Development of an Obesity Prevention Dashboard for Wisconsin

Karissa Ryan, BS; Parvathy Pillai, MD, MPH; Patrick L. Remington, MD, MPH; Kristen Malecki, PhD, MPH; Sara Lindberg, PhD, MS

ABSTRACT

Importance: A comprehensive obesity surveillance system monitors obesity rates along with causes and related health policies, which are valuable for tracking and identifying problems needing intervention.

Methods: A statewide obesity dashboard was created using the County Health Rankings model. Indicators were obtained through publicly available secondary data sources and used to rank Wisconsin amongst other states on obesity rates, health factors, and policies.

Results: Wisconsin consistently ranks in the middle of states for a majority of indicators and has not implemented any of the evidence-based health policies.

Conclusions and Relevance: This state of obesity report shows Wisconsin has marked room for improvement regarding obesity prevention, especially with obesity-related health policies. Physicians and health care systems can play a pivotal role in making progress on obesity prevention.

INTRODUCTION

Public health surveillance encompasses a systematic collection and interpretation of data in order to enact change to improve the health of a population.[1] Progress reports, such as dashboards, have been used in many settings to provide quick reference for managers to assess progress and identify areas for improvement.[2] This Wisconsin obesity dashboard aims to provide a new group of indicators to measure obesity through data that can be found through publicly available sources.

Systems to monitor obesity typically have focused on measuring individual indicators; energy expenditure, energy intake, and weight status.[3] However, we now recognize there are multiple upstream determinants that impact childhood obesity rates.[4,5] Thus, a comprehensive childhood obesity surveillance system is needed that incorporates not only obesity rates, but also upstream determinants of childhood obesity. We wanted to develop a list of sentinel indicators of childhood obesity that might be used both in Wisconsin and nationally to look at clinical and public health prevention programs.

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Author Affiliations: Population Health Institute, University of Wisconsin School of Medicine and Public Health (UWSMPH), Madison, Wis (Ryan, Remington, Malecki); Department of Population Health Sciences, UWSMPH (Pillai, Malecki).

Corresponding Author: Karissa Ryan, 735 WARF Building, 610 Walnut St, Madison, WI 53726; phone 608.604.7990; e-mail kryan8@wisc.edu.

METHODS

This state obesity dashboard design was based on the County Health Rankings (Rankings) model, a population health model which highlights key factors that, if improved, would make the counties and communities healthier places to live.[6] The Rankings measures health based on 3 elements: health outcomes, health factors, and policies and programs.[7] While in the Rankings model adult obesity rates are considered a health factor for many chronic diseases, we adapted the model such that age-based obesity rates were considered the primary outcomes of interest, because of the low prevalence of chronic disease in childhood.

A broad list of possible indicators was developed through a literature review of obesity prevention and intervention programs, noting measures commonly used to evaluate these programs. Potential indicators were evaluated with respect to both their relevance to ongoing obesity prevention efforts in Wisconsin and to the obesity-adapted Rankings model. In selecting the final subset of sentinel indicators, criteria for potential inclusion the need to be modifiable, accessible through publicly available data, and available at a spatial scale that would allow for state-to-state comparisons. The list ultimately was narrowed to include 3 health outcome indicators, 6 health factor indicators, and 4 policy indicators (Table 1) through consensus discussion with the Obesity Prevention Initiative surveillance and evaluation team members. The health factors were divided into 3 categories: behavior, clinical, and environment. However, a more comprehensive list of indictors we identified can be found through the

Table 1. Obesity Outcomes and Health Factors

Indicator	Indicator Summary (n=states with data available)	Data Source*	Best Rate %	Worst Rate %	Wisconsin Rate (Rank) %	National Rate	Healthy People 2020 Goal
% obese by BMI preschool or toddler (2-5)	Outcome (n=44)	Pediatric Nutrition Surveillance System 2011	Utah 9.0 %	California 16.8%	(21st /44) 14.0%	14.4%	9.4% Reduce % children aged 2-5 who are obese
% obese by BMI adolescents (12-17)	Outcome (n=42)	Youth Risk Behavior Surveillance System 2013	Utah 6.4%	Kentucky 18.0%	(14th/42) 11.6%	13.7%	16.1% Reduce % children aged 12-19 who are obese
% obese by BMI adults (18+)	Outcome (n=51)	Behavior Risk Factor Surveillance System 2013	Colorado 21.3%	Arkansas 35.9%	(Tied 37th/51) 31.2%	28.1%	30.5% Reduce % adults who are obese
% infants breastfed or fed breast milk (initiation)	Breastfeeding (n=51)	National Inpatient Sample	Washington 93.6%	Mississippi 57.6%	(30th /51) 79.9%	80.0%	81.9% Increase % infants who are breastfed
% Children who consume sugar-sweetened beverages daily	Diet (n=39)	Youth Risk Behavior Surveillance System 2013	New Jersey 12.2%	West Virginia 38.0%	(13th/39) 19.6%	27.0%	N/A
% children (12-17) who have <3 hours screen time	Behavior (n=40)	Youth Risk Behavior Surveillance System 2013	Utah 85.1%	Mississippi 60.5%	(6th/40) 77.5%	67.5%	73.9% Increase % of children (grades 9-12) that have screen time <2 hours/ day
% children (12-17) who partake in >60 minutes of structured physical activity/day (in past 7 days)	Physical Activity (n=41	Youth Risk Behavior Surveillance System 2013	Oklahoma 38.5%	Utah 19.7%	(28th/41) 24.0%	27.1%	31.6% Increase the proportion of adolescents who are meeting activity guidelines
% pregnant women with > recommended weight gain	Quality of Care (n=26, Including DC)	Pediatric Nutrition Surveillance System 2011	New York 41.5%	New Hampshire 53.3%	(13th/26) 49.7%	48.0%	N/A
Neighborhood amenities	Environment (n=51)	National Survey of Children's Health 2011	DC 94.3%	Mississippi 64.1%	(16th/51) 88.7%	83.5%	N/A

