

# MICHIGAN BRFSS SURVEILLANCE BRIEF



A newsletter from the Lifecourse Epidemiology & Genomics Division, MDHHS

Vol. 15 No. 2

August 2024

## Social Determinants of Health and Mental Health among Michigan Adults, 2022

Using data from the 2022 Michigan Behavioral Risk Factor Survey (MiBRFS), this surveillance brief examines the prevalence of social determinants of health (SDOH) and mental health outcomes by demographic characteristics among Michigan adults. Additionally, this brief assesses the associations between SDOH and mental health outcomes, adjusting for demographics.

### Background

SDOH are the conditions in the environments where people are born, live, learn, work, play, worship and age that affect a wide range of health, functioning and quality-of-life outcomes and risks.<sup>1</sup> SDOH comprises a broad array of social, structural and contextual experiences such as educational attainment, employment status, access to food and housing, financial stability and access to health care.<sup>2</sup> Adverse SDOH experiences have great impacts on people's physical health, mental well-being and quality of life.<sup>2-6</sup> Because some of these experiences are highly interrelated, a composite measure of SDOH has been used to evaluate the effect of SDOH on health outcomes,<sup>5,6</sup> instead of focusing on individual social risk factors.

### Methods

The Michigan Behavioral Risk Factor Surveillance System (MiBRFSS) is a telephone-based health survey of adult Michigan residents that provides statewide prevalence of chronic health conditions, health-related behaviors, medical conditions and preventive health care practices. The Michigan BRFSS provides cross-sectional data, and a temporal relationship cannot be established. To improve the generalizability of the data, making it possible to draw conclusions about the health of Michiganders, the CDC weighted survey data using iterative proportional fitting, also known as raking, to account for demographic differences between the survey sample and Michigan's population.

In the 2022 Michigan BRFSS survey, the SDOH module consists of 10 questions assessing social risk experiences, as indicated in Table 1.<sup>7</sup> The SDOH summary score was created based on these 10 questions. Exposure to any single risk experience counted as one point toward the score. The final SDOH summary score was the sum of the total number of points accumulated; scores ranged from zero to 10. Respondents who reported zero adverse SDOH were considered to

### What is the Michigan Behavioral Risk Factor Surveillance System (MiBRFSS)?

The MiBRFSS comprises annual, statewide telephone surveys of Michigan adults aged 18 years and older and is part of the national BRFSS coordinated by the Centers for Disease Control and Prevention (CDC).

The MiBRFSS follows the CDC BRFSS protocol and use the standardized English core questionnaire that focuses on various health behaviors, medical conditions and preventive health care practices related to the leading causes of mortality, morbidity and disability. Landline and cell phone interviews are conducted across each calendar year.

Data are weighted to adjust for the probabilities of selection and a raking weighting factor is used to adjust for the distribution of the Michigan adult population based on eight demographic variables.

All analyses are performed using SAS-callable SUDAAN<sup>®</sup> to account for the complex sampling design.

have none of the social needs. The SDOH summary scores were categorized as 5-level: SDOH score=0, SDOH score=1, SDOH score=2, SDOH score=3, and SDOH score≥4.

**Table 1: Social Determinants of Health Module Questions, MiBRFS, 2022**

<p><b>Life dissatisfaction</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “dissatisfied/very dissatisfied” to the question, “In general, how satisfied are you with your life? Are you...”</li></ul> <p><b>Lack of social and emotional support</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “sometimes/rarely/never” to the question, “How often do you get the social and emotional support that you need? Is that...”</li></ul> <p><b>Social isolation or loneliness</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “always/usually/sometimes” to the question, “How often do you feel socially isolated from others? Is it...”</li></ul> <p><b>Loss or reduced hours of employment</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “yes” to the question, “In the past 12 months, have you lost employment or had hours reduced?”</li></ul> <p><b>Receiving food stamps or SNAP</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “yes” to the question, “During the past 12 months, have you received food stamps, also called Supplemental Nutrition Assistance Program (SNAP), the Supplemental Nutrition Assistance Program on an electronic benefits transfer (EBT) card?”</li></ul> <p><b>Food insecurity</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “always/usually/sometimes” to the question, “During the past 12 months, how often did the food that you bought not last, and you didn’t have money to get more? Was that...”</li></ul> <p><b>Housing insecurity</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “yes” to the question, “During the last 12 months, was there a time when you were not able to pay your mortgage, rent, or utility bills?”</li></ul> <p><b>Experiencing threat to shut off utility services</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “yes” to the question, “During the last 12 months, was there a time when an electric, gas, oil, or water company threatened to shut off services?”</li></ul> <p><b>Lack of reliable transportation</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “yes” to the question, “During the past 12 months, has a lack of reliable transportation kept you from medical appointments, meetings, work, or from getting things needed for daily living?”</li></ul> <p><b>Mental stress</b></p> <ul style="list-style-type: none"><li>• Defined with a response of “always/usually” to the question, “Stress means a situation in which a person feels tense, restless, nervous or anxious, or is unable to sleep at night because their mind is troubled all the time. Within the last 30 days, how often have you felt this kind of stress? Was it...”</li></ul>
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This study used two mental health outcomes in the 2022 MiBRFS. Subjective poor mental health was defined based on respondents who reported 14 or more days of poor mental health, which includes stress, depression and problems with emotions, during the past 30 days. Clinical diagnosis of depression was defined according to respondents who reported ever being told by a doctor, nurse or other health professional that they ever had a depressive disorder, including depression, major depression, dysthymia or minor depression.

