2021

Athol Hospital and Heywood Hospital
COMMUNITY HEALTH NEEDS ASSESSMENT

Heywood Healthcare

ATHOL HOSPITAL | HEYWOOD HOSPITAL | HEYWOOD MEDICAL GROUP | QUABBIN RETREAT

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

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INTRODUCTION

Abstract

The introduction section of this report highlights the study partners and gives an overview of Heywood Healthcare – Athol Hospital and Heywood Hospital. This section concludes with an overview of the CHNA process and an executive summary of each chapter of the report.

Introduction

This report serves as Heywood Healthcare – Athol Hospital and Heywood Hospital's 2021 Community Health Needs Assessment. The following chapters present qualitative and quantitative data for the Heywood Healthcare – Athol Hospital and Heywood Hospital's Service Area.

Acknowledgements

Study Partners

Partners in this study include Heywood Healthcare, Montachusett Regional Planning Commission (MRPC), UMass Memorial Health - HealthAlliance-Clinton Hospital (HealthAlliance-Clinton Hospital or HA-C), North Quabbin Community Coalition (NQCC), and the Community Health Network of North Central Massachusetts CHNA 9 Group (CHNA-9). Descriptions of these organizations are provided below:

About Us

Heywood Healthcare – Athol Hospital and Heywood Hospital

Athol Hospital is a Critical Access, non-profit acute care hospital serving the nine communities of the North Quabbin Region. The hospital's service area includes the towns of Athol, Erving, New Salem, Orange, Petersham, Phillipston, Royalston, Warwick, and Wendell. Athol Hospital features a highly trained staff of dedicated professionals providing diagnosis and treatment in all major medical disciplines. The Athol Hospital campus features acute care treatment facilities, including fully equipped operating room suites, 24-hour emergency rooms, and a Swing Bed program, which transitions beds from acute care to sub-acute care to accommodate the rehabilitation needs of recovering patients. Our Outpatient Services includes on-site cardiac specialists, high tech laboratory, radiology, cardio-pulmonary testing, and a short-stay unit.

Heywood Hospital is a non-profit community-owned hospital licensed for 134 bed hospital, located in Gardner, Massachusetts. The Hospital is located forty-five minutes northwest of Worcester and one hour from Boston, Heywood Hospital's primary service area includes the City of Gardner and the towns of Ashburnham, Hubbardston, Templeton, Westminster, and Winchendon. Heywood offers medical surgery, specializing in bariatrics and orthopedics, and services including telemetry and intensive care, emergency care, maternity and pediatrics, geriatric and adult inpatient care, inpatient adult mental health, outpatient oncology and hematology, advanced imaging, special procedures, a skilled nursing sub-acute care unit, rehabilitation services and many others on an inpatient and outpatient basis.

Athol Hospital and Heywood Hospital is part of Heywood Healthcare, an independent, community-owned healthcare system serving north central Massachusetts and southern New Hampshire. Heywood

Healthcare is governed by a local community Board of Trustees. Heywood Healthcare employs over 1400 employees. The Medical Staff includes 400+ active, courtesy, and consulting physicians in primary care and a multitude of specialties. It is comprised of Heywood Hospital; Athol Hospital, a 25-bed not-for-profit, Critical Access Hospital in Athol, MA; Heywood Medical Group, with primary care physicians and specialists located throughout the region; The Quabbin Retreat, providing treatment of mental health and substance misuse. The organization also includes Heywood Rehabilitation Center, Heywood Family Medicine and Urgent Care in Gardner; Winchendon Health Center and Murdock School-based Health Center in Winchendon; Athol Community Elementary School-based Health Center and Tully Family Medicine and Walk-in in Athol; Miller's River Health Center in Orange; and Heywood Medical Group Specialty Care in Rindge, NH. The organization also includes the Heywood Healthcare Charitable Foundation.

Our Vision: To be one of the best community health systems in America.

Our Mission: To be our communities' trusted choice for exceptional patient-centered care.

Our C.A.R.E. Values:

Compassion
Attitude
Respect
Excellence

Athol Hospital Website: http://www.atholhospital.org/

Heywood Hospital Website: http://www.heywood.org/

Montachusett Regional Planning Commission (MRPC)

The Montachusett Regional Planning Commission is in its fourth decade of providing technical planning assistance to its 22-member communities. Located in north central Massachusetts, the MRPC was formed in 1968 under the State Enabling Legislation Massachusetts General Law Chapter 40B and is one of thirteen regional planning agencies across the Commonwealth. MRPC's purpose is to carry out comprehensive planning in the Montachusett Region, an area of approximately 685 square miles that is home to some 228,000 individuals.

Website: http://www.mrpc.org/

UMass Memorial Health - HealthAlliance-Clinton Hospital

UMass Memorial Health - HealthAlliance-Clinton Hospital is a not-for-profit, full service, acute care hospital with a primary service area including Ashburnham, Ashby, Bolton, Clinton, Fitchburg, Gardner, Harvard, Lancaster, Leominster, Lunenburg, Princeton, Sterling, Townsend, and Westminster. As a member of UMass Memorial Health - HealthAlliance-Clinton Hospital offers direct access to the advanced medical technology and specialty services that are part of the region's academic medical center.

The HealthAlliance-Clinton Hospital system includes:

- 163-bed community hospital with services on three campuses in Clinton, Fitchburg (Burbank) and Leominster
- Simonds-Sinon Regional Cancer Center
- Simonds-Hurd Complementary Care Center
- Outpatient physical therapy centers
- Home health and hospice agency

In total, HealthAlliance-Clinton Hospital has more than 1,600 employees and 400 physicians, providing 40 health care specialties.

Website: https://www.umassmemorialhealthcare.org/healthalliance-clinton-hospital

CHNA 9 Group (CHNA-9)

The Community Health Network Area of North Central Massachusetts (CHNA 9) is one of 27 CHNAs across Massachusetts created by the Massachusetts Department of Public Health in 1992. The CHNA 9 area includes the communities of Ashburnham, Ashby, Ayer, Barre, Berlin, Bolton, Clinton, Fitchburg, Gardner, Groton, Hardwick, Harvard, Hubbardston, Lancaster, Leominster, Lunenburg, New Braintree, Oakham, Pepperell, Princeton, Rutland, Shirley, Sterling, Templeton, Townsend, Westminster, and Winchendon. CHNAs are an initiative to improve health through local collaboration. CHNA 9 is a partnership between the Massachusetts Department of Public Health, residents, hospitals, local service agencies, schools, faith communities, businesses, boards of health, municipalities, and other concerned citizens working together to:

- Identify the health needs of member communities
- Find ways to address those needs
- Improve a broad scope of health in these communities

Website: http://www.chna9.com/index.html

Project Description

The 2021 Community Health Needs Assessment (CHNA) of Heywood Healthcare – Athol Hospital and Heywood Hospital presents issues related to the health, wellbeing and related factors that impact the health of those living in Heywood Healthcare – Athol Hospital and Heywood Hospital's (referenced as Heywood or HH for the remainder of this document) catchment area (from here on referred to as the "Service Area"). This study was a collaborative effort conducted by Heywood, the Montachusett Regional Planning Commission, HealthAlliance-Clinton Hospital, and the CHNA 9 Group. Various other organizations and individuals also contributed to this effort, including community-based organizations and health service partners, community coalitions, residents, public health officials and local schools. Staff at the Montachusett Regional Planning Commission (MRPC) were responsible for conducting research and analysis efforts for this study. MRPC is located in Leominster, Massachusetts.

Qualitative Activities

The qualitative work was completed with the combined efforts of Heywood Healthcare, MRPC, and HealthAlliance-Clinton Hospital. We greatly appreciate all the organizations who helped organize our 18 Focus Groups as well as the 200+ participants.

Quantitative and Qualitative Data Analysis

Montachusett Regional Planning Commission (MPRC) staff: Executive Director Glenn Eaton, Senior Planners Jennifer Burney and Blair Haney, Principal Planners Matt Leger and Bruce Hughes, as well as interns Rhiannon Dugan and Nick Mellis.

CHNA Purpose

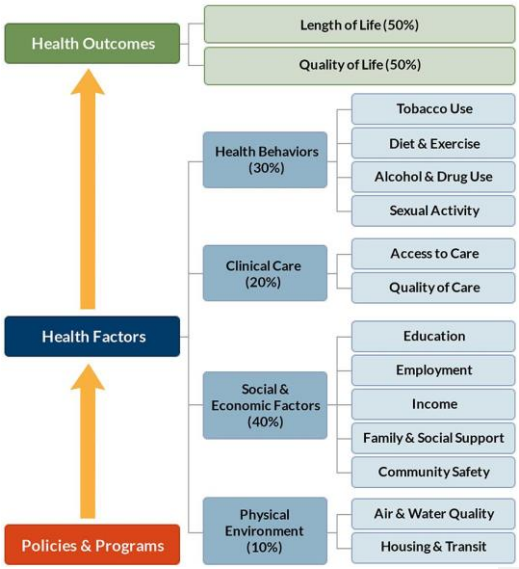
The 2021 CHNA study provides a comprehensive overview of the health status, issues and concerns of residents, social determinants, and health inequities as well as assets that currently exist to provide services to locals in need. This study also explores relevant social issues affecting health and wellbeing that exist across the Service Area, and even cross over bordering communities. This report builds on the 2018 CHNA, also written by MRPC, and is intended to inform local residents, government officials, businesses, community organizations, and other relevant stakeholders of the health status of their communities, compared with the last report and using the most up-to-date and comprehensive quantitative and qualitative data.

Throughout this study, special attention was paid to "communities within communities", health disparities and health equity, as well as the impacts of the COVID-19 pandemic. Study researchers were careful to ensure that information and insights from population groups under-represented by race, gender, class, disability, and geography were collected from surveys, focus groups, and State and National data. This report's intent is to provide a comprehensive review of Heywood Healthcare's Service Area which will help inform their Community Health Improvement Plan (CHIP). The CHIP identifies areas of health needs and priority populations with strategies to improve the health outcomes of residents and workers in the Service Area.

CHNA & CHIP

As stated above, the purpose of the CHIP is to serve as a roadmap for the development of a comprehensive, accessible, equitable health care system capable of providing the highest quality services in a cost-effective manner to those who live and work in their service area. With this in mind, the CHNA and the CHIP provide vital information that will be used by Heywood Healthcare and other stakeholders to help drive the region's community health improvement plan and identify community health strategies that will address community need and show public health value.

Figure 1: COMMUNITY HEALTH IMPROVEMENT FRAMEWORK

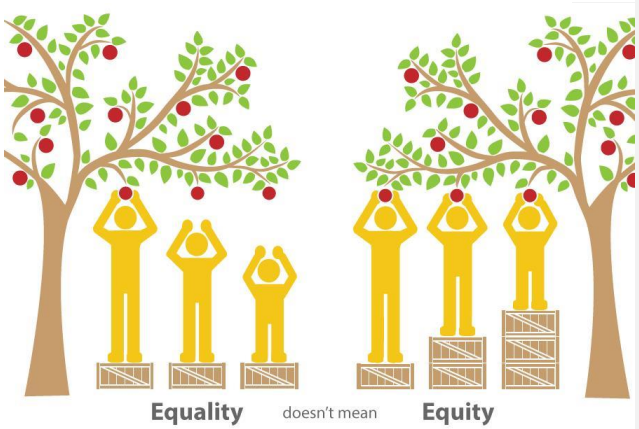


The Massachusetts Attorney General's Office, through the Community Benefits Guidelines, have established a set of priorities which are intended to be used to focus the community benefit work of hospitals. These priorities include: 1) Support of the Commonwealth's Health Care Reform Agenda, 2) Chronic Disease Management in Disadvantaged Populations, 3) Reducing Health Disparities, 4) and Promoting Wellness of Vulnerable Populations. Moreover, there is a growing appreciation that health system improvements related to access and the capacity and quality of health care services have a relatively limited impact on overall health status, at least on their own; research shows that only 10-20% of one's overall health is attributable to clinical services; the remainder is linked to genetics, behavior, and social and physical environments. To have real and sustained impact on overall well-being and the health disparities that exist in Heywood's CBSA, the Hospital and its partners must also address the underlying social determinants, inequities, and injustices that are at the root of the health status issues that exist.

In providing guidance related to the development of the CHNA, Heywood was clear that in addition to assessing health service gaps, capacity, utilization, and the distribution of health services that the assessment needed to consider a more extensive array of quantitative and qualitative data related to

the underlying social determinants of health. It was important that these issues be considered when identifying community health priorities and developing the strategic action steps that would be at the heart of the CHIP.

Figure 2: HEALTH EQUITY

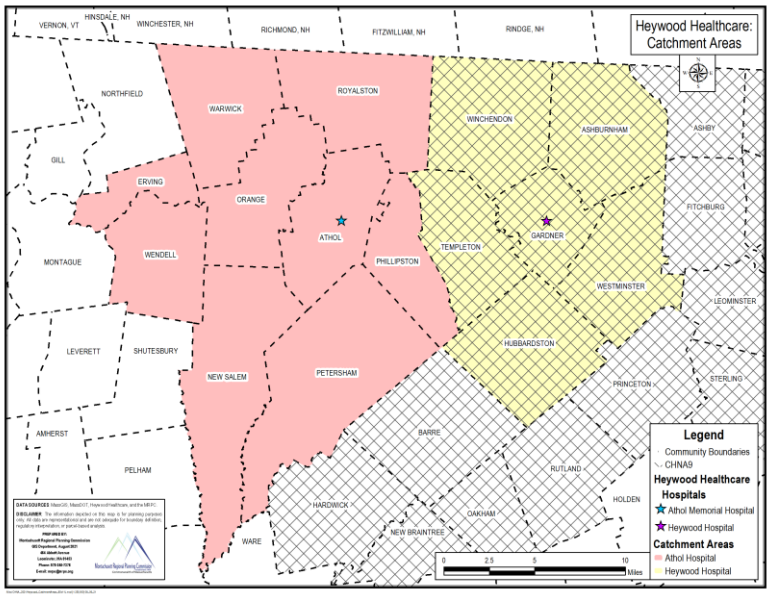


Health equity is the attainment of the highest level of health for all people. Each of our Focus Group meetings began by asking, "How do you define a "healthy community"?" Achieving health equity requires valuing everyone equally with intentional efforts focused and reducing barriers and addressing avoidable inequalities, underlying socioeconomic factors, and historical and contemporary injustices. Ultimately, the goal of health equity is the elimination of health and health care disparities.

Description of the Service Area

Heywood Healthcare's Service Area includes the quasi-urban city of Gardner, large towns (>10,000 population) of Athol and Winchendon, mid-sized towns (5,000-10,000) of Ashburnham, Orange, Templeton, and Westminster, and the rural towns (<5,000) of Hubbardston, Erving, New Salem, Petersham, Phillipston, Royalston, Warwick, and Wendell. While great efforts are made to improve the health status, provide diagnostic screening, and address access barriers of all residents within these communities, special attention is given to address the needs of diverse and/or low income, vulnerable segments of the population. Census data and qualitative information from our survey and focus groups showed that many of the cities/towns in the Hospitals' service area have significant proportions of low income, racially and ethnically diverse, foreign born, and/or geographically isolated residents. The challenges that these cohorts face with respect to social determinants of health and access to care are often intense and are at the root of the challenges and poorer health outcomes faced in these communities.

Map – 1 Service Area Communities and Hospital Locations



Methodology & Data Sources

Framework Guiding the Community Health Needs Assessment Process

The process of organizing and crafting a Community Health Assessment is a collaborative one. Throughout the process, stakeholders across all communities that make up Heywood's Service Area were engaged in focus group sessions, discussions, and surveys that informed insights for this report. In the background, the public health professionals at Heywood Healthcare and the Massachusetts Department of Public Health, as well as staff at the Montachusett Regional Planning Commission (MRPC) were hard at work collecting and analyzing quantitative data on a swath of key data points for all 15 communities in the Service Area from sources like the US Census Bureau, the American Community Survey, and the Massachusetts Department of Public Health. This section provides an overview of the process required to complete this report using a guiding framework that directed the efforts of Heywood Healthcare and the MRPC.

Community Health Assessment Guiding Framework

The following section describes the process undertaken by Heywood Healthcare and MRPC to conduct the 2021 Community Health Needs Assessment (CHNA).

1. Set Agenda

The Heywood Healthcare leadership gathered with MRPC staff in November 2020 for a planning session to discuss the CHNA process and requirements. The group established an agenda for the report, identifying key data points as desired from the healthcare group as well as those required of the CHNA according to the Internal Revenue Service (IRS). From there a timeline was crafted by the team for reaching critical milestones and tasks were delegated to Heywood and MRPC staff. Heywood's staff along with MRPC also gathered input from the CHNA Advisory Group made up of department heads from Athol and Heywood Hospitals, the CHNA-9 Group, other relevant community partners, and community residents.

2. Data Collection

Qualitative and quantitative data was collected by various staff at Heywood and the MRPC over the succeeding months. Healthcare provider and community focus groups were conducted by MRPC staff, and an online survey was distributed across the Service Area. The data and information collected through these activities were used to provide public input on health issues facing local residents. Secondary data sources like the US Census, the American Community Survey, the Massachusetts Department of Labor and Workforce Development, and the Massachusetts Department of Public Health, for example, were used to quantify data critical to painting a full picture of the health status of the Service Area.

3. Data Analysis

The data collected during step two was then organized into tables, graphs, and graphics and analyzed by MRPC and Heywood Healthcare staff. MRPC staff reviewed the latest data against the 2018 report's data to identify trends and service gaps. The analysis is summarized in beginning of each chapter under the highlights section.

4. Draft Report

The analysis done by Heywood Healthcare and MRPC staff was then written into a narrative by several staff at MRPC. This was meant to provide a reader with explanations of the data to help make sense of the large amount of data in front of them.

5. Review and Edit

The draft report was then peer reviewed by subject matter experts, partner organizations and presented to the CHNA Advisory Committee for quality assurance and recycled to the MRPC for final edits.

6. Public Comment

A draft report was shared with the Community Benefits Advisory Committee for review and comment.

7. Board Approval

A draft report was presented to the Heywood's Board of Trustees for final approval.

Data Collection

Quantitative data for this report came from Massachusetts Public Health Information Tool (Mass PHIT) data from the Massachusetts Department of Public Health (MassDPH); the Youth Risk Behavior Survey (YRBS) data; US Census data (including data from the American Community Survey); and other Commonwealth and Federal Government organizations and agencies. All data were subject to rigorous review, fact-checking and verification processes.

Qualitative data was gathered through Focus Groups and a community survey. Both data gathering efforts were managed by MRPC and included communities, organizations, and people from the Service Area of Heywood and HealthAlliance-Clinton Hospital. Below is the list of joint Focus Groups conducted by MRPC on behalf of the two hospital systems and the primary quantitative data sources.

Figure 3: FOCUS GROUPS & DATA SOURCES

18 Focus Groups	• Gardner Community Action Team (03.09.21) • Patient & Family Advisory Council (03.18.21) • Clinton Area Partnership (03.24.21) • Gardner Chamber of Commerce (03.25.21) • North Quabbin Food Alliance (03.29.21) • Clinton Community Stewards (03.30.21) • Schwartz Rounds (04.07.21) • CHNA-9 BHMHSU (04.08.21) • Youth Change Leaders (04.14.21) • Transportation Group (04.20.21) • North Central Homelessness Task Force (04.21.21) • GAIT (04.23.21) • Transportation Group II (04.28.21) • Care Transitions Group (05.04.21) • Racial Justice Group (05.17.21) • LGBTQ+ Group (05.19.21) • Disabilities Group (05.20.21) • Veterans Group (05.21.21)
Quantitative Data Sources	• US Census/American Community Survey (ACS) • Mass Department of Workforce Development (DWD) • Youth Behavior Risk Survey (YRBS) • Mass Department of Public Health (DPH) • Mass Department of Mental Health (DMH) • Behavioral Risk Factor Surveillance Survey (BRFSS)

Quantitative Data Sources

US Census Data

The Census Bureau's mission is to serve as the leading source of quality data about the nation's people and economy. We honor privacy, protect confidentiality, share our expertise globally, and conduct our work openly.

We are guided on this mission by scientific objectivity, our strong and capable workforce, our devotion to research-based innovation, and our abiding commitment to our customers.

Website: https://www.census.gov/en.html

[Due to COVID-19, delays in the 2020 decennial Census data collection process did not allow for MRPC to use 2020 Census data for this report]

American Community Survey Data (American Fact Finder)

The American Community Survey (ACS) is a nationwide survey designed to provide communities a fresh look at how they are changing. It is a critical element in the Census Bureau's decennial census program. The ACS collects information such as age, race, income, commute time to work, home value, veteran status, and other important data. As with the 2010 decennial census, information about individuals remains confidential.

The ACS collects and produces population and housing information every year instead of every ten years. Collecting data every year provides more up-to-date information throughout the decade about the US population at the local community level. About 3.5 million housing unit addresses are selected annually, across every county in the nation.

The ACS produces 1-year estimates annually for geographic areas with a population of 65,000 or more. This includes the nation, all states and the District of Columbia, all congressional districts, approximately 800 counties, and 500 metropolitan and micropolitan statistical areas, among others.

The ACS produces 3-year estimates annually for geographic areas with a population of 20,000 or more, including the nation, all states and the District of Columbia, all congressional districts, approximately 1,800 counties, and 900 metropolitan and micropolitan statistical areas, among others.

In 2010, the Census Bureau released the first 5-year estimates for small areas. These 5-year estimates are based on ACS data collected from 2005 through 2009.

Website: https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

Mass Department of Labor and Workforce Development Data

The Executive Office of Labor and Workforce Development manages the Commonwealth's workforce development and labor departments to ensure that workers, employers, and the unemployed have the tools and training needed to succeed in the Massachusetts economy.

Website: https://www.mass.gov/orgs/executive-office-of-labor-and-workforce-development

Youth Risk Behavior Surveillance System Data

The Youth Risk Behavior Surveillance System (YRBS) monitors six types of health-risk behaviors that contribute to the leading causes of death and disability among youth and adults, including:

- Behaviors that contribute to unintentional injuries and violence

- Sexual behaviors related to unintended pregnancy and sexually transmitted diseases, including HIV infection
- Alcohol and other drug use
- Tobacco use
- Unhealthy dietary behaviors
- Inadequate physical activity

YRBS also measures the prevalence of obesity and asthma and other priority health-related behaviors plus sexual identity and sex of sexual contacts.

YRBS includes a national school-based survey conducted by CDC and state, territorial, tribal, and local surveys conducted by state, territorial, and local education and health agencies and tribal governments. Website: https://www.cdc.gov/healthyyouth/data/yrbs/index.htm

Behavioral Risk Factor Surveillance System Data

The Behavioral Risk Factor Surveillance System (BRFSS) is the nation's premier system of health-related telephone surveys that collect state data about US residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. Established in 1984 with 15 states, BRFSS now collects data in all 50 states as well as the District of Columbia and three US territories. BRFSS completes more than 400,000 adult interviews each year, making it the largest continuously conducted health survey system in the world.

Website: https://www.cdc.gov/brfss/index.html

Mass Department of Public Health

DPH regulates, licenses, and provides oversight of a wide range of healthcare-related professions and services. Additionally, the Department focuses on preventing disease and promoting wellness and health equity for all people. Information is available for residents, providers, researchers, and stakeholders.

Website: https://www.mass.gov/orgs/department-of-public-health

Mass Department of Mental Health

Most mental health services, including medication and therapy are provided through health insurance – MassHealth (Medicaid), the Massachusetts Health Connector (health insurance marketplace) or through private insurance (employer-based). The Department of Mental Health (DMH) has a specialized role in the healthcare delivery system as DMH provides supplemental services for people with the most serious needs.

Website: https://www.mass.gov/orgs/massachusetts-department-of-mental-health

Qualitative Data Sources

As is common practice in a CHNA, the qualitative data for this report was gathered from community leaders and members of the communities in Heywood's Service area. This is an incredibly important step in the CHNA process, as it is meant to collect insights on the public health concerns and assets as

experienced by real people every single day. The collection of quantitative data often lags the reality "on the street" experienced by Service Area residents and workers. These insights were used to clarify and authenticate the concerns of local residents and deepen the researchers' understanding of the real problems occurring in these communities, as close to real-time as possible. Qualitative data was gathered from Focus Groups and a community survey.

All focus groups hosted by MRPC were joint focus groups for both Heywood and HealthAlliance-Clinton Hospital as an effort by both hospitals to collaborate on addressing the needs of area residents. MRPC facilitated information sharing between both hospitals.

The survey was also a joint survey, and the responses reflect those of both Service Areas' residents and workers. The survey was made available to both health care organizations' Service Area using their website and email lists. The survey received 1,341 responses and 47% completion rate.

Focus Group Methodology:

Staff at MRPC held 18 focus groups (see list above with public/private sector leaders and community members across various HealthAlliance communities. All focus groups were conducted virtually via Zoom to ensure safety of participants during the pandemic. An MRPC staff member typically facilitated questioning and conversation for the session. The Focus Group sessions would last anywhere from 60 to 90 minutes.

Focus Group Facilitation and Content:

All focus groups were conducted virtually via Zoom to ensure safety of participants during the pandemic. Focus groups lasted from 60 to 90 minutes. The first 20 to 30 minutes were spent with all focus group participants in one room where they were asked two questions (see below). The groups were then broken up into 2 or 3 breakout rooms based on the communities which service area (Heywood Hospital, Athol Hospital, or HealthAlliance-Clinton Hospital) they worked or lived in. These questions were typically used as conversation starters where additional questions were asked based on responses or the area of expertise present in the room.

Figure 4: FOCUS GROUP PROCESS

Provider/Community Voices Focus Group Questions
First 20 – 30 minutes: • In your mind, how do you define a "healthy community"? Probe: What are the key characteristics that help you paint a picture of what a health community looks like? • Now imagine you had an opportunity to completely rethink how healthcare services were delivered in your community…. What would you need to do to achieve your definition of a "healthy community"? Breakout Groups: • When it comes to HEALTH SUBJECT (e.g., food access and nutrition), what are the greatest challenges we are experiencing the region? • Has the HEALTH SUBJECT improved or worsened in the last few years? What has contributed to this change? • Which population segment is most affected by this HEALTH SUBJECT?

- What do you believe are some of the underlying root causes contributing to this health issue?
- How has COVID-19 impacted this health issue if at all? (Worse, better, same?)
- Are there assets or protective factors in your area that are available to help address these issues?
- Are there any organizations or programs in the region that stand out as working well toward this issue?
- Are you aware of any innovative or creative programs/policies/best practices that have been implemented successfully elsewhere that we should try and emulate?

Figure 5: FOCUS GROUP ATTENDENCE

FOCUS GROUP	TYPE	LENGTH	SIGN UPS
GARDNER COMMUNITY ACTION TEAM	PROVIDER	90 mins	26
PATIENT & FAMILY ADVISORY COUNCIL	COMMUNITY	90 mins	13
CLINTON AREA PARTNERSHIP	PROVIDER	90 mins	6
GARDNER CHAMBER OF COMMERCE	PROVIDER	90 mins	21
NORTH QUABBIN FOOD ALLIANCE	PROVIDER	90 mins	23
CLINTON COMMUNITY STEWARDS	COMMUNITY	60 Mins	9
SCHWARTZ ROUNDS	PROVIDER	60 mins	2
CHNA-9 BHMHSU	PROVIDER	90 mins	14
YOUTH CHANGE LEADERS	COMMUNITY	45 mins	10
TRANSPORTATION GROUP	PROVIDER	60 mins	10
NORTH CENTRAL HOMELESSNESS TF	PROVIDER	90 mins	2
GAIT	PROVIDER	60 mins	12
TRANSPORTATION GROUP	PROVIDER	60 mins	6
CARE TRANSITIONS	PROVIDER	90 mins	27
RACIAL JUSTICE	PROVIDER	90 min	29
LGBTQ+	PROVIDER	60 mins	3
DISABILITIES	PROVIDER	60 mins	9
VETERANS	PROVIDER	60 mins	7
TOTAL = 18 Focus Groups			**229**

Survey Distribution

Methodology:

Staff from Heywood, HealthAlliance-Clinton Hospital, and MRPC discussed and finalized 22 survey questions to be distributed to the general public for comment. A copy of the survey can be found in Appendix B. The survey was left open from January 2021 to May 2021 on SurveyMonkey.com. Heywood, HealthAlliance-Clinton Hospital, MRPC advertised the survey link on their respective websites and emailed to their distribution lists, and a text message with a survey link sent to the Heywood Medical Group patients.

Analysis and Results:

Surveys filled out by community members on SurveyMonkey.com were analyzed using the "Analyze Results" feature on the MRPC's SurveyMonkey profile. Respondents completed 1,321 surveys with 41% completing all questions. The questions in 2021 were identical to the questions in 2016 to allow for comparison and identifying trends. Final results can be found in Appendix B; however, a couple of multi-pronged questions are examined below to highlight community opinion on social determinants of health and community health issues.

Survey Conclusions:

Question #3 asked people their opinion about how the following list of community amenities impacted their "health and well-being?" Not surprisingly healthcare (76%) and public safety (75%) ranked highest in the "positively" column in 2016, and 80% and 79%, respectively, in 2021. Food systems also ranked high, but behind public safety, for both surveys, 69% in 2016 and 70% in 2021. Transportation (46% in 2016, 44% in 2021) and housing (42% in 2016, 42% in 2021) ranked similar in each survey, but lower than expected compared to the perceived impacts other amenities have on health and well-being. Transportation, or lack thereof, and unaffordable housing were regular themes in Focus Group discussions. Figure 6 (2016) and Figure 7 (2021) show results from Question 3.

Figure 6: (Survey Questions #3 - 2016) The following list includes amenities identified in your community as those that have some impact (positive or negative) on the health and well-being of the overall community. Please rank each based on how YOU BELIEVE they impact the health and well-being of the overall community.

	Negatively		Somewhat Negatively		Neither Positive nor Negative		Somewhat Positively		Positively		Not Applicable		Total
Healthcare Services (i.e., Hospitals, Urgent Care Centers, Community Health Centers, etc.)	52.00%	3	1.92%	11	4.72%	27	15.03%	86	76.22%	436	1.57%	9	572
Cultural Assets (i.e., Museums, Performing Arts Organizations, Public Spaces, etc.)	1.05%	6	5.10%	29	13.88%	79	21.09%	120	51.67%	294	7.21%	41	569
Recreational Assets (i.e., School-based Athletics Programs, Community Centers, Walking/Biking Trails, etc.)	0.69%	4	1.92%	11	6.42%	37	18.92%	109	67.53%	389	4.51%	26	576
Food System Assets (i.e., Full-Service Grocery Stores, Community Gardens, Farmer's Markets, etc.)	0.70%	4	3.50%	20	5.59%	32	17.66%	101	69.58%	398	2.97%	17	572
Public Safety Assets (i.e., Police and Fire Departments, Environmental Protection Agencies, etc.)	0.87%	5	2.10%	12	5.59%	32	13.99%	80	75.52%	432	1.92%	11	572
Employment Assets (i.e., Major Employers, Small Employers, Unemployment and Job Placement Services, etc.)	3.33%	19	7.86%	45	11.73%	67	24.52%	140	46.76%	267	5.78%	33	571
Transportation Assets (i.e., Public Transportation Providers,	4.90%	28	8.74%	50	11.01%	63	22.90%	131	46.68%	267	5.77%	33	572

Health Visit Transportation and Land Use Planning, etc.)													
Housing Assets (i.e., Homeless Prevention and Housing Organizations, Weatherization and Home Improvement Programs, etc.)	3.69%	21	8.61%	49	16.70%	95	22.85%	130	42.71%	243	5.45%	31	569
Educational Assets (i.e., Childcare and Preschool Providers, K-12 School Districts, Colleges and Universities, etc.)	0.70%	4	4.75%	27	8.96%	51	18.80%	107	60.81%	346	5.98%	34	569
Organizational Assets (i.e., Informal Groups and Meetings, Multi-Sector Coalitions, Local Charities, etc.)	1.24%	7	3.36%	19	17.70%	100	31.33%	177	40.71%	230	5.66%	32	565

Figure 7: (Survey Question #3 - **2021**) The following list includes amenities identified in your community as those that have some impact (positive or negative) on the health and well-being of the overall community. Please rank each based on how YOU BELIEVE they impact the health and well-being of the overall community.

	Negatively		Somewhat Negatively		Neither Positive nor Negative		Somewhat Positively		Positively		Not Applicable		Total
Healthcare Services (i.e., Hospitals, Urgent Care Centers, Community Health Centers, etc.)	1.50%	10	2.10%	14	5.24%	35	10.18%	68	80.39%	537	0.60%	4	668
Cultural Assets (i.e., Museums, Performing Arts Organizations, Public Spaces, etc.)	1.96%	13	3.46%	23	17.32%	115	21.08%	140	47.44%	315	8.73%	58	664
Recreational Assets (i.e., School-based Athletics Programs, Community Centers, Walking/Biking Trails, etc.)	0.60%	4	1.65%	11	9.76%	65	16.52%	110	68.17%	454	3.30%	22	666
Food System Assets (i.e., Full-Service Grocery Stores, Community Gardens, Farmer's Markets, etc.)	1.51%	10	1.66%	11	5.88%	39	17.80%	118	70.89%	470	2.26%	15	663
Public Safety Assets (i.e., Police and Fire Departments, Environmental Protection Agencies, etc.)	0.60%	4	0.75%	5	5.71%	38	11.56%	77	79.43%	529	1.95%	13	666
Employment Assets (i.e., Major Employers, Small Employers, Unemployment and Job Placement Services, etc.)	2.71%	18	6.93%	46	14.31%	95	18.07%	120	50.60%	336	7.38%	49	664
Transportation Assets (i.e., Public Transportation Providers, Health Visit Transportation and Land Use Planning, etc.)	4.22%	28	8.58%	57	15.06%	100	18.98%	126	44.58%	296	8.58%	57	664
Housing Assets (i.e., Homeless Prevention and Housing Organizations, Weatherization and Home Improvement Programs, etc.)	3.46%	23	8.42%	56	17.89%	119	18.95%	126	42.26%	281	9.02%	60	665
Educational Assets (i.e., Childcare and Preschool	1.36%	9	4.37%	29	11.01%	73	19.46%	129	56.26%	373	7.54%	50	663

Providers, K-12 School Districts, Colleges and Universities, etc.)													
Organizational Assets (i.e., Informal Groups and Meetings, Multi-Sector Coalitions, Local Charities, etc.)	2.11%	14	3.32%	22	19.46%	129	25.34%	168	42.84%	284	6.94%	46	663

Question #4 asks if certain community health issues changed for the better or worse. Substance abuse in 2016 was 34% worsened, but in 2021 dropped to 20%. In 2016, opioid problems were plaguing families, overextending community resources, and straining healthcare systems, not to mentioned regularly discussed in the news. Similarly, the Pandemic led to major upticks in social isolation (8% said it was worsening in 2016, 32% in 2021) and unemployment/poverty (11% in 2016 and 28% in 2021). Figure 8 (2016) and Figure 9 (2021) show results from Question 4.

Figure 8: (Survey Question #4 - **2016**) In past surveys, community members identified common themes or issues such as those listed, below. How have these issues "changed" IN YOUR COMMUNITY over the past few years?

	Worsened a Great Deal		Worsened Somewhat		Neither Improved nor Worsened		Improved Somewhat		Improved a Great Deal		Not Applicable		Total
Cost of Accessing and Utilizing Health Care	13.11%	73	29.26%	163	29.98%	167	16.52%	92	6.28%	35	4.85%	27	557
Language and Cultural Barriers	2.36%	13	11.98%	66	47.01%	259	17.06%	94	3.63%	20	17.97%	99	551
Mental Health, Depression, Suicide and Stress	14.31%	80	28.09%	157	24.87%	139	19.68%	110	5.90%	33	7.16%	40	559
Substance Abuse	34.47%	192	26.39%	147	12.93%	72	13.46%	75	5.57%	31	7.18%	40	557
Social Isolation	8.01%	44	28.05%	154	41.17%	226	9.84%	54	2.37%	13	10.56%	58	549
Transportation	6.99%	39	14.87%	83	50.00%	279	15.95%	89	3.05%	17	9.14%	51	558
Unemployment and Poverty	11.83%	66	28.14%	157	34.59%	193	15.05%	84	2.51%	14	7.89%	44	558
Chronic Conditions (i.e., Diabetes or heart disease, etc.)	6.49%	36	22.52%	125	46.13%	256	10.81%	60	3.24%	18	10.81%	60	555
Cancer	6.07%	36	22.52%	125	46.12%	251	9.93%	54	2.94%	16	13.23%	72	544
Environmental Conditions (i.e., Water or air pollution)	5.58%	31	21.58%	120	50.54%	281	13.49%	75	3.06%	17	5.76%	32	556
Violence and Public Safety	9.21%	51	24.91%	138	39.35%	218	18.41%	102	3.79%	21	4.33%	24	554
Oral Health	4.00%	22	11.82%	65	57.64%	317	14.00%	77	4.00%	22	8.55%	47	550

Figure 9: (Survey Question #4 - **2021**) In past surveys, community members identified common themes or issues such as those listed, below. How have these issues "changed" IN YOUR COMMUNITY over the past few years?

	Worsened a Great Deal		Worsened Somewhat		Neither Improved nor Worsened		Improved Somewhat		Improved a Great Deal		Not Applicable		Total
Cost of Accessing and Utilizing Health Care	10.33%	68	23.86%	157	35.41%	233	17.78%	117	7.90%	52	4.71%	31	658
Language and Cultural Barriers	2.28%	15	8.66%	57	43.62%	287	17.02%	112	5.93%	39	22.49%	148	658

Mental Health, Depression, Suicide and Stress	17.60%	116	27.47%	181	22.46%	148	17.30%	114	5.61%	37	9.56%	63	659
Substance Abuse	20.57%	136	27.69%	183	19.52%	129	13.16%	87	6.20%	41	12.86%	85	661
Social Isolation	37.27%	246	28.18%	186	17.58%	116	6.82%	45	2.42%	16	7.73%	51	660
Transportation	6.54%	43	17.35%	114	49.01%	322	10.96%	72	3.35%	22	12.79%	84	657
Unemployment and Poverty	28.48%	188	40.30%	266	17.12%	113	5.00%	33	1.52%	10	7.58%	50	660
Chronic Conditions (i.e., Diabetes or heart disease, etc.)	8.70%	57	26.87%	176	41.07%	269	8.09%	53	1.68%	11	13.59%	89	655
Cancer	8.50%	55	19.17%	124	45.60%	295	6.96%	45	3.40%	22	16.38%	106	647
Environmental Conditions (i.e., Water or air pollution)	7.01%	46	16.92%	111	49.39%	324	15.70%	103	2.74%	18	8.23%	54	656
Violence and Public Safety	8.38%	55	25.00%	164	41.77%	274	15.70%	103	2.59%	17	6.55%	43	656
Oral Health	5.82%	38	15.16%	99	52.83%	345	12.25%	80	3.37%	22	10.57%	69	653

Qualitative Data Conclusions

Qualitative data is summarized here to provide context for the quantitative chapters to follow. Qualitative data was only included in this report when mentioned multiple times in the Focus Groups and the survey. Comments from participants provided qualitative data for the study's authors to gain insights from the community and to help expand on quantitative findings. As mentioned, quantitative statistics lags the "on the ground" reality for many people, and the qualitative data can provide evidence of emerging issues or trends in real time. Community input can be found throughout the report in the form of anonymous quotes in corresponding sections of the narrative.

Qualitative Data Themes

Predominant themes throughout the survey and 18 Focus Groups included (order reflects frequency of topic):

1. **Healthcare Access and Health Equity:**
   - Everyone needs access to quality healthcare regardless of job status, income, immigration status, race/ethnicity, or sexual orientation/gender identity
   - Health providers need more training to better understand different races/ethnicities/cultures or needs (e.g., LGBTQ, Veterans)
   - Education on preventative health measures, health insurance and outreach to people in need

2. **COVID-19 Pandemic:**
   - Caused limited access to health care, delayed appointments, or procedures/surgeries
     - Not all patients have access to tele-health technology or reliable internet
     - COVID vaccination sign-up required online access at many locations.
   - Increased mental and behavioral health needs
     - Social isolation devastating to young people, elderly, and immune-compromised

    - Increased substance abuse overdose and relapse
- Significantly impacted the wellbeing of families as they struggle to afford necessities including housing, food, and childcare
    - Increased the demand for assistance with meeting basic needs (e.g., quality housing, food, childcare).
    - Women leaving the workforce to watch children at home from school, many are not returning.
    - Food insecurity became a massive issue during the pandemic as unemployment rose, supermarkets struggled to keep products on shelves, and children and elderly did not have access to school lunches and senior dining meals.
    - Delayed public response to reach non-English speaking residents, immigrants (afraid to seek help or sign-up for vaccine).
    - Digital Divide: Many low-income households had no access or limited access to the internet and computers during COVID. Broadband access provides numerous socio-economic benefits to households, including access to benefits, labor, education, healthcare, and social engagement. School age children with limited broadband and/or technology access fell behind during the Pandemic. In addition, with the closure of Senior Centers and libraries, elderly individuals lacked access to basic resources as well as social interactions.
    - Anecdotal evidence (with some quantitative statistics) that more children exposed to lead poisoning due to increased time at home; significantly reduced number of children placed in DCF care due to limited contact with adults required for mandatory reporting such as teachers and doctors.
    - Similarly, anecdotal evidence suggests incidences of domestic violence increased and/or were underreported

3. **Address Social Determinants of Health:**
    - Public transportation does not reach many neighborhoods or popular destinations like supermarket or health facilities; infrequency of schedule does not accommodate people with off-hour shifts or two jobs.
    - The combination of rising housing costs, low paying jobs, and unemployment contributed to declining housing stability costs of living contributed to declining housing stability and an increase in homelessness.
    - Financial wellness has a direct correlation on physical health and social well-being. While access to basic needs, including quality housing and healthy food access, should be a priority, livable wages and employment opportunities for low-income individuals need to be addressed.
    - Food insecurity continues to plague low-income population, leading to significant increases of health issues from insufficient nutrition. Many neighborhoods still lack easy access to supermarkets (food deserts) or the transportation to get to a supermarket.

POPULATION CHARACTERISTICS

Chapter 1

Abstract

This chapter provides a comprehensive overview of the population characteristics in Heywood Healthcare's 15 communities.

Chapter 1 - Population Characteristics

This chapter provides a comprehensive overview of the population characteristics for the 15 communities in Heywood Healthcare – Athol Hospital and Heywood Hospital's catchment area. Communities in the Service Area vary significantly in terms of their demographic, social, and economic factors. Some communities in Heywood Service Area are more rural while others are urban; others are more affluent while others are considered economically disadvantaged; some are more racially/ethnically diverse while others are considered more homogenous. Due to these factors, the health disparities and inequities experienced by people in the region vary widely from community to community.

This chapter highlights the following characteristics using data from the various quantitative sources listed in the introduction of this report:

- Demographics

Chapter Highlights

Demographics

- The overall population of the service area has grown only by 2.5% from 2010 to 2019. This rate is less than half of the U.S. overall (5.9%) and less than Massachusetts (5.0%).
- The service area has a median age nearly seven percent higher than the state and almost eight percent higher than the nation.
- The *average* percent of white population in the Service Area decreased by approximately 1.2% since 2016. During that same time, the black population remained the same, but the "Other" population increased by 0.6% and the Hispanic population increased by 0.7%.
- 20.4% Athol Hospital Health Area and 16.2% Heywood Hospital Health Area is 65 years and older compared to the State 17%.
- The rural nature of Heywood Healthcare's communities and the social isolation of older adults living alone makes it more challenging to access basic daily needs.
- There is a slightly greater prevalence of most disabilities in Franklin County when compared to Worcester County, the state, and the US.
- Patients spoke 30 different languages during Emergency Department (ED) visits in 2020; top three languages after English were Spanish, Korean, and American Sign Language.
- Veterans in the service area (9.2% of 18+) far exceeds the state (5%) and nation (6.9%), but only 23.9% of Service Area veterans claim a disability compared to the state (34%) and nation (29.9%)

Demographics

The demographics section highlights population characteristics that describe the Service Area's residents, including population size, growth, and distribution; age and gender differences; and population data to quantify several sociodemographic characteristics, including race/ethnicity, marital status, disability, and veteran status.

Population Size and Growth

The population throughout most of Heywood's service area grew over the last decade and a half. According to US Census data indicated in Table PC-1, from 2010 to 2019, Heywood's Service Area saw growth of 2.5%, from 84,296 to 86,438. This rate is less than half the rate of the US overall (5.9%) and less than the Commonwealth of Massachusetts (5.0%). It is important to note here that the population sizes of Heywood's communities' range widely, from as low as 796 in Warwick to as high as 20,610 in Gardner. Twelve (12) of Heywood Healthcare's 15 communities saw some population growth; three others, Warwick (-3.9%), New Salem (-3.4%), and Royalston (-2.5%), were the only communities to experience population decline.

Of Athol Hospital's communities, Petersham saw the highest population percentage increase since 2010 at 7.4%, followed by Wendell at 6.1 %, and Athol at 3.2%. Three of the Towns saw population decline: Warwick (-3.9%), New Salem (-3.4%), and Royalston (-2.5%).

Of Heywood Hospital's communities, no communities have seen population declines. Three of the six communities have five percent and over increases in population since 2010: Ashburnham (7.9%), Westminster (6.3%), and Winchendon (5.0%). Heywood Hospital's Service Area population is two times larger than Athol Hospital's and has experienced a more significant population increase since 2010 (3.7% vs. 0.3%). The community with the most significant population growth was Ashburnham at 7.9%, growing from 6,081 in 2010 to 6,281 in 2019. The next highest change occurred in Westminster, where the population grew from 7,277 to 7,766, a 6.3% increase.

PC - 1 Population Growth in the Service Area from 2010 to 2019

	Community	2010 Census	2015-2019 ACS	% change (from 2010)
Athol	**Athol**	11,584	11,713	3.2%
	Erving	1,800	1,740	1.1%
	New Salem	990	1,009	-3.4%
	Orange	7,839	7,644	1.8%
	Petersham	1,234	1,188	7.4%
	Phillipston	1,682	1,784	1.9%
	Royalston	1,258	1,366	-2.5%
	Warwick	780	796	-3.9%
	Wendell	848	862	6.1%
	Health Area Total	**28,015**	**28,102**	**0.3%**
He	**Ashburnham**	6,081	6,281	7.9%

Gardner	20,228	20,610	1.4%
Hubbardston	4,382	4,708	2.0%
Templeton	8,013	8,130	1.6%
Westminster	7,277	7,766	6.3%
Winchendon	10,300	10,841	5.0%
Health Area Total	**56,281**	**58,336**	**3.7%**
Service Area Total	**84,296**	**86,438**	**2.5%**
Franklin County*	71,372	70,577	-1.1%
Worcester County*	798,552	824,772	3.2%
Massachusetts*	6,547,629	6,892,503	5.0%
U.S.*	308,745,538	328,239,523	5.9%
Sources: 2010 Census; ACS 2015-2019 5-Year Estimates U.S. Census Bureau			

Age and Gender Distribution

Table PC-2 helps paint a picture of the age distribution in Heywood Healthcare's Service Area from 2019. The largest age group in Heywood's service area was 55 to 64 at 17.3%, followed by 45 to 54 at 13.3%. Older age groups experienced a steady decline, falling to 10.8% for the 65 to 74 group and 1.8% for those 85 and over. There was a roughly even concentration between the 5 to 14 (10.4%), 15 to 24 (11.7%), and 25 to 34 (13.2%) age groups, with a slight dip for the 35 to 44 group (11.2%). The most significant increase between two consecutive age groups was from minus 5 to 5 to 14 at 5.2%. The most considerable drop-off between the two age groups was from 65 to 74 to 74 to 85 at 4.6%.

The total percentage of the population within the Service Area age 65 and over was 18.6%. The population who was age 34 or younger combined for 37.7% of the population. Those aged 35 to 64 accounted for the most significant cluster concentration of the population at 43.5%.

Those identified as age 45 to 54, 55 to 64, and 65 to 74 reported such numbers at higher rates than the state and nation. Those identified as less than five, 15 to 24, and 25 to 34 reported such numbers notably lower than the state and nation. Particularly important, the census counted those aged 45 to 54 and 55 to 64 at 1.7% and 3.5% higher than the state, and 2.3% and 4.2% higher than the nation, respectively. These numbers indicate that Heywood has a rapidly aging population.

PC - 2 Age Group Distribution in the Service Area by Community 2019

	Community	< 5	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Athol	Athol	6.1%	10.1%	12.2%	10.8%	13.5%	13.0%	17.3%	10.3%	4.3%	2.5%
	Erving	5.6%	11.8%	11.1%	8.9%	16.0%	12.9%	14.9%	12.9%	5.0%	1.1%
	New Salem	4.8%	8.7%	8.9%	4.3%	8.3%	13.9%	27.5%	15.3%	5.4%	3.2%
	Orange	5.4%	10.8%	11.3%	11.0%	11.0%	15.7%	16.5%	11.9%	5.1%	1.3%
	Petersham	3.1%	7.9%	13.4%	5.1%	9.9%	19.9%	15.3%	16.2%	3.0%	6.2%
	Phillipston	3.6%	12.7%	10.1%	12.8%	11.0%	17.2%	18.3%	8.8%	4.5%	0.8%
	Royalston	3.4%	9.9%	7.0%	9.7%	9.0%	19.3%	19.0%	16.0%	6.2%	0.6%
	Warwick	2.4%	11.5%	8.3%	8.4%	6.2%	13.4%	29.9%	13.3%	5.8%	0.9%
	Wendell	3.6%	11.5%	5.1%	8.9%	12.3%	14.4%	21.4%	18.4%	3.5%	0.8%
	Health Area Average	**4.2%**	**10.5%**	**9.7%**	**8.9%**	**10.8%**	**15.5%**	**20.0%**	**13.7%**	**4.8%**	**1.9%**

Heywood	Ashburnham	7.8%	13.5%	11.3%	11.7%	13.2%	12.0%	17.5%	11.4%	1.2%	0.7%
	Gardner	6.2%	10.7%	10.2%	15.1%	11.8%	13.9%	16.5%	8.6%	3.9%	2.9%
	Hubbardston	4.8%	10.4%	13.9%	11.1%	9.1%	14.8%	17.2%	12.3%	5.1%	1.2%
	Templeton	4.1%	11.6%	11.0%	13.6%	10.9%	16.5%	15.1%	9.5%	5.5%	2.5%
	Westminster	4.2%	14.2%	9.3%	12.4%	10.7%	10.5%	21.2%	13.0%	3.8%	0.7%
	Winchendon	7.9%	11.4%	12.2%	14.9%	10.9%	13.3%	15.2%	8.5%	3.6%	2.0%
	Health Area Avg	**5.8%**	**12.0%**	**11.3%**	**13.1%**	**11.1%**	**13.5%**	**17.1%**	**10.6%**	**3.9%**	**1.7%**
	Service Area Avg	**4.9%**	**11.1%**	**10.4%**	**10.6%**	**10.9%**	**14.7%**	**18.9%**	**12.4%**	**4.4%**	**1.8%**
	Franklin County*	3.9%	9.5%	10.4%	11.7%	12.2%	12.6%	16.3%	14.7%	6.2%	2.3%
	Worcester County*	5.3%	11.7%	13.5%	13.1%	12.1%	13.8%	14.4%	9.5%	4.6%	2.0%
	Massachusetts*	5.2%	10.9%	13.5%	14.4%	12.4%	13.0%	13.6%	9.8%	4.9%	2.3%
	U.S.*	5.9%	12.5%	13.0%	13.9%	12.7%	12.4%	12.9%	9.6%	4.9%	1.9%
	Sources: American Community Survey 2015-2019 5-Year Estimates U.S. Census Bureau; * 2019 American Community Survey 1-Year Estimates										

Table PC-3 shows the median age of the Service Area population (46.3) was notably older than the state (39.7) and national (38.5) median; a difference of 6.6 and 7.8 years, respectively. Important to note here was that the concentration of those aged 65 and older in the region total 18.6% of total population, a larger but less significant difference compared to the state (17.0%) and nation (16.5%).

