



2022 Greater Lowell Community Health Needs Assessment

TuftsMedicine
Lowell General Hospital

in partnership with



GLHA
GREATER LOWELL HEALTH ALLIANCE



CONDUCTED ON BEHALF OF:

Tufts Medicine Lowell General Hospital

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September 30, 2022

Acknowledgements

The Greater Lowell Health Alliance extends sincere thanks to the following people and organizations who provided critical assistance and partnership to the completion of the 2022 Greater Lowell Community Health Needs Assessment:

Hannah Tello, Ph.D.

Who designed data collection tools including the Greater Lowell Community Needs Assessment survey, created tools for community engagement, analyzed and compiled the results, and served as the primary author of this report.

Devon Goldberg, MPH

For her assistance with data collection, analysis of secondary public health data, and assistance with writing and editing of the report.

Amanda Clermont

For scheduling listening sessions and key informant interviews.

Lisa Taylor-Montminey, as Community Benefits Manager, she served as liaison to Lowell General Hospital and UMASS Lowell partners and advised on hospital and AG requirements, and recommendations. UMass Lowell Professor **Larissa Gaias, Ph.D.** her undergraduate student **Olivia Nazaire**, and the entire service learning class, for help with scheduling, facilitating, and note taking over 30 sessions throughout the community, including **Alexandra Morena, M.A., Giovanni Bautista, Mark Deveau, B.A., Jamie Fay, B.A., Kimberly Holman, Chioma Opara, Samuel Orphanos, B.A., Mahima Patel, Dominique Peralta, B.A., Anastasia Vittum, B.A., and Julia Yeadon.**

The following community partners for hosting Listening Sessions:

The Hunger and Homeless Commission, Housing and Built Environment Task Force, Wellness and Chronic Disease Task Force, AgeSpan, Nonprofit Alliance of Lowell, Lowell Early Childhood Coalition, Maternal Child Health Task Force, African Community Center, Community Benefits Advisory Council, Billerica Substance Use Prevention and Treatment, Abisi Adult Learning Center, Lowell Community Health Center TeenBLOCK, COVID Equity Task Force, Acre Family Childcare, Massachusetts Alliance of Portuguese Speakers, Coalition for a Better Acre, Tewksbury Public Library, and Chelmsford Senior Center for hosting listening sessions. Luz Vasudevan for assistance with organizing and hosting the listening session with members of the Spanish speaking community.

UMass Lowell Professor Dr. Leland Ackerson and his undergraduate Community Needs Assessment **students who conducted key informant interviews** including Angelica Antoine, Pateal Aprahamian, Sharelle Bailey, Gio Baltodano, Jill Brown, Erica Canela Bello, Makayla Clougherty, Hygina Durand, Yuliana Garcia, Dylan Genovese, Margaret Hoff, Joshua Kelly, Matt McGillivray, Rashidah Namutebi, Taylor Nguyen, Lyla Nguyen, Alytah Noum, Erin O’Sullivan, Kajal Patel, Kiss Quick, Nery Rodriguez, Valeria Saldana, Michaela Szymanski, Chloe Tarlin, Michael Top, Allan Vallante, and Periya Yath.

Greater Lowell Health Alliance interns - UMass Lowell, Public Health students **Clara Casale, Olivia Massena, Deysha Morrobel, Gianna Sandelli, Krista Sawyer, Danait Teclezghi, and Soliana Yebio.** Each student focused on an individual town, outreaching to community leaders, attending community events, and working with community partners to distribute and collect surveys. Melanie Chaves, Lowell High School student and Ronan Dowd, Chelmsford High School student, for assistance with conducting survey outreach and inputting survey data.

Susan West-Levine, GLHA Board Chair, for her support with getting surveys completed among the Lowell Community Health Center, patients and employees. **Sue Rosa, GLHA Board Member**, for her help with getting surveys completed in the town of Chelmsford. **Dr. Damian Folch, GLHA Board Member**, for his assistance to increase physician participation in key information interview survey.

Britany Nash, Regional Community Health and Wellness Coordinator for the North West Coalition - Westford, Lowell, Dracut, Acton Health Departments for her help with outreach and coordination to increase participation in the CHNA.

Members of the 2022 Greater Lowell Health Alliance Board and Steering Committees and for their oversight, advice, and guidance.

And all participants who completed the community survey, participated in a listening session and/or served as a key informant for interviews to make this report a success.

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Executive Summary

In collaboration with Lowell General Hospital and UMass Lowell, the Greater Lowell Health Alliance conducted the 2022 Greater Lowell Community Health Needs Assessment. The 2022 Needs Assessment builds upon previous needs assessments, incorporating updated approaches to data collection, analysis, community engagement, and health equity. The assessment is an evidence-based, data-driven description of the health priority areas defined by community members and key stakeholders in Greater Lowell, which includes the communities of Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough and Westford. The assessment also identifies populations of focus that are uniquely impacted by health inequities, as well as makes recommendations for future action to address these concerns. A summary of available community resources is also provided.

Data for this assessment included primary data collection from three sources: 1) a Community Health Survey that was completed by 2,055 community members; 2) twenty-six focus group sessions that collected input from approximately 250 community members; 3) and thirty key informant interviews. Public health data was also analyzed to summarize key indicators and describe relevant trends and disparities. Data was integrated across these sources in order to prioritize key health issues.

Social determinants of health play a significant role in the health needs and health experiences of the Greater Lowell community, as is evidenced by the top barriers and resources. Specifically, participants in this **assessment identified socioeconomic factors including housing costs, utilities costs, the cost of insurance and low wages as critical barriers to their ability to access health services.** Additionally, immigrants, refugees, and ethnic and racial minorities identified additional barriers, **including language barriers, fear of seeking care due to their**

documentation status, and experiences of disrespect or mistreatment by medical personnel. Access to transportation and technology were also features of the built environment that impacted people's ability to access care.

The **top health priorities** identified in this assessment are, in order: 1) mental health, 2) chronic health and wellness, including heart health and nutrition 3) substance and alcohol use, 4) COVID-19 and other infectious diseases, 5) reproductive, sexual and pregnancy health, 6) lung and breathing health, 7) cancer, 8) infant and child health, 9) environmental health and 10) violence.

This assessment identified barriers to accessing health services. By an immense margin, **difficulty understanding and navigating the health system was the most often cited barrier by participants.** Additional barriers include: **cost of care and insurance, lack of transportation, lack of multilingual health services and providers, stigma, mistrust, mistreatment associated with health services, and technology barriers and digital inequities.**

Wellness is not limited to the management of physical health. Community resources that support well-being beyond physical wellness are also critical; these resources typically address social determinants of health as well. The **top resources** identified in this assessment were 1) a robust and accessible healthcare service infrastructure, 2) substance use prevention and treatment services, 3) nutrition and food security, 4) affordable, safe housing, 5) services for children and youth, 6) a network of community-based organization and non-profits, 7) public and subsidized programs and services, 8) services for older adults, 9) a built environment that is accessible to all community members and 10) health education services.

Recommendations from participants highlight the critical need to address social determinants of health while simultaneously improving facets of the healthcare system. The most frequent recommendation from participants was to **increase the accessibility of existing healthcare services**; this includes providing education about existing services, removing barriers to securing insurance, and consolidating available health and social services into a centralized resource hub. Focus group participants stressed the need to **engage with local and state officials to reduce the cost of living**, with a particular focus on housing and utilities cost, as the primary recommendation for improving their health. **Improvements in communication to the community**, including transparency in data collection and reporting, were also requested. Suggestions to improve equity included increasing the multilingual health care provider workforce, **increasing the number of print and online materials available in languages other than English, and addressing racism and its impacts in both the health system and the broader community level**. Specific suggestions for actions within the healthcare system and the community system related to these requests are described in the Future Actions section of each chapter.

Thanks to a community-driven, collaborative approach to the design, implementation and development of this report, the next steps for translating data into action are already underway via the network of engagement collaborators across the Greater Lowell community who will turn this data into a Community Health Improvement Plan, as well as a range of implementation plans and strategic vision plans in a range of settings and organizations. These efforts will continue to be evaluated as they improve the health and well-being of the Greater Lowell community.

Process and Methods

Partners and Collaborators

The 2022 Needs Assessment was undertaken with several key partners.

Tufts Medicine Lowell General Hospital - Tufts Medicine is the parent organization of Lowell General Hospital, a 390-bed, not-for-profit community hospital based in Lowell, Mass. Founded in 1891, Lowell General operates two inpatient hospital campuses, a cancer center, four urgent care centers and several physician and outpatient facilities in the Greater Lowell area. Offering state-of-the-art technology and a full range of medical and surgical services, Lowell General serves as the region's primary healthcare provider and is its largest employer. Tufts Medicine is also the parent organization of Tufts Medical Center, MelroseWakefield Healthcare, an expansive home care and hospice network, and a large clinically integrated physician network that cares for more than 1 million patients per year. The health system is dedicated to providing patients with the highest quality of care as close to home as possible.

UMass Lowell is a public research university in Lowell, MA with a satellite campus in Haverhill, MA. The GLHA has partnered with various departments and research centers across the UMass Lowell campus to engage students and faculty in the research design process, data collection, analysis and various aspects of report writing. In this assessment, university partners were responsible for focus group data collection, as well as conducting a portion of the key informant interviews.

The Greater Lowell Health Alliance (GLHA) is a non-profit organization comprised of healthcare providers, business leaders, educators, civic and community leaders with a common goal to help the Greater Lowell community identify and address its health and wellness priorities.

The GLHA was founded in 2006 through collaboration with Lowell General Hospital, Saints Medical Center, UMass Lowell, Middlesex Community College, Lowell Community Health Center, VNA of Greater Lowell, City of Lowell, and Lowell Public Schools. In 2008, the GLHA merged with the Community Health Network Area 10 (CHNA 10). The GLHA served as the primary author of this report, including in the creation and distribution of data collection tool, data analysis, and report authorship.

Defining Our Community

Geographic Community

The 2022 Needs Assessment defines the community served based on the Lowell General Hospital’s service area. The service area includes the Greater Lowell communities that comprise CHNA 10; these communities are Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough and Westford. This service area encompasses the primary patient population of Lowell General Hospital, as well as the geographic locations of additional Tufts Medicine resources included under the healthcare system, such as urgent cares. Table 1 summarizes key sociodemographic indicators of the Greater Lowell region.

Table 1: Select Demographics of Greater Lowell Communities

	Popula- tion	% White	% Black	% Asian	% His- panic	% Born Outside the US	% Aged 0-17	% Aged 65+	Median Income	% Under Poverty Line
Billerica	41,453	81.7	5.0	7.2	5.3	13.9	18.9	15.5	113,239	4.3
Chelmsford	35,933	87.3	1.2	8.5	3.3	10.0	21.0	17.8	117,582	4.3
Dracut	32,159	87.8	4.0	3.7	6.4	9.2	21.5	16.7	92,685	6.3
Dunstable	3,374	93.7	0.0	2.9	1.9	5.7	21.0	16.0	158,523	1.4
Lowell	113,994	60.3	8.9	21.2	17.9	26.7	21.0	11.5	62,196	17.3
Tewksbury	30,876	91.5	3.2	2.8	2.2	8.4	17.3	18.3	104,610	4.0
Tyngsborough	12,421	85.6	.8	10.6	5.0	12.9	20.1	12.0	115,280	6.7
Westford	24,446	73.1	0.6	23.1	2.6	17.8	27.0	13.2	149,437	1.9
Total/Weighted Average	294,656	75.4	5.1	13.3	9.5	17.5	20.8	14.3	114,260	9.6

Community Populations

This assessment also considers populations of focus that are targeted by Lowell General Hospital's efforts to reduce health disparities as part of its mission of health equity.

Immigrants, Refugees, and Foreign-born

Greater Lowell is home to a large foreign-born population. Approximately 26.6% of Lowell's residents were born outside of the United States.¹ Just under half of the foreign-born population (48.4%) is Asian, with Lowell being home to the second-largest Cambodian population in the U.S., as well as significant populations of Vietnamese and Laotian residents. Lowell has also seen an increase in African immigrants; African and Black community members account for 6.8% of Lowell's total population, but 14.6% of its foreign-born population. While Lowell accounts for the largest portion of foreign-born residents, surrounding communities are also home to many immigrants and refugees, including Westford (17.8% foreign-born), Billerica (13.9%), Tyngsborough (12.9%), Chelmsford (10.0%), Dracut (9.2%), Tewksbury (8.4%), and Dunstable (5.7%). Past needs assessments also identified foreign-born immigrants and refugees as a population at increased risk for health disparities.

The Elderly and Aging Community

The 2019 assessment identified the elderly and aging population as a population of focus. Approximately 15% of Lowell's population is over age 60. In a Tufts Health Plan assessment of healthy aging metrics, Lowell scored worse than the state average on 34 indicators.² The aging population in Lowell is less likely to engage in physical activity or have an annual dental exam; Lowell's aging population also has higher rates of a range of diseases and illness, including high

cholesterol, mental health needs, substance use disorder, diabetes, stroke, COPD, and asthma. While Lowell is the only Greater Lowell community that has been identified at the state level as in need of healthy aging interventions to address inequities, additional communities have undertaken age-friendly initiatives to address the needs of their aging population; for example, Tyngsborough and Chelmsford have joined the AARP national campaign to establish a network of age-friendly communities and initiatives. To engage with this population, the GLHA partnered closely with the research team at UMass Lowell in charge of the Tufts Health Plan Age-Friendly Lowell initiative.

People Experiencing Poverty

Many barriers to health services are attributable to the gap between the high cost of services (and cost of living more broadly) and low incomes. For example, in 2019, 16.8% of Community Survey participants reported not being able to afford prescription medication and 12.3% reported not being able to afford mental health services.³ In Greater Lowell, Lowell is the least affluent community, with a median annual household income of \$62,126; the community with the next highest median income is Dracut (\$92,685). All other communities that make up the Greater Lowell region report median household incomes of over \$100,000. Lowell also has a significantly higher portion of residents living below the poverty line (17.3% compared to the regional rate of 9.4%). The current needs assessment collected sociodemographic data about participants to identify unique disparities in the population of participants who are low-income.

People Living with Chronic Illness

People with chronic diseases experience complex medical needs that make them vulnerable to health inequities. Lowell General Hospital provides a wide range care services related to

1 U.S. Census Bureau. (2022). *2020 American Community Survey 5-year Estimated Subject Sample: Selected Characteristics of the Native and Foreign-Born Population*.

2 Tufts Health Plan Foundation. (2018). *Massachusetts Healthy Aging Community Profile: Lowell*. Retrieved from https://mahealthyagingcollaborative.org/wp-content/themes/mhac/pdf/community_profiles/MA_Town-code160_Lowell.pdf

3 2019 Greater Lowell Community Health Needs Assessment. Retrieved at https://www.lowellgeneral.org/files/lghPublication/documentFile/2019_gl_comm_health_needs_final-3.pdf

lifelong wellness, including prevention services, disease management services and health education to community members. People with chronic illnesses were also identified in the 2019 assessment as a population of focus. In the current assessment, we collected information about participants health status to identify unique health experiences of people living with chronic health conditions.

People with Behavioral Health and/or Substance Use Issues

People with behavioral health challenges are likely to experience additional barriers to services, and have been identified as population of interest in previous needs assessments. Massachusetts ranks 21st out of 50 states in the United Health Foundation health rankings for frequent mental distress, with a rate of 12.9%⁴. Opioid-related deaths in the Greater Lowell region are high, with Lowell accounting for the highest number of deaths in 2021. People living with severe mental illness and/or substance use issues are also more likely to experience homelessness, which exacerbates many health issues. This assessment partnered with several mental health and substance use service providers to host targeted focus groups, survey distribution, and key informant interviews to ensure engagement with this population.

Previous Needs Assessments

The most recent Greater Lowell Community Health Needs Assessment was concluded in 2019. Data from the Community Health Survey and Listening Sessions from the 2019 assessment identified the top health priorities as: mental health, substance use/alcohol use disorders, obesity, cancer, diabetes, nutrition, infectious disease, and respiratory health. Several barriers to health services were also noted, particularly in the social determinant domains of housing, transportation, and the built environment.

Following the publication of the 2019 Community Health Needs Assessment, strategic plans were developed based on the assessment's data. In particular, Lowell General Hospital published the [FY 2020-2021 Community Benefit Implementation Strategy Plan](#), which describes the initiatives undertaken by the hospital within each priority health domain described by the Community Health Needs Assessment. Additionally, the Greater Lowell Health alliance published the [2020 Greater Lowell Community Health Improvement Plan](#), which identifies SMART goals and objectives within each health priority domain area, as well as specific action steps towards achieving those goals, via leveraging relationships with a range of community partners and organizations. The 2019 Community Health Needs Assessment was also a critical component in a range of individual agency strategic plans, needs assessments, and grant making.

Between the 2019 and 2022 assessments, the Greater Lowell Health Alliance also partnered with several agencies conducting concurrent assessments in the region to optimize data sharing and reduce duplication. In particular, the GLHA coordinated the 2022 Needs Assessment in conjunction with:

- *Community Teamwork's 2021 Community Needs Assessment*, which collects and analyzes data on the causes and conditions of poverty in the Greater Lowell region;
- *Mill City Grow's 2022 Community Food Assessment*, which evaluates the strengths and weaknesses of Lowell's food system;
- the *REACH LoWELL* evaluation project, in partnership with Lowell Community Health Center, which seeks to identify and eliminate diabetes disparities among Southeast Asian and Hispanic/Latinx community members;
- and *Age-Friendly Lowell*, a Tufts Health Plan-funded research project through the University of Massachusetts Lowell, which evaluates needs of the aging population in Lowell to implement community-level changes to improve the course of aging

4 United Health Foundation Health Rankings. (2021). Massachusetts Summary 2021. Retrieved from https://www.americashealthrankings.org/explore/annual/measure/Depression_a/state/MA

Methods

This assessment uses a community-activated approach. Community activation refers to the engagement of community stakeholders in every step of the assessment process, from conceptualization to publication. While the Steering Committee ensures that the assessment meets all judiciary requirements, the community-guided process is critical to grounding this assessment in the community served.

Data Sources

Identification of community health priorities, as well as resources and barriers to accessing health services, was produced via four sources of primary and secondary data.

Community Health Survey

A 46-item Community Health Survey was included in this assessment. The Community Health Survey collected data across eight domains: Demographics, Evaluation of Changes in Health and Wellbeing Indicators, Community Health Resources, Health Needs and Issues, Community Safety, Incidence of Health Issues and Access Barriers, Service Utilization History, and Open Response Feedback. The survey was translated from English into six additional languages: Spanish, Portuguese, Khmer, Arabic, French, and Swahili. Participants were able to complete the survey digitally on Survey Monkey or on paper.

Multiple engagement strategies were deployed to promote participation:

Digital media kits for social media posts and hashtags were distributed to the GLHA partner network of over 2,000 agencies. Flyers with the survey QR code were distributed to businesses throughout the Greater Lowell region.

Over 2,000 paper copies of the survey were printed, in multiple languages, and distributed to pick-up and drop-off sites in each community. These sites ensured equitable access to the survey for people with limited technology access or people experiences other barriers with the digital format.

Live survey administration was available to community members at over 20 in-person events. Participants could sit with a survey administrator who would read the survey aloud and record participants' answers. Many live survey administrations were conducted in languages other than English with an interpreter.

Survey data collection yielded 2055 responses (Table 2). A summary of survey participant demographics is provided in Table 3. Because Lowell is the largest municipality by a significant margin in the Greater Lowell region, as well as the most culturally diverse and least affluent by a number of economic indicators, a demographic summary of survey participants from Lowell is also provided.

Table 2: Community Health Survey Participants, by town, 2019 and 2022

	Count	Change from 2019	% Survey	% Population
TOTAL	2055			
Billerica	67	-143	3.3%	15%
Chelmsford	796	+602	38.7%	12%
Dracut	100	-13	4.9%	11%
Dunstable	7	-4	.5%	1%
Lowell	709	+170	34.5%	38%
Tewksbury	34	-59	1.7%	11%
Tyngsborough	56	-52	2.7%	4%
Westford	286	+199	13.9%	8%

Table 3: Selected Community Health Survey Demographics, total and Lowell

	Survey Total		Lowell Participants	
	Count	%	Count	%
TOTAL	2055		709	
Age				
Under 18	95	4.8	24	3.6
18-26	100	5.1	59	8.8
27-34	184	9.3	80	11.9
35-44	436	22.1	108	16.1
45-54	419	21.3	138	20.5
55-64	343	17.4	128	19.1
65-74	244	12.4	88	13.1
75-84	126	6.4	37	5.5
85-94	23	1.2	10	1.5
Gender				
Woman	1491	76.2	486	73.9
Man	444	22.7	167	25.4
Non-binary	18	1.0	4	.6
Transgender	2	.05	-	-
Sexual Orientation				
Heterosexual	1654	89.3	501	86.5
Bisexual	80	4.3	35	6.0
Gay	18	1.0	7	1.2
Lesbian	27	1.5	10	1.7
Asexual	9	.5	1	.2
Pansexual	19	1.0	.7	4
Queer	13	.7	6	1.0
Other/Self Describe	32	1.7	15	2.6
Race				
White/Caucasian Only	1475	76.7	415	65.8
Black/African American Only	87	4.5	71	11.3
Asian/Asian American Only	211	10.9	105	16.6
Indigenous	19	1.0	12	1.9
Native Hawaiian/Pacific Islander	6	.3	3	.5
Middle Eastern/North African	20	1.0	3	.5
Another Race	87	4.5	45	7.1

Hispanic/Latino/a				
Yes	217	10.5	153	23.4
Country of Origin				
Outside of U.S.	348	17.7	182	27.0
Veteran Status				
Yes	104	5.6	32	4.9
Primary Language (n>5)				
English	1622	87.9	500	77.6
Spanish	95	5.2	79	12.3
Khmer	39	2.1	31	4.8
Portuguese	20	1.1	15	2.3
Swahili	7	.4	2	.3
Multilingual				
Yes	500	27.9	276	44.6

Survey participants ranked their top three Health Resources, Health Issues, and Safety Issues, assigning their top priority within each of the categories a “1”, the second priority a “2” and their third priority a “3”. These ranked scores were then weighted, with a rank of “1” earning the highest value. Items with the highest total weighted value indicated higher priority and higher ranking. Appendix A provides a summary of the complete scoring.

In the topic of Health Resources, Community Health Survey participants identified the following as the top priorities:

1. Access to Healthy Food (1506 weighted score)
2. Affordable, Safe Housing (1421)
3. Access to Mental Health Services (1370)
4. Public Education (902)
5. Emergency Health Services (566)

In the topic of Health Issues, Community Health Survey participants identified the following as the top priorities:

1. Mental Health (2004 weighted score)
2. Heart Health (1094)
3. Lung and Breathing Health (543)
4. Cancer (540)
5. Substance Use Disorder (494)

In the topic of Safety Issues, Community Health Survey participants identified the following as the top priorities:

1. Discrimination based on Race (1400 weighted score)
2. Domestic Violence (1034)
3. Sexual Assault (842)
4. Bullying (537)
5. Discrimination based on sex/gender (488)

Participants were also asked to indicate which barriers or challenges they had encountered related to seeking healthcare services. Participants indicated encountering the following barriers:

- Wait times for appointments are too long (27.1% of participants reported experiencing this barrier)
- Health insurance is too expensive (19.8%)
- The healthcare system is difficult to understand and navigate (12.8%)
- I cannot afford mental health services (9.0%)
- The office is not open when I am available (8.7%)
- I cannot afford prescription medication (7.7%)
- I do not feel welcome or respected by staff (5.6%)
- I do not have transportation (4.3%)
- I cannot find a doctor who speaks my language (2.5%)
- I was discriminated against by a doctor or other medical provider (2.5%)

Focus Groups

Twenty-seven focus groups were conducted in collaboration with UMass Lowell via trained focus group facilitators and notetakers from UMass Lowell and GLHA. Focus groups were held in or with organizations that served populations of interest; for example, focus groups were conducted in collaboration with Coalition for a Better Acre (serving primarily Spanish- and Khmer-speaking community members), Abisi Adult Education (which provides English Language Instruction as well as GED and HiSET instruction for immigrants and recent arrivals), Chelmsford Senior Center (serving the elderly and aging population), the Recovery Café (which provides services for people with substance use disorder and people experiencing homelessness), and the African Community Center (which provides services for African immigrants and refugees). Participants were asked eight questions about health priorities, special populations, and barriers to health services. Notetakers recorded key points made by participants, as well as generated density scores

that reflected the number of times a theme was mentioned or endorsed.

More than 230 people participated in focus groups. Density scores were assessed in four areas: priority health issues, special or at-risk populations, priority health resources, and barriers to health services. Focus group participants conceptualized “health issues” differently than they were conceptualized in the design of the survey. For example, the most frequently noted “health issue” in focus groups was difficulty navigating and understanding the healthcare system (density score 88.6). In the survey, difficulty understanding the healthcare system was assessed as a barrier to services, rather than as a “health issue” itself. Other high-ranking health issues identified in the focus groups were mental health (68), substance use (23.5), food insecurity and nutrition (18.5), and COVID-19 (12.2). Focus group participants also identified populations disparately impacted by health issues or in need of more attention in public health efforts, including immigrants and refugees (42.5), the elderly (27.3), people who are low income (24.5) and children and youth (22.7). A summary of the categories and density scores is provided in Appendix A.

Key Informant Interviews

Key informant interviews were conducted in collaboration with UMass Lowell. Key informants were identified by community stakeholders and the steering committee during the assessment design process. In addition to the phone interviews, GLHA also asked a subset of physicians to complete a written version of the key informant interview. All key informants were asked to answer questions regarding their perceptions of health priorities, significant barriers, and community resources.

A total of 14 phone interviews were completed; an additional 16 key informants completed the written form, for a total of 30 key informants. The top Health Issues identified by key informants were mental health (density score 25), chronic illness (including obesity, diabetes, and asthma) (16), substance use (15), general access and equity issues (10), housing (5), infectious disease

including COVID-19 (4), vectorborne illnesses (2) and unplanned pregnancy (2). Key informants also identified specific populations of focus, including immigrants and refugees (11), elders (8), infants, children, and youth (7), people living in poverty (6), and people who are homeless (4). Key informants also summarize the most significant barriers they feel people experience seeking healthcare, with confusion about navigating the healthcare system being the highest ranking (25), followed by lack of transportation (12), cost (12), fear, mistrust, and stigma (11), lack of technology (5), lack of health education (5), and language barriers (5). A summary of the categories and density scores is provided in Appendix A.

Public Health Data

Public health data allows us to observe changes in trends over time and highlight key indicators of health. A majority of the public health data referenced in this report is sourced from the Massachusetts Department of Public Health Population Health Information Tool (PHIT), which provides community-specific health data across several domains. Data sources for the PHIT directory include the Massachusetts Cancer Registry, Massachusetts Mortality and Morbidity reports, Behavioral Risk Factor Surveillance System, Massachusetts Center for Health Information and Analysis reports, the Massachusetts Drug Control Prescription Monitoring Program, the Pregnancy Risk Assessment Monitoring System, BSAS Substance Addition Treatment data, and others. Additional secondary data sources include the U.S. Census Bureau American Community Survey 2020 5-Year Estimates, the Community Teamwork, Inc. 2021 Community Health Survey Report, and the Mill City Grows Community Food Assessment.

The most recently available public data is used throughout. When possible, we have presented city- and town-level data to identify disparate outcomes. In other cases, we present public health data for relevant populations of interest (for example, people born outside the U.S.). In many cases, specific towns may not have community-level data available, or community-level data may be suppressed for confidentiality reasons. In those cases, towns may be missing from tables or charts.

How We Determined Health Priorities

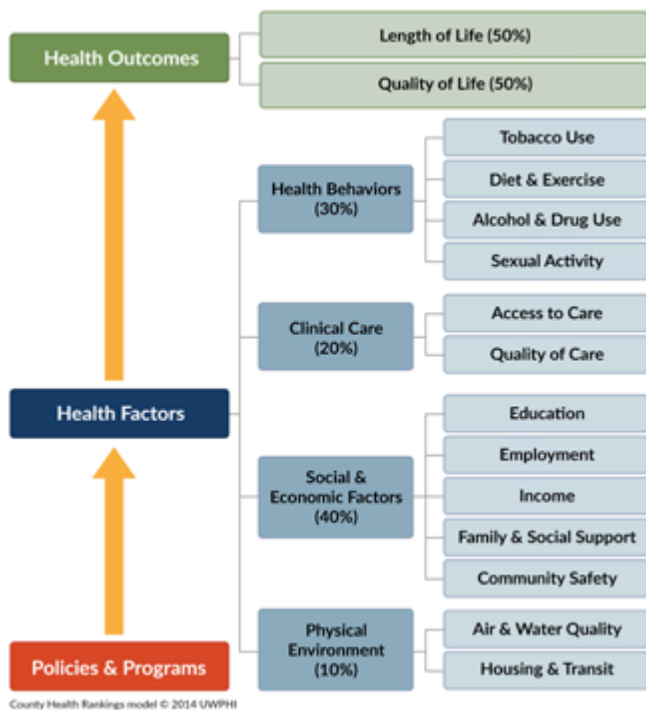
We utilized a mixed-methods analytic process to operationalize data across the three primary data sources so they can be interpreted together into a final ranked list. Weighted scores for Health Issue items from the survey were combined where appropriate. For example, the scores for Heart Health, Nutrition, Diabetes, and Autoimmune Disorders were combined to create the category Chronic Health and Wellness. Density scores for Focus Group and Key Informant data were also combined where appropriate. For example, the scores for Obesity and Heart Health were combined to create the category Chronic Health Issues. The ranked scores for categories in each data source were evaluated together to determine the final priority list, with higher scoring items earning higher ranking placement. Public health data was reviewed to identify categories with high rates of health disparities and inequities, particularly for the populations of interest identified in this assessment. These categories were given priority ranking.

A summary of the score for each priority is listed at the beginning of each chapter. Additional public health data to support the ranking placement is provided throughout each chapter as well. See Appendix B for more details.

Addressing Social Determinants of Health: The Path to Health Equity

When evaluating their overall health, most people consider individual factors and health behaviors: their age, diet, activity level, underlying health conditions, etc. But individual health behaviors account for only a small portion of a person's overall wellbeing. Individual factors are estimated to contribute only about 30% of the variability in a person's health outcomes and wellbeing (Figure 1). The other approximately 70% of a person's health varies based on the conditions of the environments in which they are born, live, work, and age.

Figure 1: County Health Rankings Model



Source: University of Wisconsin Population Health Institute. County Health Rankings & Roadmaps 2022. www.countyhealthrankings.org.

The County Health Rankings Model estimates that 20% of individual health is predicted by your access to quality healthcare services, including things like your proximity to specialists and ability to afford preventative care. Another 40% of the variability in health outcomes is the result of social and economic factors in your environment: the quality of your education, the type of work you do and how much you are compensated for it, and how safe you feel in your community are all factors that influence health. Factors that make up your physical environment, including housing and transportation infrastructure, the quality of the air you breathe, and the types of structures built around you, account for the last 10% in variability of your health. Taken together, these conditions, and the underlying factors that influence them, can be considered the social determinants of health: the set of environmental and social exposures that contribute, in positive and negative ways, to a person's well-being.⁵

Social determinants of health help us understand, and address, differences in health outcomes between populations. Sometimes, differences in health outcomes are expected; for example, we see a difference in rates of cancer between people under age 5 and people over age 70, and this disparity is often difficult to prevent or address. However, some differences in health outcomes are avoidable, preventable, unjust and the result of systematic differences in the way social determinants of health affect different groups of people; these kinds of differences are health inequities. Health inequities are measurable differences in quality of life, life

5 Healthy People 2020, Social Determinants of Health, 2019

expectancy, and rates and severity of disease between different communities, populations, or groups of people that are the result of social determinants of health.

In order to meaningfully impact people's individual health and quality of life, health service providers must consider not only individual health behaviors and factors, but also the social and structural determinants that influence those health behaviors and factors. Our CHNA therefore applies a health equity lens to our data collection, analysis and interpretation, and recommendations include both health system recommendations and community system recommendations to address upstream root causes of inequities.

Social Determinants of Health

The Massachusetts Department of Public Health identifies six domains of social determinants: built environment, education, employment, housing, social environment, and violence (Figure 2).⁶ Factors within each domain can disparately impact health outcomes at the individual and population level.

Figure 2: Massachusetts' Six Domains of Social Determinants of Health



Source: Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017.

Built and Natural Environment

The built and natural environment encompasses the wide range of spaces in which people live, work, learn, and play. Features of the built and natural environment can promote or inhibit health. Communities with more resources typically have environments that facilitate better wellbeing, and many communities have been historically excluded from access to resources to promote healthy built environments, or to protect their natural environment from exploitation.

Hospitals, schools, community organization spaces, and other places where essential community functions are housed comprise the resource and service infrastructure of a community. The Greater Lowell region is home to a considerable network of health services,

⁶ Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017.

including Lowell General Hospital's two campuses, Lowell Community Health Center, the Tufts Medicine provider network which includes primary care physicians and a range of specialists, a network of urgent care facilities, dozens of pharmacies, as well as public health departments. Many of these health resources are located in Lowell, and community members from the other Greater Lowell communities utilize Lowell as a "healthcare home."

The various ways that people interact across the built environment make up the connective infrastructure of the community, and these include resources like transportation, walkability, and accessibility. Accessible, affordable transportation is critical to promoting health equity because it ensures that all community members have the opportunity to engage in employment, education, and health opportunities, even if those opportunities require travel. Communities that are walkable or accessible are those that provide safe sidewalks, well-maintained trails, and shared roadways that are safe for bicycles. Ample parks and green spaces are also essential features of a healthy built environment, and tend to be more common in higher-resource communities.

An increasingly critical feature of the built environment is digital infrastructure, which refers to the technology and services available that allow people to utilize the internet and other digital resources. Though digital equity has always been a critical component to health equity, the surge in telehealth and digital service during the COVID-19 pandemic has escalated the need to promote equitable access to digital health services. In some ways, the pandemic-driven transition to expanded digital health services increased health access for many; for example, people with limited mobility or no access to transportation experienced an increase in their ability to access healthcare. For others, the new wave of telemedicine only exacerbated barriers they experience; for example, people who do not have access to high-speed internet, smart phones, or laptops with video conferencing capabilities may have had reduced access to health services given that in-person care was reduced.

Education, Employment, and Income

People who have better health are also more likely to be successful in traditional schools, and access to higher education is associated with lifelong health benefits. Schools are also sites where health-related services can be delivered effectively. People who have higher educational attainment are also more likely to earn higher incomes and report higher lifelong economic stability, which is a considerable predictor of positive health.

Historically, education funding has been determined as a function of property taxes; as a result, higher income communities therefore have more funding for public education, resulting in significant disparities in educational funding between higher and lower resource communities. In Massachusetts, lower resource communities also tend to be more racially and ethnically diverse, resulting in considerable educational disparities based on racism.

Educational attainment is a strong predictor of lifelong earning potential; people who have access to high-quality education are more likely to secure jobs that earn higher incomes. In other words, people who come from high-income communities with better educational resources are more likely to maintain access to high incomes throughout their lifetime. Discriminatory hiring that limits access to high-paying jobs is a major factor to disparities in earning, particularly for people who are non-White, have disabilities, or are women.

But income and earnings are not the only way that employment impacts health. Employment can have a direct impact on individual health through a range of employment-based environmental exposures and hazards, for example, jobs that require exposure to harmful chemicals or have a high risk of injury negatively impact health. High-stress jobs are also risks for negative health impacts.

Housing

Access to safe, stable, affordable spaces to live and sleep is one of the most significant factors that contributes to health and wellbeing. Being housing insecure (which includes homelessness) is associated with negative health outcomes, including higher risk of onset and poor management of chronic health conditions, like cancer and cardiovascular disease, as well as higher incidence and mortality from acute health issues, like injury and infection.⁷

Housing affordability is the main driver of housing access. Lack of affordable housing options results in increasing rates of homelessness. In Greater Lowell, significant gaps between wages and housing cost result in significant housing cost burden even for people who are able to afford housing. People who spend significant amounts of money on housing are not only less able to spend money on other needs (like healthcare), but are also more likely to suffer the effects of chronic stress due to housing instability. People who are not able to afford housing are at significant risk of health issues, including substance use disorder, infectious disease, and death due to environmental exposures in extreme weather. People without housing are also at high risk for exploitation, including being victims of violence and sex trafficking.

Social, Civic and Cultural Environment

The social, civic and cultural environment refers to the varying opportunities available for an individual to cultivate a sense of belonging and value in their community. Historically, specific populations have been targeted to be excluded from community engagement. Efforts to restrict voting access, limit immigration and resettlement, or physically exclude community members from

public spaces have disenfranchised people of color, women, people who are disabled, people who are LGBTQ+T, and more. These exclusions lead to health inequities driven by the hoarding of health resources, and also by contributing to the stress of exclusion and discrimination, and the resulting health impacts therein. The ability to engage in civic processes like voting is not as simple as having the right to vote. Multilingual voter education, advocacy at polling locations to protect the right to vote without identification, and endorsement of a diverse pool of candidates in local elections are all critical pillars of meaningful civic engagement.

The cultural environment is also influenced by community diversity. In Greater Lowell, communities vary greatly in their level of racial, ethnic, and language diversity, with Lowell representing the most diverse population of all Greater Lowell communities. Structural racism, xenophobia, sexism, and ableism carry significant risks for social isolation, poverty, and increased health issues. Mitigating these harms requires intentional efforts to remove barriers to engagement with social, civic and cultural activities in the community, which in turn yields short- and long-term health benefits.

Violence

Many models of SDOH include violence as a social determinant because of the significant impact that exposure to violence and discrimination has on health outcomes, and because the disproportionate impact of violence on Black people, Asian people, Hispanic people, women, people with disabilities, LGBTQ+T people, and people with mental health issues. In this assessment, violence was identified as a priority health issue, and is therefore discussed within its own chapter beginning on page 106.

7 Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017.

Community Profiles

Greater Lowell Region

Population: 294,656

The Greater Lowell region includes eight communities in northeastern Massachusetts: Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough, and Westford. These communities also comprise the Community Health Network Area 10 (CHNA 10). Lowell accounts for the highest percent of the Greater Lowell population (38.7%, or 113,994 people) and Dunstable accounts for the smallest (1.1%, or 3,374 people). The Merrimack Valley is one of the fastest growing regions in the state.

Greater Lowell is majority white, non-Hispanic (76%), followed by Asian (13.3%). Approximately 5.1% of the Greater Lowell population is Black, and 6.2% is another race. Nearly 1 in 10 Greater Lowell residents (9.5%) is Hispanic or Latino/a. Greater Lowell has a considerable foreign-born population, with 17.5% of residents born outside of the United States. Racial and ethnic diversity in

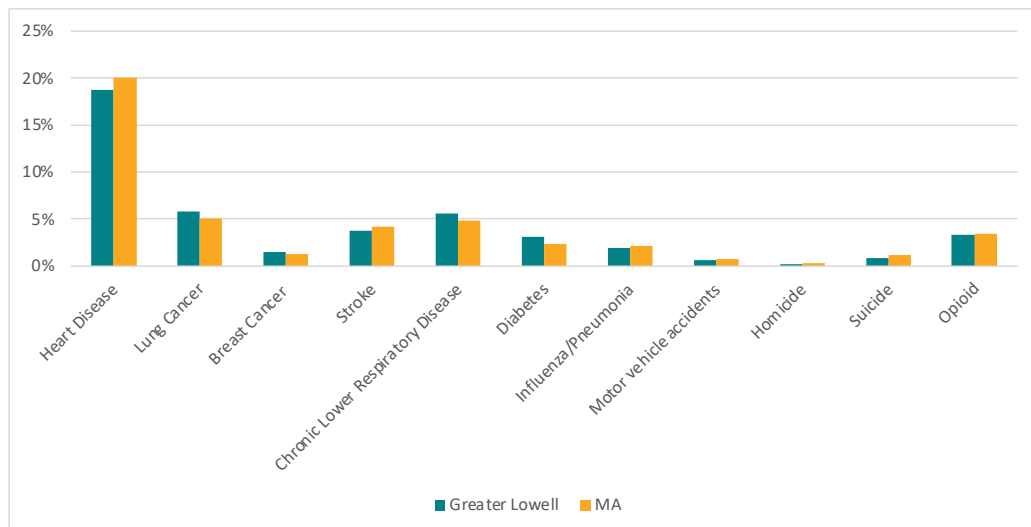
Greater Lowell varies significantly by community, with Lowell being the most diverse and Dunstable being the least.