The prevalence of SDOH use and each mental health outcome among Michigan adults was assessed by age, race/ethnicity, education, household income, and health insurance. Weighted logistic regression models were used to assess the relationship between SDOH and mental health outcomes, controlling for demographics. All analyses accounted for the complex sample design.

## Results

### Prevalence of Social Determinants of Health Summary Score

Based on 2022 MiBRFS data, an estimated 45.1% of Michigan adults reported experiencing none of the social needs; about 23.2% of adults experiencing one risk factor; 11.4% of adults experiencing two risk factors; 8% experiencing three risk factors; and 12.3% of adults experiencing at least four risk factors (Table 2).

- Young adults were more likely to report SDOH summary score  $\geq 4$  (18.3% for adults aged 18-44 years old and 11% for adults aged 45-64 years old) than adults aged 65 years and older (3.8%).
- The prevalence of SDOH summary score  $\geq 4$  was significantly higher among non-Hispanic Black adults (23.4%) than non-Hispanic white adults (9.6%).
- The prevalence of SDOH summary score  $\geq 4$  was significantly higher among adults with high school graduate or less education (18.1%) than those with some college or more education (9%).
- The prevalence SDOH summary score  $\geq 4$  decreased with increasing household income (44.5% for household income less than \$20,000, 13.9% for \$20,000-74,999, and 1.9% for \$75,000 or above).
- Uninsured adults reported SDOH summary score  $\geq 4$  more frequently (25.2%) than insured adults (12%).

**Table 2. The Prevalence of Social Determinants of Health Summary Score by Demographics, MiBRFS 2022**

	Having none of the social needs		SDOH score=1		SDOH score=2		SDOH score=3		SDOH score $\geq 4$	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
<b>Statewide</b>	45.1	(43.3-46.9)	23.2	(21.7-24.8)	11.4	(10.2-12.6)	8.0	(6.9-9.3)	12.3	(11.1-13.7)
<b>Age</b>										
18-44 years	33.8	(30.8-37.0)	23.3	(20.6-26.2)	13.0	(10.9-15.5)	11.5	(9.3-14.2)	18.3	(15.8-21.1)
45-64 years	48.4	(45.5-51.2)	22.6	(20.2-25.3)	11.0	(9.3-12.9)	7.0	(5.7-8.7)	11.0	(9.4-12.8)
65+ years	60.1	(57.5-62.8)	23.7	(21.4-26.3)	9.0	(7.5-10.7)	3.4	(2.4-4.7)	3.8	(2.9-4.9)
<b>Race/Ethnicity</b>										
White non-Hispanic	50.1	(48.1-52.0)	23.6	(22.0-25.4)	10.2	(9.0-11.5)	6.5	(5.4-7.8)	9.6	(8.4-11.0)
Black non-Hispanic	28.9	(23.5-34.9)	19.2	(14.9-24.4)	19.1	(14.7-24.4)	9.5	(6.0-14.6)	23.4	(18.2-29.5)
Other	31.3	(26.4-36.6)	25.4	(20.3-31.3)	11.5	(8.4-15.6)	14.4	(10.4-19.7)	17.3	(13.3-22.3)
<b>Education</b>										
$\leq$ High school diploma	34.6	(31.5-37.7)	22.3	(19.6-25.3)	14.3	(12.0-17.0)	10.7	(8.5-13.4)	18.1	(15.5-21.1)
Some college or more	51.1	(49.0-53.2)	23.7	(21.9-25.5)	9.7	(8.6-11.0)	6.5	(5.3-7.9)	9.0	(7.8-10.4)
<b>Household Income</b>										
< \$20,000	9.6	(6.8-13.2)	17.4	(12.9-23.0)	16.3	(11.9-21.9)	12.2	(8.1-17.9)	44.5	(38.1-51.2)
\$20,000 - \$74,999	39.0	(36.3-41.8)	24.2	(21.8-26.8)	12.4	(10.6-14.4)	10.5	(8.5-12.8)	13.9	(11.8-16.3)
$\geq$ \$75,000	61.7	(58.6-64.6)	22.3	(19.8-24.9)	9.9	(8.1-11.9)	4.4	(3.1-6.2)	1.9	(1.2-2.9)
<b>Health Insurance</b>										
Insured	46.1	(44.2-47.9)	23.3	(21.7-25.0)	11.0	(9.9-12.2)	7.7	(6.6-9.0)	12.0	(10.7-13.4)
Uninsured	26.4	(18.4-36.3)	21.1	(13.9-30.6)	17.0	(10.0-27.6)	10.3	(5.8-17.8)	25.2	(16.4-36.6)