The communities with the highest median age were New Salem at 55.6 years, Warwick at 54.9 years, Petersham at 51.9 years, and Royalston at 50.8 years. The communities with the lowest median age were Winchendon at 37.9 years, Ashburnham at 39.1 years, Gardner at 42.4 years, and Athol at 43.7 years. Thirteen (13) of the 15 communities in Heywood's service area have a median age of at least 40 years, all higher than the state (39.7 years) and national (38.5 years) medians.

The Athol Hospital's Service Area median age was nearly seven years higher than in Heywood Hospital's, and Athol Hospital's percentage of those aged 65 or older was 4.3% higher than Heywood's. In Athol Hospital's Service Area, four communities have a population of those 65 and older that accounts for one-fifth of the overall community's population: Petersham (25.4%), New Salem (23.8%), Royalston (22.8%), and Wendell (22.7%). Comparatively, the town with the highest percentage of those 65 and older in Heywood's Service Area was Hubbardston (18.6%).

For Heywood Healthcare's Service Area, the most significant concern here is in those communities where there are individuals who are aged 65 and older *and living alone*. In Athol's Service Area, Orange (45.4%), Athol (42.1%), and Erving (40.7%) lead the way in percentage of population 65 and older living alone where Warwick (25.9%) and Phillipston (26.7 %) fall on the lower end of the spectrum. In Heywood Hospital's Service Area, Gardner (49.2%), Winchendon (39.8%), and Templeton (36.1%) lead the way in percentage of the population aged 65 and older and living alone, whereas Ashburnham (28.3%), Hubbardston (31.2%) and Westminster (30.0%) fall on the lower end of the spectrum.

PC - 3 Median Age, 65 and Older, and 65 and Older Living Alone in the Service Area 2019

	Community	Median age (years)	% Aged 65+	% Of 65+ living alone	Sex ratio (males/100 females)
Athol	Athol	43.7	17.1%	42.1%	85.5
	Erving	44.0	18.9%	40.7%	80.3
	New Salem	55.6	23.8%	30.7%	119.3
	Orange	45.4	18.2%	45.4%	86.4
	Petersham	51.9	25.4%	32.9%	90.7
	Phillipston	44.7	14.1%	26.7%	100.4
	Royalston	50.8	22.8%	36.9%	107.0
	Warwick	54.9	20.0%	25.9%	100.0
	Wendell	50.2	22.7%	34.3%	103.3
	Health Area Average	**49.0**	**20.3%**	**35.1%**	**97.0**
Heywood	Ashburnham	39.1	13.2%	28.3%	97.3
	Gardner	41.0	15.4%	49.2%	106.6
	Hubbardston	46.1	18.6%	31.2%	98.1
	Templeton	44.2	17.4%	36.1%	95.0
	Westminster	44.3	17.5%	30.0%	100.6
	Winchendon	37.9	14.1%	39.8%	108.0
	Health Area Average	**42.1**	**16.0%**	**35.8%**	**100.9**
	Service Area Average	**46.3**	**18.6%**	**35.3%**	**98.6**
	Franklin County*	47.4	23.2%	42.7%	93.5
	Worcester County*	40.2	16.1%	40.8%	97.3
	Massachusetts*	39.5	17.0%	68.7%	94.3
	U.S.*	38.1	16.5%	37.8%	97.0
Sources: ACS 2015-2019 5-Year Estimates U.S. Census Bureau					

Racial/Ethnic Populations

Racism—both interpersonal and structural —negatively affects the mental and physical health of millions of people, preventing them from attaining their highest level of health, and consequently, affecting the health of our nation.[1]

The data show that racial and ethnic minority groups, throughout the United States, experience higher rates of illness and death across a wide range of health conditions, including diabetes, hypertension, obesity, asthma, and heart disease, when compared to their White counterparts. Additionally, the life expectancy of non-Hispanic/Black Americans is four years lower than that of White Americans. The COVID-19 pandemic, and its disproportionate impact among racial and ethnic minority populations is another stark example of these enduring health disparities.[2]

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446334/
[2] Center for Disease Control and Prevention (CDC) https://www.cdc.gov/healthequity/racism-disparities/index.html

"Spanish speaking folks from the community felt that they're mistreated in our healthcare systems."

"These marginalized communities receive funding for those in need, but not a seat at the table."

Table PC-4 highlights the concentration of each race/ethnicity throughout the Service Area. Overall, the Service Area is predominantly white (94.9%), far above the state (77%) and nation (72%). The communities with the largest concentration of white residents are Westminster at 99.5% and Royalston at 98.9%. The community with the lowest concentration of white residents is Gardner at 87%. All other races/ethnicities throughout the service area identified on US Census reports are far underrepresented.

The Service Area is gradually becoming more diverse. The Service Area white population decreased by approximately 1.2% since 2016. The state (-2.3%) decreased a larger percent than the Service Area. The communities of Wendell (-5.3%), Gardner (-5.2%), Winchendon (-3.3%), and Hubbardston (-2.2%) experienced the highest percent decrease of white population in the three years. During that same time, the black population remained the same, but the other population increased by 0.6% and the Hispanic population increased by 0.7%.

Black or African Americans make up 1.0% of the Service Area population compared to 7.9% of the state and 12.8% nationally. Asian Americans make up 1.3% of the population compared to 6.9% of the state and 5.7% nationally. One-half of one percent of the population identified as "Other" compared to 4.3% of the state and 5.0% nationally. Just 2.2% of the population identified as two or more races, a little more than half of the state (3.6%) and nation (3.4%). Pacific Islanders are not represented at all in the service area. The only exception in the service area were Native Americans, who make up 0.5% of the population, higher than the state at 0.3%, and lower than the nation at .9%.

PC - 4 Race/Ethnicity of Service Area Communities 2019

	Community	White	White % Change Since 2016	Black or African American	Native American	Asian	Other	Two or More Races	Hispanic/ Latino
Athol	Athol	93.4%	0.1%	0.8%	0.7%	0.7%	1.3%	3.4%	4.1%
	Erving	95.7%	1.3%	1.4%	0.9%	0.0%	0.0%	2.0%	2.9%
	New Salem	96.7%	-0.7%	0.5%	0.7%	0.3%	0.0%	1.8%	0.4%
	Orange	96.5%	-1.0%	0.6%	0.4%	0.9%	0.0%	1.7%	2.5%
	Petersham	96.2%	-1.5%	0.3%	0.0%	1.0%	1.0%	1.6%	3.4%
	Phillipston	93.8%	-0.8%	1.5%	0.0%	0.7%	0.0%	4.0%	1.3%
	Royalston	98.9%	0.2%	0.0%	0.0%	0.7%	0.0%	0.4%	0.0%
	Warwick	96.6%	-0.3%	0.0%	0.3%	0.5%	0.5%	2.1%	2.0%
	Wendell	89.0%	-5.3%	4.5%	0.0%	0.8%	0.1%	5.6%	1.3%
	Health Area Average	**95.2%**	**-0.9%**	**1.1%**	**0.3%**	**0.6%**	**0.3%**	**2.5%**	**2.0%**
Heywood	Ashburnham	97.4%	0.6%	1.1%	0.0%	0.3%	0.0%	1.2%	1.7%
	Gardner	87.0%	-5.2%	2.8%	0.1%	3.2%	2.7%	4.2%	9.3%
	Hubbardston	93.3%	-2.3%	1.0%	0.0%	3.5%	0.0%	2.3%	5.8%

Templeton	96.6%	-1.1%	0.0%	0.3%	2.2%	0.8%	0.0%	2.9%
Westminster	99.5%	2.2%	0.0%	0.0%	0.2%	0.0%	0.2%	3.3%
Winchendon	93.0%	-3.3%	1.2%	0.0%	2.6%	0.7%	2.5%	3.2%
Health Area Average	**94.5%**	**-1.7%**	**1.0%**	**0.1%**	**2.0%**	**0.7%**	**1.7%**	**4.4%**
Service Area Average	**94.9%**	**-1.2%**	**1.0%**	**0.2%**	**1.2%**	**0.5%**	**2.2%**	**2.9%**
Franklin County*	92.1%	-0.4%	1.3%	0.1%	1.5%	1.7%	3.3%	4.2%
Worcester County*	83.5%	-1.2%	5.1%	0.3%	5.1%	2.8%	3.2%	12.2%
Massachusetts*	77.0%	-2.3%	7.9%	0.3%	6.9%	4.3%	3.6%	12.4%
U.S.*	72.0%	-1.3%	12.8%	0.9%	5.7%	5.0%	3.4%	18.4%

Sources: American Community Survey 2015-2019 5-Year Estimates U.S. Census Bureau; * 2019 American Community Survey 1-Year Estimates

Table PC-5 shows the race/ethnicity of patients who visited the Emergency Department (ED) in 2020 at Athol and Heywood Hospital. For service providers, it is vitally important to understand the races and ethnicities of those who use Heywood Healthcare services. Cultural and language barriers can inhibit effective care.

As to be expected, a significant majority of patients identified as American at Athol (96.98%) and Heywood (93.32%) Hospitals. Beyond those identified as American, a great mix of patients from other ethnic groups came to the ED, particularly at Heywood Hospital, as seen in Table PC-5. African American and Puerto Rican top the list after American.

PC - 5 ED Patients by Race/Ethnicity at Heywood and Athol Hospitals 2020

Ethnicity	# ED Patients Athol	% ED Patients Athol	# ED Patients Heywood	% ED Patients Heywood
African American	15	0.16%	111	0.62%
African	1	0.01%	1	0.01%
American	9,004	96.98%	16,818	93.32%
Asian	2	0.02%	12	0.07%
Asian Indian	1	0.01%	1	0.01%
Brazilian	2	0.02%	10	0.06%
Cambodian	-		1	0.01%
Canadian	1	0.01%	22	0.12%
Cape Verdean	5	0.05%	2	0.01%
Caribbean	7	0.08%	7	0.04%
Central American	-		1	0.01%
Chinese	-		2	0.01%
Cuban	3	0.03%	-	
Dominican	1	0.01%	7	0.04%
Eastern European	3	0.03%	9	0.05%
European	3	0.03%	10	0.06%

Filipino	-		1	0.01%
French	-		14	0.08%
Guatemalan	-		2	0.01%
Haitian	-		-	
Honduran	-		1	0.01%
Japanese	-		5	0.03%
Korean	-		4	0.02%
Laotian	-		4	0.02%
Lithuanian	-		1	0.01%
Mexican	-		13	0.07%
Middle Eastern	-		10	0.06%
Other	73	0.79%	359	1.99%
Polish	-		-	
Portuguese	2	0.02%	12	0.07%
Puerto Rican	11	0.12%	157	0.87%
Russian	1	0.01%	4	0.02%
South American	-		3	0.02%
Unknown	149	1.60%	415	2.30%
Vietnamese	-		3	0.02%
TOTAL ED PATIENTS	**9,284**		**18,022**	
Source: Heywood Hospital Multicultural Services Department				

Of those ethnic groups that used the ED at Athol or Heywood Hospital in 2020, many languages were spoken, as seen in table PC-6 below. Spanish, Korean, and American Sign Language were top non-English languages spoken by patients at Athol Hospital. Spanish, Arabic, Creole, American Sign Language, and Portuguese were the primary languages at Heywood Hospital. In total, patients spoke 30 different languages between the two hospitals.

PC - 6 ED Patients by Languages Spoken at Athol and Heywood Hospitals 2020

Language	# ED Patients Athol	% ED Patients Athol	# ED Patients Heywood	% ED Patients Heywood
Albanian	-		7	0.04%
Arabic	1	0.01%	42	0.23%
Armenian	-		1	0.01%
Cambodian	-		1	0.01%
Chinese Mandarin	1	0.01%	6	0.03%
Creole	-		9	0.05%
English	9,172	98.80%	17,445	96.80%
Finnish	-		1	0.01%
French	-		3	0.02%
German	-		1	0.01%
Greek	3	0.03%	3	0.02%
Hebrew	1	0.01%	1	0.01%

Hindi	-		4	0.02%
Hmong	-		2	0.01%
Indonesian	-		-	
Japanese	-		1	0.01%
Korean	5	0.05%	5	0.03%
Kpelle	-		1	0.01%
Kurmanji	-		1	0.01%
Laotian	-		4	0.02%
Other	3	0.03%	16	0.09%
Polish	2	0.02%	1	0.01%
Portuguese	-		12	0.07%
Russian	-		4	0.02%
Sign Language	6	0.06%	25	0.14%
Spanish	66	0.71%	407	2.26%
Thai	-		-	
Unknown	22	0.24%	17	0.09%
Urdu	1	0.01%	-	
Vietnamese	-		2	0.01%
TOTAL ED PATIENTS	**9,283**	**100.00%**	**18,022**	100.00%
Source: Heywood Hospital Multicultural Services Department				

Marital Status

Table PC-7 shows a complete breakdown of married couple households by the community in both service areas. Overall, 14 of 15 communities in the Service Area have a higher percentage of married-couple households when compared to the state (46.7%) and nation (47.5%). The Service Area average is 55.4%, with Ashburnham leading the way at 66.2%, followed by Hubbardston (65.8%) and Phillipston (65.4%). On the lower end, Gardner has the lowest percentage of married-couple households (40.4%), followed by Wendell (48.6%) and Orange (47.8%).

PC - 7 Occupied Housing Units with Family and Married Couple Households by Community 2019

	Community	% Of Occupied Housing Units that are Family Households	% Of Occupied Housing Units that are Married Couple Households
Athol	**Erving**	62.8%	51.3%
	New Salem	72.6%	59.9%
	Orange	62.4%	47.8%
	Petersham	60.7%	50.1%
	Phillipston	76.2%	64.5%
	Royalston	68.6%	58.1%
	Warwick	60.9%	52.0%
	Wendell	58.5%	48.6%
	Health Area Average	**65.3%**	**54.0%**

Heywood	Ashburnham	84.4%	66.2%
	Gardner	61.5%	40.4%
	Hubbardston	76.1%	65.8%
	Templeton	64.8%	48.8%
	Westminster	74.3%	62.3%
	Winchendon	72.2%	60.3%
	Health Area Average	**72.2%**	**57.3%**
	Service Area Average	**68.3%**	**55.4%**
	Franklin County*	54.7%	40.0%
	Worcester County*	66.4%	50.1%
	Massachusetts*	62.8%	46.7%
	U.S.*	64.8%	47.5%
	Source: American Community Survey 2015-2019 5-Year Estimates		

Persons with Disabilities

The American Community Survey (ACS) tracks a series of disabilities that have a notable impact on the health and well-being of those living with a disability. These include hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties. Unfortunately, these disabilities are not tracked down to the town/city-specific level but are tracked to the county level.

> *"Can't forget the folks with physical disabilities either, who are already somewhat isolated under the best conditions."*
>
> *"Intellectual and developmental disability [patients] end up on a long list for mental health treatment."*

Franklin and Worcester Counties fall within the Service Area and have similar percentages of their respective populations living with these disabilities. When each county is compared to the state and national percentages, Franklin County disproportionately sees a more significant percentage of their population living with hearing, cognitive, self-care, and independent living difficulties, but not by a substantial margin (2% or less).

PC - 8 Disability Status as Percentage of the Population by Community 2019

Disability Type	Franklin County	Worcester County	Massachusetts	United States
Hearing Difficulty				
Total Population with Disability	3,576	26,091	211,104	11,495,247
% Population with Disability	5.1%	3.2%	3.1%	3.6%
Vision Difficulty				
Total Population with Disability	1,003	14,675	112,017	7,467,040
% Population with Disability	1.4%	1.8%	1.6%	2.3%
Cognitive Difficulty				
Total Population with Disability	4,665	41,705	324,784	15,797,245
% Population with Disability	7.0%	5.4%	5.0%	5.2%
Ambulatory Difficulty				
Total Population with Disability	5,486	45,390	372,584	20,843,415
% Population with Disability	8.2%	5.9%	5.8%	6.9%
Self-Care Difficulty				

Total Population with Disability	1,650	18,857	157,832	8,004,156
% Population with Disability	2.5%	2.4%	2.4%	2.6%
Independent Living Difficulty				
Total Population with Disability	3,661	36,104	290,484	14,690,563
% Population with Disability	6.3%	5.6%	5.3%	5.9%
Source: American Community Survey 2015-2019 5-Year Estimates				

Veteran Status

Table PC-9 shows that, overall, the Service Area has a notably higher percentage population of those age 18 or older with veteran status (9.2%) than the state (5.0%) and nation (6.9%). Particularly notable are the veteran populations in Templeton (11.9%), New Salem (11.6%), and Warwick (10.9%). All 15 Service Area communities have a higher veteran population percentage than the state, and 13 of the 15 Service Area communities have a higher veteran population than the nation. Ashburnham and Wendell, both at 6.3%, have a lower veteran population than the nation (6.9%).

> *"Vet mental health (war related; service related) could not be treated by civilian therapists, so vets might have a fear to seek help given their unique experiences."*

Additionally, the overall percentage of veterans living with a disability in the Service Area (23.9%) ranks lower than the state (29.3%) and Nation (29.9%). Some veteran communities, however, have far more veterans living with a disability than other communities. Orange (44%), Gardner (29.7%), and Ashburnham (25.5%) have far more veterans with a disability than do Westminster (18.9%), Hubbardston (18.4 %), or Winchendon (16.4%).

Athol Hospital's Health Area has a slightly higher percentage of the population with veteran status compared to Heywood (9.3% v. 9.2%); both are notably higher than the state (5.0%) and national averages (6.9%). In Heywood's Service area, veterans have a lower percentage living with a disability (21.5 % v. 25.5%) despite having nearly three times as many veterans compared to Athol's Service Area. Both Service Areas have a lower percentage of veterans living with a disability than the state and nation.

PC - 9 Veteran Status of Service Area Residents 2019

	Community	# Of Vets	% Of Civilian Population Over Age 18 w/ Veteran Status	% Of Veterans with a Disability
Athol	**Athol**	895	9.6%	28.1%
	Erving	112	8.3%	21.4%
	New Salem	97	11.6%	23.7%
	Orange	643	10.4%	44.0%
	Petersham	87	8.5%	20.7%
	Phillipston	124	8.7%	25.8%
	Royalston	106	9.4%	24.5%
	Warwick	73	10.9%	19.2%
	Wendell	45	6.3%	22.2%
	Health Area Total/Average	**242**	**9.3%**	**25.5%**
Heyw	**Ashburnham**	298	6.3%	25.5%
	Gardner	1,386	8.4%	29.7%

Hubbardston	374	9.8%	18.4%
Templeton	772	11.9%	19.8%
Westminster	514	8.4%	18.9%
Winchendon	847	10.2%	16.4%
Health Area Total/Average	**699**	**9.2%**	**21.5%**
Service Area Total/Average	**6,373**	**9.2%**	**23.9%**
Franklin County*	4,748	8.1%	34.0%
Worcester County*	38,888	5.9%	30.4%
Massachusetts*	277,814	5.0%	29.3%
U.S.*	17,418,351	6.9%	29.9%
Source: American Community Survey 2015-2019 5-Year Estimates			

SOCIAL AND ECONOMIC CHARACTERISTICS

Chapter 2

Abstract

This chapter provides a comprehensive overview of the social and economic characteristics in Heywood Healthcare's 15 communities

Chapter 2 – Social and Economic Characteristics

This chapter provides a comprehensive overview of the social and economic characteristics in Heywood Healthcare – Athol Hospital and Heywood Hospital's (Heywood or HH) 15 communities. Some communities are more rural while others are urban; other communities are more affluent while some are economically disadvantaged. These and other factors influence the health outcomes and inequities experienced by people in the region.

This chapter highlights the following socio-economic characteristics and data:

- Income
- Poverty
- Household Composition
- Labor Force and Unemployment
- Education
- Built Environment/Housing

Chapter Highlights

Income and Employment

- Between 2016 and 2019, the Service Area Average Per Capita Income (PCI) increased by 12.5% compared to 15.0% in the state.
- In 2019, notable towns of child poverty (<18 years old) include Winchendon (18.8%), Gardner (17.0%) Athol (15.0%) and Royalton (14.3%).
- The Service Area Median Family Income (MFI) in 2016 was $78,760 and increased to 2019 $92,822 (+17.8%), compared to the state MFI which increased 14.3%.

Households

- The percent of households with single women and children for the Service Area (3.3%) was less than half of the state average (6.8%) and the nation (7.2%).
- The population of the Service Area of 65+ living alone in 2019 is 11.6%, which is higher than Massachusetts (10.7%) and the U.S. (9.4%).

Education

- The Hispanic student population in the Service Area increased 3.4% since 2010/2011 and the White student population decreased 5.7%.
- The Orange School District has the highest percentage of economically disadvantaged students (56.7%), with Gardner (53.9%) and Athol/Royalston (47.7%) close behind. These numbers far surpass the state average percent of disadvantaged students of 32%.

Built Environment/Housing

- The rural nature of the Service Area provides ample opportunity for residents to get exercise outdoors in a tranquil environment, ultimately improving health outcomes for those who use the space.
- Service Area households paying greater than 30% of income towards housing in 2019 (27.0%) was slightly higher than the state in 2019 (30.1%). The Service Area rate in 2016 was 30.8%. In Wendell, Warwick, Orange, and Athol, over 50% of renters exceed 30% of income.

Transportation

- Service Area residents have greater access to personal vehicles but have longer commuting times compared to the State.
- Residents with no access to a car was lower than the state, a few communities like Gardner (13.1%) and Winchendon (11.4%) stuck out among the other Service Area communities.

Food Desert

- In 2019, large areas of Orange, Athol, and Gardner qualify as "Low Income (LI) & Low Access" requiring greater distance to travel for grocery stores.
- According to the USDA's standards, almost the entire city of Gardner is considered a food desert.

Crime Statistics

- Service Area average rates for Assault, Sexual Assault, and Homicide nearly doubled from 2016 to 2019; similar to the state. For example, assault in the SA went from 9 in 2016 to 16.98 in 2019 whereas the state went from 8.89 in 2016 to 17.21 in 2019.

Income

Various measures of wealth reflect the local economy's health: per capita, median household, and median family incomes. Per capita income is equal to the total income generated by a population divided by the number of persons in that area. Communities with a higher number of persons per household or smaller household/family incomes would likely have smaller per capita income figures.

In 2019, the median household income was $76,057 for White (non-Hispanic) households, $45,438 for Black households, $98,174 for Asian households, and $56,113 for Hispanic/Latino households.[3] The poverty rate was 9.0% for White households, 21.2% for Black households, 17.2% for Hispanic/Latino households, 9.7% for Asian/Native Hawaiian and Pacific Islander households, and 24.2% for American Indian/Alaska Native households.[4] With respect to geographic location, between 2013 and 2017, rural counties had lower median household incomes and higher rates of poverty than their urban counterparts.[5] In the U.S. in 2020, there was an uncharacteristic but unsurprising decrease in household income and increase in the poverty rate. [6]

The COVID-19 pandemic affected older American adults both financially and medically. 19% of adults aged 65 and older reported spending most of their savings and/or losing a job due to the COVID-19 pandemic. This percentage increased to 32% and 39% for Black and Hispanic/Latino adults over 65, respectively. 35% of adults over 65 with multiple chronic conditions reported having a doctor's

[3] https://www.census.gov/library/publications/2020/demo/p60-270.html
[4] https://www.kff.org/other/state-indicator/poverty-rate-by-raceethnicity/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D
[5] https://www.census.gov/library/stories/2018/12/differences-in-income-growth-across-united-states-counties.html
[6] https://www.census.gov/library/publications/2021/demo/p60-273.html#:~:text=Median%20household%20income%20was%20%2467%2C521,and%20Table%20A%2D1

appointment cancelled or postponed due to the pandemic. 23% reported that aid services were cancelled or limited for them during the pandemic.[7]

As depicted in Table SE-1, the per capita income for Massachusetts in 2019 was $43,761, while that of the service area was $34,343 (a difference of $9,418). The highest per capita income in the region came from Westminster, where individual workers earned $44,228 on average (roughly 37% higher than the service area average), followed by Templeton at $39,294 (18% higher), and Hubbardston at $39,249 (17%). The lowest per capita incomes came from Athol at $25,016 (28% lower than the service area average), Orange at $28,013 (19% lower), and Gardner at $28,208 (18% lower). Warwick (3%) was the only community to hold a per capita income within plus or minus 5% of the service area average. This suggests that the accessibility of healthcare services varies widely from community to community, as some communities are better able to afford and have access to local healthcare services. Despite being lower than the state, the average per capita income of the service area is higher than that of the nation ($34,103).

In comparing per capita income levels from the previous CHNA (2016 data), incomes have gone up overall throughout the Service Area. Table SE – 1 shows that Royalston saw the most significant increase in per capita income at $7,369, followed by Templeton at $6,832 and Phillipston at $6,108. On average, per capita income increased by nearly $2,000. In only two communities, per capita incomes decreased: Warwick (-$1,522) and New Salem ($1,482).

Overall, Athol Hospital's Service Area residents have lower per capita income levels than Heywood by $4,538.56. As shown in Table SE-1 for Athol's Service Area, three communities have significantly lower per capita income rates compared to the Service Area overall ($34,343) that drive down the average; Athol ($25,061), Orange ($28,103) and Warwick ($30,061). Two communities have notably higher rates that raise per capita income rates in the other direction; Petersham ($38,959) and Royalton ($35,704).

Heywood's Service Area has a similar pattern of per capita income differences with two communities that bring the overall average ($37,066) down; Gardner ($28,208) and Winchendon ($32,354). On the opposite side of the spectrum, three communities pull the area average up: Westminster ($44,228), Templeton ($39,294), and Hubbardston ($39,249). Two of Athol Hospital's communities saw per capita incomes decline Warwick (-$1,527) and New Salem (-$1,482). All of Heywood Hospital's communities saw increases in per capita incomes from 2016 to 2019. Income distributions are uneven across both Service Areas, creating challenges in anticipating healthcare affordability.

SE - 1 Average Per Capita Income in the Service Area 2016 vs. 2019

	Community	Average per capita income (2016)	Average per capita income (2019)	% Change
Athol	**Athol**	$24,962	$25,016	0.2%
	Erving	$27,169	$32,882	21.0%
	New Salem	$35,585	$34,103	-4.2%
	Orange	$21,854	$28,015	28.2%
	Petersham	$35,322	$38,959	10.3%
	Phillipston	$27,995	$34,103	21.8%

[7] https://www.commonwealthfund.org/publications/surveys/2021/sep/impact-covid-19-older-adults?utm_source=alert&utm_medium=email&utm_campaign=Improving+Health+Care+Quality

	Royalston	$28,335	$35,704	26.0%
	Warwick	$31,588	$30,061	-4.8%
	Wendell	$28,709	$33,904	18.1%
	Health Area Average	**$29,058**	**$32,527**	**11.9%**
Heywood	Ashburnham	$35,860	$39,063	8.9%
	Gardner	$24,680	$28,208	14.3%
	Hubbardston	$34,042	$39,249	15.3%
	Templeton	$32,462	$39,294	21.0%
	Westminster	$41,812	$44,228	5.8%
	Winchendon	$27,530	$32,354	17.5%
	Health Area Average	**$32,731**	**$37,066**	**13.2%**
	Service Area Average	**$30,527**	**$34,343**	**12.5%**
	Franklin County*	$31,689	$35,908	13.3%
	Worcester County*	$33,272	$35,908	7.9%
	Massachusetts*	$38,069	$43,761	15.0%
	U.S.*	$29,829	$34,103	14.3%
	Sources: ACS 2015-2019 5-Year Estimates U.S. Census Bureau			

Another measure of wealth in a community is its median household income. In Table SE-2, family incomes are differentiated from household incomes. For example, a single student or person living alone is considered a household but not a family. According to the ACS 2015-2019 Estimates, the Service Area's average median household income ($69,149) is higher than the nation ($62,843) but lower than the state ($81,215). Household income varies from community to community, with Westminster leading the pack at $100,972 per year; Athol ranks lowest at $49,653 per year. Seven communities have median household incomes lower than the Service Area average. In comparing 2016 median household incomes, the Service Area saw an average of a nearly $5,1500 increase across communities. Orange saw the most significant increase in median household income at over $20,000, and Winchendon saw the largest decrease at -$5,225. Despite overall gains, the average median household income (7.0%) grew less than the Commonwealth (14.5%) and Franklin County (8.2%).

Additionally, the region's median family income ranges vastly from community to community, ranging from $63,881 in Athol to $124,424 in Westminster, as indicated in Table SE-2 below. Just four of the communities in Heywood's service area have median family incomes higher than the Commonwealth ($103,126): Westminster ($124,424), Hubbardston ($1215,727), Templeton ($111,691), and Ashburnham ($103,863. The lowest median family incomes are in Gardner ($63,843), Athol ($63,881), Orange ($74,091), and Warwick ($85,165). Median family incomes increased by an average of $14,434 across the Service Area, with Wendell seeing the largest increase at $33,658 and Ashburnham seeing the only decrease at -$1,243.

Athol Hospital's Service Area household and family incomes vary significantly from Heywood Hospital's. Overall, the average Median Household Income (MHI) for Athol's service area is $63,746 compared to Heywood's $77,253; and Median Family Income (MFI) for Athol's is $86,521 compared to Heywood's $102,274. The communities with the highest MHI in Athol's Service Area are Phillipston ($76,661) and Royalton ($72,732); those with the lowest MHI are Athol ($49,653) and Wendell ($53,875). Petersham ($105,938) and Wendell ($94,283) have the two highest MFIs in Athol's Service Area. The communities with the highest MHI in Heywood's Service Area are Westminster ($96,953) and Ashburnham ($86,219);

the lowest MHI by far is Gardner ($46,410), whose MHI was less than half that of Westminster's. Not surprisingly, Westminster ($106,273) and Ashburnham ($105,106) have the highest MFIs in the Service Area, and Gardner ($59,007) has the lowest.

In comparing the most recent data to the previous CHNA (2013 data), Athol Hospital's Service Area saw a slight decline in median household incomes overall, with MHI's decreasing in New Salem, Orange, Petersham, and Wendell. Royalston had the most significant increase in MHI. Median Family Income increased by nearly $4,000 overall. In Heywood Hospital's Service Area, there was an about $3,000 increase in MHI and a $5,000 increase in MFI. All communities saw an increase in MFI, the average increase in Heywood's Service Area (17.9%) exceeded the state (14.4%).

SE - 2 Median Household and Family Incomes in the Service Area by Community 2016 v. 2019

	Community	Median Household Income (2016)	Median Family Income (2016)	Median Household Income (2019)	Median Family Income (2019)
Athol	Athol	$47,642	$60,716	$49,653	$63,881
	Erving	$62,171	$75,139	$63,600	$87,286
	New Salem	$71,373	$79,432	$68,250	$89,055
	Orange	$37,183	$55,920	$57,547	$74,091
	Petersham	$65,774	$78,750	$66,458	$105,938
	Phillipston	$73,750	$79,338	$76,661	$89,131
	Royalston	$68,068	$77,625	$72,732	$89,857
	Warwick	$56,838	$79,844	$64,939	$85,165
	Wendell	$43,036	$60,625	$53,875	$94,283
	Health Area Average	**$58,426**	**$71,932**	**$63,746**	**$86,521**
Heywood	Ashburnham	$86,219	$105,106	$95,625	$103,863
	Gardner	$46,410	$59,007	$49,679	$63,843
	Hubbardston	$84,805	$94,512	$83,438	$115,727
	Templeton	$67,515	$89,046	$77,031	$111,691
	Westminster	$96,953	$106,273	$100,972	$124,424
	Winchendon	$61,998	$80,060	$56,773	$94,097
	Health Area Average	**$73,983**	**$89,001**	**$77,253**	**$102,274**
	Service Area Average	**$64,649**	**$78,760**	**$69,149**	**$92,822**
	Franklin County	$56,347	$73,782	$60,950	$81,069
	Worcester County	$67,005	$85,560	$74,069	$96, 313
	Massachusetts	$70,954	$90,180	$81,215	$103,126
	U.S.	$55,322	$67,871	$62,843	$77,263

Sources: American Community Survey 2015-2019 5-Year Estimates U.S. Census Bureau

It is also essential to highlight Service Area veterans' economic status and well-being to identify disparities in social determinants of health. Table SE-3 compares median incomes and unemployment rates of veterans compared to the overall community in 2019. The median income of veterans in some areas like Warwick is as low as $27,321, while they are as high as $86,250 in Westminster. The unemployment rates are notably higher for veterans as well when compared to the community overall in nearly every community. In five communities in the Service Area, the unemployment rate for veterans

reaches beyond 10%: Royalston (9.5%), Athol (7.9%), Orange (4.8%), Templeton (3.8%), and Gardner (2.0%). Eight communities reportedly have 0% unemployment rates for veterans; however, the ACS Estimates require sample sizes of a particular size to make the most accurate predictions.

There is one (1) community in which veterans have a higher median income than the community they reside in and fourteen (14) where they do not.

In Heywood's Service area, veterans have a lower unemployment rate (1%) than Athol's Service Area (4.6%) and higher median income ($51,808 v. $41,085) despite having nearly three times as many veterans compared to Athol Hospital's Service Area. Important to note is the community in Athol Hospital's Service Area that has a veteran population with double-digit unemployment rates: Erving: (18.8%). No communities in Heywood's Service Area have a veteran population with double-digit unemployment rates. Regardless, veterans' unemployment rates in either Service Area are higher than the unemployment rate for non-veterans everywhere else.

SE - 3 Economic Well-Being of Service Area Veterans 2019

	Community	Median Income of Veterans	Overall Median Income	Veteran Unemployment Rate	Overall Unemployment Rate 2019*
Athol	Athol	$30,319	$54,142	7.9%	3.7
	Erving	$32,778	$63,600	18.8%	2.9
	New Salem	$33,152	$66,063	0.0%	2.4
	Orange	$31,974	$50,795	4.8%	3.4
	Petersham	$45,795	$71,484	0.0%	3.0
	Phillipston	$51,250	$80,208	0.0%	2.9
	Royalston	$60,769	$76,974	9.5%	3.3
	Warwick	$27,321	$59,167	0.0%	1.9
	Wendell	$56,406	$53,875	0.0%	2.9
	Health Area Average	**$41,085**	**$64,034**	**4.6%**	**2.9**
Heywood	Ashburnham	$39,250	$95,625	0.0%	2.7
	Gardner	$37,260	$49,679	2.0%	3.8
	Hubbardston	$50,398	$91,734	0.0%	3.0
	Templeton	$52,941	$77,031	3.8%	3.0
	Westminster	$86,250	$100,972	0.0%	2.6
	Winchendon	$44,750	$80,096	0.0%	2.9
	Health Area Average	**$51,808**	**$82,523**	**1.0%**	**3.0**
	Service Area Average	**$45,374**	**$71,430**	3.1%	**3.0**
	Franklin County*	$38,327	$60,018	2.0%	2.7
	Worcester County*	$43,522	$78,345	4.2%	3.1
	Massachusetts*	$44,676	$85,843	4.5%	2.9
	U.S.*	$42,455	$65,712	5.3%	3.6

Source: American Community Survey 2015-2019 5-Year Estimates *Overall Unemployment Rates for 2019 from MA Department of Labor and Workforce Development

Poverty

Another measure of wealth in a community is the poverty rate. These statistics can pose significant problems moving forward, as young people living in poverty struggle to get the proper nutrition and healthcare they need to develop and avoid future health problems fully. According to the World Health Organization (WHO), poor people "have higher than average child and maternal mortality, higher levels of disease, and more limited access to health care and social protection."[8] Furthermore, "poverty begets poverty"; those born into it are very likely to remain in it and pass it down to the next generation.[9] Such a high percentage of young people living in poverty in cities like Gardner is a likely indication of increased demand for a wide range of healthcare services in the near and long term. Cities and towns in the Service Area with high poverty rates have, and will likely continue to have, clear implications for healthcare service allocation moving forward throughout the region.

Table SE-4 shows that there is less poverty in the service area overall (8.0%) when compared to the state (10.3%), nation (13.4%), and even Franklin (9.7%) and Worcester (10.1%) Counties. However, the poverty rates do vary significantly between the city and towns in the Service Area. Athol, Gardner, Wendell, Winchendon, and Erving have the highest poverty rates at 17.3%, 13.9%, 11.7%, 10.6%, and 10.5%, respectively, all of which exceed the state (10.3%). On the other end of the spectrum, Ashburnham, Westminster, and Petersham have the lowest poverty rates at 1.8%, 2.6%, and 4.3%, respectively. Nine communities in the area have lower poverty rates, and six have poverty rates higher than the 8.0% average for the Service Area. Athol and Gardner have poverty rates higher than the national average.

Child poverty rates (% under 18) are higher in some of these cities and towns than the overall poverty rates. In 2019, notable towns include Winchendon (18.8%), Gardner (17.0%) Athol (15.0%) and Royalton (14.3%). These communities have poverty rates higher than the state (13.2%), and Winchendon is higher than the nation overall (18.5%). Perhaps more disheartening is the poverty rate in some communities of those less than 5 years of age; Hubbardston (19.8%) and Athol (15.4%) have high rates of poverty for this age group when compared to the state (14.4%) and nation (20.7%). Winchendon has an alarmingly high poverty rate for those less than five years old at 40.3%.

Across the board for Athol and Heywood Hospital's Service Areas, the poverty rates are notably lower than the state and national averages, as depicted in Tables SE-4. The levels of poverty vary significantly from community to community in both service areas. In Athol's Service Area, Athol (17.3%), Wendell (11.7%), and Erving (10.5%) have the highest poverty rates overall, with Petersham having a significantly lower rate of 4.3%. In Heywood's Service Area, Gardner (13.9%) and Winchendon (10.6%) have the highest poverty rates overall, and Ashburton (1.8%) and Westminster (2.6%) fall on the lower end of the spectrum.

[8] http://www.who.int/tobacco/research/economics/publications/oecd_dac_pov_health.pdf
[9] http://opencommons.uconn.edu/cgi/viewcontent.cgi?article=1544&context=srhonors_theses

SE - 4 Poverty Rates in the Service Area by Community 2019

	Community	% Of pop below 100% of poverty level	% Of under 18 years old below poverty level in 2019	% Of under 5 years old below poverty level in 2019	% Of female householders with no spouse present	% Of population 65+ years living below 100% of the poverty level in 2019
Athol	Athol	17.3%	15.0%	15.4%	23.8%	9.6%
	Erving	10.5%	11.5%	4.3%	25.9%	5.2%
	New Salem	5.3%	1.2%	0.0%	11.4%	5.0%
	Orange	9.4%	11.4%	11.4%	13.6%	3.8%
	Petersham	4.3%	0.0%	0.0%	7.5%	0.0%
	Phillipston	6.5%	2.3%	12.3%	15.4%	15.1%
	Royalston	7.9%	14.3%	10.6%	19.2%	3.5%
	Warwick	6.9%	5.6%	0.0%	9.1%	6.9%
	Wendell	11.7%	7.1%	9.7%	23.1%	5.6%
	Health Area Avg	**8.9%**	**7.6%**	**7.1%**	**16.6%**	**6.1%**
Heywood	Ashburnham	1.8%	0.6%	0.0%	0.0%	0.0%
	Gardner	13.9%	17.0%	11.1%	21.2%	10.3%
	Hubbardston	6.2%	9.2%	19.8%	18.8%	5.6%
	Templeton	4.4%	2.2%	0.0%	3.4%	8.5%
	Westminster	2.6%	0.7%	0.0%	8.9%	0.0%
	Winchendon	10.6%	18.8%	40.1%	31.9%	4.4%
	Health Area Avg	**6.6%**	**8.1%**	**11.8%**	**14.0%**	**4.8%**
	Service Area Avg	**8.0%**	**7.8%**	**9.0%**	**15.5%**	**5.6%**
	Franklin County*	9.7%	11.6%	13.3%	16.0%	5.8%
	Worcester County*	10.1%	12.3%	13.4%	21.4%	8.2%
	Massachusetts*	10.3%	13.2%	14.4%	22.1%	9.0%
	U.S.*	13.4%	18.5%	20.3%	26.5%	9.3%

Source: 2015-2019 American Community Survey 5-Year Estimates

Table SE-5 shows changes in poverty rates. The table shows that compared to 2016 poverty levels; the Service Area has seen a decline in poverty overall from 9.7% to 6.6%. Only a couple of communities, Athol (0.3%), Wendell (0.9%), and Winchendon (0.5%) rose marginal amounts.

Communities saw declines in poverty with Templeton dropping from 8.7% to 1.0%, Royalton dropping from 10.4% to 5.0%, Erving dropping from 11.2% to 5.0%, Westminster dropping from 4.4% to 2.8%,Warwick dropping from 8.9% to 3.0%, Royalston dropping from 14.2% to 10.4%, Ashburnham dropping from 6.2% to 1.0%, Gardner dropping from 10.0% to 13.9%, Orange dropping from 13.7% to 9.4%, New Salem dropping from 5.8% to 2.0%, Hubbardston dropping from 4.9% to 2.0%, Phillipston dropping from 4.7% to 3.0%, Wendell dropped from 16.1% to 17.0%, Winchendon from 11.8% to 12.3%, Petersham from 4.7% to 4.3% and Westminster dropping from 2.8 % to 2.6%.

The Heywood Health Area saw a slightly greater decline (-3.4%) than the Athol Health Area (-2.9%). Both service areas exceeded the state decline of -1.1%.

SE - 5 Percentage of Service Area population living below poverty 2016 v. 2019

	Community	% Of pop below 100% of poverty level by town 2016	% Of pop below 100% of poverty level by town 2019	% Change
Athol	Athol	17.0%	17.3%	0.3%
	Erving	11.2%	5.0%	-6.2%
	New Salem	5.8%	2.0%	-3.8%
	Orange	13.7%	9.4%	-4.3%
	Petersham	4.7%	4.3%	-0.4%
	Phillipston	4.7%	3.0%	-1.7%
	Royalston	10.4%	5.0%	-5.4%
	Warwick	8.9%	3.0%	-5.9%
	Wendell	16.1%	17.0%	0.9%
	Health Area Average	**10.3%**	**7.3%**	**-2.9%**
Heywood	Ashburnham	6.2%	1.0%	-5.2%
	Gardner	19.0%	13.9%	-5.1%
	Hubbardston	4.9%	2.0%	-2.9%
	Templeton	8.7%	1.0%	-7.7%
	Westminster	2.8%	2.6%	-0.2%
	Winchendon	11.8%	12.3%	0.5%
	Health Area Average	**8.9%**	**5.5%**	**-3.4%**
	Service Area Average	**9.7%**	**6.6%**	**-3.1%**
	Franklin County*	11.3%	9.7%	-1.6%
	Worcester County*	11.4%	10.1%	-1.3%
	Massachusetts*	11.4%	10.3%	-1.1%
	U.S.*	15.1%	13.4%	-1.7%
	Source: 2015-2019 American Community Survey 5-Year Estimates			

Household Composition

As can be seen in Table SE-6, communities with the highest percentages of households with married couples in 2019 include Ashburnham (66.2%), Hubbardston (65.8%), Ashburnham (63.9%), Phillipston (64.5%), and Westminster (62.3%). Throughout the Service Area, about 54% of households have married couples. Of those married couple households, 17.6% have children under 18, slightly higher than the State (19.7%) and Nation (20.2%). Important for Heywood Healthcare to be aware that 3.3% of households have single women with children under 18 throughout the Service Area, with higher percentages noted in Gardner (8.0%), Athol (7.7%), and Winchendon (6.3%). This Service Area rate (3.3%) is lower than the state (6.8%) and nation (7.2%).

Equally crucial to Heywood Healthcare is the percentage of the population aged 65 or older and living alone. As of 2019, 11.6% of households in the Service Area consisted of 65+ individuals living alone, higher than the state (10.7%) and nation (9.4%). Some communities have more than others; the highest is Royalston (19.3%) and Petersham with 17.7%, and the lowest is in Ashburnham and Gardner at 5.2% and 7.5%, respectively.

In comparing Athol and Heywood Hospitals' Health Areas in Table SE-6, the household composition is similar across the board. Athol Hospital has a slightly smaller percentage of married-couple households (52.6% v. 55.3%), married-couple households with children (16.2% vs. 19.7%), and single-mother households (2.5% vs. 4.6%), with a higher percentage of those aged 65 or older living alone (12.8.% vs. 9.8%). Overall, there are more family households in the Service Area, and there are higher rates of those 65 and older and living alone compared to the state and nation.

Since 2010, the percent of households with married couples and married couples with children has not changed significantly in the Service Area (-0.8% decrease and -2.7% decrease, respectively). The percent of single women with children households decreased as well by -2.2% which was significant given the small percentage of total households comprised of single women with children. The percent of households with 65+ living alone increased a noticeable amount of 3.2%. The trends of decreased single women and increased 65+ households in this table coincides with the decrease in children and increase of elderly in the Service Area.

SE – 6 Household Composition in the Service Area by Community 2019

	Community	% Of Households Composed of Married Couples (2019)	% Of Households Composed of Married Couples with Children Under 18 (2019)	% Of Households Composed of Single Women and Children Under 18 (2019)	% Of Households Composed of 65+ Living Alone (2019)
Athol	Athol	34.6%	13.7%	7.7%	11.2%
	Erving	51.3%	19.9%	0.4%	13.1%
	New Salem	59.9%	14.3%	1.8%	9.1%
	Orange	46.1%	20.5%	3.9%	13.7%
	Petersham	58.4%	14.9%	3.0%	17.7%
	Phillipston	64.5%	19.6%	2.2%	7.9%
	Royalston	58.1%	12.3%	1.8%	19.3%
	Warwick	52.0%	15.2%	0.0%	11.8%
	Wendell	48.6%	15.4%	1.6%	11.3%
	Health Area Average	**52.6%**	**16.2%**	**2.5%**	**12.8%**
	2010 Health Area Average	**52.5%**	**17.8%**	**5.2%**	**8.5%**
Heywood	Ashburnham	66.2%	26.6%	3.8%	5.2%
	Gardner	40.4%	13.5%	8.0%	7.5%
	Hubbardston	65.8%	23.0%	1.6%	12.9%
	Templeton	48.8%	16.5%	4.7%	11.5%
	Westminster	62.3%	23.5%	2.9%	9.8%
	Winchendon	48.1%	15.3%	6.3%	11.8%
	Health Area Average	**55.3%**	**19.7%**	**4.6%**	**9.8%**
	2010 Health Area Average	**57.7%**	**23.9%**	**5.9%**	**8.2%**
	Service Area Average	**53.7%**	**17.6%**	**3.3%**	**11.6%**
	2010 Service Area Average	**54.5%**	**20.3%**	**5.5%**	**8.4%**

Franklin County*	44.8%	15.6%	6.1%	11.2%
Worcester County*	50.0%	21.9%	7.1%	18.8%
Massachusetts*	46.3%	19.7%	6.8%	10.7%
U.S.*	48.4%	20.2%	7.2%	9.4%
Source: 2015-2019 American Community Survey 5-Year Estimates				

Labor Force and Unemployment

Unemployment significantly hinders an individual's ability to access healthcare. With no employer to provide healthcare benefits, no income to pay for medical bills, and no activity to keep physically and mentally active, some studies have shown a strong positive association between unemployment and a greater risk of morbidity.

Heywood Healthcare needs to take note of the unemployment rates among the communities it serves. SE-7 shows the unemployment rates of the Service Area communities in 2020 as well as total labor force. The Service Area unemployment rate was 9.4% compared to 8.9% in the state and 8.1% in the US. Unemployment rates were based on a 13-month average; much of this time coincided with the global pandemic. National unemployment rates in 2020 were much higher for Black and Hispanic/Latino individuals (12.1% and 9.7% respectively) than for White individuals (7.0%).[10]

Both Health Area averages exceeded the state. Rates in Gardner, Athol (9.3%), and Wendell (9.0%) exceeded the state. Gardner (9,703) and Athol (5,808) equal 34.9% of the total labor force for the Service Area.

> *"When you look at the unemployment rates for North Central mass. I mean, they're still higher for the most part than the state average… people need money in their pocket to go to the doctors."*

> *"Women dropping out of the workforce during Covid to care for stay-at-home children."*

SE - 7 Labor Force and Unemployment Rates in the Service Area by Community 2020

	Community	Total Labor Force	# Employed	# Unemployed	Unemployment Rate
Athol	**Athol**	5,808	5,268	540	9.3%
	Erving	964	891	73	7.6%
	New Salem	596	564	32	5.4%
	Orange	3,513	3,203	310	8.8%
	Petersham	670	626	44	6.6%
	Phillipston	945	872	73	7.7%
	Royalston	699	652	47	6.7%
	Warwick	501	476	25	5.0%
	Wendell	458	417	41	9.0%
	Health Area Overall	**14,154**	**12,969**	**1,185**	**9.1%**

[10] https://www.dol.gov/agencies/wb/data/latest-annual-data/employment-rates

Heywood	Ashburnham	3,596	3,323	273	7.6%
	Gardner	9,703	8,687	1,016	10.5%
	Hubbardston	2,579	2,420	159	6.2%
	Templeton	4,256	3,906	350	8.2%
	Westminster	4,626	4,266	360	7.8%
	Winchendon	5,556	5,091	465	8.4%
	Health Area Overall	**5,053**	**4,616**	**437**	**9.5%**
	Service Area Overall Total	**44,470**	**40,662**	**3,808**	**9.4%**
	Massachusetts*	3,658,300	3,334,100	324,200	8.9%
	U.S.*	160,742,000	147,795,000	12,947,000	8.1%
	Source: MA Department of Labor and Workforce Development (unemployment rate = 13-month average)				

Table SE-8 shows the distribution of the nearly 41,000 workers in the region who are employed. A few industries stand out for their employment number: Education/Health and Social Services each have 11,312 employees; Manufacturing rated number two with 5,183; Retail accounted for 5,015 jobs; and Professional, Science, Management and Waste Management came in fourth with 3,823 jobs. Combined, these four industries make up 60.36% of employment in the region. It is extremely important to note the decline in manufacturing and retail jobs nationwide, as mature manufacturing industries continue their downward slide, and e-Commerce sites like Amazon.com become more popular for consumers to use as an alternative to going to local stores and malls. These trends have troubling implications for Heywood's Service Area workers, as a loss of jobs in these industries can have devastating effects on the local economy. It is important to note that Hospitals in the Service Area are one of the top employers for local residents.