There is significant socio-economic variation in Greater Lowell. Approximately 9.6% of residents live below the federal poverty line, but the median income ranges from a high of \$158,523 in Dunstable to a low of \$62,196 in Lowell.

The premature mortality rate (PMR) is a measure of deaths that occur before age 75, calculated as a rate per 100,000 residents. The PMR of Greater Lowell (295.7 per 100,000) is higher than the state rate (272.8 per 100,000).

In 2019, there were 2,368 deaths in Greater Lowell. A majority (18.7%) were due to heart disease (Figure 3). Compared to the rest of the state, the Greater Lowell region experiences a slightly higher percentage of deaths due to lung cancer (5.7% in Greater Lowell versus 5.0% in Massachusetts), chronic lower respiratory diseases (5.5% versus 4.8%), and diabetes (3.1% versus 2.4%).

Figure 3: Causes of Death, Greater Lowell and State, 2019



Source: MA Registry of Vital Records, Death Data, 2019

Billerica

Population: 41,453

Billerica is the second largest community in the Greater Lowell region. The population of Billerica is 81.7% white, non-Hispanic, 7.2% Asian and 5.0% Black; Billerica has the second-highest percentage of Black residents, following Lowell. Approximately 5.3% of Billerica’s population is Hispanic.

Income and Housing in Billerica

Total Households	15,499
Average Household Size	2.7
Owner-occupied units	77.6%
Renter-occupied units	22.4%
Median gross rent	\$1,674
Median income	\$113,329

Approximately 94.2% of Billerica residents age 25 or older have completely a high school or equivalent degree; 37.9% of residents age 25 or older have a Bachelor’s degree or higher.

The PMR in Billerica is 229.8 per 100,000, which is better than both the regional rate (295.7 per 100,000) and the state rate (272.8 per 100,000).

Sixty-seven Billerica residents completed the 2020 Community Health Survey. Selected Billerica participant highlights from the Community Health Survey include:

- 64.2% reported spending more than 30% of their income on housing expenses
- 7.5% reported not having any health insurance
- 28.4% reported speaking more than one language
- 41.8% reported definitely agreeing that they had opportunities to improve their community and make their voices heard
- 31.3% reported not always being able to afford the medical care they need
- 25.4% reported that their physical health had gotten somewhat or a lot worse over the last year

The Top Three Health Resources ranked by Billerica participants in the Community Health Survey were:

- Affordable, Safe Housing (34.3% of Billerica participants ranked item in their top three)
- Access to Healthy Food (29.8%)
- Access to Mental Health Services (22.4%)

The Top Three Health Issues ranked by Billerica participants in the Community Health Survey were:

- Mental Health (43.3% of Billerica participants ranked item in their top three)
- Heart Health (29.9%)
- COVID-19 (22.4%)

Chelmsford

Population: 35,933

Chelmsford accounts for approximately 12.2% of the population of Greater Lowell. Approximately 87.3% of Chelmsford residents are white, 8.5% are Asian and 1.2% are Black. Approximately 3.3% of the population is Hispanic. Nearly one in ten Chelmsford residents was born outside the United States.

Income and Housing in Chelmsford

Total Households	13,371
Average Household Size	2.6
Owner-occupied units	83%
Renter-occupied units	17%
Median gross rent	\$1,656
Median income	\$117,582
Residents below the poverty line	4.3%

Approximately 97.2% of Chelmsford residents age 25 or older have completed a high school or equivalent degree; 53.7% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Chelmsford is 193.0 per 100,000, which is better than both the regional rate (295.7 per 100,000) and the state rate (272.8 per 100,000).

Approximately 795 Chelmsford residents completed the 2020 Community Health Survey. Selected Chelmsford participant highlights from the Community Health Survey include:

- 14.0% reported being born outside the U.S.
- 14.8% reported being the primary caregiver for an adult (for example, an elderly parent or an adult child with special needs)
- 57.7% reported spending more than 30% of their income on housing expenses
- 4.7% reported not having health insurance
- 68.3% definitely agreed that they have safe, clean parks in their community

The Top Three Health Resources ranked by Chelmsford participants in the Community Health Survey were:

- Access to Healthy Food (34.9% of Chelmsford participants ranked item in their top three)
- Access to Mental Health Services (32.6%)
- Public Education (30.6%)

The Top Three Health Issues ranked by Chelmsford participants in the Community Health Survey were:

- Mental Health (46.5% of Chelmsford participants ranked item in their top three)
- Heart Health (26.0%)
- Infant and Child Health (16.9%)

Dracut

Population: 32,159

Dracut accounts for approximately 10.9% of the population of Greater Lowell. Approximately 87.8% of Dracut residents are white, 4.0% are Black and 3.7% are Asian. Approximately 6.4% of the population is Hispanic. Approximately 9.2% of Dracut residents were born outside the U.S.

Income and Housing in Dracut

Total Households	11,784
Average Household Size	2.7
Owner-occupied units	80.4%
Renter-occupied units	19.6%
Median gross rent	\$1,398
Median income	\$92,685
Residents below the poverty line	6.3%

Approximately 91.9% of Dracut residents age 25 or older have completed a high school or equivalent degree; 31.7% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Dracut is 294.2 per 100,000, which is better than the state rate (272.8 per 100,000) but comparable to the regional rate (295.7 per 100,000).

One hundred Dracut residents completed the 2020 Community Health Survey. Selected Dracut participant highlights from the Community Health Survey include:

- 10.0% of participants were Hispanic
- 33% reported being the primary caregiver for a child under age 18
- 11.5% reported not having any health insurance
- 84.1% reported definitely feeling safe in their neighborhood during the day
- 22.2% reported that their mental health had gotten somewhat or a lot worse in the last year

The Top Three Health Resources ranked by Dracut participants in the Community Health Survey were:

- Access to Mental Health Services (46.0% of Dracut participants ranked item in their top three)
- Affordable, Safe Housing (32.0%)
- Access to Healthy Food (30.0%)

The Top Three Health Issues ranked by Dracut participants in the Community Health Survey were:

- Mental Health (53.0% of Dracut participants ranked item in their top three)
- Heart Health (32.0%)
- Substance Use Disorder (18.0%)

Dunstable

Population: 3,374

Dunstable has the smallest population of all communities in Greater Lowell; it is also the most affluent. Approximately 93.7% of Dunstable residents are white and 2.9% are Asian.

Approximately 1.9% of the population is Hispanic. Approximately 5.7% of Dunstable residents were born outside the U.S. Dunstable is the most racially and ethnically homogenous community in Greater Lowell.

Income and Housing in Dunstable

Total Households	1,155
Average Household Size	2.9
Owner-occupied units	94.5%
Renter-occupied units	4.5%
Median gross rent	\$1,750
Median income	\$158,523
Residents below the poverty line	1.4%

Due to low participation of Dunstable residents in the Community Health Survey, a summary of findings is not provided to protect confidentiality.

Approximately 97.8% of Dunstable residents age 25 or older have completed a high school or equivalent degree; 56.8% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Dunstable is 127.4 per 100,000, which is significantly better than the state rate (272.8 per 100,000) and the regional rate (295.7 per 100,000).

Lowell

Population: 113,994

Lowell is the largest community by population in Greater Lowell. Approximately 60.3% of Lowell residents are white, 8.9% are Black and 21.2% are Asian. Approximately 17.9% of the population is Hispanic. Approximately 26.7% of Lowell residents were born outside the U.S. It is the most racially and ethnically diverse of all the Greater Lowell communities, as well as one of the most diverse communities in Massachusetts.

Income and Housing in Lowell

Total Households	40,260
Average Household Size	2.6
Owner-occupied units	43.4%
Renter-occupied units	56.6%
Median gross rent	\$1,229
Median income	\$62,196
Residents below the poverty line	17.3%

Approximately 82.9% of Lowell residents age 25 or older have completed a high school or equivalent degree; 27.3% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Lowell is 412.2 per 100,000, which is significantly worse than the state rate (272.8 per 100,000) and the regional rate (295.7 per 100,000).

Approximately 709 Lowell residents completed the 2020 Community Health Survey. Selected Lowell participant highlights from the Community Health Survey include:

- 14.8% of participants were Asian, 10.0% were Black, and 21.6% were Hispanic
- 9.3% of participants were Cambodian, 8.3% were Puerto Rican, 3.5% were Portuguese and 3.0% were Dominican
- 25.7% were born outside the U.S.; of them, 15.1% have been in the U.S. less than six years
- 30.6% reported living in public or subsidized housing
- 31.2% reported an income below \$25,000
- 5.9% reported not having health insurance
- 38.9% reported speaking more than one language

The Top Three Health Resources ranked by Lowell participants in the Community Health Survey were:

- Affordable, Safe Housing (33.9% of Lowell participants ranked item in their top three)
- Access to Healthy Food (28.2%)
- Access to Mental Health Services (25.2%)

The Top Three Health Issues ranked by Lowell participants in the Community Health Survey were:

- Mental Health (35.4% of Lowell participants ranked item in their top three)
- Heart Health (19.9%)
- Lung and Breathing Health (14.2%)

Tewksbury

Population: 30,876

Tewksbury accounts for 10.5% of the population of Greater Lowell. Approximately 91.5% of Tewksbury residents are white, 3.2% are Black and 2.8% are Asian. Approximately 2.2% of the population is Hispanic. Approximately 8.4% of Tewksbury residents were born outside the U.S.

Income and Housing in Tewksbury

Total Households	11,925
Average Household Size	2.6
Owner-occupied units	89.6%
Renter-occupied units	10.4%
Median gross rent	\$1,938
Median income	\$104,610
Residents below the poverty line	4.0%

Approximately 94.6% of Tewksbury residents age 25 or older have completed a high school or equivalent degree; 38.1% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Tewksbury is 287.5 per 100,000, which is slightly worse than the state rate (272.8 per 100,000) but better than the regional rate (295.7 per 100,000).

Approximately 34 Tewksbury residents completed the 2020 Community Health Survey. Due to the low participation, demographic summaries are not provided.

The Top Three Health Resources ranked by Tewksbury participants in the Community Health Survey were:

- Access to Mental Health Services (47.1% of Tewksbury participants ranked item in their top three)
- Affordable, Safe Housing (38.2%)
- Access to Healthy Food (29.4%)

The Top Three Health Issues ranked by Tewksbury participants in the Community Health Survey were:

- Mental Health (35.3% of Tewksbury participants ranked item in their top three)
- Heart Health (26.5%)
- COVID-19 (23.5%)

Tyngsborough

Population: 12,421

Tyngsborough accounts for 4.2% of the population of Greater Lowell; it is the second smallest community by population after Dunstable. Approximately 85.6% of Tyngsborough residents are white, .8% are Black and 10.6% are Asian. Approximately 5.0% of the population is Hispanic. Approximately 12.9% of Tyngsborough residents were born outside the U.S.

Income and Housing in Tyngsborough

Total Households	4,153
Average Household Size	2.6
Owner-occupied units	82.1%
Renter-occupied units	17.6%
Median gross rent	\$1,266
Median income	\$115,280
Residents below the poverty line	6.7%

Approximately 94.7% of Tyngsborough residents age 25 or older have completed a high school or equivalent degree; 42.6% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Tyngsborough is 279.9 per 100,000, which is slightly worse than the state rate (272.8 per 100,000) but better than the regional rate (295.7 per 100,000).

Approximately 56 Tyngsborough residents completed the 2020 Community Health Survey. Selected Tyngsborough participant highlights from the Community Health Survey include:

- 7.4% of participants were born outside the U.S.
- 49.1% reported being the primary caregiver for a child under age 18
- 69.1% reported spending more than 30% of their income on housing expenses
- 10.9% reported not having health insurance
- 76.7% definitely agreed that the quality of their children's education was good
- 49.1% believed that it was definitely not accurate or somewhat inaccurate to say their community was accepting of diversity

The Top Three Health Resources ranked by Tyngsborough participants in the Community Health Survey were:

- Access to Mental Health Services (49.1% of Tyngsborough participants ranked item in their top three)
- Affordable, Safe Housing (32.7%)
- Access to Healthy Food (27.3%)

The Top Three Health Issues ranked by Tyngsborough participants in the Community Health Survey were:

- Mental Health (52.7% of Tyngsborough participants ranked item in their top three)
- Heart Health (29.1%)
- Substance Use Disorder (21.8%)

Westford

Population: 24,446

Westford accounts for 8.3% of the population of Greater Lowell. Approximately 73.1% of Westford residents are white, .6% are Black and 23.1% are Asian. Approximately 2.6% of the population is Hispanic. Approximately 17.8% of Westford residents were born outside the U.S. Westford is the second most affluent community in Greater Lowell, with a median income only slightly lower than Dunstable's.

Income and Housing in Westford

Total Households	8,544
Average Household Size	2.9
Owner-occupied units	88.3%
Renter-occupied units	11.5%
Median gross rent	\$2,064
Median income	\$149,437
Residents below the poverty line	1.9%

Approximately 98.1% of Westford residents age 25 or older have completed a high school or equivalent degree; 69.4% of residents age 25 or older have a Bachelor's degree or higher.

The PMR in Westford is 147.8 per 100,000, which is significantly better than the state rate (272.8 per 100,000) and the regional rate (295.7 per 100,000).

Approximately 286 Westford residents completed the 2020 Community Health Survey. Selected Westford participant highlights from the Community Health Survey include:

- 8.0% of participants were born outside the U.S.
- 24.5% reported being the primary caregiver for a child under age 18
- 46.5% reported spending more than 30% of their income on housing expenses
- 10.9% reported not having health insurance
- 8.9% were veterans
- 40.2% believed it was definitely not accurate or somewhat inaccurate to say their community was accepting of diversity
- 16.8% said that their physical health was a lot or somewhat worse than one year ago

The Top Three Health Resources ranked by Westford participants in the Community Health Survey were:

- Access to Healthy Food (33.9% of Westford participants ranked item in their top three)
- Access to Mental Health Services (27.6%)
- Affordable, Safe Housing (23.1%)

The Top Three Health Issues ranked by Westford participants in the Community Health Survey were:

- Mental Health (40.2% of Westford participants ranked item in their top three)
- Heart Health (28.3%)
- Environmental Health (16.8%)

Summary of Findings

The 2022 Community Health Needs Assessments has identified the following ten health priority areas:

1. Mental Health
2. Chronic Health and Wellness
3. Substance and Alcohol Use Disorder
4. COVID-19 and Other Infectious Disease
5. Reproductive, Sexual, and Pregnancy Health
6. Lung and Breathing Health
7. Cancer
8. Infant and Child Health
9. Environmental Health
10. Violence

The following sections summarize data relevant to each of these priority areas, including specific trends and disparities at the local, state, and national levels, as well as the impact of relevant social determinants. Recommendations for future actions for both the healthcare system and broader community system are provided.

1. Mental Health

Score Summary		
Source	Score	Rank
Survey	2005	1
Focus Groups	68	1
Key Informants	25	1

“It can be difficult to get mental health services if you do not have data about what is going on in the community”

— Key Informant, Westford

Overview

Mental health encompasses many mood and behavioral disorders, and is known to be a critical indicator of physiological health.⁸ Mental health disorders are associated with increased risk and morbidity of several health conditions, including high blood pressure, heart disease, stroke, and cancer.^{9 10}

Mental health was identified in previous needs assessments as the top health concern of Greater Lowell residents. In the current assessment, Mental Health was ranked as the number one priority across all three data sources. In the Community Health Survey, 41.8% of participants ranked Mental Health in their top three priorities. Nearly one-third of Community Survey participants also reported experiencing mental health issues, with 29.4% reporting issues like anxiety, depression, and PTSD, and 11.2% reporting suicidal ideation or a previous suicide attempt. Compared to the 2019 Community Health Survey, prevalence of depression and anxiety remained relatively stable (33.4% and 26.2% in 2019, respectively), but there was an increase in the number of participants reporting suicidal ideation or a previous attempt (7.3% in 2019).

In focus groups and key informant interviews, accessing mental health services was noted as being particularly challenging and expensive. A dearth of services for children and for people who need a multilingual provider was highlighted. Mental health issues were also cited as barriers to health services, as people with untreated mental illness may struggle to initiate, coordinate, or sustain their care.

Depression and Anxiety

Depression and anxiety are among the most common mental health disorders, and are robust predictors of other co-occurring health problems.

8 U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion. 2020 Leading Health Indicators: Mental Health. Retrieved from <https://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Mental-Health>

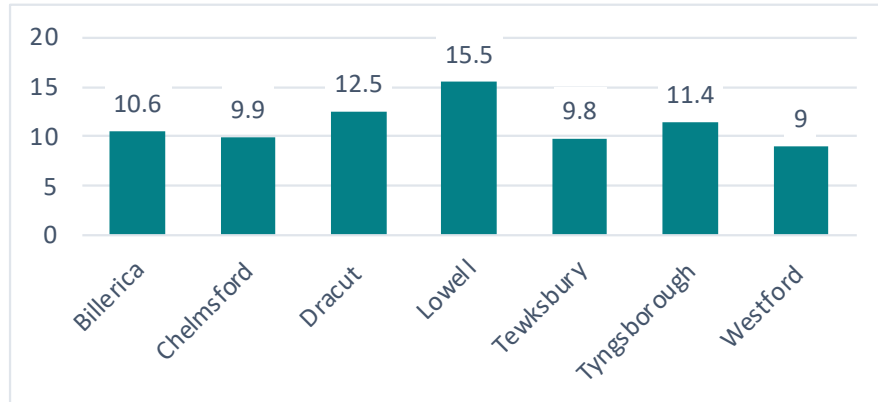
9 Jonas BS, Franks P, Ingram DD. Are symptoms of anxiety and depression risk factors for hypertension? Arch Fam Med. 1997;6:43-49.

10 Chapman DP, Perry GS, Strine TW. The vital link between chronic disease and depressive disorders. Preventing Chronic Disease. Atlanta, GA: Centers for Disease Control and Prevention; 2005. Available from: http://www.cdc.gov/pcd/issues/2005/jan/04_0066.htm

Trends and Disparities

Statewide, 31.4% of Massachusetts adults reported symptoms of either depressive or anxiety disorder.¹¹ Locally, 11.2% of Greater Lowell residents report fifteen or more days of poor mental health (Figure 4). Dracut, Lowell, and Tyngsborough report higher averages than the state average of 11.1%.

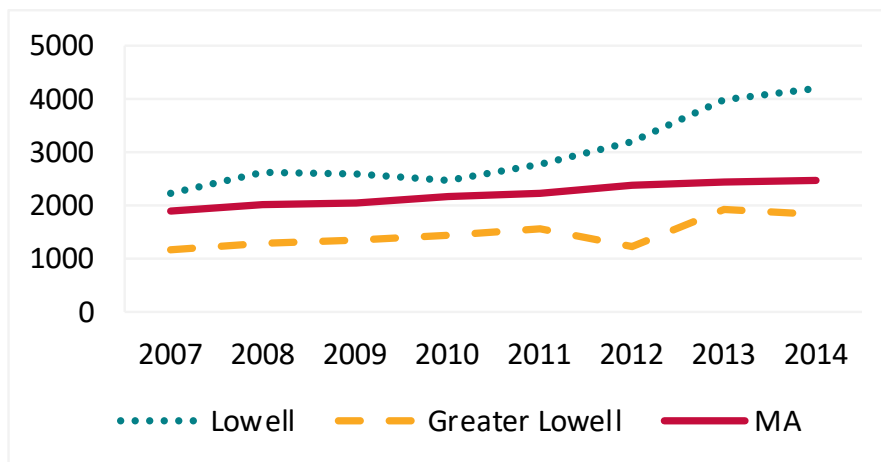
Figure 4: Percent of Adults Reporting 15+ Days of Poor Mental Health (2012-2016)



Source: BFRSS Results via PHIT

Utilization of the emergency department for mental health needs was also significantly higher in Lowell (4,199 per 100,000) when compared to both the state average (2,466 per 100,000) as well as the regional rate (1,834 per 100,000) (Figure 5).

Figure 5: Age-Adjusted Mental Health Emergency Department Visits per 100,000



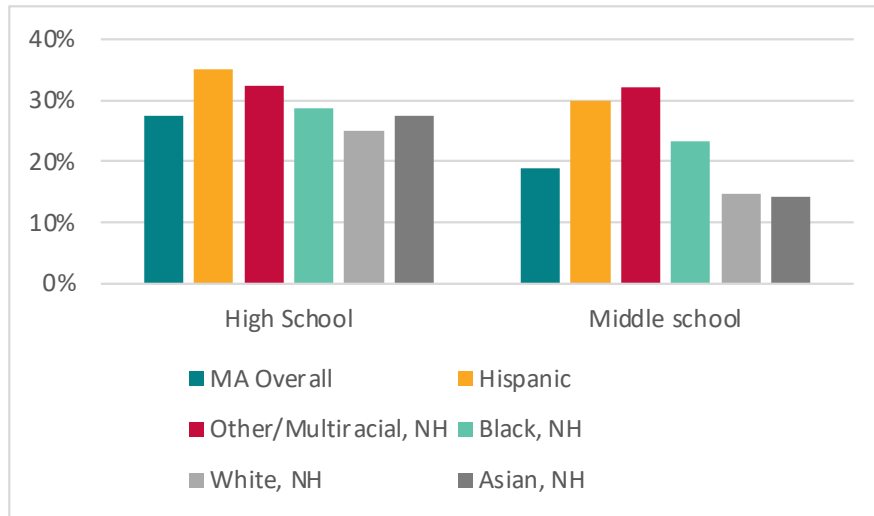
Source: Center for Health Information and Analysis (CHIA) via PHIT

Massachusetts adolescents were nearly twice as likely as adults to report a major depressive episode in the last year (15.6% versus 8.1%).¹² Students of color are more likely to report depressive symptoms than their white, non-Hispanic peers (Figure 6).

¹¹ U.S. Census Bureau. *Household Pulse Survey, 2021*.

¹² SAMHSA, 2018-2019 NSDUH: State Model Based Prevalence Estimate, Table 31.

Figure 6: Youth Reporting Depressive Symptoms in MA, by race/ethnicity



Source: Youth Health Survey (2017) via PHIT

The MA Department of Public Health COVID-19 Community Impact Survey found that all demographic groups in the state experienced an increase in their rates of poor mental health since the 2019 assessment, but not all groups experienced the same degree of increase.¹³ The highest rates of poor mental health were found among respondents who were transgender/non-binary, were LGBTQ+, were multiracial and/or Hispanic/Latinx, were young adults or adolescents, earned less than \$35,000 per year, and/or had low educational attainment. Our Community Health Survey data aligns with these trends. Of the 30% of participant reporting a mental health issue, 26.3% were under age 34, even though only 19.2% of the total survey participants overall were in that age range. Participants with mental health needs were also more likely to report being LGBTQ+ (16.2% versus 9.0% of the total survey participants). Participants who reported mental health issues also reported higher rates of several co-occurring health issues compared to the overall survey participant rate, including asthma (29.7% of participants with mental health issues compared to 14.5% of participants overall), cancer (18.1% versus 10.2%), diabetes (17.6% versus 10.5%) and suicidal ideation (32.8% versus 11.2%).

Suicide

Though rates of suicides in Massachusetts had been steadily increasing until a peak of 725 suicides in 2018, since then, rates of suicides have decreased, with 615 suicides occurring statewide in 2020.¹⁴

Trends and Disparities

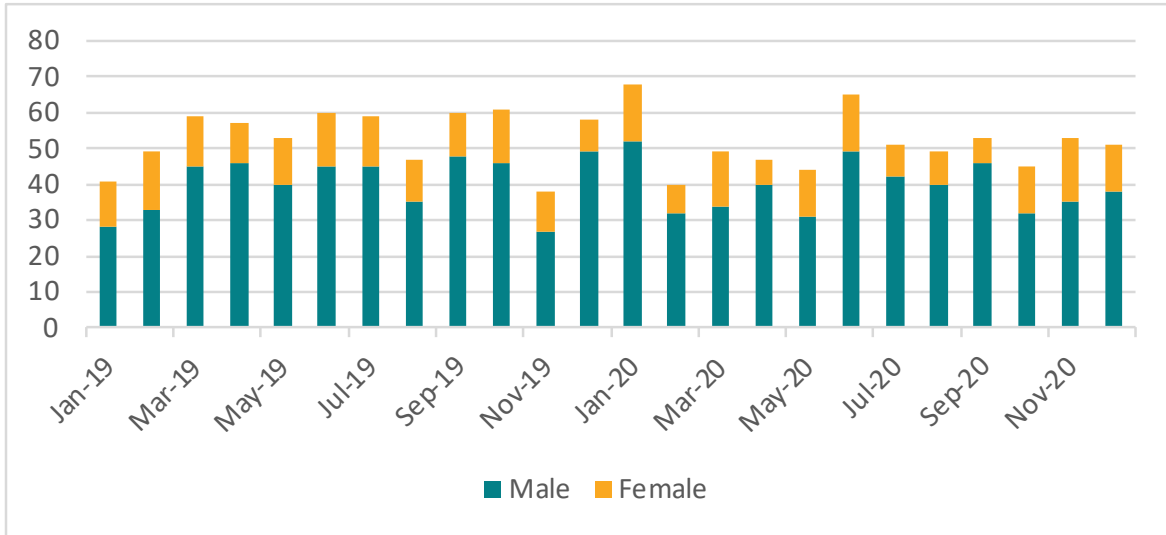
Since 2019, when the Massachusetts Syndromic Surveillance Program began reporting emergency department data on suicide and suicidal ideation, statewide rates of emergency visits related to suicidal ideation have remained relatively stable, with about 4,882 emergency department visits per month statewide.¹⁵ While females are more likely to report suicidal ideation and make up a majority share of emergency department visits for suicide attempts, males are significantly more likely to die by suicide (Figure 7).

¹³ Massachusetts Department of Public Health COVID-19 Community Impact Survey, 2021.

¹⁴ MA Department of Public Health, *COVID-19 Data Brief 2020: Suicides, Suicide Attempts, and Suicidal Ideation in Massachusetts, Fall 2021*.

¹⁵ Massachusetts Syndromic Surveillance Program via *COVID-19 Data Brief 2020: Suicides, Suicide Attempts, and Suicidal Ideation in Massachusetts*

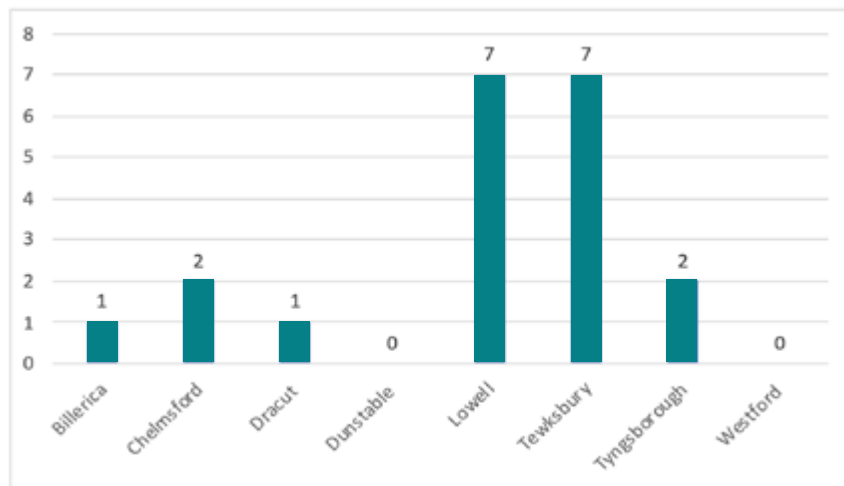
Figure 7: Suicides by Sex and Month Statewide, 2019-2020



Source: Registry of Vital Records and Statistics (RVRS) 2019-2020

From 2019 to 2020, there was a statewide decrease in deaths by suicide, from 651 in 2019 to 615 in 2020.¹⁶ In 2019, there were 20 deaths by suicide in the Greater Lowell region.¹⁷ Of them, seven occurred in Lowell and seven occurred in Tewksbury, suggesting a particularly high rate of suicide in Tewksbury given its smaller population. (Figure 8)

Figure 8: Suicides by town/city, 2019



Source: Registry of Vital Records and Statistics (RVRS) 2019-2020

While city-specific data is not available past 2019, the Syndromic Surveillance Program did release county-specific data regarding deaths by suicide for the year 2020 in an effort to evaluate the impact of COVID-19 on rates of death by suicide. Though statewide deaths by suicide decreased from 2019 to 2020, in Middlesex County deaths by suicide increased by 3%. Rates of deaths by suicide also increased among certain

16 Massachusetts Syndromic Surveillance Program via COVID-19 Data Brief 2020: Suicides, Suicide Attempts, and Suicidal Ideation in Massachusetts

17 Massachusetts Registry of Vital Records and Statistics (2022), Massachusetts Death Data 2019

demographic groups, including older adults, people who are Asian, and people who are Hispanic/Latinx (Table 4).

Table 4: Suicide by Select Demographic Group, Statewide, 2019-2020

Demographic Group	2019	2020	Percent Change
Age			
0-14	3	4	-
15-24	68	66	-3%
25-34	101	98	-3%
35-44	97	95	-2%
45-54	117	126	+8%
55-64	153	105	-31%
65-74	65	79	+22%
75-84	27	25	-7%
85+	11	17	+55%
Race/Ethnicity			
White, NH	547	518	-5%
Black, NH	32	22	-31%
Asian, NH	21	26	+24%
Hispanic/Latino/a	40	45	+13%

Source: Registry of Vital Records and Statistics via Massachusetts Syndromic Surveillance Program

In our Community Health Survey, 225 participants (10.9%) self-reported thoughts of suicide or a previous suicide attempt (See Table 5). Participants reporting suicidal ideation were disproportionately from Lowell (34.5% of the total survey participants but 45.6% of participants reporting suicidal thoughts). While only 19.2% of total survey participants were under age 35, people under age 35 accounted for 38.7% of participants reporting suicidal ideation. Participants reporting suicidal thoughts were also more likely to be LGBTQ+, Asian, and earn less than \$25,000 per year compared to the general survey population. Additionally, participants who reported suicidal thoughts were also more likely than the general survey population to not have reliable transportation (18.2% versus 10.8%), to not feel safe in their neighborhoods (41.8% versus 24.6%), and to not be able to afford the medical care they need (41.1% versus 30.4%).

Table 5: Select Demographics Comparison of Community Survey Participants Who Report Suicidal Thoughts

	Participants with Suicidal ideation	Total Survey Participants
Location	N (%)	N (%)
Billerica	6 (2.7)	67 (3.3)
Chelmsford	68 (30.1)	796 (38.6)
Dracut	13 (5.8)	99 (4.8)
Dunstable	-	7 (.3)
Lowell	103 (45.6)	709 (34.5)
Tewksbury	5 (2.2)	34 (1.7)
Tyngsborough	7 (3.1)	56 (2.7)
Westford	24 (10.6)	286 (13.9)
LGBQ+	58 (27.4)	198 (10.7)
Asian/Asian American	38 (16.9)	211 (11.0)
Income <\$25,000	46 (20.6)	277 (15.6)

Source: Community Health Survey

Service Access

Participants in this assessment overwhelmingly noted that the most significant health challenge they experience is accessing care, with specific focus on barriers to accessing mental health services. Difficulty navigating healthcare services was mentioned 180 times across 27 focus groups, and 35 times across 30 key informant interviews. Nearly 9% of survey participants reported not being able to afford mental health services, and access to mental health services was ranked as the third most critical community resource, with 26% of participants ranking it among their top three resource priorities.

Trends and Disparities

In 2018-2019, 6.3% of Massachusetts adults reported an unmet mental health need.¹⁸ The mental health workforce was able to meet only 32.2% of the demand for mental health services in 2021.¹⁹ Only 46.7% of Massachusetts youth aged 12-17 who experienced a major depressive episode received depression care. Among Massachusetts adults with any diagnosed mental illness, only 52.8% received mental health services.

Participants in the Community Health Survey, focus groups, and key informant interviews were asked to identify the barriers to accessing services that they experience. The most significant barriers participants

¹⁸ U.S Census Bureau, Household Pulse Survey, 2021

¹⁹ Bureau of Health Workforce, Health Resources and Services Administration, Designated Health Professional Shortage Areas Statistics: Designated HPSA Quarterly Summary, September 30, 2021

experienced are difficulty understanding how to access mental health services; the cost of mental health services, especially if they are not covered by insurance; lack of transportation to appointments; excessive wait lists for mental health appointments; a lack of mental health providers who speak languages other than English, and not having reliable technology to utilize telehealth options.

Though 5.6% of survey participants overall reported not being able to afford mental health services, some demographic groups had a significantly higher proportion of participants reporting not being able to afford services. Participants who were Asian/Asian American (11.1%), Black/African American (12.9%), Hispanic/Latino/a (13.4%), born outside the U.S. (10.9%), LGBTQ+ (16.8%), living with chronic illness (13.8%), or who had a mental health need (20.4%) all reported a higher prevalence rate of inability to afford services than the survey average.

Recommendations

One of the many ways that COVID-19 has impacted the community landscape is through an increased attention to the drivers and manifestations of mental illness and wellbeing. COVID-19 dramatically impacted the mental health of our community members in a number of ways: the direct impact of loss of loved ones and community members as a result of COVID infection; the cascading impacts of social isolation during lockdowns, particularly for the elderly population and youth; the mental and emotional burden of delayed medical care for people with chronic health needs; increased financial stress due to job losses or being unable to work while ill; and the long-term, and still emerging, mental health impacts of long COVID.

Recommendations to address the mental health of our community consider both the root causes of mental wellbeing, as well as factors that exacerbate symptomology or inhibit the ability to access care.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address mental and behavioral health needs include the following:

- Free and reduced cost mental health and wellness education provided by Lowell General Hospital directly to community members on topics including anger management, stress management, meditation, and mental health first aid
- Community-wide implementation of behavioral health screening tools in pediatric offices, primary care offices, schools and community organizations to increase accessibility of tools and resources available to community members to address their mental health needs, led by Lowell General Hospital
- Implementation of the NAN Project in local schools to increase awareness of mental health and prevent suicide among youth
- Establishment of co-response teams in several Greater Lowell communities to include social workers and other mental health professionals as first responders to 911 calls that involve people experiencing mental health crises
- Distribution of over \$115,000 in GLHA grant funding from 2019-2022 towards projects designed to improve mental health in Greater Lowell

Future Actions

Healthcare System Recommendations:

- Continued recruitment and training of multilingual mental health clinicians to meet the needs of community members who speak a language other than English
- Optimized referral systems to streamline the process of linking patients to both in-patient psychiatric treatment and out-patient mental health services

- Robust cultural competency training to address the disparate burden of mental illness and suicide on populations of interest, specifically Hispanic/Latinx populations, Black population, Multiracial populations, LGBTQ+ populations, and the elderly population
- Expansion of free/reduced cost education and training programs to empower community members with skills and tools to identify risk factors for mental health, manage stress, and access mental health services efficiently
- Implement evidence-based workplace programs to provide support for doctors, nurses, and other healthcare staff to support mental health and prevent suicide (for example, the Healer Education Assessment and Referral (HEAR) Program)²⁰

Community System Recommendations:

- Expanded access to free/reduced cost transportation options to increase access to healthcare services
- Implementation of suicide prevention programming in high-impact settings, including schools, elder care facilities, veteran service programs, and shelters
- Multilingual implementation of mental health first aid training at free/reduced cost
- Diversified options for mental health support services (for example, art/music therapy and faith- or spirituality-based services) to meet population needs for mental well-being

20 American Medical Association, Success Story: HEAR to Identify Care Team Members at Risk of Suicide. <https://edhub.ama-assn.org/steps-forward/module/2702612>

2. Chronic Health and Wellness

Score Summary		
Source	Score	Rank
Survey	1883	2
Focus Groups	28.5	2
Key Informants	18	2

“Affordable, community programs such as yoga, pickleball, golf, biking, hiking”
— Survey Participant

“Promote diverse edible landscapes; lots of waste with lawns”
— Survey Participant

Overview

Prevention and management of chronic health conditions is a critical community health priority area. Chronic conditions include hypertension, heart disease, diabetes, and certain autoimmune diseases. Chronic diseases account for nearly 60% of mortality in Massachusetts as well as more than half of all healthcare expenditures.²¹ Adequate nutrition and regular physical activity are two prevention and management tools for mitigating the burden of chronic disease.

The prevalence of Community Health Survey participants reporting heart disease nearly doubled from 2019 to 2022 (5.7% to 9.3%). Approximately 10.5% participants reported having diabetes; diabetes prevalence was higher among Hispanic participants (14.3%), Black participants (14.9%), and participants who were born outside the U.S. (12.4%). While only 13% of total survey participants reported living in public or subsidized housing, 23.5% of participants with diabetes live in public housing. While only 7.7% of all participants reported not being able to afford prescription medication, the rate was twice that (14.4%) among participants with diabetes.

Key informants and focus group participants noted that many chronic health issues were impacted by social determinants of health, like access to healthy foods, lack of transportation, or prohibitive costs of high-quality produce. Focus group participants also noted that education about prevention and management of chronic health issues was often only available in English, or did not consider the cultural background of community members (for example, nutrition education that didn't incorporate healthy recipes from the client's food culture).

Heart Health

Cardiovascular disease (CVD) includes coronary heart disease, peripheral arterial disease, and stroke; some of these chronic conditions, like stroke, can lead to catastrophic acute events. One of the most significant risk factors for CVD is hypertension, or high blood pressure, along with diabetes and high cholesterol.

21 Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017.