95% CI = 95% Confidence Interval. SDOH = Social Determinants of Health.

### Prevalence of Mental Health Outcomes

- In 2022, an estimated 16.1% Michigan adults reported 14 or more days of poor mental health, which includes stress, depression and problems with emotions, during the past 30 days (Table 3).
- Higher prevalence of poor mental health was observed among younger adults, adults with high school graduate or less education and adults with lower household income.

- An estimated 23.2% of adults reported ever being told by a doctor, nurse or other health professional that they ever had a depressive disorder including depression, major depression, dysthymia or minor depression.
- The prevalence of clinical diagnosis of depression was significantly higher among younger adults, white, non-Hispanic adults, and adults with lower household income.

**Table 3. The Prevalence of Mental Health Outcomes by Demographics, MiBRFS 2022**

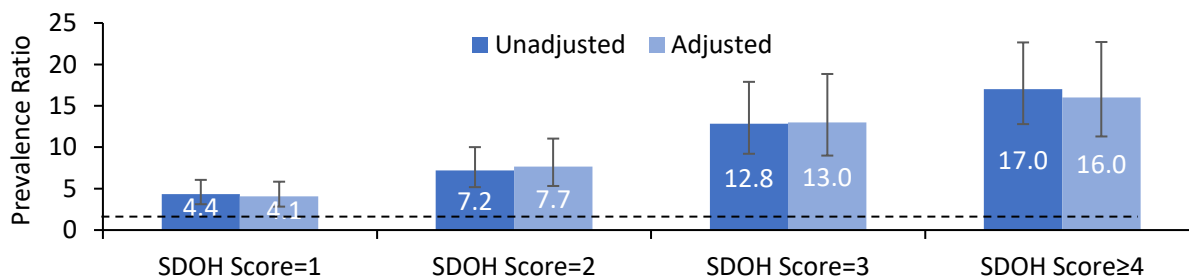
	Poor Mental Health		Clinical Diagnosis of Depression	
	%	95% CI	%	95% CI
<b>Statewide</b>	16.1	(14.7-17.6)	23.2	(21.6-24.8)
<b>Age</b>				
18-44 years	22.4	(19.6-25.5)	29.1	(26.1-32.3)
45-64 years	14.2	(12.5-16.1)	21.6	(19.4-23.9)
65+ years	7.8	(6.4-9.6)	15.0	(13.3-16.8)
<b>Race/Ethnicity</b>				
White non-Hispanic	15.4	(13.9-17.1)	23.8	(22.0-25.6)
Black non-Hispanic	18.3	(13.8-23.9)	15.5	(11.7-20.4)
Other	18.7	(14.3-24.0)	26.3	(21.3-32.0)
<b>Education</b>				
≤High school diploma	19.0	(16.2-22.1)	23.8	(20.9-27.0)
Some college or more	14.5	(13.0-16.2)	22.9	(21.1-24.7)
<b>Household Income</b>				
< \$20,000	30.5	(24.7-37.0)	37.5	(31.2-44.1)
\$20,000 - \$74,999	18.2	(15.8-20.7)	25.2	(22.7-27.8)
≥\$75,000	10.0	(8.3-12.2)	16.4	(14.3-18.9)
<b>Health Insurance</b>				
Insured	15.9	(14.4-17.4)	22.9	(21.4-24.6)
Uninsured	21.3	(13.8-31.3)	24.4	(16.2-35.0)

95% CI = 95% Confidence Interval.