SE - 8 Employment by Sector in the Service Area by Community 2019

	Community	AGR/FOR/FIS/MIN	CONS	MFG	WS	RT	TRM/WAR/UTL	INFO	FIN/INS/RE	PRO/SCI/MGN/WMS	EDU/HLTH/SS	ART/ENT/REC/FDS	OTHER	PA	Total by Community
Athol	Athol	69	257	948	92	521	317	118	120	318	1,714	311	312	232	5,329
	Erving	13	37	173	31	97	68	0	38	30	243	63	28	43	864
	New Salem	8	36	64	16	52	25	8	14	42	155	26	27	18	491
	Orange	80	220	499	20	465	124	138	201	339	1,083	216	58	128	3,571
	Petersham	24	40	73	15	71	22	0	30	49	166	50	43	41	624
	Phillipston	3	90	112	6	117	55	7	22	59	272	35	32	63	873
	Royalston	11	61	85	0	68	36	26	23	64	160	71	44	70	719
	Warwick	23	40	65	0	32	22	4	8	22	131	13	23	19	402
	Wendell	22	41	11	0	35	15	4	8	25	170	19	19	38	407
	Health Area Total	**253**	**822**	**2,030**	**180**	**1,458**	**684**	**305**	**464**	**948**	**4,094**	**804**	**586**	**652**	**13,280**
Heywood	Ashburnham	20	166	295	35	575	54	99	189	362	122	303	175	70	465
	Gardner	43	538	160	184	1,262	433	58	419	713	2,661	1,085	558	354	9,868
	Hubbardston	17	293	314	70	245	109	74	143	332	684	160	121	91	2,653
	Templeton	27	357	669	70	483	156	68	216	569	1,095	355	211	283	4,559
	Westminster	0	379	713	52	323	196	14	102	459	948	338	268	204	3,996
	Winchendon	46	317	1,002	14	669	251	53	330	440	1,708	368	245	360	5,803
	Health Area Total	**153**	**2,050**	**3,153**	**425**	**3,557**	**1,199**	**366**	**1,399**	**2,875**	**7,218**	**2,609**	**1,578**	**1,362**	**27,344**
	Service Area/Region Total	**406**	**2,872**	**5,183**	**605**	**5,015**	**1,883**	**671**	**1,863**	**3,823**	**11,312**	**3,413**	**2,164**	**2,014**	**40,624**
	Region Average	**27.1**	**191.5**	**345.5**	**40.3**	**334.3**	**125.5**	**44.7**	**124.2**	**254.9**	**754.1**	**227.5**	**144.3**	**134.3**	**2,708.3**
	Franklin County*	956	2,273	3,762	751	3,897	1,407	940	1,468	3,082	12,364	2,677	1,566	1,585	36,728
	Worcester County*	1,909	26,962	51,109	10,439	47,977	18,255	7,834	25,900	46,907	118,178	32,402	18,420	15,546	421,838
	Massachusetts*	14,795	205,718	317,827	78,806	370,824	140,484	82,102	265,085	506,967	1,018,564	312,504	161,589	137,110	3,612,375
	U.S.*	2,743,687	10,207,602	15,651,460	4,016,566	17,267,009	8,305,602	3,114,222	10,151,206	17,924,655	35,840,954	14,962,299	7,522,777	7,134,146	158,842,185

Source: American Community Survey 2015-2019 5-Year Estimates

AGR = Agriculture	CONS = Construction	TRN = Transportation	FIN = Finance	SCI = Scientific	HLTH = Health Care	REC = Recreation
FOR = Forestry	MFG = Manufacturing	WAR = Warehousing	INS = Insurance	MGN = Management	SS = Social Services	FDS = Food Service
FIS = Fishing	WS = Wholesale Trade	UTL = Utilities	RE = Real Estate	WMS = Waste Manage.	ART = Arts	OTHR = Other
MIN = Mining	RT = Retail	INFO = Information	PRO = Professioanl	EDU = Education	ENT = Entertainment	

Table SE-10 presents the changes that took place in the region's local economy from 2001 to 2019. The number of establishments in Heywood's Service Area increased during this period by 590 establishments (36.9%). All but one of Heywood's Service Area communities (Royalston – 4.5% = -1 establishment) gained establishments during this period. Establishment percentage growth was highest in Athol, where they grew by 72.3% (+170), followed by Warwick at 71.4% (+5), and Orange at 70.3% (+121). Despite increased establishments in places like Warwick, job growth has not necessarily equated to higher wages. Warwick's total wages decreased 56.2% during this same time. Another example includes Wendell, who experienced a 74.1% increase in total establishments but saw a nearly 54% decrease in real wages. Conversely, Phillipston added nine (+50%) new establishments since 2001 and saw wages explode by more than double their 2001 levels (+141.6%). Five communities in the service area saw total wages go down; the remaining 10 saw increases between 23.9% and 92.8%. Total wages increased in the Service Area by 30.8% compared to the state which saw wage increases of 86.1%.

SE - 10 Employment and Wages in the Service Area by Community 2001 and 2019

	Community	# Of Establishments			Total Wages			Average Monthly Employment			Average Weekly Wage		
		2001	2019	% Change	2001	2019	% Change	2001	2019	% Change	2001	2019	% Change
Athol	Athol	235	405	72.3%	$102,953,479	$157,986,870	53.5%	3,628	4,169	14.9%	$546	$729	33.5%
	Erving	25	38	52.0%	$11,743,257	$19,661,156	67.4%	359	473	31.8%	$630	$799	26.8%
	New Salem	20	27	35.0%	$2,938,421	$3,906,251	32.9%	160	100	-37.5%	$353	$751	112.7%
	Orange	172	293	70.3%	$53,822,875	$66,681,329	23.9%	2,071	1,730	-16.5%	$500	$741	48.2%
	Petersham	30	36	20.0%	$2,251,727	$4,340,846	92.8%	140	131	-6.4%	$309	$637	106.1%
	Phillipston	22	33	50.0%	$2,264,687	$5,471,996	141.6%	178	231	29.8%	$244	$456	86.9%
	Royalston	22	21	-4.5%	$2,533,989	$3,451,704	36.2%	152	96	-36.8%	$320	$691	115.9%
	Warwick	7	12	71.4%	$2,705,557	$1,246,548	-53.9%	112	50	-55.4%	$466	$479	2.8%
	Wendell	15	20	33.3%	$4,919,521	$1,522,785	-69.0%	228	84	-63.2%	$414	$349	-15.7%
	Health Area Total/Avg	**548**	**885**	**61.5%**	**$186,133,513**	**$264,269,485**	**42.0%**	**7,028**	**7,064**	**0.5%**	**$3,782**	**5,632**	**48.9%**
Heywood	Ashburnham	105	121	15.2%	$34,610,406	$9,584,278	-72.3%	1,064	1,011	-5.0%	$626	$943	50.6%
	Gardner	452	519	14.8%	$261,384,725	$418,898,181	60.3%	8,463	8,642	2.1%	$594	$932	56.9%
	Hubbardston	69	73	5.8%	$18,497,583	$16,722,285	-9.6%	632	421	-33.4%	$563	$764	35.7%
	Templeton	105	154	46.7%	$55,759,529	$76,612,257	37.4%	1,667	1,598	-4.1%	$643	$922	43.4%
	Westminster	148	223	50.7%	$158,406,240	$143,377,245	-9.5%	3,266	2,664	-18.4%	$933	$1,035	10.9%
	Winchendon	170	212	24.7%	$48,517,453	$68,930,020	42.1%	1,840	1,720	-6.5%	$507	$771	52.1%
	Health Area Total/Avg	**1,049**	**1,302**	**24.1%**	**$577,175,936**	**734124266**	**27.2%**	**16,932**	**16,056**	**-5.2%**	**$3,866**	**5,367**	**38.8%**
	Service Area Avg	**106**	**146**	**36.9%**	**$50,887,297**	**$66,559,583**	**30.8%**	**1597**	**1,541**	**-3.5%**	**$510**	**$733**	**43.8%**
	Service Area Total	**1,597**	**2,187**	**36.9%**	**$763,309,449**	**$998,393,751**	**30.8%**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
	Massachusetts*	193,547	261,292	35.0%	$147,345,755,224	$274,265,224,027	86.1%	$3,276,103	$3,633,635	10.9%	$865	$1,452	67.9%
	Source: Massachusetts Division of Unemployment Assistance												

Education

Public Schools Available

In the Service Area, 15 public school districts cover the 15 communities, with 41 individual schools contained within those 15 districts. There are twenty elementary schools, seven middle schools, and fourteen high schools. Table SE-11 shows all available public schools for the 2020-2021 school year, total enrollments, and the communities served.

The Town of Erving has its own elementary school, or students can attend the Swift River School in New Salem. Once Erving students reach seventh grade, however, they attend the Great Falls Middle School and the Turners Fall's High School in Montague, which is in the Gill-Montague School District, not Service Area communities. New Salem and Wendell serve as a school district for elementary grades at the Swift River School but attend 7th – 12th grades in the Ralph C. Mahar District. Similarly, Orange and Petersham each have their own school districts for elementary grades PK – 6, but students attend the Ralph C. Mahar Regional High School after elementary. Hubbardston is the only Service Area community in the Quabbin School District; students attend the Hubbardston Center School for K – 6th and then move on to the Quabbin Regional Middle and High Schools in Barre for 7th – 12th. Barre is not a Service Area community.

"If the youth are struggling, then the entire family is struggling, the siblings, the parents, it's huge."

SE – 11 Public Schools Available in the Service Area Including Enrollment Totals (2020-21)

School District	Schools Available	Grades	Location	Enrollment Total	Service Area Communities Included
Ashburnham-Westminster	John Briggs Elementary School	PK-5	Ashburnham	461	Ashburnham
	Meetinghouse Elementary School	K-1	Westminster	157	Westminster
	Westminster Elementary School	2-5	Westminster	370	
	Overlook Middle School	6-8	Ashburnham	559	
	Oakmont High School	9-12	Ashburnham	647	
Athol-Royalston	Royalston Community Elementary	PK-4	Royalston	136	Athol
	Athol Community Elementary	K-4	Athol	526	Royalston
	Athol-Royalston Middle School	5-8	Athol	417	
	Athol High School	9-12	Athol	346	
Erving	Erving Elementary School	PK-6	Erving	113	Erving
Franklin County Technical School	Franklin County Technical School	9-12	Turner's Falls	555	Erving, New Salem Orange, Warwick, Wendell
Gardner	Waterford Street School	PK-1	Gardner	370	Gardner
	Elm Street School	2-4		452	
	Gardner Middle School	5-7		544	
	Gardner High School	8-12		731	
	Gardner Academy for Learning & Tech.	9-12		114	

Gill-Montague	Great Falls Middle School	6-8	Montague	210	Erving (Grade 7-12)
	Turner's Falls High School	9-12	Montague	190	
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School	9-12	Fitchburg	1417	Ashburnham, Athol Gardner, Hubbardston, Petersham, Royalston, Templeton, Westminster, Winchendon, Phillipston
Narragansett	Templeton Center Elementary	K-1	Templeton	569	
	Narragansett Middle School	5-8	Baldwinville	339	
	Narragansett Regional High School	9-12	Baldwinville	419	
New Salem-Wendell	Swift River School	PK-6	New Salem	129	Erving, New Salem, Wendell
Orange Elementary	Fisher Hill School	PK-2	Orange	201	Orange
	Dexter Park School	3-6		264	
Petersham	Petersham Center School	K-6	Petersham	123	Petersham
Pioneer Valley	Bernardston Elementary	PK-6	Bernardston	182	Northfield, Bernardston
	Northfield Elementary	PK-6	Northfield	169	
	Pioneer Valley Regional School	7-12	Northfield	280	
Quabbin	Hardwick Elementary	PK-5	Hardwick	197	Hubbardston, Hardwick, New Braintree, Oakham, Barre
	New Braintree Grade School	K-1	New Braintree	48	
	Oakham Center School	2-5	Oakham	123	
	Ruggles Lane Elementary School	PK-5	Barre	337	
	Hubbardston Center School	K-6	Hubbardston	243	
	Quabbin Regional Middle School	7-8	Barre	515	
	Quabbin Regional High School	9-12	Barre	632	
Ralph C. Mahar	Ralph C. Mahar Regional	7-12	Orange	619	New Salem, Orange, Petersham, Wendell. All communities (choice in)
Winchendon	Winchendon Preschool Program Memorial School	PK	Winchendon	56	Winchendon
	Toy Town Elementary School	K-2		293	
	Memorial	K-2		258	
	Murdock Middle School	3-5		274	
	Murdock Academy for Success	6-8		35	
	Murdock High School	9-12		262	
Source: Massachusetts Department of Elementary and Secondary Education					

Table SE-12 shows the types of schools available and the enrollment by type in Service Area communities. All the communities in the Service Area have access to nine traditional academic high schools and two technical vocational high schools. The Montachusett Regional Vocational Technical School District includes the Service Area communities of Ashburnham, Athol, Gardner, Hubbardston, Petersham, Royalston, Templeton, Westminster, Winchendon, and Phillipston. The Franklin County Technical School District includes the Service Area communities of Erving, New Salem, Orange, Warwick, and Wendell. Gardner and Winchendon are the only Service Area communities with their own school districts that include traditional academic high schools that are not regional. Students in the remaining 13 communities attend regional high schools.

Only two (2) communities, Petersham (90.1%) and Wendell (90.9%) have less of a percentage of students who attend public schools than the state (91.4%) by a slim margin. These two (2) communities each have less than 85 students total in their towns. More than 95% of all students in the Service Area attend public schools, except for Petersham, Wendell, and Winchendon. *The Service Area communities that list zero (0) in the Local Public Schools column are part of a regional school district.* The communities with the highest percentage of students who attend public districts other than their own are Erving (37.2), Royalston (25.4), Orange (11.1), Athol (18.5%), Warwick (10.3), Gardner (10.2%), and Templeton. This tends to indicate the lack of confidence local parents have in their own school systems.

SE - 12 Schools Available in the Service Area Including Enrollment Totals (2020-2021)

Community	Local Public Schools	Academic Regional Schools	Vocational Technical Regional Schools	Collaboratives	Charter Schools	Out-of-District Public Schools	% Out of District Public Schools	Home School	In State Private & Parochial Schools	Total Students	Total Public	% Public
Ashburnham	0	973	56	3	7	30	2.8	9	37	1,115	1,078	96.7
Athol	0	1,215	84	19	0	310	18.5	52	5	1,685	1,680	99.7
Erving	110	0	33	0	8	92	37.2	4	4	251	247	98.4
Gardner	2,194	0	153	10	18	275	10.2	35	113	2,798	2,685	96
Hubbardston	0	496	75	2	28	29	4.4	32	15	677	662	97.8
New Salem	0	56	0	0	0	5	7.8	3	0	64	64	100
Orange	509	0	0	0	2	65	11.1	9	0	585	585	100
Petersham	61	0	0	0	0	7	9.6	5	8	81	73	90.1
Phillipston	0	195	26	1	0	17	6.8	11	9	259	250	96.5
Royalston	0	86	14	1	0	35	25.4	2	5	143	138	96.5
Templeton	0	921	96	6	6	118	10	30	50	1,227	1,177	95.9
Warwick	0	64	7	0	1	9	10.3	6	2	89	87	97.8
Wendell	0	57	0	1	0	1	1.7	1	6	66	60	90.9
Westminster	0	1,112	72	5	5	29	2.3	21	30	1,274	1,244	97.6
Winchendon	1,178	0	160	20	55	82	5.3	41	88	1,627	1,536	94.4
Massachusetts	734,829	93,406	26,616	3,837	34,721	21,454	2.3	7,511	76,857	1,000,886	914,863	91.4

Source: MA DESE

Table SE-13 categorizes student enrollment by race/ethnicity from the 2020-2021 school year for each school district in the Service Area communities. Currently, eight (8) of the school districts have greater than ninety percent white students, and all the districts have a higher percentage of whites than the state by a wide margin. Even the more urban communities, such as Gardner and Athol, are less diverse than the state. The communities in the Service Area have traditionally been predominantly white; however, as shown in Tables SE-13 and 14, the minority population is increasing, especially among the Hispanic population.

SE – 13 Student Enrollment by Race/Ethnicity in the Service Area School Districts (2020-2021)

Community	% African American	% Asian	% Hispanic	% Native American	% White	% Native Hawaiian, Pacific Islander	% Multi-Race, Non-Hispanic
Ashburnham - Westminster	1.2%	1.0%	5.1%	0.1%	89.7%	0.0%	3.0%
Athol - Royalston	1.8%	1.0%	10.4%	0.1%	82.8%	0.0%	3.9%
Erving	0.0%	0.0%	4.4%	0.0%	85.0%	0.0%	10.6%
Franklin County Technical School	1.1%	0.0%	6.3%	0.2%	89.4%	0.7%	2.3%
Gardner	3.2%	2.4%	23.2%	0.2%	63.5%	0.0%	7.6%
Gill-Montague	1.5%	0.5%	14.5%	0.0%	76.0%	0.2%	0.1%
Montachusett Regional Vocational Technical School	2.0%	1.8%	17.2%	0.0%	74.8%	0.0%	4.1%
Narragansett	0.7%	0.3%	7.5%	0.1%	87.9%	0.1%	3.4%
New Salem - Wendell	0.0%	0.0%	3.9%	0.0%	87.6%	0.0%	8.5%
Orange	1.3%	0.6%	8.2%	0.2%	84.5%	0.0%	5.2%
Petersham	0.0%	0.0%	8.1%	0.0%	88.6%	0.0%	3.3%
Pioneer Valley	0.6%	0.6%	1.3%	0.0%	93.0%	0.5%	4.0%
Quabbin	0.9%	1.2%	5.9%	0.1%	89.6%	0.1%	2.1%
Ralph C. Mahar	1.6%	1.8%	7.9%	0.2%	84.5%	0.2%	3.9%
Winchendon	1.9%	1.7%	6.5%	0.1%	86.1%	0.3%	3.6%
Service Area Average	1.19%	0.86%	8.69%	0.09%	84.20%	0.14%	4.37%
Massachusetts	9.3%	7.2%	22.3%	0.2%	56.7%	0.1%	4.1%

Source: MA DESE

Table SE-14 shows the percent changes in race/ethnicity for the student population in the Service Area school districts between 2010 and 2020. The most considerable percent change in the Service Area is the white population, with a decrease of 5.5%. The Asian and Native American populations each declined by 0.1%. The Hispanic (3.4%), Multi Race, Non-Hispanic (2.3%), and African American (0.1%) student populations each increased over the period. The school districts with the most significant increase to the Multi-Race Non-Hispanic student populations are Erving (7.6%), New Salem-Wendell (5.7%), Gardner (4.9%), and Orange (3.0%). In the state, there was an increase of 1.7% of multi-Race students. The Hispanic student population in the Service Area has increased 3.4% over the years, much less than the 6.9% increase in statewide Hispanic students. The districts with the highest percent change of Hispanic

students are Gardner (12.2%) at nearly twice the state rate, Athol-Royalton (5.7%), and Narragansett (5.3%).

Compared to the change in the Service Area communities' racial makeup, as shown in Table PC-4 in Chapter 1, the student populations appear to be growing at a much greater rate. This can be attributed to the way the data is collected. For the student populations, these are exact numbers as submitted to the Massachusetts Department of Elementary and Secondary Education by the school districts. On the other hand, the general population data is an estimate collected by the U.S. Census American Community Survey. It is clear from the student numbers that the Hispanic and Multi-Race categories are growing, and the white population is decreasing in most communities in the Service Area, especially in Gardner.

SE – 14 Percent Change in Race/Ethnicity in Service Area School Districts 2010-2011 v. 2020-2021

Community	African American % Change	Asian % Change	Hispanic % Change	Native American % Change	White % Change	Native Hawaiian, Pacific Islander % Change	Multi-Race, Non-Hispanic % Change
Ashburnham - Westminster	0.3%	-0.2%	1.7%	0.0%	-2.7%	0.0%	1.2%
Athol-Royalton	0.1%	0.3%	5.7%	-0.1%	-7.0%	-0.1%	1.2%
Erving	0.0%	0.0%	0.7%	0.0%	-8.3%	0.0%	7.6%
Franklin County Technical School	0.9%	-0.6%	3.1%	0.0%	-4.0%	0.3%	0.3%
Gardner	-0.1%	0.3%	12.2%	-0.1%	-17.1%	0.0%	4.9%
Gill-Montague	-0.4%	-0.2%	8.3%	0.0%	-12.2%	0.0%	4.4%
Montachusett Regional Vocational Technical	0.3%	-0.3%	4.3%	-0.1%	-3.9%	-0.1%	-0.3%
Narragansett	0.2%	0.0%	5.3%	-0.2%	-6.2%	-0.2%	1.1%
New Salem-Wendell	0.0%	-2.1%	3.2%	0.0%	-6.9%	0.0%	5.7%
Orange	0.4%	-0.2%	3.1%	0.1%	-6.5%	0.0%	3.0%
Petersham	-0.9%	-0.9%	0.1%	0.0%	2.8%	0.0%	-1.1%
Pioneer Valley	0.1%	0.2%	-1.1%	-0.1%	-1.8%	0.4%	2.3%
Quabbin	0.2%	0.7%	2.6%	-0.1%	-3.1%	0.1%	-0.5%
Ralph C. Mahar	0.3%	0.5%	5.0%	0.1%	-5.4%	0.2%	-0.5%
Winchendon	0.3%	0.0%	1.9%	-0.1%	-3.6%	0.3%	1.5%
Service Area Average	**2.1%**	**-0.2%**	**3.7%**	**0.0%**	**-5.7%**	**0.1%**	**2.1%**
Massachusetts	1.1%	1.7%	6.9%	0.0%	-11.3%	0.0%	1.7%
Source: MA DESE							

Table SE-15 shows the percentage of English Language Learner (ELL), disabled, economically disadvantaged, and high needs students. ELL is a student whose first language is a language other than English and cannot perform ordinary classroom work in English. Economically disadvantaged is based on a student's participation in one or more of the following state-administered programs: the Supplemental Nutrition Assistance Program (SNAP); the Transitional Assistance for Families with Dependent Children (TAFDC); the Department of Children and Families (DCF) foster care program; and MassHealth

(Medicaid). A student is high needs if he or she is designated as either low income (prior to School Year 2015), economically disadvantaged (starting in School Year 2015), ELL or former ELL, or a student with disabilities. A former ELL student is a student not currently an ELL but had been at some point in the two previous academic years.

The Gardner School District has the highest average percentage (3.4%) of students who are ELL, followed by Gill-Montague (3.2% - serving Erving) and Athol-Royalston (2.3%); however, none of the Service Area school districts come close to the state percentage of 10.2% ELL. Franklin County Technical School (31.6) is the school district in the Service Area with the highest average rate of students with disabilities, followed by Orange (25.8%) and Athol-Royalston (24.4%). Eight out of the fifteen school districts in the Service Area are above the state (17.7%) for percent of disabled students, and all fifteen of the Service Area districts fall above the nation (12.9%).

Economically disadvantaged is a new term for the MA Department of Elementary and Secondary Education (DESE). Before 2015, DESE quantified low-income students based on family income, and this determined whether a student could qualify for free or reduced lunch. The new economically disadvantaged category includes other metrics of low-income in deciding whether students need resources. The Orange School District has the highest percentage of economically disadvantaged students (56.7%), with Gardner (53.9%) and Athol/Royalston (47.7%) close behind. These numbers far surpass the state average percent of disadvantaged students of 32%, and six additional school districts in the Service Area also exceed the state percent.

The percent of high needs students is calculated by summing the number of low-income (pre-2015) or economically disadvantaged (post 2015), disabled, and ELL students, then dividing that total by enrollment. Orange's average percent of high needs students (65%) is the highest in the Service Area, followed by Gardner (63.1%) and Athol-Royalston (58.4%). Seven out of the fifteen Service Area districts fall above the state (46.6%) in average high needs students.

SE - 15 Student Enrollment by English Language Learning, Disability, Economic Disadvantage, and High Needs (2020-2021)

School District	School	Grades	% English Language Learner (ELL)	% Students with Disabilities	% Economically Disadvantaged	% High Needs
Ashburnham-Westminster	John Briggs Elementary School	PK-5	3.3	21.3	17.2	34.7
	Meetinghouse Elementary School	k-1	3.1	9.3	15.4	24.1
	Westminster Elementary School	2-5	2.4	17.5	15.9	30.8
	Overlook Middle School	6-8	1	18	15.9	31.8
	Oakmont High School	9-12	1	14.7	13.9	24.8
Athol-Royalston	Royalston Community Elementary	PK-4	0.7	16.5	37.4	46
	Athol Community Elementary	K-4	2.5	28.2	56.6	67.1
	Athol-Royalston Middle School	5-8	4.3	27.6	49.9	62.4
	Athol High School	9-12	1.6	25.3	47	57.9
Erving	Erving Elementary School	PK-6	1.4	17.5	29.6	42
Franklin County Technical School	Franklin County Technical School	9-12	0.2	31.6	37	53.6

Gardner	Waterford Street School	PK-1	4.5	21.4	57.7	66.5
	Elm Street School	2-4	4.9	22.8	52.4	62.1
	Gardner Middle School	5-7	3.3	24.7	52.3	63.4
	Gardner High School	8-12	2.8	19.1	42.5	50.9
	Gardner Academy for Learning	9-12	1.4	26	64.4	72.6
Gill-Montague	Great Falls Middle School	6-8	3.7	26.5	43.7	58
	Turner's Falls High School	9-12	2.7	21	31.1	42
Montachusett Regional +Vocational Technical School	Montachusett Regional Vocational Technical School (Monty Tech)	9-12	0.6	15.1	26	36.7
Narragansett	Phillipston Memorial School	PK-4	1.2	24.9	35.5	48.5
	Baldwinville Elementary School	2-4	0	17.3	30.8	39.8
	Templeton Center Elementary	K-1	0	14.7	27.1	37.6
	Narragansett Middle School	5-8	0.2	15.5	29.1	37
	Narragansett Regional High	9-12	0.3	15.7	24.1	32.5
New Salem-Wendell-Erving	Swift River School	PK-6	0	16.4	34.9	42.8
Orange Elementary	Fisher Hill School	PK-2	0.7	24.4	60.9	67.7
	Dexter Park School	3-6	2.2	27.2	52.4	62.3
Petersham	Petersham Center School	K-6	0.9	23.9	26.1	44.4
Pioneer Valley	Warwick Community School	K-6	0	15.3	27.1	35.6
	Pioneer Valley Regional School	7-12	0	13.3	16.9	27.2
Quabbin	Hubbardston Center School	K-6	0.3	16.9	18.2	29.5
	Quabbin Regional Middle School	7-8	0.3	21.2	27	39.9
	Quabbin Regional High School	9-12	0.2	14.9	21.2	31.5
Ralph C. Mahar	Ralph C. Mahar Regional	7-12	1.6	16.2	39.9	46.6
Winchendon	Winchendon Preschool Program Memorial School	PK	1.3	22.8	53.2	63.3
	Toy Town Elementary School	3-5	1.3	16.9	48.2	54.7
	Murdock Middle School	6-8	1	15.3	39.8	47.3
	Murdock Academy for Success	6-12	0.7	13.9	37.7	43.6
	Murdock High School	9-12	0	34.5	62.1	75.9
			0.7	22	39.1	52
Massachusetts			10.2	17.7	32	46.6
Sources: MA DESE; National Center for Education Statistics (NCES)						

Attendance, Discipline, Graduation, and Drop-out Rates

Table SE-16 shows the attendance and retention rates for all the Service Area school districts. Attendance rate indicates the average percentage of days in attendance for students enrolled in grades PK-12. Petersham District, which is only K-6, has the highest attendance rate at 99.6%, followed by Franklin County Technical School (96.5%) and Ashburnham (96.0%). Erving has the lowest attendance rate at 92.6%, with Winchendon (93.1%) and Athol-Royalton District (93.6%) close behind. There are nine districts whose attendance rate is below that of the state (94.7%).

Chronically absent is the percentage of students absent 10% or more of their total number of student days of membership in a school. For example, a student who enrolled in a school for 50 days and missed five days, the student is counted as absent 10% or more that school year. Nine of the fifteen Districts have a higher chronically absent rate than the state (13.0%). The three highest rates are Orange Elementary at 22.5%, Winchendon (19.9), and Gardner (19.1%). The districts with the lowest rates are Petersham (0%), Franklin County Technical (5.1%), and Ashburnham-Westminster (6.8%).

The unexcused absences rate is calculated based on the number of students with unexcused absences for more than nine days divided by the end of the year enrollment (including transfers, dropouts, etc.) for the school year; each school district defines what constitutes an unexcused absence therefore rates may vary between districts. The district with the highest rate of unexcused absences is Winchendon (14.4%), followed by Gardner (14,1%) and Narraganset (7.8%). A total of five out of 15 districts has a greater rate than the state (6.8%). The districts with the best rates are Erving (0%), Franklin County Technical School (0%), New Salem Wendell (0%), and Petersham (0%).

Retention rate is the percentage of enrolled students in grades 1-12 who were repeating the grade they were enrolled in the previous year. Ralph C. Mahar (6.6), Winchendon (4.1%), and Gardner (1.6%) have the highest rate of students who repeat grades. The lowest rated districts are Erving (0%), Pioneer Valley (0.2%), and Narragansett (0.3%). Only five of the districts have a rate greater than the state (1.3%).

SE - 16 Attendance and Retention Rates of School Districts in the Service Area (2020-2021)

School District	Attendance Rate	Average # of Days Absent	Absent 10 or more days	Chronically Absent (10% or more)	Unexcused Absences >9	Retention Rate
Ashburnham-Westminster	96.0%	4.3	8.3	6.8	5.8	0.4
Athol-Royalston	93.6%	6.6	20.4	19.2	12	1.4
Erving	92.6%	7.9	26.5	22.1	0	0
Franklin County Technical School	96.5%	3.8	5.9	5.1	0	2
Gardner	93.8%	6.3	21.1	19.1	14.1	1.6
Gill-Montague	94.0%	6.5	20	17.8	6.9	0.7
Montachusett Regional Vocational Technical School	95.5%	5	12.2	10.5	6.4	0.8
Narragansett	94.5%	5.7	15.6	13.1	7.8	0.3
New Salem-Wendell	94.9%	5.6	15.6	15	0	0.9
Orange Elementary	92.7%	7.8	27.1	22.5	6.2	0.9
Petersham	99.6%	0.5	0	0	0	1.1
Pioneer Valley	95.2%	5.1	13.6	10.3	2	0.2
Quabbin	94.9%	5.2	13.7	12.3	4.7	1.8
Ralph C. Mahar	93.9%	6.5	20.5	17.8	0.5	6.6
Winchendon	93.1%	7.2	22.2	19.9	14.4	4.1
Massachusetts	94.7%	5.7	16	13	6.8	1.2

Source: MA DESE

Table SE-17 is the in- and out-of-school suspension percentages for the 15 school districts in the Service Area. For instances less than 6, the data is suppressed. Ralph C. Mahar has the highest in-school suspension rate at 8.6%, far above the other school districts and the state (1.2%). The Erving, New Salem-Wendell, and Petersham Districts have the lowest in-school suspension rates at 0.0%.

The district with the highest out-of-school suspension rate is Ralph C. Mahar at 4.9%, followed by Winchendon (3.6%) and Montachusett Regional Vocational Technical School (3.0%). All are above the state rate of 2.0%. The lowest rates are in Erving (0%), New Salem-Wendell (0%), and Petersham (0%). Nine of the fifteen districts are below the state. A reminder that every school district has different policies and procedures regarding discipline, so comparing them may not be equal.

SE - 17 Student Suspensions by School District in the Service Area (2019-2020)

School District	% In-School Suspension*	% Out-of-School Suspension*
Ashburnham-Westminster	2.6	0.4
Athol-Royalston	3.2	2.4
Erving	0	0
Franklin County Technical School	1.8	2.8
Gardner	0.7	1.3
Gill-Montague	0.5	0.1
Montachusett Regional Vocational Technical School	2.3	3
Narragansett	2.3	2.7
New Salem-Wendell	0	0
Orange Elementary	0.2	1.7
Petersham	0	0
Pioneer Valley	0.7	0.6
Quabbin	1.3	2.6
Ralph C. Mahar	8.6	4.9
Winchendon	2.9	3.6
Massachusetts	1.2	2
Source: MA DESE; NCES		

In the U.S. during the 2018-2019 school year, the public high school graduation rate was 86%. It was 93% for Asian/Pacific Islander students, 89% for White students, 82% for Hispanic/Latino students, 80% for Black students, and 74% for American Indian/Alaska Native students.[11]

Table SE-18 presents the graduation and dropout rates for each Service Area school district (note only applies to high school, therefore only 11 schools shown not 15). The Number in Cohort is the number of students who graduated in four years, and the Percent Graduated is based on that number. The Percent Still in School is the students who did not graduate within the four years. Non-Grad Completer includes:

[11] https://nces.ed.gov/programs/coe/indicator/coi

1) students who earned a certificate of attainment, 2) students who met local graduation requirements, but the district does not offer certificates of attainment, and 3) students with special needs who reached the maximum age (22) but did not graduate.

The school districts with the highest percent graduated was Montachusett Regional Vo-Tech at 97.2%, followed by Pioneer Valley (96.6%) and Narragansett (96.3%). Gardner (75.3%), Gill-Montague (75.3%), and Athol-Royalston (78.2%) were the lowest percent graduated. Six school districts have a more significant percent graduated than the state (89%), and seven were greater than the US (84%).

The percent of students who dropped out of high school is highest in Winchendon (11%), Quabbin (10.9%), and Gill-Montague (11.7%), Quabbin Regional High (10.6%), and Athol-Royalston and Gardner (both at 10.3%). The districts with the lowest percentage of students dropping out are Ashburnham-Westminster (0.6%), Montachusett Regional Vo-Tech (0.9%), and Narragansett (1.2%). The percentage of students dropping out in the state is 4.7%, and all but the top three school districts listed above are higher than that number. Similarly, all districts except the top three have dropout percentages higher than the nation (5.9%). Fortunately, no students in any of the school districts were permanently excluded from school.

SE – 18 Student Graduation and Drop-out Rates by School District in the Service Area (2020-2021)

School District	School	# In Cohort	% Graduated	% Still in School	% Non-Grad Completers	% H.S. Equivalent	% Dropped Out	% Permanently Excluded
Ashburnham-Westminster	Oakmont High School	161	95.1	1.9	0	0.6	0.6	0
Athol-Royalston	Athol High School	78	78.2	7.7	0	3.8	10.3	0
Franklin County Technical School	Franklin County Technical School	121	94.2	3.3	0	0	2.5	0
Gardner	Gardner High School	146	75.3	8.2	4.1	2.1	10.3	0
Gill-Montague (Erving)	Turner's Falls High School	60	73.3	8.3	0	3.3	11.7	3.3
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School	322	97.2	1.6	0	0.3	0.9	0
Narragansett	Narragansett Regional High	81	96.3	2.5	0	0	1.2	0
Pioneer Valley	Pioneer Valley Regional School	59	96.6	1.7	0	0	1.7	0
Quabbin	Quabbin Regional High School	161	82.6	6.2	0	0.6	10.6	0

Ralph C. Mahar	Ralph C. Mahar Regional	160	89.4	3.1	0	1.3	6.3	0
Winchendon	Murdock High School	84	88.1	9.5	0	0	2.4	0
Massachusetts	Total all Sr. Highs	74,232	89	5.3	0.6	0.4	4.7	0
Source: MA DESE; NCES								

Table SE-19 shows the plans of students after high school graduation in the Service Area districts (note only applies to high school, therefore only 11 schools shown not 15). The number of graduates, percent attending 2- and 4-year colleges and universities, other post-secondary settings, work, military, other and unknown are all included. The two technical high schools will typically have fewer graduates attending college as they are skilled in a trade that allows them to work right out of high school.

The districts with the highest percent of graduated students attending college are Ashburnham-Westminster (81.5%), Pioneer Valley (75.9%), and Quabbin (75.7%). The districts with the lowest percentage of students attending college, except for the two technical schools, are Athol-Royalston (31.9%), Winchendon (42.5%), and Narragansett (59.8%). Athol-Royalston is the only non-vocational school district to fall below the state percent of graduated students attending college (42.5%).

SE - 19 Plans of High School Graduates by School District in the Service Area (2020-2021)

School District	# Of Grads	% College/Univ.	% 2 Year Private College	% 4 Year Private College	% 2 Year Public College	% 4 Year Public College	% Other Post-Second.	Work	Military	Other	Unk
Ashburnham-Westminster	162	81.5	0.6	27.4	17.7	37.2	0	10.4	2.4	1.2	3
Athol-Royalston	83	31.9	0	13.9	30.4	15.2	5.1	26.6	5.1	1.3	1.3
Franklin County Technical School	118	34.1	0	4.8	22.9	1.9	0	62.9	2.9	0	1..9
Gill-Montague	46	65.2	0	14.6	22.9	0	0	6.3	2,1	0	0
Gardner	112	73.2	0.5	10.1	36.4	26.8	5.1	16.7	2.5	0	2
Montachusett Regional Vocational Technical School	313	54	0	9.3	24.9	21	1.8	31.5	0.9	3.6	6.9
Narragansett	49	59.8	0	21.9	13.7	28.8	4.1	2.7	4.1	0	24.7
Pioneer Valley	58	75.9	0	35	20	32.5	0	2.5	5	2.5	2.5
Quabbin	136	75.7	0	28.4	16.3	33.3	2.8	14.2	2.1	0.7	1.4
Ralph C. Mahar	158	69	0	11.1	33.3	21	4.9	12.3	2.5	1.2	13.6
Winchendon	158	42.5	0	17.6	29.4	20	8.3	28.3	0	1.7	1.7
Massachusetts	80	42.5	0.5	27.8	15.9	30	2.1	10.3	1.7	1.7	9.6
Source: MA DESE											

Table SE-20 shows how much money each school district spends per pupil per year. Per Pupil Expenditures are calculated by dividing a district's operating expenditures by its average pupil membership, including in-district expenditures per pupil and total expenditures per pupil. Each school district must supply a comprehensive report of revenues and expenditures to the state each fiscal year. The two technical high schools have a high total expenditure per pupil because these school districts are spending much more money on the capital outlay to ensure their technical programs are up to date with industry standards.

The traditional school districts with the highest per pupil expenditure in 2019 were Erving ($26,230), New Salem ($19,364), and Pioneer Valley ($18,777). The districts with the lowest expenditure per pupil were Ashburnham ($13,131), Narragansett ($13,448), and Gardner ($13,555). Only five of the fifteen districts were spending more than the state average of $17,150. New Salem (+26.1%), Erving (+22%), and Petersham (+16.9%) had the largest increase since 2016.

SE - 20 Per Pupil Expenditure Per School District in the Service Area 2019

School District	Total Expenditure Per Pupil (2019)	Total Expenditure Per Pupil (2016)	Percent Change (2016 to 2019)
Ashburnham-Westminster	$13,131	$12,713	3.3%
Athol-Royalston	$14,257	$14,028	1.6%
Erving	$26,230	$21,499	22.0%
Franklin County Technical School	$26,376	$23,717	11.2%
Gardner	$13,555	$12,450	8.9%
Gill-Montague	$16,584	$16,418	1.0%
Montachusett Regional Vo-Tech School	$19,771	$18,751	5.4%
Narragansett	$13,448	$12,807	5.0%
New Salem-Wendell-Erving	$19,364	$15,352	26.1%
Orange Elementary	$14,284	$12,767	11.9%
Petersham	$16,694	$14,281	16.9%
Pioneer Valley	$18,777	$17,719	6.0%
Quabbin	$16,844	$14,578	15.5%
Ralph C. Mahar	$17,145	$15,765	8.8%
Winchendon	$14,164	$13,934	1.7%
Massachusetts	$17,150	$15,545	10.3%

Source: MA DESE

Teacher Demographics

Table SE-21 shows the percentage of teachers according to race, ethnicity, and gender for the Service Area school districts. Overall, the teachers are mostly white females, with only the technical high schools having higher percentages of male teachers. All districts in the Service Area have higher rates of white teachers than the state (88.9%) and the nation (79.0%). With the growing population of Hispanic and Multi-Race students, the teacher race/ethnicity should keep up with the population trends of the students.

SE - 21 Teacher Race/Ethnicity/Gender by Percentage by School District in the Service Area (2020-2021)

School District	African American	Asian	Hispanic	White	Native American	Native Hawaiian, Pacific Islander	Multi-Race, Non-Hispanic	Males	Females
Ashburnham-Westminster	1.3	0	0.7	97.4	0	0	0.7	22.9	77.1
Athol-Royalston	1.4	0	0.6	98	0	0	0	18	82
Erving	0	0	0	93.4	0	0	6.6	9.3	90.7
Franklin County Technical School	0	0	0	96.3	1.2	0	2.5	61.1	38.9
Gardner	0.3	1.2	2.5	94.9	0	0	1.1	23.7	76.3
Gill-Montague	0	1.2	3	95.2	0	0	0.6	17.5	82.5
Montachusett Regional Vocational Technical School	0.5	0	4.4	94	1.1	0	0	42.7	57.3
Narragansett	0.5	0	0.5	98.9	0	0	0	20.4	79.6
New Salem-Wendell-Erving	3.2	0	3.2	87	0	0	6.5	8.3	91.7
Orange Elementary	0	0	1.2	98.8	0	0	0	10.7	89.3
Petersham	0	0	0	100	0	0	0	12.1	87.9
Pioneer Valley	0	0	0	100	0	0	0	15	85
Quabbin	0.7	0.7	0.7	97.6	0	0	0.4	16.5	83.5
Ralph C. Mahar	0	1.1	2.2	96.7	0	0	0	28.6	71.4
Winchendon	1.3	0	1.3	96.8	0	0.6	0	12.9	87.1
Massachusetts	4.60	1.70	4.90	88.10	0.1	0.1	0.5	20.40	79.60
Source: MA DESE									

Table SE-22 shows the number of teachers and student/teacher ratio in each school in the Service Area. The districts with the highest overall student/teacher ratio are Winchendon, Pioneer Valley, and Ashburnham-Westminster. Those with the lowest ratio are Erving, Franklin County, and Ralph C Mahar.

SE - 22 Student/Teacher Ratio per School District in the Service Area (2020-2021)

School District	School	Grades	# Of Teachers	Student/ Teacher Ratio
Ashburnham-Westminster	John Briggs Elementary School	PK-5	36.1	12.8 to 1
	Meetinghouse Elementary School	K-1	12.3	12.7 to 1
	Westminster Elementary School	2-5	23.9	15.5 to 1
	Overlook Middle School	6-8	35.7	15.7 to 1
	Oakmont High School	9-12	45.7	14.2 to 1
Athol-Royalston	Royalston Community Elementary	PK-4	10.2	13.3 to 1
	Athol Community Elementary	PK-4	43	12.2 to 1
	Athol-Royalston Middle School	5-8	33.4	12.5 to 1
	Athol High School	9-12	28.9	12.0 to 1
Erving	Erving Elementary School	PK-6	17.2	6.6 to 1
	Franklin County Regional	9-12	53.6	10.4 to 1

Franklin County Technical School	Vocational Technical School			
Gardner	Waterford Street School	PK-1	30	12.3 to 1
	Elm Street School	2-4	39.5	11.4 to 1
	Gardner Middle School	5-7	42	13.0 to 1
	Gardner High School	8-12	58.4	12.5 to 1
	Gardner Academy for Learning	9-12	7.8	14.6 to 1
Gill-Montague	Great Falls Middle School	6-8	21.6	9.7 to 1
	Turner's Falls High School	9-12	20.1	9.5 to 1
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School	9-12	105	13.5 to 1
Narragansett	Templeton Center Elementary	PK-4	34	16.7 to 1
	Narragansett Middle School	5-8	27.5	12.3 to 1
	Narragansett Regional High School	9-12	37.5	11.2 to 1
New Salem-Wendell	Swift River School	PK-6	12.5	10.3 to 1
Orange Elementary	Fisher Hill School	PK-2	16.5	12.2 to 1
	Dexter Park School	3-6	23.3	11.3 to 1
Petersham	Petersham Center School	K-6	13	9.5 to 1
Pioneer Valley	Bernardston Elementary	PK-6	17	10.7 to 1
	Northfield Elementary	PK-6	18.5	9.2 to 1
	Pioneer Valley Regional School	7-12	25.1	11.1 to 1
Quabbin	Hardwick Elementary	PK-5	10.9	18.1 to 1
	Hubbardston Center	K-5	14.5	16.7 to 1
	New Braintree Grade	K-1	6.6	7.2 to 1
	Oakham Center	2-5	12.9	9.5 to 1
	Quabbin Regional High School	9-12	40.6	15.6 to 1
	Quabbin Regional Middle School	6-8	33	15.6 to 1
	Ruggles Lane	PK-5	22.2	15.2 to 1
Ralph C. Mahar	Ralph C. Mahar Regional	7-12	57.6	10.7 to 1
Winchendon	Winchendon Preschool Program	PK	3	18.7 to 1
	Memorial School	K-2	16	16.1 to 1
	Toy Town Elementary School	3-5	16.5	17.8 to 1
	Murdock Middle School	6-8	21	13.1 to 1
	Murdock Academy for Success	6-12	0.2	175 to 1
	Murdock High School	9-12	21.2	12.4 to 1
Source: MA DESE				

Educational Attainment

Numerous studies consistently report "significant associations between formal educational attainment and individual health outcomes" for health issues like "mortality, smoking, drug abuse, accidents and contraction of many diseases."[12] As shown in Table SE-23, all but one community in Heywood's service area (Wendell at 23.0%) have a population percentage with a high school diploma higher than the state's 23.9.% average. More than 40% of the populations of Erving (43.2%), Orange (43.2%), and Royalston (42.5%) have a high school diploma, the highest of all communities in the area. There are nine (9) communities with higher percentages of residents with no high school diploma compared to the state

[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3188849/

(4.5%): Templeton (8.5%), Warwick (7.9%), Gardner (7.7%), Athol (7.0%), Phillipston (6.9%), Winchendon (5.8%), Wendell (5.0%), Erving (4.9%) and Petersham (4.6%).

Fourteen (14) of the 15 communities have populations with a higher percentage of residents with "at least some college, no degree" compared to the state. Fourteen (14) of 15 communities have populations with a greater percentage of residents with an "associate degree" compared to the state. Three of 15 communities have a higher percentage of the population with a bachelor's degree compared to the state overall (Ashburnham, Wendell, and Westminster). One community has a higher percentage of the population with a "professional, or graduate degree" compared to the state (Petersham).

One likely reason so many people in the area have at least some colleges or an associate degree is the accessibility of Mount Wachusett Community College (MWCC) in Gardner, Greenfield Community College in Greenfield, and the increased attendance of online colleges. MWCC offers two-year programs and, not far away but outside of the service area, lies Fitchburg State University that offers four-year programs. Both colleges are far more accessible and affordable than other options across the state and even the nation.

Between Athol and Heywood Hospitals' Service Areas, as seen in Tables SE-23, educational attainment is relatively equal across the board. The Service Area has a lower rate of the population with no high school diploma compared to the state (7.1% vs. 9.3%), and a higher percentage with a high school diploma only (32.4% vs. 24%). However, the Service Area has a lower percent of the population with a bachelor's degree compared to the state (17.7% vs. 24.1%).

Athol's Health Area has a higher percentage of the population with a high school diploma compared to the Heywood Health Area (34.3% vs. 29.5%). Although, Athol's Health Area has a slightly higher rate of those with no high school diploma (7.3% vs. 6.6%). Heywood's Health Area has a marginally higher percentage of those with some college but no degree (22.1% vs. 21.4%), a slightly higher percentage of those with an associate degree (12.7% vs. 10.7%), and a somewhat higher percentage of those with a bachelor's degree (19.2% vs. 15.8%). In Heywood's Service Area, 10.9% of the population has a Graduate or Professional degree compared to 8.4% in Athol.

SE - 23 Educational Attainment in the Service Area for Population 25 Years and Over

	Community	No High School Diploma	High School Graduate	Some College, No Degree	Associate degree	Bachelor's Degree	Graduate or Professional Degree
Athol	**Athol**	9.7%	37.7%	21.7%	11.4%	13.1%	6.4%
	Erving	8.9%	43.3%	21.2%	10.7%	10.0%	6.1%
	New Salem	5.9%	26.8%	16.6%	9.2%	20.7%	20.9%
	Orange	10.4%	40.2%	20.7%	9.6%	12.7%	6.5%
	Petersham	4.6%	29.0%	22.8%	7.2%	13.9%	22.5%
	Phillipston	8.0%	37.1%	20.2%	12.2%	14.3%	8.2%
	Royalston	6.0%	42.5%	20.9%	10.6%	10.1%	9.8%
	Warwick	7.9%	29.5%	22.4%	7.6%	21.9%	10.6%
	Wendell	4.7%	23.3%	15.0%	9.9%	27.6%	19.6%
	Health Area Average	7.3%	34.3%	20.2%	9.8%	16.0%	12.3%
He	**Ashburnham**	2.6%	24.4%	21.4%	11.9%	27.2%	12.6%

Gardner	11.0%	35.0%	22.7%	13.1%	11.+6	6.7%
Hubbardston	3.1%	27.7%	24.3%	13.3%	20.3%	11.3%
Templeton	9.9%	28.3%	25.1%	14.8%	16.3%	5.7%
Westminster	4.4%	26.5%	18.6%	10.1%	26.4%	14.0%
Winchendon	8.7%	35.3%	20.3%	13.1%	13.4%	9.2%
Health Area Average	6.6%	29.5%	22.1%	12.7%	20.7%	9.9%
Service Area Average	**7.1%**	**32.4%**	**20.9%**	**11.0%**	**17.7%**	**11.3%**
Franklin County	6.7%	28.5%	17.3%	10.3%	20.4%	16.9%
Worcester County	6.6%	19.0%	12.3%	5.8%	27.5%	28.8%
Massachusetts	9.3%	24.0%	15.4%	7.6%	24.1%	19.6%
Source: 2015-2019 American Community Survey 5-Year Estimates						

Built Environment

The built environment is the human-made elements of where we live, work, worship, travel, and play. It includes open spaces, transportation systems, infrastructure, and the systems that connect them. Built environment characteristics have an impact on available resources and services across communities. Access to healthy food and safe places to exercise and play influence a person's ability to be healthy.