Abbreviations: BMI, body mass index; HS, high school; N/A, not applicable.
*See http://www.wihealthatlas.org/wmjindicators/ for more information about these data sources. Accessed Nov 1, 2016.

Obesity Prevention Initiative website: www.wihealthatlas.org/WMJindicators.

Health outcome and health factor data were collected from 5 publicly available national data sources: the Pediatric Nutrition Surveillance System (PedNSS), Youth Risk Behavioral Surveillance System (YRBSS), Behavioral Risk Factor Surveillance System (BRFSS), National Survey of Children's Health (NSCH), and National Immunization Survey (NIS). Data from each source for the identified sentinel indicators were extracted as raw percentages. For those with data available, all states and the District of Columbia were then ranked for each indicator using the raw percentages. The states were ranked with low scores (ie, 1) being the best. Healthy People 2020 goals also were included as the future benchmark for each indicator where available.

Data regarding the health policy indicators were collected from the Centers for Disease Control and Prevention and Smart Growth America. These were subsequently examined as dichotomous yes/no variables depending on whether or not there was a state-level policy in place.

Approval by the University of Wisconsin-Madison Review Board for Human Subjects Research was not required as determined by the "Not Research Determination Decision Tool."

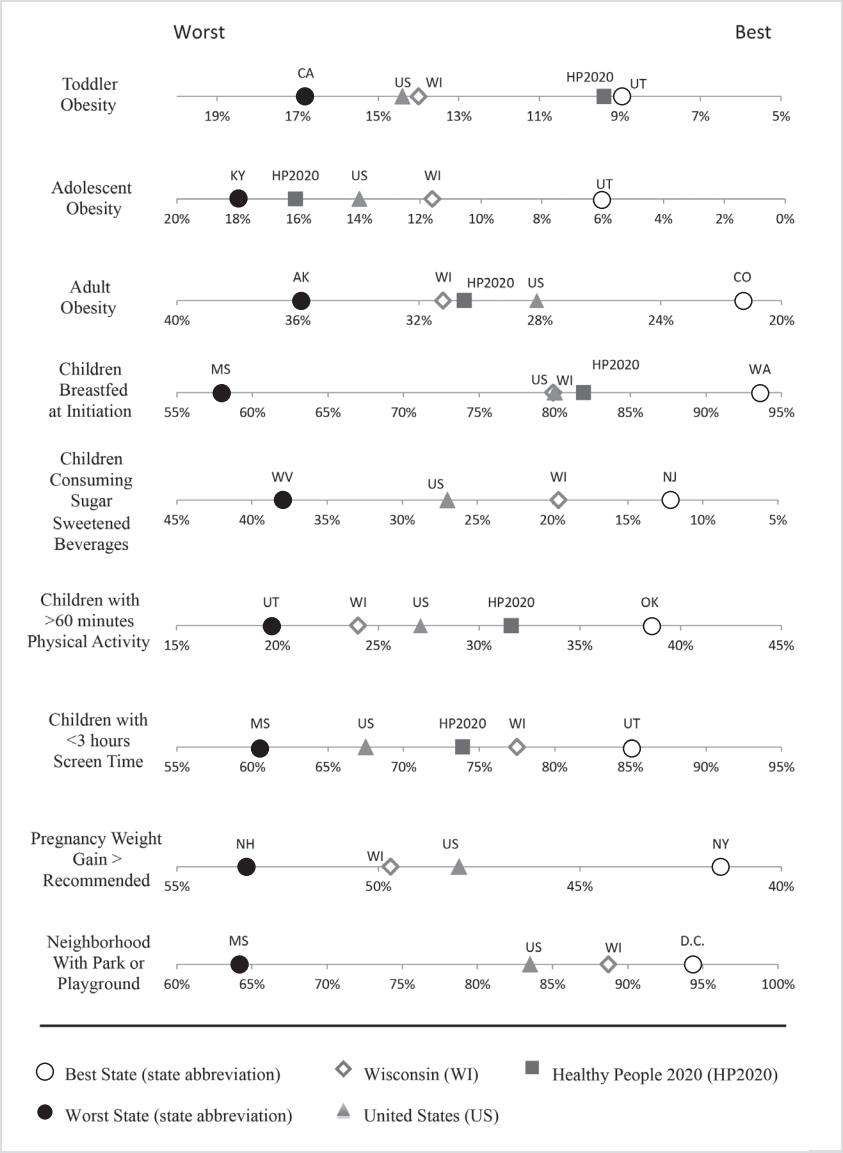
RESULTS

The state dashboard uses a horizontal bar to illustrate how Wisconsin ranks among other states in regards to each sentinel indicator. National average and Healthy People 2020 targets also are provided for each indicator when available in order to provide greater context to the rankings (Figure 1). We applied these indicators to the state of Wisconsin and describe the results below.

