



Wisconsin Family Health Survey, 2021 Technical Notes

Wisconsin Family Health Survey design

Introduction

The Wisconsin Family Health Survey (FHS) is a survey of Wisconsin households conducted using telephone interviews. It is designed to provide estimates of health insurance coverage, various health conditions, and use of health care services among Wisconsin residents of all ages.

For more than 20 years, the FHS sampling frame consisted of all Wisconsin households with a working landline telephone. Due to the rapid increase in cellphone usage, and the lack of cell-phone-only households in the sampling frame, we switched to a residential, address-based sampling frame starting with the 2012 FHS. The shift to an address-based sample design means the unweighted sample now consists of a combination of:

- “Cell-phone-only” households.
- Households with both landline telephones and cell phones.
- Households with only landline telephones.

Sample design

The sample design for the survey divides the state into six sample strata based on U.S. census tracts. Two of the strata are composed of census tracts with greater than 50% minority population. The first minority stratum includes census tracts within Milwaukee County, and the second minority stratum includes census tracts elsewhere in the state. Minority population is defined as all persons who indicate their race or ethnicity to be a group other than White, non-Hispanic. The other four strata are groupings of census tracts by county size.

Survey implementation

The University of Wisconsin Survey Center (UWSC), the contracted survey laboratory, purchased randomly selected residential addresses for each stratum, drew the samples, and conducted all the interviews for 2021. Among the selected addresses, 37% had an identified telephone number (called “matched sample”) that was used to contact the household. The addresses without telephone numbers were contacted by mail to request a phone number (called “unmatched sample”). Trained interviewers called the telephone numbers and conducted the survey interviews using a computer-assisted telephone interview system. Interviewers called the same phone number at least ten times before designating it as “unanswered.”

The questions asked in the FHS were designed in the Health Analytics Section of the Office of Health Informatics, Division of Public Health, Department of Health Services. UWSC staff conducted interviews from January of 2021 through February of 2022. The final FHS sample consisted of 2,506 household interviews, comprising a total of 5,542 Wisconsin household residents.



The interviewer selected the adult who self-identified as knowing the most about the health of all household members to answer all survey questions during the interview. This respondent answered survey questions for themselves as well as for all other household members.

The data set for analysis of the 2021 FHS was constructed in the Office of Health Informatics, using the individual as the basic unit for analysis. Missing data on age and income were imputed when possible.

Wisconsin Family Health Survey 2021 Sample

Total	5,542		
Age groups		Milwaukee County	992
0–17	999		
18–44	1,419	Residence	
45–64	1,542	City of Milwaukee	694
65+	1,582	Other metropolitan	3,385
		Non-metropolitan	1,463
Sex and age groups		Poverty status	
Male		Poor	467
0–17	527	Near-poor	887
18–44	697	Not poor	4,048
45–64	721		
65+	742	Educational attainment (adults)	
Female		Less than high school diploma	213
0–17	472	High school diploma	1,297
18–44	722	More than high school	3,033
45–64	821		
65+	840	Employment	
Ethnicity and race		Ages 0–17	
Hispanic or Latino	291	Live with no employed adult(s)	84
White, NH	4,453	Live with employed adult(s)	915
Black or African American, NH	362	Ages 18–64	
American Indian or Alaska Native, NH	136	Employed full-time	1,714
Asian, NH	117	Self-employed full-time	149
Other, NH	66	Employed or self-employed part-time	352
Two or more races, NH	117	Not employed/Not in labor force	744

NH: Non-Hispanic/Latino

Data set weighting

FHS is designed to capture health access and utilization information about Wisconsin's household population. Rather than contacting every member of this population for information — that is, conducting a census — it is much more cost-effective to contact a sample of the



population and then assign a weight to each record so that when the results are multiplied by these weights, they are representative of the full population. The sum of the entire set of case weights is equal to the household population of the state of Wisconsin.

Weighting procedure

The first part of the weighting process involves adjusting for the varying sampling and response rates by sampling season (spring or fall), matching status (matched or unmatched sample), and stratum. The next step adjusts the household weights to match the household distribution of the 2020 American Community Survey (ACS) data on household type and home ownership. This is done by a process known as iterative proportional fitting or raking.

