

Population Health Certificate

Accessing Data to Identify Population Health Trends
 Katie Gillespie, Co-Faculty



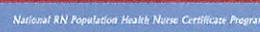

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Population-based data

Population-based data is data that represents the whole population and is used to make decisions for organizations and families. It includes information such as:

- Demographics
- Vital statistics
- Diagnoses
- Family history





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Key concepts

- Data
- Epidemiology
- Analyses
- Aggregate
- Integration
- Stratification
- Interoperability

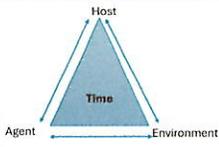
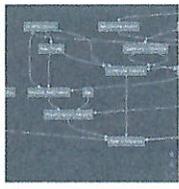




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Epidemiology

- Triangle
- Web of Causation



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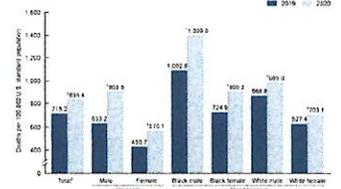
Data and Epidemiology




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Descriptive epidemiology

- Rates
- Incidence and prevalence
- Mortality rates
- Case fatality rates

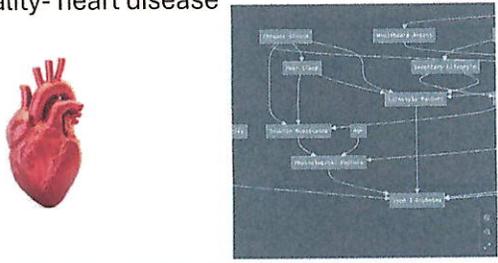


Group	2019	2020
Total	716.2	694.4
Male	633.7	603.9
Female	835.7	792.1
Black male	1,002.8	1,209.9
Black female	724.6	760.2
White male	664.8	700.9
White female	527.4	573.1




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Causality- heart disease



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Public Health Databases-Wisconsin

WISH (Wisconsin Interactive Statistics on Health) Query System

- WISH
- Vital Records
- Registries

This site gives you information about health indicators (measures of health) in Wisconsin. WISH allows online users, health professionals, and the public to submit questions (requests for data) and receive answers (tables) over the internet. To construct answers to your questions, WISH uses selected databases containing Wisconsin data from a variety of sources. Most modules contain data for multiple years and geographic areas.

WISH User video tutorial:



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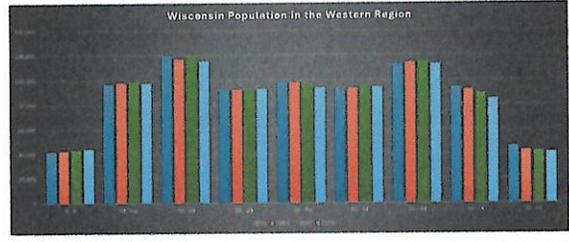
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Using Data to Improve Population Health

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Wisconsin Population Query



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Electronic Health Record

- Adds options to communicate with patients
- Useful across multiple electronic devices
- Links to Health Information Exchanges
- Populates health registries



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Census Data: <https://data.census.gov/>

<p>Everyone</p> <ul style="list-style-type: none"> • Gender • Age • Education • Race • Marital status • Household size 	<p>Select sample</p> <ul style="list-style-type: none"> • Occupation • Income • Household facilities
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Measuring America's People, Places, and Economy

We Believe in the Power of Quality Data to Impact Public Life

Dane County, Wisconsin

Label	White alone		Black or African American alone		Hispanic or Latino of any race (200-299)	
	Number	Percent	Number	Percent	Number	Percent
HOUSING TENURE						
Discard of housing units	118,876	100.0	5,379	100.0	4,124	100.0
Owner-occupied housing units	96,238	80.9	503	9.3	1,056	25.6
Renter-occupied housing units	22,638	19.1	4,876	90.7	3,068	74.4
Average household size of owner-occupied units	2.61	(0)	2.87	(0)	3.73	(0)
Average household size of renter-occupied units	1.90	(0)	2.63	(0)	2.89	(0)

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Behavior Risk Factor Surveillance System

- WISH
- County Health Rankings & Roadmaps
- CDC BRFSS Prevalence and Trends Data Tool
- Wisconsin Cancer Collaborative County Cancer Profiles
- The Burden of Binge Drinking in Wisconsin Report
- Adult Alcohol Use in Wisconsin
- Opioid and Prescription Pain Medication Use

County Health Rankings & Roadmaps
Dane County Health Outcomes - 2024

Dane County is faring better than the average county in Wisconsin for Health Outcomes, and better than the average county in the nation.