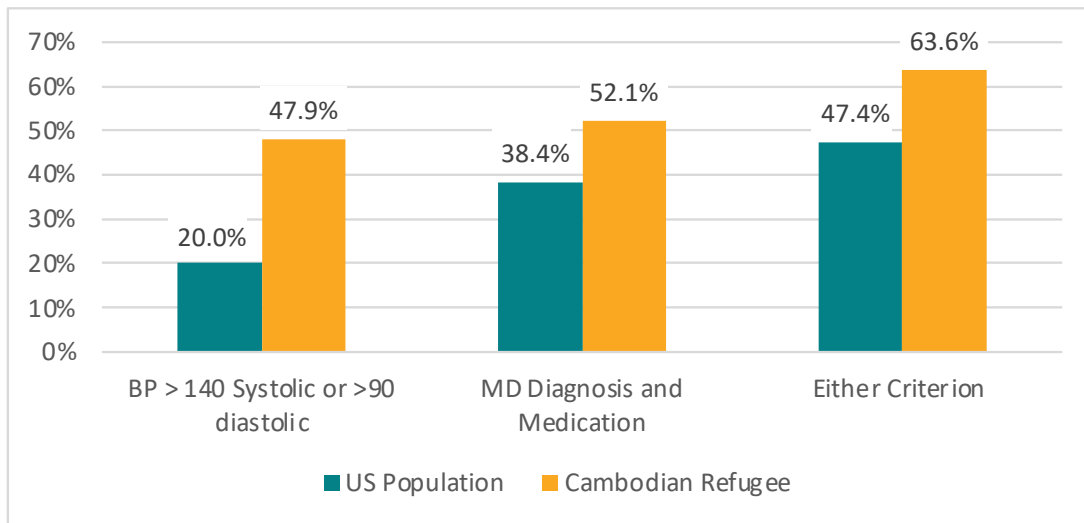
Trends and Disparities

Hypertension

Hypertension is a significant predictor of heart attack, stroke, and heart failure. Statewide in 2021, 28.1% of Massachusetts adults were diagnosed with high blood pressure.²² At the state level, rates of hypertension for Black non-Hispanic community members have been increasing over time at a rate higher than other demographics groups (from 35% to 40% for Black, NH individuals compared to 30% to 31% for White, NH individuals).²³

Though state level data identifies the lowest rates of hypertension among the Asian population, state level data is likely not generalizable to the specific Greater Lowell Asian population. Of the approximately 466,000 Asian/Asian Americans living in Massachusetts, 18.8% are of southeast Asian origin. Southeast Asians are more likely to be recent arrivals and/or refugees compared to East Asian community members, and therefore have distinct health and wellbeing risk factors. Of the 25,000 Cambodian community members in Massachusetts, 56% of them live in the Greater Lowell region.²⁴ Rates of hypertension in Cambodian refugee and immigrant populations are significantly higher than the general U.S. population, with studies identifying age- and gender-adjusted rates of hypertension between 47.9% to 63.6% in the Cambodian refugee population (Figure 9).²⁵

Figure 9: Hypertension Prevalence, Age- and Gender-Adjusted, US Population and Cambodian Refugee Population, 2015-2016



Source: Marshall, G. N., Schell, T. L., Wong, E. C., Berthold, S. M., Hambarsoomian, K., Elliott, M. N., Bardenheier, B. H., & Gregg, E. W. (2016).

22 CDC Behavioral Risk Surveillance System via America's Health Rankings

23 Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017

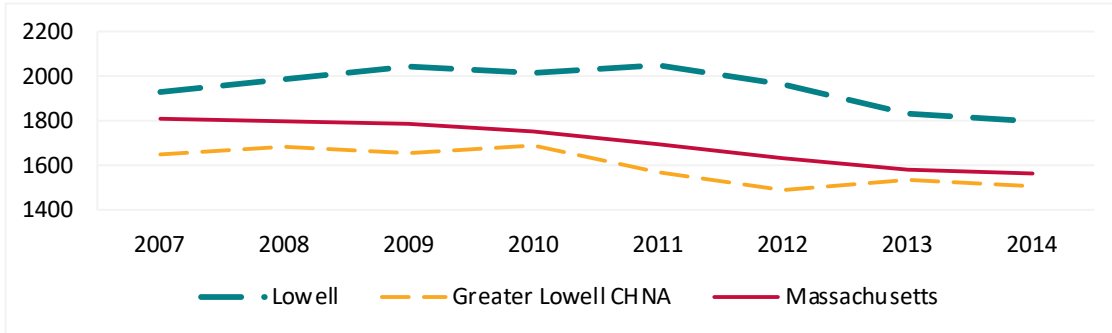
24 U.S. Census 2017, Table B03002.

25 Marshall, G. N., Schell, T. L., Wong, E. C., Berthold, S. M., Hambarsoomian, K., Elliott, M. N., Bardenheier, B. H., & Gregg, E. W. (2016). Diabetes and Cardiovascular Disease Risk in Cambodian Refugees. *Journal of immigrant and minority health*, 18(1), 110–117. <https://doi.org/10.1007/s10903-014-0142-4>

Cardiovascular Disease and Stroke

Hospital admission rates for CVD in Lowell remain significantly above both the state average as well as the Greater Lowell regional average (Figure 10).

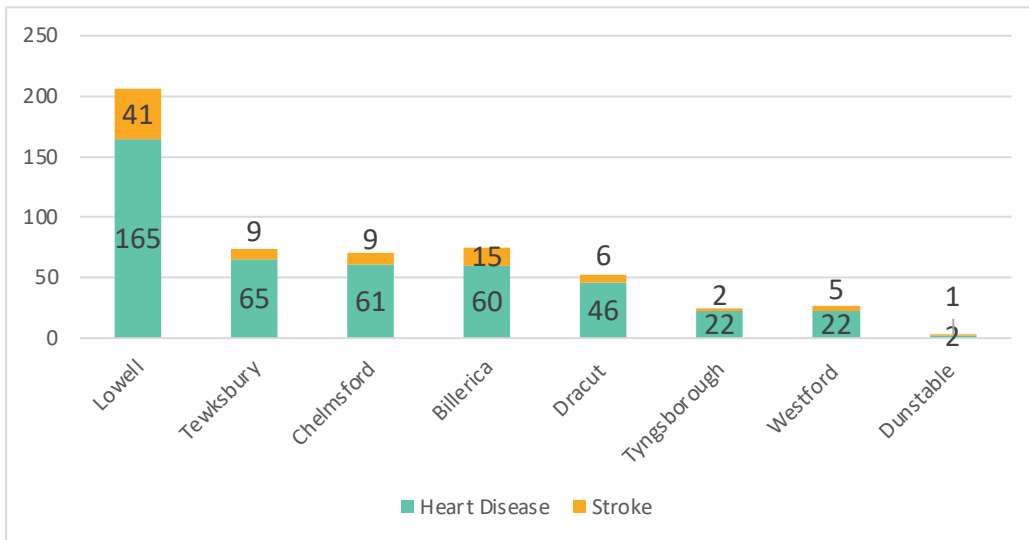
Figure 10: Age-Adjusted Rates of Admissions/Hospitalizations for Cardiovascular Disease per 100,000



Source: Center for Health Information and Analysis (CHIA) via PHIT

Heart disease is the second leading cause of death in Massachusetts, and stroke is the fifth. In 2019, there were 443 deaths in Greater Lowell from heart disease, and an additional 88 deaths from stroke (Figure 11).

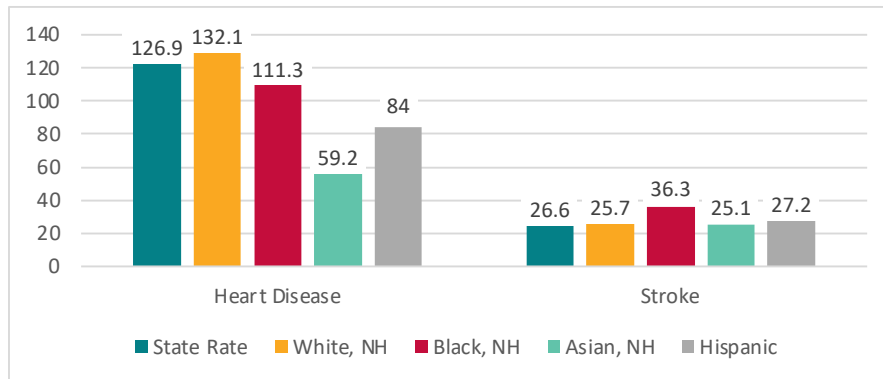
Figure 11: Heart Disease and Stroke Deaths by City/Town, 2019



Source: Registry of Vital Records and Statistics (RVRS) 2019-2020

Similar to hypertension data, at the state level, stroke mortality rates vary by race and ethnicity, with white, non-Hispanic residents experiencing disproportionately higher mortality by heart disease and Black, non-Hispanic and Hispanic residents experiencing disproportionately higher mortality by stroke (Figure 12).

Figure 12: Heart Diseases and Stroke Death Rates, Age-Adjusted and By Race/Ethnicity



Source: Registry of Vital Records and Statistics (RVRS) 2019-2020

However, also similar to hypertension data, state-level data regarding stroke mortality for the Asian population is likely not generalizable to the Greater Lowell population. Ethnic Cambodians experience mortality from stroke at significantly higher rates than comparison groups, both in Cambodia and as refugees and immigrants in the U.S. Stroke is the leading cause of death in Cambodia, excluding communicable diseases.²⁶ Though local data is not available for the proportion of stroke deaths that occurred in the Cambodians population, it is appropriate to assume that Cambodian immigrants and refugees are at greater risk of stroke than the state rate for Asians indicates.

Diabetes

Diabetes mellitus is a chronic condition in which glucose levels in the blood cannot be effectively regulated due to the body's inability to make or respond to insulin. Though diabetes mellitus includes type 1 and type 2 diabetes, the two types are distinct and therefore have distinct prevention or management plans. Type 1 diabetes is believed to be an autoimmune disorder, and therefore cannot be prevented through health behavior changes as the only known risk factor is a family history. Type 2 diabetes is developed over time, and there are several modifiable risk behaviors that can be used to prevent or manage type 2 diabetes. A vast majority of people with diabetes have type 2 (approximately 92%).²⁷ At the state level, diagnoses of diabetes have doubled in the past two decades, from a rate of 3.9% in 1993 to 8.8% in 2020.²⁸

Trends and Disparities

The most currently available local data suggests that while most Greater Lowell communities have rates of diabetes comparable to the state rate, Lowell and Tewksbury have diabetes rates above the state average (9.6% and 9.2% respectively) (Figure 13). In 2019, of the state's 1,300 diabetes-related deaths, just over 5% occurred in CHNA10, with the greatest number of deaths (25) occurring in Lowell.²⁹

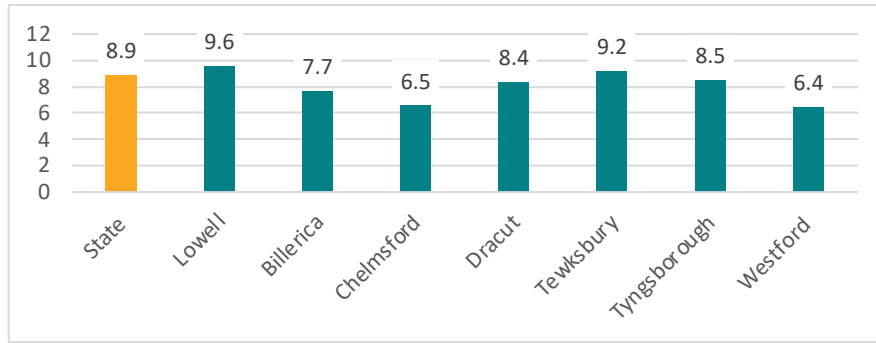
26 GBD 2019 Diseases and Injuries Collaborators: A systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2020

27 CDC: Type 2 Diabetes, <https://www.cdc.gov/diabetes/basics/type2>

28 CDC, Behavioral Risk Factor Surveillance System, America's Health Rankings, Trends: Diabetes in Massachusetts.

29 Registry of Vital Records and Statistics (RVRS) 2019-2020

Figure 13: Percent of Adults with Diabetes, by Town



Source: BFRSS Results via PHIT

Diabetes rates are impacted by socioeconomic disparities. In Massachusetts, adults with an annual household income of less than \$25,000 (15.6%) have a diabetes rate that is three times the rate of households with an income more than \$75,000 (5%).³⁰ In the Community Health Survey, 26% of participants with diabetes reported an income below \$25,000 (compared to 15.6% of total survey participants).

Significant disparities in emergency department utilization are also observable at the state level, with Black, non-Hispanic (419.1 per 100,000 population) and Hispanic (376.5 per 100,000) residents utilizing emergency services for diabetes-related illness at a rate more than four times as high as the age-adjusted rate for white, non-Hispanics (99.3 per 100,000). This suggests additional disparities related to disease management and mortality and morbidity.

Nutrition and Physical Activity

Adequate nutrition and physical activity are factors in the prevention and management of many chronic health conditions. Poor quality diets account for nearly half (45.4%) of metabolic and cardiovascular-related deaths across the country.³¹ While nutrition and physical activity are often assessed as modifiable individual-level behaviors, social determinants of health play a significant role in people's access to affordable, nutritious, culturally-appropriate food, and safe opportunities for engagement with physical activity.

Trends and Disparities

Maintaining a healthy body weight is a prevention and management tool for some chronic illnesses; adequate nutrition and physical activity are critical for avoiding the health risks associated with being both underweight and overweight. At the state level, the age-adjusted rate of obesity among Massachusetts adults is 25.9, though inequities exist by race and ethnicity.³² Though white, non-Hispanic residents have some of the lowest rates of obesity, their obesity rate has increased slightly from 2014 to 2019, from 22.5% to 25.4%. Conversely, though the obesity rate among Hispanic/Latino/a residents has been decreasing consistently during the same period, it is still markedly higher overall than the state rate (28.4% versus 25.9%). Similarly, though for several years the obesity rate among Black, non-Hispanic residents had been declining, most recent data identified a significant increase, from 25.9% in 2018 to 33.0% in 2019.

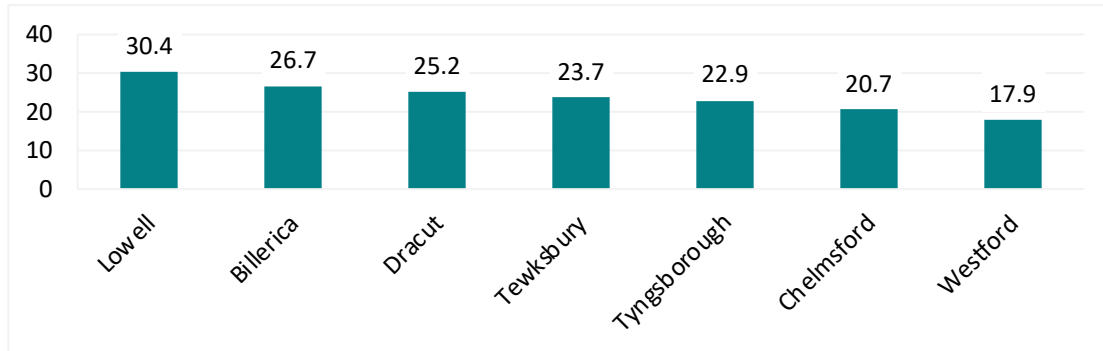
30 Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017.

31 Micha, R et al. Association Between Dietary Factors and Mortality from Heart Disease, Stroke, and Type 2 Diabetes in the United States. JAMA. 2017;317(9):912-924. doi:10.1001/jama.2017.0947.

32 BFRSS Results via PHIT

More locally, the prevalence of obesity among adults is close to or lower than the state rate in Dracut, Tewksbury, Tyngsborough, Chelmsford and Westford (Figure 14). However, the prevalence of adulthood obesity is higher than the state rate in both Billerica (26.7%) and Lowell (30.4%), using the most recently available data.

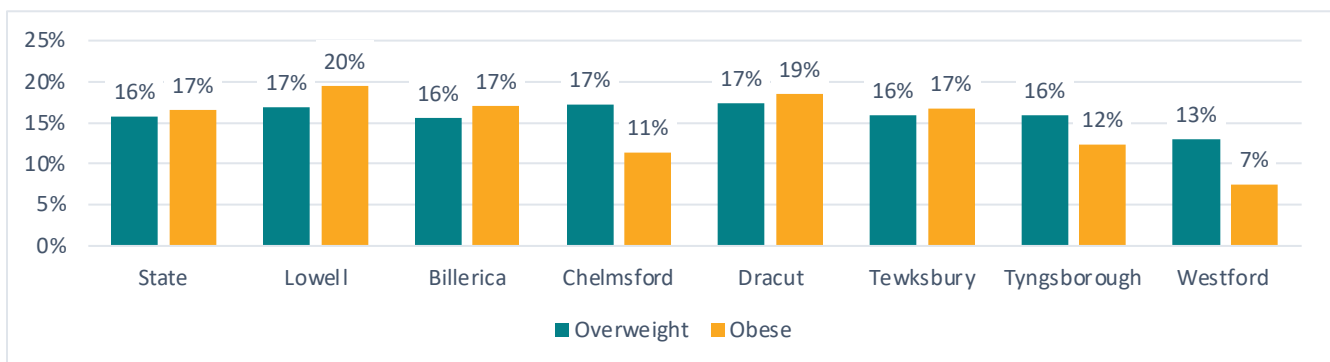
Figure 14: Percent Adults who Meet Obesity Criteria, 2014



Source: BFRSS Results via PHIT

Maintaining a healthy weight in childhood can establish lifelong habits to prevent chronic disease. While some school districts in Greater Lowell, like Westford and Tyngsborough, have rates of overweight/obese children below the state average, both Lowell and Dracut have childhood rates of both overweight and obesity higher than the state average. (Figure 15).

Figure 15: Percent of Children Meeting Criteria for Overweight or Obesity, in Grades 1, 4, 7, 10 in MA School Districts, 2017

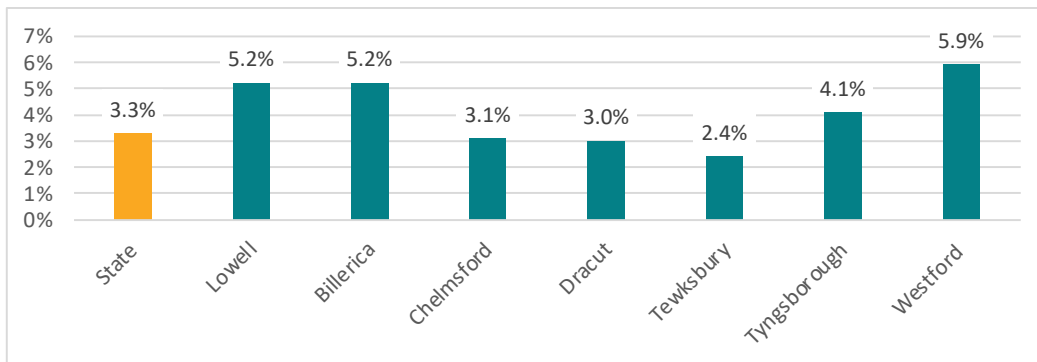


Source: BMI Screening in MA Public School Districts (2017)

*Data from Dunstable is not included because school district data for this community includes Groton

Being underweight is also a risk factor for poor health outcomes; being underweight may also be an indicator of food insecurity, poor nutrition, or disordered eating. Lowell (5.2%), Billerica (5.2%), Tyngsborough (4.1%) and Westford (5.9%) have rates of underweight children above the state rate (Figure 16).

Figure 16: Percent of Underweight Children in Grades 1, 4, 7, 10, by city/town, 2017



Source: BMI Screening in MA Public School Districts (2017)

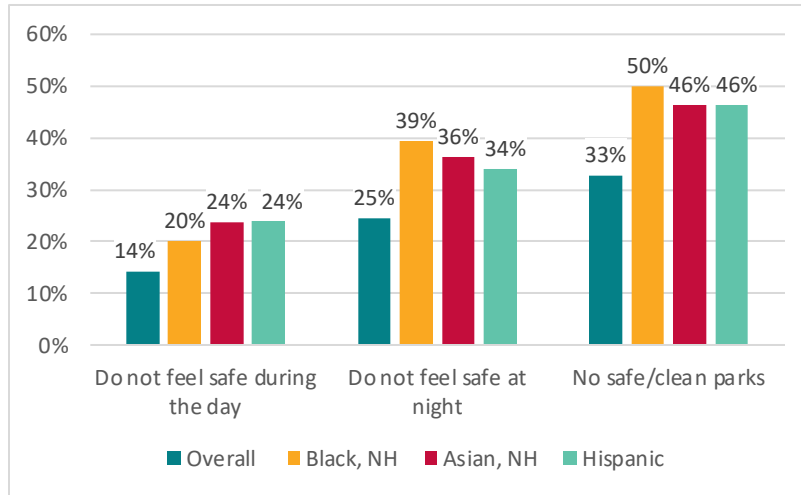
*Data from Dunstable is not included because school district data for this community includes Groton

Individuals who meet the recommended guidelines for physical activity are less likely to report negative health outcomes.³³ For example, in Massachusetts, adults who met the recommendations for physical activity had lower prevalence rates of depression (26.0% for adults not meeting activity guidelines versus 17.1% for adults who did meet guidelines), diabetes (11.9% versus 4.8%), and obesity (31.7% versus 14.6%).

The ability to meet the recommendations for physical activity is impacted by features of the built environment. For example, the availability of green spaces like parks and trails, accessibility for people with disabilities, the prevalence of infrastructure for safe cycling, and feeling safe in one’s neighborhood all contribute to individual ability and desire to engage in physical activity.

In the 2022 Community Health Survey, 14.2% of participants indicated that they sometimes did not feel safe in their neighborhoods during the day, with 24.6% indicating not feeling safe in their neighborhoods at night. Nearly one-third of participants indicated that there were no safe, clean parks in their communities. Participants who were Black, Asian, and Hispanic/Latino/a were also more likely to indicate that they did not feel safe in their communities and that that did not have access to safe, clean parks (Figure 17).

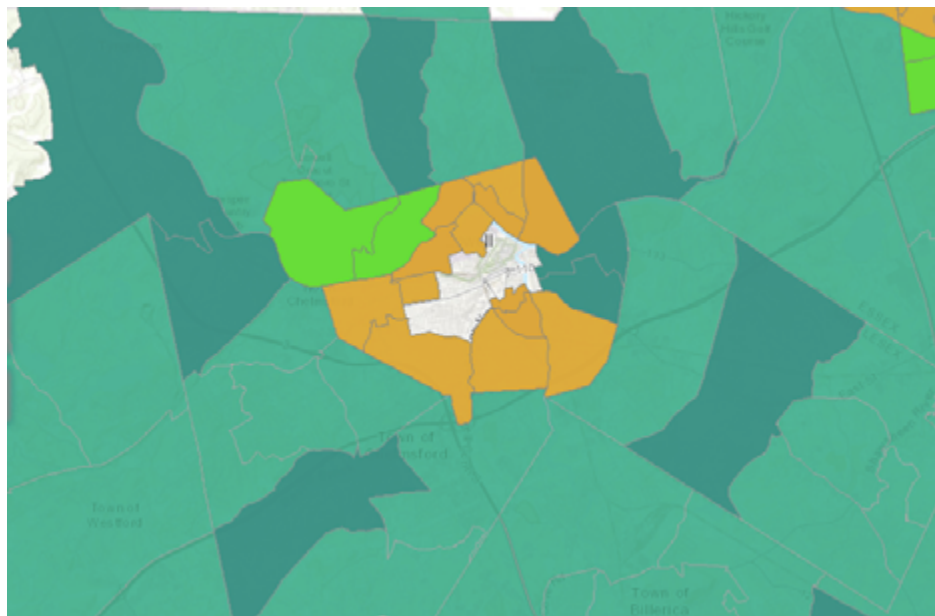
Figure 17: Survey Participants Reporting Sense of Safety and Access to Green Spaces, by Race/Ethnicity



Source: 2022 Community Health Survey

Nutrition is similarly impacted by features in the built and social environment. Income, distance to a grocery store, and access to transportation impact people’s access to nutritious, affordable foods. The USDA utilizes census tract data to identify areas in which there is a high density of households that are low-income, as well as a high density of households that are outside of reasonable distance to a supermarket (Figure 18). Outside of the center of Lowell, nearly all community census tracts in Billerica, Chelmsford, Dracut, and Tewksbury are in a low access zone (shaded in light green). Additionally, several census tracts in Lowell meet the criteria for being both low-income and low-access, with low-income households that do not live within ½ mile (shaded in orange) or 1 mile (shaded in lime green) of a grocery store.

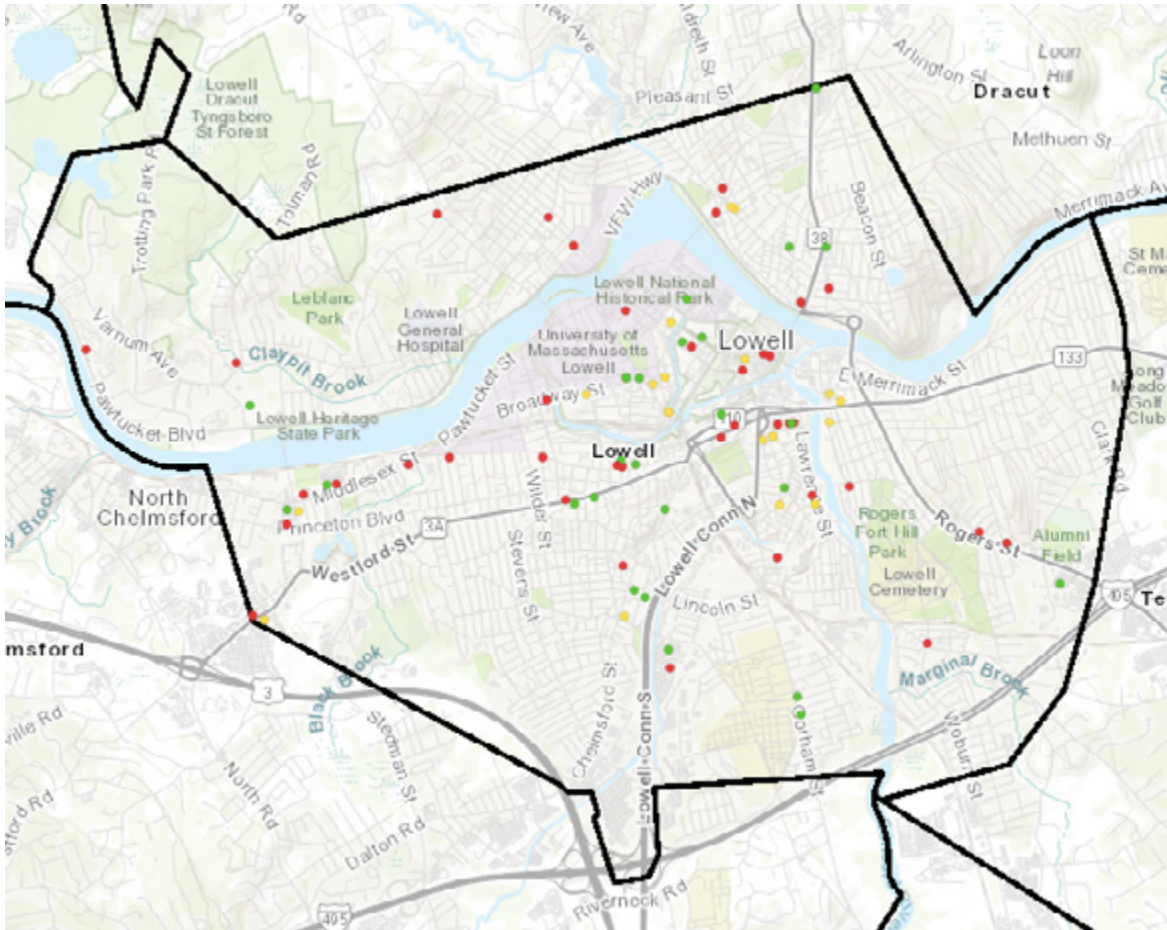
Figure 18: Visualization of Greater Lowell Low Access and Low-Income Areas



Source: USDA Economic Research Service, Food Access Research Atlas, 2019

The 2021 Mill City Grows Community Food Assessment provides more specific insight into the food landscape of low-income, low-access neighborhoods in Lowell. Their food assessment map specifies the quality of food vendor produce within Lowell census tracts, with green indicating the highest produce quality and variety, yellow indicating moderate quality and variety, and red indicating lower quality and variety (Figure 19). Many of the food vendors with lower quality or variety produce are concentrated in census tracts that are low-income and low-access according to the USDA.

Figure 19: Location, Quality and Variety of Produce in Lowell

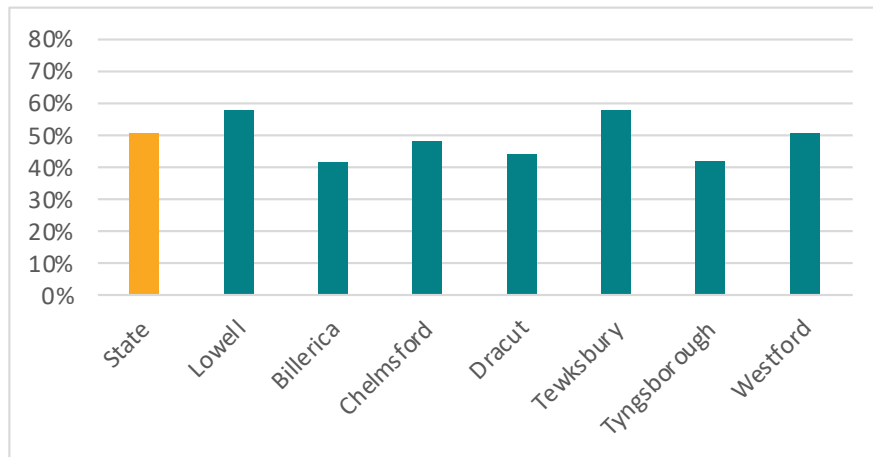


Source: Food Vendor Map, Mill City Grows Community Food Assessment, 2021

Several social programs to support nutritious food access are available, but appear underutilized. Approximately 12% of Massachusetts residents receive benefits from the Supplemental Nutritional Assistance Program (SNAP). Only Lowell (23.2%) has a higher percentage of households receiving SNAP benefits compared to the state average.³⁴

However, several Greater Lowell communities have a benefit utilization rate below the state rate, indicating that significant portions of the population are eligible for benefits, but are not enrolled (Figure 20). For example, though at the state level, 50.6% of eligible households are enrolled in WIC, Billerica (41.5%), Chelmsford (48.4%), Dracut (44.3%), and Tyngsborough (41.8%) have less than half of eligible households enrolled.

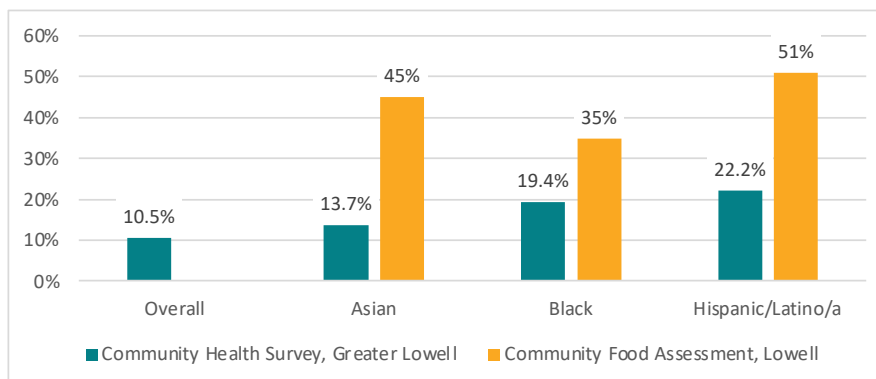
Figure 20: Percent of Eligible Households Enrolled in WIC, 2019



Source: 2019 WIC Needs Assessment, Massachusetts Department of Public Health

Food insecurity is also not experienced at the same rate across all populations. For example, among Lowell participants in the Community Food Assessment, participants who were white experienced not being able to afford food at a lower rate (26%) than other participants. Similarly, in our Community Health Survey, participants who were Asian (13.7%), Black/African American (19.4%), and Hispanic/Latino/a (22.2%) had higher rates of reporting unreliable access to nutritious food compared to the overall survey participant population (10.5%). (Figure 21).

Figure 21: Community Members Without Consistent Reliable Access to Nutritious Food, by race/ethnicity, Greater Lowell and Lowell Respondents



Importantly, though community members may not be meeting the criteria for adequate nutrition, evidence indicates that most are motivated to, but experience barriers. For example, participants indicated in the Community Food Assessment that the food they would most like to have more of in their households was fresh produce (80%). Likewise, Access to Healthy Food was ranked the No. 1 health resource in the Community Health Survey, with over one-third of participants ranking the item in their top three.

Recommendations

Strategies to address chronic health needs should consider both disease prevention and disease management. People living with lifelong chronic health problems experience unique health needs, as well as barriers to meeting those needs, particularly if they also experience sociodemographic barriers to care and treatment, including poverty, racism and language barriers. Meaningful interventions in this area recognize that improvements to the healthcare system are critical to increasing people's access to early screening, diagnosis and treatment options, but more upstream strategies that increase people's equitable access to prevention are also important priorities.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address chronic disease and promote wellness have included the following:

- Implementation of the Transit to Treatment program via Lowell General Hospital, which reduced barriers to accessing treatment for chronic diseases by increasing access to a ride service program
- The Lowell Healthy Food Access program at Lowell General Hospital, which collaborated with health food vendors to increase the presence of mobile markets and promoted nutritional education for people with chronic illnesses that are impacted by nutrition
- The Lowell General Hospital Physical Activity program, which provided a range of fitness classes to community members
- Completion of a Walking Audit by the Physical Activity Working Group of the Greater Lowell Health Alliance in collaboration with Walk Boston to identify built environment barriers to physical activity
- Completion of the Mill City Grows Food Assessment to assess the food system in Lowell, which food insecurity is the most significant in the Greater Lowell Region
- Expansion of the Gardens for Good project in Chelmsford, which increased the capacity of community gardens
- Distribution of over \$133,000 in GLHA grant funding to support community projects that address chronic illness, nutrition, and physical activity throughout the Greater Lowell region

Future Actions

Healthcare System Recommendations

- Collaborate with local partners, including health departments and community-based organizations, to deploy community-based health fairs as opportunities for accessing preventative care and health screenings (for example, blood sugar tests, cholesterol testing, blood pressure monitoring, etc.), with on-site referrals to additional services as needed
- Convene community experts to evaluate health education materials for cultural accessibility, including accurate translations, language accessibility/readability, and content that is appropriate to the community targeted (for example, dietary recommendations that consider Southeast Asian traditional diets)
- Provide incentivized nutrition education that is culturally specific
- Explore the feasibility of partnerships with local farmers and produce suppliers to increase access to healthy, affordable food options via "nutrition prescriptions" or other food vouchers
- Incorporate on-site evaluation and enrollment in available supplemental nutrition programs at the point of care (for example, at the conclusion of an annual physical)

Community System Recommendations

- Collaborate with local restaurants that serve populations disparately impacted by cardiovascular and diabetes risk to incentivize offering healthier versions of traditional dishes on their menus
- Increase and advertise the number of free recreational teams and activities available to residents of all abilities, including walking groups, tai chi and yoga as well as competitive sports like kickball, basketball and volleyball
- Coordinate local chapters of national programs that incentivize physical activity, like the National Physical Activity Alliance Move With Us program
- Facilitate the completion of the Blue Zones community assessment to determine readiness for implementation of community-wide well-being interventions

3. Substance and Alcohol Use

Score Summary		
Source	Score	Rank
Survey	654	3
Focus Groups	23.5	3
Key Informants	15	3

“Alcoholism seems really underestimated in our culture, though it is one of the most prevalent health issues I see in my community.”

— Survey Participant

Overview

Substance use disorder (SUD) and alcohol use disorder (AUD) are chronic diseases. The impacts of SUD/AUD are far-reaching, and include significant individual costs (such as increased risk of a range of co-occurring health issues like HIV, hepatitis, and unplanned pregnancy) and social and community impacts (such as increased public health costs).

SUD/AUD have remained high-ranking health concerns in Greater Lowell for several years. Participants in the Community Health Survey ranked Substance Use and Alcohol Use the third most important health issue; participants in focus groups and key informant interviews mentioned substance use nearly forty times. More specifically, participants noted an increase in rates of overdose and overdose death as particularly critical, especially for community members who are homeless. Participants also identified difficulty in securing substance use services for their family members, citing long waiting lists or confusion about access. Substance and alcohol use was also highlighted as especially concerning in the perinatal period, as key stakeholders identified pregnant people as a population of focus.

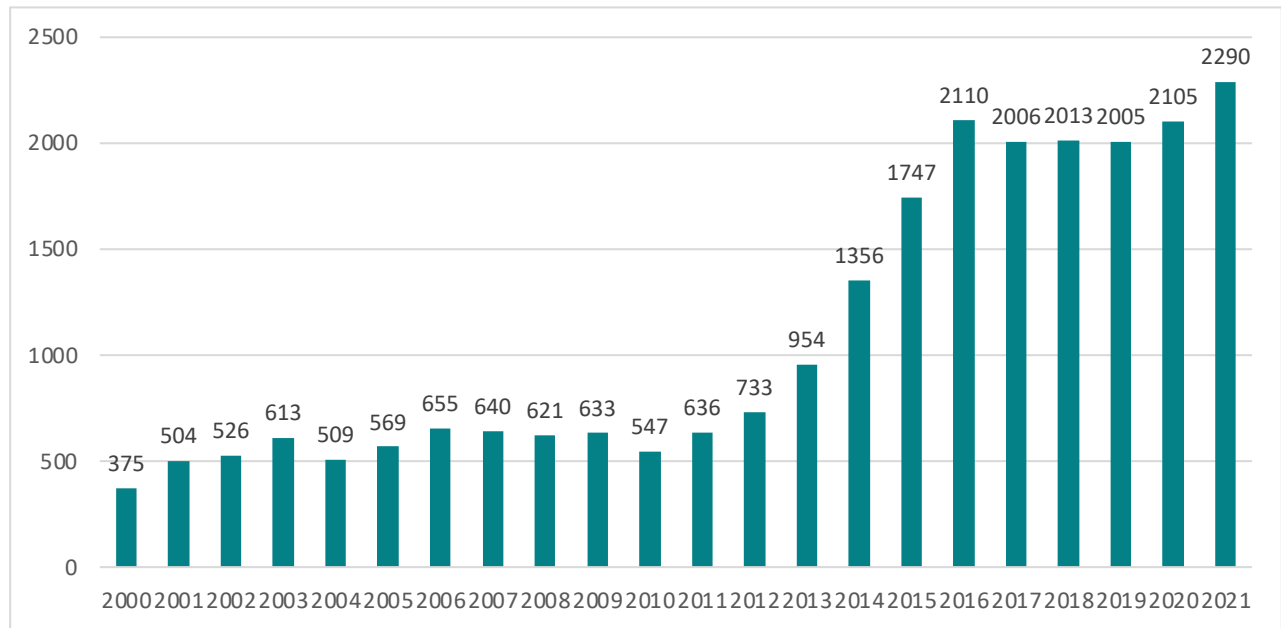
Opioids

Opioids are a class of drugs that includes pain relievers that are legally available by prescription (like oxycodone and morphine) as well as synthetic opioids like fentanyl, and illegal drugs like heroin. Opioids are often prescribed to people who are dealing with acute or chronic pain, though their high capacity for dependency coupled with their significant cardiac and respiratory effects have made them an especially dangerous substance when used recreationally or illegally.

Trends and Disparities

Participants in this needs assessment identified opioids as a drug of particular concern, due to the high rate of overdose and overdose death associated with opioid use. In Massachusetts, opioid-related overdose death has increased significantly from 375 deaths in 2000 to 2,290 in 2021 (Figure 22). The Massachusetts Department of Public Health notes that the presence of fentanyl in the drug supply is a major contributor to the increase in overdose death among Massachusetts residents, with fentanyl being present in 93.3% of overdose deaths in 2021, up from 41.9% in 2014.³⁵

Figure 22: Opioid-Related Overdose Deaths, All Intents, Massachusetts Residents



Source: Massachusetts Department of Public Health Data Brief: Opioid Related Overdose Deaths, June 2022

In Greater Lowell, there have been 681 deaths due to opioid-related overdose since 2015 (Table 6). A majority of these deaths are to Lowell residents, though almost all communities have experienced at least one death due to opioid overdose every year.