Next the household weights are used as the initial “person-level” weights, and those weights are adjusted to match the 2020 ACS distribution on:

- Department of Health Services region (with Milwaukee County separate from the Southeast DHS region).
- Age.
- Gender.
- Educational attainment.
- Race/ethnicity.
- The interaction between age and gender.
- The interaction between race/ethnicity and Milwaukee County residence. (This is done because the majority of African American and Hispanic residents in Wisconsin live in Milwaukee County.)

When the final weight is applied to the data set, the results for age groups, sex, education, race, household composition, and region/Milwaukee County closely resemble official estimates of Wisconsin’s household population from the U.S. Census Bureau.

The resulting weighting variable was used to compute all estimates presented in the 2021 FHS results. All references to “weighted” data refer to data that have been adjusted using this weighting variable. When the weighting variable is applied to the data set, the results are representative of all Wisconsin household residents in 2021. This method produces the most reliable results from the survey data.

Definitions of variables used in FHS publications

Age and sex

These characteristics are reported by the respondent answering for each household member. Individual years of age are classified into four groups for analysis: ages 0–17, 18–44, 45–64, and 65 and older.

Ethnicity and race

FHS respondents were first asked if anyone in the household was Hispanic or Latino. Then they were asked to report each household member’s race or races. Up to five races could be reported for each person.



In FHS publications, all persons who were reported to be Hispanic or Latino are in the Hispanic/Latino category. All persons not reported as Hispanic/Latino, but for whom two or more races were reported, are in the “two or more races” category. All remaining persons are distributed in the “single-race, not Hispanic/Latino” categories. Some ethnic and racial groups are not included in the tables due to small sample sizes, which make any estimates based on those samples unreliable.

Metropolitan and non-metropolitan

Twenty-six Wisconsin counties are designated as metropolitan counties by the federal Office of Management and Budget, based on the 2010 U.S. Census standards (2020 Census standards had not been released at the time): Brown, Calumet, Chippewa, Columbia, Dane, Douglas, Eau Claire, Fond du Lac, Green, Iowa, Kenosha, Kewaunee, La Crosse, Marathon, Milwaukee, Oconto, Outagamie, Ozaukee, Pierce, Racine, Rock, St. Croix, Sheboygan, Washington, Waukesha, and Winnebago.

Counties are designated as metropolitan because they either have a central city of at least 50,000 people or are adjacent and economically linked to a “central city” county. For the published tables of FHS estimates, results for the city of Milwaukee have been separated from the rest of the metropolitan counties. The “Other metropolitan” category includes Milwaukee County outside the city, plus the remaining 25 metropolitan counties. The other 46 counties are non-metropolitan.

Poverty status

The relationship between the number of people in a household and the annual income of that household determines the poverty status. FHS asked several questions about total household income during the calendar year prior to the survey (2020) and used current household size to determine whether a household’s income was below the federal poverty guideline. A household of four people was considered poor if the total income was below \$26,000. This is based on federal guidelines, published annually in the Federal Register. The “near-poor” category used in this report includes all people in households where the income was greater than the poverty guideline but less than twice the guideline. For a household of four, this was \$52,000.

Wisconsin Family Health Survey Poverty Guidelines, 2021

Household Size	Poor	Near-Poor
1	\$13,000	\$26,000
2	\$17,000	\$34,000
3	\$22,000	\$43,000
4	\$26,000	\$52,000
5	\$31,000	\$61,000
6	\$35,000	\$70,000



Source: 2021 Family Health Survey, Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Guidelines derived from *Federal Register*, 2020, and rounded to nearest \$1,000.

Note: All members of a household were considered "poor" if total household income was less than the poverty guideline (less than 100% federal poverty level, or FPL) shown for a household of that size. Household members were considered "near-poor" if total household income fell between the poor and near-poor guidelines (between 100% and 200% FPL) shown for a household of that size. Household members were considered "not poor" if the total household income was greater than 200% of the poverty guideline shown for a household of that size.

Educational attainment

For adults, years of schooling completed are categorized in three groups. Adults who finished 11 grades of school or less are in the first group, "Less than high school diploma." Adults who completed 12 years of school or a G.E.D. are in the "High school graduate" group. Adults who attended college or technical school after high school are in the "Education beyond high school" group.