**SDOH Summary Score and Mental Health Outcomes**

Figure 1 displays the unadjusted and adjusted prevalence ratio of poor mental health in relation to SDOH summary score among Michigan adults. Overall, these results indicated the significant association between SDOH summary score and poor mental health. Compared to adults experiencing none of the social needs, respondents who reported experiencing 1, 2, 3, or 4+ SDOH needs had significantly higher adjusted prevalence ratio [95% confidence interval] for poor mental health (4.1 [2.8-5.8] for SDOH=1, 7.7 [5.3-11] for SDOH=2, 13 [9-18.8] for SDOH=3, 16 [11.3-22.7] for SDOH≥4), adjusting for age, race/ethnicity, education, household income and health insurance.

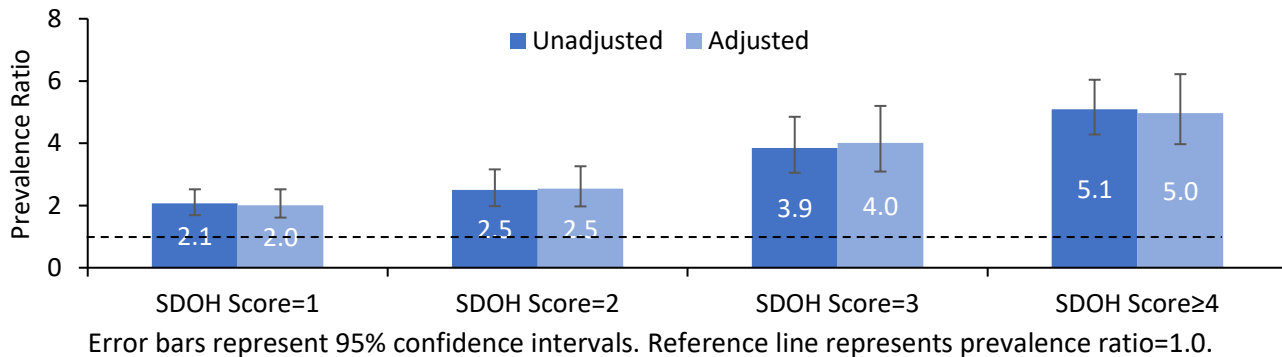
**Figure 1. Unadjusted and Adjusted Prevalence Ratio of Poor Mental Health in Relation to SDOH Score, MiBRFS 2022**



Error bars represent 95% confidence intervals. Reference line represents prevalence ratio=1.0.

Figure 2 displays the unadjusted and adjusted prevalence ratio of clinical diagnosis of depression in relation to SDOH summary score among Michigan adults. Significant associations were observed between SDOH summary score and clinical diagnosis of depression. Compared to adults experiencing none of the social needs, respondents who reported experiencing 1, 2, 3, or 4+ SDOH had significantly higher adjusted prevalence ratio [95% confidence interval] for depressive disorders (2 [1.6-2.5] for SDOH=1, 2.5 [2-3.3] for SDOH=2, 4.0 [3.1-5.2] for SDOH=3, 5 [4-6.2] for SDOH≥4), adjusting for age, race/ethnicity, education, household income, and health insurance.

**Figure 2. Unadjusted and Adjusted Prevalence Ratio of Clinical Diagnosis of Depression in Relation to SDOH, MiBRFS 2022**



## Discussion

Based on the 2022 MiBRFS data, this brief observed that the prevalence of adverse SDOH was higher among adults under 45 years old and Black non-Hispanic adults, as well as people with a high school diploma or less education, people who are uninsured, and among households with an income less than \$20,000. The findings suggest Michigan adults currently experiencing adverse social needs reported significantly higher rates of poor mental health and depressive disorders than those experiencing none of the social needs. This study highlights that SDOH have a profound impact on people’s mental health and that addressing adverse SDOH could lead to improvement in mental health equity. Decision-makers and policymakers can use this information to understand and assess the impact of SDOH on mental health, and to evaluate interventions.

One limitation of this brief is that the Michigan BRFS provides cross-sectional data, and a temporal relationship cannot be established; as a result, we cannot address causation. Although SDOH may not be the primary cause of poor mental health, addressing SDOH may prove beneficial when forming treatment plans for those with poor mental health. More policies and programs are needed to address the burdens of poor mental health with adverse SDOH among Michigan adults.

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**Suggested citation:** Tian Y, Kleyn M. Social Determinants of Health and Mental Health Outcomes among Michigan Adults, 2022. Michigan BRFSS Surveillance Brief. Vol. 15, No. 2. Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division, August 2024.