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All Topics

Population estimates, July 1, 2025 (V2025)

	31,879	280,261	477,247	338,812,898
Housing				
Discard of housing units, July 1, 2025 (V2025)	118,876	5,379	266,142	145,330,836
Owner-occupied housing units, 2018-2022	79.7%	47.0%	17.9%	64.6%
Median value of owner-occupied housing units, 2018-2022	\$192,509	\$176,000	\$342,900	\$276,900
Median value of monthly owner costs with a mortgage, 2018-2022	\$1,413	\$1,274	\$2,047	\$1,829
Median selected monthly owner costs without a mortgage, 2018-2022	\$345	\$307	\$445	\$388
Median gross rent, 2018-2022	\$795	\$1,291	\$1,204	\$1,206
Computer and Internet Use				
Households with a computer present, 2018-2022	87.4%	90.6%	90.5%	84.0%
Households with a broadband Internet subscription present, 2018-2022	74.6%	90.2%	61.8%	68.5%
Education				
High school graduate or higher percent of persons age 25 years, 2018-2022	90.5%	88.5%	90.0%	89.0%
Bachelor's degree or higher percent of persons age 25 years, 2018-2022	24.3%	28.9%	23.0%	24.5%

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National Survey of Children's Health

A project of the Child and Adolescent Health Measurement Initiative

- Funded by the Maternal and Child Health Bureau of HRSA
- Collects information on children-including physical and mental health, healthcare access, family, neighborhood, school, and social context
- The survey is administered as a mail and web-based survey by the Census Bureau
- Interactive Query available

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Pregnancy Risk Assessment Monitoring System (PRAMS)

- Data on maternal attitudes and experiences before, during, and after pregnancy
- Works with partners to identify additional questions or methods to capture better population data

WISCONSIN PRAMS
Your attitudes and experiences are the foundation of a healthy pregnancy and delivery.

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NSCH- Emotional and Mental Health

Indicator 2.6: Compared to other children their age, how much difficulty does this child have making or keeping friends, age 6-17 years?

	No difficulty	A little difficulty	A lot of difficulty	Total %	
Wisconsin	%	76.0	19.4	4.5	100.0
	CI	73.0-79.6	17.1-21.9	3.8-6.0	
	Sample Count	1,259	310	90	
	Pop. Est.	6,584,551	169,520	38,711	
Minnesota	%	74.3	20.7	5.0	100.0
	CI	72.6-77.7	17.6-24.2	3.7-6.8	
	Sample Count	493	156	54	
	Pop. Est.	4,534,825	182,357	43,900	

CI = 95% Confidence Interval
Percentages and population estimates (Pop. Est.) are weighted to represent child population in US

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Working with IT



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HL7 Standards

FHIR (Fast Healthcare Interoperability Resources)

- RESTful architecture
- Mobile-friendly design
- Modular resources



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Data Security and Privacy in Healthcare

- HIPAA
 - Privacy Rule
 - Security Rule
 - Breach Notification Rule
 - Omnibus Rule
- HITECH Act
- State regulations



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Nurses and Data Integration

- Documentation and data entry
 - Accurate and standardized documentation
 - Understanding structure data entry
 - Validation of imported data
- Workflow integration
 - Identifying integration points in clinical workflows
 - Supporting seamless data flow
 - Quality assurance in data exchange



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Collaborating on data integration and interoperability

- Data Integration - a unified view
- Interoperability – exchange data across systems



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Potential for AI in Population Health

- Generative- Artificial intelligence algorithms that can create **new** content (text, images, video, audio, computer code, etc.)
- Large Language Model- An AI model that figures out, based on probabilities, what word or sequence of words is likely to come next



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Case Example- Heart Health

Metropolitan Health System



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Clinical Improvements:

- 25% reduction in hospital admissions
- 30% reduction in ED visits
- 15% improvement in medication adherence
- 20% increase in preventive service completion

Process Improvements:

- 35% reduction in care gaps
- 40% increase in timely follow-up appointments
- 28% improvement in referral completion

Financial Impact:

- \$3.2M reduction in hospital costs
- \$800K reduction in ED costs
- \$1.5M increase in preventive service revenue



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Metro Health System's Heart Health Initiative

Demographics

- Total cardiac patients: 32,000
- Age distribution: 45-85 years
- Gender: 55% male, 45% female
- Primary diagnoses:
 - Coronary artery disease: 45%
 - Heart failure: 30%
 - Arrhythmias: 15%
 - Other cardiac conditions: 10%

Risk Stratification:

- High risk: 20% (6,400 patients)
- Medium risk: 45% (14,400 patients)
- Low risk: 35% (11,200 patients)

Clinical Decision Support

- Automated alerts
- Patient Registry Developed
- Custom registry for each risk level
- Care Management Protocols



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Case Example- Data Integration

Improving Child Health with School Nurses



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High-Risk Patients:

- Monthly nurse practitioner visits
- Weekly remote monitoring check-ins
- Medication reconciliation every 30 days
- Social worker assessment quarterly

Medium-Risk Patients:

- Quarterly provider visits
- Monthly remote monitoring check-ins
- Medication reconciliation every 90 days

Low-Risk Patients:

- Semi-annual provider visits
- Quarterly remote monitoring check-ins
- Annual medication reconciliation



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Improving Child Health with HIE

- School nurses are isolated from pediatric care
- ~ 40% of school-aged children experience a chronic health condition




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Improving Child Health with HIE (cont.)

- The Health Information Exchange is established
- School RNs are connected
- School RNs can communicate with health providers in real time to triage health concerns and adjust medications
- More children are staying in school for the entire day and parents can remain at work
- School RNs can share documentation with clinics immediately

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Final Thoughts

- Data is simply a collection of facts or values that can be used to represent a concept or idea
- You already use data
- Explore, read, and **Be Curious!**



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