Working-age adults (ages 18–64)

People in this age range are classified by employment status. Those who were working full time for an employer at the time of the survey interview are grouped together; some in this group were also additionally self-employed. Among those not working full time for an employer, those who were self-employed full time are grouped together, as are those who were working part time. The remaining adults ages 18–64 include homemakers, retired individuals, full-time students, persons laid off, the unemployed (either looking or not looking for work), and individuals with disabilities who are unable to work. Together they make up the "Not employed/Not in labor force" category.

Children under age 18

All children under age 18 are classified by the employment status of the adults in their household. If at least one adult was employed either part time or full time, then the child was classified as living with an employed adult. If no adult in the child's household was employed at the time of the interview, then the child was classified as living with no employed adults.

Health insurance

As used in FHS publications, "health insurance" includes any kind of private or public coverage for health care costs, including Medicare, Wisconsin Medicaid (or BadgerCare Plus), and other government-funded insurance.

Questions about health insurance coverage ask about specific types of insurance in this sequence: Medicare, SeniorCare, Health Insurance Marketplace (also known as "exchange"), employer-sponsored, Medicare supplement or Medigap, private (insurance bought directly from



an agent or company), coverage from someone not living in the household, military health care (TRICARE, CHAMPUS, CHAMP-VA, VA), Medicaid (including BadgerCare Plus), and other types of coverage. For each type of insurance, the respondent is asked whether any household members are currently enrolled and, for each enrolled person, whether that person has been enrolled for less than or more than 12 months.

At the end of this set of questions, the respondent is asked about each person who was not reported to be covered by any type of insurance. This verification question locates another small group of people who otherwise would mistakenly be considered uninsured.

People with Indian Health Service medical care and no other coverage are considered uninsured in FHS publications. This is based on a decision of the U.S. Census Bureau to modify the definition of the population without health insurance to count people with Indian Health Service medical care as uninsured. The effect of this change on the overall estimates of health insurance coverage in Wisconsin is negligible.

Health insurance coverage over the past year

This estimates three groups: the percentage of residents who were covered by any type of insurance over the entire 12 months preceding the telephone interview, the percentage who had insurance during part of the 12 months and had no insurance part of the time, and the percentage who had no health insurance at all during the preceding 12 months.

Because FHS interviews were conducted from January 2021 to February 2022, the “preceding 12-month” period is variable. For example, respondents interviewed in September 2021 were asked to report their health insurance coverage for the 12-month period between September 2020 and September 2021.

Insured and uninsured (point-in-time)

The estimate of health insurance coverage is the percentage (or number) who had health insurance coverage at the time of the interview. It is a “snapshot” estimate, a cross-section of the Wisconsin household population at one point in time. Any type of public or private insurance coverage at the time of the interview classifies a person as having health insurance. Those with no insurance at the time of the interview are considered uninsured.

Insurance type

In the “Type of Insurance” section of the “Point-in-Time” table, the insurance categories were created as mutually exclusive groups. If an individual carries more than one type of insurance, the insurance coverage for that individual is counted only once. In other words, a person who has two types of insurance is included in only one insurance type category (the one that appears first in the table). For example, an individual with both employer-sponsored and private coverage is included only in the “Employer” insurance count.

Published tables

The tables include estimated percentages, 95% confidence intervals, and estimated numbers of people. Results are referred to as “estimated” percentages and numbers because they are



derived from a sample survey. The weighted survey data provide reliable estimates of characteristics of Wisconsin's population. The estimated numbers of people, which are estimates of the Wisconsin household population, are rounded to the nearest 1,000.

FHS conducts interviews with randomly selected households, a sample of all Wisconsin households. The random sample is used to represent the actual Wisconsin population, but the sample will have a small amount of variation from the actual population. Statistical procedures, such as constructing confidence intervals, are a guide to the amount of precision attributed to the survey results.

Confidence intervals and statistical tests

In most published tables, the 95% confidence interval (for both the estimated percentage and number of people) is in parentheses. This means that there is a 95% probability that the true parameter (that is, the percentage or number of people) is likely to be in that range of values.

In some tables, the percentage estimates would be expected to sum to 100%, but they do not. This is due to the omission of "no answer" categories. The "no answer" category includes refusals to answer and answers of "don't know." Information about the "no answer" or "missing data" category is presented in tables when it is a notable percentage.