1. **Housing**

Table SE-24 shows housing characteristics for the service area. Housing costs continue to rise in Massachusetts and throughout the country adding stress upon stress for residents of the service area. Renters are the most vulnerable to housing stresses: rising rents, low supply, difficult landlords, or rental units converted to condos or short-term rentals such as Airbnb. Table SE-24 shows that in many communities, over 40% of renters pay greater than 30% of their income to their housing cost. This does not leave much for living expenses or savings. In Wendell, Warwick, Orange, and Athol, over 50% of renters exceed 30% of income. Communities in the Heywood service area have a substantially higher proportion of housing units as deed-restricted affordable units. In the Heywood service area, no community is above 50% of renters paying over 30% of income.

"Because of ballooning rental prices, cohabitating is necessary."

"Accessing housing, particularly subsidized housing, if you have any kind of criminal history or anything like that is very difficult."

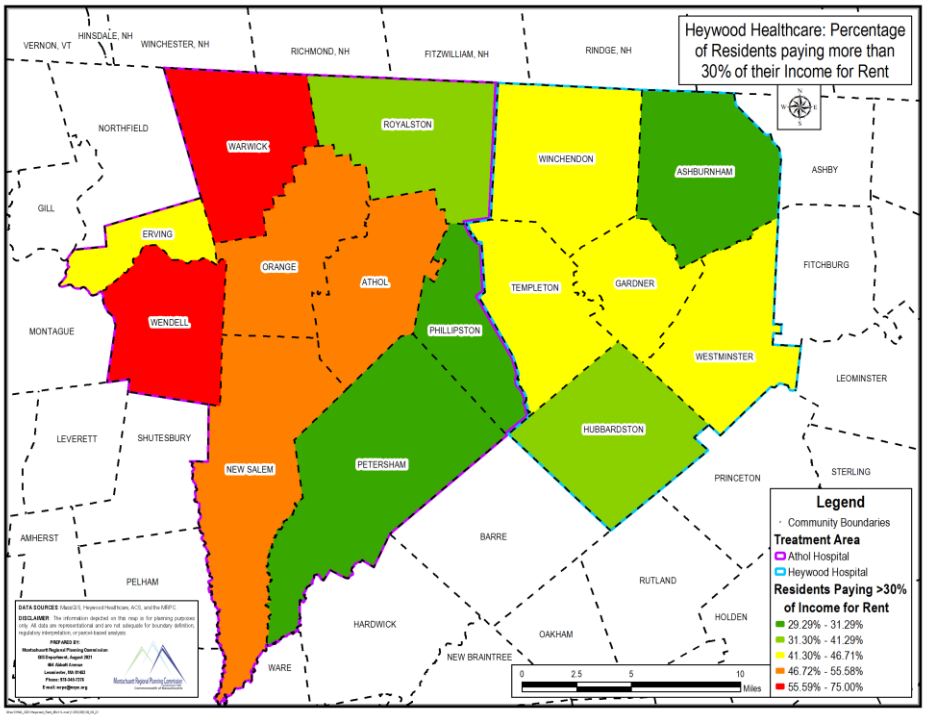
SE – 24 Housing Characteristics in the Service Area 2019

	Community	Total Housing Units	# Of Vacant Housing Units	Home-Owner Vacancy Rate	Rental Vacancy Rate	Median Housing Costs/Month w Mortgage	Median Rental Costs/Month	% Paying >30% of Income on Mortgage	% Paying >30% of Income on Rent	# Of Public Housing Units Available*
Athol	Athol	5,231	592	3.4%	0.0%	$1,378	$877	27.3%	51.9%	284
	Erving	772	102	0.0%	0.0%	$1,314	$775	15.4%	43.6%	0
	New Salem	504	63	2.8%	0.0%	$1,420	$1,080	28.9%	52.5%	0
	Orange	3,488	386	1.2%	0.0%	$1,535	$895	30.2%	55.6%	410
	Petersham	541	68	2.4%	0.0%	$1,727	$960	33.5%	31.3%	0
	Phillipston	811	168	0.0%	0.0%	$1,642	$1,323	37.0%	29.3%	5
	Royalston	669	99	0.0%	0.0%	$1,478	$871	33.9%	41.3%	3
	Warwick	451	103	1.8%	0.0%	$1,711	$1,042	15.9%	68.4%	0
	Wendell	435	52	5.3%	0.0%	$1,358	$955	33.7%	75.0%	5
	Health Area Average	1,434	181	1.9%	0.0%	$1,507	$975	28.4%	49.9%	79
	2016 HA Average	**13,260**	**1,753**	**2%**	**2%**	**$1,407**	**$920**	**32.7%**	**54.8%**	**731**
Heywood	Ashburnham	2,589	558	0.0%	0.0%	$1,784	$1,636	26.0%	30.6%	29
	Gardner	9,125	897	1.4%	1.1%	$1,580	$838	25.8%	45.2%	1361
	Hubbardston	1,827	130	0.0%	11.9%	$1,916	$1,095	24.2%	38.2%	49
	Templeton	3,487	170	0.0%	6.4%	$1,444	$1,065	21.5%	44.9%	233
	Westminster	3,080	210	0.0%	0.0%	$1,893	$1,104	25.7%	46.7%	87
	Winchendon	4,384	603	3.5%	5.7%	$1,613	$732	26.0%	44.8%	326
	Health Area Average	4,082	428	0.8%	4.2%	$1,705.0	$1,078.3	24.9%	41.7%	348
	2016 HA Average	**24,800**	**2,794**	**1.4%**	**4.7%**	**$1,614**	**$991**	**28.1%**	**36.2%**	**2,090**
	Service Area Avg	**2,493**	**280**	**1.5%**	**1.7%**	**$1,586**	**$1,017**	**27.0%**	**46.6%**	**186**
	2016 Service Area Avg	**38,060**	**4,547**	**1.7%**	**3.1%**	**$1,490**	**$948**	**30.8%**	**47.3%**	**2,821**
	Franklin County	34,134	36	1.0%	3.0%	$1,592	$976	32.3%	52.0%	NA
	Worcester County	335,104	25,153	1.3%	3.7%	$1,929	$1,060	19.7%	47.9%	NA
	Massachusetts	2897259	279762%	1.0%	3.6%	$2,225	$1,282	30.1%	49.5%	273004

Sources: US Census Bureau ACS 2015-2019 5-year Estimates; * MA DHCD Chapter 40B Subsidized Housing Inventory (SHI) as of 12/20/20

SE-Map 1 illustrates the percentage of renters in each community paying more than 30% of their income to rent. The communities with higher rates tend to be further from major job-centers like Fitchburg, Leominster, and Worcester. Longer commutes adds stress and cost to living in these communities.

SE – Map 1 Percent Paying More Than 30% of Income on Rent 2019



2. Homelessness

Homelessness and health problems co-exist within the population that must be accounted for by health care systems. Mental health issues, substance misuse, and inadequate nutrition will be the primary concerns. Tables SE-25 and SE-26 show "point in time" counts of homeless from January 2021 in Worcester City and County, which partially includes the Heywood Healthcare Service Area.

The total number of individuals sheltered or unsheltered during the time of the count was 1,196. Of those, 369 or 30.8% were under 18 years old. This a staggering and concerning number of children not properly housed and therefore subject to numerous health related issues, not to mention inconsistent education opportunities. SE-26 shows that 51.5% were men, 47.8% were women, and about half a percent were transgender or non-conforming.

"Newly homeless is hardest to reach, don't know system."

"Intersectionality of race/ethnicity and action towards helping homeless."

SE – 25 Point in Time Count of Homeless by Households Worcester City & County CoC 2021

Total Households and Persons					
	Sheltered			Unsheltered	Total
	Emergency	Transitional	Safe Haven		
Total Number of Households	366	162	13	225	**766**
Total Number of Persons	702	234	13	247	**1,196**
Number of Children (under age 18)	296	66	0	7	**369**
Number of Persons (18 to 24)	54	49	0	46	**149**
Number of Persons (over age 24)	352	119	13	194	**678**
Source: Central Mass Housing Alliance, Point in Time (PIT) Count January 27, 2021					

SE – 26 Point in Time Count of Homeless by Gender Identity Worcester City & County CoC 2021

Gender					
	Sheltered			Unsheltered	Total
	Emergency	Transitional	Safe Haven		
Female	372	108	2	90	**572**
Male	327	122	11	157	**617**
Transgender	2	4	0	0	**6**
Gender Non-Conforming (i.e., not exclusively male or female)	1	0	0	0	**1**
Source: Central Mass Housing Alliance, Point in Time (PIT) Count January 27, 2021					

3. Open Spaces and Trails

According to MassGIS data, the Service Area is chock full of open space parcels defined for this report as any conservation land or outdoor recreational facility owned by federal, state, county, municipal or nonprofit entities. This may also include town forests, parkways, agricultural land, aquifer protection land, watershed protection land, cemeteries, and forest land. These lands may have permanent protection where they are off-limits to development, temporary protection where they are protected from development for a specific timeframe or unprotected where development may occur at any time. It is also important to note that not all this land is open for public use but that they contribute positively to the health and well-being of area residents.

Table SE-27 displays the number of open space parcels per community as defined above. The number of open space parcels varies from community to community, with Hubbardston leading the pack at 284, followed by Petersham at 252 and Royalston at 215. Erving has the lowest number of open space parcels at 42, followed by Templeton (69) and Phillipston (101).

The rural nature of the Service Area provides ample opportunity for residents to get exercise outdoors in a tranquil environment, ultimately improving health outcomes for those who use the space. Table SE-27 shows a vast number of public trails for area residents to hike and play on. Warwick residents have access to over 110 miles of trails, far surpassing any other community in the Service Area. Wendell (84.26 miles) and Petersham (70.72 miles) have the second and third most trail miles. The remaining communities have between 16.23 (Hubbardston) and 84.26 miles (Wendell) of trails accessible to the public. In total, Service Area residents have access to over 578 (38.58 miles per community on average) of trails they can use to help improve health outcomes for themselves and their families.

SE - 27 Number of Open Space Parcels and Trails per Community

	Community	# Of Open Space Parcels	Total Acreage of Open Space	Percent of Open Space	Total Trail Length (Miles)
Athol	**Athol**	155	5995.09	28%	36.61
	Erving	42	3094.43	34%	27.11
	New Salem	158	23317.27	62%	16.48
	Orange	146	7275.35	32%	26.93
	Petersham	264	26194.41	60%	70.97
	Phillipston	100	6440.83	41%	16.57
	Royalston	214	11378.40	42%	30.17
	Warwick	101	14331.99	59%	110.21
	Wendell	148	12404.25	60%	84.26
	Health Area Average	148	12270.22	46%	46.59
Heywood	**Ashburnham**	125	7609.86	29%	20.64
	Gardner	152	4515.38	31%	34.68
	Hubbardston	286	11888.11	44%	16.23
	Templeton	69	5501.60	27%	17.35
	Westminster	118	6921.60	29%	28.23
	Winchendon	199	8335.03	30%	42.32
	Health Area Average	158	7461.93	32%	26.58
	Service Area Average	**152**	**10346.91**	**41%**	**38.58**
	Service Area Total	**2277**	**155203.60**	**43%**	**578.76**
	Source: MassGIS and the MRPC 2021				

2. Food Deserts and Swamps

The US Department of Agriculture (USDA) defines a "food desert" as "parts of the country vapid of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers' markets, and healthy food providers." In place of what should be food stores filled with affordable fresh fruit and whole foods, these locations are often " heavy on local quickie marts that provide a wealth of processed, sugar, and fat laden foods that are known contributors to our nation's obesity epidemic".[13] These places are considered "food swamps" where the number of fast-food restaurants, convenience stores, and liquor stores exceed the number of whole food markets.

[13] http://americannutritionassociation.org/newsletter/usda-defines-food-deserts

The existence of a food swamp has been proven to be "a stronger predictor of obesity rates than the absence of full-service grocery store" and this "grocery gap" disproportional affects people of color at higher rates than their white counterparts – African Americans are 2.49 times and Latinos are 1.38 times more likely than Whites to live in neighborhoods without access to a full-service grocery store. This inequitable access to affordable, healthy food perpetuates the disparity of rates of nutrition-related health issues between races.

As part of this effort, the USDA created the "Food Access Research Atlas" using Census tracts to identify locations across the country that are Low Income (LI) and have Low-Access (LA) to food within one-half to one-mile for urban areas, and 10 to 20 miles for rural areas.[14] The map also tracks which of those area have little to no vehicle access that would allow them to get to the nearest food store. Low-access communities qualify as such if they have "at least 500 people and/or at least 33% of the census tracts population must reside within one mile from a supermarket or large grocery store (10 miles for rural districts)".[15]

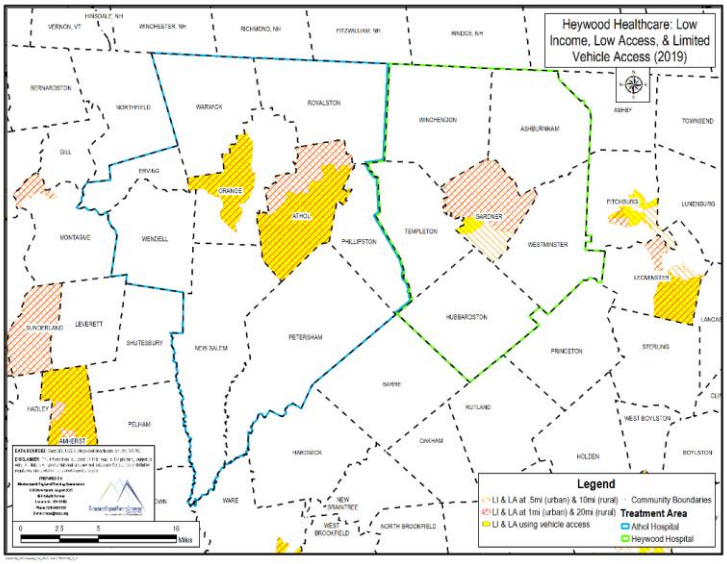
The solid colors in SE-Map 2 and SE-Map 3 show low income and low access areas for 2019 and the hatched areas show the same for 2015. According to the Food Access Research Atlas, large areas of Orange, Athol, and Gardner qualify as LI and LA at one (1) and 10 miles, one (1) in 20 miles, and using vehicle access. According to the USDA's standards, almost the entire city of Gardner is considered a food desert.

> *"Winchendon doesn't have a supermarket; people need a car or public transportation."*

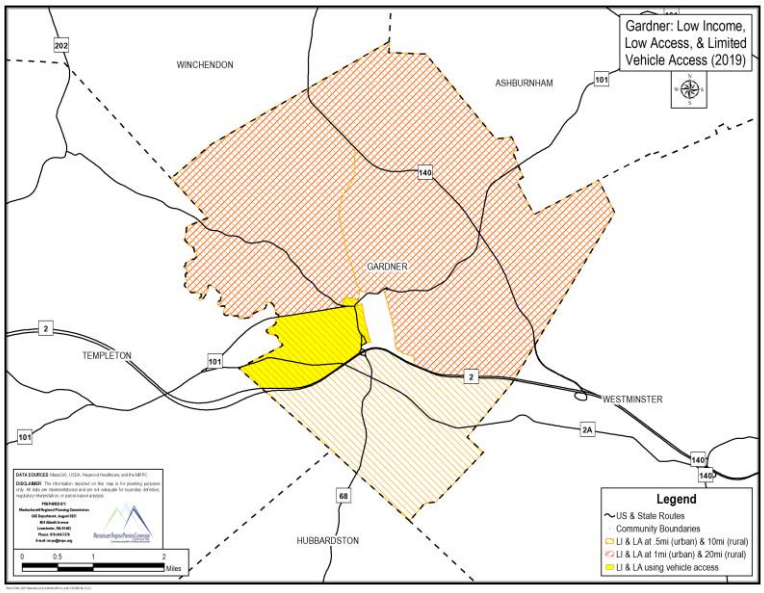
> *"Access to healthy foods is an equity issue; we need to increase education of what is a healthy food and access to healthy foods."*

[14] https://www.ers.usda.gov/data/fooddesert/
[15] http://americannutritionassociation.org/newsletter/usda-defines-food-deserts

SE - Map 2 LI and LA and limited vehicle access in Service Area communities 2019



SE - Map 3 LI and LA and limited vehicle access in Gardner 2019



Impact of COVID-19/Pandemic - Food Insecurity:

The pandemic has disrupted food access and greatly impacted food security across many rural communities in America. In one study conducted in Vermont using the US Department of Agriculture's food security measurements, it was found that there was a ⅓ increase in household food insecurity since the onset of COVID-19. Another study using United States survey data found that 44% of low-income adults self-identified as being food insecure. Based on Feeding America's Map the Meal Gap (MMG), there is a direct correlation between food insecurity and poverty. According to the Harvard School of Public Health, within the United States, the percentage of children who are food insecure has doubled from 14% to 28%. Along with this, 2.5 million children have fallen below the poverty line from October to May 2020.

3. Transportation

According to Table SE-28, on average, nearly 81% of Service Area workers drive alone to their place of work, 11% higher than the state (69.9%). About 9.5% of Service Area workers did carpool, which is slightly higher than the state's 7.5%; however, considerably fewer workers in the Service Area used public transportation (1.1%) than the state (10.4%).

In comparing commuters in Athol and Heywood Service Areas in Table SE-28, the rates at which people use public transportation, walk, bike, taxi, or ride a motorcycle to work are relatively equal. Most workers across the Services Areas drive themselves to work, with Athol's workforce driving themselves 79.5% of the time compared to 82.9% of Heywood's workers. Athol commuters carpool a bit more often than Heywood commuters (10.3% vs. 8.3%) and work from home 6.1% of the time compared to Heywood's 5.1%.

> *"There were 26 people using that bus to go to work in Worcester. And they said, 26 is not enough, which meant those 26 people lost their transportation to work."*
>
> *"Transportation issue is huge among my clients, 70% of my clients cannot access transit."*
>
> *"I think our families with young children if they don't have transportation, then they can't get to the library, they can't get to the Resource Center, they can't get to the park."*

SE – 28 Means of Travel to Work by Community 2019

	Community	Drove Alone	Carpooled	Public Transit	Walked	Bicycle	Taxicab, Motorcycle, Other	Worked from Home
Athol	**Athol**	76.9%	14.2%	1.2%	3.3%	0.2%	1.4%	2.7%
	Erving	80.7%	11.3%	2.2%	3.6%	0.0%	0.8%	1.4%
	New Salem	82.4%	12.0%	0.0%	0.0%	0.0%	0.4%	5.2%
	Orange	77.0%	12.9%	0.7%	2.8%	0.5%	0.3%	5.8%
	Petersham	79.8%	7.9%	2.0%	2.9%	0.2%	1.6%	5.7%
	Phillipston	79.9%	6.1%	2.2%	0.7%	0.0%	0.7%	10.5%
	Royalston	88.1%	5.1%	0.0%	2.1%	0.0%	1.7%	3.0%
	Warwick	82.3%	8.2%	0.0%	1.3%	0.0%	0.0%	8.2%
	Wendell	68.6%	15.3%	1.6%	2.1%	0.0%	0.0%	12.5%

	Health Area Average	79.5%	10.3%	1.1%	2.1%	0.1%	0.8%	6.1%
Heywood	**Ashburnham**	83.2%	5.0%	1.2%	2.2%	0.3%	0.0%	8.1%
	Gardner	77.8%	11.2%	1.0%	3.5%	0.1%	2.1%	4.3%
	Hubbardston	80.7%	8.5%	0.8%	2.6%	0.0%	0.0%	7.4%
	Templeton	86.5%	10.2%	0.0%	1.9%	0.0%	0.3%	1.1%
	Westminster	87.4%	4.4%	2.5%	0.0%	0.0%	1.2%	4.5%
	Winchendon	81.5%	9.5%	0.5%	2.6%	0.0%	1.0%	4.9%
	Health Area Average	82.9%	8.1%	1.0%	2.1%	0.1%	0.8%	5.1%
	Service Area Average	**80.9%**	**9.5%**	**1.1%**	**2.1%**	**0.1%**	**0.8%**	**5.7%**
	Massachusetts	69.9%	7.5%	10.4%	4.9%	0.9%	1.3%	5.2%
	Sources: US Census Bureau ACS 2015-2019 5-year Estimates							

It is important to note here that commuting alone to work is not necessarily a bad thing. Research has shown a strong positive link between access to automobiles and/or public transportation and economic opportunity. A higher percentage of people driving alone suggests that people have greater access to vehicles that can help them sustain employment and have a greater opportunity to climb the economic ladder.

- *"Families with access to cars found housing in neighborhoods where environmental and social quality consistently and significantly exceed that of the neighborhoods of households without cars"*
- *"Over time, households with automobiles experience less exposure to poverty and are less likely to return to high-poverty neighborhoods than those without car access"*
- *"Keeping or gaining access to automobiles is positively related to the likelihood of employment"*
- *"Improved access to public transit is positively associated with maintaining employment"*
- *"On earnings, both cars and transit access have a positive effect, though the effect of car ownership is considerably greater"*

Table SE-29 shows that a higher percentage of Service Area residents had access to two vehicles (43.2%), or three or more vehicles (25%) compared to the state (36.3% and 16.2%, respectively). Additionally, fewer Service Area residents had no access to any vehicle (5.1%) compared to the state (12.4%). While no access to a car was lower than the state, a few communities like Gardner (13.1%) and Winchendon (11.4%) stuck out among the other Service Area communities. Residents in those communities had a significantly higher chance of experiencing healthcare disparities due to the inability to get around for their healthcare needs and other essential services.

Since public transportation is limited, many area residents are forced to find alternative means to work. Fortunately, far more Service Area residents have access to personal transportation than typical in the state and nation. Access to a vehicle allows them to find and sustain employment. In addition to traveling to work, vehicle access also means greater access to food, schools, and other essential needs and services, which can be critical to communities like Winchendon with no supermarkets and Royalston with no gas stations.

> *"Transportation to VA facilities is not easily accessed and if you get sick after 4 PM or when VA closes, you wait until morning."*

SE - 29 Number of Vehicles Available for those Aged 16 and Over in Households 2019

	Community	No Vehicle	1 Vehicles	2 Vehicles	3+ Vehicles
Athol	Athol	8.9%	31.6%	38.1%	21.3%
	Erving	7.2%	27.5%	39.0%	26.4%
	New Salem	2.0%	22.7%	51.7%	23.6%
	Orange	8.9%	33.0%	39.1%	19.0%
	Petersham	6.1%	32.6%	36.8%	24.5%
	Phillipston	2.6%	20.4%	44.2%	32.8%
	Royalston	3.7%	23.3%	46.7%	26.3%
	Warwick	1.7%	25.0%	50.0%	23.3%
	Wendell	2.1%	24.3%	52.7%	20.9%
	Health Area Average	4.8%	26.7%	44.3%	24.2%
Heywood	Ashburnham	1.1%	14.3%	51.2%	33.4%
	Gardner	13.1%	36.6%	36.7%	13.6%
	Hubbardston	3.4%	24.3%	36.2%	36.1%
	Templeton	2.4%	35.3%	37.4%	24.9%
	Westminster	1.5%	22.2%	50.8%	25.6%
	Winchendon	11.4%	27.8%	37.6%	23.2%
	Health Area Average	5.5%	26.8%	41.7%	26.1%
	Service Area Average	**5.1%**	**26.7%**	**43.2%**	**25.0%**
	Massachusetts	12.4%	35.2%	36.3%	16.2%
	Sources: US Census Bureau ACS 2015-2019 5-year Estimates				

Heywood's concerns lie primarily with commute times of Service Area residents in terms of health outcomes. As can be seen in Table SE-30, the average commuting time (one way) for a resident in 11 of Heywood's 15 communities in its service area was higher than both the state (28.7 minutes) and national (25.9 minutes) averages.

Average commute times increased from commute times in 2000 in 11 of the 15 communities; some by under a minute (Hubbardston 35.5 minutes to 35.6 minutes) and others between 8 and 9 minutes (Petersham 29.5 minutes to 36.7 minutes; Templeton 25.2 minutes to 32.0 minutes). Commute times were reduced in one community, Royalston. Increasing commute times in many of these areas suggests that housing costs are forcing residents further from job centers. This trend hits low-income residents the hardest.

SE - 30 Mean Travel Time to Work by Community 2000-2016

	Community	2000 (Minutes)	2015-2019 (Minutes)	Change in Minutes
Athol	Athol	24.6	32.2	7.6
	Erving	22.6	25.7	3.1
	New Salem	22.8	31.1	8.3
	Orange	25.1	27.6	2.5
	Petersham	29.5	36.7	7.2
	Phillipston	29.4	31.4	2
	Royalston	35.1	33.0	-2.1
	Warwick	27.8	30.0	2.2
	Wendell	31.6	32.1	-0.5
	Health Area Average	27.6	31.2	3.6
Heywood	Ashburnham	31.4	38.3	6.9
	Gardner	24.1	29.6	5.5
	Hubbardston	35.5	35.6	0.1
	Templeton	25.2	31.0	5.8
	Westminster	28.7	31.8	3.1
	Winchendon	26.5	30	3.5
	Health Area Average	28.6	32.7	4.2
	Service Area Average	28.0	31.9	3.9
	Franklin County	23.7	24.9	1.2
	Worcester County	25.8	29.7	3.9
	Massachusetts	27	30.2	3.2
	U.S.	25.5	26.9	1.4
	Sources: US Census Bureau ACS 2015-2019 5-year Estimates,			

4. Crime and Incarceration

The National Incident-Based Reporting System (NIBRS), maintained by the Federal Bureau of Investigation, allows law enforcement agencies to collect detailed incident level data regarding individual offenses and arrests and submit them using prescribed data elements and data values. NIBRS presents quantitative and qualitative data that describes each incident and arrest and is broken down by community. Data users should not rank locales because many factors cause the nature and type of crime to vary from place to place. These statistics include only jurisdictional population figures along with reported crime data. Thus, rankings ignore the uniqueness of each locale.

Table SE-31 shows selected crime statistics for the communities in the Service Area. As mentioned above, communities' comparison is not recommended as different socio-economic circumstances occur in each community. However, comparing the Service Area communities' crime rates to the overall state rates can be beneficial. Table SE-30 compares this data. Data points with a "—" mean the information is not available because the community may not use the FBI's NIBRS software.

SE - 31 Selected Crime Statistics in the Service Area Communities 2019 and 2016

						Selective Crime Rates	2019			2016		
	Community Police Department	Population	Assaults	Homicides	Rape	Community Police Department	Assault Rate	Homicide Rate	Sexual Assault Rate	Assault Rate	Homicide Rate	Sexual Assault Rate
Athol	Athol	11,679	39	1	7	Athol	33.39	0.86	5.99	11.37	0	0.86
	Erving	1,171	0	0	0	Erving	0.00	0.00	0.00	10.16	0	1.69
	New Salem	1,009	--	--	--	New Salem	--	--	--	--	--	--
	Orange	7,643	17	0	3	Orange	22.24	0.00	3.93	9.59	0.13	1.05
	Petersham	1,188	--	--	--	Petersham	--	--	--	--	--	--
	Phillipston	1,784	--	--	--	Phillipston	--	--	--	--	--	--
	Royalston	1,366	0	0	0	Royalston	0.00	0.00	0.00	--	--	--
	Warwick	796	--	--	--	Warwick	--	--	--	--	--	--
	Wendell	862	--	--	--	Wendell	--	--	--	--	--	--
	Health Area Average	3,055	**56**	0	3	Health Area Average	13.91	0.21	2.48	10.4	0.0	1.2
Heywood	Ashburnham	6,281	6	0	2	Ashburnham	9.55	0.00	3.18	4.83	0	0.64
	Gardner	20,610	49	0	13	Gardner	23.77	0.00	6.31	NA*	0.05	1.33
	Hubbardston	4,708	--	--	--	Hubbardston	--	--	--	--	--	--
	Templeton	8,130	11	0	2	Templeton	13.53	0.00	2.46	5.26	0	0.73
	Westminster	7,766	19	0	1	Westminster	24.47	0.00	1.29	4.74	0	0.26
	Winchendon	10,841	28	0	0	Winchendon	25.83	0.00	0.00	15.38	0	2.14
	Health Area Average	9,723	**113**	0	4	Health Area Average	19.43	0.00	2.65	7.6	0.0	1.0
	Service Area Average	5,722	**169**	0	3	Service Area Average	16.98	0.10	2.57	9	0	1
	Massachusetts	6,892,503	11,860	103	1,867	Massachusetts	17.21	0.15	2.71	8.89	0.01	0.28

Source: FBI Uniform Crime Reporting Data 2019 Massachusetts

MATERNAL AND INFANT HEALTH

Chapter 3

Abstract

This chapter provides a comprehensive overview of the trends, disparities and resources surrounding maternal and infant health status and health outcomes of residents in Heywood's 15 communities.

Chapter 3 – Maternal and Infant Health

This chapter provides a comprehensive overview of the trends, disparities, and resources surrounding maternal and infant health status and health outcomes of residents in Heywood Healthcare – Athol Hospital and Heywood Hospital's (Heywood or HH) 15 communities.

This chapter highlights essential findings from the data gathered around the following topics:

- Maternal and Infant Health

Chapter Highlights

Maternal and Infant Health

- There were 791 babies born in the Service Area in 2017, including 216 in Gardner, 125 in Athol, and 110 in Winchendon. Overall, the service area experienced a 3.9% decrease from 2016
- There were 32 teen births throughout the Service Area in 2016 vs. 9 in 2017. All nine births in 2017 occurred in Athol. The same communities with high teen birth rate numbers in 2016-2017 from were the same communities with high teen birth rates at Heywood hospital in 2020-2021. The data also shows that teen births were predominately found in white mothers at a ratio of 12:2.
- The percent of non-Hispanic white births in the Service Area were at 88.3%, much higher than the state percentage of 60.5%. In addition, all the non-White races and ethnicity births in the Service Area represented much less than the state and the nation averages.
- Templeton, Westminster, and Winchendon had the highest percentage of low birthweight babies in 2016 vs Gardner, Winchendon, Athol, and Templeton in 2017.
- Total number of low birthweight births in the Service Area decreased from 42 in 2016 to 31 in 2017, a 35.4% decrease. In the Heywood Health Area, there was a significant increase of 120% in low birthweight births, primarily in Gardner.
- Throughout the Service Area in 2017, there were 49 preterm births, a 0.4.% decrease from the 51 in 2016.
- Orange, Templeton, and Winchendon had the highest rate of preterm births in the Service Area communities in 2017.
- The percent of WIC infants born at Heywood Hospital who have ever breastfed shows that in each of the three and a half years represented, breastfeeding rates were lower than the state average of infants ever breastfed.
- Athol, Gardner, and Orange reported percentages of mothers that smoked cigarettes during pregnancy far above the State average at 27.4%, 20.8% and 35.5%, respectively

Maternal and Infant Health

The maternal and infant health section of this report focuses on highlighting critical data points relevant to the health of mothers and their children. Some important data points include birth, fertility, teen pregnancy, and infant mortality rates, prenatal care, and child nutrition.

Nationally, the number of births declined 4% in 2020, consistent with annual declines since 2014. The most recent date for that Athol and Heywood Hospital Health Areas showed a similar decline between 2016 and 2017, greater than the 0.9% decrease across Massachusetts during the same time period. The decline in number of births was greater for American Indian and Alaska Native women (6%) and Asian women (8%). The birth rate for teenagers decreased 8%. The preterm birth rate declined (0.14%) for the first time since 2014. However, data shows that the preterm birth rate in the Athol and Heywood Hospital Health Areas declined earlier (from 51 in 2016 to 49 in 2017). The preterm birth rate decreased by 3% among Asian women, 2% among White women, and 1% among Hispanic/Latino women.[16] Provisional data showed a statistically significant decrease in "very low birthweight" births (less than 1.5 kg) in September and October, as compared with the same time period in 2019.[17]

(Note: changes to regulations limited data availability for maternity datasets after 2015. Certain tables in this chapter use 2015 data, which is identical to data tables from the 2018 CHNA report for Heywood. Where available, the report includes 2020 data from the two hospital Emergency Departments.)

(Note: Double dashes (--) represent a number from 1-4, this is suppressed for confidentiality.)

[16] https://www.cdc.gov/nchs/data/vsrr/vsrr012-508.pdf
[17] https://www.cdc.gov/nchs/covid19/technical-notes-outcomes.htm

1. **Overall Births**

According to the Massachusetts Birth Reports from 2016 and 2017 shown in Table HS-1, three communities saw significant increases to total births between the two years: Phillipston (90.9%), Petersham (57.1%), and Hubbardston (51.9%). The Athol Hospital Health Area saw a 3% decrease in the number of births from 2016 to 2017. In the Heywood Hospital Health Area there was a 4.3% decrease in the number of births in the same period. Overall, in the Service Area Total there was a 3.9% decrease in the number of births. This is far greater than the state (-0.9%) in the same period.

HS - 1 Number of Births in the Service Area in 2016 and 2017

		2016			2017			
	Community	# of Births	% of Total Service Area Births	% of All MA Births	# of Births	% of Total Service Area Births	% of All MA Births	% Change 2016-2017
Athol	Athol	124	15.1%	0.17%	125	15.8%	0.18%	0.8%
	Erving	20	2.4%	0.03%	17	2.1%	0.02%	-15.0%
	New Salem	7	0.9%	0.01%	8	1.0%	0.01%	14.3%
	Orange	74	9.0%	0.10%	59	7.5%	0.08%	-20.3%
	Petersham	7	0.9%	0.01%	11	1.4%	0.02%	57.1%
	Phillipston	11	1.3%	0.02%	21	2.7%	0.03%	90.9%
	Royalston	7	0.9%	0.01%	6	0.8%	0.01%	-14.3%
	Warwick	6	0.7%	0.01%	5	0.6%	0.01%	-16.7%
	Wendell	10	1.2%	0.01%	6	0.8%	0.01%	-40.0%
	Health Area Total	**266**	**32.3%**	**0.37%**	**258**	**32.6%**	**0.36%**	**-3.0%**
Heywood	Ashburnham	45	5.5%	0.06%	43	5.4%	0.06%	-4.4%
	Gardner	230	27.9%	0.32%	216	27.3%	0.31%	-6.1%
	Hubbardston	27	3.3%	0.04%	41	5.2%	0.06%	51.9%
	Templeton	71	8.6%	0.10%	69	8.7%	0.10%	-2.8%
	Westminster	65	7.9%	0.09%	54	6.8%	0.08%	-16.9%
	Winchendon	119	14.5%	0.17%	110	13.9%	0.16%	-7.6%
	Health Area Total	**557**	**67.7%**	**0.78%**	**533**	**67.4%**	**0.75%**	**-4.3%**
	Service Area Total	**823**	**100%**	**1.15%**	**791**	**100%**	**1.12%**	**-3.9%**
	Franklin County*	621	-	0.9%	557	-	0.8%	-10.3%
	Worcester County*	8,598	-	12.1%	8,513	-	12.0%	-1.0%
	Massachusetts*	71,319	-	100%	70,704	-	100%	-0.9%
	Sources: MA DPH Data - 2016 and 2017 Birth Reports							

2. **Births by Race/Ethnicity**

Of all births in the Service Area in 2015, 678 or 88.3% were non-Hispanic White births. Overall, there were 36 Hispanic births (5.3%), 12 (1.6%) Non-Hispanic Asian/Pacific Islander, and six (0.8%) were Non-Hispanic Black as seen in Table HS-2. The percent of non-Hispanic white births in the Service Area were at 88.3%, much higher than the state percentage of 60.5%. In addition, all the non-White races and ethnicity births in the Service Area represented much less than the state and the nation averages.

(Note: This table is not updated from the 2018 CHNA report due to the lack of municipal level data available from the Department of Health.)

HS - 2 Births by Race/Ethnicity in the Service Area 2015

	Community	Total # of Births	Total Non-Hispanic White Births	Total Non-Hispanic Black Births	Total Non-Asian/PI Births	Total American Indian Births	Total Hispanic Births
	Athol	113	99			NA	8
Athol	Erving	6	5	0	0	NA	0
Athol	New Salem	--	--	0	0	NA	0
Athol	Orange	78	72	0	--	NA	0
Athol	Petersham	9	9	0	0	NA	0
Athol	Phillipston	15	14	0	--	NA	0
Athol	Royalston	11	10	0	--	NA	--
Athol	Warwick	--	--	0	0	NA	0
Athol	Wendell	12	11	0	--	NA	0
Athol	**Health Area Total**	**244**	**220**	**0**	**0**	**NA**	**8**
Heywood	Ashburnham	39	36	0	0	NA	--
Heywood	Gardner	229	192	6	6	NA	23
Heywood	Hubbardston	33	33	0	0	NA	0
Heywood	Templeton	62	60	0	--	NA	0
Heywood	Westminster	62	52	0	--	NA	--
Heywood	Winchendon	99	85	--	6	NA	5
Heywood	**Health Area Total**	**524**	**458**	**6**	**12**	**NA**	**28**
	Service Area Total	**768**	**678**	**6**	**12**	**NA**	**36**
	% of Service Area Births	**100.0%**	**88.3%**	**0.8%**	**1.6%**	**NA**	**4.7%**
	Massachusetts	71,319	40,773	6,953	6,100	396	13,609
	% of All MA Births	100.0%	57.2%	9.7%	8.6%	0.6%	19.1%
	Sources: 2015 MA DPH Birth Report						

The data below in Table HS-3 received from DPH is the most recent data on the race of infants born at Heywood Hospital and shows the race of infants who are covered under the Women, Infants, and Children (WIC) Program born in 2020. According to this DPH data, 89% of infants in WIC born at Heywood where white, including Hispanics, seven percent were black or African American, two percent were of multiple races, and one percent were Asian or Native Hawaiian/Pacific Islander.

HS - 3 Race of WIC Infants Born at Heywood Hospital in 2020

White	89%
Black or African American	7%
Multiple Races	2%
Asian	1%
Native Hawaiian or Other Pacific Islander	1%

3. Overall Teen Births

The birth rate for teenagers decreased 8% nationally. The data shown in Table HS-4 shows that according to the Massachusetts Birth Reports there were 11 *reported* teen births in the Athol Hospital Health Area in 2016 and nine in 2017 (22.22% decrease) versus 21 *reported* teen births in the Heywood Hospital Health Area in 2016 (the total in 2017 is unable to be calculated due to suppressed results). The total results for each health area and the total service are greatly impacted by the suppressed data; results are presented below but must be viewed understanding the limits of the data.

HS - 4 Teen Births in the Service Area 2016 & 2017

	Community	# of Teen Births 2016	Teen Birth % of All Resident Births 2016	# of Teen Births 2017	Teen Birth % of All Resident Births 2017
Athol	**Athol**	5	4.0%	9	7.2%
	Erving	--	--	--	--
	New Salem	--	--	0	0.0%
	Orange	6	8.1%	--	--
	Petersham	0	0.0%	0	0.0%
	Phillipston	0	0.0%	0	0.0%
	Royalston	--	--	0	0.0%
	Warwick	0	0.0%	0	0.0%
	Wendell	--	--	0	0.0%
	Health Area Total	**NA**	**NA**	**NA**	**NA**
Heywood	**Ashburnham**	--	--	0	0.0%
	Gardner	13	5.7%	--	--
	Hubbardston	0	0.0%	--	--
	Templeton	--	--	--	--
	Westminster	--	--	--	--
	Winchendon	8	6.7%	--	--

Health Area Total	**NA**	**NA**	**NA**	**NA**
Service Area Total/Avg	**NA**	**NA**	**NA**	**NA**
Franklin County*	24	3.86%	18	3.23%
Worcester County*	300	3.46%	270	3.17%
Massachusetts*	1,931	2.71%	1,827	2.58%
Source: 2016 MA DPH Birth Report, 2017 MA DPH Birth Report.				

4. Teen Births by Race/Ethnicity

Heywood provided teen birth data by town and race/ethnicity as shown in Table HS-5. The data captures teen births between June 2020 and May 2021. The Athol Health Area saw five teen births whereas the Heywood Health Area saw nine teen births. The same communities with high teen birth rate numbers in 2016-2017 from were the same communities with high teen birth rates at Heywood hospital. The data also shows that teen births were predominately found in white mothers at a ratio of 12:2.

HS – 5 Teen Births by Race/Ethnicity in the Service Area June 2020 to May 2021

	Community	# of Teen Births	White	Hispanic	Other
Athol	**Athol**	3	3		
	Erving	1	1		
	New Salem				
	Orange	1	1		
	Petersham				
	Phillipston				
	Royalston				
	Warwick				
	Wendell				
	Health Area Totals	**5**	**5**		
Heywood	**Ashburnham**				
	Gardner	3	1	1	1
	Hubbardston				
	Templeton	4	4		
	Westminster				
	Winchendon	2	2		
	Health Area Totals	9	7	1	1
	Service Area Totals	**14**	**12**	**1**	**1**
	Source: Heywood Hospital				

5. **Low birth weight**

As shown in Table HS-6, in 2017, the Service Area total number of Low Birthweight births decreased from 42 in 2016 to 31 in 2017, a 35.4% decrease, however, as shown in Table HS-7, the number in 2015 (28) is still slightly lower than the number in 2017 (31). The number of Low Birthweight births in Massachusetts only experienced a 0.15% decrease during the same period.

In the Athol Health Area, the number of low birthweight births were 15 in 2015 and seven in 2017, a decrease of 53%. In the same period for Heywood Health Area, the number was 13 in 2015 and 38 in 2017, a significant increase of 120% in low birthweight births, primarily in Gardner.

HS - 6 Low Birth Weight in Service Area Communities 2016 and 2017

	Community	# of Low Birthweight Births 2016	Low Birthweight % of All Resident Births 2016	# of Low Birthweight Births 2017	Low Birthweight % of All Resident Births 2017
Athol	Athol	10	8.1%	7	5.6%
	Erving	--	--	--	--
	New Salem	--	--	0	0.0%
	Orange	--	--	--	--
	Petersham	0	0.0%	0	0.0%
	Phillipston	0	0.0%	--	--
	Royalston	0	0.0%	--	--
	Warwick	0	0.0%	0	0.0%
	Wendell	0	0.0%	0	0.0%
	Health Area Total/Average	**10**	**1.34%**	**7**	**1.1%**
Heywood	Ashburnham	--	--	--	--
	Gardner	6	2.6%	10	4.6%
	Hubbardston	--	--	--	--
	Templeton	8	11.3%	6	8.7%
	Westminster	7	10.8%	--	--
	Winchendon	11	9.2%	8	7.3%
	Health Area Total/Average	**32**	**8.47%**	**24**	**6.9%**
	Service Area Total/Average	**42**	**4.9%**	**31**	**4.0%**
	Massachusetts*	5,341	7.5%	5,261	7.5%
	Source: 2016 and 2017 MA DPH Birth Reports				

Table HS-7 displays disparities in low birth weight by race ethnicity throughout the Service Area. Due to suppression rules at Mass DPH, data around incidences of low birth weight for non-white ethnic groups could not accurately be displayed.

(Note: This table is not updated from the 2018 report due to the lack of municipal level data available from the Department of Health.)

HS - 7 Low Birth Weight in Service Area Communities by Race/Ethnicity 2015

	Community	Number of NH White Low Birthweight Births	NH White Low Birthweight %	Number of NH Black Low Birthweight Births	NH Black Low Birthweight %	Number of NH Asian/PI Low Birthweight Births	NH Asian/PI Low Birthweight %	Number of Hispanic Low Birthweight Births	Hispanic Low Birthweight %
Athol	Athol	8	8.1%	0	0.0%	--	--	--	--
	Erving	--	--	--	--	0	0.0%	0	0.0%
	New Salem	0	0.0%	--	--	0	0.0%	0	0.0%
	Orange	7	9.7%	--	--	0	0.0%	0	0.0%
	Petersham	--	--	--	--	0	0.0%	0	0.0%
	Phillipston	0	0.0%	--	--	0	0.0%	0	0.0%
	Royalston	--	--	--	--	0	0.0%	0	0.0%
	Warwick	0	0.0%	--	--	0	0.0%	0	0.0%
	Wendell	0	0.0%	--	--	0	0.0%	0	0.0%
	HA Total/Avg	**15**	**3.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Heywood	Ashburnham	--	--	--	--	0	0.0%	0	0.0%
	Gardner	13	6.8%	0	0.0%	0	0.0%	--	--
	Hubbardston	--	--	--	--	0	0.0%	0	0.0%
	Templeton	--	--	--	--	0	0.0%	0	0.0%
	Westminster	--	--	--	--	0	0.0%	0	0.0%
	Winchendon	--	--	0	0.0%	0	0.0%	0	0.0%
	HA Total/Avg	**13**	**6.8%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
	Service Area Total/Avg	**28**	**3.5%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
	Massachusetts*	5321	7.4%	734	10.6%	553	8.5%	1071	8.3%

Source: 2015 Mass DPH Data

6. Premature Birth Rates

According to the March of Dimes, premature birth is defined as birth that occurs before 37 weeks. The earlier a baby is born, the more likely they are to experience adverse health effects later in life including "long-term intellectual and development disabilities".

According to Table HS-8, throughout the Service Area in 2017, the number of Preterm Births decreased from 51 in 2016 to 49 in 2017, a 0.4% decrease. In Massachusetts during the same period there was a .17% increase in the number of Preterm births. Orange and Templeton experienced the highest rate of Preterm births.

HS – 8 Preterm Births in Service Area Communities 2016 and 2017

	Community	# of Preterm Births 2016	Preterm Birth % of All Resident Births 2016	# of Preterm Births 2017	Preterm Birth % of All Resident Births 2017
Athol	Athol	9	7.26%	11	8.8%
	Erving	--	--	0	0.0%
	New Salem	--	--	0	0.0%
	Orange	5	6.76%	8	13.6%
	Petersham	0	0.00%	0	0.0%
	Phillipston	0	0.00%	0	0.0%
	Royalston	0	0.00%	0	0.0%
	Warwick	0	0.00%	0	0.0%
	Wendell	--	--	--	--
	Health Area Total/Avg	**14**	**2.34%**	**19**	**2.79%**
Heywood	Ashburnham	--	--	--	--
	Gardner	10	4.35%	13	6.0%
	Hubbardston	--	--	--	--
	Templeton	14	19.72%	7	10.1%
	Westminster	7	10.77%	--	--
	Winchendon	6	5.04%	10	9.1%
	Health Area Total/Avg	**37**	**9.97%**	**30**	**8.42%**
	Service Area Total/Avg	**51**	**5.39%**	**49**	**0**
	Franklin County*	45	7.25%	52	9.34%
	Worcester County*	707	8.22%	695	8.16%
	Massachusetts*	6,167	8.65%	6,272	8.87%

Source: 2016 and 2017 Mass DPH Data, Less than 37 weeks gestation; " --" Due to privacy (n=1-4), exact count not provided

Table HS-9 displays disparities in preterm births among Service Area communities in 2015. Due to suppression rules, accurate preterm birth numbers could not be displayed for most communities of racial groups.

(Note: This table is not updated from the 2018 report due to the lack of municipal level data available from the Department of Health.)

HS – 9 Preterm Births in Service Area Communities by Race/Ethnicity 2015

	Community	# of NH White Preterm Births	% of NH White Preterm Births	# of NH Black Preterm Births	% of NH Black Preterm Births	# of NH Asian/PI Preterm Births	% of NH Asian/PI Preterm Births	# of Hispanic Preterm Births	% of Hispanic Preterm Births
Athol	Athol	9	9.1%	0	0.0%	--	--	--	--
	Erving	--	--	0	0.0%	0	0.0%	0	0.0%
	New Salem	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Orange	--	--	0	0.0%	0	0.0%	0	0.0%
	Petersham	--	--	0	0.0%	0	0.0%	0	0.0%
	Phillipston	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Royalston	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Warwick	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Wendell	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Health Area Total/Avg	**9**	**1.5%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Heywood	Ashburnham	--	--	0	0.0%	0	0.0%	0	0.0%
	Gardner	12	6.3%	--	--	0	0.0%	--	--
	Hubbardston	--	--	0	0.0%	0	0.0%	0	0.0%
	Templeton	--	--	0	0.0%	0	0.0%	0	0.0%
	Westminster	--	--	0	0.0%	0	0.0%	0	0.0%
	Winchendon	--	--	0	0.0%	0	0.0%	0	0.0%
	Health Area Total/Avg	**12**	**6.3%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
	Service Area Total/Avg	**21**	**2.2%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
	Massachusetts*	3,365	7.8%	723	10.4%	527	8.1%	1,192	9.2%
	Source: 2015 MA DPH Data								

7. Infant Mortality Rate

The infant mortality rate is measured as the number of infant deaths per 1,000 live births according to the CDC. The CDC also states that infant mortality "is the death of an infant before their first birthday".[18]

Throughout the Service Area, there were five (5) cases of infant mortality in 2015; two (2) each in Templeton and Westminster, and one (1) in Royalston as seen in Table HS-10. With five (5) infant deaths, the infant death rate for the Service Area is 6.5 per 1,000 which is 2.1 infant deaths higher than the state rate of 4.4 per 1,000.

In Athol Health Area, Royalston was the only community to experience a case of infant mortality in 2015. Four (4) of the five (5) cases of infant mortality in the Service Area occurred in Heywood 's Health Area; two (2) each in Templeton and Westminster.

(Note: This table is not updated from the 2018 report due to the lack of municipal level data available from the Department of Health.)

HS - 10 Infant Mortality Rate in Service Area Communities 2015

	Community	# of Infant Deaths	Infant Mortality Rate per 1,000
Athol	Athol	0	0.0
	Erving	0	0.0
	New Salem	0	0.0
	Orange	0	0.0
	Petersham	0	0.0
	Phillipston	0	0.0
	Royalston	1	--
	Warwick	0	0.0
	Wendell	0	0.0
	Health Area Total	**1**	**0.0**
Heywood	Ashburnham	0	0.0
	Gardner	0	0.0
	Hubbardston	0	0.0
	Templeton	2	--
	Westminster	2	--
	Winchendon	0	0.0
	Health Area Total	**4**	**0.0**
	Service Area Total	**5**	**0.0**
	Massachusetts	315	4.4
	Source: 2015 MA DPH Data		

[18] https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm

8. Cigarette Smoking During Pregnancy

Smoking while pregnant can have a very serious impact on the health of the mother, as well as the baby. Smoking while pregnant increases the likelihood of miscarriage, premature birth, birth defects and sudden infant death syndrome (SIDS).