Table 6: Opioid-Related Overdose Deaths, by city/town

	2015	2016	2017	2018	2019	2020	2021	TOTAL
Billerica	14	16	14	13	11	10	10	88
Chelmsford	5	6	6	3	3	4	7	34
Dracut	8	6	5	10	11	7	9	56
Dunstable	0	0	1	1	1	0	0	3
Lowell	65	68	53	65	44	46	59	400
Tewksbury	9	13	11	7	6	5	10	61
Tyngsborough	5	1	3	5	2	1	2	19
Westford	0	3	7	2	0	4	4	20
							TOTAL	681

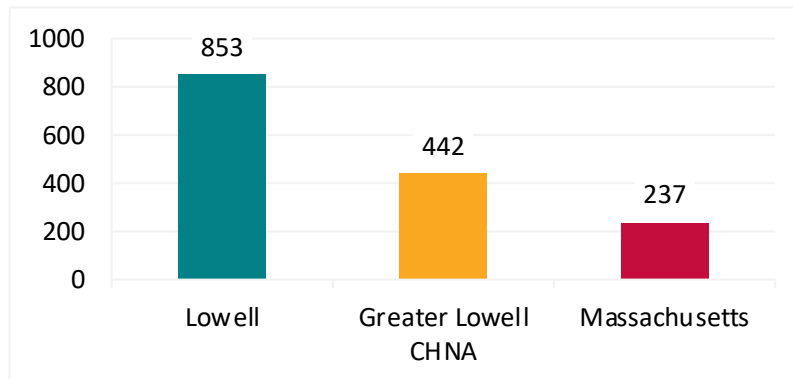
Source: Registry of Vital Records and Statistics (RVRS) 2019-2020

At the state level, the opioid-related death rate per 100,000 residents is 30.2. In Greater Lowell, most communities average below the state death rate, with the exception of Lowell. In 2021, Lowell’s opioid-related overdose death rate was 53.2 per 100,000, significantly higher than the state rate and significantly higher

than the rates of all surrounding communities. In 2021, Tewksbury also observed an overdose death rate above the state average (32.6) which was a considerable increase over previous years.³⁶

The state rate of opioid-related EMS calls is approximately 237 per 100,000 residents. The Greater Lowell rate is significantly higher, at 442 per 100,000; when Lowell is isolated, its city-specific rate is more than three times the state rate, at 853 per 100,000 (Figure 23). Trinity EMS also reports opioid-related EMS calls and provides more recent data. From 2012 to 2022, the daily rate of opioid-related calls to Trinity EMS doubled from .7 per day to 1.4 per day, with a peak in 2017-2018 of 2.2 calls per day.³⁷

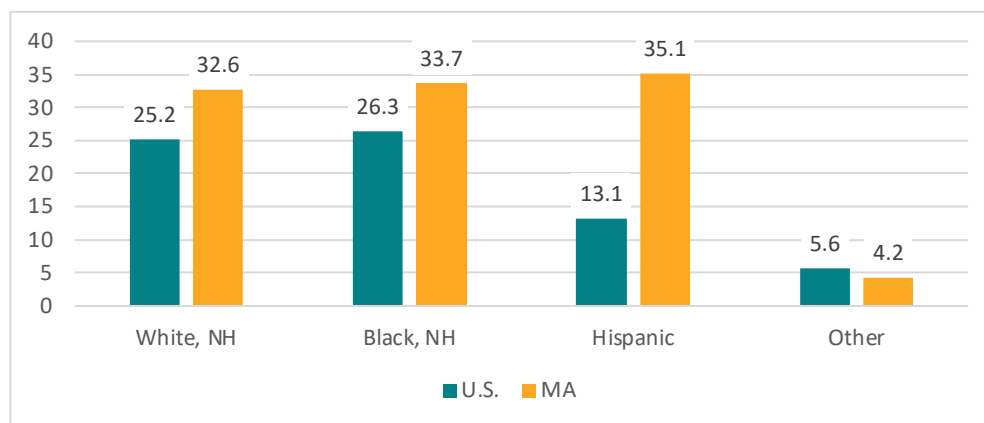
Figure 23: Opioid-Related EMS Incidents per 100,000 in 2018



Source: MA DPH Opioid-Related EMS Incidents 2013-2021 Data Brief

Disparities in opioid-related overdose deaths by race and ethnicity persist at the national and state level (Figure 24). The opioid-related death rate per 100,000 for Black, non-Hispanic residents at the national level is 26.3, but 33.7 in Massachusetts; the disparity for Hispanic residents is even more significant, with a national rate of 13.1 but a state death rate of 35.1. Between 2018 and 2020, Massachusetts has seen a recent significant increase in the rate of opioid-related deaths among Black (from 15.7 to 36 per 100,000) and Hispanic (from 31.2 to 36.3 per 100,000) residents.

Figure 24: Opioid-Related Overdose Death, National and State Level, by race/ethnicity



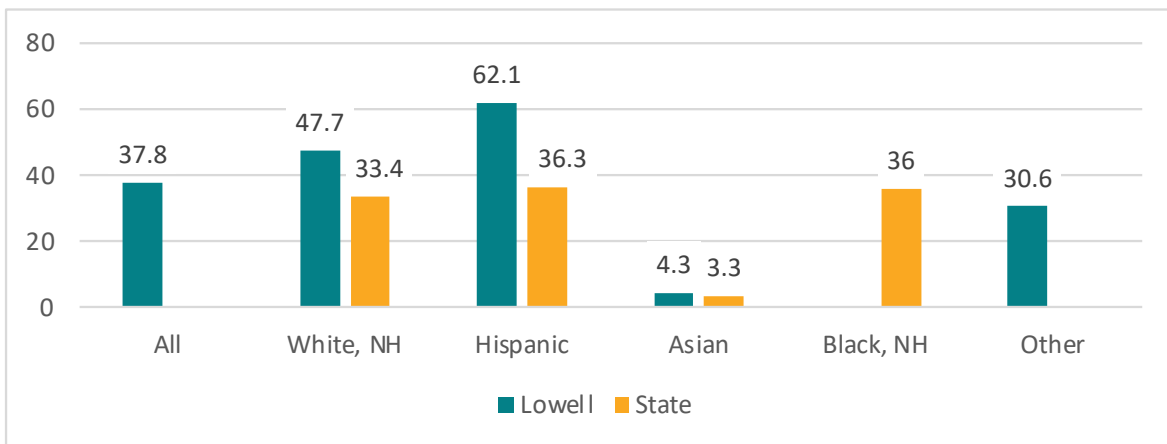
Source: KFF analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics

36 MA DPH Number of Opioid-Related Overdose Deaths, All Intents, by City/Town, 2015-2021

37 Trinity EMS Overdose Report April 2022

In Lowell, the overdose death rates for every racial and ethnic group are above the comparable state rate (with the exception of Black, non-Hispanic residents, for whom Lowell data was not available). In particular, Lowell’s opioid-related death rate is higher than the state rate for white, non-Hispanic residents (47.7 per 100,000), Hispanic residents (62.1 per 100,000) and Asian residents (4.3 per 100,000) (Figure 25).

Figure 25: Opioid Overdose Death Rate by Race/Ethnicity, Lowell and Massachusetts, Per 100,000 Residents



Source: HEALing Communities Study Community Profile: Lowell 2019
 *Data for Black, non-Hispanic overdose death is missing from the Lowell data

Approximately 3.8% of participants in the 2022 Community Health Survey indicated that they had a substance use problem. Though Lowell is often regarded as the Greater Lowell community with the most significant burden of substance use-related issues, only 50% of survey participants with substance use issues reported living in Lowell. Survey participants with SUD were more likely than the general survey population to report being LGBTQ+ (18% of participants with SUD versus 11% overall), Black/African American (8.2% versus 4.5%), Hispanic/Latino/a (20% versus 11.2%), and to report having mental health needs (89.3% versus 29.4%). This local data support trends and disparities seen at both the state and national level, indicating that efforts to address SUD and OUD should be especially honed to the needs of populations disparately impacted, include LGBTQ+ people, Black populations, Hispanic/Latino/a populations, and people with co-occurring mental health issues.

Alcohol Use Disorder

Alcohol increases the risk of injury and death from accidents, can increase risk of perpetration of and victimization by violence, and can cause alcohol poisoning. Additionally, long-term or excessive alcohol consumption is associated with increased risk of high blood pressure, heart disease, stroke, cancer, and can lead to alcohol use disorder (AUD).³⁸ Nearly 53% of participants in the 2022 Community Health Survey indicated that they believed alcohol use disorder should be a High Priority for community health efforts in Greater Lowell, and 8.8% of survey participants also identified as having alcohol use disorder or problems with alcohol.

Trends and Disparities

Overall, 19.1% of Massachusetts adults report binge drinking within the last month, and 7.8% report heavy drinking.³⁹ Statewide, binge drinking is more common among younger people. Alcohol use disorder among

38 CDC: Alcohol Use and Your Health, 2020.

39 A Profile of Health Among Massachusetts Adults, 2019

young adults in Massachusetts is higher than the national average, with 13.9% of Massachusetts residents age 18-25 reporting AUD compared to the U.S. national average of 9.8%.⁴⁰

Changes in alcohol use in Massachusetts have been impacted by COVID-19. According to the COVID Community Impact Survey, approximately 41% of respondents indicated that their use of substances had increased compared to prior to COVID-19, and of participants who reported substance use in the past 30 days, 49.1% reported using alcohol.⁴¹ Participants who reported alcohol use in the past 30 days were also more likely to report poor mental health compared to participants who did not report any use in the past 30 days (45% versus 39%).

Variations in excessive drinking by race and ethnicity are observable at the state level. Since 2018, the percent of white, non-Hispanic MA residents who engage in excessive drinking has decreased from 23.9% to 19.5%, and a similar consistent decline is observable among Black residents (from 17.6% to 13.4%). Though Asian and Hispanic residents saw an overall decrease in excessive alcohol consumption, the most recent data for these populations show a slight increase from 2019 to 2020.⁴²

Importantly, though the overall rate of excessive drinking for Asian residents in MA is comparatively low, the average rate for the state is higher than for the U.S. population (14.3% of Asian residents in MA versus 9.9% for the total U.S. Asian population). Some studies have identified a greater risk for alcohol use disorder among certain immigrant and refugee populations due to a range of factors including acculturative stress that may incentivize engagement in maladaptive coping.⁴³ In one of the only studies to compare Cambodian refugees living in Massachusetts to Cambodian refugees living in California, researchers found that Cambodians living in Massachusetts were much more likely to report using alcohol to cope with stress when compared to Cambodians living in California.⁴⁴ These findings are in line with the current needs assessment, in which participants in focus groups and key informant interviews identified the Southeast Asian population, and recent arrivals more broadly, as particular populations of focus for addressing alcohol use disorder.

Massachusetts has a particularly high rate of alcohol consumption among youth ages 12 to 17. Approximately 10.8% of MA youth reporting consuming alcohol, ranking the state 43rd and placing MA above the national average of 9.2%.⁴⁵ From Greater Lowell communities where data is available, a significant portion of high school students report ever consuming alcohol (Figure 26). In Lowell, 49.7% of high school students reported consuming alcohol, with even higher percentages in Billerica (50.6%), Dracut (51.0%) and Chelmsford (59.0%).

40 Behavioral Health Barometer: Massachusetts, Volume 6.

41 COVID-19 Community Impact Survey: Substance Use.

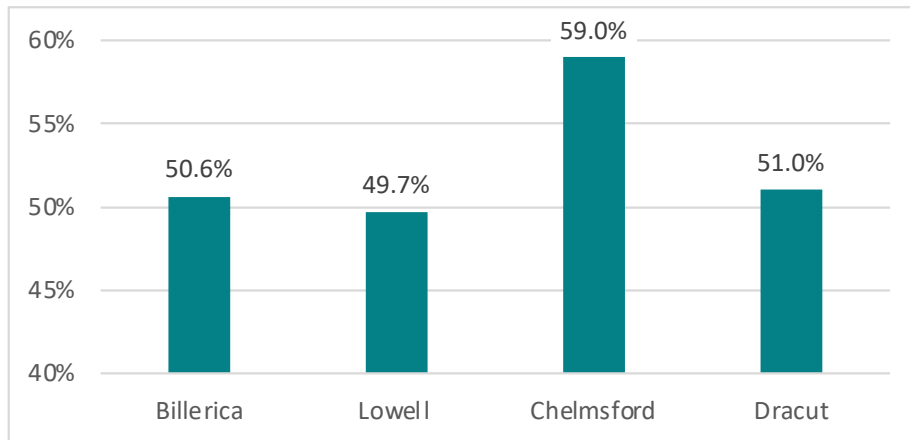
42 CDC, Behavioral Risk Factor Surveillance System, 2020

43 Drug and Alcohol Multicultural Education Center: *Are Refugees at Increased Risk of Substance Misuse?*

44 D'Avanzo CE (1997). Southeast Asians: Asian-Pacific Americans at risk for substance misuse. *Substance Use and Misuse*, 32(7-8): 829-848.

45 SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health

Figure 26: Percent of High School Students Reporting Any Alcohol Consumption in Their Lifetime



Source: Billerica Communities that Care Survey 2019, Lowell Communities that Care Survey 2016, Chelmsford Youth Risk Behavior Survey 2016 and Dracut Youth Risk Behavior Survey 2015

Prevention and Treatment

Participants in the current needs assessment stressed their desire for a two-pronged approach to SUD/AUD that includes both prevention and treatment. Participants in focus groups expressed desire for more in-school prevention programming to reduce the rates at which young people are engaging in substance and alcohol use. Participants also acknowledged the need for more accessible comprehensive treatment programs for people who are using drugs or alcohol. Both focus group participants and key informants expressed frustration at the lack of programs that target people with polysubstance use, or people who have a stimulant use disorder.

Trends and Disparities

The most recent BSAS data identified 3,280 enrollments or admissions for substance use services in the Greater Lowell region.⁴⁶ Lowell had the highest number of enrollments (2039), followed by Billerica (400), Tewksbury (334), Dracut (286) and Chelmsford (221).⁴⁷ Of those admissions, a majority were for people whose primary substance of use was heroin, across all communities. The second most common substance of primary use for admission as alcohol, across all communities. Addition admissions included primary substances of marijuana and cocaine.

At the state level, of people who were receiving substance use treatment, 56.7% were receiving care for a substance use problem only, 14.6% were receiving care for alcohol use only, and 28.7% were receiving care for both alcohol and substance use. The types of treatment options vary from medically supervised detox to outpatient clinics to the use of medication-assisted therapy to treat addiction. In Massachusetts, enrollment in buprenorphine treatment had steadily increased from 4,113 in 2015 to 11,316 in 2019; more locally, Lowell has seen similar increases in enrollment in MAT, with 965 people receiving buprenorphine in 2018 to 1,094 in 2019.⁴⁸

Enrollment in treatment varies by race and ethnicity. At the state level, 7.3% of admissions for treatment are Black/African American residents, but every Greater Lowell community with data available admitted far below

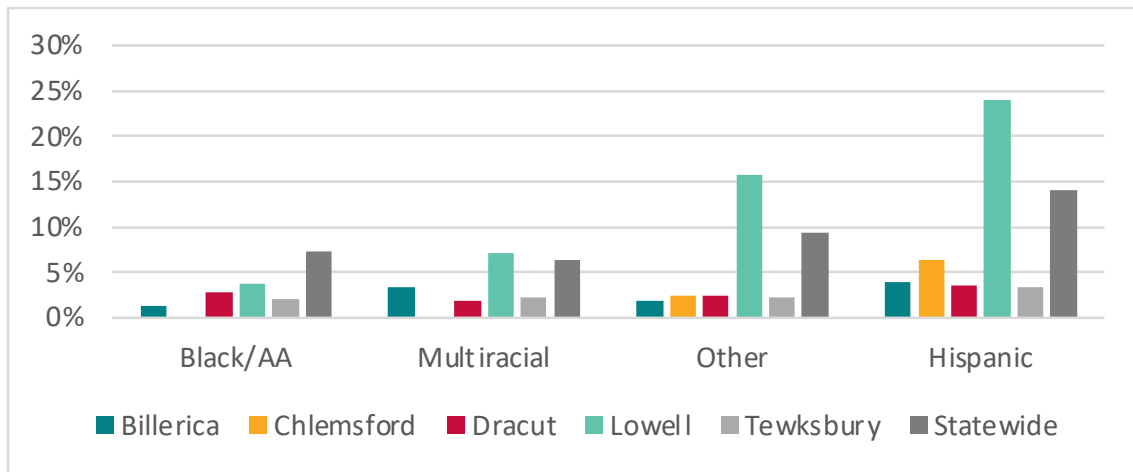
⁴⁶ Communities with fewer than 100 enrollments are not included: Dunstable, Tyngsborough, and Westford.

⁴⁷ MA Dept. of Public Health BSAS Geographic Fact Sheets FY2017

⁴⁸ Behavioral Health Barometer, Massachusetts Volume 6 and HEALing Communities Study Profile: Lowell Community Profile

the state average of Black/African American community members (Figure 27). Similarly, admissions from Lowell for Hispanic residents far exceeded the state average (24.0% for Lowell compared to 14.0% statewide). Importantly, 15.8% of Lowell’s admissions were in the race/ethnicity category of “Other” (compared to only 9.3% of the state’s admissions). This may be a function of the high population of Asian/Asian Americans in Lowell, since the data does not break out the data by Asian race.

Figure 27: Percent of Treatment Admissions by Race/Ethnicity, by town/city and state



Source: BSAS, FY2017

Racial and ethnic difference in access to treatment are significant particularly for opioid use disorder. Black, non-Hispanic and Hispanic people with OUD are less likely to receive medications for opiate use disorder (MOUD) despite significant evidence that MOUD is an extremely effective treatment option.⁴⁹ Methadone is much more likely to be utilized for treatment of OUD in Black and Hispanic populations, and is also significantly more stigmatized as a treatment option and carries a more burdensome regimen.⁵⁰

Nationally, a majority of prevention messaging that reaches young people is through media messages and in-school settings, with 75.7% of teens reporting receiving prevention messaging through the media and 67.9% reporting receiving prevention messaging at school.⁵¹ A smaller proportion young people report having conversations about substance use with their parents, and only between 9% and 12% of young people report receiving prevention education and messaging outside of school settings, like afterschool and youth programs.

Recommendations

Because so many of the substance and alcohol use treatment services are located in Lowell, many residents from surrounding communities come to Lowell seeking treatment and services, which increases the strain on Lowell’s healthcare system, especially as the healthcare system attempts to meet the needs of Lowell’s diverse population. Efforts to address substance and alcohol use disorder should simultaneously attempt to prevent engagement with substances with a focus on efforts for youth, recent arrivals, and the aging population, while also ensuring a robust, well-funded network of treatment services that offer a

49 Stahler GJ, Mennis J, Baron DA. Racial/ethnic disparities in the use of medications for opioid use disorder (MOUD) and their effects on residential drug treatment outcomes in the US. *Drug Alcohol Depend.* 2021 Sep 1;226:108849

50 Andraka-Christou B. Addressing Racial and Ethnic Disparities In The Use Of Medications For Opioid Use Disorder. *Health Aff (Millwood).* 2021 Jun;40(6):920-927.

51 SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs), 2002 to 2005, 2006 to 2010 (revised March 2012), and 2011 to 2015.

range of treatment options including medication assisted treatment, outpatient care, and counseling and therapy options.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address substance and alcohol use have included the following:

- Funding for the Lowell General Hospital Bridge Clinic via the NIH-funded HEALing Communities study, which recorded over 1,600 encounters with patients with OUD and 776 encounters with patients with AUD during the study observation year from January 2021 to April 2022. The Bridge Clinic also reported 271 MOUD initiations for people with OUD and 66 medication initiations for patients with AUD
- Implementation of an in-patient Addiction Consult Service at Lowell General Hospital via the NIH-funded HEALing Communities study, which yielded 480 bedside consults for patients with either OUD or AUD who were receiving treatment at the hospital
- Lowell General Hospital's participation in Project SMART, a study that explores the efficacy of two types of support for pregnant and postpartum women with OUD
- Initiation of a multi-lingual street outreach team at Lowell House, including an outreach nurse, to engage with community members who experience substance use issues and housing issues
- Funding of Wheels of Hope, which provides free rides to treatment and other substance use related services via the state Helpline
- Launched the now-annual Merrimack Valley Substance Use Disorder Symposium, a free forum for service providers to receive training and education
- Since 2019, disbursement of over \$86,000 in GLHA grant funding to community projects that address substance and alcohol use

Future Actions

Healthcare System Recommendations

- Commit to sustainability of Lowell General Hospital's Bridge Clinic and increase their capacity to incorporate SUD/AUD services to cover night and weekend hours, as well as replicate their model into additional Tufts Medicine sites
- Increase the number of buprenorphine waived providers in the Greater Lowell region
- Reduce the number of residents experiencing high-risk prescribing
- Increase the number of addiction specialists, including doctors, nurses, and social workers, providing on-site addiction consult services at the bedside

Community System Recommendations

- Increase community distribution of Naloxone through Naloxboxes, pharmacies, and non-traditional settings like bars, restaurants, and laundromats
- Increase access to mobile services (for example, via a service van) to increase engagement with populations most vulnerable to overdose
- Increase participation from agencies providing SUD/AUD services throughout Greater Lowell into existing coalitions to streamline care and advocate for services
- Increase the number of peer specialists offering support and case management to residents interested in reducing or stopping their substance or alcohol use
- Increase the visibility and accessibility of harm reduction tools and resources (for example, fentanyl test strips) to reduce death

4. COVID-19 and Other Infectious Disease

Score Summary		
Source	Score	Rank
Survey	545	5
Focus Groups	13.2	5
Key Informants	4	6

“[COVID-19] took a lot of resources away, even simple things like addiction groups or counseling groups. It all just fell off the map. People were really left on their own, for a much greater amount of time.”

— Key Informant, Lowell

Overview

One of the most significant health events to occur since the 2019 Greater Lowell Community Health Needs Assessment is the global COVID-19 pandemic. The Greater Lowell region was especially impacted, with Lowell being identified as a high-outbreak area during the first year of the pandemic, and later as an area of high inequity and therefore a target for public health efforts to increase vaccination rates. However, even before COVID-19 escalated the community’s attention to communicable disease, infectious disease had been identified as a priority area in the 2019 assessment. The additional threat of COVID-19 resulted in greater concern for all infectious diseases for this needs assessment. COVID-19, HIV/AIDS and Hepatitis cumulatively ranked as the number five health concern overall in the Community Health Survey. Key informants with specialization in infectious disease also expressed concerns over low rates of vaccination for infectious childhood illnesses, and indicated that more should be done to increase vaccination rates for a range of infectious diseases.

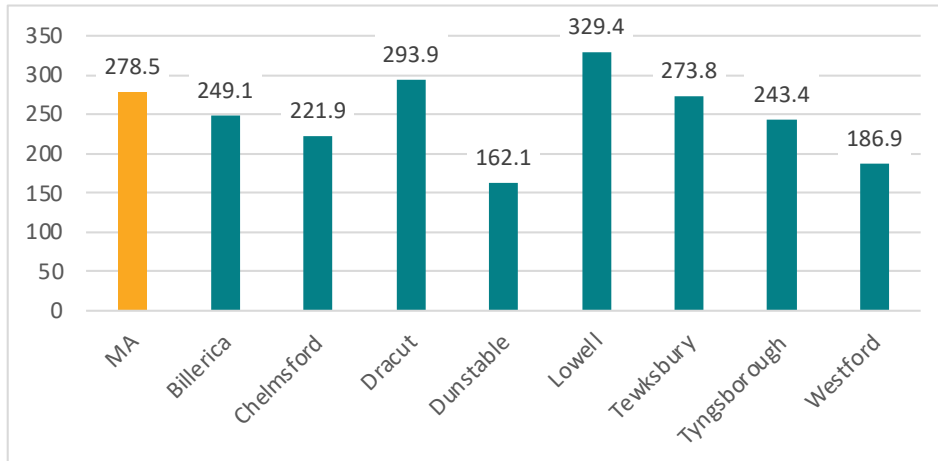
COVID-19 Infection and Vaccination

Coronavirus disease, or COVID-19, is a disease caused by infection by the SARS-CoV-2 virus. The first cases emerged in the December 2019, and were defined by a cluster of respiratory symptoms. COVID-19’s high transmissibility and mortality in severe cases make it a particularly concerning infectious illness, especially for people who are immunocompromised.

Trends and Disparities

At the time of publication, there have been 1,753,978 cases of COVID-19 reported in Massachusetts, and 20,901 deaths. Nearly 82,000 COVID-19 cases occurred in the Greater Lowell region, with the highest proportion of cases occurring in Lowell (37,554). The state cumulative case rate per 1000 residents is approximately 278.5 (Figure 28). Compared to the state case rate, only Dracut (293.9) and Lowell (329.4) report rates higher.

Figure 28: Cumulative COVID-19 Cases, by City/Town, per 1000 Residents

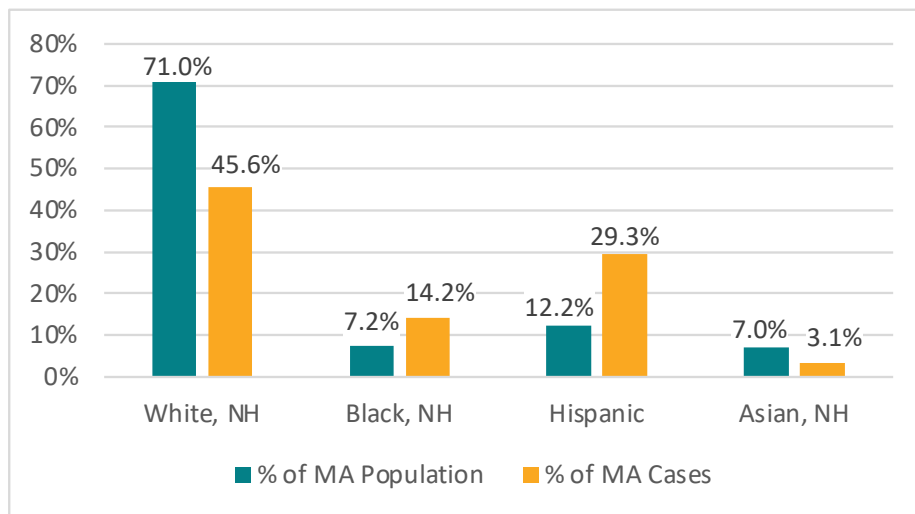


Source: MA DPH Archive of COVID-19 Cases, Weekly Report

Age is a considerable risk factor for COVID-19 mortality and morbidity. Risk of hospitalization and death increases significantly for older adults. An adult who is 39-years-old is four times as likely to die from COVID-19 compared to an adult who is 18-years-old. For a person who is 75, their risk of death is 140 times that of an 18-year-old.⁵²

In Massachusetts and Greater Lowell, considerable disparities in rates of COVID-19 infection as well as COVID-19 mortality emerged. Though 71.0% of the Massachusetts population is white, white residents account for only 45.6% of COVID-19 infections (Figure 29).

Figure 29: Percent of MA Population and Percent of COVID-19 Cases, by race/ethnicity



Source: MA DPH, Health Equity Advisory Group Recommendations and Public Health Council Presentation

52 CDC, Risk for COVID-19 Infection, Hospitalization, and Death by Age Group

COVID-19 mortality disparities also persist at the state level when adjusting death rates to age-specific race/ethnicity categories (Table 7). COVID-19 age-specific death rates per 100,000 residents are significantly higher among Hispanic and Black, non-Hispanic residents within every age bracket for which data is available.

Table 7: Age-Specific COVID Death Rates, per 100,000, Massachusetts

	White, NH	Hispanic	Black, NH	Asian, NH
20-29	1.95	5.54		
20-39	3.81	14.26	15.81	
40-49	9.87	40.09	53.07	
50-59	29.47	126.97	105.80	30.68
60-69	111.46	355.98	353.10	98.59
70-79	430.25	905.04	1000.63	368.85
80+ years	2404.62	3117.20	3263.72	1777.03

Source: MA DPH, Health Equity Advisory Group Recommendations and Public Health Council Presentation

COVID-19 also had a significant impact on hospital and healthcare systems in Massachusetts. Hospitals adjusted to accommodate the increased need for ICU-capacity to care for COVID patients; Lowell General Hospital erected alternative care sites in partnership with UMass Lowell to accommodate patient overflow. As a result of both cancelled elective procedures, as well as individual fear and hesitation to go to the hospital for care, inpatient admissions decreased by 32%, and COVID-related admissions accounted for 20% of all hospital admissions in the state by the end of 2020.⁵³ Community hospitals that serve diverse populations, like Lowell General, were also significantly impacted financially; of the eight large hospital systems reporting negative margins, seven were community hospitals. There was also a significant increase in the utilization of telehealth services, with a peak utilization of telehealth services in Massachusetts in April 2020, though telehealth options still represent between 20% to 30% of patient visits.⁵⁴

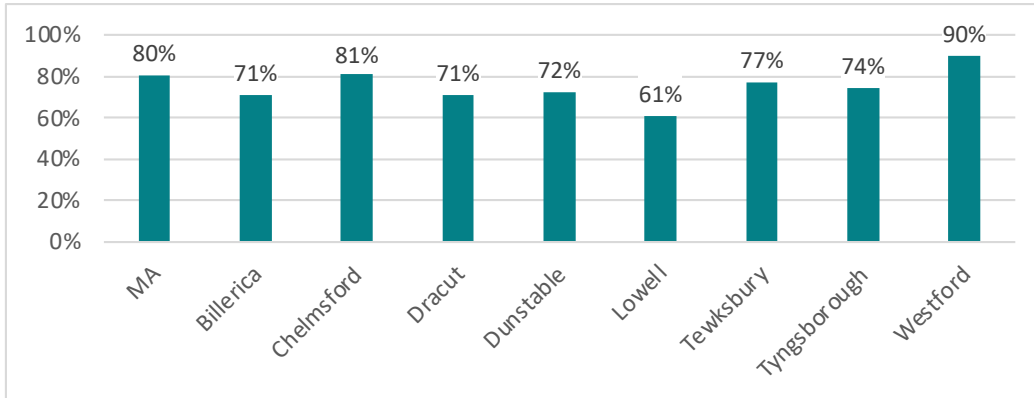
Participants in Focus Groups expressed concern about low rates of COVID-19 vaccination among particular communities and neighborhoods. For example, a Focus Group participant noted that it was difficult to find COVID-19 vaccine information for elders in his community who could not speak or read English. A key informant also noted low rates of vaccination among children and young people as a particular concern for school and daycare settings.

Overall, vaccination rates in Massachusetts are high, though rates in several Greater Lowell communities are slightly below the state rate (Figure 30). Lowell has the lowest rate of individuals with at least one dose of COVID vaccine, at 61%, while Westford has the highest rate, at 90%.

⁵³ Massachusetts Health Policy Commission, Impact of COVID-19 on the Massachusetts Health Care System: Interim Report

⁵⁴ Massachusetts Health Policy Commission, Impact of COVID-19 on the Massachusetts Health Care System: Interim Report

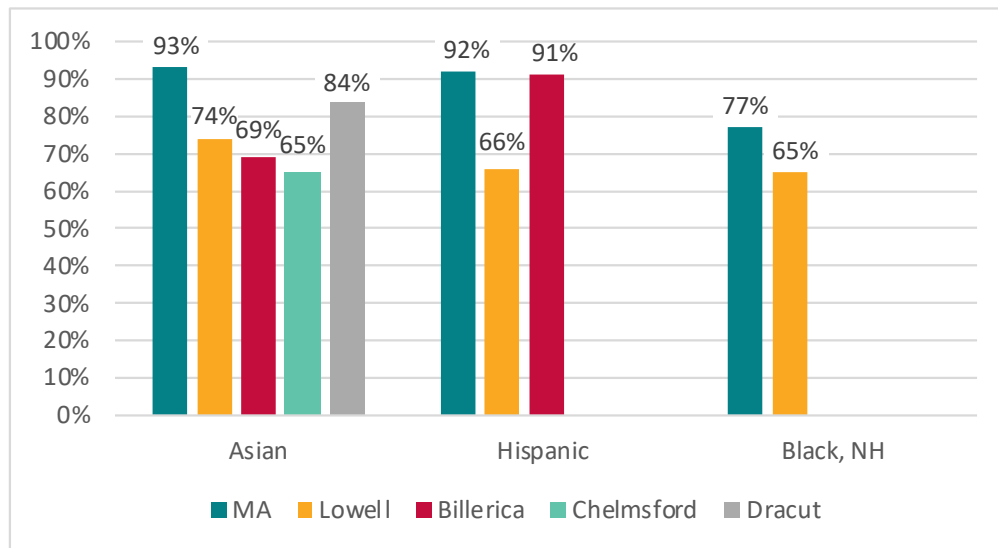
Figure 30: Individuals with At Least One Dose of COVID Vaccine, by city/town



Source: MA DPH COVID-19 Vaccination Weekly Dashboard

Inequities in vaccination rates by race/ethnicity are of particular concern, since the populations least likely to receive a vaccine are also among the most likely to suffer higher COVID-19 morbidity and mortality. While at the state level, the vaccination rate among Asian residents is 93%, it is significantly lower in several Greater Lowell communities, including Lowell (74%), Billerica (69%), Chelmsford (65%), and Dracut (84%) (Figure 31). Similarly, while the rate of vaccination among Hispanic residents is comparable to the state rate in Billerica (91% in Billerica versus 92% at the state level), in Lowell the rate is much lower at only 66%. Lastly, Lowell's vaccination rate among Black community members is also below the state rate, at 65% versus 77%.

Figure 31: Individuals with At Least One Dose, by race/ethnicity



Source: MA DPH Daily COVID-19 Vaccination Report, June 27, 2022

*Race/ethnicity data is not available/reliable for vaccination rates in Tyngsborough, Tewksbury, Westford, and Dunstable; vaccination rates for Hispanic residents in Chelmsford and Dracut, as well as Black residents in Chelmsford, Dracut and Billerica was also excluded due to overall low populations of these groups in these communities

The Community Health Survey also identified race and ethnicity differences in how participants ranked the importance of COVID-19 as a priority health issue. White, non-Hispanic participants ranked COVID-19 as the seventh most important health issue over all, with a weighted score of 21.4. However, participants who were Black (50.5), Asian (130.3), and Hispanic (31.8) all ranked COVID-19 as their third most important health issue

overall, with significantly higher scores. This indicated that these communities perceive COVID-19 to be a greater threat to health and wellbeing, and is in alignment with trends in disparities seen at the state level.

In addition to the direct health impacts of COVID-19, participants in this assessment also identified other impacts across other domains of health. For example, participants noted concern over the impact of school closures on children’s educational access and social wellbeing. Many families were impacted financially, either through individual job loss, the debilitating impact of medical debt associated with COVID illness, or the death of a family member who served as head of household. Considerable data has also detailed the degree to which COVID-19 negatively impacted residents mental health. For example, the COVID Community Impact Survey observed a dramatic increase in the portion of people reporting 15 or more days of poor mental health in the past month in the year follow the onset of COVID compared to several years prior.

Other Infectious Diseases

Infectious diseases that remain health priorities in Greater Lowell include HIV/AIDS, Hepatitis C, and tuberculosis. Additionally, key informants, including infectious disease experts and educators, also stressed the importance of continued delivery of childhood vaccinations, particularly for students who are recent arrivals and may have limited documentation regarding their vaccination status. Detailed information about childhood vaccinations is available in Section 8: Infant and Child Health.

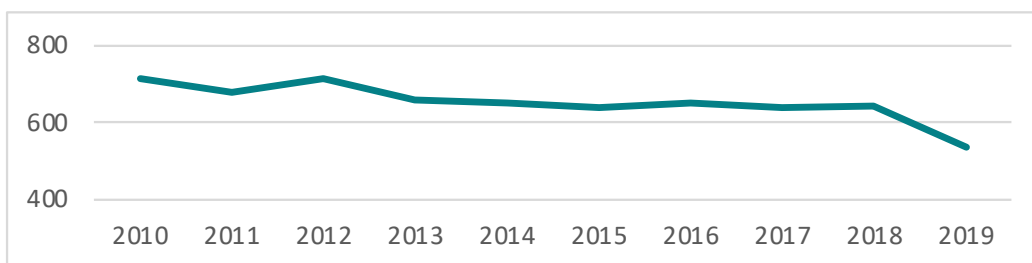
Trends and Disparities

HIV/AIDS

Human Immunodeficiency Virus (HIV) is a viral infection that interferes with a person’s immune system. HIV is spread through contact with an HIV-positive person’s bodily fluids. Most new cases of HIV are the result of infection via syringe sharing or sexual activity. The most serious stage of HIV can result in Acquired Immunodeficiency Syndrome (AIDS).

In 2019, there were approximately 23,291 people living with HIV in Massachusetts.⁵⁵ At the state level, rates of new HIV infection have declined, reaching their lowest point in the last decade in 2019, with 538 new infections and a 25% decrease overall (Figure 32). However, Lowell has the third highest annual rate of HIV infection diagnosis in the state (26.9 per 100,000).

Figure 32: Yearly Rates of New HIV Infection Diagnosis, Massachusetts, 2010-2019



Source: Massachusetts HIV/AIDS Epidemiologic Profile, Statewide Report

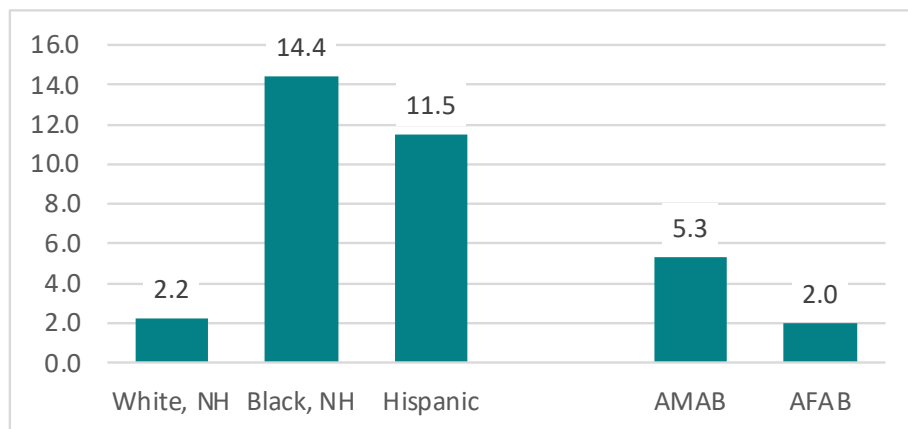
55 Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences. Massachusetts HIV/AIDS Epidemiologic Profile, Statewide Report – Data as of 2/1/2021 <https://www.mass.gov/lists/hivaids-epidemiologic-profile> Published February 2022.

At the state level, race and ethnicity disparities regarding the rate of change in new HIV infections are evident. HIV infection diagnoses among white, non-Hispanic residents decreased by the most significant degree (37%), followed by Asian residents (25%), Black, non-Hispanic residents (24%), and Hispanic/Latino/a residents (19%).

From 2016 to 2018, Lowell (as well as Lawrence, MA) was identified as an HIV outbreak area following an increase in the rates of new HIV infection in these communities, despite decreases in new infections at the state level. During the outbreak, there were a total of 129 new infections. The Department of Public Health, in coordination with the CDC, initiated an enhanced field investigation to identify factors that contributed to the outbreak. The primary means of transmission during the outbreak period was via injection drug use, with 116 incidences of transmission via syringe use being reported in 2017. A targeted public health response followed, including the initiative in Lowell of a syringe service exchange program. As a result, transmission via injection drug use decreased to a rate of 60 in 2019.

Though the overall mortality rate of people living with HIV has declined dramatically over the last two decades, difference in rates of death persist by race and sex assigned at birth (Figure 33). The overall average annual age-adjusted death rate in Massachusetts for people living with HIV is 3.5 per 100,000, but people who are assigned male at birth (5.3 per 100,000), people who are Black (14.4), and people who are Hispanic (11.5) have significantly higher death rates.

Figure 33: Average Annual Age-Adjusted Death Rates Among Individuals Reported with HIV/AIDS per 100,000 population



Source: Massachusetts HIV/AIDS Epidemiologic Profile, Statewide Report

Additional disparities among new HIV diagnoses persist in Lowell (Table 8). Lowell has a rate higher than the state rate of new HIV diagnoses among individuals assigned female at birth (33% of new HIV infections in Lowell versus 27% of new infections at the state level), among individuals who contract HIV via injection drug use (43% in Lowell versus 15% at the state level), and among Hispanic/Latino/a individuals (20% in Lowell versus 27% at the state level).

