlighting the usefulness of this model as an important tool in monitoring the overall health of a state.<sup>4</sup> Based on this experience in Wisconsin, and with support from the Robert Wood Johnson Foundation, the County Health Rankings were developed in 2010, ranking the health of all counties in the nation.<sup>5</sup>

Monitoring long-term trends in health rankings can be used to assess relative progress in health outcomes, determinants, and

**Table 2.** Wisconsin State Health Rankings, 1990 and 2018

Measure	Value	Rank	Weight
<b>1990 only</b>			
Total death rate <sup>a</sup>	833	16	10%
Motor vehicle death rate <sup>b</sup>	1.9	8	5%
Limited activity days/month	2.9	8	2.5%
Adequate prenatal care (%)	78.6	4	5%
<b>Median (range)</b>		<b>8 (4-16)</b>	
<b>2018 only</b>			
Excessive drinking (%)	24.2	50	2.5%
Disparity in health status (%)	31.3	41	3¼%
Immunization – children (%)	69.2	36	2.5%
Mental health providers <sup>a</sup>	191	34	3%
Drug deaths <sup>a</sup>	16.4	24	2.5%
Frequent physical distress (%)	11.9	23	3¼%
Immunization–adolescent (z-score)	0.197	21	2.5%
Dentists <sup>a</sup>	58.2	21	3%
Primary care physicians <sup>a</sup>	150	20	3%
Low birthweight (%)	7.4	17	3%
Preventable hospitalizations/ 1000	45	17	3%
Frequent mental distress (%)	11.6	17	3¼%
Air pollution (µg/m <sup>3</sup> )	6.8	12	5%
Diabetes (%)	9.1	12	3¼%
Physical inactivity (%)	22.4	8	2.5%
<b>Median (range)</b>		<b>21 (8-50)</b>	

<sup>a</sup> Per 100,000 population.

<sup>b</sup> Per 100,000 miles driven.

related public health investments at the state and local levels.<sup>6-8</sup> Even though Wisconsin improved in absolute values in most of the domains, the magnitude of these improvements was insufficient to preserve Wisconsin's initial top 10 ranking in 1990. However, these gains were eclipsed by greater improvements

across similar domains recorded by several US states. Obesity, children living with poverty, and violent crime rate were the only measures that recorded negative absolute changes within this period directly contributing to the decline. However, more research is required to determine the effects of the introduction of new measures on Wisconsin's change in ranking. The decline serves as a call for action to address the inciting root causes and to keep abreast of advances achieved by other states to improve overall population health.

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