Table HS-11 presents the data regarding smoking during pregnancy in the Service Area. Throughout the Service Area, over 125 pregnant mothers reported smoking while pregnant in 2015, and six (6) communities had a higher rate than the State average (5.9%). Cases by community include 47 from Gardner, 29 from Athol, and 27 from Orange. These same communities reported percentages far above the State average at 27.4%, 20.8% and 35.5%, respectively. Erving, New Salem, and Warwick were the only three communities to report no mothers who smoked during pregnancy.

The Athol Health Area included two of the top three communities (Athol and Orange). Petersham, Phillipston, Royalston, and Wendell each reported mothers who smoked while pregnant more than zero but less than four. In Heywood Health Area, all six (6) communities reported having mothers that smoked during pregnancy. Gardner reported the most by far with 47 with Winchendon next at 11.

(Note: This table is not updated from the 2018 report due to the lack of municipal level data available from the Department of Health.)

HS - 11 Cigarette Smoking During Pregnancy in Service Area Communities 2015

	Community	# of Mother's that Smoked During Pregnancy	% of Mother's that Smoked During Pregnancy
Athol	**Athol**	29	27.4%
	Erving	0	0.0%
	New Salem	0	0.0%
	Orange	27	35.5%
	Petersham	--	--
	Phillipston	--	--
	Royalston	--	--
	Warwick	0	0.0%
	Wendell	--	--
	Health Area Total/Average	**56**	**12.6%**
Heywood	**Ashburnham**	5	13.2%
	Gardner	47	20.8%
	Hubbardston	--	--
	Templeton	7	11.3%
	Westminster	--	--
	Winchendon	11	11.3%
	Health Area Total/Average	**70**	**14.2%**
	Service Area Total/Average	**126**	**13.3%**
	Massachusetts	4,043	5.9%
	Source: 2015 MA DPH Data		

Table HS-12 displays the disparities in smoking while pregnant between racial/ethnic groups in the Service Area. Due to suppression rules, data could only be represented for select communities for white mothers. In each community with unsuppressed data, white pregnant mothers smoked cigarettes at higher rates than the national average of 10%. Notable were the smoking rates of white mothers in Athol (28.1%), Gardner (22.6%) and Orange (37.1%).

(Note: This table is not updated from the 2018 report due to the lack of municipal level data available from the Department of Health.)

HS – 12 Cigarette Smoking During Pregnancy in Service Area Communities by Race/Ethnicity 2015

	Community	# of NH White Mothers that Smoked While Pregnant	% of NH White Mothers that Smoked While Pregnant	# of NH Black Mothers that Smoked While Pregnant	% of NH Black Mothers that Smoked While Pregnant	# of NH Asian/PI Mothers that Smoked While Pregnant	% of NH Asian/PI Mothers that Smoked While Pregnant	# of Hispanic Mothers that Smoked While Pregnant	% of Hispanic Mothers that Smoked While Pregnant
Athol	Athol	27	28.1%	--	--	0	0.0%	--	--
	Erving	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	New Salem	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Orange	26	37.1%	0	0.0%	0	0.0%	--	--
	Petersham	--	--	0	0.0%	0	0.0%	0	0.0%
	Phillipston	--	--	0	0.0%	0	0.0%	0	0.0%
	Royalston	--	--	0	0.0%	0	0.0%	0	0.0%
	Warwick	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Wendell	--	--	0	0.0%	0	0.0%	0	0.0%
	HA Total/Avg	**53**	**13.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Heywood	Ashburnham	5	14.3%	0	0.0%	0	0.0%	0	0.0%
	Gardner	43	22.6%	--	--	0	0.0%	--	--
	Hubbardston	--	--	0	0.0%	0	0.0%	0	0.0%
	Templeton	7	11.7%	0	0.0%	0	0.0%	0	0.0%
	Westminster	0	0.0%	0	0.0%	0	0.0%	--	--
	Winchendon	10	11.7%	0	0.0%	--	--	0	0.0%
	HA Total/Avg	**65**	**12.1%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
	Service Area Total/Avg	**118**	**12.6%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
	Massachusetts	3173	7.5%	263	3.9%	71	1.1%	485	3.9%

Source: 2018 Mass DPH Data

9. Neonatal Abstinence Syndrome

According to self-reported data in 2019, 7% of women reported using opioid pain relievers during pregnancy.[19] Among these women, 1 out of 5 reported "opioid misuse," defined as obtaining opioid pain relievers from a non-healthcare source or using them for something other than pain relief.[20] Nationally, between 2010 and 2017, the number of women with opioid-related disorders documented at delivery increased by 131% (from 3.5 to 8.2 per 1000 newborn hospital stays).

During that same time, the number of cases of NAS increased by 82% (from 4.0 to 7.3 per 1000). After steadily increasing since at least 2010, the NAS rate dipped for the first time in 2018, to 6.8 per 1000.[21] In Massachusetts, the NAS newborn hospitalization rate increased from 9.9 (per 1000) in 2010 to 14.6 (per 1000) in 2013. That value plateaued until 2017 when it began to consistently decline. In 2019, the rate of NAS newborn hospitalizations was 9.9 per 1000. This decline may be due to an initiative launched by the Massachusetts Health Policy Commission in 2016 (Mother and Infant-Focused Neonatal Abstinence Syndrome Interventions). However, it may also be due to changes in how NAS cases are coded in hospitals; between 2015 and 2016, although the number of NAS diagnoses started to decline, the total number of infants diagnosed with either NAS or substance exposure combined increased significantly from 1,368 to 1,877.

NAS results in longer and costlier stays for newborns. In 2017, the average newborn hospital stay was 11 days for NAS, compared with 2 days for healthy newborns. The average cost of that hospital stay was $8,200 for NAS, compared with $1,000 for healthy newborns.[22]

In central Massachusetts in 2017, the combined number of NAS diagnoses and substance-exposed newborns was 29 per 1000 live births. Heywood Hospital had 17 newborns diagnosed with NAS in 2019 and 20 NAS newborns in 2020.

Breastfeeding

According to the National Institutes of Health (NIH), breastfeeding can save infant lives and reduce the possibility of disease. Table HS-13 shows breastfeeding rates of the WIC program including some of the Heywood Service Area. The rate of breastfeeding through three months and six months for both WIC service areas exceeded state averages all three years.

[19] https://www.cdc.gov/pregnancy/opioids/data.html
[20] https://www.cdc.gov/mmwr/volumes/69/wr/mm6928a1.htm
[21] https://jamanetwork.com/journals/jama/fullarticle/2774834
[22] https://www.hcup-us.ahrq.gov/faststats/NASServlet?setting1=IP&location1=MA

HS – 13 Exclusive Breastfeeding Rates for WIC North Central and FHNQ 2021

	North Central WIC		FNHQ WIC		Statewide WIC Average	
	3 mos.	6 mos.	3 mos.	6 mos.	3 mos.	6 mos.
FY18	17.6%	14.6%	28.7%	23.8%	14.0%	10.9%
FY19	14.6%	12.7%	26.5%	28.9%	13.5%	10.9%
FY20	15.6%	14.1%	27.2%	24.0%	14.2%	11.7%
Source: WIC Offices North Central and Franklin Hampshire North Quabbin 2021						

According to the MA Department of Health (DPH), as of September 2021, 11% of infants in WIC who were born at Heywood Hospital were exclusively breastfed at three (3) months, but 0% of infants in WIC were breastfed exclusively at six (6) months.

In Table HS-14, the percent of WIC infants born at Heywood Hospital who have ever breastfed shows that in each of the three and a half years represented, breastfeeding rates were lower than the state average of infants ever breastfed.

HS – 14 Percent of WIC Infants Born at Heywood Hospital Ever Breastfed

Year	Born at Heywood Hospital	State Average
2018	78%	82%
2019	75%	82%
2020	78%	82%
Jan - Aug 2021	64%	81%

ENVIRONMENTAL HEALTH

Chapter 4

Abstract

This chapter provides a comprehensive overview of the environmental health of Heywood's 15 communities

Chapter 4 - Environmental Health

This chapter provides a comprehensive overview of the environmental health of Heywood Healthcare – Athol Hospital and Heywood Hospital's (Heywood or HH) 15 communities. Communities in the Service Area are exposed to a range of environmental hazards that can adversely impact health.

This chapter highlights the following environmental exposures that affect the health of Service Area residents:

- Ambient Air Quality
- Water Quality
- Childhood Lead Exposure
- Climate Health
- Environmental Justice Populations
- Brownfield Sites
- Solid Waste
- Food Waste

Chapter Highlights

Environmental Exposures

- In the past three years, Ambient Air Quality in Worcester and Franklin Counties has not violated the EPA Air Quality Standards for Fine Particles and Dust Standards.
- In 2021, there were 38 brownfield sites throughout the Service Area compared to 30 in 2016, a 26.66% increase.
- There were 16 violations for drinking water quality over the past five years, compared to 4 violations in 2014. Fifteen were in the Athol Service Area, and one was in the Heywood Service Area
- In 2018, only 50% of children on average in the Service Area were screened for Blood Lead Levels (BLL) compared to the state average of 73%. Gardner was the only community considered "high risk" for lead exposure. In 2016, 51% of children were screened in the Service Area compared to 77% state average.
- Of the six communities that exceeded the median number of houses built before 1978 in their corresponding Health Area, four exceeded median lead testing rates.
- Gardner, Orange, Athol, Wendell, and Winchendon contain neighborhoods that qualify as Environmental Justice (EJ) populations for minority population, income, or both.

Environmental Exposures

Recent research shows that American people of color are disproportionately affected by air pollution, and that this trend holds true for both urban and rural communities. Analysis by the nonprofit organization US Water Alliance revealed similar trends in water access; approximately 0.3 percent of households with white occupants lack complete plumbing, compared to 0.5 percent for Black and Hispanic/Latino households, and 5.8 percent for Native American households.[23] Data from the National Center for Health Statistics shows that, on average, Black and Mexican-American children have higher median blood lead levels than White children, and that blood lead levels are higher for children living in low-income households.[24]

With respect to the effect of COVID-19 on pollution, a study by Jesse Berman and Keita Ebisu (October 2020) showed that air pollution in the U.S. decreased between January and April 2020, and that decreases in NO2 and PM2.5 were statistically significant in urban counties and, for PM2.5, counties that instituted "early business closures" (March 24th, 2020).[25] Although most of the Athol and Heywood Hospital Health Areas are considered rural, Massachusetts non-essential businesses were closed on March 23rd, one day before the study's early closure cut-off.

According to the 2017 Massachusetts State Health Assessment, "environmental exposure includes results from contact with physical, chemical, biological, and radiological substances." The following factors are essential in determining whether environmental exposures can lead to health risks:

- Amount of exposure
- Source of exposure (eating, drinking, breathing, or physical contact)
- Harmfulness of the substance

This section highlights the following environmental exposure topics that impact the health of residents in the Service Area: ambient air quality, water quality, childhood lead exposure, climate health, environmental justice populations, and solid and food waste.

1. **Ambient Air Quality**

The U.S. Environmental Protection Agency (EPA), since the passing of the Clean Air Act, is responsible for establishing and maintaining "National Ambient Air Quality Standards" (NAAQS) to limit the concentration of pollutants in the atmosphere. The goal is to prevent exposure to contaminants that can damage the cardiovascular and respiratory systems.

The Mass Department of Environmental Protection (MassDEP) tracks National Ambient Air Quality Standards (NAAQS) on the county level in Massachusetts. The NAAQS are standards established by the US EPA to set limits on safe air pollution levels. Among the measures established by the NAAQS are ozone levels and fine particles. Ozone violations are measured in parts-per-million (ppm) and are not to exceed 0.075 ppm for an 8-hour period. Fine particles are measured in Particle Matter (PM2.5) and are not to exceed 35 µg/m3 in a 24-hour period.

[23] http://uswateralliance.org/sites/uswateralliance.org/files/publications/Closing%20the%20Water%20Access%20Gap%20in%20the%20United%20States_DIGITAL.pdf
[24] https://www.epa.gov/americaschildrenenvironment/ace-biomonitoring-lead
[25] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7442629/#bb0045

According to Mass DEP Environmental Tracking for 2010-2014, there was an average of 12 days where air quality standards for fine particles and ozone exceeded the NAAQS minimum standards throughout the Service Area. Notably, Petersham and Phillipston had the highest total number of days above NAAQS standards at 17 each. Conversely, Warwick and Wendell had the lowest number of days above NAAQS standards at five, as seen in Table EH-1.

EH - 1 Total Number of Days Above NAAQS standards 2010-2014

	Community	Number of Over NAAQS 2010-2014
Athol	**Athol**	13
	Erving	5
	New Salem	13
	Orange	9
	Petersham	17
	Phillipston	17
	Royalston	10
	Warwick	5
	Wendell	5
	Health Area Average	**10**
Heywood	**Ashburnham**	13
	Gardner	13
	Hubbardston	15
	Templeton	15
	Westminster	14
	Winchendon	13
	Health Area Average	**14**
	Service Area Average	**12**
	Source: MA Environmental Public Health Tracking	

2. Drinking-Water Quality

The US EPA also sets standards for contamination levels in drinking water to protect public health. Among the contaminants tracked as part of these measurements are Arsenic, Lead, Nitrates, and Uranium. The MassDEP Drinking Water Program is responsible for monitoring water quality throughout the Commonwealth and enforcing EPA standards.

Table EH-2 lists violations reported by water service providers in each Service Area community. The EPA monitors these reported violations. In the last five (5) years, there were 16 major water quality violations in Heywood's Service Area: 15 in the Athol Health Area and one (1) in the Heywood Hospital Health Area. The violation in Ashburnham was related to high chlorine levels in the water and has since returned to compliance. In the Athol Hospital Service Area, 12 of the 15 cases were in Petersham caused by volatile organic chemicals. The other three were in New Salem and Warwick.

EH - 2 Major Drinking Water Violations in the Service Area Over the Last 5 Years

	Community	# Of Major Water System Violations Reported in Community Drinking Source	Name of Contaminant and Type of Violation	Year of Violation	Compliance Status	Violating Agency
Athol	**New Salem**	1	Total Haloacetic Acids (HAAS)	2019	Returned to Compliance	Swift River Elementary
		1	Lead and Copper Rule - Lead Consumer Notice	2019	Returned to Compliance	Swift River Elementary
	Petersham	12	Volatile Organic Chemicals	2018	Returned to Compliance	The Quabbin Retreat
	Warwick	1	Revised Total Coliform Rule - Monitoring, Routine	2018	Returned to Compliance	Warwick Community School
	Health Area Total	**15**	--	--	--	--
Heywood	**Ashburnham**	1	Chlorine - Monitoring and Reporting	2017	Known	Ashburnham Water Department
	Health Area Total	**1**	--	--	--	--
	Service Area Total	**16**	--	--	--	--

Source: US Environmental Protection Agency SDWIS Federal Reporting Services System 2019

In addition, Table EH-3 notes 59 non-major water quality violations that occurred throughout Heywood Healthcare's Service Area over the last five (5) years. There were nine (9) cases in the Heywood Hospital Service Area and 50 in the Athol Hospital Service Area. Notably, the town of Royalston had 21 violations in 2019, and Petersham had 22 violations. Communities that denote zero violations may not have a water supply district in their community or had no violations between 2014 and 2019.

EH - 3 Non-Major Health-Related Drinking Water Violations in the Service Area Over the Last 5 Years

	Community	# Of Non-Major Health-Related Water Violations in Community Drinking Source	Name of Contaminant and Type of Violation	Year of Violation	Compliance Status	Violating Agency
Athol	**Athol**	1	Consumer Confidence - Failure to Report	2016	Returned to Compliance	Athol DPW Water Division
	Erving	1	Lead and Copper Rule - Lead Consumer Notice	2016	Open	Erving Water Department
		1	Lead and Copper Rule - Lead Consumer Notice	2016	Open	Erving Paper Mills
		1	Lead and Copper Rule - Lead Consumer Notice	2016	Returned to Compliance	Erving Station
	New Salem	1	Lead and Copper Rule - Lead Consumer Notice	2016	Returned to Compliance	Swift River Elementary
	Petersham	22	Volatile Organic Chemicals	2018	Returned to Compliance	The Quabbin Retreat
	N/A	1	Revised Total Coliform Rule - Report Same Results/Fail Monitor	2018	Returned to Compliance	Quabbin Woods Restaurant
	Royalston	21	Volatile Organic Chemicals - Monitoring, Regular	2019	Returned to Compliance	Royalston Community School

	Warwick	1	Lead and Copper Rule - Lead Consumer Notice	2016	Open	Warwick Community School
	Health Area Total	**50**	--	--	--	--
Heywood	**Ashburnham**	1	Lead and Copper Rule - Lead Consumer Notice	2019	Returned to Compliance	Ashburnham Water Department
		1	Revised Total Coliform Rule - Monitoring, Routine	2018	Returned to Compliance	Camp Wellville
	Hubbardston	1	Lead and Copper Rule - Lead Consumer Notice	2019	Open	Breezy Hill Plaza
		1	Lead and Copper Rule - Lead Consumer Notice	2019	Returned to Compliance	Hubbardston Center School
	Templeton	1	Total Haloacetic Acids (HAAS)	2019	Known	Templeton Municipal Light & Water Plant
		1	Revised Total Coliform Rule - Reporting, Assessment Form	2018	Returned to Compliance	Templeton Fish & Game
	Westminster	1	Lead and Copper Rule - Lead Consumer Notice	2018	Returned to Compliance	Leino Park Water District
		1	Coliform - Monitoring, Repeat Minor	2016	Returned to Compliance	The Woods at Westminster
		1	E. Coli - Monitoring, Source Water	2016	Returned to Compliance	The Woods at Westminster
	Health Area Total	**9**	--	--	--	--
	Service Area Total	**59**	--	--	--	--

Source: US Environmental Protection Agency SDWIS Federal Reporting Services System 2019

3. Childhood Lead Exposure

For children, lead poisoning has been known to damage the brain, kidney, and nervous systems, slow growth, and cause behavioral problems and learning disabilities. In addition, many older homes have lead paint. When the paint chips, peels or is removed, lead dust can be released throughout the house and ingested by unsuspecting children causing lead poisoning. In 1978, the U.S. outlawed lead paint, but many homes built before 1978 in Massachusetts still have lead paint on their walls.

State and Federal regulations require children to be screened for Blood Lead Levels (BLL) three times before turning three to monitor lead poisoning in children. The Massachusetts Department of Public Health (DPH), Bureau of Environmental Health (BEH), and Childhood Lead Poisoning Prevention Program (CLPPP) track lead-related activity throughout the Commonwealth. These agencies monitor BLL screening for children aged nine (9) months to 48 months, the estimated confirmed cases of greater than or equal to 5 µg/dL, and the confirmed cases of elevated BLL greater than or equal to 10 µg/dL. The agencies determine whether a community is considered a "high-risk lead community" based on this monitoring. High-risk lead communities are determined by the CLPPP using the number of old housing in stock, the percentage of LMI residents, and the number of elevated BLL over the previous five years.

Table EH-4 shows the percent of screening for children between 9 and 48 months, the results of the screenings, the percentage of housing units in each Service Area community built before 1978, and whether the community is considered a High-Risk Lead Community.

Throughout the Service Area, 50% of the children have been screened for BLL on average compared to the state average of 73%. The percentage of children adequately screened varies widely from community to community, with Westminster leading the way at 86%, followed by Winchendon at 71%, and Ashburnham at 64%. On the lower end of the spectrum, seven (7) of the 15 communities have less than 50% of children screened for BLL; Erving (44%). New Salem (29%), Orange (35%), Phillipston (26%), Royalston (31%), Wendell (32%) and Templeton (43%).

Table EH-4 shows a concerning overlap between communities where children have not been adequately screened for BLL and communities with the highest percentage of housing units built before 1978. Orange, Erving, and New Salem each have a percent difference greater than 22%. There are wide disparities in childhood lead screening between Athol and Heywood Hospitals' Service Areas. In Athol's Service Area, adequate BLL screening is just 41% of children aged nine to 48 months, whereas BLL screening in Heywood Hospital's Service Area is 64% of children. Both fall behind the state total of 73%. Perhaps most concerning, five (5) of Athol Hospital's communities have just a third or less of their children adequately screened for BLL, and each of those communities pre-1978 housing stock between 50% and 80%. Those communities are Athol, Erving, New Salem, Orange, Petersham, and Phillipston.

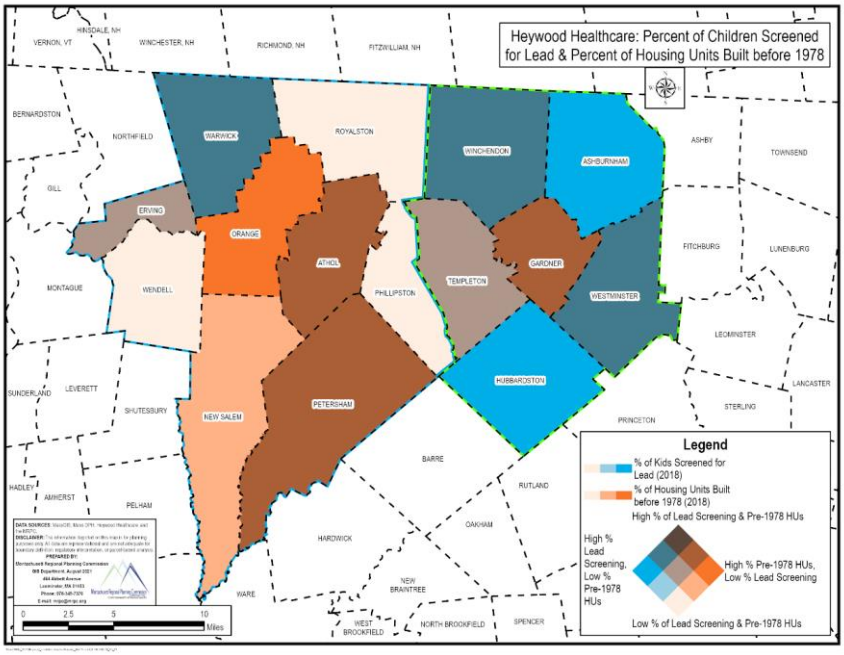
EH - 4 Childhood Lead Screening and pre-1978 Housing Units in the Service Area in 2018

	Community	% Of Children 9 to <48 Months Screened for Lead	Estimated Confirmed Cases ≥5 µg/dL	Confirmed Elevated Blood Lead Levels (BLL) ≥10 µg/dL	Percentage of Housing Units Built Before 1978	Considered a High-Risk Lead Community 2014-2018
Athol	Athol	55.0%	--	--	76%	No
	Erving	44.0%	0	0	67%	No
	New Salem	29.0%	--	0	55%	No
	Orange	35.0%	--	0	71%	No
	Petersham	58.0%	0	0	68%	No
	Phillipston	26.0%	0	0	49%	No
	Royalston	31.0%	0	0	51%	No
	Warwick	59.0%	0	0	67%	No
	Wendell	32.0%	0	0	41%	No
	Health Area Total/Average	**41.0%**	**0**	**0**	**61%**	**--**
Heywood	Ashburnham	64.0%	--	0	52%	No
	Gardner	57.0%	18	--	77%	Yes
	Hubbardston	63.0%	0	0	34%	No
	Templeton	43.0%	--	0	53%	No
	Westminster	86.0%	0	0	58%	No
	Winchendon	71.0%	10	--	55%	No
	Health Area Total/Average	**64.0%**	**28**	**0**	**55%**	**--**
	Service Area Total/Average	**50.2%**	**28**	**0**	**58%**	**--**
	Massachusetts	73.0%	2355	493	70%	

Source: Mass DPH BEH Childhood Lead Poisoning Prevention Program (CLPPP) 2018; Census ACS 2015-2019

EH-Map 1 illustrates the Percent of Children screened for Lead and the Percent of Housing Units built before 1978. The "orange" tone represents high percent of pre-1978 housing units but low testing rates. These communities should be considered priority areas to increase lead testing in children. Anecdotally, an August 2021 Boston Globe article reported that Rhode Island experience a 22% increase to lead poisoning during 2020. Professional's attribute this to increase time in the home during the Covid-19 pandemic.

EH – Map 1 Percent of Children Screened for Lead & Percent of Housing Units Built Before 1978



Climate Health

In Massachusetts, the most serious climate-related health hazards result from increasing temperatures on very hot summer days, worsening air pollution, the spread of insect-borne disease, increasing precipitation and potential flooding, and sea-level rise.

Evidence indicates that the health effects of climate change will be felt most directly and severely at the local level. It is important for local health departments to become key players in preparing for climate impacts and delivering health services to the public.

The Massachusetts Municipal Vulnerability Preparedness Program (MVP), created in 2017 by Governor Baker, provides grant funding for cities and towns in Massachusetts to identify climate hazards, assess vulnerabilities, and develop action plans to improve resilience to climate change. Communities that

complete the MVP Planning Grant process become designated as an MVP Communities and are eligible for MVP Action Grant funding to implement the priority actions identified through the planning process.

Of the fifteen communities in the service area, thirteen of them have achieved MVP designation, one is in progress of receiving MVP designation (Petersham), and the only town to not achieve designation is Phillipston.

5. Environmental Justice Populations

According to the Environmental Justice (EJ) policy of the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), environmental justice contends that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment regardless of race, ethnicity, income, national origin, or English language proficiency.

The Commonwealth of Massachusetts designates a neighborhood (census block group) as an "Environmental Justice Community" if at least one of the following are true:

- the annual median household income is not more than 65 per cent of the statewide annual median household income (I).
- minorities comprise 40 per cent or more of the population (M).
- 25 per cent or more of households lack English language proficiency (E); or

The following links provide more information on the Massachusetts Environmental Justice Populations:

- http://www.mass.gov/eea/agencies/massdep/service/justice/
- https://docs.digital.mass.gov/dataset/massgis-data-2010-us-census-environmental-justice-populations

Table EH-5 lists the EJ populations in the Service Area. The City of Gardner and the Towns of Orange, Athol, Wendell, and Winchendon include neighborhoods that qualify as EJ populations. Gardner, Athol, and Winchendon qualify under the Minority and Income standards; Orange and Wendell qualify under the Income standards. The entire community of Wendell qualifies as an EJ community. Meeting these standards is an indication that the communities have a greater susceptibility to environmental pollutants that can have a detrimental effect on the health and well-being of area residents.

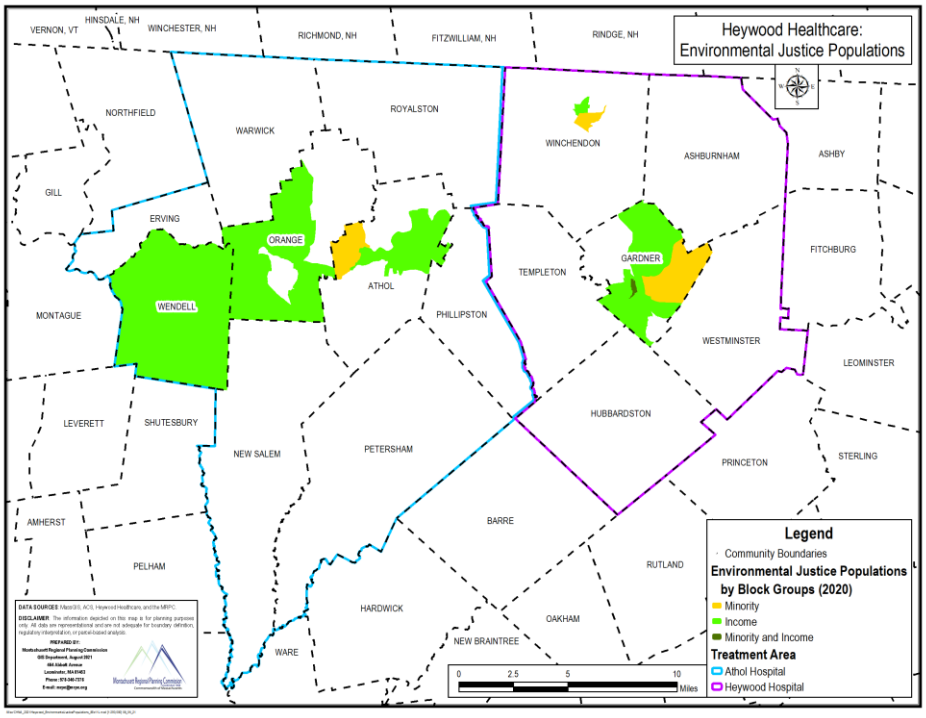
EH - 5 Environmental Justice Populations in the Service Area

	Community	Environmental Justice (EJ) Criteria	Population in EJ Block Groups	Percent of Population in EJ Block Groups
Athol	**Athol**	MI	5,028	42.90%
	Erving	-	-	-
	New Salem	-	-	-
	Orange	I	4,527	55.70%
	Petersham	-	-	-
	Phillipston	-	-	-
	Royalston	-	-	-
	Warwick	-	-	-
	Wendell	I	862	100%

	Health Area Total		10,417	
Heywood	**Ashburnham**	-	-	-
	Gardner	MI	16,453	79.80%
	Hubbardston	-	-	-
	Templeton	-	-	-
	Westminster	-	-	-
	Winchendon	MI	1,932	17.80%
	Health Area Total	-	18,385	
	Massachusetts	-	3,100,468	44.10%
	Source : Mass.gov Environmental Justice Populations			

EH- Map 2 shows the locations of the Environmental Justice (EJ) Populations in the Service Area by Block Groups (2020). The largest EJ block group is in Wendell, followed by Orange, Gardner, Athol, and Winchendon. Low income is the primary EJ qualifier for service area neighborhoods.

EH – Map 3 Location of the Environmental Justice Populations in the Service Area



6. Brownfield Sites

Table EH-6 lists the number of brownfield sites in each community. According to the EPA, a brownfield is a "property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."[26] The Massachusetts Department of Environmental Protection (DEP) tracks brownfield sites in Massachusetts and maintains a database on the Mass.gov website. According to that database, there are 38 brownfield sites throughout Heywood Healthcare's Service Area, with 15 in Gardner, eight (8) in Winchendon, three (3) in Athol, and five (5) in Templeton.[27] Gardner, Athol, and Winchendon all qualify as E.J. populations, which means the brownfield sites increase the chances of exposure to environmental hazards for low-income residents and minority residents in their communities.

EH – 6 Brownfield Sites throughout the Service Area 2021

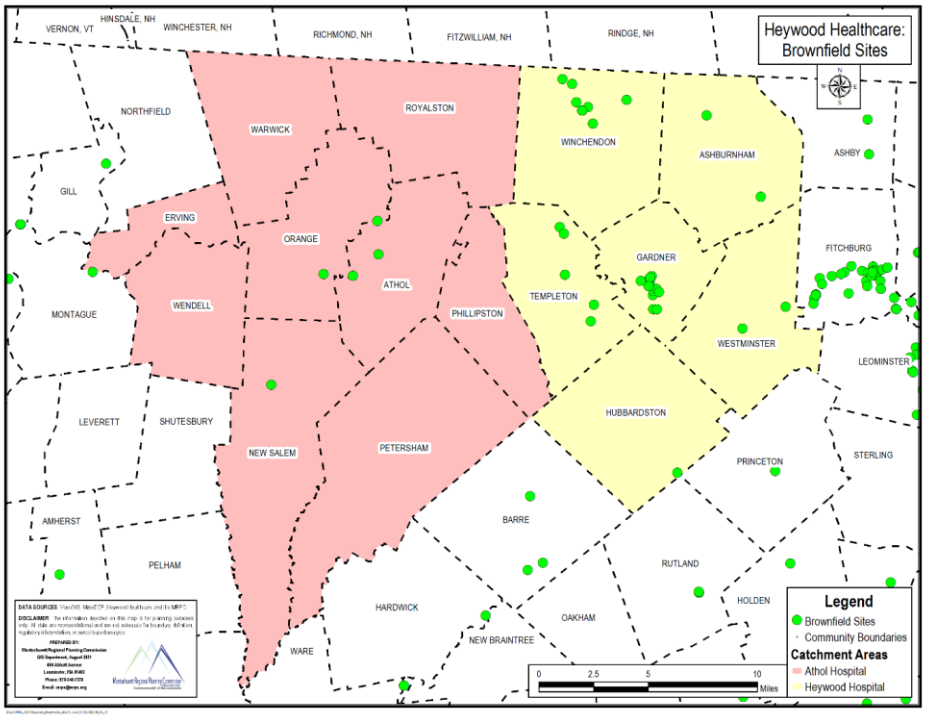
	Community	# Of Brownfield Sites
Athol	Athol	3
	Erving	0
	New Salem	1
	Orange	1
	Petersham	0
	Phillipston	0
	Royalston	0
	Warwick	0
	Wendell	0
	Health Area Total	**5**
Heywood	Ashburnham	2
	Gardner	15
	Hubbardston	1
	Templeton	5
	Westminster	2
	Winchendon	8
	Health Area Total	**33**
	Service Area Total	**38**
	Massachusetts	1,278
	Source: Mass Department of Environmental Protection 2021	

In addition to the database, the Mass DEP also maintains a spot map of brownfield sites throughout the Commonwealth. EH-Map 4 shows how lands plagued by contaminants often concentrate in the same area of a town. Even more concerning is the correlation between brownfield sites and EJ populations as shown in EH-Map 3. Communities with EJ populations include Wendell, Orange, Gardner, Athol, and

[26] https://www.epa.gov/brownfields/overview-brownfields-program
[27] https://www.mass.gov/service-details/find-brownfields-sites

Winchendon. Notice that many brownfield sites are located on the borders of other communities. Also noteworthy is the exceptionally high number of sites in Fitchburg, just outside the Heywood service area.

EH – Map 4 Brownfield Sites throughout the Service Area 2021



7. **Solid Waste**

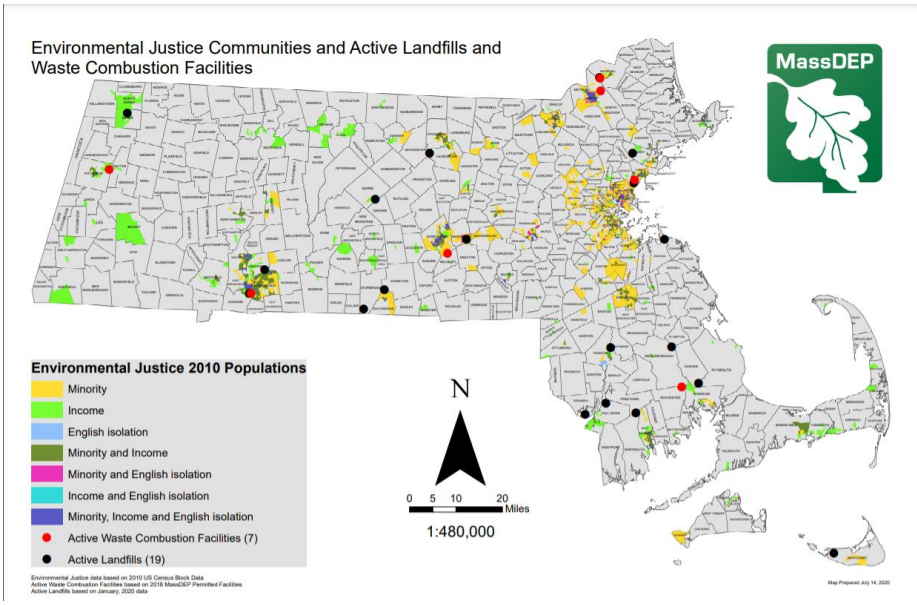
Since the 1970's there has been growing concerns in the United States over the increasing volume of municipal and industrial solid waste. Based on these concerns, Congress adopted the Resource Conservation and Recovery Act (RCRA) to govern the disposal of solid and hazardous waste. The Massachusetts Department of Environmental Protection (MassDEP) is the enforcing authority for solid waste regulations in Massachusetts.

Proper management of solid waste is important to protecting human health and the environment. Improperly handled solid waste can cause a variety of problems including water, land, and air contamination. To protect public health, safety, and the environment, MassDEP regulates the sites of solid waste facilities and the operations which recycle compost or convert recyclable materials.

EH-Map 5 illustrates, that in 2020 of the 15 communities in the Service Area, there was only one active landfill, it borders the town of Westminster. There are no active waste combustion facilities in any of these communities. The major activities of solid waste management include reduction and reuse to

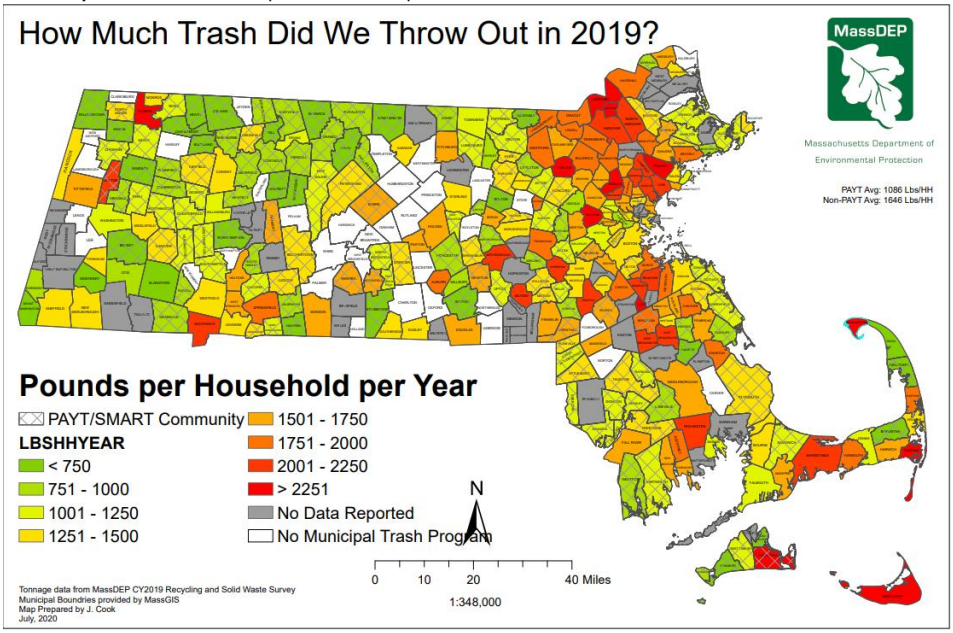
prevent waste, recycling and composting to divert waste, and treatment and disposal in a managed landfill.

EH – Map 5 EJ Communities and Active Landfills and Waste Combustion Facilities



EH-Map 6 shows that according to MassDEP, in 2019, of the fifteen communities in the service area, three of these communities use less than 750 pounds of trash per household per year (Athol, Warwick and Winchendon), four use less than 1,000 pounds (Orange, Phillipston, Royalston, and Wendell), two use less than 1,250 pounds (Erving and New Salem), two use less than 1,500 pounds (Gardner and Petersham), three have no managed waste programs (Hubbardston, Templeton, and Westminster), and one community has no data reported (Ashburnham).

EH – Map 6 Pounds of Trash per Household per Year

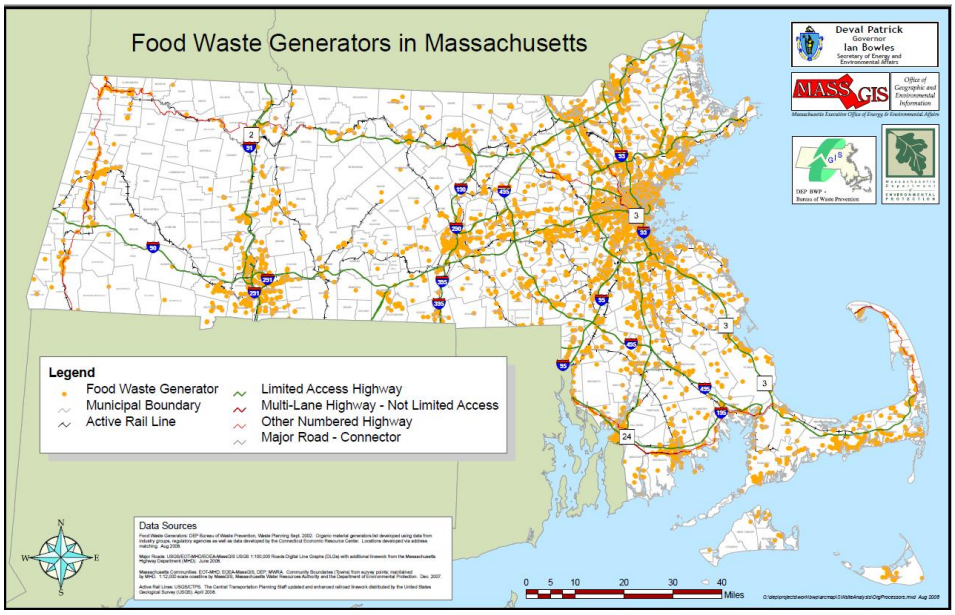


8. **Food Waste**

Food waste poses an environmental hazard like solid waste because discarded organic matter in landfills creates methane, a greenhouse gas, that contributes to climate change. The process of landfilling or incinerating food waste is expensive for municipalities and causes public health and environmental impacts with a disproportionately negative impact on the low-income communities in which these facilities are often built.

EH-Map 7 highlights food waste generators in Massachusetts and the areas where the greatest number of large food producers exist. Most of these large generators are close to highways, urban areas, and cities. Because the majority of the fifteen communities in the service area are either suburban or rural, the number of large generators is low, except for a higher concentration in the city of Gardner due to grocery stores, a college (Mount Wachusett Community College), a hospital, multiple schools, and restaurants.

EH – Map 7 Food Waste Generators in Massachusetts



INFECTIOUS DISEASE

Chapter 5

Abstract

This chapter provides information on the prevalence of infectious diseases in Heywood's 15 communities and highlights trends and disparities among residents

Chapter 5 - Infectious Disease

This chapter provides information on the prevalence of infectious diseases in Heywood Healthcare – Athol Hospital and Heywood Hospital's (Heywood or HH) 15 communities and highlights trends and disparities among residents. The following infectious disease topics are discussed:

- Sexually Transmitted Infections (STI)
- Influenza
- Tickborne Disease
- Covid-19

Chapter Highlights

Sexually Transmitted Infections (STIs)

- Cases of Hepatitis C declined in the region from 132 cases in 2015 to 119 cases in 2016 to 95 cases in 2017 but still remains higher than the State rate.
- Gardner reported a much higher rate of Chlamydia than most other communities all three years.

Influenza

- There was a 10.5% increase in influenza deaths from 2015 to 2017 in the Service Area vs. a 0.5% decrease in influenza deaths in Massachusetts during the same period.

Tickborne Disease

- The overall number of tickborne Anaplasmosis cases in the Heywood Hospital Area was zero, but the overall number in the Athol Hospital Service Area increased from 17 in 2016 to 49 in 2017 to 25 in 2018

Covid-19

- Overall, the Service Area had a 3.6% positivity rate, and the state was 2.8%.
- Many healthcare providers have moved to tele-health care services during the pandemic in an effort to increase access to healthcare services. The number of adults who had a telehealth appointment in the US was 24.5% and 30.8% in the state.

Sexually Transmitted Infections (STI)

Across the U.S., the number of annual acute hepatis C cases per 100,000 people was reported to be 0.3 in 2009, increasing to 1.2 in 2018.[28] This is in contrast to declining numbers in the Athol and Heywood Service Areas between 2015 and 2017. According to the CDC, American Indian/Alaska Native patients were the group most affected by acute hepatitis C in 2018. New HIV infections in the U.S. declined by 8% between 2015 and 2019.[29] A study from 2005 showed that HIV rates are generally lower in rural areas as compared with suburban and urban areas, but that HIV diagnosis rates in these rural areas are higher among Black and Hispanic/Latino patients than White patients.[30]

In contrast to local data, the CDC estimated a decrease in influenza deaths of approximately 25% from 2014-2015 to 2016-2017, though there is no clear trend in either direction over multiple years.[31] Flu-related hospitalization rates are highest for Black patients, followed in order by American Indian/Alaska Native, Hispanic/Latino, White, and Asian patients.[32] Of note regarding geographic factors in influenza-related healthcare, children in rural communities have lower vaccination rates than children in suburban and urban communities.[33]

Consistent with local trends, national reported Anaplasmosis cases increased between 2000 and 2017 before declining in 2018 (though cases rose again in 2019). The majority of cases were reported in the Northeast and Upper Midwest.[34]

Sexually Transmitted Infections (STIs) include Chlamydia, Gonorrhea, Syphilis, HIV, Viral Hepatitis, and Hepatitis C. STIs are infectious diseases primarily spread through sexual activity that can cause damage to reproductive organs or cause general body infections.

It is important to note that cells in tables portrayed as double dash marks or "- -" are in communities where greater than 0 but less than 5 cases were reported and are suppressed to protect confidentiality.

1. Chlamydia

According to the Centers for Disease Control (CDC), Chlamydia is a common STI frequently experienced by both men and women that can cause severe damage to women's reproductive system if left untreated. This damage can make it difficult for women to get pregnant in the future and could even cause potentially fatal ectopic pregnancy (pregnancy that occurs outside the womb.

[28] https://www.cdc.gov/mmwr/volumes/69/wr/mm6914a2.htm#:~:text=The%20annual%20rate%20of%20reported%20acute%20hepatitis%20C%20cases%20per,years%20(2.6)%20in%202018.
[29] https://www.cdc.gov/hepatitis/statistics/2018surveillance/HepC.htm
[30] https://pubmed.ncbi.nlm.nih.gov/16092299/#:~:text=Results%3A%20The%20rate%20of%20HIV,areas%20(22.7%20per%20100%2C000)
[31] https://www.cdc.gov/flu/about/burden/index.html
[32] https://www.cdc.gov/flu/highrisk/disparities-racial-ethnic-minority-groups.html
[33] https://pubmed.ncbi.nlm.nih.gov/33071004/
[34] https://www.cdc.gov/anaplasmosis/stats/index.html

The Mass Department of Public Health (DPH) tracks reported cases of Chlamydia throughout Massachusetts using public health data collected from Massachusetts hospitals and calculates per-100,000 rates using decennial Census data. Chlamydia cases in the Service Area are in Table ID-1.
For the Service Area, rates increased from 199.0 in 2016 to 249.9 in 2018. The state rates were considerably higher than the Service Area, increasing from 383.8 in 2016 to 439.8 in 2018.

In Athol Hospital's Health Area, four of the nine communities reported zero to five cases of Chlamydia annually from 2016 to 2018. Erving and Warwick reported zero to five cases of Chlamydia annually in 2016 and 2018, and Wendell reported zero to five cases of Chlamydia in 2018. Athol and Orange were the only two communities to report higher numbers of Chlamydia cases every year. Rates in Athol grew and fell over time but stayed lower than Orange's, except for 2018, which saw a slight decline in Chlamydia cases but wherein Athol had a higher rate. Orange saw a jump in cases in 2017 (from 17 to 28) but then saw a slight dip to 16 cases in 2018.

In Heywood Hospital's Health Area, all six communities reported five or more cases of Chlamydia in 2016-2018. Gardner reported a much higher rate than most other communities all three years. However, Templeton was the only community to experience an increase in reported cases from year to year, ranking low in total cases but high in the overall rate. Westminster and Winchendon saw their rates fall and then rise again, Ashburnham and Hubbardston saw their rates rise and then fall again, and Gardner's rates slowly increased overall.

ID – 1 Reported Cases of Chlamydia in the Service Area from 2016 to 2018

	Community	2016		2017		2018	
		Count	Rate per 100,000	Count	Rate per 100,000	Count	Rate per 100,000
Athol	Athol	26	222.0	34	290.3	31	264.7
	Erving	--	--	6	344.8	--	--
	New Salem	--	--	--	--	--	--
	Orange	17	222.4	28	366.3	16	209.3
	Petersham	--	--	--	--	--	--
	Phillipston	--	--	--	--	--	--
	Royalston	--	--	--	--	--	--
	Warwick	--	--	0	0.0	--	--
	Wendell	0	0.0	0	0.0	--	--
	Health Area Total/Rate	**43**	**153.0**	**68**	**242.0**	**47**	**167.2**

Heywood	Ashburnham	8	127.4	11	175.1	8	127.4
	Gardner	53	257.2	53	257.2	71	344.5
	Hubbardston	5	106.2	9	191.2	5	106.2
	Templeton	8	98.4	23	282.9	26	319.8
	Westminster	21	270.4	15	193.1	23	296.2
	Winchendon	34	313.6	11	101.5	36	332.1
	Health Area Total/Rate	**129**	**221.1**	**122**	**209.1**	**169**	**289.7**
	Service Area Total/Rate	**172**	**199.0**	**190**	**219.8**	**216**	**249.9**
	Massachusetts	26,455	383.8	29,199	423.6	30,311	439.8
	Source: Mass DPH, 2015-2019 American Community Survey 5-year Estimates for communities Center for Disease Control for state						

2. Gonorrhea

The CDC reports that gonorrhea is an STI that can cause infections in the genitals, rectum, and throat. The STI can be easily treated and cured with medication but can cause severe complications like pelvic inflammatory disease (PID) in women and cause a man to become sterile. According to the CDC, in 2018, the overall rate of reported gonorrhea cases among Blacks in the United States was 7.7 times the rate among Whites. This disparity was similar for Black males (8.5 times the rate among White males) and Black females (6.9 times the rate among White females). As in previous years, the disparity in gonorrhea rates for Blacks in 2018 was larger in the Midwest and Northeast than in the South and West.

A breakdown of gonorrhea cases in the Service Area can be found in Table ID-2. Throughout the Service Area, there are a minimal number of gonorrhea cases, however the number of cases grew from 23 in 2017 to 31 in 2018.

In Athol's Health Area, a few communities reported greater than zero but less than five cases of gonorrhea in 2016 or 2017 but saw zero cases throughout their Service Area in 2018. In Heywood's Health Area, all six communities reported greater than zero but less than five cases of gonorrhea at some point from 2016 to 2018. Gardner led all communities in 2017 and 2018 but reported just under five cases in 2016.

From 2016 to 2018, only Gardner, Athol, and Winchendon reported enough cases of gonorrhea where the data would not be suppressed. The number of cases of gonorrhea in Athol has remained steady from 2017 to 2018 at six cases, which was the number of cases Winchendon had in 2018. Gardner had a surprising number of cases at 17 in 2017 and 19 in 2018.