Health Outcomes and Health Factors

Figure 1 illustrates how Wisconsin ranks among other states based on the sentinel indicators of obesity. Wisconsin falls in the middle

Figure 1. Wisconsin's Obesity Prevention Dashboard, 2016



of the nation with regard to all 3 weight status indicators within all 3 age groups, ranking 21st of 44 in preschool/toddler obesity, 14th of 42 in adolescent obesity, and 37th of 51 in adult obesity.

Figure 1 also provides the rankings among indicators regarding upstream health factors. The health factors for obesity risk were divided into 3 categories: behavior, clinical, and environment. Among the behavioral categories, Wisconsin ranks among the best in regard to children who watch less than 3 hours of television (6th of 40 states). Under clinical care, Wisconsin ranked 13th of 26 states on the percentage of women with more than the recommended weight gain during pregnancy. Representing the environmental indicators, Wisconsin ranked 16th of 51 states in percentage of neighborhoods in which parks or playgrounds exist.

Policy

Table 2 summarizes select health policies and if they have been adopted in Wisconsin, as well as how many other states have adopted similar policies. Of note, Wisconsin had adopted none of the indicator policies. The most frequently adopted policy by other states was some form of a complete streets policy with 32 states (including the District of Columbia and Puerto Rico).

DISCUSSION

This Wisconsin obesity dashboard, the new collection of measures described, allows for easy comparison of Wisconsin to other states on the multiple upstream indicators of obesity, as well as obesity as a health outcome. Compared with other states, Wisconsin still has marked room for improvement with regard to obesity prevention. It consistently ranks in the middle of states reported regarding most of the health outcome and health factor indicators and is neither the best nor the worst in the nation for any selected indicator. However, Wisconsin remains behind other states in adopting obesity-related health policies, which strongly indicates that state government policy represents a high priority place to promote obesity prevention efforts. Wisconsin has not enacted any of the 4 policies that support healthy environments and support communities and individuals in their attempts to eat healthy foods and be active.

A strength of this dashboard is that much of the data for each of these indicators is publicly and readily available. Indeed, it has been noted that due to the number of data sources and the lack of a universal or central hub of obesity data, these sources often go underused.[8] By compiling data from these various sources into 1 comprehensive surveillance system, we will provide a preliminary framework and infrastructure for more rigorous evaluation of obesity trends and factors. Our current analysis focuses on national and state comparisons, but this model could be adopted at the local community level as well. Using a ranking approach for this surveillance system provides a greater likelihood that the results will mobilize a community action response.

While this is a first step towards compiling consistent national data for tracking childhood obesity surveillance in a comprehen-

Table 2. Obesity-Related Policies

Health-Related Policy and Data Source	Does Wisconsin Have the Policy? (yes/no)	Number of States With Policy
State policy at least partially follows Institute of Medicine guidelines for competitive foods and beverages in US schools. http://www.cdc.gov/healthyyouth/nutrition/pdf/compfoodsbooklet.pdf[9]	No	34 with at least some Institute of Medicine standards partially met
Child care regulations meet Caring For Our Children Guidelines of moderate- to vigorous-intensity physical activity for preschoolers in all settings http://www.cdc.gov/physicalactivity/downloads/pa_state_indicator_report_2014.pdf[10]	No	0 (including District of Columbia)
Adopted some form of Complete Streets policy http://www.smartgrowthamerica.org/complete-streets-2014-analysis[11]	No	32 (including Puerto Rico and District of Columbia)
Healthier Food Retail Legislation http://www.cdc.gov/obesity/downloads/Healthier_Food_Retail.pdf[12]	No	12 (including District of Columbia)

sive way, several limitations exist. How each of the indicators was operationalized was dependent on what was available in each of the data sources. Not all sources included data from all states and/or territories; therefore, the ranking of states may not be generalizable to the nation, and there may be some inherent bias due to unique characteristics of those states that could not be ranked due to missing data. Furthermore, we recognize that the raw estimates might not lead to an accurate ranking of the states.

Another limitation we are working to overcome is that the data sources are not always broken down to geographic units smaller than a state, and local communities might want to adapt indicators to their own efforts. To obviate this limitation, we are building an obesity surveillance system that incorporates comprehensive, community-level data. We hypothesize that local data will be especially valuable for Wisconsin communities, health systems, and policymakers in the future, enabling citizens to monitor and track obesity prevention and intervention efforts within their own communities.

This state of obesity report shows Wisconsin has marked room for improvement regarding obesity prevention, especially with obesity-related health policies. Physicians and health care systems can play a pivotal role in making progress on obesity prevention.

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