Table 8: Rates of New HIV Diagnoses in Lowell versus Massachusetts, by sex assigned at birth, means of transmission and Hispanic/Latino/a ethnicity

	HIV Dx Among AFAB		HIV Dx Due to IDU		HIV Dx Among Hispanic/Latino	
	N	%	N	%	N	%
MA	519	27%	269	15%	528	27%
Lowell	33	33%	40	43%	28	28%

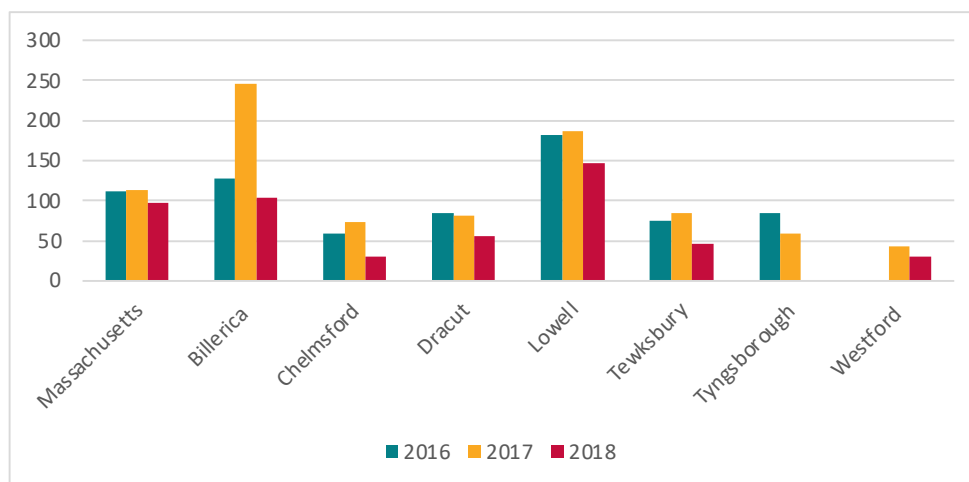
Source: Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences. Massachusetts HIV/AIDS Epidemiologic Profiles, for Women, Injection Drug Users, and Race/Ethnic Minorities

Viral Hepatitis

Hepatitis is an inflammation of the liver that can impair vital liver functions. Viral hepatitis is can be caused by hepatitis A, B, or C viruses. Because hepatitis A and B infection is vaccine-preventable, and Hepatitis C disproportionately impact populations of focus (including people who use substances and people who are homeless), hepatitis C is of particular focus for this needs assessment.

Hepatitis C (HCV) was the third most commonly reported infectious disease in 2018. Though HCV is curable with an aggressive direct-acting antivirals, most cases are chronic infections with long-term negative impacts on health. The HCV case rate per 100,000 residents in Massachusetts is approximately 97.9 (Figure 34). Most Greater Lowell communities have case rates near or below the state rate, with some exceptions. In 2017, an outbreak cluster in Billerica brought the town’s case rate to a regional high of 245.1 per 100,000 residents. Additionally, HCV rates have remained above the state rate in Lowell for several years.

Figure 34: Hepatitis C Case Rates per 100,000, by city/town, 2016-2018



Source: MA Infectious Disease Outcomes via PHIT

Co-occurrence of HIV and HCV infection is a public health concern, since HIV can accelerate the progress of liver disease associated with HCV. Coinfections are most common among people who use injection drugs, making this group particularly vulnerable. At the state level, the coinfection rate had been steadily decreasing, but the outbreak cluster in Lowell and Lawrence between 2016-2018 likely drove an increase in coinfection

rates during that time period, as close to 90% of people affected by the outbreak also had an HCV exposure at some point in the same time period.⁵⁶

Tuberculosis

Tuberculosis (TB) is a bacterial infection usually found in the lungs that is spread through the air. Latent tuberculosis infection (LTBI) refers to the presence of TB organism but no symptomatology associated with tuberculosis disease (TB). Among people with LTBI, between 5 and 10% will develop TB if left untreated.

At the state level, the TB case rate has remained relatively low and stable, decreasing from 3.3 per 100,000 in 2016 to 2.9 in 2018, similar to the U.S. rate of 2.9. Most Greater Lowell communities have rates even lower than the state rate, with several communities reporting no TB cases for the last several years. However, Lowell's TB case rate is significantly higher than both the state and U.S. rate, peaking at over 16.1 per 100,000 in 2014, and decreasing to 6.1 in 2018.⁵⁷

This disparity in case rates is largely driven by the higher concentration of people born outside the U.S. in Lowell compared to other Greater Lowell communities. In the most recent available reporting year, 87% of TB cases in Massachusetts were reported in people who were born outside the United States; since 2006, the rate of MA cases to people born outside the U.S. has varied from a low of 74% to a high of 87%.⁵⁸ Early detection and treatment of TB, particularly for Lowell, remains a top priority as an increasing percent of TB cases are resistant to medication treatment.

Recommendations

In 2019, Infectious Disease emerged as a new high priority area in the 2019 Greater Lowell Needs Assessment, driven largely by community concerns about increasing rates of infectious diseases among people experiencing homelessness, people who use injection drugs, and people who are elderly or aging. Since then, the COVID-19 pandemic and its significant impacts on the Greater Lowell community has only escalated the community concern for the effective prevention and management of infectious diseases in the community. The health system resources available in Greater Lowell have proven invaluable in this area, with many participants citing Lowell General Hospital, Lowell Community Health Center, and city and town Health Departments as critical resources for infectious disease treatment, vaccine distribution, and the distribution of reliable, evidence-based health information regarding infectious disease. Nevertheless, disparities in infectious disease burden persist among populations who are especially vulnerable to exposure or who experience barriers to prevention and treatment options. Recommendations in this area capitalize on the robust, cross-community network of service providers and community leaders who have emerged over the last three years in response to COVID-19, as well as broaden the scope of infectious disease prevention to normalize and enshrine the mitigation strategies that prevent the spread of not just COVID-19, but a range of other infectious diseases as well.

56 MA Department of Public Health Bureau of Infectious Disease and Laboratory Sciences, *2019 Integrated HIV/AIDS, STD, and Viral Hepatitis Surveillance Report, December 2020*

57 MDPH Bureau of Infectious Disease & Laboratory Sciences via PHIT

58 Massachusetts Department of Public Health. *Massachusetts State Health Assessment*. Boston, MA; October 2017.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address substance and alcohol use have included the following:

- The formation of the COVID-19 Equity Leadership Group, which began meeting weekly in December of 2020 in order to share data, identify strategies and implement direct action across all 8 Greater Lowell communities to address disparities in COVID-19 infection and, later, vaccination
- Creation and distribution of COVID-19 infection and vaccine educational materials, including videos, flyers, home mailers, brochures and radio ads, in six languages, featuring infectious diseases experts from Lowell General Hospital, Lowell Community Health Center, and town/city Health Departments as well as community experts and trusted community liaisons, in order to ensure access to information for all Greater Lowell community members
- Established field hospitals and off-site COVID treatment and testing centers to meet increased demand
- Established the Lowell General Hospital Mass Vaccination Program Site with the capacity to deliver 2000 vaccines per day and delivering a total of 140,000 vaccines during the course of the program
- Hosted over 30 community-based vaccine clinics through collaborations with Greater Lowell Health Alliance, town and city health departments, the Massachusetts Department of Public Health, and Lowell Community Health Center
- Continued to increase access to screening and treatment services for infectious disease through Lowell Community Health Centers PASS program
- Established the Lowell Syringe Service Program to reduce the spread of disease through increased access to clean syringes
- Allocated over \$40,000 dollars in COVID-related funding for PPE, hygiene items, and translation needs for all Greater Lowell communities via the GLHA

Future Actions

Healthcare System Recommendations

- Increase provider participation in community-based COVID-19 Vaccine Equity coalitions to provide expertise and collaboration in efforts to increase vaccination rates among under-vaccinated groups, including children
- Increase access and adherence to PrEP for appropriate candidates
- Incorporate harm reduction strategies into medical messaging regarding infectious diseases (for example, support for utilization of syringe exchanges)
- Engage with and employ people living with HIV as peer support for people with new diagnoses

Community System Recommendations

- Expand community ambassador program to increase the number of employed community outreach workers providing education, support, and resources regarding COVID-19 vaccination, as well as other infectious disease risks
- Increase or sustain community distribution of PPE, hygiene kits and other infectious disease prevention tools, as well as expand distribution to include additional harm reduction tools, like condoms
- Participate in community efforts to reduce the stigma associated with infectious diseases like HIV and HCV to increase utilization of both prevention and treatment services

5. Reproductive, Sexual & Pregnancy Health

Score Summary		
Source	Score	Rank
Survey	578	4
Focus Groups	5	7
Key Informants	-	-

“I wish there was an easier way to get birth control. I am under 18 and I have to jump through a lot of hoops to get it without my parents knowing and that just makes me less inclined to try and get it.”

— Survey Participant

Overview

Reproductive, sexual and pregnancy health includes pregnancy and birth, perinatal and maternal health, healthy sexuality, sexuality transmitted infections, and pregnancy prevention.

Though this category is broad, one of the limitations of previous needs assessments has been the failure to identify need areas that are identified as high-priority at both the state and national level, like maternal mortality and pregnancy prevention. For this needs assessment, two new survey items were offered as potential ranked priorities (Reproductive & Sexual Health and Pregnancy Health), and their scores were combined to assess their overall score. Over 40% of Community Health Survey participants indicated that Pregnancy Health should be a high priority; 32.5% indicated that Reproductive and Sexual Health should be a high priority.

Pregnancy prevention, particularly for teens, and maternal health were also mentioned during focus groups as priority issues. Though key informants did not mention priority topics in this area, none of the key informants had specific expertise in this health area. Furthermore, Maternal Health, Teen Pregnancy and STIs are identified in the MA State Needs Assessment as priority areas, and significant disparities persist for populations of focus in these areas.

Maternal Mortality

Maternal mortality refers to any pregnancy-related death that occurs during pregnancy or in the year following the end of pregnancy. Maternal deaths in Massachusetts are rare; in 2020, Massachusetts’s maternal mortality rate is 14.7 per 100,000 births, far below the U.S. rate of 23.4.⁵⁹ However, disparities in maternal mortality that are seen at the national level are also present in Massachusetts and Greater Lowell.

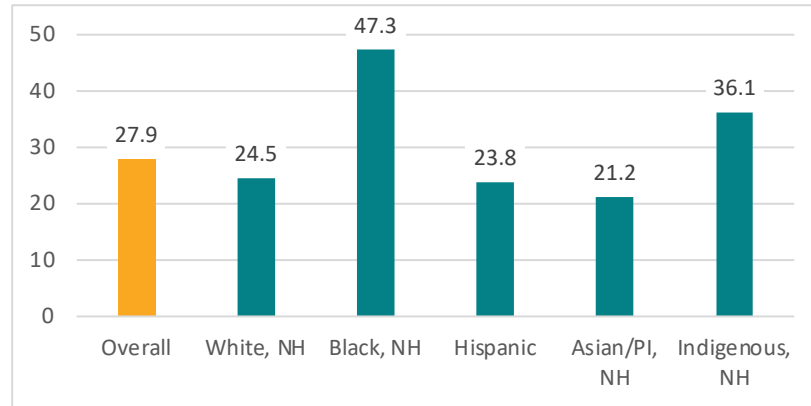
Trends and Disparities

Massachusetts calculates pregnancy-associated mortality rates (PAMR), which includes deaths during pregnancy. A review of pregnancy-associated deaths found that, despite an overall low number of deaths in a seven-year review period (168), the PAMR was not consistent across populations. For Black, non-Hispanic

⁵⁹ NCHS, National Vital Statistics System, Maternal deaths and mortality rates: Each state, the District of Columbia, United States, 2018–2020

residents, the PAMR was twice as high as the PAMR for white, non-Hispanic residents; indigenous residents also had a PAMR considerably higher than the state average (Figure 35). Disparities also emerged for individuals who were under age 30 (PAMR 28.1), over age 35 (PAMR 36.1), on public insurance (PAMR 36.2), and had less than no more than 12 years of education (PAMR 35.2).

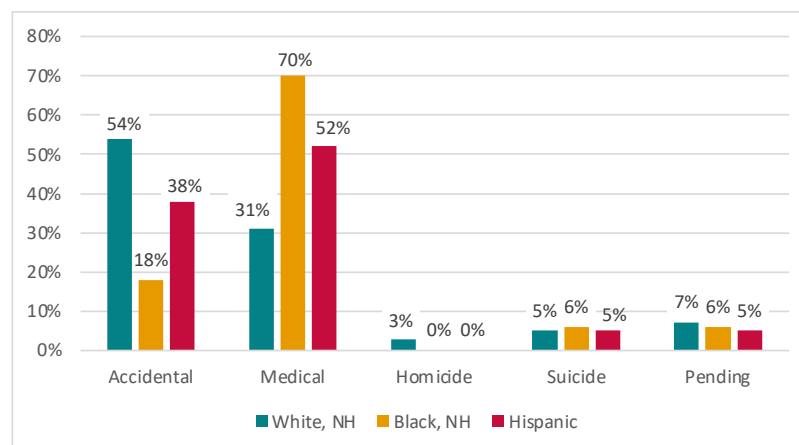
Figure 35: Pregnancy-Associated Mortality Rates in Massachusetts, 2000-2007, race/ethnicity



Source: Maternal Mortality and Morbidity Review in Massachusetts: A Bulletin for Health Care Professionals, Pregnancy-Associated Mortality, 2000-2007, February 2014.

PAMR also considers deaths that occur as a result of injuries (including accidental deaths, suicides and homicides) as well as deaths that occur as a result of medical causes, like hypertension and birth complications. A review of pregnancy-associated deaths in 2020 identified disparities in cause of death by race and ethnicity (Figure 36). Though the largest portion of pregnancy-associated deaths among white, non-Hispanic residents was accidents (54%), medical causes were the most common cause of pregnancy-associated deaths among Asian residents (100%)⁶⁰, Black, non-Hispanic residents (70%), and Hispanic residents (52%). Hypertension was the most commonly associated medical issues noted in pregnancy-associated deaths due to medical reasons; Black, non-Hispanic individuals had the highest percent of documented hypertension on death certificates (47%). Since disparities in maternal mortality coexist with disparities in hypertension, it is critical to address hypertension as a preventable driver of maternal mortality inequities.

Figure 36: Pregnancy-Associated Deaths by Cause, by race/ethnicity, 2014-2017, Massachusetts



Source: Maternal Mortality and Morbidity Review in Massachusetts A Bulletin for Health Care Professionals Racial and Ethnic Inequities and Hypertension among Pregnancy Associated Deaths—Massachusetts, 2014-2017

60 There were only three pregnancy-associated deaths to Asian residents in the observation period.

Massachusetts also identified substance use a critical factor driving pregnancy-associated deaths. A review of 199 pregnancy-associated deaths in MA between 2005 and 2014 found that 20.6% of deaths were related to substance use.⁶¹ Additionally, the rate of pregnancy-associated deaths involving substance use had increased dramatically during the review period, from a rate of 8.7% in 2005 to 41.4% in 2014. This trend is consistent with the increase in deaths by opioid overdose overall.

Massachusetts evaluates several indicators that impact pregnant people's risk for pregnancy-associated mortality or morbidity. One of the most significant protective factors against pregnancy-related poor health outcomes is early access to prenatal care. Though overall Massachusetts residents have high utilization of prenatal care, race and ethnicity disparities persist. Consistently, early prenatal care utilization has been lower among Black, non-Hispanic residents (81.8%) Hispanic residents (85.5%) and Asian residents (87.7%) compared to white, non-Hispanic residents (93.2%).⁶² At the state level, 82.5% of people giving birth reported receiving adequate prenatal care. At Lowell General Hospital, the rate was nearly identical to the state rate, at 82.4%.⁶³

Pregnancy Intention

Control over reproduction via access to family planning tools including education, contraception, and termination services is fundamental to protecting equitable access to education, employment, and lifelong wellness. Health consequences of unintended or unwanted pregnancy include maternal impacts (including poor mental health and substance use), infant impacts (including low birth weight) and social impacts (including increased healthcare and social service costs).⁶⁴

Since data collection for the 2022 Needs Assessment has closed, the U.S. Supreme Court overruled the 1973 *Roe v. Wade* decision via *Dobbs v. Jackson Women's Health Organization*, effectively erasing national protections guaranteeing the right to abortion. Though Massachusetts has historically regarded abortion as a right to be fundamentally protected in the state, the Supreme Court decision has far-reaching impacts and implications for the future of reproductive rights in the U.S. Since data collection closed prior to the Supreme Court decision, it is likely that issues related to abortion, contraception and pregnancy intention would be ranked much higher were we to repeat data collection now. Nevertheless, unwanted and unplanned pregnancies were identified as a priority health issue even prior to this ruling, indicating that residents consistently regard this issue a significant to the wellbeing of our community.

Trends and Disparities

Rates of unintended pregnancy vary significantly by race and ethnicity in Massachusetts. White, non-Hispanic residents and Asian residents report the lowest rates of unintended pregnancy (12.2% and 16.9% in 2020, respectively), while Black, non-Hispanic residents and Hispanic residents report considerably higher rates of unintended pregnancy (24.0% and 27.9% in 2020, respectively).⁶⁵

Though not all births to teens are unintended, a considerable portion are, and the risks associated with teen pregnancy and birth include poor outcomes for both the parents and the infant, including an increased risk of low birth weight and higher infant mortality.⁶⁶ Teens births have consistently declined in Massachusetts over the last several decades, from 35.4 per 1,000 in 1990 to 6.7 per 1,000 in 2019.⁶⁷

61 Massachusetts Department of Public Health, *Maternal Mortality and Morbidity Review in Massachusetts: A Bulletin for Health Care Professionals Substance Use among Pregnancy-Associated Deaths — Massachusetts, 2005–2014, Spring 2018*

62 Pregnancy Risk Monitoring System via PHIT

63 MA Birth Report, 2019.

64 Massachusetts Department of Public Health. *Massachusetts State Health Assessment*. Boston, MA; October 2017.

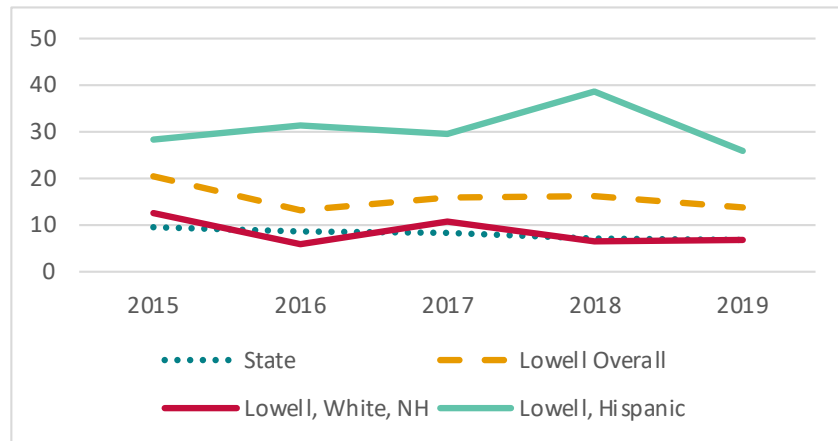
65 Pregnancy Risk Monitoring System via PHIT

66 Massachusetts Department of Public Health. *Massachusetts State Health Assessment*. Boston, MA; October 2017.

67 Massachusetts Birth Report 2020.

In 2019, Westford, Tyngsborough and Dunstable reported zero teen births. Billerica, Dracut, Chelmsford, and Tewksbury all reported between one to four teen births. Lowell was the only Greater Lowell community to report more than four teen births, reporting a total of 53.⁶⁸ Lowell has consistently reported one of the highest teen birth rates in the state, though it has been declining for several years. Since 2015, Lowell's overall teen birth rate has declined from 20.4 per 1,000 to 13.8 per 1,000, making it the 15th highest teen birth rate in the state. Hispanic residents in Lowell have the highest teen birth rate, at 25.7 per 1,000 in 2019 (Figure 37).

Figure 37: Teen Birth Rate, Lowell, by race/ethnicity, 2015-2019



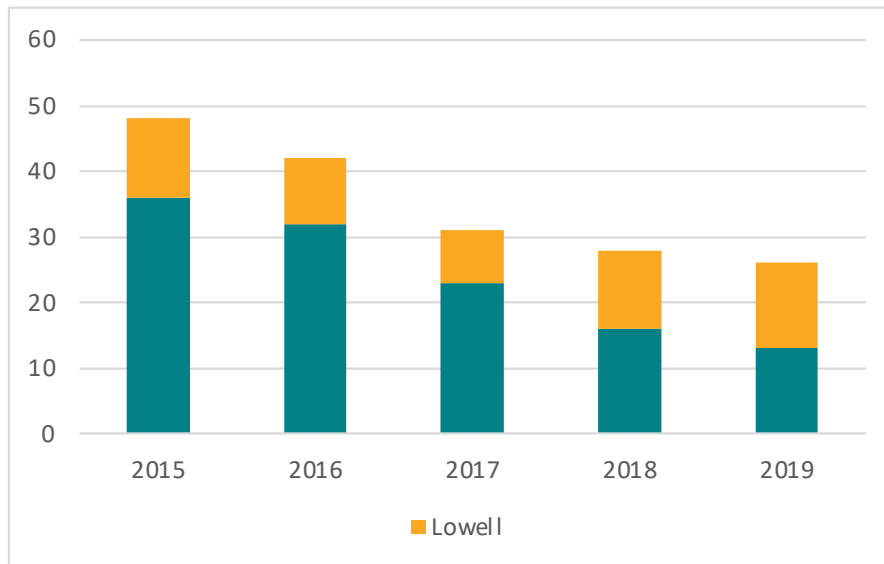
Source: Massachusetts Birth Report, 2015-2019

While many of the other communities with higher-than-average teen birth rates observe particularly high rates of teen birth among Black, non-Hispanic teens, Lowell's teen birth rate in this population has been inconsistent. In 2015, the teen birth rate in Lowell to Black, non-Hispanic teens was 41.8, the highest of any race or ethnic group in the city. However, the following year there were no birth to Black, non-Hispanic teens, and since 2018, there have been fewer than four per year, and therefore not reported in the birth report.

In contrast, Lowell is an outlier for births to Asian teens. While the overall birth rate to Asian teens is so low that it is not reported at the state level, Lowell is the only community in the state where the Asian teen birth rate is higher than the state rate. Since 2015, Lowell has accounted for an increasing proportion of teen births to Asian teens in the state, even as the overall rate decreases (Figure 38). In 2015, Lowell accounted for 25% of the state's teen births to Asian residents, but in 2019, Lowell accounted for 50%.

68 Refers to births to residents, not location of births. Communities with fewer than four births do not report specific numbers, for privacy reasons

Figure 38: Proportion of Births to Asians Teens Occurring in Lowell out of the State Total, 2015-2019



Source: Massachusetts Birth Report, 2015-2019

Sexually Transmitted Infections

Sexually transmitted infections (STIs) refer to a number of bacterial, viral, and parasitic infections that can be transmitted through intimate or sexual contact, usually but not always via contact with bodily fluids. All STIs are preventable, either via vaccination (for HPV, hepatitis A and hepatitis B) or through preventative health behaviors, like condom use. However, prevention and treatment of STIs is especially challenging because people may feel uncomfortable discussing sexual behavior, or because many STIs are stigmatized.

Trends and Disparities

Chlamydia is a bacterial infection and one of the most infectious STIs. It is the most frequently reported infectious disease in Massachusetts, with over 24,000 cases reported in 2020.⁶⁹

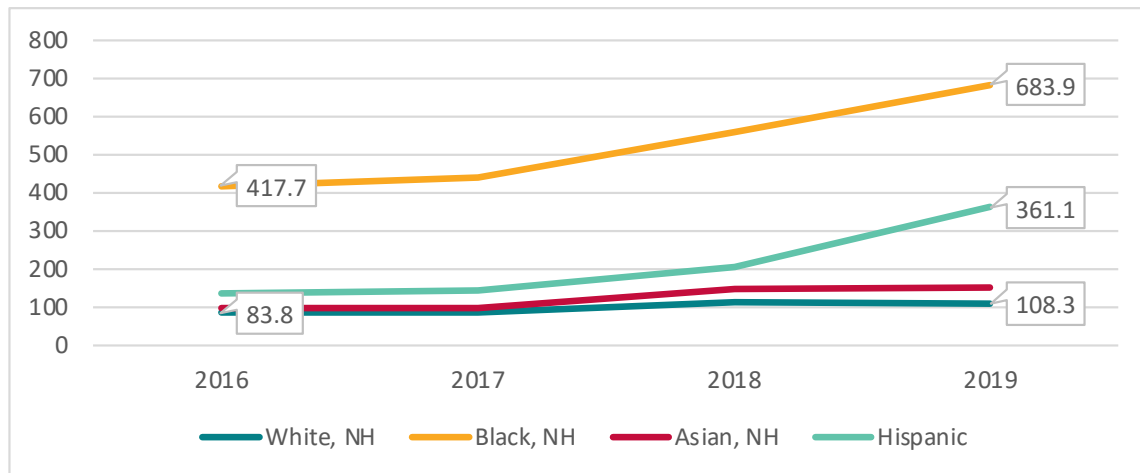
The rate of chlamydia cases per 100,000 has been steadily climbing in Massachusetts, from a rate of 35.5 in 2011 to 110.3 in 2018. Though most Greater Lowell communities have a rate lower than the state average, Lowell's has been consistently above the state rate for several years, from 50.7 in 2011 to 145.4 in 2018.⁷⁰ Importantly, though their average rates remain below the state rate, Tewksbury, Dracut and Billerica have been observing increases in their chlamydia rates as well.

Racial and ethnic disparities in rates of chlamydia infection are significant at the state level. In 2019, the rate of chlamydia among Black, non-Hispanic resident was six times higher than the rate of white, non-Hispanic residents; the rate for Hispanic residents was three times higher (Figure 39).

69 Massachusetts Department of Public Health/Bureau of Infectious Disease and Laboratory Sciences/ Division of STD Prevention

70 Select Reportable Infectious Disease Data in Massachusetts via PHIT

Figure 39: Rates of Chlamydia per 100,000 Residents, by race/ethnicity, Massachusetts, 2016-2019



Source: CDC, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Atlas

Gonorrhea is a bacterial STI that, if untreated, can cause pelvic inflammatory disease, infertility, and ectopic pregnancy. Gonorrhea is especially concerning because the bacteria that causes the infection is resistant to the medications used to treat it. Rates of gonorrhea have been increasing at the state level, from a rate of 67.6 per 100,000 in 2016 to 110.3 per 100,000 in 2018.⁷¹ Only Lowell has rates of gonorrhea above the state rate (at 145.4 per 100,000 in 2018).

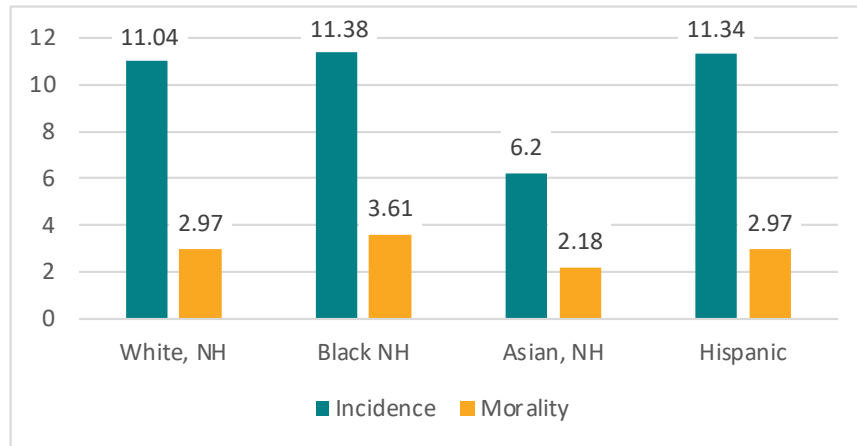
Human papillomavirus (HPV) is a viral infection that can be spread through contact with bodily fluids as well as through skin-to-skin contact. It is the most common STI in the United States, with 13 million new infections in 2018. There are many types of HPV, with varying levels of severity. HPV can cause genital warts, as well as oropharyngeal, cervical, vulvar, vaginal and penial cancers. The HPV vaccine protects against the types of HPV that cause the most significant health outcomes, including cancer.

Of all HPV-associated cancers, oropharyngeal is the most common among Massachusetts men (age-adjusted incidence rate 7.85 per 100,000), and cervical is the most common among Massachusetts women (age-adjust incidence rate 5.46 per 100,000)⁷². Differences in both incidence and mortality rates are evident in Massachusetts (Figure 40). Black, non-Hispanic residents have the highest incidence (11.38 per 100,000) and mortality rate (3.62 per 100,000) of HPV-associated cancers in the state, followed by Hispanic residents (11.34 incidents per 100,000 and 2.97 deaths per 100,000).

71 Select Reportable Infectious Disease Data in Massachusetts via PHIT

72 MA Department of Public Health, Data Brief: HPV-Associated Cancers in Massachusetts, March, 2018.

Figure 40: Age-adjusted Incidence and Mortality Rates of HPV-Associated Cancers, Massachusetts, 2008-2014



Source: MA Department of Public Health, Data Brief: HPV-Associated Cancers in Massachusetts

At the national level, approximately 49% of adolescents age 13-17 have received the recommended doses of HPV vaccine by 2018. In MA, the rate is higher, with 66% of adolescents completing the HPV vaccine series in 2018.⁷³

Recommendations

Reproductive, sexual and pregnancy health are associated with a far-reaching care continuum featuring a range of health specialties, as well as coordination with public health, education, and prevention efforts. The ability to make informed, evidence-based decisions about one’s reproductive and sexual wellbeing is a critical predictor of long-term health outcomes, as well as outcomes related to education, employment and upward economic mobility. High-quality care in these areas optimizes the likelihood that community members will be able to make decisions about their reproductive and sexual well-being that are free of coercion, fear, and stigma. Though this specific health priority area is new to the Greater Lowell Needs Assessment, community and hospital efforts to reduce unintended pregnancy, increase paccess to STI detection and treatment, and protect access to both contraception and termination options have been underway in the region for years. Recommendations in this area focus on collaboration across sectors to maximize the impact of interventions, as well as highlight the particular need for efforts to address race and ethnicity disparities related to perinatal care, unintended pregnancy, and infections.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address reproductive, sexual and pregnancy health have included the following:

- Established the Obstetric Emergency Department at Lowell General Hospital to provide 24-hour access to OB/GYN care for the evaluation of pregnancy related emergencies or concerns
- Transitioned maternity and postpartum related education program at Lowell General Hospital to include digital options to protect access to education materials for pregnant people during COVID restrictions
- Partnered with Yale University on the SMART program to increase access to treatment and care options for mothers with substance use disorder who are patients at Lowell General Hospital

73 MA Department of Public Health, Vaccine Preventable Diseases, <https://www.mass.gov/info-details/vaccine-preventable-diseases#childhood-and-adolescent-immunization-rates>

- Established the Perinatal Mental Health Coalition through the Greater Lowell Health Alliance to convene across sectors to address perinatal emotion complications and advocate for universal screening by of perinatal mood by all area providers
- Funded Healthy Sexuality curriculum to be delivered by Girls, Inc.
- Distributed over \$24,000 in funding for community projects related to reproductive, sexuality and pregnancy health via GLHA grants

Future Actions

Healthcare System Recommendations

- Expand the services and expertise available within the Greater Lowell area to include services for transgender individuals seeking gender-affirming care
- Reduce barriers to access contraception, particularly for adolescents, including promoting confidential reproductive health services and reducing costs via supplemental grant funding to cover cost without insurance
- Increase utilization of services to prevent and manage the chronic health conditions that can result in increased risk of maternal death (for example, hypertension) particularly for people who are Black/African American and/or Hispanic/Latino/a
- Increase access to postpartum home-based services to provide a clinical care bridge between post-delivery hospital discharge and postpartum follow-up appointments
- Increase the capacity of pediatric practices to provide maternal mental health support and resources
- Increase access to and education about long-acting reversible contraception (LARCs) as options for people interested in preventing pregnancy
- Review local maternal health outcomes data to identify inequities in outcomes specific to the Greater Lowell community

Community System Recommendations

- Establish free, community- or neighborhood-based new parent support groups to increase access to community resources
- Engage in campaigns to reduce the stigma of STIs to encourage routine screening and treatment, especially for populations are greater risk for infection
- Support educational programs and policies that provide age-appropriate, comprehensive reproductive health education to young people
- Galvanize local efforts to protect access to safe abortion services

6. Lung and Breathing Health

Score Summary		
Source	Score	Rank
Survey	543	6
Focus Groups	-	-
Key Informants	4	6

“[The top issue] is substance use. And not just opioid use and marijuana use, but also vaping and smoking cigarettes.”

— Key Informant, Lowell

Overview

Massachusetts experiences an average daily rate of 16 deaths due to diseases and disorders related to respiratory health.⁷⁴ Lung and Breathing Health includes both acute and chronic conditions ranging from pneumonia, hypoxia, and Chronic Lower Respiratory Disease (CLRD), as well as behaviors and environmental exposures, like smoking and vaping, that affect breathing.

Approximately 11.6% of 2022 Community Health Survey participants ranked Lung and Breathing health as one of their top three priorities, and one in three participants stated that lung and breathing health should be a “high priority” in their communities. Though key informants did not name lung and breathing health specifically as a priority, several specified smoking or vaping as a priority health issue, particularly in relation to chronic illness and cancer. Focus group participants did not specifically identify lung and breathing health, but did identify cancer, smoking and youth vaping as health concerns. The Massachusetts State Health Assessment also identifies COPD, tobacco use, smoking cessation and asthma as health priorities. Significant disparities related to asthma, lung cancer, CLRD and smoking identify the need to critical attention to these health issues in Greater Lowell. Lung Cancer is addressed in this needs assessment in Section 7: Cancer.

Asthma

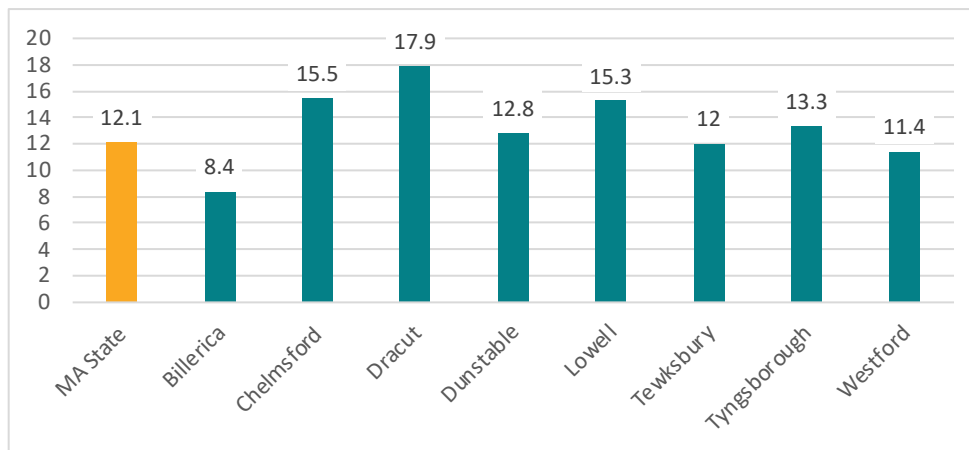
Asthma is a chronic respiratory illness that results in recurrent inflammation of the airways, causing wheezing and coughing, chest tightness, and shortness of breath. In some cases, severe asthma can result in death. A range of familial, allergenic, socioeconomic, and environmental factors contribute to overall risk of developing asthma, or of experiencing significant morbidity related to asthma. Approximately 14.5% of participants in the 2022 Community Health Survey reported having asthma. Participants with asthma were more likely to report living in Lowell (42.3% of participants with asthma versus 34.5% of total survey participants). They were also more likely to be Hispanic (14.9% versus 10.5%). Nearly one-fourth (24.4%) of participants with asthma make less than \$25,000 per year, compared to 13.4% of survey participants overall.

Trends and Disparities

At the state level, approximately one in nine residents (10.2% of adults and 12.1% of children) has asthma, a higher prevalence rate than the national rate.⁷⁵ Several populations are more at risk of asthma diagnosis and morbidity, including low-income residents, families with lower educational attainment, adults who smoke, and people who have a disability. Rates of childhood asthma are especially important, as most asthma begins in childhood and the risk of poorly managed symptoms is higher during this period. In Massachusetts, the rate of childhood asthma has remained stable at around 12.1 per 100 children over the last several years of data collection.

Only two Greater Lowell communities have pediatric asthma rates lower than the state rate: Westford (11.4) and Tewksbury (12) (Figure 41). Dracut had the highest prevalence of pediatric asthma (17.9) followed by Chelmsford (15.5) and Lowell (15.3).

Figure 41: Pediatric Asthma Prevalence per 100 Students, by city/town

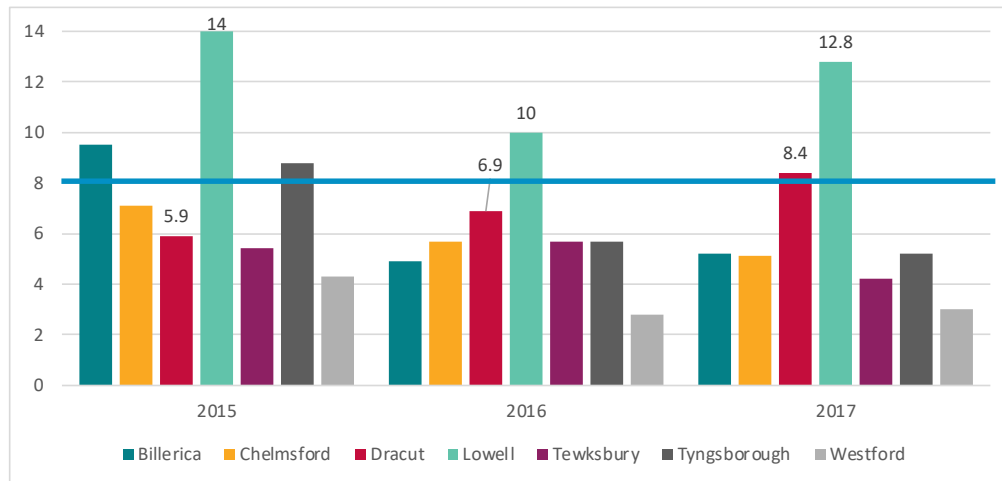


Source: MDPH Pediatric Asthma Surveillance Program 2016

Complications from asthma have a significant impact on the healthcare system and resource utilization. In 2017, the age-adjusted rate of asthma hospitalizations in Lowell was over 12.8 per 10,000 residents, significantly higher than the state rate of 8.0 per 10,000 residents (Figure 42). This high hospitalization rate is particularly insightful, because while Lowell has the highest hospitalization rate in the region, Lowell does not have the highest overall rate of asthma, suggesting that asthma morbidity in Lowell may be higher than the surrounding communities.