ID – 2 Reported Cases of Gonorrhea in the Service Area from 2016 to 2018

	Community	2016		2017		2018	
		Count	Rate	Count	Rate	Count	Rate
Athol	Athol	0	0.0	6	51.2	6	51.2
	Erving	0	0.0	--	--	--	--
	New Salem	0	0.0	0	0.0	0	0.0
	Orange	0	0.0	--	--	--	--
	Petersham	0	0.0	0	0.0	0	0.0
	Phillipston	0	0.0	0	0.0	--	--
	Royalston	0	0.0	--	--	0	0.0
	Warwick	0	0.0	0	0.0	0	0.0
	Wendell	0	0.0	0	0.0	0	0.0
	Health Area Total/Rate	**0**	**0.0**	**6**	**21.4**	**6**	**21.4**
Heywood	Ashburnham	--	--	--	--	--	--
	Gardner	--	--	17	82.5	19	92.2
	Hubbardston	0	0.0	--	--	--	--
	Templeton	--	--	--	--	--	--
	Westminster	--	--	--	--	--	--
	Winchendon	--	--	--	--	6	55.3
	Health Area Total/Rate	**0**	**0.0**	**17**	**29.1**	**25**	**42.9**
	Service Area Total/Rate	**0**	**0.0**	**23**	**26.6**	**31**	**35.9**
	Massachusetts	4,980	72.3	7,737	112.3	8,076	117.2

Source: Mass DPH, 2015-2019 American Community Survey 5-year Estimates for communities; Center for Disease Control for state

3. Syphilis

Syphilis is a treatable and curable STI that can cause serious health problems if left untreated. Syphilis occurs in several stages: primary, secondary, latent, and tertiary. At any stage, syphilis can infect the brain and nervous systems or the eyes, causing further complications.

No community reported enough cases throughout the Service Area to determine which community reported the highest syphilis rates, and there are not enough cases to determine Service Area-wide rates. The rate of syphilis cases statewide increased from 2016 to 2018. In 2016 there were 1,036 cases of syphilis, 1,102 cases in 2017, and 1,164 cases in 2018, this equaled a rate of 16.9 per 100,000.

ID – 3 Reported Cases of Primary and Secondary Syphilis in the Service Area from 2016 to 2018

	Community	2016		2017		2018	
		Count	Rate per 100,000	Count	Rate per 100,000	Count	Rate per 100,000
Athol	Athol	26	222.0	34	290.3	31	264.7
	Erving	--	--	6	344.8	--	--
	New Salem	--	--	--	--	--	--
	Orange	17	222.4	28	366.3	16	209.3
	Petersham	--	--	--	--	--	--
	Phillipston	--	--	--	--	--	--
	Royalston	--	--	--	--	--	--
	Warwick	--	--	0	0.0	--	--
	Wendell	0	0.0	0	0.0	--	--
	Health Area Total/Rate	**43**	**153.0**	**68**	**242.0**	**47**	**167.2**
Heywood	Ashburnham	8	127.4	11	175.1	8	127.4
	Gardner	53	257.2	53	257.2	71	344.5
	Hubbardston	5	106.2	9	191.2	5	106.2
	Templeton	8	98.4	23	282.9	26	319.8
	Westminster	21	270.4	15	193.1	23	296.2
	Winchendon	34	313.6	11	101.5	36	332.1
	Health Area Total/Rate	**129**	**221.1**	**122**	**209.1**	**169**	**289.7**
	Service Area Total/Rate	**172**	**199.0**	**190**	**219.8**	**216**	**249.9**
	Massachusetts	26,455	383.8	29,199	423.6	30,311	439.8
	Source: Mass DPH, 2015-2019 American Community Survey 5-year Estimates for communities Center for Disease Control for state						

4. Human Immunodeficiency Virus (HIV)

Human Immunodeficiency Virus (HIV) is a virus spread through the transfer of bodily fluids from one infected individual to a non-infected individual. HIV is transferred by semen, vaginal fluid, blood, or breastmilk but not by tears, sweat, feces, or urine. Over time, HIV weakens the body's immune system, making it very difficult for the infected individual to stay healthy.

Table ID-4 shows HIV cases and rates from 2015 to 2017. During that period, only Orange and Gardner reported cases and all reports were suppressed due to incidences being less than five. The remaining communities reported zero cases, or there was no information for towns such as Athol, Erving, and Ashburnham. In 2017, Massachusetts reported 611 cases, which was slightly fewer than 2015 (613) and 2016 (646).

ID – 4 Reported Cases of HIV in the Service Area from 2015 to 2017

	Community	2015		2016		2017	
		Count	Rate	Count	Rate	Count	Rate
Athol	Athol	0	0.0	NA	NA	NA	NA
	Erving	0	0.0	NA	NA	NA	NA
	New Salem	0	0.0	0	0.0	0	0.0
	Orange	0	0.0	--	--	--	--
	Petersham	0	0.0	0	0.0	0	0.0
	Phillipston	0	0.0	0	0.0	0	0.0
	Royalston	0	0.0	0	0.0	0	0.0
	Warwick	0	0.0	0	0.0	0	0.0
	Wendell	0	0.0	0	0.0	0	0.0
	Health Area Total/Rate	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
Heywood	Ashburnham	0	0.0	NA	NA	NA	NA
	Gardner	--	--	0	0.0	0	0.0
	Hubbardston	0	0.0	0	0.0	0	0.0
	Templeton	--	--	0	0.0	0	0.0
	Westminster	0	0.0	0	0.0	0	0.0
	Winchendon	0	0.0	0	0.0	0	0.0
	Health Area Total/Rate	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
	Service Area Total/Rate	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
	Massachusetts	613	8.9	646	9.4	611	8.9

Source: Mass DPH, 2015-2019 American Community Survey 5-year Estimates for communities; Center for Disease Control for state

5. Hepatitis C

Hepatitis C is a bloodborne virus that, like hepatitis B, can cause acute and chronic infection of the liver. The disease can be transferred through contact with bodily fluid, most commonly blood. Hepatitis C is most often asymptomatic, meaning it shows no symptoms is very rarely life-threatening. Most infected individuals clear the disease within six months of infection without treatment.

Table ID-5 shows cases and rates of hepatitis C in the Service Area from 2015 to 2017. The Service Area rate dropped all three years from 152.7 in 2015 to 109.7 in 2017. The state rate decreased as well from 111.8 in 2015 to 98.2 in 2017. The Service Area rate remained significantly higher than the state but decreased a larger percentage than the state.

In Athol Hospital's Health Area, Athol and Orange reported the highest number of hepatitis C cases, but both saw their case count fluctuate minimally between 2015 to 2017. Orange saw an overall decrease in cases from 10 to 8. Athol's cases stayed at 23. All other communities reported zero cases or suppressed.

In Heywood Hospital's Health Area, Gardner saw significant decreases in hepatitis C from 2015 (59 cases) to 2017 (29), about a reduction of half of its total cases. Templeton saw a decline as well from 21 to 7 cases over 2015 to 2017. Winchendon also saw a decrease of 19 to 13 from 2015 to 2017. The remaining communities saw a slight fluctuation in cases of hepatitis C from 2015 to 2017, in both directions.

ID – 5 Reported Cases of Hepatitis C in the Service Area from 2015 to 2017

	Community	2015		2016		2017	
		Count	Rate	Count	Rate	Count	Rate
Athol	Athol	23	196.4	24	204.9	23	196.4
	Erving	0	0.0	--	--	--	--
	New Salem	0	0.0	--	--	0	0.0
	Orange	10	130.8	11	143.9	8	104.7
	Petersham	--	--	0	0.0	0	0.0
	Phillipston	0	0.0	--	--	--	--
	Royalston	--	--	0	0.0	0	0.0
	Warwick	0	0.0	--	--	--	--
	Wendell	0	0.0	0	0.0	0	0.0
	Health Area Total/Rate	**33**	**117.4**	**35**	**124.5**	**31**	**110.3**
Heywood	Ashburnham	--	--	5	79.6	8	127.4
	Gardner	59	286.3	46	223.2	29	140.7
	Hubbardston	--	--	--	--	--	--
	Templeton	21	258.3	10	123.0	7	86.1
	Westminster	--	--	5	64.4	7	90.1
	Winchendon	19	175.3	18	166.0	13	119.9
	Health Area Total/Rate	**99**	**169.7**	**84**	**144.0**	**64**	**109.7**
	Service Area Total/Rate	**132**	**152.7**	**119**	**137.7**	**95**	**109.9**
	Massachusetts	7,708	111.8	7,786	113.0	6,770	98.2
	Source: Mass DPH, 2015-2019 American Community Survey 5-year Estimates for communities; Center for Disease Control for state						

Influenza

The influenza virus, otherwise known as the flu, is a contagious respiratory illness that can infect an individual's nose, throat, and lungs. Symptoms can range from mild to severe and include fever, cough, sore throat, muscle aches, fatigue, vomiting, and diarrhea. Influenza can be fatal in some cases.

According to the Center for Disease Control, Flu activity was unusually low throughout the 2020-2021 flu season in the United States. The low level of flu activity during this past season contributed to dramatically fewer flu illnesses, hospitalizations, and deaths compared with previous flu seasons. COVID-19 mitigation measures such as wearing face masks, staying home, hand washing, school closures, reduced travel, increased ventilation of indoor spaces, and physical distancing, likely contributed to the decline. Higher number of individuals receiving influenza vaccination may also have contributed to reduced flu illness during the 2020–2021 season.

Table ID-6 shows total number of deaths due to influenza for the most current years available. There was a 10.5% increase in the Service Area deaths from 2015 to 2017 compared to a 0.5% decrease in influenza deaths in Massachusetts in the same period. There was a 33.33% decrease in influenza deaths in the Athol Hospital Health Area from 2015 to 2017 versus a 58% increase of deaths in the Heywood Hospital Health Area from 2015 to 2017.

ID – 6 Deaths by Influenza in the Service Area 2015 to 2017

	Community	2015	2016	2017
Athol	Athol	4	2	3
	Erving	0	0	1
	New Salem	0	0	0
	Orange	6	0	4
	Petersham	0	1	0
	Phillipston	1	0	0
	Royalston	1	0	0
	Warwick	0	1	1
	Wendell	0	0	0
	Health Area Total/Rate	**12**	**4**	**9**
Heywood	Ashburnham	0	0	0
	Gardner	3	3	6
	Hubbardston	0	1	0
	Templeton	2	0	2
	Westminster	0	2	0
	Winchendon	2	2	4
	Health Area Total/Rate	**7**	**8**	**12**
	Service Area Total/Rate	**19**	**12**	**21**
	Massachusetts	1512	1243	1434
	Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

Tickborne Disease

Tickborne diseases are spread from tick bites. Ticks can carry a wide range of pathogens that can transmit infections like Lyme Disease, Babesiosis and Anaplasmosis to humans. Tickborne diseases are prevalent in New England. Anaplasmosis is a tickborne disease that can cause fever, sweats, chills, fatigue, headache, muscle pain, malaise, and rash, among other symptoms. If not treated correctly, anaplasmosis can be fatal.

ID-7 shows cases for anaplasmosis from 2016 to 2018. Throughout the Service Area, there were very few cases between 2016 and 2018. By 2018, every community reported zero anaplasmosis cases in the Athol Hospital Health Area. The Heywood Hospital Health Area, also saw zero cases except for Ashburnham, Gardner, and Templeton, which reported between zero and five. The state total cases have dropped significantly from 2016 (874) and 2017 (1,218), to 655 cases in 2018.

ID – 7 Reported Cases of Anaplasmosis in the Service Area from 2016 to 2018

	Community	2016	2017	2018
Athol	Athol	0	0	0
	Erving	--	0	0
	New Salem	0	0	0
	Orange	--	--	0
	Petersham	0	--	0
	Phillipston	0	0	0
	Royalston	0	0	0
	Warwick	0	0	0
	Wendell	0	0	0
	Health Area Total/Rate	**0**	**0**	**0**
Heywood	Ashburnham	0	--	--
	Gardner	0	0	--
	Hubbardston	0	--	0
	Templeton	0	--	--
	Westminster	0	0	0
	Winchendon	0	0	0
	Health Area Total/Rate	**0**	**0**	**0**
	Service Area Total/Rate	**0**	**0**	**0**
	Massachusetts	874	1,218	655
	Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

Covid-19

Covid-19 is a mild to severe respiratory illness that is caused by a coronavirus severe acute respiratory syndrome coronavirus 2 of the genus Beta coronavirus). It is transmitted chiefly by contact with infectious material (such as respiratory droplets) or with objects or surfaces contaminated with the causative virus, and is characterized especially by fever, cough, and shortness of breath and may progress to pneumonia and respiratory failure. Table ID-8 shows total cases and tests in the Service Area through June 26, 2021. Overall, the Service Area had a 3.6% positivity rate, and the state was 2.8%.

Impact of COVID-19/Pandemic - Access to Healthcare:

According to the CDC, May 2020 had the lowest rates of access to healthcare during the entire pandemic. During this time the national average for percentage of people who did not get the care they needed or got delayed care was 45.5% with Massachusetts being at 37.2%. During this time, females had a disproportionately more difficult time getting access to healthcare with 49% of females not having access and 42.2% of males not having proper access.

The most recent data from the CDC (June-July 2021) on lack of healthcare access shows a national average of 18.6% and the Massachusetts average of 18.3%. The same inequality as last year is still present with 20.3% of females having improper access compared to 16.7% of males. There is also a large disparity between disabled and non-disabled people. Currently 34.0% of people with a disability in the US have had delayed or no care at all, compared to 16.2% for people without a disability.

As a result of the pandemic, many healthcare providers are moving to a telehealth format to increase access. Based on the most up to date CDC data, 22.2% of households in the US and 26% in Massachusetts had a child attend a medical appointment via videoconferencing. The number of adults who had a telehealth appointment in the US was 24.5% and 30.8% in the state.

> *"[During the Pandemic] We're meeting people where they are especially homebound, especially seniors, especially people who are facing barriers in transportation, language, things like that. It's important right now that we kind of come together to make sure we're developing the infrastructure to deliver those services to deliver the vaccine in the next 30 days, 90 days into the summer into the fall."*
>
> *"To obtain a Covid-19 shot a patient has read the English language, have a computer, have a phone, have a lot of time and energy to make multiple calls, and understand the system as a whole."*
>
> *"Our state has an existing infrastructure for doing things like vaccinations. So, to supplant that with these million-dollar contracts with for profit companies to come in and just create mass vaccine sites really limits access for anyone in our region, certainly, especially our most vulnerable elders."*

ID – 8 Covid-19 Cases and Tests in the Service Area through June 26, 2021

	Community	Total Cases	Total Tests	14 Day Positivity
Athol	Athol	811	26,108	0
	Erving	73	4,280	0
	New Salem	18	1,809	0
	Orange	361	16,005	0.93%
	Petersham	49	2,256	0
	Phillipston	95	2,409	0
	Royalston	74	2,285	0
	Warwick	18	1,322	0
	Wendell	11	1,907	0
	Health Area Total	**1,510**	**58,381**	**0**
Heywood	Ashburnham	422	16,352	0
	Gardner	2,330	45,021	0.25
	Hubbardston	186	7,917	0
	Templeton	664	17,495	0
	Westminster	553	14,957	0
	Winchendon	763	19,453	0
	Health Area Total	**4,918**	**121,195**	**0**
	Service Area Total	**6,428**	**179,576**	**0**
	Massachusetts	663,822	23,825,346	1
	Source: Mass DPH Covid-19 Dashboard			

Table ID – 9 shows the vaccination numbers and percentages for the two Health Areas as of November 2021. The Athol Hospital Health Area has 68% of individuals with a single vaccine dose and 60% of the population fully vaccinated. Erving and Petersham have the highest total vaccination rates at 74% and 65% respectively. The Heywood Hospital Health Area shows 69% with a single dose and 60% fully vaccinated. Westminster and Gardner have the highest total vaccination rates at 72% and 65% respectively. The fully vaccinated percentages for the Service Area totals (60%) is less than the state's fully vaccinated rate of 69%.

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ID – 9 COVID Vaccination Rates in the Service Area through November 2021

	Community	Population	Individuals with at least one dose	% Individuals with at least one dose per capita	Fully vaccinated individuals	% Fully vaccinated individuals per capita
Athol	Athol (includes Phillipston)	13,695	9,084	66	7,985	58
	Erving	2,113	1,837	87	1,573	74
	New Salem	975	729	75	628	64
	Orange	8,125	5,269	65	4,645	57
	Petersham	1,268	942	74	825	65
	Phillipston (includes Athol)	13,695	9,084	66	7,985	58
	Royalston	1,274	859	67	745	58
	Warwick	*	*	*	*	*
	Wendell	*	*	*	*	*
	Health Area Totals	**27,450**	**18,720**	**68%**	**16,401**	60%
Heywood	Ashburnham	6,287	4,432	71	3,894	62
	Gardner	19,874	14,764	74	12,871	65
	Hubbardston	4,680	3,187	68	2,810	60
	Templeton	9,020	5,502	61	4,813	53
	Westminster	7,316	6,079	83	5,275	72
	Winchendon	10,765	6,255	58	5,492	51
	Health Area Totals	**126,537**	**86,743**	**69%**	**75,942**	**60%**
	Service Area Totals	**153,987**	**105,463**	**68%**	**92,343**	**60%**
	MA Totals	**6,952,001**	**5,651,400**	**81%**	**4,829,403**	**69%**

*=no data available. Data as of Nov. 2021, Table MassLive Source: MA Dept. of Public Health

INJURIES AND VIOLENCE

Chapter 6

Abstract

This chapter provides a comprehensive overview of injury and violence issues in Heywood's 15 communities. Trends and disparities related to injuries and violence are highlighted and emphasized.

Chapter 6 - Injuries and Violence

This chapter provides a comprehensive overview of injury and violence issues in Heywood Healthcare – Athol Hospital and Heywood Hospital's (Heywood or HH) 15 communities. Trends and disparities related to injuries and violence are highlighted and emphasized.

This chapter highlights the following topics that affect the health of Service Area residents:

- Self-inflicted Injuries & Suicides
- Motor-Vehicle-Related Mortality
- Violence & Child Maltreatment
- Elder Abuse & Neglect

Chapter Highlights

Self-inflicted Injuries and Suicides

- In 2020, the Service Area experienced ten suicides for a rate of 11.6 which was slightly higher than the state rate of 9.4.

Motor Vehicle-Related Mortality

- Service Area vehicle related deaths in 2014 was five compared to ten in 2017
- The rate of motor vehicle related deaths in the Service Area was 11.6% per 100,000, which is double the State rate of 5.8 % per 100,000

Violence & Child Maltreatment

- 2020 saw a 12.7% decrease in DCF caseloads from the same time in 2018. Due to the COVID-19 pandemic, many mandatory reporting organizations like schools and hospitals saw fewer children, therefore reported few cases of maltreatment.
- As of Q1 of FY2020, 3,842 (55%) of DCF consumers were white, 1,926 (28%) were Hispanic/Latino, and 366 (5%) were Black, however, the population of the Service Area was 96.1% white, 2.2% are Hispanic/Latino, and only 1% is Black.
- Restraining orders filed in 2020 decreased, likely due to limited access to courts during the pandemic.

Self-inflicted Injuries and Suicides

In contrast to the service area, which showed a decrease in suicides between 2015 and 2017, the national rate of suicides increased over the same time (13.3 to 14.0 per 100,000). This number has consistently risen every year since 2005 before declining slightly in 2019. Suicides rates in 2019 were highest among American Indian/Alaska Native individuals, followed by White individuals.[35] Between 2001 and 2015, suicide rates were higher in rural counties as compared with urban counties.[36]

The Mental Health and Substance Abuse Needs Assessment of North Central Massachusetts defines "Self-Inflicted Injuries" as "those judged by hospital staff to be an intentional effort to hurt or kill oneself. This excludes unintentional overdoses of either prescription or illegal drugs." This section highlights suicide rates in the Service Area, a very prescient issue to Heywood Healthcare and staff at Heywood and Athol Hospitals.

As seen in Table IV-2, the number of suicides over ten years is variable, with the numbers of suicides in the Service Area increasing from nine (9) in 2012 to 13 in 2015 and then decreasing down to eight (8) in 2020 and five for the wight months of data in 2021.

> *"Four suicides this year, three under 40's in age and one in the 70s – all Caucasians – shotguns used – the duration of the pandemic is adversely affecting the population."*

IV-2 Montachusett Suicide Prevention Task Force Catchment Area Suicides in Service Area Communities 2012-2021

	Community	2012	2013	2014	2015	2016	2017	2018	2019	2020	Jan-Aug 2021
Athol	Athol	0	0	2	3	1	3	1	4	2	0
	Erving	0	0	1	1	0	0	0	0	1	0
	New Salem	0	0	0	1	0	0	0	0	0	1
	Orange	0	0	1	1	0	0	0	1	1	0
	Petersham	0	0	0	0	0	0	0	0	0	1
	Phillipston	0	0	0	0	0	0	0	0	0	0
	Royalston	0	0	0	0	0	0	0	0	0	0
	Warwick	0	0	0	0	0	0	0	0	0	0
	Wendell	0	0	2	0	0	0	0	0	0	0
	Health Area Total	**0**	**0**	**2**	**6**	**0**	**3**	**1**	**5**	**4**	**2**
Heywood	Ashburnham	1	1	1	0	1	1	1	1	0	0
	Gardner	6	3	5	4	2	0	4	0	0	2
	Hubbardston	0	0	0	0	0	0	0	0	0	0
	Templeton	1	1	0	1	0	1	1	1	0	0
	Westminster	1	1	1	2	1	0	0	0	3	1
	Winchendon	0	1	0	0	1	2	2	1	1	0
	Health Area Total	**9**	**7**	**7**	**7**	**5**	**4**	**8**	**3**	**4**	**3**
	Service Area Total	**9**	**7**	**9**	**13**	**5**	**7**	**9**	**8**	**8**	**5**
	Source: 2021 Mass State Police for District Attorney Early and District Attorney Sullivan's Offices										

[35] https://www.nimh.nih.gov/health/statistics/suicide
[36] https://www.cdc.gov/media/releases/2017/p1005-rural-suicide-rates.html

Motor Vehicle-Related Mortality

Motor vehicle-related mortality refers to the instances of death caused by motor vehicle accidents. This section highlights mortality rates in the Service Area caused by motor vehicle accidents.

Between 2014 and 2017, the national average of motor vehicle fatalities per 100,000 people rose from 10.28 to 11.40,[37] just below the service area's average of 11.6. In 2019, 45% of motor vehicle fatalities occurred in rural areas, however the rate of crash fatalities per 100 million miles traveled was twice as high in rural areas as in urban areas.[38] Between 2015 and 2019, the rate of motor vehicle fatalities for American Indian/Alaska Native individuals was nearly three times as high as the national average.[39] Of note regarding COVID, preliminary data suggests that although Americans drove less in 2020, the total number of motor vehicle fatalities was the highest it has been since 2007.[40]

Throughout the Service Area, there were ten (10) motor vehicle related deaths in 2017. The 2017 rate and total deaths was double the 2015 rate (5.86) per 100,000 residents and total deaths (5). However, the rate statewide decreased from 6.86 in 2015 to 5.8 in 2017, as well as total deaths from 467 in 2015 to 396 in 2017.

One (1) occurred in Athol health area and nine (9) occurred in the Heywood health area. The rate of vehicle related deaths for the Service Area is 11.6 per 100,000, which is double the State rate of 5.8. This distribution is displayed in Table IV-2.

IV - 2 Vehicle-Related Deaths and Death Rates in Service Area Communities 2017 & 2015

	Community	Vehicle-Related Deaths	Vehicle-Related Deaths per 100,000	Vehicle-Related Deaths (2015)	Vehicle-Related Deaths per 100,000 (2015)
Athol	Athol	0	0.0	2	--
	Erving	0	0.0	0	0
	New Salem	0	0.0	0	0
	Orange	1	13.1	0	0
	Petersham	0	0.0	0	0
	Phillipston	0	0.0	0	0
	Royalston	0	0.0	0	0
	Warwick	0	0.0	0	0
	Wendell	0	0.0	0	0
	Health Area Total/Rate	**1**	**3.6**	**2**	**--**
Heyw	Ashburnham	1	15.9	1	--
	Gardner	2	9.7	1	--

[37] https://en.wikipedia.org/wiki/Motor_vehicle_fatality_rate_in_U.S._by_year
[38] https://www.iihs.org/topics/fatality-statistics/detail/urban-rural-comparison
[39] https://www.ghsa.org/sites/default/files/2021-06/An%20Analysis%20of%20Traffic%20Fatalities%20by%20Race%20and%20Ethnicity.pdf
[40] https://www.nhtsa.gov/press-releases/2020-fatality-data-show-increased-traffic-fatalities-during-pandemic

	Hubbardston	1	21.2	0	0
	Templeton	1	12.3	0	0
	Westminster	1	12.9	0	0
	Winchendon	3	27.7	1	--
	Health Area Total/Rate	**9**	**15.4**	**3**	**--**
	Service Area Total/Rate	**10**	**11.6**	**5**	**5.86**
	Massachusetts*	**396**	**5.8**	**467**	**6.86**
Source: 2017 Mass DPH Data, *2019 CDC WISQARS, Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data. 2015 Mass DPH Data, *2016 CDC WISQARS					

Violence & Child and Elder Maltreatment

Violence is a notable public health issue across the United States and the Commonwealth, including the Service Area. Violence is a critical aspect that must be prevented in order to achieve true health equity, despite it often being viewed as a criminal justice issue. This section highlights data regarding various categories of violence experienced by Service Area residents and analyzes trends and disparities.

1. Homicide

In 2019, the national homicide rate was 5.8 per 100,000, higher than the service area rate of 4.6 between 2015 and 2019.[41] From 2015 to 2019, there were a total of four homicides throughout the Service Area, as seen in Table IV-3. The homicide rate for the Service Area (4.6) was much lower than the State (6.3). This five-year period rate of 4.6 was an increase compared to the three-year period of 2014 to 2016 at a rate of 3.5. The statewide rate for 2015 to 2019 (6.3) was a huge increase over 2014 to 2016 (2.03).

IV - 3 Homicides and Homicide Rates in Service Area Communities 2015-2019

	Community	Total Homicides 2015-2019	Homicide Rate 2015-2019 per 100,000	Total Homicides (2014-2016)	Homicide Rate (2014-2016) per 100,000
Athol	Athol	1	8.5	0	0.0
	Erving	0	0.0	0	0.0
	New Salem	--	--	0	0.0
	Orange	1	13.1	2	26.2
	Petersham	--	--	0	0.0
	Phillipston	--	--	0	0.0
	Royalston	0	0.0	0	0.0
	Warwick	--	--	0	0.0
	Wendell	--	--	0	0.0
	Health Area Total/Rate	**2**	**7.1**	**2**	**7.1**
He	Ashburnham	0	0.0	0	0.0

[41] https://www.cdc.gov/nchs/fastats/homicide.htm

	Gardner	2	9.7	0	0.0
	Hubbardston	--	--	1	21.2
	Templeton	0	0.0	0	0.0
	Westminster	0	0.0	0	0.0
	Winchendon	0	0.0	0	0.0
	Health Area Total/Rate	**2**	**3.4**	**1**	**1.7**
	Service Area Total/Rate	**4**	**4.6**	**3**	**3.5**
	Massachusetts	**433**	**6.3**	**414**	**2.03**

Source: FBI Crime Data Explorer, Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data. 2014-2016 CDC WISQARS (crude rates). "--" = Not available

2. Assaults

Table IV-4 below presents the number of assaults in the Service Area communities and the State for 2019. Data for the smaller communities was unavailable on the FBI's website and were listed "--".

Athol (3.2), Orange (2.2), Gardner (2.4), Westminster (2.4), and Winchendon's (2.6) assault rates are higher than the Service Area's average rate of 1.9, and the State's assault rate of 1.7 per 1,000 residents. There were 54 assaults in Athol Hospital's Service Area in 2019 combined between Athol (37) and Orange (17); the only two (2) communities in which there were assaults out the communities for which data was available. There were 113 assaults in Heywood Hospital's Service Area in 2019 with 49 in Gardner and 28 in Winchendon alone. Hubbardston was the only community for which assault data was unavailable.

IV - 4 Assaults and Assault Rates in the Service Area 2019

	Community	2019 Assaults	2019 Assault Rate per 1,000
Athol	Athol	37	3.2
	Erving	0	0.0
	New Salem	--	--
	Orange	17	2.2
	Petersham	--	--
	Phillipston	--	--
	Royalston	0	0.0
	Warwick	--	--
	Wendell	--	--
	Health Area Total/Rate	**54**	**1.9**
Heywood	Ashburnham	6	1.0
	Gardner	49	2.4
	Hubbardston	--	--
	Templeton	11	1.4
	Westminster	19	2.4
	Winchendon	28	2.6
	Health Area Total/Rate	**113**	**1.9**

Commented [GM1]: Numbers are so low please show trends past three years

Service Area Total/Rate	**167**	**1.9**
Massachusetts	11,785	1.7
Source: FBI Crime Data Explorer		

3. Child Maltreatment

The health outcomes of children are strongly linked to family structure, stability, and home environments. Various studies have found that growing up with unstable family structures can lead to difficulties in adequate cognitive, behavioral and physical health outcomes.[42] More importantly, children who experience multiple "transitions in family structure may face worse developmental outcomes than children raised in stable, two-parent families and perhaps even children raise in stable, single-parent families".[43] Children in abusive households where they are physically or emotionally mistreated by adults often develop significant behavioral, emotional and learning problems that have serious and wide-ranging implications for long term health outcomes.[44]

Impact of COVID-19/Pandemic - Domestic Violence and Child Abuse:

During the COVID-19 pandemic, victims were forced to isolate themselves with their abusers. Nationwide statistics show an increase in intimate partner abuse and child abuse and a decrease in traffic through helplines and domestic abuse shelters. One article describes access as the number one roadblock to getting help, with online reporting either not existent or not accessible for many people. In more rural areas, where public transportation is lacking, it is nearly impossible for victims without access to cars to seek help privately. In the case of child abuse, the isolation from other caring adults such as teachers, and day care providers reduces the detection of the signs of abuse. Recommendations include advertising domestic violence reporting locations or phone numbers and increasing broadband access in rural areas. To catch signs of child abuse without in person interaction, teachers could provide a virtual survey for students to fill out during class time.

> *"For families and children in the DCF system, every handoff is a is a potential gap [in helping the customers]."*
>
> *"In the state system for treating abused children, money is slow to produce solutions."*
>
> *"So, providing people what they need, is a way of keeping them safe, because their needs are being met. So, whether it's somebody who needs mental health help, or somebody who needs special education, help, or somebody who needs, you know, housing help, whatever the help, whatever that is, would help them to be safe"*
>
> *"As a community health worker, what I see is, with the great resources that we do have, I think that we need to market them more."*

[42] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3806110/
[43] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3171291/
[44] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3869039/

Heywood Health Handle with Care Program

Due to our region's heightened need around childhood trauma Heywood Healthcare and area partners launched *Handle with Care*. Handle with Care promotes partnerships between schools, first responders, healthcare and community organizations aimed at ensuring that children who are exposed to trauma in their home, school, or community receive appropriate interventions and support to help them achieve academically and grow personally Training provided around Trauma Informed Care and Adverse Childhood Experiences for schools, police, and early childcare providers better equipped the community to respond to trauma.

The Gardner Police Department and school department have piloted the Handle with Care program and developed a system to identify students impacted by a traumatic event and then communicate with schools to support the students affected by a traumatic event. In 2020, the Gardner PD made 80 referrals to the schools. Often, the referrals include families that have multiple children in a household. 80% of the referrals link with middle and high school aged children and 20% from elementary school/early ed. The majority of referrals stem from domestic violence and substance abuse calls. Others reflect traumatic events, including house fires or injury/hospital access for a child's primary care support. Most, if not all, families/children were assisted with access to timely behavioral health and social support services and lessening the stress on the family/child.

The Massachusetts Department of Children and Families (DCF) Offices in Greenfield and North Central Mass are tasked with handling child maltreatment cases for the Service Area to help families develop stable home environments or to find safer homes for children in abusive households. As of the first quarter of FY2020 (the most recent available data), there were 3,279 children in caseload between both DCF offices with 2,195 in North Central and 1,084 in Greenfield. It should be noted that during this same quarter in 2018, the two offices had 3,755 total cases for children under 18 years old. 2020 saw a 12.7% decrease. Due to the COVID-19 pandemic, many mandatory reporting organizations like schools and hospitals saw fewer children, therefore reported few cases of maltreatment.

Of those children in caseloads, only 724 (22%) were in placement with an average of 79 clinical cases opening each month, and 114 clinical cases closing each month between July 2020 and September 2020. The large caseloads are extremely difficult to manage which has left many children stuck in unstable, unsafe, and unhealthy environments for long periods of time, significantly increasing the chances of poor health outcomes for them over time.

IV - 5 DCF Caseload at Greenfield and North Central offices FY20 Quarter 1

Caseload	Greenfield		North Central	
	FY 2018 Q1	FY 2020 Q1	FY 2018 Q1	FY 2020 Q1
Ave Clinical Cases Opened per Month	33	31	65	48
Ave Clinical Cases Closed per Month	42	47	74	67
Children <18 Pending Response	98	87	145	135
Children <18 in Caseload	1,293	1,084	2,462	2,195
Children <18 Pending Placement	348	252	577	472
% Of Child Caseload in Placement	27	23	23	22

Clinical Cases	703	590	1,233	1,074
Adoption Cases	87	96	156	129
Clinical Cases w/Child <18 in Placement	153	94	226	166
% Clinical Cases that are Placement Cases	22	16	18	15
Adoptions Legalized	6	13	10	4
Guardianships Legalized	2	5	5	11
Source: Mass Department of Children and Families Quarterly Profile, FY 18 Q1 and FY 20 Q1				

To understand disparities in the need for DCF services, it is important to highlight the racial/ethnic makeup of those children and adults using DCF services. Hispanic/Latino and Black families are significantly overrepresented in the DCF community when compared to their white counterparts and are far more likely to need family service assistance. This has notable implications for the health outcomes of non-white children moving forward and is an important challenge to address if the Service Area is to achieve true health equity over time.

> *"Hiring people [social workers] who look like your community is extremely important. And also partnering with other agencies that serve all people or even just a certain segment so that you can have that representation."*

IV - 6 Race & Ethnicity of DCF Consumers (Adults and Children) at Greenfield and North Central Offices 2020

Race	Greenfield	North Central	Total
White	1,410	2432	**3,842**
Hispanic/Latino	415	1511	**1,926**
Black	117	249	**366**
Asian	36	26	**62**
Native Americans	5	4	**9**
Pacific Islander	0	3	**3**
Multi-Racial	108	182	**290**
Unknown	131	179	**310**
Missing	50	75	**125**
Total	**2,272**	**4,661**	**6,933**
Source: Mass Department of Child and Families Quarterly Profile FY 2020 Q1			

Of those 823 children in placement mentioned previously, 143 were zero (0) to two (2) years old, 140 were three (3) to five (5) years old, 208 were six (6) to 11 years old, and 233 were 12 to 17 years old, as seen in Table IV-7. At the DCF Greenfield office, the older the age group, the more children there were in placement. At the DCF North Central office, the number of children in the three (3) to five (5) age group (89) was lower than those in the zero (0) to two (2) age group (92) and the number of children in the six (6) to 11 age group (142) and 12 to 17 age group (149) were virtually the same.

IV - 7 Total Children in Placement at Greenfield and North Central DCF Offices by Age FY20 Quarter 1

Age Group	Greenfield	North Central	Total
0-2 Years	51	92	**143**
3-5 Years	51	89	**140**
6-11 Years	66	142	**208**
12-17 Years	84	149	**233**
Total	**252**	**472**	**724**
Source: Mass Department of Child and Families Quarterly Profile FY 2020 Q1			

Of the 823 children in placement between the Greenfield and North Central offices, 686 are in placement for protective services, meaning 83% of children in placement came from homes where DCF investigations were able to substantiate abuse or neglect was occurring in the home. A step below protective services is alternative response where the services made available to homes were adjusted based on the needs of the family (investigations for these cases were unable to fully substantiate neglect or abuse allowing the agency to be flexible with their response to the case).[45] The remaining 17% of cases were voluntary request (11), CFA referral (9), court referral (12) or other (6) as seen in Table IV-8.

IV - 8 Children in Placement at Greenfield and North Central DCF Offices by Case Type FY20 Quarter 1

Most Recent Intake	Greenfield	North Central	Total
Protective	238	448	**686**
Alternative Response	0	0	**0**
Voluntary Request	3	8	**11**
CFA Referral (Children Requiring Assistance)	4	5	**9**
Court Referral	6	6	**12**
Other/Unspecified	1	5	**6**
Total	**252**	**472**	**724**
Source: Mass Department of Child and Families Quarterly Profile FY 2020 Q1			

Of those children in placement, almost a quarter (22%) in the Greenfield and North Central offices stay in placement for half of one (0.5) year or less (160). The greatest number of children (174) are in placement from one (1) to two (2) years. However, more than half (59%) of children coming through these two (2) DCF offices are in placement from anywhere between one (1) and four (4) or more years (424) as can be seen in Table IV-9.

IV - 9 Average Time in Placement for Children at Greenfield and North Central DCF Offices FY20 Quarter 1

Time in Placement	Greenfield	North Central	Total
.5 years or less	50	110	**160**
>.5 years to 1 year	35	105	**140**
>1 year to 2 years	68	106	**174**
>2 years to 4 years	69	88	**157**
>4 years	30	63	**93**
Total	**252**	**472**	**724**
Source: Mass Department of Child and Families Quarterly Profile FY 2020 Q1			

[45] https://www.childwelfare.gov/topics/systemwide/assessment/approaches/alternative/

As of the first quarter of FY2020, there were 2,554 children not in placement from the Greenfield (832) and North Central (1,722) offices which is nearly four times the number of those children in placement. The greatest number of children awaiting placement, accounting for over one-third (1/3) of children not in placement, were those age six (6) to 11 (862). Those aged zero (0) to five (5) accounted for a little more than a third of children not in placement for a total of 971 children as seen in Table IV-10.

IV - 10 Total Children Not in Placement at Greenfield and North Central DCF Offices by Age FY20 Quarter 1

Age Group	Greenfield	North Central	Total
0-2 Years	173	345	**518**
3-5 Years	142	311	**453**
6-11 Years	282	580	**862**
12-17 Years	235	486	**721**
Total	**832**	**1722**	**2554**
Source: Mass Department of Child and Families Quarterly Profile FY 2020 Q1			

For those children not in placement, the vast majority of children at 97% (2,486) are those in the protective category where they are under investigation or awaiting investigation of abuse or neglect. Only 0.2% (7) of children are also awaiting alternative response services as seen below in Table IV-11.

IV - 11 Children Not in Placement at Greenfield and North Central DCF Offices by Case Type FY20 Quarter 1

Most Recent Intake	Greenfield	North Central	Total
Protective	797	1689	**2486**
Alternative Response	3	4	**7**
Voluntary Request	3	13	**16**
CFA Referral (Children Requiring Assistance)	17	1	**18**
Court Referral	11	16	**27**
Other/Unspecified	1	0	**1**
Total	**832**	**1723**	**2555**
Source: Mass Department of Child and Families Quarterly Profile FY 2020 Q1			

4. Elder Mistreatment and Abuse

Elder mistreatment can be defined as "any knowing, intentional, or negligent act by a caregiver or any other person that causes harm or a serious risk of harm to an older adult". The ACL Elder Justice Act further defines the types of elder maltreatment:[46]

- "abuse" is the knowing infliction of physical or psychological harm or the knowing deprivation of goods or services that are necessary to meet essential needs or to avoid physical or psychological harm.
- "exploitation" the fraudulent or otherwise illegal, unauthorized, or improper act or process of an individual, including a caregiver or fiduciary, that uses the resources of an elder for monetary or personal benefit, profit, or gain, or that results in depriving an elder of rightful access to, or use of, benefits, resources, belongings, or assets.

[46] NCEA. Frequently Asked Questions. National Center on Elder Abuse Administration for Community Living. Accessed July 20, 2019. https://ncea.acl.gov/FAQ.aspx

- "neglect" is the failure of a caregiver or fiduciary to provide the goods or services that are necessary to maintain the health or safety of an elder; or self-neglect due to physical or mental impairment or diminished capacity to perform essential self-care tasks
- "serious bodily injury" is an injury involving extreme physical pain; substantial risk of death; protracted loss or impairment of the function of a bodily member, organ, or mental faculty; or requiring medical intervention such as surgery, hospitalization, or physical rehabilitation.
- "sexual abuse" Bodily injury shall be considered to have occurred if the conduct causing the injury is conduct relating to sexual abuse or any similar offense under State law.

Elder mistreatment is prevalent in the United States and has devastating consequences for older adults, families, health systems, and communities. Elder mistreatment is associated with increased rates of depression,[47] dementia, and mortality[48]. Older adults who are mistreated visit the emergency room more often,[49] experience higher rates of skilled nursing facility admissions,[50] and higher rates of 30-day hospital readmission. Elder mistreatment is estimated to cost over five billion dollars per year in health care expenditures.[51] Despite the prevalence urgency of the problem, elder mistreatment is largely unrecognized, and fewer than 5% of cases are reported to authorities.[527]

Table IV-12 Represents the number and types of cases involved in the LifePath Protective Services program. LifePath's Protective Services Program handles reports in Franklin County or the North Quabbin area. The agency determines if an investigation is warranted, investigates the situation, and determines the best course of action to alleviate the risk.

Table IV-12 July 2020 - June 2021 LifePath Protective Services Cases

	Male	%	Female	%	Total	Total %
Elder Abuse	30	13%	70	20%	100	17
Exploitation	35	15%	35	10%	70	12
Neglect	42	18%	63	18%	105	18
Bodily Injury	21	9%	39	11%	60	10.2
Sexual	1	0.5%	4	1%	5	0.8
Self-Neglect	104	44.5%	141	40%	245	42
Totals	**233**	**100%**	**352**	**100%**	**585**	**100**

In response to growing concerns for older adults in the community and increased isolation due to limited access to transportation, lack of behavioral health resources, and high suicide rates, Heywood Hospital

[47] Dyer CB, Pavlik VN, Murphy KP, Hyman DJ. The high prevalence of depression and dementia in elder abuse or neglect. Journal of the American Geriatrics Society. 2000 Feb 2000;48(2):205-8.
[48] Mark s. Lachs CSW, Shelley O'Brien, Karl A. Pillemer, Mary E. Charlson. The Mortality of Elder Mistreatment. JAMA. 1998;280(5):428-432.
[49] Dong X, Simon MA. Association between elder abuse and use of ED: findings from the Chicago Health and Aging Project. Am J Emerg Med. Apr 2013;31(4):693-8. doi:10.1016/j.ajem.2012.12.028
[50] Dong X, Simon MA. Elder Self- Neglect Is Associated with an Increased Rate of 30-Day Hospital Readmission: Findings from the Chicago Health and Aging Project. Gerontology. 2015;61(1):41-50. doi:10.1159/000360698
[51] Mouton CP, Rodabough RJ, Rovi SL, et al. Prevalence and 3-year incidence of abuse among postmenopausal women. Am J Public Health. Apr 2004;94(4):605-12.
[52] Lachs M, Berman J. Under the Radar:
New York State Elder Abuse Prevalence Study; SELF-REPORTED PREVALENCE AND DOCUMENTED CASE SURVEYS FINAL REPORT. 2011.

joined the National Collaboratory to Address Elder Mistreatment (The Collaboratory). The Collaboratory includes leading experts in elder mistreatment: the Massachusetts Executive Office of Elder Affairs, UMASS Medical School, USC Keck School of Medicine, UTHealth, and Weill Cornell Medical College. Education Development Center is the project leader, with funding support from The John A. Hartford Foundation, the Gordon and Betty Moore Foundation, and The Health Foundation for Western and Central New York. Together they developed and in 2020 tested a care model for identifying elder mistreatment in health care settings (EM-SART), beginning within the hospital emergency department.

The implementation of EM-SART began at the same time as the COVID-19 outbreak. The COVID cases had begun to inundate the ED, and the number of older adults presenting in the ED declined as their fears of infection with the coronavirus grew. Despite this, according to Table IV-13, the ED screened 4,588 (84%) of all older ED patients over nine months using the EM-SART brief screen. Of those, 53 received the triggered screen, and 19 were determined positive for possible mistreatment. Of these 19 patients, 11 were reported to Adult Protective Services, a more than 7-fold (annualized) increase over the prior year. Heywood's social services team handled most of the remaining positive screens to connect the older adult to support in the community.

IV-13 Heywood EM-SART Results 2/12/20-10/31/20

Heywood EM-SART Results	Number
Total patients age 60+	5,456
Total brief screens	4,588
Positive brief screens	53
Positive brief screens resulting in service referrals	24
Positive triggered screens	19
Positive triggered screens resulting in APS report	11

5. Interpersonal Violence

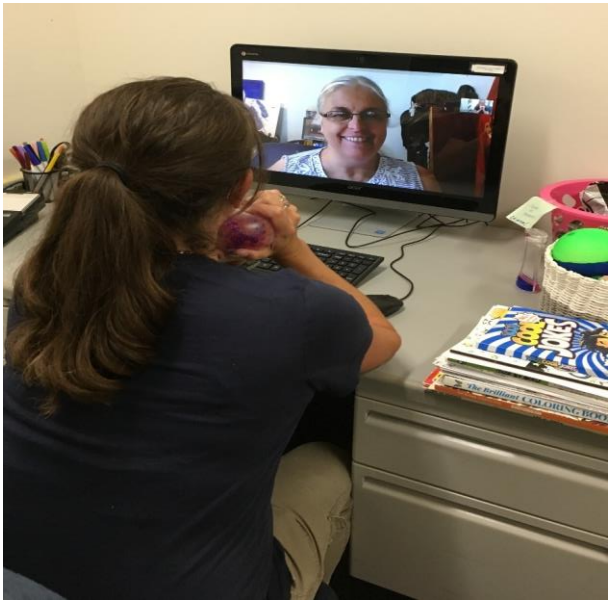
Table IV-14 below shows that restraining orders for interpersonal violence (formerly known as Domestic Violence or Intimate Partner Violence) have fluctuated significantly over the past 13 years. For example, in Gardner District Court, restraining orders decreased by 12%, which is significantly different from the overall State increase of 24%. Winchendon (17%) and Orange (6%) District Courts have had substantially lower increases in the number of filings than the state, but still increases. There was a significant uptick in filings during the period of the Great Recession between FY08 and FY11, indicating economic pressures and situations affecting domestic relationships. FY20 saw a noticeable decrease in the number of filings, most likely driven by limited access to the courts during the COVID-19 pandemic.

> *"This year with COVID right now, it's very, very minimal individuals seeking protective orders. I do more in safety planning or referring to other agencies with digital support, but it isn't a population that is served right now."*

IV - 14 Restraining Orders Filed in the Service Area District Courts FY08-FY20

District Court	ABUSE PREVENTION FILED		*RESTRAINING ORDERS FILED			
	FY08	FY11	FY14	FY17	FY20	Percent Change FY08-FY20
Gardner DC	224	368	321	301	198	-12%
Orange DC	178	283	293	289	189	6%
Winchendon DC	153	230	239	192	179	17%
Massachusetts	27,076	38,865	36,809	36,985	33,509	24%

*Abuse Prevention was renamed Restraining Order by FY2010
Source: Massachusetts Probate and Family Court Department Website



BEHAVIORAL HEALTH & SUBSTANCE MISUSE

Chapter 7

Abstract

This chapter provides a comprehensive overview of behavioral health and substance misuse in Heywood's 15 communities

Chapter 7 - Behavioral Health & Substance Misuse

This chapter provides a comprehensive overview of behavioral health and substance misuse in Heywood Healthcare – Athol Hospital and Heywood Hospital's 15 communities.

This chapter highlights the following behavioral health and addiction topics that affect the health of Service Area residents:

- Mental Health
- Alcohol/Substance Misuse
- Tobacco/Vape Use

Chapter Highlights

- The communities of Athol, Orange, Gardner, and Winchendon consistently rank amongst those facing the greatest challenges regarding all the issues enumerated below, demonstrating the interconnected nature of these issues.
- It also suggests that focus and resources should be directed towards these four communities in particular.

Mental Health

- In 2020, the 25-34 age group exceeded all other age groups for mental health Emergency department (ED) discharge diagnoses.
- The high rates among 8th grade students self-reporting mental health issues demonstrates the importance of early intervention by schools, communities, and health professionals.

Alcohol/Substance Misuse

- In 2020, the 25-34 age group discharged from the hospital's ED experienced the highest percentage of mental health diagnoses and substance misuse diagnoses.

Opioid-Related Fatal Overdose

- The Service Area experienced a peak in total opioid deaths in 2018 followed by a decline in 2019, though 2019 still saw more deaths compared to each of 2015, 2016, or 2017.

Tobacco/Vape Use

- The Service Area 2014-2018 average smoking rate was 19.5%, versus 13.7% for Massachusetts.
- The communities with the highest smoking rates have taken steps to limit the immediate availability of tobacco, though such policies and bylaws appear to have only been passed reactively, as most communities with low rates have yet to enact such policies.
- In the 2016/2017 school year, 20.1% of Massachusetts students (58,901) who used e-cigarettes, or "vaped".
- The largest category of the vape users were white students (23.2%).

Note: Data from the ED was during COVID and not reflective of normal ED population. Hospital will look to compare with other years and make updates to the CHNA.

Mental Health

In the United States in 2019, serious mental illness was more prevalent among women as well as among people aged 18-25, as compared with 26-49 and 50+. In order, the groups that presented with the highest rates of serious mental illness were multiracial individuals, followed by American Indian/Alaska Native, White, Hispanic/Latino, Black, Asian, and Native Hawaiian or Other Pacific Islander patients.[53]

1. Mental Health ED Discharges

According to the US Substance Abuse and Mental Health Services Administration,

> *"Behavioral health is a state of mental/emotional being and/or choices and actions that affect wellness. Substance abuse and misuse are one set of behavioral health problems. Others include (but are not limited to) serious psychological distress, suicide, and mental illness. Such problems are far-reaching and exact an enormous toll on individuals, their families and communities, and the broader society."*

This section highlights data critical to understanding the mental health status of Service Area residents overall.

Athol and Heywood Hospitals each collect data regarding Emergency Department (ED) visitors on an annual basis. Table BHA-1 shows that for either hospital, roughly 23% of ED discharges included mental health diagnoses on their records in 2020. Moreover, in both hospitals, the 25-34 age group led all others in the number of such diagnoses. Both hospitals experienced a significant decline (approximately -50%) from 2017 to 2020 in ED discharges with mental health diagnoses on their record. This is a surprising number based on other mental health-related statistics during the pandemic; this significant decrease could be due to reduced patient visits and mostly COVID related admissions in 2020 during the pandemic.

[53] https://www.nimh.nih.gov/health/statistics/mental-illness#:~:text=males%20(3.9%25).-,Young%20adults%20aged%2018%2D25%20years%20had%20the%20highest%20prevalence,50%20and%20older%20(2.9%25)

BHA - 1 ED Discharges with Mental Health Diagnoses at Hospitals by Age Group 2020

	Heywood					Athol				
AGE	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH MENTAL HEALTH**	**% MENTAL HEALTH 2020**	**% MENTAL HEALTH 2017**	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH MENTAL HEALTH**	**% MENTAL HEALTH 2020**	**% MENTAL HEALTH 2017**
85+	611	3.4%	91	14.9%	33.2%	385	4.1%	54	14.0%	29.3%
75-84	1,110	6.2%	148	13.3%	26.5%	644	6.9%	79	12.3%	21.1%
65-74	1,713	9.5%	295	17.2%	25.2%	1,251	13.5%	234	18.7%	26.5%
55-64	2,566	14.2%	558	21.7%	36.6%	1,387	14.9%	381	27.5%	39.4%
45-54	2,287	12.7%	649	28.4%	47.6%	1,141	12.3%	326	28.6%	57.6%
35-44	2,450	13.6%	749	30.6%	64.8%	1,286	13.9%	399	31.0%	74.6%
25-34	2,922	16.2%	896	30.7%	79.8%	1,309	14.1%	409	31.2%	86.1%
15-24	2,319	12.9%	619	26.7%	77.0%	952	10.3%	240	25.2%	82.0%
5-14	1,126	6.2%	135	12.0%	54.8%	554	6.0%	37	6.7%	62.1%
<5	918	5.1%	8	0.9%	59.6%	375	4.0%	8	2.1%	28.6%
TOTAL	**18,022**	**100%**	**4,148**	**23.0%**	**46.0%**	**9,284**	**100%**	**2,167**	**23.3%**	**50.7%**
Source: Athol and Heywood Hospital's ED Discharge Data 2020 and 2017										

BHA- Map 1 highlights Percentage of 2020 Mental Health Emergency Department Discharges by Zip Code at both Heywood and Athol Hospital in 2020. The map shows concentrations for ED discharge diagnoses near population centers, Athol, and Gardner. Communities immediately adjacent to both centers also experienced higher mental health diagnoses.

BHA – Map 1 Percentage of ED Discharges with Mental Health Diagnoses at Hospitals

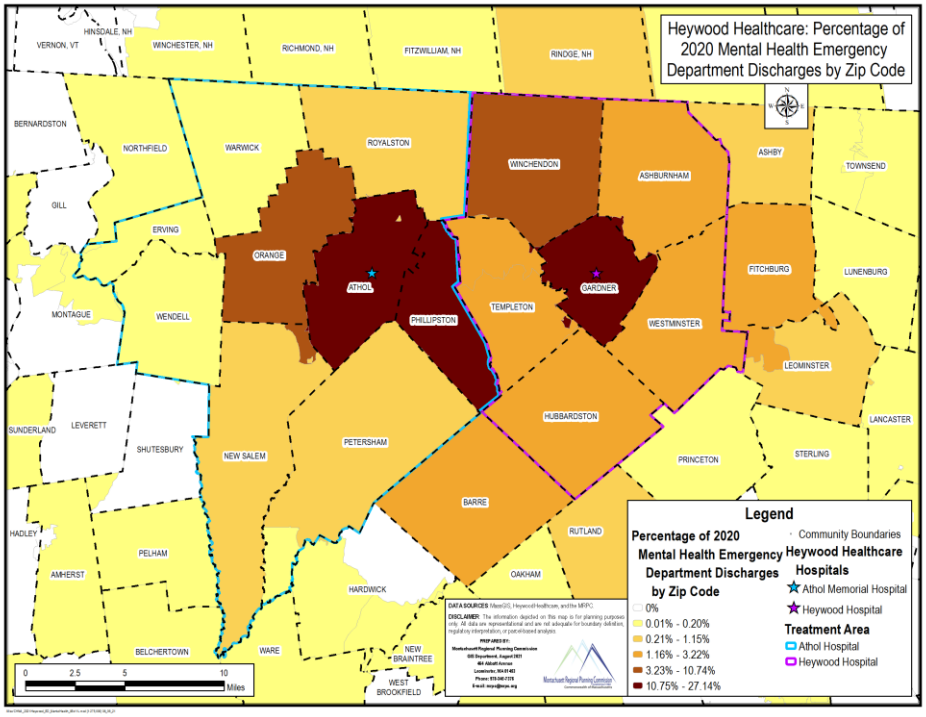


Table BHA-2 shows self-reported mental health responses for grades 8, 10, and 12 from 2021 Franklin County/North Quabbin Youth Risk Behavior Survey (YRBS). The high-risk behavior rates among 8th grade students are particularly troubling and demonstrates the importance of early intervention by schools, communities, and health professionals. Unfortunately, resource limitations often constrain the ability of these institutions to screen for such issues and address them in a timely manner.

> *"We have one school adjustment counselor for 600 kids, which is ridiculous. Especially in a pandemic year."*

BHA - 2 Self-Reported Mental Health Responses from 2021 Franklin County/North Quabbin YRBS

	Grade Level			Income		Gender		Race		Sexual Orientation	
Mental Health	**8th Grade**	**10th Grade**	**12th Grade**	**Low Income**	**High Income**	**Female**	**Male**	**Students of Color**	**White Students**	**LGBTQ**	**Hetero-sexual**
Felt anxious for 2 weeks (past 12 months)	38%	44%	47%	46%	42%	56%	26%	48%	43%	68%	33%
Felt sad or hopeless for 2 weeks (past 12 months)	39%	42%	44%	44%	41%	51%	28%	42%	42%	66%	33%
Seriously considered suicide (past 12 months)	14%	20%	15%	20%	15%	20%	10%	20%	16%	33%	10%
Sources: 2019 Franklin County/North Quabbin YRBS 2021 YRBS											

As can be seen above, certain student demographics represent a greater share of mental health respondents than others. Of particular concern are LGBTQ students, who constituted an outright majority of those who reported feeling anxious, feeling sad or hopeless, or seriously considering suicide; double to tripling the share of heterosexual students in each category. Students who identified as female were also significantly more prevalent amongst respondents in all three categories than their male counterparts. Low-income students were more prevalent across all three fields than those from higher income families as well, though by much narrower margins.

Heywood Healthcare provides school-based tele-behavioral health services for high school students in the Athol, Mahar, Narragansett, and Gardner School Districts. Since the 2018-2019 school year, nearly 700 students have been referred to the program and 5,657 tele-behavioral health sessions have been completed. The most common reasons for the referrals are academic burdens and anxiety, depression, perfectionism, grief and loss, familial dynamics and sibling rivalries, sudden onset illnesses, environmental or social anxieties, LGBTQ stressors, post-secondary school direction & decision-making, and post-traumatic stress triggers.

Impact of COVID-19/Pandemic - Social Isolation:

Social isolation because of COVID-19 is a huge issue for people of all ages. According to a survey conducted by the University of Miami, 80% of participants aged 18-35 reported "significant depressive symptoms" during the pandemic. Along with the feeling of loneliness, participants reported an increase in drug and alcohol use with 38% citing it as "severe". This has been shown using statistics from the Insurance Information institute where the total fatality rate (per 100 million vehicle miles) increased from 1.1 in 2019 to 1.35 in 2020. It is well known that youth who suffer from social isolation and loneliness have an increased risk of developing anxiety and depression. The Center for Promise at America's Promise Alliance conducted a national survey of young people aged 13-19 and found that 30% reported feeling more unhappy or depressed. When breaking down the location of youth, city dwellers were 13% more

likely to have depressive symptoms than rural dwellers. Asian (44%) and Latinx (40%) youth reported a higher percentage of poor emotional and cognitive health than their white classmates.

Social Isolation within the elder population has also been a large concern during the pandemic. In June 2020, 56% of people over the age of 50 reported feeling isolated often. The same survey was conducted in 2018 where only 27% of people over 50 felt isolated. Social connections were difficult to maintain, with 46% of older adults reporting infrequent interactions with a friend compared to 28% in 2018. Older adults with access to technology reported less loneliness. Social isolation in older adults can have serious health consequences including a 50% increase in risk of dementia, 29% increased risk of heart disease, 32% increased risk of stroke, higher rates of anxiety, depression, suicide, and an increase in hospitalization. The serious mental and physical health risks of social isolation in the elder community make this population a priority.

> *"We [social workers] serve the limited English, they are very much isolated prior to COVID because of their lack of being able to understand and get the get to the resources that they need. A lot of that is sometimes fear, you know, insecurity. A lot of it is just basically being here by themselves without any connections. So that definitely is not just related to COVID but has definitely worsened because of it."*

> *"We need to be prepared for mental health of the population after the pandemic as well as during the pandemic."*

> *"Chronic stress, illness with the low-income populations that we're dealing with isolates people even more. So, it just creates more health, mental health issues and one perpetuates the other and it becomes a vicious cycle."*

Alcohol/Substance Misuse

According to the National Institute on Drug Abuse, substance use disorder is most prevalent among young adults (age 18 to 25). The rates of mental health disorders and substance use disorders seem to be higher in a slightly older population group (age 25-34) in the Service Area.[54]

According to the World Health Organization (WHO), "substance abuse refers to the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs". Substance abuse is often a side effect of mental health disorders and has wide ranging implications for the health status and health outcomes of people with living with mental health problems. This section highlights data around substance abuse, heretofore referred to as "Substance Misuse" or "Substance Use Disorder", in the Service Area. For this report's purposes, a focus is placed upon binge drinking, smoking, and opioid related fatalities.

> *"I think like law enforcement has done a lot of work around helping to break that stigma with folks that struggle with substance use disorder, because now there's, you know, they're not punishing, they're doing knock and talks, right, post overdose, a police officer will go to recovery coach to someone's home and say, how are you? Is there something that we can do to help you?"*

[54] https://archives.drugabuse.gov/trends-statistics/abuse-prescription-rx-drugs-affects-young-adults-most

"It's not a moral failing, this is a disease."

1. **Emergency Department (ED) Visitors with Alcohol/Substance Misuse Diagnoses**

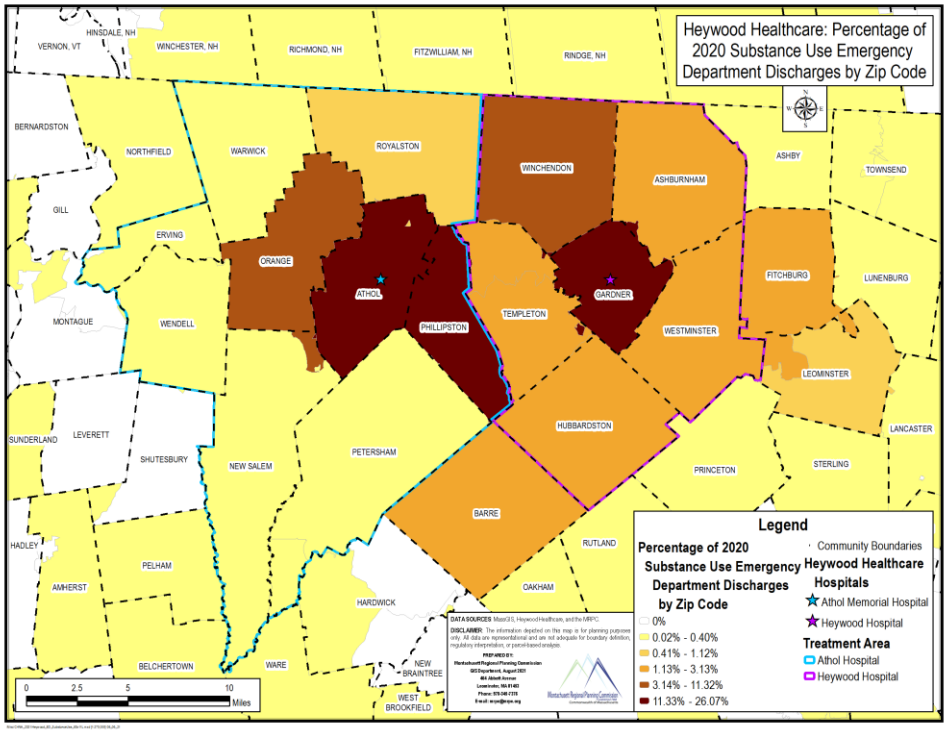
As seen in Table BHA-3, 15.2% of Heywood Hospital and 17.6% of Athol Hospital ED discharges involved alcohol or substance misuse diagnoses. These diagnoses were most prominent amongst discharges aged 35 to 44 years old at Heywood Hospital and 25 to 34 years old at Athol Hospital. Understandably, these same age groups were highly represented amongst ED discharges with mental health diagnoses as well.

BHA - 3 ED Discharges with Alcohol/Substance Misuse Diagnoses at Hospitals by Age Group 2020 & 2017

	Heywood					Athol				
AGE	# OF PATIENTS	% OF PATIENTS	# WITH SUBSTANCE MISUSE	SUBSTANCE MISUSE % 2020	SUBSTANCE MISUSE % 2017	# OF PATIENTS	% OF PATIENTS	# WITH SUBSTANCE MISUSE	SUBSTANCE MISUSE % 2020	SUBSTANCE MISUSE % 2017
85+	611	3.4%	7	1.1%	2.5%	385	4.1%	4	1.0%	2.6%
75-84	1,110	6.2%	61	5.5%	7.3%	644	6.9%	24	3.7%	7.8%
65-74	1,713	9.5%	190	11.1%	12.8%	1,251	13.5%	164	13.1%	17.2%
55-64	2,566	14.2%	411	16.0%	24.6%	1,387	14.9%	317	22.9%	30.8%
45-54	2,287	12.7%	491	21.5%	33.3%	1,141	12.3%	276	24.2%	47.8%
35-44	2,450	13.6%	574	23.4%	45.1%	1,286	13.9%	327	25.4%	63.0%
25-34	2,922	16.2%	666	22.8%	60.4%	1,309	14.1%	347	26.5%	75.9%
15-24	2,319	12.9%	336	14.5%	43.5%	952	10.3%	169	17.8%	50.4%
5-14	1,126	6.2%	4	0.4%	1.1%	554	6.0%	2	0.4%	0.8%
<5	918	5.1%	3	0.3%	0.0%	375	4.0%	0	0.0%	0.0%
TOTAL	**18,022**	**100%**	**2,743**	**15.2%**	**27.2%**	**9,284**	**100%**	**1,630**	**17.6%**	**35.5%**
Source: Athol and Heywood ED Discharge Data 2020										

BHA- Map 2 highlights the share of substance misuse related ED discharges from Heywood Healthcare in 2020 by zip code. While it demonstrates that substance misuse is evident throughout the region, the highest percentage of cases occurred in and around Athol and Gardner. This is unsurprising, as these represent the most populous areas of the region.

BHA – Map 2 ED Discharges with Alcohol/Substance Misuse Diagnoses at Hospitals 2020



1. Opioid-Related Fatal Overdose

The national rate of drug overdose deaths rose by over 4% between 2018 and 2019, in contrast to the Service Area, which saw a decline over the same time period. Drug overdose death rates were highest for American Indian/Alaska Native individuals (41.1% above national rate), followed by White (21.3% above national rate) and then Black individuals (14.8% above national rate).[55]

As mentioned previously in this chapter, prior substance misuse diagnoses of ED patients are prevalent throughout the Service Area. These include the unprescribed use of opioids, which has become an epidemic in Massachusetts and across the United States. In some instances, such misuses can result in fatal overdoses (ODs).

Mass DPH releases quarterly reports on opioid-related fatal ODs for each town throughout the Commonwealth. Table BHA-4 presents overdose totals for the Athol and Heywood Hospital Healthcare Areas (HAs) between 2015 and 2019. Overall, the OD rate per 100,000 residents for the entire Service Area increased from 24.29 to 31.24 in that time frame compared to a statewide shift from 25.27 to 29.05.

[55] https://www.cdc.gov/drugoverdose/deaths/index.html

This amounted to a total of 132 opioid related fatal ODs in the Service Area, with 40 ODs in the Athol Hospital HA and 92 in the Heywood Hospital HA. Such deaths peaked in 2018, with a decline in 2019, though the number of opioid related OD deaths in 2019 was still higher than in 2015, 2016, or 2017.

BHA - 4 Opioid-Related Fatal Overdoses in Service Area Communities 2015-2019

		Total Opioid-Related Fatal Overdoses								
	Community	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**	**% Change 2015 - 2019**	**OD Rate per 100,000 - 2015**	**OD Rate per 100,000 - 2019**
Athol	**Athol**	3	3	6	6	7	25	133%	25.61	59.76
	Erving	0	0	0	0	1	1	100%	0.00	57.47
	New Salem	1	0	0	0	0	1	-100%	99.11	0.00
	Orange	3	1	1	4	1	10	-67%	39.25	13.08
	Petersham	0	0	0	0	1	1	100%	0.00	84.18
	Phillipston	0	0	0	0	0	0	0%	0.00	0.00
	Royalston	0	1	0	0	0	1	0%	0.00	0.00
	Warwick	1	0	0	0	0	1	-100%	125.63	0.00
	Wendell	0	0	0	0	0	0	0%	0.00	0.00
	Health Area Total	**8**	**5**	**7**	**10**	**10**	**40**	**25%**	**28.47**	**35.58**
Heywood	**Ashburnham**	1	2	0	1	2	6	100%	15.92	31.84
	Gardner	6	9	8	12	6	41	0%	29.11	29.11
	Hubbardston	2	1	1	2	1	7	-50%	42.48	21.24
	Templeton	2	5	2	4	1	14	-50%	24.60	12.30
	Westminster	0	0	2	4	2	8	200%	0.00	25.75
	Winchendon	2	1	3	5	5	16	150%	18.45	46.12
	Health Area Total	**13**	**18**	**16**	**28**	**17**	**92**	**31%**	**22.28**	**29.14**
	Service Area Total	**21**	**23**	**23**	**38**	**27**	**132**	**29%**	**24.29**	**31.24**
	Massachusetts	1735	2097	1999	2005	2002	9838	15%	25.17	29.05

Source: Mass DPH February 2021 Quarterly Report of Opioid-Related Fatal Overdose Deaths by City/Town - *OD Rates for 2015 and 2019 were calculated using ACS population estimates for 2019

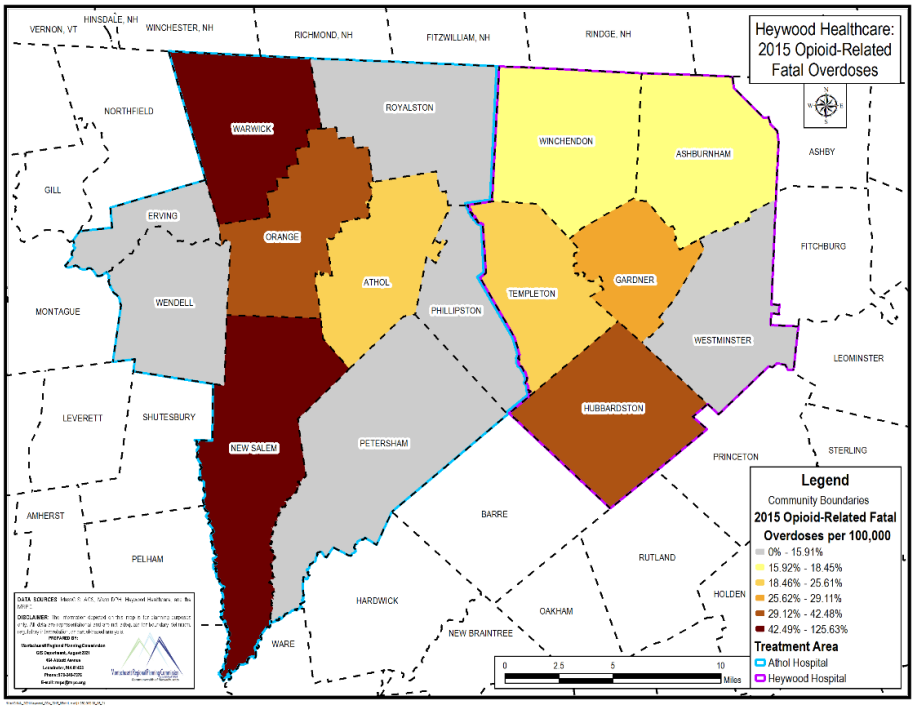
From the table above, communities within the Heywood Hospital HA suffered opioid related OD fatalities with greater regularity than those which constituted Athol Hospital's HA. Still, Athol Hospital's HA suffered more OD related fatalities per 100,000 residents than Heywood Hospital's, and only Phillipston and Wendell went the full five years without a single opioid related death reported.

Within Athol Hospital's HA, Orange and Athol face the greatest challenges. Due to the small size of the communities Athol Hospital serves and the fact that many went years without an OD fatality, percentile changes and fatality rates per 100,000 residents can result in a misleading illustration. However, both Orange and Athol lost residents to OD fatalities steadily throughout the five-year period and suffered OD fatality rates of more than 10 deaths per 100,000 residents in 2015 and 2019. This is sadly in line with their high rates of mental health and alcohol misuse ED discharges during that same five-year period.

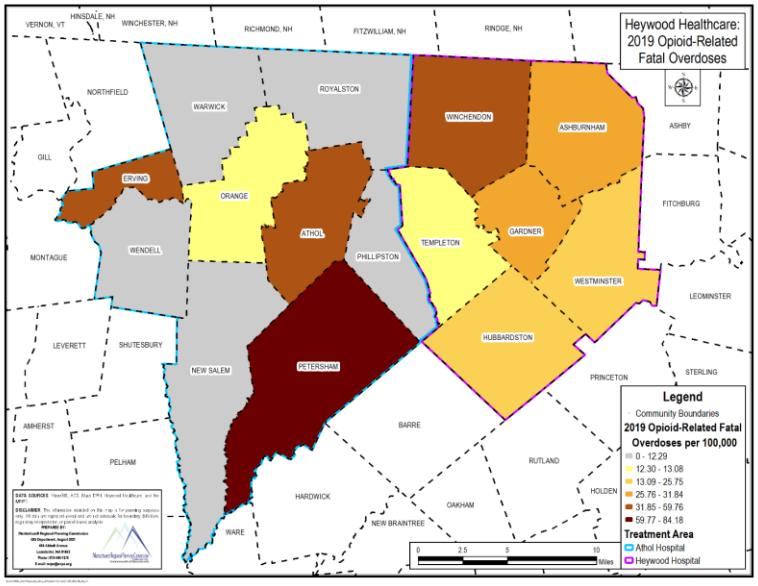
Gardner saw the highest number of OD fatalities within the SA or Heywood Hospital's HA by far- though it did not produce the highest fatality rate per 100,000 persons for either year. Instead, Hubbardston suffered the HA's highest OD related fatality rate in 2015 while Winchendon led in 2019. Regarding Gardner and Winchendon, these heightened fatality rates can once again be coupled with heightened ED discharge rates for mental health and alcohol substance misuse.

BHA-Map 4 and BHA-Map 5 show 2015 and 2019 Heywood Healthcare Opioid Related Fatal Overdoses per 100,000 people. The darker the area the higher the overdose rate. The maps show where ODs increased (and decreased. Communities that jumped at least two shades include Winchendon, Westminster, Petersham, and Erving.

BHA – Map 4 Opioid-Related Fatal Overdoses in Service Area Communities 2015



BHA – Map 5 Opioid-Related Fatal Overdoses in Service Area Communities 2019



Tobacco & Vape Use

According to the CDC, 14% of U.S. adults regularly smoked cigarettes in 2019, lower than the Service Area average of 19.5% between 2014 and 2018. Smoking rates were highest among American Indian/Alaska Native individuals, followed by White, Black, Hispanic/Latino, and Asian individuals.[56]

The Mass Department of Public Health tracks smoking rates and retail tobacco regulations across Massachusetts communities. They maintain an interactive database that can be found at makesmokinghistory.org where users can select communities to compare tobacco related information across the State. The data includes community population, median incomes from the 2015-2019 ACS, and smoking rates drawn from Massachusetts' 2014-2018 *Behavioral Risk Factor Surveillance System* (BRFSS) data.

1. **Tobacco Use**

According to Table BHA-4 the total population of the Service Area in 2014-2018 was 86,438. The Service Area Average Median Income was $71,429.67. The Service Area Smoking Rate Average was 19.5% which was higher than the Massachusetts average of 13.7%. The Heywood Hospital boasts a much higher median income and a lower average smoking rate. However, it should be noted that information on

[56] https://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/index.htm

smoking rates is unavailable for a majority of the Athol Hospital communities. This is likely due to the size of its respective communities and ensuing data masking.
Poverty appears to be a factor in relation to smoking rates. Except for Winchendon, smoking rates remained below the Service Area average in communities whose median incomes were above that Service Area average. The inverse was also true for communities with median incomes below that level. This evidence suggests lower incomes correlate with increased smoking rates.

At the municipal level, the highest smoking rates existed in Athol, Orange, Gardner, and Winchendon- all communities that have been associated with heightened ED discharge rates for mental health diagnoses and alcohol misuse. All have also struggled steadily with opioid related OD fatalities. This once more posits that these challenges are likely correlated and that a particular focus should be placed on these four communities.

BHA - 5 Population, Median Income, and Smoking Rates in Service Area Communities 2011-2018

	Community	Total Population	Median Income*	Smoking Rates** 2014-2018	Smoking Rates** 2011-2015
Athol	Athol	11,713	$54,142	25.1%	24.4%
	Erving	1,740	$63,600	-	13.8%
	New Salem	1,009	$66,063	-	-
	Orange	7,644	$50,795	24.1%	24.1%
	Petersham	1,188	$71,484	14.6%	14.6%
	Phillipston	1,784	$80,208	-	17.4%
	Royalston	1,366	$76,974	-	-
	Warwick	796	$59,167	-	17.3%
	Wendell	862	$53,875	-	17.1%
	Health Area Total/Average	**28,102**	**$64,034**	**21.3%**	**18.4%**
Heywood	Ashburnham	6,281	$95,625	12.9%	12.4%
	Gardner	20,610	$49,679	24.3%	24.2%
	Hubbardston	4,708	$91,734	14.8%	14.0%
	Templeton	8,130	$77,031	17.7%	17.8%
	Westminster	7,766	$100,972	16.4%	16.1%
	Winchendon	10,841	$80,096	25.4%	23.7%
	Health Area Total/Average	**58,336**	**$82,523**	**18.6%**	**18.0%**
	Service Area Total/Average	**86,438**	**$71,429.67**	**19.5%**	**18.2%**
	Massachusetts	6,547,629	$85,843	13.7%	15.5%

Source: Mass DPH 2014-2018 Adult Smoking Rates - Make Smoking History * Median Income and Population from 2015-2019 ACS **Smoking Rates calculated using Small Area Estimates from the 2011-2015 & 2014-2018 Mass BRFSS

BHA- Map 3 illustrates adult smoking rates for Heywood Healthcare communities from 2014 to 2018. The communities for which the rate could not be calculated were shaded grey. The darker color the higher the adult smoking rate is. Athol and Winchendon had the highest rates (24.30% to 25.40%)- both overall and in their respective HAs.

BHA – Map 3 Smoking Rates in Service Area Communities 2014-2018

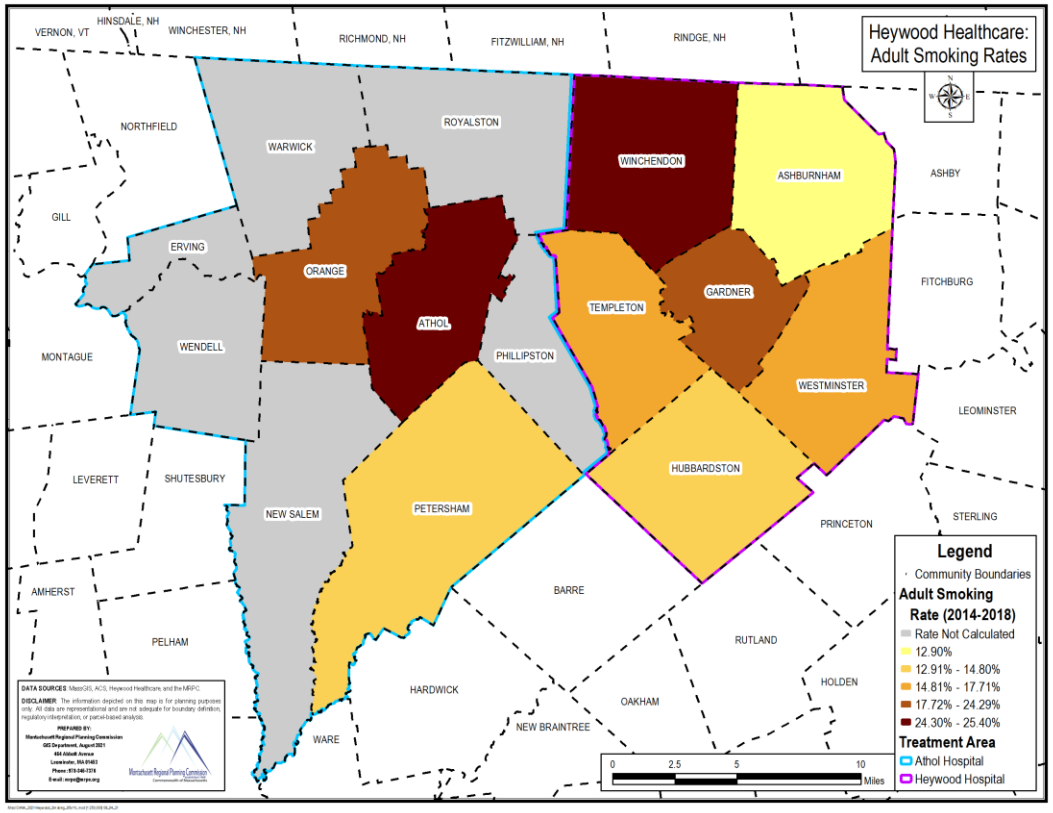


Table BHA-6 is a checklist of all retail tobacco policies implemented by Service Area communities according to the Mass DPH Make Smoking History Program. As seen below, the four (4) communities with the highest smoking rates have all implemented retail restrictions. Moreover, all but Gardner are counted amongst those with the most stringent retail tobacco sale policies, while some of the communities with the lowest smoking rates have absolutely no retail tobacco policies implemented at all. This suggests that many of these policies have been implemented in responsive manner, seeking to combat high smoking rates once recognized.

BHA - 6 Retail Tobacco Policies by Service Area Community

	Community	Ban of Tobacco Sale in Pharmacies	Cap on # of Retail Licenses	Minimum Legal Sale Age of 21	Restriction on Packaging of Cheap Cigars	Restriction on Sale of Flavored Products	No Retail Tobacco Policies
Athol	Athol	Y	Y	Y	Y	Y	N
	Erving	N	N	N	N	N	Y
	New Salem	N	N	N	N	N	Y
	Orange	Y	Y	Y	Y	Y	N
	Petersham	N	N	N	N	N	Y
	Phillipston	N	N	N	N	N	Y
	Royalston	N	N	N	N	N	Y
	Warwick	N	N	N	N	N	Y
	Wendell	N	Y	N	Y	N	N
Heywood	Ashburnham	Y	Y	Y	Y	Y	N
	Gardner	Y	N	N	Y	Y	N
	Hubbardston	Y	Y	Y	Y	N	N
	Templeton	Y	Y	Y	Y	Y	N
	Westminster	N	Y	N	Y	Y	N
	Winchendon	Y	Y	Y	Y	Y	N
	Source: Mass DPH Make Smoking History - Local Tobacco Regulations in Massachusetts						

One inhibition on a community's ability to limit tobacco use is the presence of tobacco retailers in those communities. Table BHA-7 shows that, across the Service Area, the four communities with the highest smoking rates also boasted the highest number of tobacco purveyors. These four communities include Athol and Orange in the Athol Hospital HA and Gardner and Winchendon from the Heywood Hospital HA. Interestingly, these did not always translate into the communities with the highest ratio of purveyors per 1,000 residents.

It should be noted that while the number of tobacco retailers within the Service Area has declined, that decline was produced entirely in the Athol Hospital HA. In what may be seen as an encouraging trend- these closures were further concentrated in two of the communities just mentioned, Orange and Athol. Three retailers shuttered in the former while a fourth closed in the latter. This may be due to the increased restrictions detailed in BHA- 6 but might also suggest that demand for tobacco products in those communities has peaked or even contracted.

BHA - 7 Number and Rate of Tobacco Retail Stores in Service Area Communities 2020

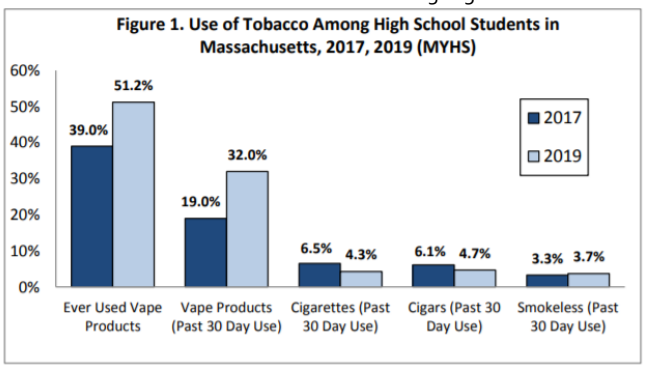
	Community	2017		2020	
		Count	Rate per 1,000	Count	Rate per 1,000
Athol	Athol	15	1.3	14	1.2
	Erving	2	1.7	2	1.1
	New Salem	1	0.0	1	1.0
	Orange	12	2.0	9	1.2
	Petersham	1	0.0	1	0.8
	Phillipston	2	1.5	2	1.1
	Royalston	1	0.0	1	0.7
	Warwick	1	0.0	1	1.3
	Wendell	1	0.0	1	1.2
	Health Area Total/Rate	**36**	**1.3**	**32**	**1.1**
Heywood	Ashburnham	6	1.3	6	1.0
	Gardner	23	1.4	24	1.2
	Hubbardston	2	0.6	2	0.4
	Templeton	6	1.0	6	0.7
	Westminster	8	1.4	7	0.9
	Winchendon	9	1.2	9	0.8
	Health Area Total/Rate	**54**	**0.9**	**54**	**0.9**
	Service Area Total/Rate	**90**	**1.04**	**86**	**1.0**

Source: Make Smoking History, Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data.

2. E-Cigarette (Vape) Use

Table BHA-8 shows that vaping use increased from 2017 to 2019 but that cigarette use decreased. High school student vaping in 2017 was 19% in the last 30 days, while in 2019 it increased to 32%. Meanwhile, cigarette use in the last 30 days went from 6.5% among high school students in 2017 down to 4.3% in 2019. The rise of vaping must be tracked and integrated with early prevention programs.

BHA – 8 Electronic Nicotine Product Use Among High School Students 2019



Source: MA DPH 2019

3. Cessation Program

Mass DPH developed the Quit Works program as part of its Make Smoking History initiative to help clinicians refer their patients to the Massachusetts Smokers' Helpline. Quit Works is "a free, evidence-based stop-smoking service developed by the Massachusetts Department of Public Health in collaboration with all major health plans in Massachusetts".[57]

Table BHA-9 displays the number of smokers enrolled in the Quit Works stop smoking program in the Heywood Healthcare Service Area. The Service Area saw a total of 393 enrollees, while the Athol Hospital HA saw 161 participants and the Heywood Hospital HA saw 232 participants. The highest participation rates were in Orange, Templeton, Athol, and Royalston.

BHA - 9 Number of Smokers in Service Area Enrolled in Quit Works 2018-2020

	Community	2015-2018	
		Count	Rate/100,000
Athol	Athol	74	632
	Erving	5	287
	New Salem	5	496
	Orange	60	785
	Petersham	2	168
	Phillipston	4	224
	Royalston	7	512
	Warwick	2	251
	Wendell	2	232
	Health Area Total/Rate	**161**	**573**
Heywood	Ashburnham	11	175
	Gardner	83	403
	Hubbardston	19	404
	Templeton	60	738
	Westminster	17	219
	Winchendon	42	387
	Health Area Total/Rate	**232**	**398**
	Service Area Total/Rate	**393**	**455**

Source: Make Smoking History 2015-2018. Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data.

[57] http://quitworks.makesmokinghistory.org/about/welcome-to-quitworks.html

NUTRITION, CHRONIC DISEASE, AND MORTALITY

Chapter 8

Abstract

This chapter provides a comprehensive overview of nutrition, physical activity, chronic disease, and mortality in Heywood's 15 communities.

Chapter 8 – Nutrition, Chronic Disease, and Mortality

This chapter provides a comprehensive overview of nutrition and chronic disease in Heywood's 15 communities, with analyses of related trends and disparities.

This chapter highlights the following topics that affect the health of Service Area residents:

- Nutrition and Physical Activity
- Chronic Disease
- Mortality

Chapter Highlights

Nutrition and Physical Activity

- In 2019, roughly a third of all residents of North Central Massachusetts are food insecure which is defined by the US Department of Agriculture (USDA) as "limited or uncertain access to adequate food" as indicated by income, unemployment rates, poverty levels, and education levels.
- The rate of food insecurity in North Central Massachusetts is significantly higher than the state-wide food insecurity rate – overall, 10.6% of Massachusetts residents are food insecure.
- Respondents to a survey identified their reasons for their inability to buy food. The foremost reasons are the need to pay the mortgage (37%) and the need to pay the utilities (33%). The price of the food itself only prevented 8% of respondents from buying food
- 39% of the respondents to the 2019 North Central Massachusetts Community Food Assessment stated they used other means of transportation than driving their own car: walking (16%), others drive them (15%), or public transportation (5%).
- Children not active for 60+ minutes in the past week: 8th grade (12%), 10th grade (14%), and 12th grade (18%).

Chronic Disease

- Throughout the Service Area, six (6) of the 15 communities have a higher prevalence of asthma among K-8 students when compared to the State (12.1%)
- For diabetes, the Service Area combined rate was 9.1 which was higher than the Massachusetts Rate of 8.6. Both rates were approximately 1.5% higher than 2014.
- The Athol Hospital Health Area total rate K-8 Asthma Prevalence -Male was 18.7%, Female was 12.6 % and total in 2016/17 was 12.5%. Note the much higher rate among boys.
- The Service Area experienced 54 cerebrovascular disease (CD) deaths for a rate of 62.5 per 100,000 residents. This rate far exceeds the state at 41.2.
- Heywood Hospital's ED discharged 2,829 (15.7% of ED patients) and Athol Hospital discharged 1,773 (19.1% of ED patients) with a hypertension diagnosis in 2020
- The overall cancer death rates for three communities (Ashburnham, Athol, and Winchendon) exceeded the state average.

- The top communities for Lung Cancer Death Rate included Athol, Winchendon, Ashburnham, and Gardner; important to note that Athol, Winchendon, and Gardner ranked highest in smoking rates.

Mortality

- Opioid deaths jumped from 10th in 2015 to 6th in2017
- Pre-mature mortality (PM) Rate per 100,000 was 563.4, which was significantly higher than the Massachusetts rate of 282.2.

Note: Data from the ED was during COVID and not reflective of normal ED population. Hospital will look to compare with other years and make updates to the CHNA.

Nutrition and Physical Activity

1. Food Insecurity

Approximately 12.8% of the U.S. population are living in low-income and low-food access areas; specifically, 6.2% of the U.S. population (19 million people) have limited access to a supermarket or grocery store. The COVID-19 pandemic has exacerbated issues of food access, due to store closures, public transportation travel restrictions, and economic hardships. As of fall 2020, nearly 10% of parents with only young children did not have enough food or resources to buy food for their families.

In 2019, roughly a third of all residents of North Central Massachusetts are food insecure which is defined by the US Department of Agriculture (USDA) as "limited or uncertain access to adequate food" as indicated by income, unemployment rates, poverty levels, and education levels. The rate of food insecurity in North Central Massachusetts is significantly higher than the state-wide food insecurity rate – overall, 10.6% of Massachusetts residents are food insecure.

For the majority (61%) of those individuals who were surveyed for the 2019 North Central Massachusetts Community Food Assessment, the most popular form of transportation to obtain food was to drive themselves. The other forms of transportation used to obtain food were walking (16%), having someone else drive them (15%), and utilizing public transportation (5%) – all of which are dependent on external circumstances.

In the same survey, respondents identified the reasons for their inability to buy food. The foremost reasons are the need to pay the mortgage (37%) and the need to pay the utilities (33%). The price of the food itself only prevented 8% of respondents from buying food.

Even though the general quality of the food sold in the region is perceived as average, above average, or high, 69% of the population report having less than five servings of fruits or vegetables a day and two-thirds report that they only have one to two servings of fruits and vegetables a day. Cost (31%) is the reported leading barrier to eating the recommended servings, followed by schedule (24%) and preference (22%). Only 5% of respondents reported that their lack of cooking knowledge prevented them from eating the recommended servings.

In North Central Massachusetts, the correlation between food insecurity and the use of food support programs is strong. Of the individuals that are food insecure, 40.7% utilize SNAP/HIP benefits, 17.8% have SSI, 11.6% receive free or reduced lunch, 13% use senior coupons, and 9.5% utilize WIC benefits.[58]

The SNAP Gap is the difference between the number of low-income Massachusetts residents receiving MassHealth who are likely SNAP eligible, and the number of people actually receiving SNAP and is shown in Table WCD-1.

WCD – 1 SNAP Gaps in the Health Areas

	Community	Mass Health	SNAP Enrolled	SNAP Gap	Gap Percentage
Athol	Athol	3,933	2,442	1,491	38%
	Erving	*	*	*	*
	New Salem	*	*	*	*
	Orange	2,285	1,590	695	30%
	Petersham	*	*	*	*
	Phillipston	*	*	*	*
	Royalston	212	95	117	55%
	Warwick	*	*	*	*
	Wendell	*	*	*	*
	Health Area Totals	**6,430**	**4,127**	**2,303**	**36%**
Heywood	Ashburnham	819	313	506	62%
	Gardner	5,555	3,638	1,917	35%
	Hubbardston	456	226	230	50%
	Templeton	600	256	344	57%
	Westminster	832	294	536	64%
	Winchendon	2,347	1,326	1,021	44%
	Health Area Totals	**10,609**	**6,053**	**4,554**	**43%**
	Service Area Totals	**17,039**	**10,180**	**6,857**	**40%**

* No data available

2. Youth Healthy Eating

For a child growing up healthy, it is vitally important they are eating nutritious foods that will help them develop properly. The only recently available data available to help analyze the nutritional habits of Service Area children is through the Franklin County-North Quabbin (NQ) Youth Risk Behavior Survey (YRBS) from 2019 shown in Table WCD-2.

[58] https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx

Table WCD-2 shows Child Nutrition for Franklin County-North Quabbin 2019 YRBS. Note that in four of the five indicators the numbers decline the higher the grade. The only indicator that shows an increase from 8th to 12th grade is, "Did not have any breakfast any day in the past week."

WCD - 2 Child Nutrition for Franklin County-North Quabbin 2019 YRBS

Child Nutrition	8th Grade	10th Grade	10th Grade MA*	12th Grade	12th Grade MA*
Ate no fruit/vegetables yesterday	14%	12%	N/A	12%	N/A
Ate 3 or more fruits/vegetables yesterday	55%	52%	N/A	46%	N/A
Did not have breakfast any day in the past week	14%	16%	15%	19%	13%
Had breakfast every day in the past week	38%	29%	35%	28%	33%
Have family dinner most nights	66%	57%	N/A	48%	N/A
Source: 2019 Franklin County/North Quabbin YRBS, 2019 Massachusetts YRBS; * 2017 YRBS; N/A = Data not available					

Shown in Table WCD-3 below is Self-Reported Weight for Franklin County-North Quabbin 2019 YRBS for 8th, 10th, 12th Grades. More students in the study area reported weight issues compared to the state in all grades. Self-reported weight issues for both the state and study area increased every grade.

WCD – 3 Self-Reported Weight for Franklin County-North Quabbin 2019 YRBS

Wellness Category	8th Grade	8th Grade MA*	10th Grade	10th Grade MA*	12th Grade	12th Grade MA*
Obese, based on self-report of height & weight	13%	11%	15%	12%	15%	11%
Overweight or obese, based on self-report of height & weight	26%	25%	34%	26%	31%	23%
Described self as slightly or very overweight	28%	25%	34%	27%	32%	30%
We're trying to lose weight	43%	N/A	46%	46%	42%	42%
Source: 2019 Franklin County/North Quabbin YRBS; * 2017 YRBS; N/A = Data not available						

3. Youth Physical Activity

Physical activity is one of the most important lifestyle choices that impact health status and health outcomes. Studies show that increased physical activity can help control weight gain, reduce the risk of cardiovascular disease, type 2 diabetes, metabolic syndrome, and cancer. Increased physical activity can also help strengthen bones and muscles, improve mental health and prevent injury.[59]

Table WCD-4 shows Child Physical Activity for Franklin County-North Quabbin 2019 YRBS for the 8th, 10th, and 12th grades. Four of the six indicators show declines from the 8th to the 12th grades. Only two show increases. The 10th grade showed less activity compared to the state, where as the 12th grade showed mixed activity levels compared to the state.

[59] https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm

WCD - 4 Child Physical Activity for Franklin County-North Quabbin 2019 YRBS

Child Physical Activity	8th Grade	10th Grade	10th Grade MA*	12th Grade	12th Grade MA*
Not active for 60 minutes on any day of past week	12%	14%	13.0%	13%	18.0%
Active for 60+ minutes on all 7 days of past week	26%	27%	24.0%	23%	18.0%
Play on computer/video game system 3+ hours on average school day	47%	52%	49.0%	46%	47.0%
Attend a physical education class at least once a week	71%	68%	66.0%	57%	46.0%
Attend physical education classes daily	3%	18%	17.0%	15%	16.0%
Played on at least one sports team, past year	64%	61%	N/A	56%	N/A
Source: 2019 Franklin County/North Quabbin YRBS; *2017 YRBS; N/A = Data not available					

Chronic Illness

1. Diabetes

Diabetes is a chronic disease that shuts off your body's ability to produce insulin. There are three different kinds of diabetes: Type 1, Type 2, and Gestational. In the US alone, 30 million Americans are living with the disease and costs households nearly $250 billion annually; 422 million are living with the disease worldwide. In the last decade the number of people living with diabetes has increased by nearly 50%.[60] According to the Centers for Disease Control (CDC), Diabetes is the seventh leading cause of death.[61]

As of 2018, the obesity prevalence in the U.S. was 42.4%, reflecting a steady increasing trend since 1999. Obesity rates are highest among Black individuals, followed by Hispanic/Latino and then White individuals. According to a 2016 report from the CDC, obesity prevalence is higher in rural communities (34.2%) compared with metropolitan regions (28.7%), with the greatest differences found in the Northeast and South regions of the U.S.

In 2018, approximately 10.5% of the U.S. population had diabetes, with rates highest among Black individuals, followed by Asian, Hispanic/Latino and then White individuals. According to a 2016 study, diabetes prevalence is higher in rural areas by approximately 17% compared with urban areas.

Table WCD-5 shows the Diabetes Rates per 100 Residents in the Service Area for 2018. The Service Area combined rate was 9.1 which was higher than the Massachusetts Rate of 8.6. Both rates were approximately 1.5% higher than 2014. The Athol Hospital Health Area Average Rate was 9.6, and the Heywood Hospital Health Area Average Rate was 8.6.

[60] https://www.diabetesresearch.org/what-is-diabetes
[61] https://www.cdc.gov/nchs/fastats/diabetes.htm

WCD – 5 Diabetes Rates per 100 Residents in the Service Area 2014 & 2018

	Community	Diabetes Rates per 100 Residents 2014	Diabetes Rates per 100 Residents 2018
Athol	Athol	6.36	9.3
	Erving	-	-
	New Salem	-	-
	Orange	7.17	8.6
	Petersham	-	10.8
	Phillipston	-	-
	Royalston	-	-
	Warwick	-	-
	Wendell	-	-
	Health Area Average Rate	**6.8**	**9.6**
Heywood	Ashburnham	7.16	7.2
	Gardner	9.53	9.9
	Hubbardston	-	-
	Templeton	7.52	-
	Westminster	7.43	-
	Winchendon	7.08	8.7
	Health Area Average Rate	**7.7**	**8.6**
	Service Area Average Rate	**7.5**	**9.1**
	Massachusetts	7.08	**8.6**
	Source: CDC Places 2018, 2012-2014 Mass DPH Data		

Table WCD-6 displays ED Discharges with Diabetes at Heywood and Athol Hospitals in 2020. 7.5% of Heywood Hospital's discharges were with diabetes vs. 9.4% of Athol Hospital's. Older age groups (55-74) comprise larger proportions of diagnoses. If the Service Area median age continues to rise, so will this trend. The 2020 rates were considerably lower, by half or more in most cohorts, compared to 2017. This significant decrease could be due to reduced patient visits and mostly COVID related admissions in 2020 during the pandemic.

WCD - 6 ED Discharges with Diabetes Diagnoses at Heywood and Athol Hospitals 2020

	Heywood					Athol				
AGE	**# OF PATIENTS**	**% OF PATIENTS**	**# WTH DIABETES**	**DIABETES % 2020**	**DIABETES % 2017**	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH DIABETES**	**DIABETES % 2020**	**DIABETES % 2017**
85+	611	3.4%	63	10.3%	26.8%	385	4.1%	44	11.4%	28.6%
75-84	1,110	6.2%	198	17.8%	33.7%	644	6.9%	129	20.0%	36.9%
65-74	1,713	9.5%	299	17.5%	35.7%	1251	13.5%	242	19.3%	39.4%
55-64	2,566	14.2%	330	12.9%	29.3%	1,387	14.9%	208	15.0%	31.7%
45-54	2,287	12.7%	245	10.7%	21.0%	1141	12.3%	147	12.9%	23.2%
35-44	2,450	13.6%	123	5.0%	11.5%	1286	13.9%	69	5.4%	14.3%
25-34	2,922	16.2%	50	1.7%	4.7%	1309	14.1%	26	2.0%	5.9%
15-24	2,319	12.9%	28	1.2%	3.1%	952	10.3%	5	0.5%	4.9%
5-14	1126	6.2%	12	1.1%	1.3%	554	6.0%	3	0.5%	2.4%
<5	918	5.1%	2	0.2%	0.0%	375	4.0%	1	0.3%	0.0%
TOTAL	**18,022**	**100**	**1,350**	**7.5%**	**22.3%**	**9,284**	**100**	**874**	**9.4%**	**23.7%**
Source: Heywood and Athol Hospital ED Discharge Data 2020										

2. Asthma

Asthma is a chronic condition that adversely impacts a person's ability to breathe. Asthma inflames and narrows the bronchial tubes when exposed to sensitive substances like dust. The bronchial tubes are responsible for allowing air in and out of the lungs. An estimated 26 million Americans live with Asthma including 19 million adults and 7 million children and is one of the leading causes of school and work absences. This condition is often genetic and exacerbated by environmental factors.[62]

In the U.S., approximately 8% of adults and 7% of children have asthma; Black children are three times as likely to have asthma as compared with white children, and Black Americans are five times as likely to visit an emergency room due to asthma.