75 Massachusetts Department of Public Health, Statistics About Asthma, <https://www.mass.gov/service-details/statistics-about-asthma>

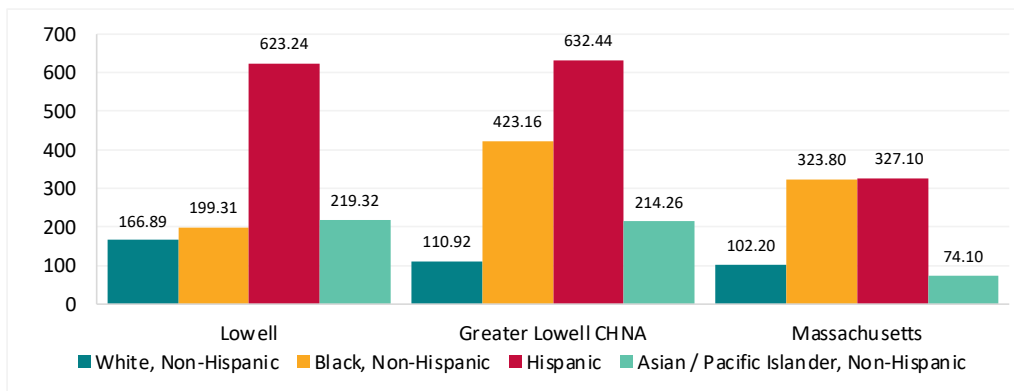
Figure 42: Age-Adjusted Hospital Admission Rate for Asthma, per 10,000 residents, by city, town, 2015-2017



Source: MEPHT Asthma Hospitalization Data via CHIA

At the national level, the greatest asthma morbidity and mortality inequities exist in the Black community, with a disproportionate number of asthma-related emergency department visits, hospitalizations, and deaths.⁷⁶ In Greater Lowell, significant inequities are also prevalent among the Hispanic and Asian communities, who both had disproportionately higher rates of asthma hospitalizations compared to both the state rates for the same population, and compared to white, non-Hispanic communities. (Figure 43).

Figure 43: Age-Adjusted 5-Year Average Annual Asthma Hospitalization Rates per 100,000 (2002-2014)



Source: Massachusetts Casemix Discharge Database, via MA CHIA

Chronic Lower Respiratory Diseases (CLRD)

The sixth most common cause of death in the United States is chronic lower respiratory diseases, including Chronic Obstructive Pulmonary Diseases (COPD).⁷⁷ CLRD are the fourth leading cause of death in Massachusetts.⁷⁸ COPD affects the lungs' air sacs and breathing capacity deteriorates. COPD can include lung diseases such as emphysema and chronic bronchitis.

⁷⁶ Asthma and Allergy Foundation of America, Asthma Capitals, 2021.

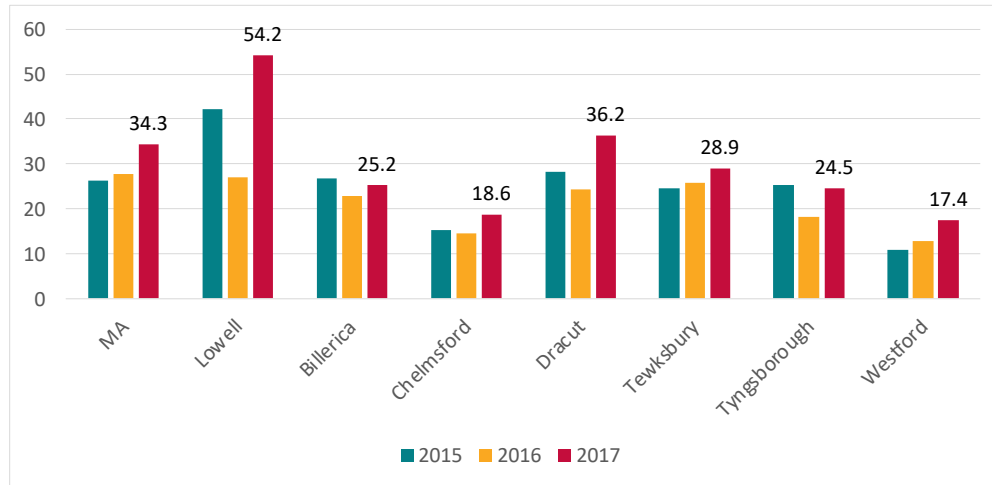
⁷⁷ CDC, Behavioral Risk Factor Surveillance System via America's Health Rankings

⁷⁸ Massachusetts Department of Public Health, Massachusetts Death 2019.

Trends and Disparities

In 2021, 4.5% of Massachusetts residents were diagnosed with CLRD, compared to 6.2% nationwide.⁷⁹ COPD-related hospital admissions place significant pressure on the healthcare system. In MA, the age-adjusted hospitalization per 10,000 residents climbed from 26.3 to 34.3 (Figure 44). Across Greater Lowell, the hospitalization rate varies significantly, from a high of 54.2 per 10,000 in Lowell to a low of 17.4 per 10,000 in Westford.

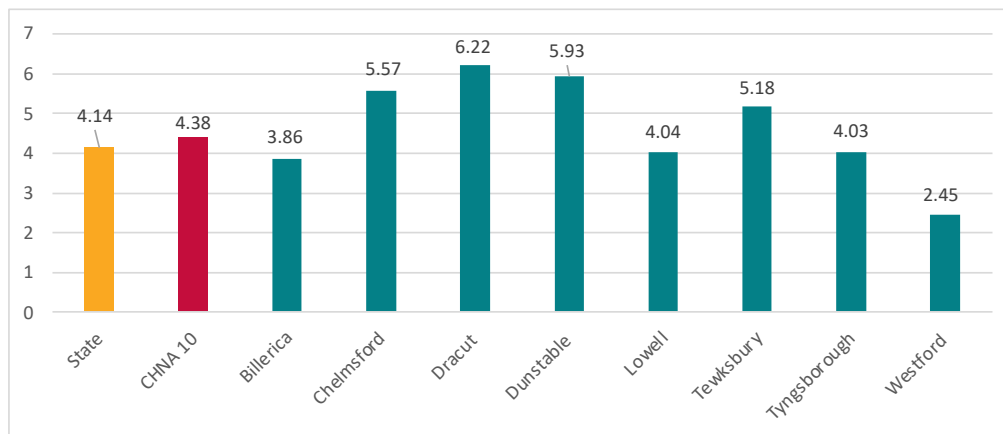
Figure 44: Age-Adjusted COPD-Related Hospital Admission Rate Per 10,000, by city/town



Source: BFRSS Results via PHIT

In 2019, there were 131 deaths due to CLRD in Greater Lowell, a rate slightly higher than the state mortality rate (4.38 per 10,000 versus 4.14 per 10,000) (Figure 45). Dracut (6.22 per 10,000) experienced the highest CLRD mortality rate in the region, followed by Dunstable (5.93 per 10,000), Chelmsford (5.57 per 10,000), and Tewksbury (5.18 per 10,000).

Figure 45: CLRD Mortality Rate Per 10,000, by city/town, 2019



Source: Registry of Vital Records and Statistics, Massachusetts Deaths 2019, Published 2022

Several Massachusetts populations are more at risk for COPD than others.⁸⁰ Women over age 65 are particularly high risk for COPD, as well as people who have low educational attainment, earn less than

79 CDC, Behavioral Risk Factor Surveillance System via America's Health Rankings

80 CDC, COPD Among Adults in Massachusetts. https://www.cdc.gov/copd/maps/docs/pdf/MA_COPDFactSheet.pdf

\$25,000 per year, have asthma, and have a history of smoking. People in Massachusetts with COPD may experience additional barriers to care, including cost and limited mobility.

Smoking and Vaping

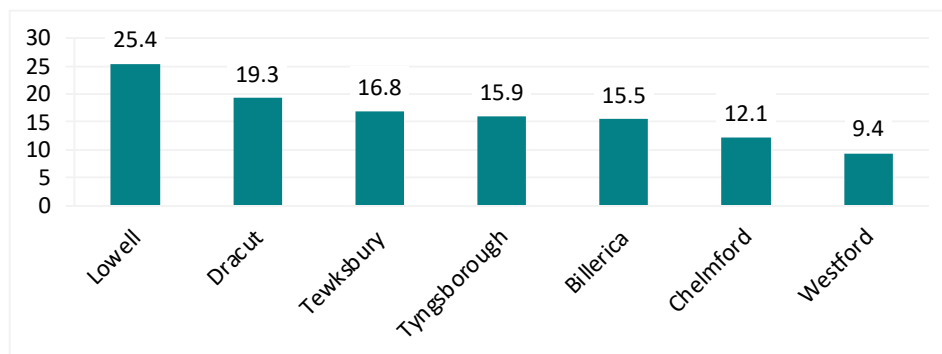
Tobacco comes in many forms, including cigars, snus/pouches, dissolvable tobacco, chewing or dipping tobacco, and e-cigarettes/e-hookahs. Tobacco’s addictive properties come from nicotine, which affects the brain. E-cigarettes use, commonly known as vaping, is on the rise, and many studies are underway to fully understand the adverse health effects.

The negative health impacts of smoking include cancer, lung diseases, heart diseases, stroke, COPD, issues with immune response, eye conditions and more. Massachusetts has robust non-smoking regulations including smoke free laws for restaurants, bars, and non-hospitality workplaces.⁸¹ Despite years of public health efforts to prevent smoking, some populations show recent increases in smoking behaviors, particularly young people who have recently begun smoking nicotine products.

Trends and Disparities

In 2020, 12.2% of Massachusetts adults reported current smoking, compared to 15.5% of adults at the national level, though the state rate from 2019 to 2020 did increase slightly.⁸² The most recently available prevalence data found the highest rates of adult smoking in Lowell (25.4%) followed by Dracut (19.3%); Westford reports the lowest rate of adult smoking (Figure 46).

Figure 46: Adult Smoking Prevalence, by city/town, 2014



Source: BRFSS via PHIT

Crude rates of adult smoking, and changes in rates of smoking, vary by race and ethnicity at the state level. Multiracial, non-Hispanic MA residents consistently have the highest rates of adult smoking (26.1% in 2020), whereas Asian, non-Hispanic residents have the lowest rates (5.5% in 2020).⁸³ While rates of smoking have decreased slightly among white, non-Hispanic and Hispanic residents, rates of smoking among Black, non-Hispanic residents increased from 11.4% in 2016 to 13.4% in 2020.

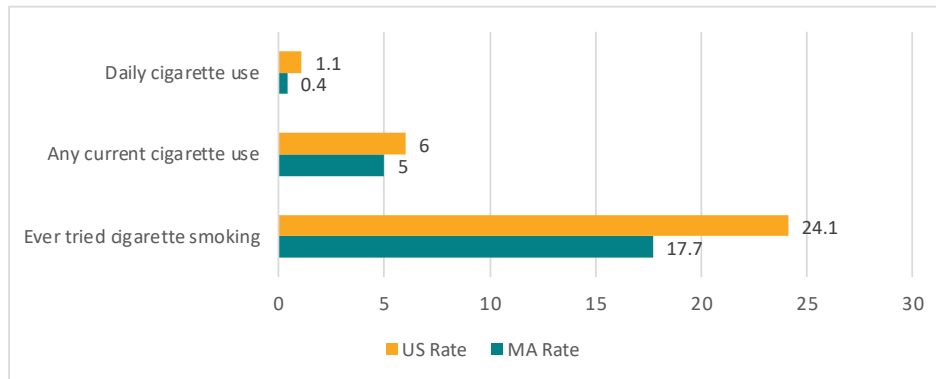
81 American Nonsmokers Rights Foundation via America’s Health Rankings.

82 CDC BRFSS 2018- 2020

83 CDC BRFSS 2018- 2020

Among young people, Massachusetts smoking rates were below to the U.S average in 2019.⁸⁴ Massachusetts youth were significantly less likely to report ever trying cigarettes (17.7% versus 24.1%), any current cigarette use (5.0% versus 6.0%), and daily cigarette use (.4% versus 1.1%) (Figure 47).

Figure 47: Cigarette Smoking Among Youth, 2019



Source: 2019 YRBS

Vaping and the use of electronic cigarettes is particularly prevalent among young people, though overall adult use in Massachusetts in 2018 was 5.6%.⁸⁵ Massachusetts young adults are much more likely to report e-cigarette use, with 13.0% of 18 to 24-year-olds reporting using e-cigarettes in 2017, compared to 7.8% in 2016. E-cigarette use is also most prevalent among Black, non-Hispanic residents (4.7%) and white, non-Hispanic residents (4.4%). Vaping and electronic cigarette use among young people in Massachusetts is slightly higher than national rates. In particular, Massachusetts reports a higher percentage of young people who report daily use of e-cigarettes (8.2% versus 7.2%).⁸⁶ Variation in youth e-cigarette use does not follow the same racial and ethnicity disparities observed in adult users. While the overall rate of frequent e-cigarette use among youth was 3.3%, African American/Black youth has a much lower rate (1.9%), while white (3.9%) and Asian (2.1%) youth reported the highest frequent use rates.

Recommendations

Since the 2019 Community Health Needs Assessment, efforts to address lung and breathing health have included the following:

Past actions

- A collaboration between Lowell Community Health Center, the Department of Housing and Urban Development, UMass Lowell, and the Department of Public Health to treat over 500 asthmatic patients through home visits, providing them with less toxic cleaning supplies and HEPA vacuum cleaners
- \$20,000 GLHA grant to the Greater Lowell Community Foundation for Asthma Spacers for School
- A ban of the sale of flavored tobacco products in any location that permitted people under 21 to enter resulted in a 70% decrease in access of flavored tobacco for young people as well as a 6% decrease in youth tobacco use in Lowell⁸⁷

84 2019 Youth Risk Behavior Survey via <https://nccd.cdc.gov/Youthonline/App/Default.aspx>

85 CDC, Behavioral Risk Factor Surveillance System, State Tobacco Activities Tracking and Evaluation System, 2021.

86 2019 Youth Risk Behavior Survey via <https://nccd.cdc.gov/Youthonline/App/Default.aspx>

87 Kingsley M, Setodji CM, Pane JD, Shadel WG, Song G, Robertson J, Kephart L, Henley P, Ursprung WWS.

- Inclusion of smoking cessation education and resources throughout all of Lowell General Hospital's inpatient and outpatient service centers, including specific education for smoking cessation during and following pregnancy
- Increased the availability of asthma resources and education provided to the community via Lowell General Hospital

Future Actions

Healthcare System Recommendations

- Strengthen the relationship between medical providers and community-based organizations providing in-home asthma services and assessments to streamline referral process for children who are diagnosed with asthma
- Increase the utilization of screening tools for people at higher risk for CLRD, particularly tools that can be administered by community health workers and home-based care providers for people who may have limited mobility or experience other barriers accessing screening resources
- Identify and provide education, resources, and screening to people who may be at increased risk for respiratory health issues due to environmental exposures associated with their employment (for example, people who work in healthcare, construction or mechanics)

Community System Recommendations

- Support youth organizations to engage young people in local and state policy efforts to reduce access to flavored tobacco and vape products that targeted young people
- Provide resources to businesses interested in establishing smoke-free policies for their outdoor properties
- Provide support and education to building managers and landlords interested in enforcing smoke-free environments in their housing units and properties
- Partner with dispensaries to offer harm reduction resources at their locations
- Increase the amount of educational materials available in multiple languages regarding lung health
- Support cross-community data sharing on youth tobacco and vaping use via the Youth Risk Behavior Survey and Communities That Care Survey

7. Cancer

Score Summary		
Source	Score	Rank
Survey	540	7
Focus Groups	1	8
Key Informants	-	-

“If you need multiple services, you're going to multiple places. And if you're struggling to get to one place, then you're struggling to get to two and three...having one centralized location is what's missing”

— Key Informant, Lowell

Overview

Cancer is a group of disorders in which abnormal cells have limitless replicative potential and metastasize, invading other tissues. Longer lifespans are a significant factor contributing to an overall increase in cancer risk. Other risks include hereditary factors, sun exposure and ionizing radiation, exposure to carcinogens, some viruses like HPV, obesity, smoking and alcohol.

Nealy 13% of all survey participants ranked cancer within their top three health priorities, and 43.1% indicated that cancer should be a high priority in their communities. Survey participants age 65 or older were much more likely to identify cancer as a top health priority, with 31.3% ranking it as a top three health priority, and 50.9% indicating it should be a high priority in their communities.

Approximately 10.1% of survey respondents reported having cancer; for participants over age 65, the self-reported cancer rate was 15.5%. Focus group participants and key informants noted concerns about cancer prevention and screening (including promotion of health behaviors known to be protective against cancer, as well as challenges accessing cancer screening care) as well as treatment (including the barriers related to referring cancer care to Boston, like cost and transportation).

Cancer Prevalence and Mortality

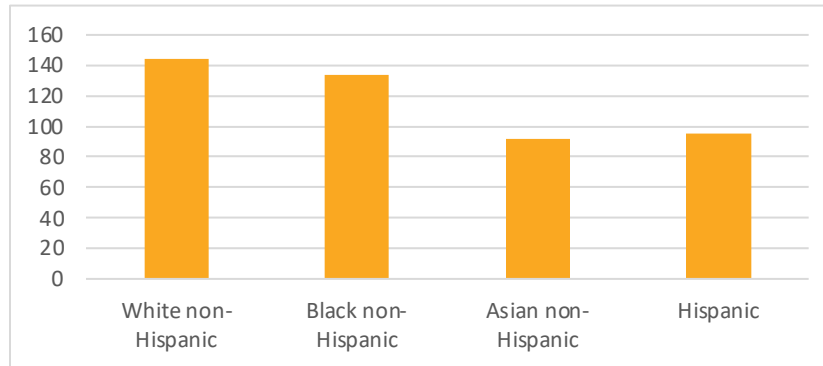
In 2019, over 1.5 million new cancer cases were reported in the U.S, and nearly 600,000 people died of cancer. In Massachusetts, the incidence rate of cancer diagnoses from 2014-18 was 456.9 per 100,000, slightly over the national average, and the cancer mortality rate was 146.9 per 100,000.⁸⁸

In Massachusetts in 2019, the rate of total cancer deaths was highest among white, non-Hispanic people (144.4 per 100,000), followed by Black, non-Hispanic (133.7), Hispanic (95.3) and Asian non-Hispanic (91.4) (Figure 48). Nationally, the most significant racial and ethnic inequities in cancer diagnoses and mortality occur in lung, breast and colorectal cancers.⁸⁹

88 American Cancer Society, Cancer Data and Statistics, Massachusetts At a Glance.

89 Zavala, V. A., et al. (2021). Cancer health disparities in racial/ethnic minorities in the United States. *British journal of cancer*, 124(2), 315–332. <https://doi.org/10.1038/s41416-020-01038-6>

Figure 48: Massachusetts Cancer Mortality Rate per 100,000, by race/ethnicity



Source: Massachusetts Registry of Vital Records and Statistics, Massachusetts Death Data 2019

There is substantial variation in cancer incidence between U.S.-born and foreign-born people residing in the United States.⁹⁰ Foreign-born Hispanic and Asian people have higher incidence of gastric cancer than their U.S.-born counterpart, however U.S.-born Latinos had greater rates of breast, colorectal, prostate, lung, and liver cancers; U.S.-born Chinese and Filipinos have higher rates of breast and colorectal cancer.

Lung Cancer

Lung cancer is the most common cause of cancer-related death. Smokers are 25 times more likely to develop lung cancer than people who don't smoke, and 80% of lung cancer fatalities are due to smoking.⁹¹

Trends and Disparities

Nationally, the lung cancer diagnosis rate is 57.7 per 100,000, but it is slightly higher in Massachusetts (60.9 per 100,000).⁹² While the national death rate for lung cancer was 36.7 per 100,000, in Massachusetts, it was lower than the national rate for women (28.9 per 100,000) but higher for men (37.3 per 100,000).⁹³ In Greater Lowell, rates of new lung cancer diagnoses were on par with or lower than new diagnoses at the state level in Chelmsford (Standard Incidence Ratio⁹⁴ 96) and Westford (SIR 89) (Figure 49). However, Billerica (SIR 124), Dracut (SIR 124), Lowell (SIR 120), Tewksbury (SIR 118) and Tyngsborough (SIR 126) all experienced higher than expected age-adjusted rates of new lung cancer diagnoses.

90 Kaiser Family Foundation, *Racial Disparities in Cancer Outcomes, Screening, and Treatment*, February 2022.

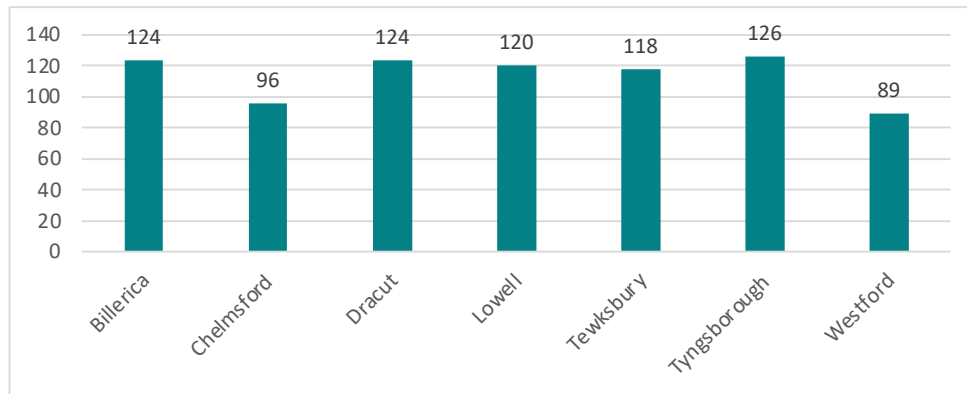
91 Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, *Lung Cancer: What Are the Risk Factors?* https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm

92 American Lung Association, *State of Lung Cancer, Massachusetts 2021*.

93 *Massachusetts Registry of Vital Records and Statistics, Massachusetts Death Data 2019*

94 Standardized Incidence Ratios describe the relationship between the observed rate of cancer diagnoses in an area compared to the rate that we expected to see, based on the standard comparison (the state level). SIRs above 100 represent higher than expected rates, and SIRs below 100 represent lower than expected rates, age-adjusted to the community

Figure 49: Standardized Incidence Ratio of New Lung Cancer Diagnosis per Community, 2011-2015

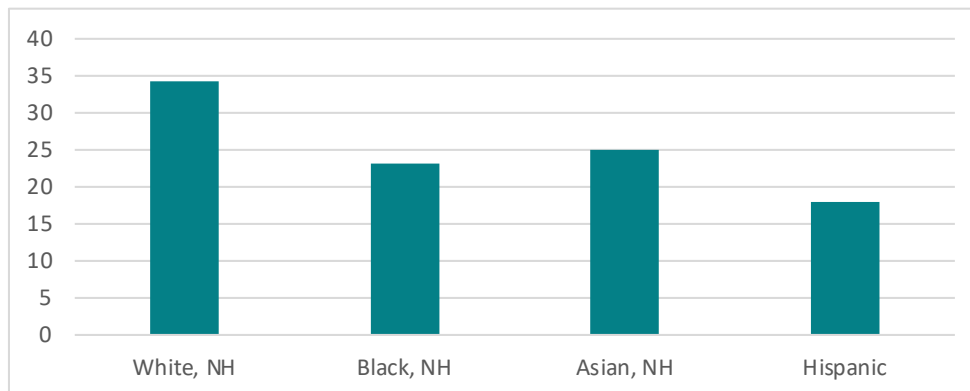


Source: MA Cancer Registry 2013 via PHIT

Racial and ethnic disparities in lung cancer diagnosis in Massachusetts are distinct from national trends in several ways. Though at the national level, the rate of new lung cancer diagnoses among Black, non-Hispanic people is 60 per 100,000, in Massachusetts the rate is much lower, at 45 per 100,000. Conversely, the new diagnosis rate among Asian and Pacific Islanders in Massachusetts is higher than the national rate (40 per 100,000 versus 34 per 100,000).⁹⁵

Racial and ethnic differences in lung cancer mortality are also evident in Massachusetts (Figure 50). In 2019 in Massachusetts, age-adjust lung cancer mortality rates were highest in the white, non-Hispanic group (34.2), followed by Asian residents (25.0). Black, non-Hispanic (23.1) and Hispanic (18.0) populations had the lowest lung cancer mortality rate in MA.

Figure 50: Age-Adjusted Lung Cancer Mortality Rate in Massachusetts, by race/ethnicity, 2019



Source: Massachusetts Registry of Vital Records and Statistics, Massachusetts Death Data 2019

Breast Cancer

From 2014-2018, the state's five-year incidence rate of breast cancer was 136.9 per 100,000 and the mortality rate was 15.3 per 100,000.⁹⁶ Since the mid-2000s, national breast cancer incidence rates have risen an average of 0.5% each year. Importantly, anyone can get breast cancer; however, most data sets report statistics specific to women, which limits our ability to assess breast cancer among men and other genders.

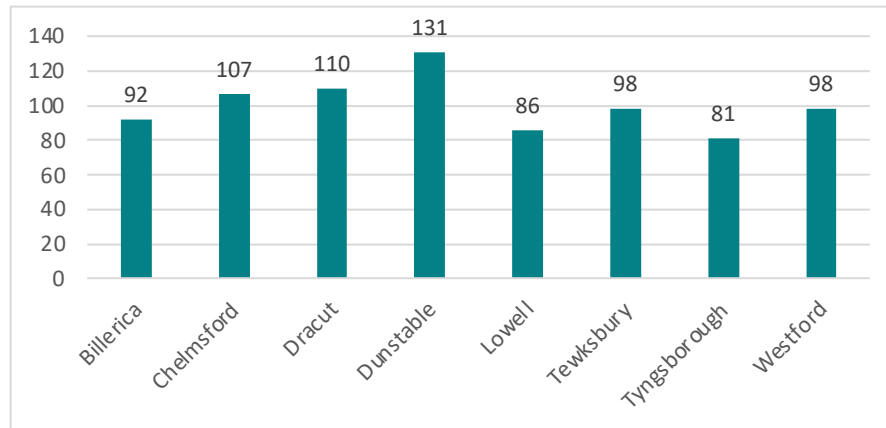
⁹⁵ American Lung Association, State of Lung Cancer, Massachusetts 2021.

⁹⁶ American Cancer Society, Cancer Statistics Center, Massachusetts At a Glance. <https://cancerstatisticscenter.cancer.org/#/state/Massachusetts>

Trends and Disparities

In Greater Lowell, the breast cancer SIR was approximately 130.0, though individual communities show variation in incidence rates (Figure 51). Though Dunstable (SIR 131) had the highest SIR, the low crude rate of breast cancer makes this statistic unstable. Billerica (SIR 92), Lowell (SIR 86), Tewksbury (SIR 98), Tyngsborough (SIR 81), and Westford (SIR 98) all experienced lower than anticipated rates of new breast cancer diagnoses. Chelmsford (SIR 107) and Dracut (SIR 110) had slightly higher than anticipated rates of new diagnoses.

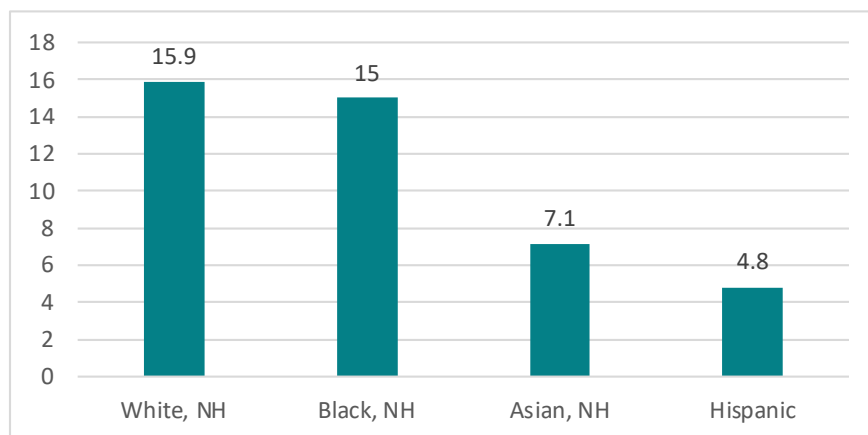
Figure 51: Age-Adjust Breast Cancer Standardized Incidence Ratios by Community



Source: MA Cancer Registry 2013 via PHIT

There are significant racial disparities for breast cancer diagnosis and mortality. Nationally, the breast cancer mortality rate for Black women is 41% higher than for white women, and Black women are twice as likely to be diagnosed with more difficult-to-treat cancer than women of other racial and ethnic groups.⁹⁷ In Massachusetts, racial and ethnic disparities vary slightly from the national picture (Figure 52). In Massachusetts, the breast cancer mortality rate for White, non-Hispanic women was the highest, at 15.9. The mortality rate for Black women was 15.0; both of these mortality rates are significantly higher than the mortality rate for Asian, non-Hispanic women (7.1) and Hispanic women (4.8).

Figure 52: Age-Adjusted Breast Cancer Mortality in Massachusetts per 100,000 Residents, by race/ethnicity



Source: Massachusetts Registry of Vital Records and Statistics, Massachusetts Death Data 2019

97 American Cancer Society, Breast Cancer Research Highlights, <https://www.cancer.org/research/acs-research-highlights/breast-cancer-research-highlights.html>

Colorectal Cancer

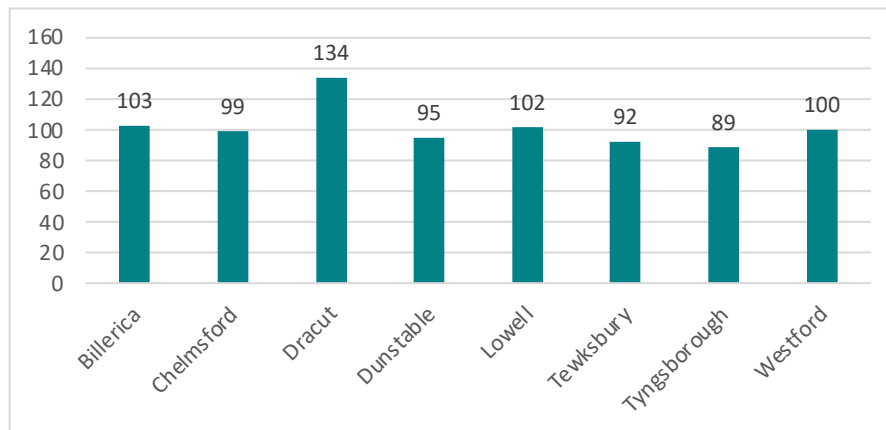
Colorectal cancer occurs when abnormal growths form in the colon or rectum, which over time, may turn into cancer without treatment. Risk factors for colorectal cancer include high body weight, physical inactivity, high red meat consumption, and alcohol consumption.

Trends and Disparities

At the national level, the incidence rates of colorectal cancer have been steadily decreasing since 1998, from a high of 55.2 per 100,000 to a current new diagnosis rate of 34.0.⁹⁸ This decrease is largely attributable to better early detection in older adults, but incidence rates are increasing by about 2.2% per year among those younger than age 50, for unknown reasons. Mortality rates have also been increasing in the under-50 age group while declining in older adults; mortality rates for people under 50 increased by 1.3% during the same time period that older adults saw a 3% decrease.⁹⁹

A majority of Greater Lowell communities reported SIRs on par with expected rates of new colorectal cancer diagnoses with the notable exception of Dracut (SIR 134), which saw considerably more cases of colorectal cancer than expected (Figure 53).

Figure 53: Age-Adjust Colorectal Cancer Standardized Incidence Ratios by Community



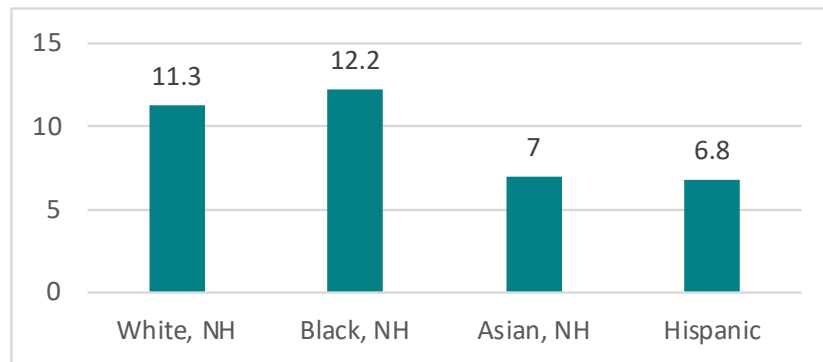
Source: MA Cancer Registry 2013 via PHIT

In 2019, Black, non-Hispanic Massachusetts residents had the highest mortality rate from colorectal cancer, at 12 per 100,000 which is slightly higher than the overall MA colorectal mortality rate (11.1 per 100,000) (Figure 54). These mortality rates align with national trends, which show that mortality rates for Black Americans are highest of all racial groups; Black Americans have a colorectal cancer mortality rate that is 40% higher than white Americans.

98 National Cancer Institute, Surveillance, Epidemiology and End Results Program, Cancer Stat Facts: Colorectal Cancer. <https://seer.cancer.gov/statfacts/html/colorect.html>

99 American Cancer Society, <https://www.cancer.org/latest-news/colorectal-cancer-rates-rise-in-younger-adults.html>

Figure 54: Age-Adjusted Colorectal Cancer Mortality Rate in Massachusetts, per 100,000 residents, by race/ethnicity, 2019



Source: Massachusetts Registry of Vital Records and Statistics, Massachusetts Death Data 2019

Education, Prevention and Treatment

Primary prevention for many types of cancers includes individual behavior change as well as systematic changes. These includes things like better access to whole foods, occupational health interventions for high-risk jobs, and engagement in behaviors like regular physical activity and wearing sunscreen. Screening is a medical procedure for asymptomatic individuals to determine the likelihood of cancer prior to symptom onset. However, disparities in screening access, as well as screening quality, persist. Access to screening services was also significantly impacted by the COVID-19 pandemic, with most screening services seeing double-digit drops due to reduced service capacity in hospitals.¹⁰⁰

While Massachusetts overall has some of the nation's highest capacity for high-quality cancer treatment and care, access to these treatment facilities and options is not always equitable. The 2015 Greater Lowell Cancer Disparities Needs Assessment described significant barriers to cancer treatment for Greater Lowell residents who were had low incomes, were foreign-born, and/or who spoke a primary language other than English.¹⁰¹ Greater Lowell residents in these categories are significantly more likely to experience barriers relating to care access, including lack of transportation, challenges with the cost of care or insurance, and higher incidences of reporting poor quality treatment from their providers. Specific needs relating to cancer prevention, screening and treatment in Greater Lowell therefore consider the unique resources and barriers relevant to populations that experience a disparate burden of cancer diagnosis, as well as higher burdens for accessing cancer resources.

Trends and Disparities

The Massachusetts Statewide Cancer Plan 2017-2021 describes several areas of focus related to prevention, screening and treatment goals.¹⁰² Reducing rates of smoking and obesity, as well as increasing vaccination and promoting policies that reducing environmental hazards, are among the primary prevention objectives described in the report; these are also all areas in which health disparities are observed. For example,

100 Fedewa SA, Star J, Bandi P, et al. Changes in Cancer Screening in the US During the COVID-19 Pandemic. *JAMA Netw Open*. 2022;5(6):e2215490. doi:10.1001/jamanetworkopen.2022.15490

101 Greater Lowell Cancer Disparities Needs Assessment, June 2015. https://www.greaterlowellhealthalliance.org/wp-content/uploads/2015/07/GLHA009_CancerDispReportweb.pdf

102 Massachusetts Statement Cancer Plan 2017-2021. <https://www.mass.gov/doc/massachusetts-statewide-2017-2021-cancer-plan-0/download>

smoking rates are highest amongst U.S. residents with lower educational attainment (20% of adults with a high school diploma smoke compared to only 7% of adults with a college education).¹⁰³

The 2015 Cancer Disparities report noted that Greater Lowell residents struggled to access cancer prevention educational materials, particularly in languages other than English, or that considered the specific cultural backgrounds of particular groups. Education around the benefits of individual health behaviors changes, like healthy eating, physical activity, and smoking cessation, were identified in the report as important primary prevention tools by providers, but other participants noted that these recommendations rarely address underlying barriers to cancer prevention, like low access to affordable produce, feeling unsafe in neighborhoods and therefore having few opportunities for physical activity, and the chronic stress of exposure to racism and other forms of discrimination that contributes to poor physiological and psychological well-being.

Access to cancer screening allows cancers to be identified in the early stages, which increases the likelihood of successful treatment and survival. Several populations experience disparate rates of screening for certain cancers (Table 9). Generally, U.S. white residents have the highest utilization of cancer screening services and Asian residents have the lowest, except in the case of colorectal cancer, in which Hispanic residents have the lowest screen rates. Differences in cancer screening are also observable by income, with lower earners having significantly lower screening rates, and by insurance status, with people who are uninsured much less likely to be screened compared to those with private insurance.

Table 9: Cancer Screening Rates Among Select U.S. Populations

	Breast Cancer	Cervical Cancer	Colorectal Cancer	Prostate Cancer
Race/Ethnicity				
White	71.8	83.2	63.7	37.1
Black/African American	74.3	85.3	59.3	30.7
Asian	66.1	75.8	52.1	17.4
Hispanic	72.1	78.6	47.4	25.5
Income				
<139% of federal poverty threshold	58.7	75.2	46.9	NA
>400% of federal poverty threshold	78.8	89.7	70.0	NA
Insurance				
Uninsured	35.3	63.8	25.1	10.2
Private insurance	76.7	86.8	65.6	29.8

Source: American Association for Cancer Research Cancer Disparities Progress Report 2020

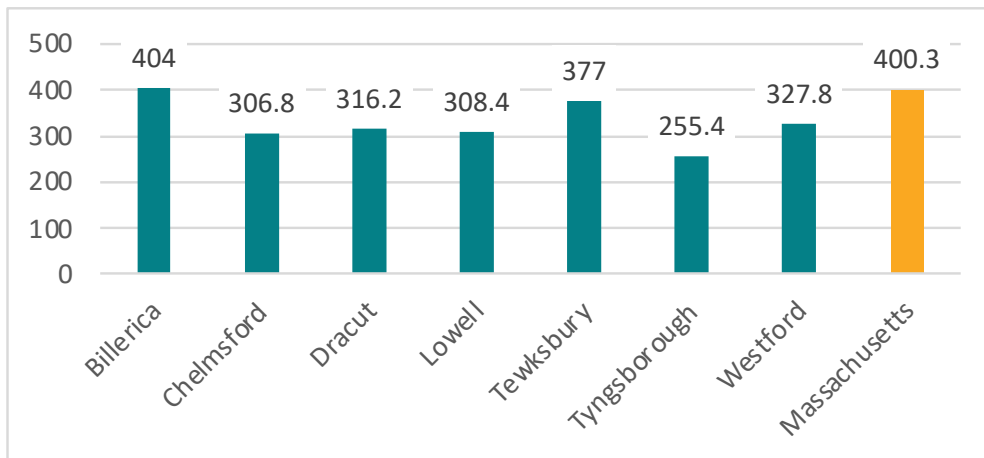
Massachusetts has a strength in their capacity to provide cancer care, thanks to a robust network of award-winning cancer treatment hospitals and other healthcare centers. However, the Greater Lowell Cancer Disparities report noted that one of the most significant barriers to treatment for cancer is the referral of patients to hospitals in or near Boston for what is often intensive, prolonged treatment regimens. Though a considerable amount of cancer treatments are available locally, many people reported being referred due to their specific care needs, or requirements related to using in-network providers. Referrals to Boston are particularly burdensome for people who are low income, who do not have transportation, or who are

103 Centers for Disease Control and Prevention, Equity in Cancer Prevention and Control.

insecurely employed with no access to paid leave options. Even for those who can access treatment options locally or in Boston, cost is a significant barrier to care and often times knowledge about how to alleviate cost within the treatment process is inaccessible.

According to the 2015 Cancer Disparities report, due to issues with insurance, many access care by hospitalization through the ER, and had difficulties finding providers who accept Medicaid and other subsidized Mass Health plans. Cancer-related hospitalizations in Greater Lowell are on par with the state rate, with Billerica (404.0 per 100,000) reporting the highest rate of age-adjust cancer hospitalization and Tyngsborough (255.4 per 100,000) reporting the lowest (Figure 55).

Figure 55: Age-Adjust Cancer-Related Hospitalization Rate Per 100,000 Residents, by city/town



Source: BRFSS via PHIT, 2014

In the 2022 Community Health Survey, 208 participants reported having cancer. Compared to the total survey participants, participants with cancer were more likely to report earning less than \$40,000 per year (33.2% versus 22.1%) and more likely to report not being able to work due to health reasons (8.8% versus 4.7%). They were also slightly more likely to report that their physical, mental, and financial health had gotten a lot or somewhat worse over the previous year compared to the general survey participants.