As demonstrated in Table WCD-7 Heywood Hospital had 4.2% of their ED discharges with Asthma diagnoses compared to Athol Hospital who had 3.1% of their ED discharges with Asthma. Younger age groups (15-34) comprise larger proportions of asthma diagnoses. The 2020 rates were much lower than the 2017 rates. This significant decrease could be due to reduced patient visits and mostly COVID related admissions in 2020 during the pandemic.

[62] http://acaai.org/asthma/about

WCD - 7 ED Discharges with Asthma Diagnoses at Heywood and Athol Hospitals by Age Group 2020

	Heywood					Athol				
AGE	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH ASTHMA**	**% ASTHMA 2020**	**% ASTHMA 2017**	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH ASTHMA**	**% ASTHMA 2020**	**% ASTHMA 2017**
85+	611	3.4%	16	2.6%	3.2%	385	4.1%	2	0.5%	3.8%
75-84	1,110	6.2%	22	2.0%	4.2%	644	6.9%	6	0.9%	2.1%
65-74	1,713	9.5%	37	2.2%	5.3%	1251	13.5%	22	1.8%	4.3%
55-64	2,566	14.2%	80	3.1%	7.3%	1,387	14.9%	32	2.3%	5.6%
45-54	2,287	12.7%	86	3.8%	10.1%	1141	12.3%	40	3.5%	11.3%
35-44	2,450	13.6%	123	5.0%	13.8%	1286	13.9%	41	3.2%	14.8%
25-34	2,922	16.2%	159	5.4%	13.7%	1309	14.1%	59	4.5%	19.5%
15-24	2,319	12.9%	144	6.2%	20.9%	952	10.3%	56	5.9%	22.7%
5-14	1126	6.2%	65	5.8%	40.2%	554	6.0%	22	4.0%	38.7%
<5	918	5.1%	18	2.0%	58.4%	375	4.0%	5	1.3%	78.6%
TOTAL	**18,022**	**100**	**750**	**4.2%**	**10.3%**	**9,284**	**100**	**285**	**3.1%**	**11.4%**
Source: Heywood and Athol Hospital ED Discharge Data 2020										

WCD- Map 1 represents Emergency Department (ED) discharges by Zip Codes at Athol and Heywood Hospitals in 2020.The darker communities represent higher percentages. The highest concentration of asthma rates exists in or near more densely population communities like Gardner and Athol.

WCD – Map 1 ED Discharges with Asthma Diagnoses at Athol and Heywood Hospitals 2020

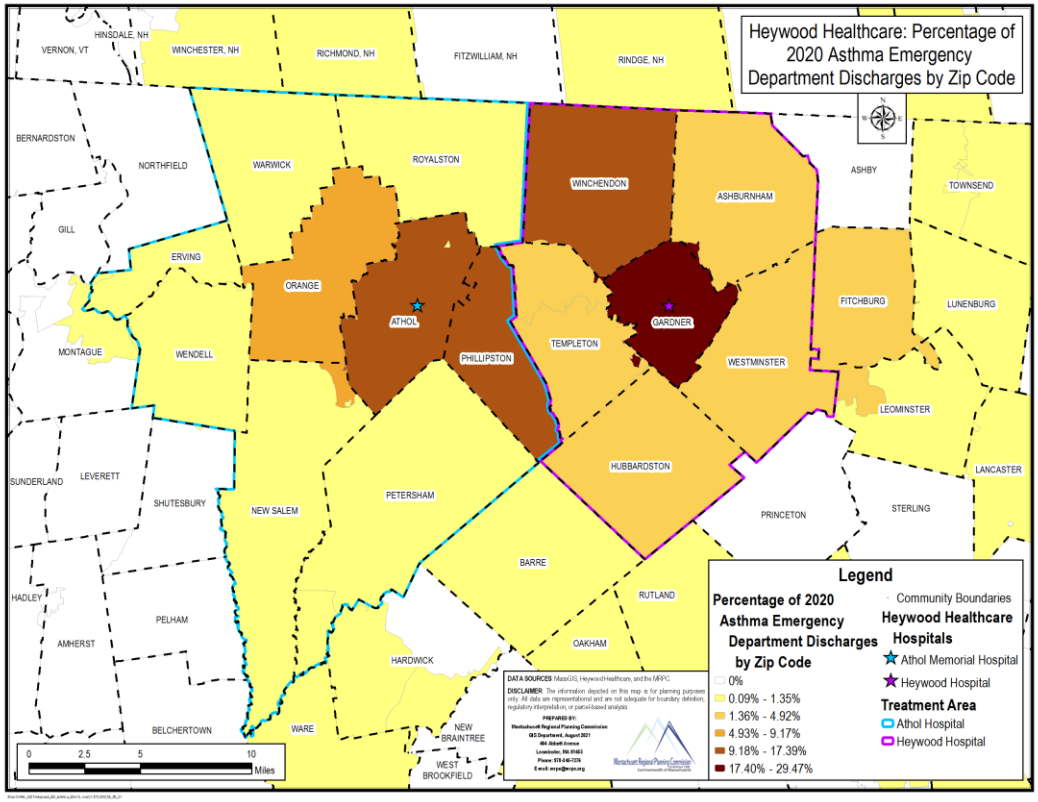


Table WCD-7 shows grades K-8 Asthma in Service Area Communities 2016/2017. The Service Area Total/Rate for the three indicators (male, female, and total) were 15.7%, 11.3 %, and 12.0%, all higher than the corresponding Massachusetts rates. The Athol Hospital Health Area total rate K-8 Asthma Prevalence -Male was 18.7%, Female was 12.6 % and total in 2016/17 was 12.5%. The Heywood Hospital Health Area total rate Male was 12.8%, Female 10.2% and total for 2016/17 was 11.4%. The 2016/2017 total rate for the Service Area was 0.5% less than the 2014/2015 rate at 13.0%.

WCD - 7 K-8 Asthma Prevalence in Service Area Communities 2016/2017

	Community	K-8 Asthma Prevalence - Male	K-8 Asthma Prevalence - Female	K-8 Asthma Prevalence Total 2016/17	K-8 Asthma Prevalence Total 2014/15	K-8 Asthma Prevalence Total % Change
Athol	Athol	20.7%	14.1%	17.5%	19.00%	-1.5%
	Erving	18.8%	7.1%	12.2%	13.40%	-1.2%
	New Salem	NS	NS	9.9%	7.10%	2.8%
	Orange	17.0%	13.1%	15.2%	18.30%	-3.1%
	Petersham	NS	17.5%	9.0%	8.40%	0.6%
	Phillipston	19.0%	8.3%	13.1%	8.90%	4.2%
	Royalston	NS	14.6%	10.9%	15.60%	-4.7%
	Warwick	17.9%	NS	NS	13.60%	-
	Wendell	NS	NS	NS	12.70%	-
	Health Area Total/Rate	**18.7%**	**12.5%**	**12.5%**	**13.0%**	**-0.5%**
Heywood	Ashburnham	10.3%	9.9%	10.7%	11.50%	-0.8%
	Gardner	21.1%	14.6%	17.5%	18.30%	-0.8%
	Hubbardston	3.7%	6.4%	5.1%	5.20%	-0.1%
	Templeton	17.9%	12.3%	14.7%	17.50%	-2.8%
	Westminster	13.3%	10.2%	11.6%	12%	-0.4%
	Winchendon	10.5%	7.8%	8.9%	10.40%	-1.5%
	Health Area Total/Rate	**12.8%**	**10.2%**	**11.4%**	**12.5%**	**-1.1%**
	Service Area Total/Rate	**15.7%**	**11.3%**	**12.0%**	**12.7%**	**-0.8%**
	Massachusetts	14.2%	10.4%	12.1%	12.20%	-0.1%
	Source: Mass DPH PHIT					

3. Cardiovascular

A. Hypertension

Hypertension, otherwise known as High Blood Pressure (HBP), can cause serious damage to blood vessels which can lead to potentially fatal complications. HBP has been known to cause serious health problems like heart attack, stroke, heart and kidney failure or angina.[63] 45% of adults in the U.S. have

[63] http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/LearnHowHBPHarmsYourHealth/Health-Threats-From-High-Blood-Pressure_UCM_002051_Article.jsp#.WpBzlejwaUk

hypertension, and only about 24% of adults with hypertension have it under control. Hypertension rates are highest among men (compared to women) and Black adults.

As seen in Table WCD-8, 15.7% of Heywood Hospital ED discharges had Hypertension Diagnoses compared to 19.1% at Athol Hospital. For both hospitals, the 55-74 age groups comprised the highest percentage of hypertension diagnoses. This group is also highest for diabetes as seen in WCD-7. The 2020 rates were significantly less than the 2017 rates among all age groups. This significant decrease could be due to reduced patient visits and mostly COVID related admissions in 2020 during the pandemic.

WCD - 8 ED Discharges with Hypertension Diagnoses at Heywood and Athol Hospital by Age Group 2020

	Heywood					Athol				
AGE	# OF PATIENTS	% OF PATIENTS	# WITH HYPERTENSION	HYPERTENSION % 2020	HYPERTENSION % 2017	# OF PATIENTS	% OF PATIENTS	# WITH HYPERTENSION	HYPERTENSION % 2020	HYPERTENSION % 2017
85+	611	3.4%	272	44.5%	79.9%	385	4.1%	205	53.2%	78.4%
75-84	1,110	6.2%	477	43.0%	77.5%	644	6.9%	274	42.5%	73.5%
65-74	1,713	9.5%	625	36.5%	69.0%	1251	13.5%	504	40.3%	65.4%
55-64	2,566	14.2%	698	27.2%	59.4%	1,387	14.9%	417	30.1%	55.1%
45-54	2,287	12.7%	438	19.2%	43.6%	1141	12.3%	212	18.6%	40.2%
35-44	2,450	13.6%	214	8.7%	25.4%	1286	13.9%	107	8.3%	22.8%
25-34	2,922	16.2%	90	3.1%	7.4%	1309	14.1%	44	3.4%	7.3%
15-24	2,319	12.9%	12	0.5%	3.7%	952	10.3%	6	0.6%	2.4%
5-14	1126	6.2%	2	0.2%	0.5%	554	6.0%	0	0.0%	0.4%
<5	918	5.1%	1	0.1%	0.0%	375	4.0%	4	1.1%	0.0%
TOTAL	**18,022**	**100**	**2,829**	**15.7%**	**47.0%**	**9,284**	**100**	**1,773**	**19.1%**	**42.5%**
Source: Heywood and Athol Hospital ED Discharge Data 2020										

B. Heart Failure

Congestive Heart Failure (CHF) is "a chronic, progressive condition in which the heart muscle is unable to pump enough blood through to meet the body's needs for blood and oxygen".[64] There are 5.7 million Americans living with CHF today and it is the leading cause of hospitalizations for people over the age of 65. CHF develops over several years and can cause health problems such as swelling of the feet, ankles and legs, fluid buildup in the lungs, fatigue, and shortness of breath.[65]

[64] http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure_UCM_002044_Article.jsp#.WpB1IOjwaUk

[65] http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure_UCM_002044_Article.jsp#.WpB1IOjwaUk

Table WCD-9 displays ED Discharges with CHF diagnoses. Heywood Hospital had 1.9% of ED discharges and Athol Hospital had 3.3%. For both hospitals, the age groups 65+ comprised the vast majority of CHF diagnoses. The 2020 rates were lower than the 2017 rates in the older cohorts, not as much in the younger age groups.

WCD – 9 ED Discharges with CHF Diagnoses in Heywood and Athol Hospitals by Age Group 2020

	Heywood					Athol				
AGE	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH CHF**	**CHF % 2020**	**CHF % 2017**	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH CHF**	**CHF % 2020**	**CHF % 2017**
85+	611	3.4%	61	10.0%	26.4%	385	4.1%	65	16.9%	23.7%
75-84	1,110	6.2%	98	8.8%	14.4%	644	6.9%	57	8.9%	15.1%
65-74	1,713	9.5%	90	5.3%	6.1%	1251	13.5%	107	8.6%	7.5%
55-64	2,566	14.2%	53	2.1%	3.2%	1,387	14.9%	54	3.9%	4.9%
45-54	2,287	12.7%	26	1.1%	1.9%	1141	12.3%	17	1.5%	2.0%
35-44	2,450	13.6%	4	0.2%	0.6%	1286	13.9%	1	0.1%	0.4%
25-34	2,922	16.2%	2	0.1%	0.1%	1309	14.1%	0	0.0%	0.3%
15-24	2,319	12.9%	0	0.0%	0.1%	952	10.3%	0	0.0%	0.0%
5-14	1126	6.2%	0	0.0%	0.0%	554	6.0%	0	0.0%	0.0%
<5	918	5.1%	0	0.0%	0.0%	375	4.0%	2	0.5%	0.0%
TOTAL	**18,022**	**100**	**334**	**1.9%**	**5.2%**	**9,284**	**100**	**303**	**3.3%**	**5.6%**
Source: Heywood and Athol Hospital ED Discharge Data 2020										

C. Coronary Heart Disease

According to the National Institutes of Health (NIH), Coronary Heart Disease (CHD) refers to the buildup of plaque in the coronary arteries on the surface of the heart. These arteries are responsible for supplying "oxygen-rich blood to your heart muscles".[66] This plaque buildup narrows the arteries and slows blood flow to the heart, which can lead to blood clots which can completely block blood flow to the heart and can be fatal.

Table WCD-10 shows Coronary Heart Disease Deaths in the Service Area in 2017. The Service Area rate exceeds the state rate but not as much as other health outcomes, like Cerebrovascular Disease or diabetes. For total deaths, Athol and Gardner lead; whereas Erving, Gardner, and Templeton lead for death rate. The Service Area rate in in 2017 (224.4) was slightly higher than the 2015 rate (214.4).

[66] https://www.nhlbi.nih.gov/health-topics/coronary-heart-disease

WCD - 10 Coronary Heart Disease Deaths in the Service Area in 2017

	Community	Heart Disease Deaths - 2015	Heart Disease Death Rate per 100,000 - 2015	Heart Disease Deaths	Heart Disease Death Rate per 100,000
Athol	Athol	9	209.6	30	256.1
	Erving	3	--	6	344.8
	New Salem	1	--	2	198.2
	Orange	22	226.4	20	261.6
	Petersham	2	--	2	168.4
	Phillipston	3	--	3	168.2
	Royalston	3	--	2	146.4
	Warwick	1	--	2	251.3
	Wendell	2	--	2	232.0
	Health Area Total/Rate	**46**	**-**	**69**	**245.5**
Heywood	Ashburnham	9	209.6	8	127.4
	Gardner	52	193.2	62	300.8
	Hubbardston	9	295.6	8	169.9
	Templeton	14	151.3	23	282.9
	Westminster	12	159.7	13	167.4
	Winchendon	22	231.9	11	101.5
	Health Area Total/Rate	**118**	**-**	**125**	**214.3**
	Service Area Total/Rate	**164**	**214.4**	**194**	**224.4**
	Massachusetts	--	137.5	12165	176.5

Source: Massachusetts Death Report 2017, Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data.

D. Cerebrovascular Disease (Stroke)

According to Medical News Today, Cerebrovascular Disease (CD) "refers to a group of conditions that can lead to a cerebrovascular event, such as a stroke".[67] A cerebrovascular event can damage blood vessels and inhibit blood supply to the brain. These kinds of events can happen very quickly and without warning. CD was the 5th leading cause of death in the US in 2014, killing nearly 135,000 people that year.

According to Table WCD-11, the Service Area experienced 54 CD deaths for a rate of 62.5 per 100,000 residents. This rate far exceeds the state at 41.2. CD that does not lead to mortality can leave patients requiring extensive long-term care. An excessive rate such as the service areas can have widespread effects on the community. Gardner, Athol, and Winchendon are primary communities to be impacted based on total deaths and/or rate.

[67] https://www.medicalnewstoday.com/articles/184601.php

WCD - 11 Cerebrovascular Disease Deaths in the Service Area in 2017

	Community	Cerebrovascular Deaths	Cerebrovascular Death Rates per 100,000	Cerebrovascular Deaths (2015)	Cerebrovascular Death Rates per 100,000 (2015)
Athol	Athol	6	51.2	5	25.8
	Erving	0	0.0	0	0
	New Salem	0	0.0	1	--
	Orange	4	52.3	3	--
	Petersham	1	84.2	0	0
	Phillipston	0	0.0	0	0
	Royalston	0	0.0	1	--
	Warwick	0	0.0	0	0
	Wendell	0	0.0	0	0
	Health Area Total/Rate	**11**	**39.1**	**10**	**--**
Heywood	Ashburnham	1	15.9	2	--
	Gardner	28	135.9	28	94.7
	Hubbardston	2	42.5	2	--
	Templeton	3	36.9	4	--
	Westminster	2	25.8	1	--
	Winchendon	7	64.6	5	49.5
	Health Area Total/Rate	**43**	**73.7**	**42**	**--**
	Service Area Total/Rate	**54**	**62.5**	**52**	**--**
	Massachusetts	2370	34.6	2,474	36.1

Source: Massachusetts Death Report 2017, Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data.

E. Chronic Obstructive Pulmonary Disorder (COPD)

Chronic Obstructive Pulmonary Disorder (COPD) is caused by chronic inflammation in the lungs that ultimately constricts airflow. COPD is most commonly caused by over-exposure to "irritating gases or particulate matter, most often from cigarette smoke".[68] With COPD comes an increased risk of heart disease and lung cancer. COPD is very treatable if given the proper medical care early on.

For 2020, Table WCD-12 shows ED Discharges with COPD Diagnoses. Heywood Hospital had 3.3% and Athol Hospital had 5.4%. For both hospitals, the age groups between 55 and 74 comprise the bulk of COPD diagnoses. The age group rates in 2020 were much lower in most groups compared to 2017. This significant decrease could be due to reduced patient visits and mostly COVID related admissions in 2020 during the pandemic.

[68] https://www.mayoclinic.org/diseases-conditions/copd/symptoms-causes/syc-20353679

WCD – 12 ED Discharges with COPD Diagnoses in Heywood and Athol Hospitals by Age Group 2020

	Heywood					Athol				
AGE	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH COPD**	**COPD % 2020**	**COPD % 2017**	**# OF PATIENTS**	**% OF PATIENTS**	**# WITH COPD**	**COPD % 2020**	**COPD % 2017**
85+	611	3.4%	36	5.9%	13.3%	385	4.1%	33	8.6%	18.1%
75-84	1,110	6.2%	119	10.7%	17.0%	644	6.9%	69	10.7%	16.8%
65-74	1,713	9.5%	170	9.9%	14.3%	1251	13.5%	223	17.8%	17.6%
55-64	2,566	14.2%	166	6.5%	11.7%	1,387	14.9%	129	9.3%	14.3%
45-54	2,287	12.7%	80	3.5%	5.8%	1141	12.3%	38	3.3%	9.9%
35-44	2,450	13.6%	24	1.0%	1.8%	1286	13.9%	9	0.7%	2.5%
25-34	2,922	16.2%	7	0.2%	0.6%	1309	14.1%	0	0.0%	0.7%
15-24	2,319	12.9%	0	0.0%	0.2%	952	10.3%	0	0.0%	0.0%
5-14	1126	6.2%	0	0.0%	0.0%	554	6.0%	0	0.0%	0.0%
<5	918	5.1%	0	0.0%	0.6%	375	4.0%	0	0.0%	0.0%
TOTAL	**18,022**	**100**	**602**	**3.3%**	**8.5%**	**9,284**	**100**	**501**	**5.4%**	**10.1%**
Source: Heywood and Athol Hospital ED Discharge Data 2020										

4. Cancer

Cancer is the second leading cause of death in the world killing 8.8 million people worldwide in 2015 alone. On average, cancer is responsible for one (1) in every six (6) deaths. In 2010, the "annual economic cost of cancer was estimated at approximately US1.16 trillion".[69] According the World Cancer Research Fund International, 13% of cancer diagnoses worldwide in 2012 (the most recent available data) were of lung cancer (1.825 million cases), making it the most common form of cancer. Breast cancer was the second most common form of cancer with 1.67 million new cases in 2012.[70]

Table WCD-13 shows Cancer Deaths and Death Rates in the Service Area in 2017, and lung cancer for 2015. The service area rate for all three cancer categories below were similar to the state rate. The total cancer rate for Athol and Ashburnham far exceeds service area median. The lung cancer rate in Winchendon and Athol were just below double and above double the service area rate. Breast cancer in Ashburnham (based on total deaths and rate) significantly exceed the service area.

The total number of lung cancer deaths in the Service Area decreased significantly from 2015 (76) to 2017 (40). Gardner (21 to 6), Templeton (10 to 1), and Orange (10 to 2) saw the most significant drops from 2015 to 2017. The top communities for Lung Cancer Death Rate include Athol, Winchendon, Ashburnham, and Gardner; important to note that Athol, Winchendon, and Gardner ranked highest in smoking rates. The state total deaths dropped as well but not as significantly.

[69] http://www.who.int/mediacentre/factsheets/fs297/en/
[70] https://www.wcrf.org/int/cancer-facts-figures/worldwide-data

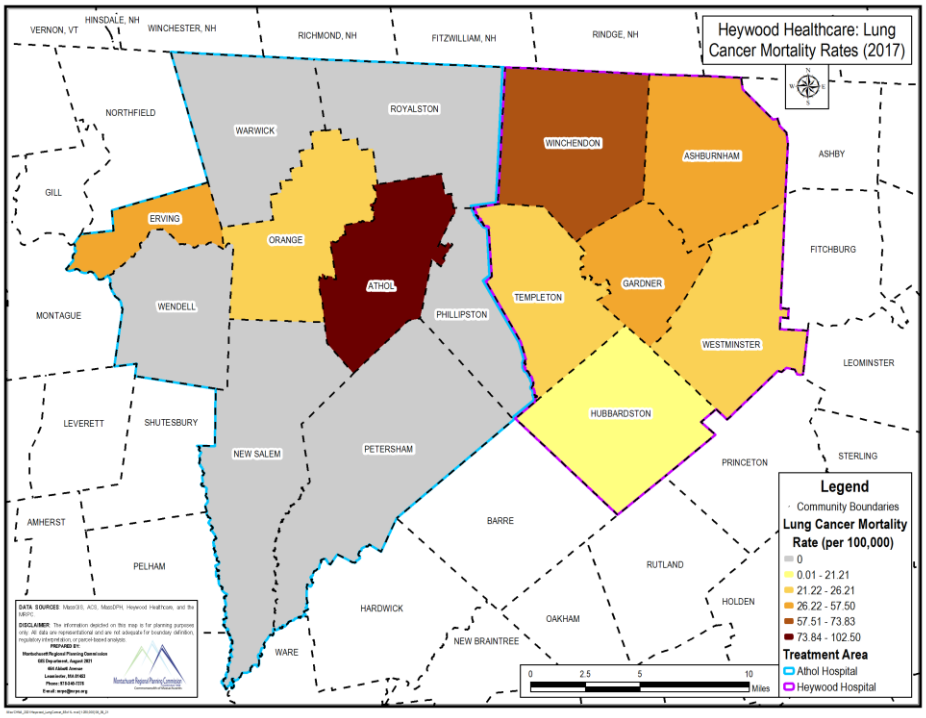
WCD – 13 Cancer Deaths and Death Rates in the Service Area in 2017

	Community	Cancer Deaths	Cancer Death Rates	Lung Cancer Deaths 2017	Lung Cancer Death Rates 2017	Breast Cancer (Female) Deaths	Breast Cancer (Female) Death Rates	Lung Cancer Deaths (2015)	Lung Cancer Death Rates (2015)
Athol	Athol	36	307.4	12	102.5	2	17.1	14	99.6
	Erving	2	114.9	1	57.5	0	0.0	1	--
	New Salem	1	99.1	0	0.0	1	99.1	0	0
	Orange	16	209.3	2	26.2	1	13.1	10	105.9
	Petersham	2	168.4	0	0.0	0	0.0	1	--
	Phillipston	3	168.2	0	0.0	1	56.1	0	0
	Royalston	1	73.2	0	0.0	0	0.0	0	0
	Warwick	1	125.6	0	0.0	0	0.0	1	--
	Wendell	0	0.0	0	0.0	0	0.0	0	0
	Total/Rate	**62**	**220.6**	**15**	**53.4**	**5**	**17.8**	**27**	**--**
Heywood	Ashburnham	21	334.3	3	47.8	4	63.7	4	--
	Gardner	44	213.5	9	43.7	6	29.1	21	85.4
	Hubbardston	8	169.9	1	21.2	0	0.0	1	--
	Templeton	11	135.3	2	24.6	1	12.3	10	102.1
	Westminster	14	180.3	2	25.8	0	0.0	7	105.7
	Winchendon	27	249.1	8	73.8	0	0.0	6	59.3
	Total/Rate	**125**	**214.3**	**25**	**42.9**	**11**	**18.9**	**49**	**--**
	Service Area Total/Rate	**187**	**216.3**	**40**	**46.3**	**16**	**18.5**	**76**	**--**
	Massachusetts	12,937	215.22	3,074	51.14	894	14.87	3,241	--

Source: Mass DPH Data 2017, Rates were calculated using 2015-2019 American Community Survey 5-year Estimates population data.

WCD- Map 3 represents the prevalence of lung cancer mortality rates in the Heywood Healthcare service area in 2017. The darker communities indicate higher rates; the grey communities do not have data. Athol and Winchendon stand-out compared to other communities. The rate of lung cancer deaths in the Heywood health area appears to be evenly among the communities.

WCD – Map 2 Lung Cancer Death Rates in the Service Area in 2017



Mortality

The mortality section of this chapter highlights critical data points around life expectancy and death rates in the Service Area. More specifically, this section highlights the leading causes of death, life expectancy, overall mortality rates and premature mortality.

Between 2013 and 2017, the national cancer death rate was 158.3, below the Service Area's rate of 216.3. According to the National Vital Statistics Report, opioid deaths did not rank in the top 10 causes of death in 2015 or 2017, in contrast to the Service Area (10th in 2015 and 6th in 2017). In 2015 and 2017, influenza/pneumonia remained the 8th most common cause of death, similar to the Service Area in both years (7th). As of 2019, the top 10 causes of death in the U.S. were (in order) heart disease, cancer, accidents, chronic lower respiratory diseases, stroke, Alzheimer's disease, diabetes, nephritis/nephrotic syndrome/nephrosis, influenza/pneumonia, and suicide.

1. **Leading Causes of Death**

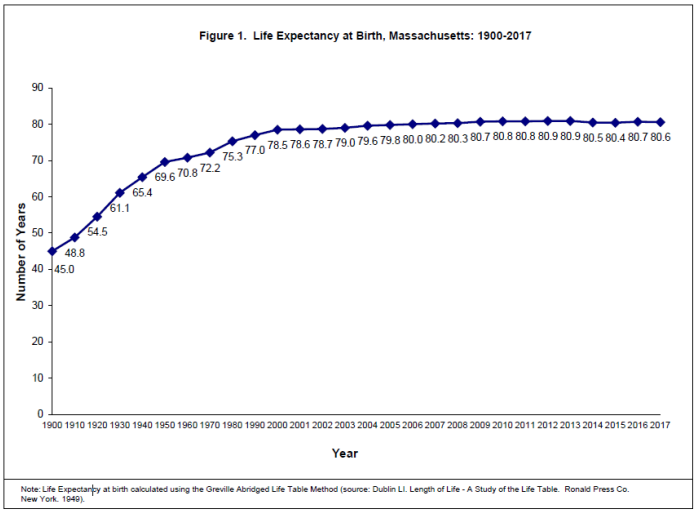
The Commonwealth of Massachusetts 2017 Death Report ranks the top ten leading causes of death among Massachusetts residents. Throughout the Service Area, the ten leading causes of death for 2017 are displayed in Table WCD-14. In 2015 Opioids were 10th, mental disorders were 6th, and Influenza was not on the list. Cancer and heart disease were the top two in 2015 as well.

WCD - 14 Top Ten Causes of Death in the Service Area 2017 & 2015

2017 RANK	Mortality Cause	Number of Deaths	% of all Service Area Deaths	2015 RANK	2015 Mortality Cause
1	Heart Disease	229	26%	1	Total Cancer
2	Total Cancer	197	23%	2	Heart Disease
3	Stroke	56	6.50%	3	Lung Cancer
4	Lung Cancer	43	5.00%	4	Injuries and Poisoning
5	Chronic Lower Respiratory Disease	35	4.00%	5	Cerebrovascular
6	Opioid Related	23	2.70%	6	Mental Disorders
7	Influenza and Pneumonia	21	5.80%	7	Diabetes
8	Diabetes	19	2.20%	8	Suicide
9	Female Breast Cancer	13	1.50%	9	Breast Cancer
10	Motor Vehicle/Suicide (tie)	10/10	1.2%/1.2%	10	Opioid Related
Source: Mass DPH Death Report 2017, Mass DPH Death Report 2015					

2. Life Expectancy

The life expectancy of Massachusetts residents has remained relatively constant since the early 2000's, increasing slightly from 78.5 years in 2000 to 80.6 years in 2017 as seen in WCD-15. Life expectancy peaked in 2012/2013 at 80.9 years.



3. Overall Mortality Rates

Table WCD-16 shows Mortality Rates in Service Area Communities in 2017 and 2015. The Service Area Total was 849 and Mortality Rate was 982.2 in 2017, which is far higher than the state rate of 675.7 in 2017. In 2015, the mortality rate for the Service Area was 777.3 from 800 deaths. Athol and Gardner were top of the list in 2015, as well.

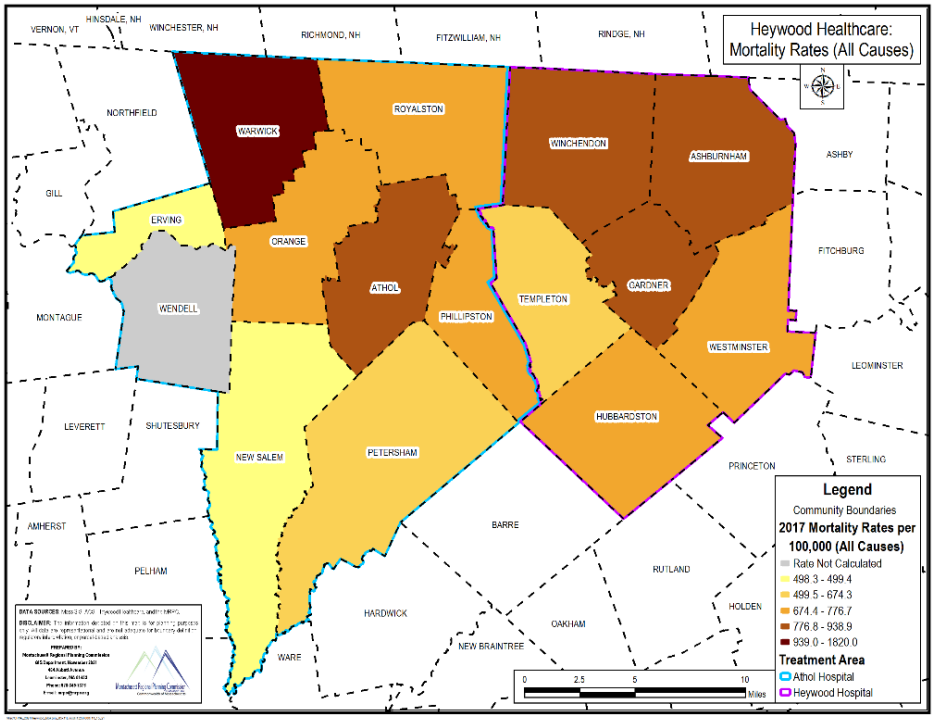
WCD - 16 Mortality Rates in Service Area Communities 2017 & 2015

	Community	Mortality (All Causes)	Mortality Rate per 100,000	Mortality (All Causes) (2015)	Mortality Rate per 100,000 (2015)
Athol	Athol	144	888.5	145	977.3
	Erving	13	499.4	11	539.8
	New Salem	5	498.3	7	777.8
	Orange	80	776.7	97	1,040.00
	Petersham	11	618.4	10	759.9
	Phillipston	9	727.7	10	808.8
	Royalston	8	727.9	5	426.4
	Warwick	12	1,820.00	7	648.1
	Wendell	4	--	8	783.3

	Health Area Total/Rate	**286**	**1017.7**	**300**	**751.3**
Heywood	**Ashburnham**	52	871.8	38	813
	Gardner	256	938.9	229	873
	Hubbardston	31	765.8	25	824.6
	Templeton	74	674.3	74	811.3
	Westminster	60	775.5	50	688.7
	Winchendon	90	826	84	887.1
	Health Area Total/Rate	**563**	**965.1**	**500**	**816.3**
	Service Area Total/Rate	**849**	**982.2**	**800**	**777.3**
	Massachusetts	58844	675.7	57,785	850.5
	Source: Mass DPH Death Report 2017				

WCD- Map 3 below shows Heywood Healthcare 2017 Mortality Rates All Causes. The darker the area the higher the number. Health area for both Athol Hospital and Heywood Hospitals is shown.

WCD – Map 3 Mortality Rates in Service Area Communities 2017



4. Premature Mortality Rates

Premature mortality is the "measure of unfulfilled life expectancy".[71] Premature mortality is measured in "Potential Years of Life Lost" or "PYLL" and is calculated by "adding together the total number of years that people who died before a specified age would have lived if they lived to that age".[72] In the US, some of the leading causes of PYLL include cancer and tumors, circulatory complications and injuries.[73]

Table WCD-19 represents Premature Mortality (PMM) rates in Service Area communities for 2017 and 2015. The SA total PMM deaths from all causes was 487 and the PMM rate per 100,000 was 563.4, which was significantly higher than the state rate of 282.2. In 2015, the SA PPM rate was much lower at 429.3 from 385 PMM deaths, however the state rate in 2015 (282.6) was nearly the same as 2017 (279.6).

WCD - 19 Premature Mortality Rates in Service Area Communities 2017 & 2015

	Community	Premature Mortality (All Causes)	Premature Mortality Rate per 100,000	Premature Mortality (All Causes) (2015)	Premature Mortality Rate per 100,000 (2015)
Athol	Athol	59	404.4	71	573.4
	Erving	4	-	3	--
	New Salem	3	-	4	--
	Orange	37	321.8	51	565.1
	Petersham	6	505.1	2	--
	Phillipston	3	-	5	227.1
	Royalston	2	-	2	--
	Warwick	8	1418.3	5	389.6
	Wendell	3	-	8	833.6
	Health Area Total/Rate	**125**	**444.8**	**151**	**517.8**
Heywood	Ashburnham	28	344.5	16	286.1
	Gardner	117	487.8	107	509
	Hubbardston	14	282.0	10	244.6
	Templeton	128	318.2	39	424.6
	Westminster	31	354.7	25	316.3
	Winchendon	44	363.4	37	352.9
	Health Area Total/Rate	**362**	**620.5**	**234**	**355.6**
	Service Area Total/Rate	**487**	**563.4**	**385**	**429.3**
	Massachusetts	22909	282.6	21,809	279.6
	Source: Mass DPH Death Report 2017				

[71] http://www.conferenceboard.ca/hcp/Details/Health/premature-mortality-rate.aspx?AspxAutoDetectCookieSupport=1

[72] https://www.healthsystemtracker.org/chart-collection/mortality-rates-u-s-compare-countries/#item-potential-years-life-lost-major-causes-mortality-u-s-relative-comparable-countries

[73] https://www.healthsystemtracker.org/chart-collection/mortality-rates-u-s-compare-countries/#item-cancer-circulatory-diseases-leading-causes-years-life-lost-u-s

Appendix 1 – Community Survey Results

Question 1:

Do you use a primary care (i.e. family) doctor for most of your routine health care?

Answer Choices	Responses	
Yes	95.83%	1265
No	4.17%	55
Answered		**1320**
Skipped		**1**

Question 2:

If you responded "No" in Question #1, then what kind of medical provider do you use for routine care?

Answer Choices	Responses	
Emergency Department	6.67%	1
Urgent Care	33.33%	5
Community Health Center	6.67%	1
Specialist	53.33%	8
Other (please specify)		7
Answered		**15**
Skipped		**1306**

Question 3:

(2021) The following list includes amenities identified in your community as those that have some impact (positive or negative) on the health and well-being of the overall community. Please rank each based on how YOU BELIEVE they impact the health and well-being of the overall community.

	Negatively		Somewhat Negatively		Neither Positive or Negative		Somewhat Positively		Positively		Not Applicable		Total
Healthcare Services (i.e. Hospitals, Urgent Care Centers, Community Health Centers, etc)	1.50%	10	2.10%	14	5.24%	35	10.18%	68	80.39%	537	0.60%	4	668
Cultural Assets (i.e. Museums, Performing Arts Organizations, Public Spaces, etc)	1.96%	13	3.46%	23	17.32%	115	21.08%	140	47.44%	315	8.73%	58	664
Recreational Assets (i.e. School-based Athletics Programs, Community Centers, Walking/Biking Trails, etc)	0.60%	4	1.65%	11	9.76%	65	16.52%	110	68.17%	454	3.30%	22	666
Food System Assets (i.e. Full-Service Grocery Stores, Community Gardens, Farmer's Markets, etc.)	1.51%	10	1.66%	11	5.88%	39	17.80%	118	70.89%	470	2.26%	15	663
Public Safety Assets (i.e. Police and Fire Departments, Environmental Protection Agencies, etc.)	0.60%	4	0.75%	5	5.71%	38	11.56%	77	79.43%	529	1.95%	13	666
Employment Assets (i.e. Major Employers, Small Employers, Unemployment	2.71%	18	6.93%	46	14.31%	95	18.07%	120	50.60%	336	7.38%	49	664

and Job Placement Services, etc.)													
Transportation Assets (i.e. Public Transportation Providers, Health Visit Transportation and Land Use Planning, etc.)	4.22%	28	8.58%	57	15.06%	100	18.98%	126	44.58%	296	8.58%	57	664
Housing Assets (i.e. Homeless Prevention and Housing Organizations, Weatherization and Home Improvement Programs, etc.)	3.46%	23	8.42%	56	17.89%	119	18.95%	126	42.26%	281	9.02%	60	665
Educational Assets (i.e. Childcare and Preschool Providers, K-12 School Districts, Colleges and Universities, etc.)	1.36%	9	4.37%	29	11.01%	73	19.46%	129	56.26%	373	7.54%	50	663
Organizational Assets (i.e. Informal Groups and Meetings, Multi-Sector Coalitions, Local Charities, etc.)	2.11%	14	3.32%	22	19.46%	129	25.34%	168	42.84%	284	6.94%	46	663
											Answered		**668**
											Skipped		**653**

Question 4:

In past surveys, community members identified common themes or issues such as those listed, below. How have these issues "changed" IN YOUR COMMUNITY over the past few years?

	Worsened a Great Deal		Worsened Somewhat		Neither Improved or Worsened		Improved Somewhat		Improved a Great Deal		Not Applicable		Total
Cost of Accessing and Utilizing Health Care	10.33%	68	23.86%	157	35.41%	233	17.78%	117	7.90%	52	4.71%	31	658
Language and Cultural Barriers	2.28%	15	8.66%	57	43.62%	287	17.02%	112	5.93%	39	22.49%	148	658
Mental Health, Depression, Suicide and Stress	17.60%	116	27.47%	181	22.46%	148	17.30%	114	5.61%	37	9.56%	63	659
Substance Abuse	20.57%	136	27.69%	183	19.52%	129	13.16%	87	6.20%	41	12.86%	85	661
Social Isolation	37.27%	246	28.18%	186	17.58%	116	6.82%	45	2.42%	16	7.73%	51	660
Transportation	6.54%	43	17.35%	114	49.01%	322	10.96%	72	3.35%	22	12.79%	84	657
Unemployment and Poverty	28.48%	188	40.30%	266	17.12%	113	5.00%	33	1.52%	10	7.58%	50	660
Chronic Conditions (i.e. Diabetes or Heart Disease, etc.)	8.70%	57	26.87%	176	41.07%	269	8.09%	53	1.68%	11	13.59%	89	655
Cancer	8.50%	55	19.17%	124	45.60%	295	6.96%	45	3.40%	22	16.38%	106	647
Environmental Conditions (i.e. Water or air pollution)	7.01%	46	16.92%	111	49.39%	324	15.70%	103	2.74%	18	8.23%	54	656
Violence and Public Safety	8.38%	55	25.00%	164	41.77%	274	15.70%	103	2.59%	17	6.55%	43	656
Oral Health	5.82%	38	15.16%	99	52.83%	345	12.25%	80	3.37%	22	10.57%	69	653
Other (please specify)													22
												Answered	**661**
												Skipped	**660**

Question 5:

In past surveys, community members identified common themes or issues such as those listed, below. How have these issues "changed" FOR YOU PERSONALLY over the past few years?

	Worsened a Great Deal		Worsened Somewhat		Neither Improved or Worsened		Improved Somewhat		Improved a Great Deal		Not Applicable		Total
Cost of Accessing or Utilizing Health Care	11.62%	76	23.55%	154	41.74%	273	11.93%	78	6.88%	45	4.28%	28	654
Language and Cultural Barriers	2.30%	15	3.68%	24	51.38%	335	5.37%	35	1.69%	11	35.58%	232	652
Mental Health, Depression, Suicide and Stress	9.09%	59	21.42%	139	35.75%	232	9.09%	59	4.47%	29	20.18%	131	649
Substance Abuse	6.16%	40	8.17%	53	33.74%	219	3.54%	23	3.85%	25	44.53%	289	649
Social Isolation	20.06%	130	32.72%	212	22.22%	144	4.63%	30	2.01%	13	18.36%	119	648
Transportation	3.86%	25	8.49%	55	47.38%	307	6.64%	43	2.62%	17	31.02%	201	648
Unemployment and Poverty	11.56%	75	18.95%	123	33.13%	215	5.39%	35	2.00%	13	28.97%	188	649
Chronic Conditions (i.e. Diabetes and Heart Disease, etc.)	5.08%	33	16.31%	106	41.38%	269	7.23%	47	3.23%	21	26.77%	174	650
Cancer	4.66%	30	7.61%	49	37.11%	239	4.81%	31	3.11%	20	42.70%	275	644
Environmental Conditions (i.e. Water and air pollution, etc.)	5.08%	33	11.38%	74	55.08%	358	8.46%	55	3.08%	20	16.92%	110	650
Violence and Public Safety	5.55%	36	12.79%	83	50.69%	329	8.01%	52	3.08%	20	19.88%	129	649
Oral Health	4.32%	28	14.97%	97	55.86%	362	10.34%	67	4.48%	29	10.03%	65	648
Other (please specify)													10
												Answered	**656**
												Skipped	**665**

Question 6:

If you need more information on a health topic, FROM WHOM do you obtain information?

	Never		Sometimes		Most of the TIme		All of the time		Total
Primary Care Physician (PCP)	4.26%	28	39.51%	260	40.58%	267	15.65%	103	658
Nurse	14.75%	96	64.67%	421	15.05%	98	5.53%	36	651
Commercial Advertising	73.85%	480	24.15%	157	1.54%	10	0.46%	3	650
Online Medical Resources	10.50%	69	61.95%	407	23.74%	156	3.81%	25	657
Council On Aging or Senior Center	83.00%	542	14.85%	97	1.38%	9	0.77%	5	653
Municipal Health Agent	82.31%	535	15.54%	101	1.54%	10	0.62%	4	650
Teacher	85.41%	556	12.44%	81	1.38%	9	0.77%	5	651
Other (please specify)									17
								Answered	**658**
								Skipped	**663**

Question 7:

If you need more information on a health topic and obtain it from one or more sources identified in the previous question, HOW do you obtain the information? (Select as many as apply to you)

Answer Choices	Responses	
In person communication	61.57%	399
Phone	60.96%	395
Email	36.57%	237
Portal	44.29%	287
Internet (i.e. Internet Queries)	64.04%	415
Social media (i.e. Facebook, Twitter)	8.64%	56
Other (please specify)		18
	Answered	**648**
	Skipped	**673**

Question 8:

Are you able to obtain an appointment with your primary care physician (family doctor) when you need one? If no, please explain why.

Answer Choices	Responses	
Yes	88.45%	582
No (please explain)	11.55%	76
Answered		**658**
Skipped		**663**

Question 9:

Do you receive all of your healthcare services locally?

Answer Choices	Responses	
Yes	76.90%	506
No	23.10%	152
Answered		**658**
Skipped		**663**

Question 10:

If you answered "No" to the previous question, for what services do you travel outside of your local area? (Select as many as apply to you)

Answer Choices	Responses	
Primary Care Physician (Family Doctor)	23.40%	33
Specialty Care Doctor	87.23%	123
Urgent Care Facility	5.67%	8
Emergency Department	5.67%	8
Other (please specify)	16.31%	23
	Answered	**141**
	Skipped	**1180**

Question 11:

If you have to travel out of your local area for the service identified in the previous question, why did you choose to go outside of the area for this health service? If "Other", please specify in the comment box below. (Select as many as apply to you)

Answer Choices	Responses	
Physician referral	54.03%	288
Insurance	12.20%	65
Quality of Care/Lack of Confidence	26.08%	139
Availability	24.58%	131
Other (please specify)	18.39%	98
Answered		**533**
Skipped		**788**

Question 12:

Have you, or someone in your household, delayed healthcare due to a lack of any of the following? (Select as many as apply to you)

Answer Choices	Responses	
Lack of Money	29.41%	125
Lack of Insurance Coverage	23.06%	98
I have health insurance coverage, but the insurance company did not approve of the request for healthcare	29.41%	125
Other (please specify)	44.94%	191
Answered		**425**
Skipped		**896**

Question 15:

Are you male, female or transgender?

Answer Choices	Responses	
Male	23.71%	142
Female	76.29%	457
Transgender	0.00%	0
Nonbinary/Nonconforming	0.00%	0
Answered		**599**
Skipped		**722**

Question 16:

Which of the following describes your race/ethnicity? Multiple responses are allowed.

Answer Choices	Responses	
White	94.55%	572
Black/African American	0.83%	5
Hispanic or Latino	2.81%	17
Native American	0.99%	6
Asian	0.66%	4
Pacific Islander	0.00%	0
Other (please specify)	2.15%	13
Answered		**605**
Skipped		**716**

Question 17:

What is the primary language spoken in your home?

Answer Choices	Responses	
English	98.52%	599
Spanish	1.15%	7
French	0.16%	1
Portuguese	0.16%	1
Arabic	0.00%	0
American Sign Language	0.00%	0
Other (please specify)	0.49%	3
Answered		**608**
Skipped		**713**

Question 18:

What is your age?

Answer Choices	Responses	
Under 18	0.17%	1
18 to 24	1.98%	12
25 to 34	7.93%	48
35 to 44	15.70%	95
45 to 54	17.19%	104
55 to 64	29.26%	177
65 to 74	22.64%	137
75 to 84	4.79%	29
85 or more	0.33%	2
Answered		**605**
Skipped		**716**

Question 19:

What City or Town do you live in?

Answer Choices	Responses	
Ashburnham	7.45%	45
Ashby	0.83%	5
Athol	11.75%	71
Ayer	0.17%	1
Bolton	0.00%	0
Clinton	0.33%	2
Erving	0.17%	1
Fitchburg	6.29%	38
Gardner	22.19%	134
Groton	0.00%	0
Harvard	0.33%	2
Hubbardston	2.81%	17
Lancaster	0.50%	3
Leominster	4.97%	30
Lunenburg	0.83%	5
New Salem	0.50%	3
Orange	6.29%	38
Pepperell	0.17%	1
Petersham	1.32%	8
Phillipston	1.99%	12
Princeton	0.50%	3
Royalston	1.49%	9
Shirley	0.33%	2
Sterling	0.33%	2
Templeton	8.44%	51
Townsend	0.00%	0
Warwick	0.17%	1
Wendell	0.00%	0
Westminster	6.13%	37
Winchendon	8.61%	52
Other	5.13%	31
	Answered	**604**
	Skipped	**717**

Appendix 2 – Sources and Footnotes

Chapter 1 –

Data Sources:

2010 Census; ACS 2015-2019 5-Year Estimates U.S. Census Bureau

ACS 2015-2019 5-Year Estimates U.S. Census Bureau; 2019 American Community Survey 1-Year Estimates

Heywood Hospital Multicultural Services Department

Footnote Sources:

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Chapter 2 –

Data Sources:

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Chapter 3 –

Data Sources:

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MA DPH Data - 2016 and 2017 Birth Reports

MA DPH Data – 2020 Birth Reports

WIC Offices North Central and Franklin Hampshire North Quabbin 2021

Footnote Sources:

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https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm

https://www.cdc.gov/pregnancy/opioids/data.html

https://www.cdc.gov/mmwr/volumes/69/wr/mm6928a1.htm

https://jamanetwork.com/journals/jama/fullarticle/2774834

https://www.hcup-us.ahrq.gov/faststats/NASServlet?setting1=IP&location1=MA

Chapter 4 –

Data Sources:

MA Environmental Public Health Tracking

Mass Department of Environmental Protection 2021

Mass DPH BEH Childhood Lead Poisoning Prevention Program (CLPPP) 2018; Census ACS 2015-2019

Mass.gov Environmental Justice Populations

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US Environmental Protection Agency SDWIS Federal Reporting Services System 2019

Footnote Sources:

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Chapter 5 –

Data Sources:

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Center for Disease Control for state

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Chapter 6 –

Data Sources:

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2017 Mass DPH Data,

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American Community Survey population estimates for 2019

FBI Crime Data Explorer, 2015-2019

Mass Department of Children and Families Quarterly Profile, FY 18 Q1 and FY 20 Q1

Mass Probate and Family Court Department Website

Footnote Sources:

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Chapter 7 –

Data Sources:

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2019 Franklin County/North Quabbin YRBS 2021 YRBS

American Community Survey 5-year Estimates population data

American Community Survey Median Income and Population from 2015-2019

American Community Survey population estimates for 2019

Athol and Heywood Hospital's ED Discharge Data 2020 and 2017

Mass DPH 2014-2018 Adult Smoking Rates - Make Smoking History

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Chapter 8 –

Data Sources:

2012-2014 Mass DPH Data

2019 Franklin County/North Quabbin YRBS

2019 Massachusetts YRBS

CDC Places 2018

Dublin L.I. Length of Life

Heywood and Athol Hospital ED Discharge Data 2020

Massachusetts Death Report 2017

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