Participants with cancer also reported several barriers to their care. For example, 12.5% of participants with cancer reported not having consistent access to a vehicle, 28.4% reported not being able to always pay their bills on time, and 26.4% reported not being able to pay for their medical care. Additionally, 17.8% reported not having a doctor with a lot of knowledge about their specific medical needs. More than a third (33.9%) of participants with cancer agreed that wait times for their appointments are too long, and 16.8% reported having difficulty navigating the healthcare system.

Because cancer treatment can require prolonged engagement with a healthcare team, establishing a positive connection is essential for retaining a patient in treatment. Structural barriers, like lack of paid leave or unreliable transportation, can make that challenging, but additional barriers related to cultural competency are also considerations. In the Community Health Survey, participants with cancer noted challenges finding a doctor who speaks their language (4.3%) or respects their culture (2.9%), which could prove to be a considerable deterrent to retention in cancer treatment.

Recommendations

The universal recommendations for cancer prevention include increasing physical activity, adequate nutrition from a diet rich in fibrous food and low in red meat, and cessation of smoking. At the community level, structural recommendations are needed to improve not only availability and access to treatment options but also the shared environment that can increased cancer risk (for example, via exposure to pollutants). Accessible information about cancer prevention, cancer screening options, and cancer treatment should consider the language and cultural needs of the community.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address cancer needs include the following:

- \$20,000 in GLHA grant funding to support the Ellie Fund to provide equitable access to breast cancer services and treatment for Greater Lowell residents, especially those experiencing barriers to care
- Raised \$654,000 via the 2022 Lowell General Hospital TeamWalk for CancerCare to support cancer patients throughout the Greater Lowell region
- Lowell General Hospital launched the First at 40 campaign to increase the percentage of people receiving their first mammograms by age 40
- Lowell General Hospital incorporated Breast Health Navigators, who are trained nurse professionals, to optimize access to clinical and non-clinical support for people with a new breast cancer diagnosis

Future Actions

Healthcare System Recommendations:

- Recruit and incentivize patients living with cancer to serve as education and treatment ambassadors in their communities
- Expand and sustain care related transportation services to increase treatment retention
- Strengthen partnerships with community-based organizations to provide community education about cancer screenings, particularly to populations who may have low utilization of or access to preventative health, or may avoid screenings due to stigma regarding particular kinds of cancers (for example, colorectal or breast cancer)
- Increase the capacity of home-based care to provide services for patients who are homebound or otherwise experiences barriers to care outside the home

Community System Recommendations:

- Increase the number of support groups for people living with cancer, and their families, especially groups hosted in languages other than English, by partnering with cultural agencies
- Expand community engagement and emphasize local, culturally suitable cancer prevention and lifestyle education programs, such as smoking cessation and nutrition programs
- Provide advocacy for local and state policies that reduce environmental exposure to known carcinogens

8. Infant and Child Health

Score Summary		
Source	Score	Rank
Survey	473	8
Focus Groups	22.7*	4
Key Informants	7*	4

“Early childcare is something that I'm hearing a lot of struggle with, especially if it's holding parents back from working or from being able to provide for their families”

— Key Informant, Lowell

Overview

Infant and child health includes infant mortality, breastfeeding, childhood diseases, and accessible services for children and youth. In previous needs assessments, infant health was assessed in the context of maternal-infant health, and adolescent health was assessed as a separate item, but focus group data from the current assessment presented increased concern for the health of young children, an age group whose needs were perceived as not being elevated. In particular, focus group participants were concerned about the rising costs and quality of daycare for their young children, the impact of low socialization and educational loss during COVID for children, the threat of COVID infection in young children, children who are experiencing food insecurity, and the increasing number of children who have parents with substance use disorder.

To better capture this data for the current assessment, survey participants were able to rank Infant and Child Health separately from maternal health. Over 40% of participants indicated that Infant and Child Health should be a high priority. In focus groups and key informant interviews, children and youth were mentioned as critical population as focus, rather than as a health issues topic. Specific areas of focus for this section were guided by public health data as well as the topics most frequently noted as concerns during focus groups and key informant interviews.

Infant Feeding

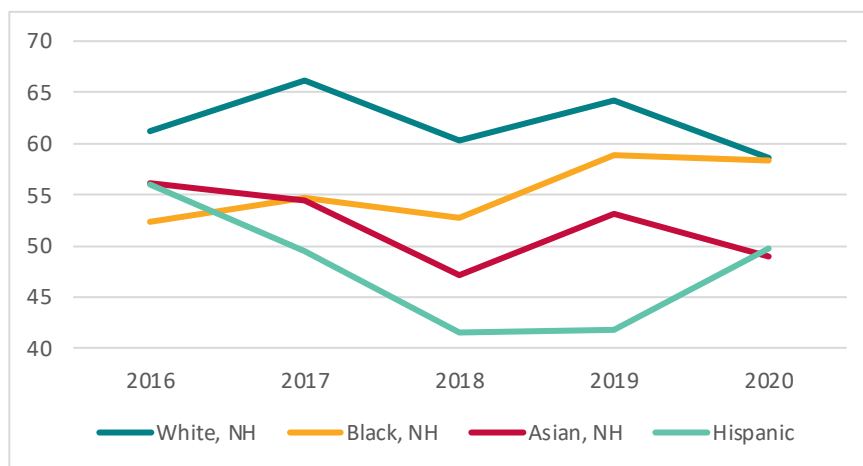
In June 2022, the American Academy of Pediatrics affirmed that long-term benefits of breastfeeding, or providing breastmilk, to infants exclusively for the first six months of life before introducing complimentary foods, and continuing to provide breastmilk through and beyond the first two years of life.¹⁰⁴ While some parents choose an alternative feeding method, like formula feeding, as their preferred method of infant feeding, other parents experience barriers to achieving breastfeeding goals, including lack of access to evidence-based support and education, lack of access to protected parental leave, or medical conditions that interfere with breastfeeding. Efforts to support infant feeding should optimize maternal and infant health outcomes, and acknowledge that successful infant feeding experiences are exceptionally diverse and influenced by a number of factors beyond individual decision making.

104 American Academy of Pediatrics, Breastfeeding and the Use of Human Milk, Policy Statement, June 27, 2022.

Trends and Disparities

At the national level, 84.1% of U.S. infants ever breastfeed, but only 58.3% of infants are still breastfeeding at all at 6 months.¹⁰⁵ Massachusetts reports breastfeeding rates slightly lower than the national rate, with only 80.7% of Massachusetts infants ever breastfeeding and 58.1% breastfeeding at 6 months. Statewide disparities in breastfeeding duration and exclusivity exist by race and ethnicity (Figure 56). White, non-Hispanic residents are exclusively breastfeeding at 4-weeks postpartum at the highest rate (58.6% of infants in 2020), followed by Black, non-Hispanic infants (58.4%), Hispanic infants (49.7%) and Asian, non-Hispanic infants (49.0%).

Figure 56: Percent of Massachusetts Infants Exclusively Breastfeeding at 4 weeks Postpartum, by race/ethnicity.



Source: Pregnancy Risk Monitoring System via PHIT

There are also state-level disparities in breastfeeding that are driven by socioeconomic factors. For example, breastfeeding duration and exclusivity rates among WIC participants are much lower than state averages, with only 14.0% of WIC participants exclusively breastfeeding for three months and only 10.9% exclusively breastfeeding for six months (compared to 44.5% and 23.9% at the state level, respectively).¹⁰⁶

In 2021, Lowell Community Health Center conducted the Community Infant Feeding Assessment as part of the REACH LoWELL initiative to evaluate the infant feeding experiences and perceptions of community members. Their results demonstrated a confusing network of conflicting information about infant feeding and breastfeeding that make optimized infant feeding challenging for new parents.¹⁰⁷ About 66% of participants in their survey reported receiving any education about breastfeeding, but where education came from varied by race and ethnicity; white respondents were most likely to report receiving education from a health care provider, while Asian respondents were least likely to report receiving breastfeeding education from a healthcare provider. Participants also reported receiving different advice about exclusivity, with only 58% of respondents reporting being supported to breastfeed exclusively, and 30% being told to combination feed with formula. The most commonly reported barriers to breastfeeding in the assessment were lack of time or ability to breastfeed (50%), concern about making enough breastmilk (44%), and the inconvenience of breastfeeding (31%).

Another critical finding of the Community Infant Feeding Assessment was that only 36% of participants felt that the infant feeding guidance they were given took into account their religious or cultural beliefs. Many cultures have specific perinatal beliefs and practices that may encourage or inhibit optimal infant feeding. For

105 CDC Breastfeeding Report Card, 2020, <https://www.cdc.gov/breastfeeding/data/reportcard.htm>

106 U.S. Department of Health and Human Services, III.E.2.c. State Action Plan - Perinatal/Infant Health - Annual Report, Massachusetts 2020, <https://mchb.tvdsdata.hrsa.gov/Narratives/AnnualReport2/90069398-3599-4510-b47a-7ed0a10c12ee>

107 Lowell Community Health Center, Community Infant Feeding Assessment Summary, 2022

example, in the early 2000s, researchers observed particularly low rates of breastfeeding among Cambodians living in Lowell (35% in Lowell versus 76.6% at the state level at the time of the study).¹⁰⁸ This was especially surprising considering the relatively high rates of breastfeeding in Cambodia (96%). Researchers found that in Cambodia, postpartum mothers are encouraged to eat hot foods for at least six weeks following birth, and that failure to do so will yield insufficient milk. When Lowell instituted a traditional Cambodian postpartum meal plan on the mother-baby unit, rates of breastfeeding increased to 66.7% from 16.4% at study initiation. Cultural values and belief systems are particularly significant in Greater Lowell, where many new parents are recent arrivals or immigrants who are interested in honoring their cultural norms.

Childhood Vaccination

Routine childhood immunizations are the most effective tool against a range of highly infectious and potentially deadly diseases, including measles, chickenpox, mumps, and whooping cough. Failure to receive childhood vaccinations not only increases the risk of individual illness, but also increases risk for children who are too young to be vaccinated or who have immune conditions that are contraindicated for vaccination. At the time of writing this report, COVID-19 vaccination has been approved for children age six months and over, though this approval had still not occurred during data collection, and many participants expressed concern over the still-pending approval of a COVID-19 vaccine for young children.

Trends and Disparities

Childhood vaccination rates in Massachusetts are consistently at or above comparable U.S. rates. Massachusetts children have higher rates of complete series of DTaP (93% in MA compared to 83% U.S.), polio (96% versus 93%), MMR (98% versus 91%), Hib (89% versus 81%), Hep B (93% versus 91%), varicella (98% versus 91%), and rotavirus (80% versus 73%).¹⁰⁹

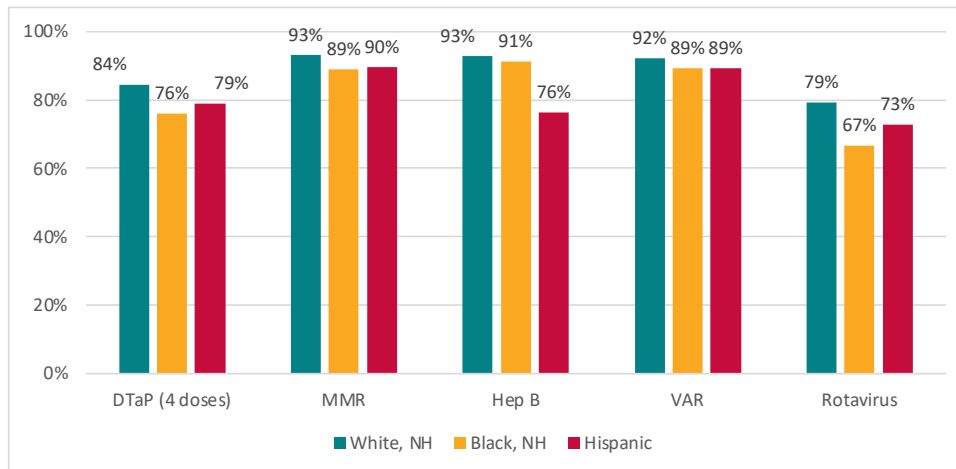
National disparities in vaccination coverage are based on race, ethnicity, and insurance coverage or type. Black and Hispanic U.S. children are vaccinated at a lower rate than white, non-Hispanic children when it comes major immunizations like DTaP, MMR, Hep B, and varicella (Figure 57). Children who are uninsured (3.3%) are also significantly more likely to receive no vaccines than children who are privately insured (.8%), and children living below the poverty line were significantly less likely to receive complete series for their DTaP (90.5% of children living in poverty versus 95.2% of children living at or above poverty), MMR (88.0% versus 92.9%), varicella (88.0% versus 92.1%), and rotavirus (66.9% versus 79.6%).¹¹⁰

108 Galvin S, Grossman X, Feldman-Winter L, Chaudhuri J, Merewood A. A practical intervention to increase breastfeeding initiation among Cambodian women in the US. *Matern Child Health J.* 2008 Jul;12(4):545-7. doi: 10.1007/s10995-007-0263-7. Epub 2007 Aug 10. PMID: 17690958.

109 MA Department of Public Health, Vaccine-preventable Diseases, <https://www.mass.gov/info-details/vaccine-preventable-diseases#childhood-and-adolescent-immunization-rates>

110 Vaccination Coverage by Age 24 Months Among Children Born in 2017 and 2018 — National Immunization Survey-Child, United States, 2018–2020

Figure 57: Vaccination Coverage by Age 2 Among U.S. Children Born in 2017 and 2018, by race and ethnicity



Source: Vaccination Coverage by Age 24 Months Among Children Born in 2017 and 2018 — National Immunization Survey-Child, United States, 2018–2020, Supplementary Table 1

Recent arrivals, including immigrants and refugees, are at greater risk for infectious diseases, due to increased exposure risks associated with migration, especially for people who endured time in refugee camps.¹¹¹ Overall, children who are born outside the U.S. have much lower total vaccine coverage compared to U.S.-born children. One study found that the total coverage rate for U.S.-born children was 65.0%, but only 26.7% for children born outside the U.S.¹¹² Though most immigrants and refugees understand the importance of vaccination, many experience barriers to immunization, including cultural barriers (for example, differing beliefs about sexuality and sexual behavior and their relation to vaccines like the HPV vaccines), socioeconomic barriers (for example, difficulty securing health insurance or being able to cover the costs associated with traveling to appointments) and other equity barriers (for example, not having any educational materials about vaccines available in the person’s native language).¹¹³

Data from the current needs assessment adds specificity to these experiences with barriers. One key informant highlighted the challenge of trying to identify students who need updated vaccines and coordinate with parents and schools to link them to medical services, noting that many children, particularly children of refugees, don’t yet have a “medical home” for their care, so service linkages are particularly challenging. While heavy attention in regards to increased utilization of COVID-19 vaccination among children has been the focus of many public health efforts, other participants noted that challenge in accessing childhood vaccinations with the same ease. One community member, a recent immigrant from Brazil, struggled to secure chickenpox vaccinations for his children to attend school, because local providers were “so busy with COVID shots” that they did not have any interest in scheduling other shots. “There’s no chicken pox vaccine clinic so I don’t know what to do.” These experiences highlight the importance to ensuring that the same tools that optimized access to COVID vaccinations are made available for community members to access other lifesaving childhood vaccinations as well.

111 Tuite, A. R., Thomas-Bachli, A., Acosta, H., Bhatia, D., Huber, C., Petrusek, K., & Khan, K. (2018). Infectious disease implications of large-scale migration of Venezuelan nationals. *Journal of travel medicine*, 25(1).
 112 Varan, Aiden & Rodriguez-Lainz, Alfonso & Hill, Holly & Elam-Evans, Laurie & Yankey, David & Li, Qian. (2017). Vaccination Coverage Disparities Between Foreign-Born and U.S.-Born Children Aged 19–35 Months, United States, 2010–2012. *Journal of Immigrant and Minority Health*. 19. 779-789. 10.1007/s10903-016-0465-4.
 113 Wilson, Lindsay & Rubens-Augustson, Taylor & Murphy, Malia & Jardine, Cynthia & Crowcroft, Natasha & Hui, Charles & Wilson, Kumanan. (2018). Barriers to immunization among newcomers: A systematic review. *Vaccine*. 36. 10.1016/j.vaccine.2018.01.025.

Child and Youth Service Needs

Services for children and youth include daycare and early childhood education, early intervention services, and afterschool and enrichment opportunities for children. Programs like these are not only beneficial to the psychosocial development of children, but they are critical to ensuring families have access to affordable resources that allow them to pursue employment, higher education, or meet their own health needs.

Trends and Disparities

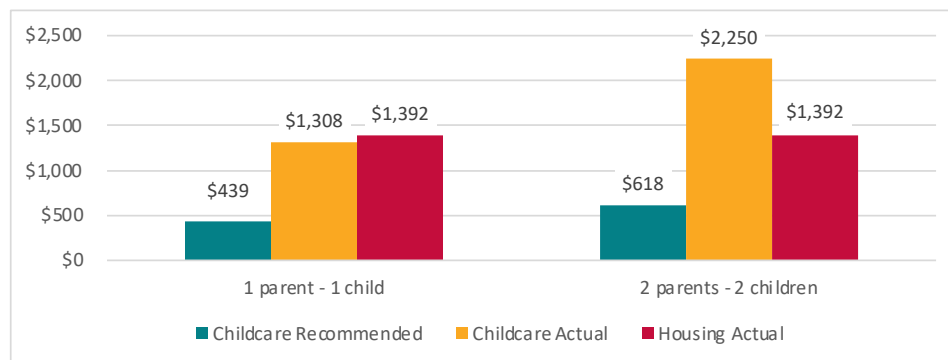
Lack of childcare is a significant barrier to accessing healthcare services in Massachusetts.¹¹⁴ Early access to high-quality childcare is associated with long-term benefits, including increases in prosocial development, improved childhood scores on cognitive tests, and measurable lifelong benefits to attentiveness. But the benefits extend beyond the individual child; families who are able to access high-quality, affordable care also have increased workforce participation, increased family income, and increased access to other social services to meet their family needs.¹¹⁵ In the 2022 Community Health Survey, 62% of survey participants identified affordable childcare as a “high priority” community resource.

Massachusetts has the second-highest cost of early childhood care in the country, behind only Washington D.C., with the estimated average annual cost of infant care rising to \$20,913 and the average annual cost for a Massachusetts four-year-old rising to \$15,095 in 2020.¹¹⁶ It is estimated that only 5.4% of Massachusetts families can comfortably afford infant care in the state.¹¹⁷

Of the potential 12,238 children in need of full or part time childcare in our region, only 7,681 slots are available in Greater Lowell, and the number of children on subsidized childcare waitlists varies greatly.¹¹⁸ More affluent towns have fewer children on their waitlists (for example, there is no waitlist in Dunstable and only 9 children on the wait list in Westford) while less affluent communities have a much higher demand for childcare assistance (For example, 55 children on the wait list in Dracut and 220 in Lowell).

Locally, the Community Teamwork, Inc. 2021 Community Needs Assessment identified affordable childcare as a critical need to address issues of poverty in the Greater Lowell region. While the federal recommendation for childcare expenditures is at or below 7% of household income, childcare costs in Greater Lowell are among the highest in the state, on par with or exceeding the cost of rent (Figure 58).

Figure 58: Recommended vs. Actual Monthly Expenditures, Childcare and Housing, Greater Lowell

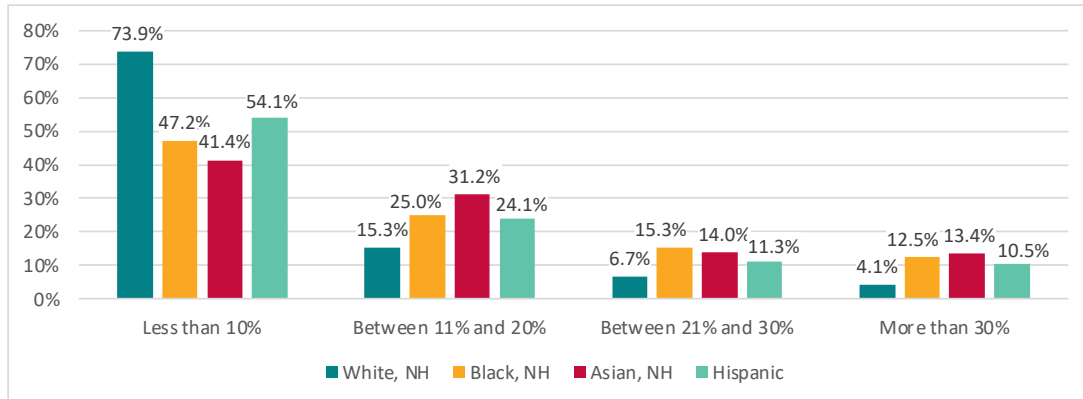


Source: Economic Policy Institute Family Budget Fact Sheet 2018 via CTI 2021 Community Needs Assessment

114 Massachusetts Department of Public Health. Massachusetts State Health Assessment. Boston, MA; October 2017.
115 Massachusetts Department of Early Education and Care (EEC) Strategic Plan 2020-2025.
116 EEC Strategic Plan, 2020-2025
117 Economic Policy Institute, 2016: The Cost of Childcare, Massachusetts Fact Sheet.
118 Community Teamwork, Inc. 2021 Community Needs Assessment.

In our Community Health Survey, only 65.5% of participants with children reported meeting the federal recommendation for childcare spending, spending less than 10% of their income on childcare needs. Participants also varied significantly in their childcare expenses based on race and ethnicity (Figure 59). White, non-Hispanic survey participants (73.9%) were more likely to spend less than 10% of their income on childcare expenses compared to Black, non-Hispanic participants (47.2%), Asian, non-Hispanic participants (41.4%) and Hispanic participants (54.1%).

Figure 59: Household Childcare Expenses as Percent of Total Income, all participants, by race/ethnicity



Source: Community Health Survey 2022, Greater Lowell Community Health Needs Assessment

Childcare was routinely cited by key informants and focus group participants as a significant factor in their ability to access or afford health care services, especially for community members who have low incomes. One focus group participant remarked, “I work just enough to make enough to pay someone to watch my kids while I work.” Others recalled choosing between basic needs, like hot water, and childcare due to costs. Others mentioned that COVID restrictions that prohibit them from being able to bring their children to appointments are especially challenging because they cannot afford to pay someone to watch their children during appointment times. Finding appropriate, affordable childcare was especially difficult for people who are single-parents or who work non-traditional hours, like nights and weekends.

In addition to infant and childcare, participants in the needs assessment also noted the need for afterschool programming for youth. Nearly 60% of participants in the Community Health Survey believed that programming for youth and adolescents should be a “high priority” for Greater Lowell. After school programs were identified as critical community resources for several reasons. First, parents who are working utilize afterschool programs as an affordable alternative to private afterschool childcare options. Second, afterschool programs were seen as enrichment opportunities for children and youth, particularly children who need additional educational support or prosocial interventions. Third, afterschool programs were seen as spaces in which education and resources related to risk and health behaviors could be delivered to young people. In a focus group with young people and youth service providers, participants noted that afterschool programs are “the main place” young people get information about reproductive health, drug prevention, and mental health in the community. Young people also noted that afterschool programs foster a sense of community and help bridge the space between different cultures and social groups.

Recommendations

Efforts to support infant and child health include addressing specific health issues that impact childhood and lifelong wellness (like nutrition) while cultivating home and social environments where youth can thrive. Though this is the first assessment to specifically identify Infant and Child Health as a priority area, many efforts throughout the region have been underway to improve childhood health outcomes for decades. Increased collaboration across sectors is critical for reducing inequities evidenced in childhood that persist into adulthood and reduce quality of life.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address infant and child health include the following:

- Lowell General Hospital hosted the World Breastfeeding Week community event to provide education and resources to families who are breastfeeding
- The completion of the Community Infant Feeding Assessment by Lowell Community Health Center's Reach LoWELL project
- Community Teamwork, Inc.'s Family Child Care program which connects low-income families with state subsidized childcare with local Child Care Homes

Future Actions

Healthcare System Recommendations

- Increase the capacity of IBCLCs and peer support specialists to provide in-home services for parents
- Evaluate existing infant feeding education materials to ensure materials are culturally-informed and appropriate for all community members
- Collaborate with community organization to host community-based health fairs that offer childhood vaccinations, particularly for children who were born outside the U.S.
- Offer educational materials regarding childhood vaccinations in multiple languages, particularly for children of immigrants/refugees or recent arrivals

Community System Recommendations

- Participate in state-level advocacy to reduce the unsustainable cost of early childcare
- Support state-level policies that protect and expand paid leave options for new parents
- Incentivize businesses to identify themselves as "breastfeeding friendly" to provide visibility for community support for breastfeeding parents
- Provide education to businesses regarding legal requirements related to pumping and breastfeeding parents returning to the workplace
- Engage community health workers to provide education regarding myths and misconceptions about childhood vaccinations

9. Environmental Health

Score Summary		
Source	Score	Rank
Survey	419	9
Focus Groups	5.5	6
Key Informants	2	7

“We have poor air quality. Especially in the warmer weather. My home and many other homes and vehicles in my community deal with black soot.”

— Survey Participant

Overview

Environmental health refers to the condition of one’s natural and built environment that contribute to either wellness or illness. These conditions include the quality of the soil, water, and air, exposure to lead and other built-environment toxins, and exposure to risks in the natural environment, like insect-borne illnesses. Environmental stressors like noise and air pollution are becoming more and more significant in our industrialized world, and can contribute to cardiovascular risk.¹¹⁹ Building materials that were once considered safe but are now known to be toxic or carcinogenic are particularly concerning in areas with high concentrations of older buildings instead of newer developments; in many cases, people who are already at increased risk for poor health outcomes are also more likely to be housed in older buildings with higher environmental exposure risk.

Though previous assessments identified environmental health topics, like insect illnesses, as health issues, this is the first year that environmental health is a ranked priority item in the Needs Assessment. In the 2022 Community Health Survey 35.3% of respondents ranked Environmental Health as a high priority, and 11.4% of respondents ranked it in their top three health issues. Additionally, 3.4% of survey respondents ranked public parks as one of their top three community resources. Improving the quality of the environment was noted in focus groups, with specific concern over the quality of parks and green spaces; key informants also stressed the need for mitigating the risk of infection from pests like ticks.

Natural Environment

Trends and Disparities

Approximately 6% of the land in the Greater Lowell area is set aside for open space, and less than 2% is used for recreation.¹²⁰ Lowell is the most urban community in Greater Lowell, and that is evident in its land use, with 70.4% of the community dedicated to urban space (Table 10). Compared to other communities, Lowell has the lowest percentage of land available for forest (14.9%) and agriculture (.2%). In high contrast, the majority of the land in Dunstable is forest (69.4%) as well as a significant portion (7.9%) for agriculture.

119 Münzel, T., Sørensen, M., Schmidt, F., Schmidt, E., Steven, S., Kröller-Schön, S., & Daiber, A. (2018, March 20). The adverse effects of environmental noise exposure on oxidative stress and cardiovascular risk. *Antioxidants & redox signaling*. Retrieved July 15, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5898791/#B162>

120 2020 ACS Census 5-year estimates, Accessed July 6, 2022.

Table 10: Greater Lowell Land Use, by community

Community % of Land Use	Agriculture	Forest	Open Space	Recreation	Urban	Water
Billerica	1.1	38.2	5.6	1.7	51.3	2.3
Chelmsford	1.7	37.1	5.9	1.5	51.4	2.4
Dracut	4.4	41.3	6.5	1.1	40.1	3.4
Dunstable	7.9	69.4	6.8	0.5	13.7	1.7
Lowell	0.2	14.9	5.1	3.4	70.4	5.9
Tewksbury	2.6	40.6	8.1	2.2	45	1.6
Tyngsborough	2.9	57.5	3.5	2.3	26.7	7.1
Westford	2.3	56.9	6.1	1.8	29.8	3.1

Air, Water and Green Space

Air pollution is responsible for an estimated 6 million deaths worldwide each year¹²¹. Global life expectancy is reduced by roughly two years as a result of air pollution¹²². Air quality in the Greater Lowell area is generally regarded as moderate, with an air quality index score (AQI) between 38 (good quality) and 57 (moderate quality) depending on the specific day and community of observation. Variations in air quality can impact people differently; for people with asthma and other respiratory health issues, poor air quality can be a considerable health hazard.

Reliable access to clean water is also critical to wellbeing. Access to safe drinking water is particularly critical for people who may be more at risk for adverse effects from exposure to even normal levels of contaminants. For example, people who have undergone organ transplants or have HIV/AIDS, people who are elderly, and infants have a higher risk of infection from contaminated water. Drinking water is tested for Lead, E. coli, Trihalomethanes, Per- and polyfluoroalkyl substances (PFAS), bacteria and other organic compounds. Thanks to aggressive state and community efforts to protect access to clean water, a vast majority of drinking water throughout the Greater Lowell region is safe to drink. In 2021, Tewksbury, Chelmsford, Dracut, and Lowell reported minor violations in drinking water quality associated with levels of per- and polyfluoroalkyl substances (PFAS), which are man-made chemicals, in drinking water samples. All communities initiated rectification protocols at relevant water treatment plants to amend their violations.

In addition to drinking water, the Greater Lowell region is situated along several natural waterways that include the Merrimack, Concord and Nashua rivers. These natural resources provide critical environmental conditions, but also necessitate the designation of potential floodways. During floods, industrial and stored household chemicals may become insecure and move away in the currents. Mold is also a potential public health problem, following floods or hurricanes. In rare cases, infectious disease outbreaks occur after floods, especially when the infrastructure and capacity for recovery are poor.

Urban farming and community gardens have increased significantly over the past decade throughout Greater Lowell, but particularly in Lowell. There are currently 10 community gardens, maintained by Mill City Grows, operable throughout the city, which allow residents to grow and harvest crops. Community gardens are also produce suppliers in Westford, Chelmsford, Tewksbury; there is also considerable productive local farming across Dunstable, Westford, and Tyngsborough. Increased accessibility of locally grown produce, as well as

121 Health Effects Institute. 2018. State of Global Air 2018. Special Report. Boston, MA: Health Effects Institute

122 Greenstone et al, 2015; <https://aqli.epic.uchicago.edu/>

increased support for individuals to grow their own produce, is an opportunity to promote environmental wellness, as well as cultivate healthy habits, across the region.

Tick and Insect Illnesses

Vectorborne diseases are infections that are transmitted through bites from infected mosquitoes, flies or ticks. These illnesses can range from mild to severe, and sometimes can result in death. Eastern Equine Encephalitis (EEE), West Nile Virus, and Lyme disease are all examples of vectorborne illnesses caused by insects.

Lyme disease, caused by ticks, is endemic in Massachusetts, with 2,984 cases reported in the most recent surveillance year.¹²³ Early-stage Lyme disease can cause a ring-like rash and, if untreated, a range of flu-like symptoms. Lyme disease can be undetected or untreated for years, resulting in more significant health impacts like arthritis or meningitis. Lyme can be difficult to treat, with some people requiring prolonged and aggressive antibiotic treatment. Lyme disease is most commonly reported in younger children and elderly adults in Massachusetts. Though exposure to ticks is often associated with more heavily forested areas, Lyme disease and tickborne illness visits accounted for 1.5 per 10,000 emergency department visits in Middlesex County in 2022.¹²⁴

The Eastern Equine Encephalitis (EEE) Virus and West Nile Virus (WNV) are both mosquito-borne illnesses, and both are relatively rare at the national level. However, Massachusetts accounts for the second highest number of EEE cases in the country¹²⁵. From 2019 to 2020, 17 Massachusetts residents were infected with EEE, resulting in seven deaths¹²⁶. In 2020, there were 11 cases of WNV in Massachusetts. Though the Greater Lowell region is considered a low-risk area for EEE, four of the known human cases of EEE have occurred in Middlesex County. In contrast, of the 218 cases of WNV in the state between 2000 and 2020, 90 (41.3%) occurred in Middlesex County, accounting for the highest county-level case density. Communities of Greater Lowell are still regarded as low risk for WNV, with more southerly Middlesex County communities accounting for a majority of WNV cases.

In the Community Health Survey, 128 participants (6.2%) reported having experienced a tick/insect illness. Nearly two-thirds of them lived in either Lowell or Chelmsford (32.0% respectively), with an additional 20.3% residing in Westford, which is an important note considering some public health efforts consider tick and insect control to be sole concerns of less urban areas. They were also slightly more likely than the total survey participants to report an income less than \$25,000 (17.8% of participants reporting tick/insect illness versus 13.4% of total participants), which may be a function of lower-paying jobs including higher-exposure, outdoor settings.

Prevention of vectorborne illness typically includes environmental prevention methods, like the application of pesticides and insecticides in high-risk areas. While these methods are effective for mitigating insect species, pesticide treatments are not without risk. Nearly 80% of U.S. households use pesticides more than once a year in and around their homes and many of these pesticides are semivolatile¹²⁷. The EPA recommends the Integrated Pest Management (IPM) protocol as an environmentally-sensitive approach to reducing the rate of

123 MA State Health Assessment, 2017.

124 Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences. Tick Exposure and Tick-borne Disease Syndromic Surveillance Report, May 2022. <http://www.mass.gov/eohhs/gov/departments/dph/programs/id/>

125 Cambridge Public Health Department. (2021). Eastern equine encephalitis. Cambridge Public Health Department. Retrieved July 15, 2022, from https://www.cambridgepublichealth.org/services/environmental-health/mosquito-borne-diseases/eastern_equine_encephalitis.php

126 Cambridge Public Health Department. (2021). Eastern equine encephalitis. Cambridge Public Health Department. Retrieved July 15, 2022, from https://www.cambridgepublichealth.org/services/environmental-health/mosquito-borne-diseases/eastern_equine_encephalitis.php

127 Environmental Protection Agency. (n.d.). Pesticides impact on Indoor Air Quality. from <https://www.epa.gov/indoor-air-quality-iaq/pesticides-impact-indoor-air-quality>

vectorborne illnesses and pests associated with them while mitigating the potentially harmful impacts of pesticides.¹²⁸

Built Environment

In addition to factors in the natural environment, the built environment, which includes housing, industrial sites, and roadways, can play a significant role in our health, particularly when we are exposed to environmental toxins in our built environment. The ability to maintain safe, healthy built environments is often associated with higher-income communities, and therefore access to healthy built environments is a considerable health disparity.

Trends and Disparities

The majority of lead poisoning in Massachusetts is caused by lead paint particles in older homes (constructed prior to 1978)¹²⁹. There is no safe level of lead exposure. When lead is ingested or inhaled, lead poisoning results. Lead poisoning can harm the neurological system, kidneys, and brain. Lead is more easily absorbed by children, which children between 9 months and 6 years of age being more at risk.

Massachusetts designated Lowell as one of 19 communities with high-risk for childhood lead poisoning due largely to the high concentration of housing built before 1978 (Table 11). Pre-1978 housing accounts for 79.8% of the housing in Lowell; the next highest concentration of pre-1978 housing is in Chelmsford, with 66.1%.

Table 11: Percent of Homes Built Before 1978, by community

	Percent of Homes
Billerica	61.9
Chelmsford	66.1
Dracut	54.7
Dunstable	35.1
Lowell	79.8
Tewksbury	47.9
Tyngsborough	29.1
Westford	42.6
MA State Total	68.9

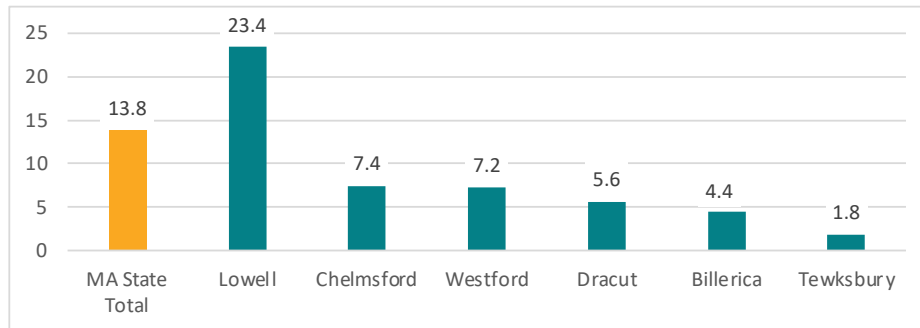
Source: MA Department of Public Health 2020 Annual Childhood Lead Poisoning Surveillance Report

128 <https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles>

129 MEPHT

The average annual prevalence of children with blood lead levels (BLL) greater than 5 ug/dL (representing an elevated BLL) remains significantly higher than the state prevalence in Lowell (Figure 60). The five-year annual average for Lowell between 2017 and 2020 is 23.4 per 1,000 children, well above the state prevalence of 13.8 per 1,000.

Figure 60: Average Prevalence of Estimated Confirmed BLL > 5 ug/dL, 5-year Annual Average, 2017-2020, children age 9 months- 48 months, by community



Source: MEPHT; Tyngsborough is not included due to unstable data; Dunstable is not included because its annual rate is 0.0.

In addition to housing, transportation is a critical component of the built environment that contributes to environmental health. Access to robust, reliable public transportation options is one feature of the built environment that can significantly contribute to a reduction of carbon emissions. In Greater Lowell, Lowell had the highest percent of people who did not own a car who took public transportation, followed by Dracut and Tewksbury. Forty-three percent of those in Lowell taking public transportation had a commute of 60 minutes or more.

Utilization of the Lowell Regional Transit Authority (LRTA) bus system was dramatically impacted by the COVID-19 pandemic, including reduced service offerings as well as an 80% drop in demand for public transportation services.¹³⁰ Since then, ridership has increased but has not yet returned to pre-pandemic levels. Utilization of the LRTA is much higher among riders with lower educational attainment, therefore disruptions in ride services are more likely to impact these community members. Additionally, community members who do not have drivers' licenses, including people who are elderly, people with disabilities, and recent immigrants, are also more likely to utilize public transportation options for every-day needs, including accessing medical appointments and care. Investment in public transportation options has far-reaching implications for wellbeing that go beyond the positive environmental health impact of these programs.

Recommendations

Improvements to the built and natural environment yield benefits to all community members, but specific efforts must be undertaken to ensure that those benefits are equitably distributed. People who are low-income, non-white, or have disabilities are more likely to be exposed to a range of environmental hazards, including poorer quality air and water, which people who are higher income are more likely to have access to clean parks, green spaces, and other high-quality environments.

130 Comprehensive Regional Transit Plan Update 2020. https://lrta.com/wp-content/uploads/2021/04/LRTA_CRTPU_MAS-TER_20210216_clean_508.pdf

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address environmental health include the following:

- The Lowell Health Department developed PSAs to provide education about the risks associated with heat stroke, with particular focus on people who are homeless or who use substances and are therefore at increased risk
- Lowell General Hospital produced and distributed a Tick Fact Sheet to provide education about Lyme disease prevention
- \$40,000 in GLHA grant funding to the Lowell Parks and Conservation Trust to increase equitable access to trails particularly for people who are aging and who speak a language other than English

Future Actions

Healthcare System Recommendations

- Provide education and resources to patients regarding potential exposures to lead and options for remediation
- Increase visibility of recycling programs throughout all hospital properties, for staff and patients
- Partner with local Asthma Coalition and other community groups to share data regarding local disparities in pediatric asthma as a tool for increasing community efforts to provide in-home environmental evaluations to identify and remediate potential asthma, or other respiratory disease, triggers
- Partner with local conservation trusts and other land management groups to incorporate trail and park signage highlighting the health benefits of access to green spaces

Community System Recommendations

- Consider incentives for landlords and building managers who use safer pesticides or engage in other environmental interventions, like reducing standing water, to dissuade pests
- Assess community spaces for urban heat islands effects and consider implementing green space interventions
- Increase community charging spaces for electric vehicles
- Increase the quantity and quality of parks, sidewalks, and trails to promote equitable access for all
- Support advocacy for policies that promote the reduction of air and water pollutants throughout the community
- Increase community engagement with the maintenance and safe use of natural waterways to incentivize community-driven protection efforts to keep waterways clean

10. Violence

“We need better relationships with the Police department, better community Policing”

— Survey Participant

Overview

Violence plays a significant role in physical health (via acute injury and chronic conditions resulting from injury), psychological health (via the impact on mental wellbeing associated with exposure to violence), and community health (via the impact on community economics, the role of police, shared community trauma and sense of community identity and belonging).

In the 2019 Community Health Assessment, community members requested including a safety assessment as part of the needs assessment; the 2019 and 2022 Community Health Survey therefore include an item that invites participants to rank safety issues, including a range of experiences of violence, in terms of priority. Because this item is separate from the item that invited participants to rank health issue, the scores cannot be compared in the ranking. However, significant and profound community input, as well as ample public health data identifying violence as a critical community health concern, justifies its inclusion on our ranked list.

In the Community Health Survey, participants ranked Discrimination Based on Race as their highest ranked safety item (score 1400), followed by Domestic Violence (1034), and Sexual Assault/Rape (842). Several other safety issues involving violence were also highly ranked, including bullying, human trafficking, unsafe gun ownership, and assault. (Table 14)

Table 12: Community Health Survey Safety Item Rankings

Rank	Item	Weighted Score
1	Discrimination based on race	1400
2	Domestic violence	1034
3	Sexual assault/rape	842
4	Bullying	537
5	Discrimination based on sex/gender	488
6	Human trafficking (i.e. labor trafficking)	430
7	Unsafe/illegal gun ownership	418
8	Other violent crime (i.e. assault)	411
9	Illegal drug sales	411
10	Discrimination based on immigration status	386
11	Property crimes (i.e. vandalism, theft)	344
12	Unsafe driving	314
13	Discrimination based on class/income	264
14	Discrimination based on sexuality	249
15	Gang activity	200
16	Discrimination based on age	174

Source: Community Health Survey, 2022

Though there was no specific question in focus group or key informant protocols about safety, the current assessment did collect qualitative data on safety. Of the participants who left written comments on the survey, twelve specifically mentioned safety issues, including gang-related violence, resources for people experiencing domestic violence, and fear of reporting to police in their community.

Sexual Assault

Sexual victimization, which includes sexual assault, rape, and childhood sexual abuse, is associated with a range of acute and chronic negative health outcomes, including physical injury, sexually transmitted infections, unwanted pregnancy, post-traumatic stress disorder, depression, and increased engagement in higher-risk health behaviors like substance use.

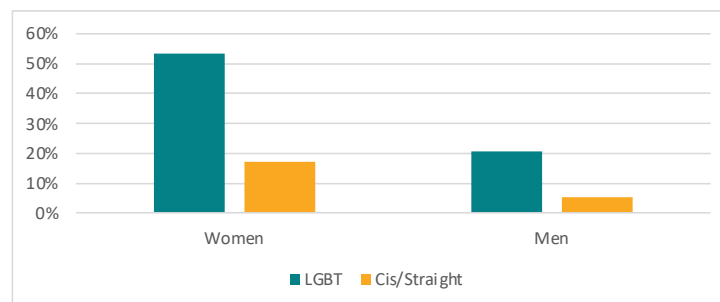
Trends and Disparities

The state rate of lifetime experience of sexual violence has remained relatively consistent between 2018 and 2020.¹³¹ Overall, Massachusetts women report experiencing sexual violence in their lifetime at a rate between 20.6% and 24.6%, representing between 1 in 5 and 1 in 4 women; for Massachusetts men, the lifetime prevalence rate is approximately 6.2%.

State level data reveals slight changes in rates of lifetime sexual assault prevalence by race and ethnicity for women (state level data does not provide trends for male victimization by race/ethnicity). Overall, since 2015, the lifetime prevalence of women experiencing sexual victimization has increased, from 15.7% in 2015 to 20.1% in 2020.¹³² For white residents, the increase has followed the state trend (15.8% in 2015 and 20.6% in 2020). For Black residents (for whom data is only available for 2018-2020), there was a significant decline in lifetime prevalence from 2018 to 2019 (26.3% to 16.6%) but a steep increase between 2019 to 2020 (22.8%). Hispanic women in Massachusetts have seen an opposite pattern with a significant decrease from 25.1% to 19.0%.

Significant differences in the lifetime prevalence of sexual violence occur as a function of disability status. Massachusetts women with a disability experience sexual violence at a rate twice that of women without a disability (30.0% versus 16.9% in 2020); for men, the rate is closer to three times as high for men with a disability (11.1% versus 4.7%).¹³³ Similarly, both men and women who are LGBTQ+ experience sexual victimization at a rate significantly higher than their cisgender and heterosexual peers, with LGBTQ+ women experiencing violence at three times the rate of female peers and LGBTQ+ men experiencing violence at four times the rate of male peers (Figure 61).

Figure 61: Lifetime Prevalence of Experiencing Sexual Violence, by LGBTQ+ Status, Massachusetts 2020



Source: BRFSS Compiled Reports, 2020

131 Results from combined 2018-2020 Massachusetts Behavioral Risk Factor Surveillance System data, Health Survey Program, Massachusetts Department of Public Health

132 BRFSS Compiled Reports, 2015-2020

133 BRFSS Compiled Reports, 2020

In Greater Lowell in 2021, 99 sexual assaults were reported to law enforcement, though low reporting rates likely indicate this is a significant underestimation of the rate of sexual assaults that occurred in the community.¹³⁴ A majority occurred in Lowell (44), though every community except Dunstable reported at least one sexual assault to police (Table 13). Most communities reported an increase in sexual assaults, except for Chelmsford and Tyngsborough which reported fewer sexual assaults in 2021 than in 2020. A majority of sexual assaults involved a person the victim knew (either a family member, partner, or acquaintance).

Table 13: Sexual Assault Data by Town/City, 2020

	Lowell	Billerica	Chelmsford	Dracut	Tewksbury	Tyngsborough	Westford
Total Reported in 2020	44	8	13	8	18	3	5
% Change Since 2019	+ 12.82	+166.7	- 7.1	+ 300.0	+ 50.0	- 25.0	+ 66.7
% Involving Known Assailant	75.6	87.5	100.0	100.0	69.2	50.0	100.0
Victim Characteristics							
Female	88.6	100.0	91.7	87.5	88.9	67.0	100.0
White	75.0	87.5	53.8	100.0	61.1	100.0	80.0
Black	6.8	NA	NA	0.0	16.7	0.0	20.0
Asian	15.9	NA	NA	0.0	NA	0.0	NA

Source: NIBRS 2021 Data

Domestic Violence

Domestic violence (DV), sometimes referred to as Intimate Partner Violence (IPV) or dating violence, is similar to sexual violence in that it imparts a wide range of acute and chronic physiological and psychological injury. People who experience DV may experience significant barriers to accessing care and treatment, including fear of repercussions from their abuser, financial abuse that limits their resources, or the belief that they are undeserving of help and care. Nationally, about 1 in 4 women and 1 in 10 men experience violence or stalking by an intimate partner in their lifetime.¹³⁵

Trends and Disparities

Massachusetts residents report slightly higher rates of lifetime exposure to DV compared to the national average. Nearly 34% of Massachusetts woman and 31.7% of men report ever experiencing DV in their lifetimes.¹³⁶ Rates of DV-related homicides have varied considerably at the state level, to a peak of 28 in 2019, which dropped off steeply in 2020 to 9, but then saw a rise in 2021 to 15 deaths.

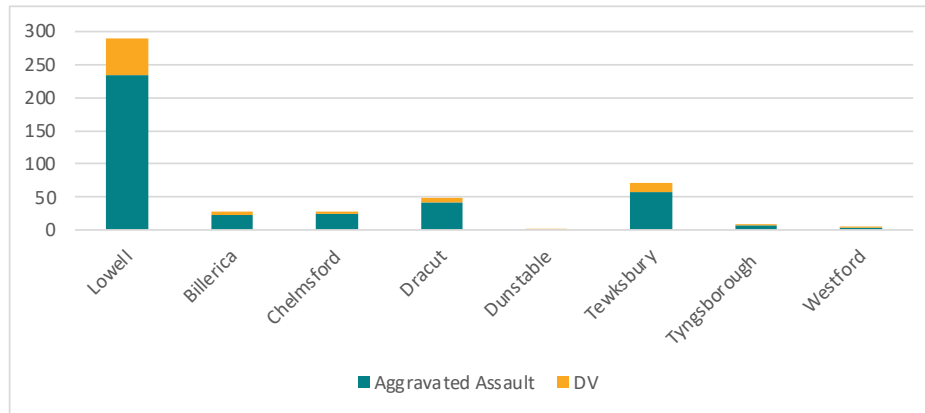
¹³⁴ National Incident Based Reporting System (NIBRS) via <https://masscrime.chs.state.ma.us/tops/>

¹³⁵ Smith, S.G., Zhang, X., Basile, K.C., Merrick, M.T., Wang, J., Kresnow, M., Chen, J. (2018). The National Intimate Partner and Sexual Violence Survey (NISVS): 2015 Data Brief – Updated Release. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

¹³⁶ National Center for Injury Prevention and Control (2019). The national intimate partner and sexual violence survey: 2010-2012 State Report. Centers for Disease Control and Prevention. Retrieved from <https://www.cdc.gov/violenceprevention/pdf/NISVS-StateReportBook.pdf>.

Of the 480 reports of aggravated assault filed in the Greater Lowell region in 2021, 88 incidents (16.9%) involved victimization by an intimate partner (Figure 62). Rates varied slightly by community; 19.5% of Tewksbury’s reported aggravated assaults involved DV, followed by 19.0% in Lowell, 14.9% in Dracut, 14.8% in Billerica, and 12.0% in Chelmsford. Other communities have overall reported assaults too low to meaningfully assign a percent to the portion attributable to DV.

Figure 62: Portion of Aggravated Assaults Committed by an Intimate Partner, by city/town, 2021



Source: NIBRS 2021 Data

Disparities in DV rates and outcomes are significant at the national and state level. At the national level, Black women have the highest incident rate for DV, at 4.7 per 100,000, followed by white women (3.9) and Hispanic women (2.8).¹³⁷In Massachusetts, despite a lower incidence rate, Hispanic women are three times as likely to be killed by a partner compared to non-Hispanic women; Black women are killed by a partner at four times the rate of white women in Massachusetts. Immigrants in Massachusetts are also at greater risk of homicide by a partner, with a rate twice that of their U.S.-born counterparts.¹³⁸

Several factors increase the barriers people face when attempting to leave DV situations. People who are primary caregivers for their children, and therefore less likely to earn income independent of their working partner, may struggle financially to make a plan to leave their partners. People who are undocumented, or whose documents are kept from them, are also at increased risk of being victimized by partners. People who require care due to health needs or disability are also at increased risk of abuse. Additionally, access to resources related to DV may be limited due to lack of transportation or lack of English literacy.

Other Violent Crimes

Violent crimes include rape, robbery, aggravated assault, and murder. In addition to concerns about sexual assault and domestic violence, participants in the needs assessment were also concerned about assault more broadly, gun violence, and violence involving gangs. Violent crime victimization can have profound impacts related to injuries, as well as lifelong psychological consequences that impact victims’ engagement with health services, ability to work or pursue education, and social relationships.

137 Truman, J. & Morgan, R. (2014). Nonfatal domestic violence 2002-2013. National Crime Victimization Survey. US Dept of Justice, Bureau of Justice Statistics. Available at: <http://www.bjs.gov/content/pub/pdf/ndv0312.pdf>.

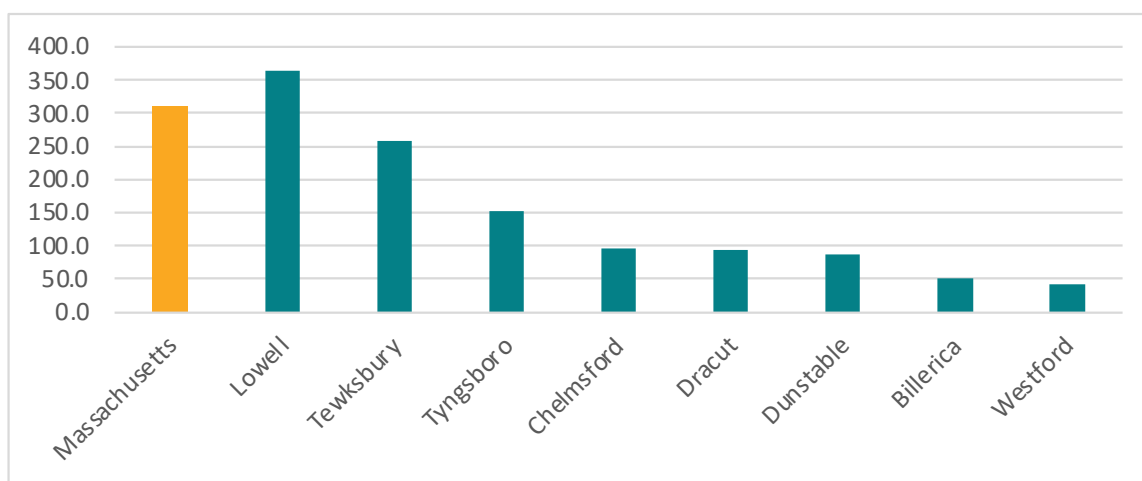
138 Chen, I (2011). Chronological and comparative trends in intimate partner homicide: Massachusetts 2003-2009. Yale University: New Haven CT

Trends and Disparities

The Massachusetts violent crime rate is lower than the national average, at about 309 per 100,000 compared to 388 per 100,000 nationally. Though the national rate of violent crime has increased, the Massachusetts rate decreased 5.7% from 2019 to 2020, though the state rate for homicides specifically increased by 5.3% during the same timeframe.¹³⁹

Lowell is the only Greater Lowell community with a violent crime rate higher than the state rate (363.5 per 100,000) (Figure 63). Tewksbury (257.8 per 100,000) has the second highest rate, followed by Tyngsborough (152.5). The remaining communities all have rates below 100 per 100,000 (though Dunstable's rate is 88.1, it is important to note that this is representative of only 3 violent crimes in total).

Figure 63: Violent Crime Rate Per 100,000 Residents, by city/town, 2019



Source: FBI Crime Statistics, Massachusetts, Offenses Known to Law Enforcement, 2019

139 Federal Bureau of Investigation Crime in the United States Database, Accessed at <https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/violent-crime>

The types of violent crimes that are most prevalent in each community vary. Lowell was the only community to record any homicides in 2019, reporting 4 (.9% of the total violent crimes in Lowell) (Table 14). Lowell also reported the highest proportion of robberies a 24.7% of total violent crimes in the city. All communities reported aggravated assault as the most frequently occurring violent crime.

Table 14: Frequency of Types of Violent Crimes, by town/city, 2019

	Total Violent	Murder/ nonnegligent manslaughter		Rape		Robbery		Aggravated	
	n	n	%	n	%	n	%	n	%
Billerica	22	0	0.0%	2	9.1%	2	9.1%	18	81.8%
Chelmsford	34	0	0.0%	4	11.8%	1	2.9%	29	85.3%
Dracut	30	0	0.0%	2	6.7%	4	13.3%	24	80.0%
Dunstable	3	0	0.0%	0	0.0%	0	0.0%	3	100.0%
Lowell	405	4	0.9%	20	4.9%	100	24.7%	281	69.4%
Tewksbury	81	0	0.0%	23	28.4%	7	8.6%	51	63.0%
Tyngsboro	19	0	0.0%	4	21.1%	3	15.8%	12	63.2%
Westford	10	0	0.0%	0	0.0%	1	10.0%	9	90.0%

Source: FBI Crime Statistics, Massachusetts, Offenses Known to Law Enforcement, 2019

Of aggravated assaults in 2019, none of them involved a gun in Billerica, Dunstable, and Tyngsborough. Very few involved a gun in Chelmsford (3.1%) and Tewksbury (2.7%), however a larger percentage of assaults in Dracut (16.0%), Westford (16.7%) and Lowell (20.5%) involved a gun.

Discrimination and Structural Violence

Exposure to discrimination is linked to a range of negative health outcomes due to the impacts of prolonged, sustained stress on the body physiology and psychology.¹⁴⁰ Exposure to discrimination is also associated with higher engagement in negative health behaviors, which contribute to acute and chronic health issues.

Since the 2019 assessment, community engagement around concerns related to discrimination, oppression, and structural violence has increased in visibility. Racism was ranked the number one safety concern of survey participants in the 2022 Community Health Survey. This was a considerable change since the 2019 Community Health Survey. In 2019, only 14.9% of participants ranked Discrimination Based on Race as one of their top three safety priorities; in the 2022 Community Health Survey, 27.9% of participants ranked racial discrimination as one of their top three safety concerns. Similarly, in 2019, discrimination based on race was not within the top five safety concerns for white, non-Hispanic participants while ranking second among non-white participants. However, in the current assessment, racial discrimination was ranked the top safety concern across all participants, as well as among white, non-Hispanic participants.

140 Pascoe EA, Smart Richman L. Perceived discrimination and health: a meta-analytic review. *Psychol Bull.* 2009 Jul;135(4):531-54. doi: 10.1037/a0016059. PMID: 19586161; PMCID: PMC2747726.

Additional discrimination categories saw increases in prioritization as well, with discrimination based on sex/gender increasing from 3.9% to 11.5% and discrimination based on sexuality climbing from 4.4% to 7.3% (Table 15).

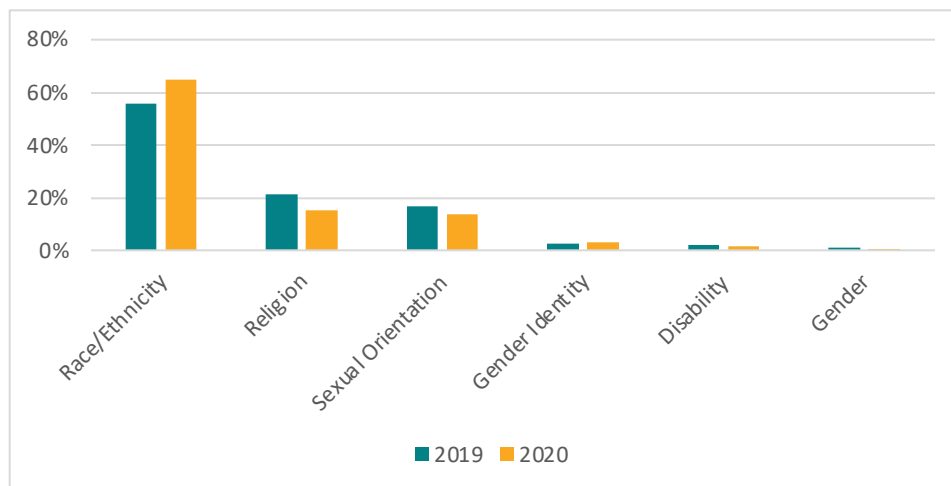
Table 15: Percent of Community Health Survey Participants Ranking Discrimination-Based Safety Items in Their Top Three Priorities

	2019	2020	Change
Discrimination based on Race	14.9	27.9	+13.0
Discrimination based on Sex/Gender	3.9	11.5	+7.6
Discrimination based on Immigration Status	9.2	10.2	+1.0
Discrimination based on Class/Income	8.8	6.8	-2.0
Discrimination based on Sexuality	4.4	7.3	+2.9

Trends and Disparities

Nationally, the total number of hate crimes rose from 2019 to 2020, from 7,103 single incidents to 8,052 single incidents.¹⁴¹ The proportion of hate crimes attributable to discrimination based on race, ethnicity, or ancestry rose considerably during the same timeframe, accounting for 55.8% of hate crimes in 2019 compared to 64.9% in 2020 (Figure 64). The increase was driven primarily by an overall increase in the total crimes against Black and African-American people, which account for 56% of racially-motivated hate crimes, but also a significant increase in the number of hate crimes motivated by anti-Asian bias, which increased from 161 in 2019 to 274 in 2020.

Figure 64: Proportion of U.S. Hate Crimes by Motivation, 2019 to 2020



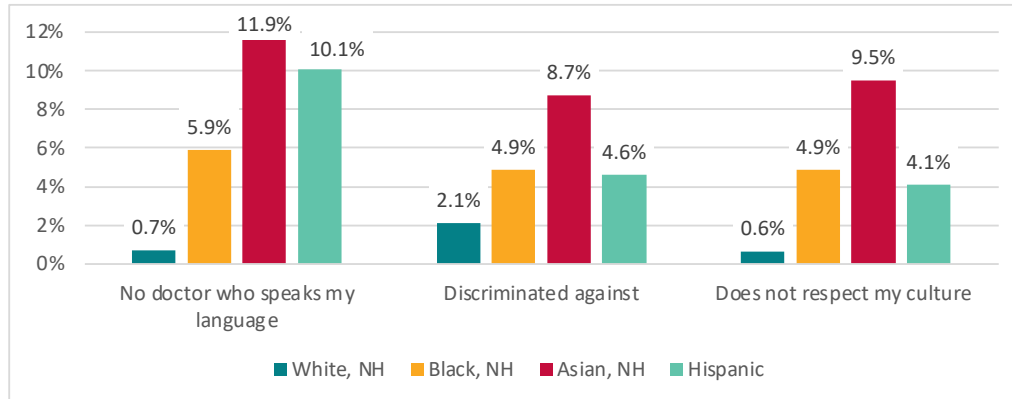
Source: FBI's Uniform Crime Reporting (UCR) Program

Between 2019 and 2021, sixteen hate crimes incidents were recorded with law enforcement in Greater Lowell.¹⁴² A majority (56.3%) were filed in Chelmsford, driven by several incidences of destruction of property and vandalism. Of all hate crimes filed between 2019 and 2021, a majority (56.2%) were racially motivated, followed by crimes motivated by anti-gay bias (25.0%) and religious bias (18.8%).

A 2021 survey of Massachusetts residents reported that Black, non-Hispanic residents were twelve times as likely to report experiencing discrimination in the previous year compared to white, non-Hispanic residents (24% versus 2%).¹⁴³ Hispanic residents (12%) were six times as likely to report discrimination compared to white, non-Hispanic residents, followed by American Indian/Alaskan Native residents (13%), multiracial residents (23%), and Asian residents (23%). The report also found that people experiencing discrimination were more likely to have health problems than those who were not experiencing discrimination, including obesity, kidney disease, high blood pressure, heart disease, diabetes, asthma, and COPD.

Participants in the 2022 Community Health Survey reported that they experienced being discriminated against by a doctor or other medical provider (2.5% of all participants), or that they could not find a provider who spoke their language (2.5%) or couldn't find a doctor who respected their cultural practices or beliefs (1.5%). However, significant differences in rates of experiencing these kinds of discrimination were observed. For example, compared to white, non-Hispanic participants, Asian, non-Hispanic participants were sixteen times more likely to report not being able to find a doctor who spoke their language, four times more likely to report being discriminated against by a doctor, and 15 times more likely to report not being able to find a doctor who respects their culture (Figure 65). Black, non-Hispanic participants and Hispanic participants were also significantly more likely to report these types of discrimination compared to white, non-Hispanic participants.

Figure 65: Discrimination Experiences by Race/Ethnicity



Source: 2022 Community Health Survey

Additional differences were also observed for other populations. For example, people who were born outside the U.S. were more likely than the general survey population to report not being able to find a doctor who speaks their language (9.8% versus 2.5%), more likely to report discrimination (3.2% versus 2.5%) and more likely to have difficulty finding a doctor who respects their culture (5.2% versus 1.5%). People who identified as LGBTQ+ were also much more likely to report being discriminated against (7.8%) and struggling to find a provider who respects their culture (3.0%).

142 NIBRS 2019-2021 Data

143 CCIS: Race Population Spotlights and Discrimination, June 8, 2021.

Recommendations

Exposure to violence, in its many forms, is a significant predictor of health outcomes and dramatically reduces individual and community wellbeing. Reducing violence and its far-reaching impacts requires not only interventions to prevent and respond to victimization, but also interventions that address more insidious forms of violence in the form of discrimination and structural violence.

Past Actions

Since the 2019 Community Health Needs Assessment, efforts to address violence include the following:

- A \$10,000 GLHA grant to the International Institute of New England to provide domestic violence education and support to refugees in Greater Lowell
- A \$5,000 GLHA grant to the Middlesex Community College Law Center to support mediation options in juvenile court
- \$430,000 Department of Justice grant to the Center for Hope and Healing to provide services and resources for youth victims of human trafficking
- Establishment of the Lowell Youth Leadership Program to provide free summer programming to youth to increase community engagement and pro-social opportunities
- \$630,000 in funding from the Shannon Grant to support violence prevention efforts via a coalition of stakeholders including the Lowell Police, UTEC, Tewksbury's Ironstone Farm, the West End Gym, the Boys & Girls Club of Greater Lowell, and others
- A \$25,000 GLHA grant to the Boys & Girls Club to incorporate training and workshops on Racism, Discrimination and Health
- A \$25,000 GLHA grant to the Center for Hope and Healing to collaborate with local schools to increase capacity for in-school support of LGBTQ/T youth, especially youth of color

Future Actions

Healthcare System Recommendations

- Increase the number of Sexual Assault Nurse Examiners (SANE) who speak languages other than English
- Evaluate adherence to universal implementation of violence screenings during healthcare visits
- Increase collaboration with area domestic violence resources to streamline immediate referrals for emergencies
- Increase resources for staff who experience violence on the job
- Increase the number of providers engaging in trainings related to providing trauma-informed care
- Evaluate and develop an implementation plan to eliminate experiences of discrimination experienced by patients in healthcare settings

Community System Recommendations

- Incorporate age-appropriate violence prevention education through schools and after-school programming, including education on consent, healthy relationships, and respecting diversity
- Engage faith leaders to provide culturally-specific support and education regarding healthy relationships and resources for safely escaping violence
- Consider offering gun buy back days in each Greater Lowell community

- Increase the capacity of expert organizations to provide skills-based trainings regarding identifying and safely intervening when witnessing discrimination and violence (for example, bystander intervention trainings)
- Incentivize business to employ people who may traditionally experience barriers to employment (for example, people returning from incarceration, or people who are homeless, or people who may need assistance securing work documents) to interrupt the cycles of poverty that cultivate crime
- Evaluate the effectiveness of community policing strategies via community listening sessions, and consider incorporating community feedback into policing behaviors in order to strengthen trust between communities and their police
- Maintain lighting in streets (including encouraging homes to leave on porch lights) to increase outdoor safety during nighttime hours

Resources

Centralized Resource Hub
WellConnected.Net
Local Health Departments
Billerica Board of Health
Chelmsford Board of Health
Dracut Health Department
Dunstable Board of Health
Lowell Health and Human Services Department
Tewksbury Police Department
Tyngsboro Health Department
Westford Health Department
Early Childhood Services
Acre Family Child Care
Community Teamwork Inc.
Healthy Families
Lowell Women, Infants and Children (WIC)
March of Dimes
Maternal Child Health Task Force-Greater Lowell Health Alliance
Project BEAM Early Intervention
South Bay Community Services
Thom Anne Sullivan Center
Elder Services
AgeSpan
Atrius Health-Chelmsford
Billerica Council on Aging
Caregiver Homes
Chelmsford Senior Center
Circle Home
Dracut Council on Aging
D'Youville Life and Wellness Community
Element Care
Glenwood Care and Rehab
Greater Lowell Elder Mental Health Collaborative
Home Away from Home
Lowell Senior Center
Senior Whole Health
Summit Elder Care-Lowell
Tewksbury Council on Aging
Town and Country Healthcare Center

Tyngsborough Senior Center
Westford Council on Aging
Employment Services
Greater Lowell Workforce Board
Merrimack Valley Workforce Investment Board
Faith-based Organizations
Bethany Christian Services
Chelmsford Unitarian Church
Christ Jubilee International Ministries
Merrimack Valley Catholic Charities
Salvation Army
Community Garden Programs
Mill City Grows
Food Bank
Merrimack Valley Food Bank
Food Pantries
Central Food Ministry
Chelmsford Community Exchange
Christ Church United
Christ Jubilee Food Pantry
Community Christian Fellowship
Dharma Food Pantry
Dracut Food Pantry
Dwelling House of Hope
Hope Dove
Lowell Public Schools Pantry-Rogers Street
Merrimack Valley Catholic Charities
Open Pantry Greater Lowell
Salvation Army
Tewksbury Community Food Pantry
Westford Food Pantry
Legal Aid Services
Justice Resource Institute CBS
Merrimack Valley Legal Services, Inc.
Northeast Legal Aid
Multi-Service Cultural Agencies
African Center of the Merrimack Valley
Cambodian Mutual Assistance Association (CMAA)
International Institute of New England-Lowell
Latin American Health Institute
Massachusetts Alliance of Portuguese Speakers (MAPS)
PFLAG
Recreational Services

Chelmsford Wellness Center
Greater Lowell YMCA
Lowell National Historical Parks
Lowell Parks and Conservation Trust, Inc.
Lowell Parks and Recreation
SLS Fitness
Shelter & Domestic Violence Services
Alternative House
Brigid's Crossing
House of Hope
Living Waters, Center of Hope
Lowell Transitional Living Center
Transportation
LRTA
Youth & Adolescents
Boys and Girls Club of Greater Lowell
Girls, Inc.
Greater Lowell Pediatrics
Healthy Futures
History UnErased
Lowell Community Health Center TeenBLOCK
Middlesex Partnership for Youth
Safe Families for Children
Safe Routes to School
Tewksbury Cares
United Teen Equality Center (UTECE)
Wayside Youth and Family Support Network
The NAN Project
YWCA of Lowell
Youth Build
Health Care Services
Hospital Services/Primary Care and Medical Specialty Care Services
Blue Cross Blue Shield of Massachusetts
Boston Medical Center HealthNet Plan
CHC Nursing
Circle Health
Damien Folch Family Practice
Lowell Community Health Center
Lowell Crisis Team
Lowell General Hospital
Mass Health
Metta Health Center
Network Health

Pawtucket Pharmacy
Tewksbury Hospital
Tufts Medicine
United Health Care
Walgreens Pharmacy
Behavioral Health (Mental Health & Substance Use)
Adcare
Arbour Counseling Services Haverhill
Baystate Counseling
Billerica Substance Abuse Program
Bridgewell/Pathfinder
Center for Hope and Healing
Clean Slate Centers
Column Health
Farnum Center
Frontline Initiative
Greater Lowell Psychiatric Associates
Habit Opco, Inc.
Institute for Health and Recovery
Learn to Cope
Life Connection Center
Lowell House Addiction Treatment and Recovery Inc.
Lowell & Lawrence Drug Courts
Lowell Tobacco Control
Massachusetts Department of Mental Health
Megan's House
Mental Health Association of Greater Lowell
Merrimack Valley Trauma Services
Northeast Behavioral Health
Northeast Tobacco Free Partnership
Northeast Recovery Learning Community
Place of Promise
Samaritans of the Merrimack Valley
Solomon Mental Health Center
Southbay Outpatient and Community Behavioral Health Clinic
Stoney Brook Counseling Center
Tewksbury Detox Center
Tewksbury Treatment Center
Tobacco Free Mass
The Phoenix
Vinfen

Ambulance Services
Lowell General Hospital-Paramedics
PRIDESTar EMS
Education, Advocacy, Research & Planning Organizations
Academic
Billerica Public Schools
Chelmsford Public Schools
Dracut Public Schools
Greater Lowell Technical High School
Innovation Academy Charter School
Lowell Adult Education Center
Lowell Middlesex Academy Charter School
Lowell Public Schools
Middlesex Community College
Merrimack Valley Area Health Education Center (AHEC)
Salem State University
Tewksbury Public Schools
Tyngsboro Public Schools
University of Massachusetts Lowell
Westford Public Schools
Wilmington Public Schools
Business and Community Development
Aramark
Coalition for a Better Acre
Entrepreneurship for All (E for All)- Lowell
Eastern Bank
Enterprise Bank
Gallagher & Cavanaugh, LLP
Greater Lowell Chamber of Commerce
Lowell Telecommunications Corporation
Marcia Cassidy Communications
Project Learn
Philanthropy
Greater Lowell Community Foundation

Appendix A:

Summary of Scores by Primary Data Source

Survey Ranking of Health Resource Priorities, with Weighted Total

	First (n)	Second (n)	Third (n)	Total	Weighted Total
Access to healthy food	324	204	126	654	1506
Affordable, safe housing	294	200	139	633	1421
Access to mental health services	274	200	148	622	1370
Public education	165	135	137	437	902
Emergency health services	78	104	124	306	566
Preventative health services (like physicals, screenings, etc.)	56	80	103	239	431
Affordable childcare	48	67	90	205	368
Services for older adults (ages 65 or older)	45	62	84	191	343
Accessibility for people with disabilities	52	69	53	174	347
Substance use treatment	25	34	73	132	216
Emergency housing/shelter	27	57	34	118	229
Services for adolescents (ages 10 to 19)	18	40	60	118	194
Reliable, high-speed internet access	12	34	54	100	158
Services for veterans	28	37	35	100	193
Substance use prevention	11	32	43	86	140
Public transportation	17	28	40	85	147
Public parks	11	23	36	70	115
Dental services	9	20	37	66	104
Eye care	5	17	20	42	69

Survey Ranking of Health Issue Priorities, with Weighted Total

	First (n)	Second (n)	Third (n)	Total	Weighted Total
Mental health (i.e. depression, anxiety, PTSD, eating disorders)	460	225	174	859	2004
Heart health (i.e. hypertension, heart disease)	215	157	135	507	1094
Lung & breathing health (i.e. asthma, COPD)	116	72	51	239	543
Cancer	108	61	94	263	540
Substance use disorder/problems with substances (i.e. opioids, cocaine)	46	121	114	281	494
Infant & child health (i.e. breastfeeding/chestfeeding, infant mortality, vaccination, childhood diseases)	62	97	93	252	473
COVID-19	83	50	108	241	457
Environmental health (i.e. insect illnesses, lead exposure, air quality)	48	89	97	234	419
Pregnancy health (i.e. prenatal care, mortality, childbirth)	39	102	52	193	373
Autoimmune health (i.e. Type 1 diabetes, rheumatoid arthritis, multiple sclerosis)	56	69	47	172	353
Nutrition	31	41	61	133	236
Reproductive & sexual health (i.e. pregnancy prevention, PCOS, sexually transmitted infections)	22	46	47	115	205
Type 2 Diabetes	23	42	47	112	200
Alzheimer's disease and related dementias	21	43	44	108	193
Hearing, vision and mobility impairments	23	34	34	91	171
Alcohol use disorder/problems with alcohol	11	29	69	109	160
Other infectious disease (i.e. tuberculosis, Hep C, the flu)	6	7	23	36	55
HIV/AIDS	4	9	3	16	33

Combined Survey Ranked Priorities, with Major and Subcategories, with Final Weighted Scores

Rank	Item (combined categories)	Final Score
1	Mental Health	2005
2	Chronic Disease Heart Health Autoimmune Health Nutrition Type 2 Diabetes	1883
3	Substance Use Substance Use Disorder Alcohol Use Disorder	654
4	Reproductive, Sexual, and Pregnancy Health Pregnancy Health Reproductive and Sexual Health	578
5	COVID-19 and Other Infectious Disease COVID-19 Other Infectious Disease	452
6	Lung and Breathing Health	543
7	Cancer	540
8	Infant and Child Health	473
9	Environmental Health	419

Focus Group Density Scores

Topic Area	Category (subcategories)	Density score
Health Issues		
	System Navigation and Access Lack of education/information Inadequate healthcare Insurance	88.6
	Mental Health	68
	Substance Use	23.5
	Food Insecurity and Nutrition	18.5
	Housing and Homelessness	13.8
	COVID-19	12.2
	Chronic Health Issues Obesity Heart Health Asthma	10.5
	Transportation	7
	Environmental Health Lead Exposure	5.5

	Dental and vision	5
	Violence	3.5
Health Resources		
	Healthcare Providers Lowell General Hospital Lowell Community Health Center Circle Health providers Services in Boston Urgent cares Tewksbury Hospital	59.7
	Substance Use Services Peer support Boston Medical Center Sober homes Life Connections Bridge Clinic Frontline Initiative Lowell Transitional Living Center Bridge Club Lowell COOP Recovery Café	22.5
	Community-Based Organizations/Non-profits Community Teamwork, Inc Greater Lowell Health Alliance Coalition for a Better Acre YMCA Lions Club Cambodian Mutual Assistance Association	21
	Social and Public Services Veteran's Office Public transportation Health department Medicaid/Medicare	15.5
	Services for Seniors	12.5
	Educational Services	9.7
	Mental health services	8
	Churches	8
	Services for Children and Youth	7.5
Special Populations		
	Immigrants, refugees, and undocumented people	42.5
	Elderly	27.3
	Low-income people	24.5
	Children and youth	22.7
	People with substance use disorder	19.8

	Racial and ethnic minorities Latino/Hispanic Asian/Asian American Black/African	10.5
	People who are homeless	7.5
	People without technology	5.5
	Parents/caregivers	5
	LGBTQ+T	4
	Veterans	2
Barriers to Health Services		
	Navigating the health system Lack of knowledge Scheduling appointments/wait times Insurance Consent/parental approvals ID/documentation	91.1
	Transportation	47.8
	Language barriers	45.7
	Cost	33
	Mistreatment, mistrust, discrimination	27.3
	Stigma	26.5
	Childcare	10.5
	Mental health barriers	8.3
	Technology	7.7

Key Informant Density Scores

Topic Area	Category (subcategories)	Density score
Health Issues		
	Mental Health	25
	Chronic Illness Nutrition Obesity Asthma	18
	Substance Use	15
	General Access and Equity	10
	Housing	5
	Smoking	4
	COVID and Infectious Disease	4
	Tick and insect illnesses	2
Populations of Focus		
	Immigrants and refugees	11
	Elders	8
	Infants, children and youth	7
	People in poverty	6
	People who are homeless	4
	People with existing health issues	3
	LGBQ+T	2
Barriers to Health Services		
	System navigation and access	25
	Transportation	12
	Cost	12
	Fear, mistrust and stigma	11
	Lack of technology	5
	Lack of education	5
	Language barriers	5

Appendix B: Operationalization of Ranked Items, by data source

	Type of Data	Operationalization	Example: Data	Example: Score
Survey	Quantitative (Ranked Items)	<ul style="list-style-type: none"> - Participants rank items 1, 2, or 3 - Each rank is given a weight - Weights are summed - Items are ranked according to score 	Mental Health Rank 1: 460 Rank 2: 225 Rank 3: 175	Rank 1: $460 \times 3 = 1380$ Rank 2: $225 \times 2 = 450$ Rank 3: $175 \times 1 = 175$ TOTAL SCORE: 2005 RANK: 1
Focus Groups	Qualitative (Notes) to Quantitative (Density)	<ul style="list-style-type: none"> - Notetakers identify themes - Notetakers count endorsements - Counts are summed & averaged - Theme counts are summed & ranked in descending order 	Mental Health Focus Group 1, Notetaker 1: 9 mentions Focus Group 1, Notetaker 2: 7 mentions Average: 8 mentions	Mental Health FG1 Average: 8 FG2 Average: 11 FG3 Average: 5 TOTAL DENSITY: 68 RANK: 1
Key Informants	Qualitative (Transcript Codes) to Quantitative (Density)	<ul style="list-style-type: none"> - Themes are identified and groups from interview transcripts - Counts for themes are identified across all transcripts - Themes are summed & ranked in descending order 	Mental Health KI1: 2 mentions KI2: 0 mentions KI3: 2 mentions	Mental Health Total mentions: 25 RANK: 1

