

2018

Heywood Healthcare Community Health Needs Assessment



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Heywood Healthcare

Athol Hospital / Heywood Hospital

Introduction

Abstract

The introduction section of this report highlights the study partners and gives an overview of Heywood Healthcare including Athol and Heywood Hospitals.

Heywood Healthcare – Athol Hospital and Heywood Hospital

In partnership with the Montachusett Regional Planning Commission

Acknowledgements

Study Partners

Partners in this study include Heywood Healthcare's Athol Hospital and Heywood Hospital, the Montachusett Regional Planning Commission (MRPC), the North Quabbin Community Coalition (NQCC), John Snow, Inc. (JSI), and the Community Health Network of North Central Massachusetts CHNA g Group (CHNA-g). Descriptions of these organizations are provided below:

Heywood Healthcare

Heywood Healthcare is an independent, community-owned healthcare system serving north central Massachusetts and southern New Hampshire. It is comprised of Athol Hospital, a 25-bed not-for-profit, Critical Access Hospital in Athol, MA; Heywood Hospital, a non-profit, 134-bed acute-care hospital in Gardner, MA; Heywood Medical Group with primary care physicians and specialists located throughout the region and Urgent Care facilities in Gardner and Athol. The Quabbin Retreat in Petersham, is the newest development of Heywood Healthcare, and will provide a full continuum of financially accessible substance misuse and mental health care services for adults and adolescents. Heywood's organization includes four satellite facilities in MA: Heywood Rehabilitation Center at Heywood Hospital; West River Health Center in Orange; Winchendon Health Center and Murdock School-based Health Center in Winchendon.

Athol Hospital

Athol Hospital is a Critical Access, non-profit 25-bed 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. The hospital opened its doors in 1950, the result of the efforts of community and business leaders to establish a local hospital to serve the healthcare needs of the region. In 2013, the hospital merged with Heywood Hospital to form Heywood Healthcare. The hospitals maintain their own not-for-profit tax-exempt corporation status. The merger strengthened the viability of Athol Hospital and brought new services and improved care coordination to this rural region.

Website: <http://www.atholhospital.org/>

Heywood Hospital

Heywood Hospital is a non-profit community-owned hospital licensed for 134-bed hospital, located in Gardner, Massachusetts. The hospital's primary service area includes six (6) communities in North Central Massachusetts including Ashburnham, Hubbardston, Templeton, Winchendon, Westminster and Gardner. The Hospital is located forty-five minutes northwest of Worcester, and just over an hour from Boston. The Hospital is governed by a local community Board of Trustees and has 1,000 employees on staff. The Medical Staff includes 200 active, courtesy and consulting physicians in primary care and a multitude of specialties.

Heywood offers medical-surgical, 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 other services on an inpatient and outpatient basis.

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/>

North Quabbin Community Coalition (NQCC)

The North Quabbin Community Coalition is a community-wide alliance committed to improving the quality of life for all those living and working in the North Quabbin region. The North Quabbin Community Coalition has provided a community-wide alliance within the nine-town North Quabbin region for over 29 years. The model for this Coalition was developed in response to community-identified issues and is focused on developing solutions that are community driven. In a region often referred to as "resource poor", the network of health and human service providers needed to pay even more attention to the issue of collaboration in order to maximize all existing resources. The spirit of collaboration has allowed the area to develop several unique partnerships, to secure many additional resources and supports and has developed a strong coalition that fosters this growth. The Coalition serves three primary purposes within the community as follows:

1. Advocacy and Response to Emergent Community Issues
2. Addressing Community Priorities
3. Information Dissemination & Networking

Website: <http://www.nqcc.org/>

John Snow, Inc. (JSI)

John Snow, Inc., and the nonprofit JSI Research & Training Institute, Inc., are public health management consulting and research organizations dedicated to improving the health of individuals and communities in the U.S. and around the globe.

JSI's mission is to improve the health of underserved people and communities and to provide a place where people of passion and commitment can pursue this cause.

For over 35 years, Boston-based JSI and affiliates have provided high-quality technical and managerial assistance to public health programs worldwide. JSI has implemented projects in 106 countries, and currently operates from eight U.S. and more than 40 international offices, with more than 500 U.S.-based professionals and 1,600 host country staff.

JSI is deeply committed to improving the health of individuals and communities and works in partnership with governments, organizations, and host-country experts to improve quality, access and equity of health systems. JSI collaborates with government agencies, the private sector, and local nonprofit and civil society organizations to achieve change in communities and health systems.

Website: <http://www.jsi.com/JSIInternet/index.cfm>

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>

Qualitative Activities

The qualitative work was completed with the combined efforts of the Heywood Healthcare's Athol and Heywood Hospitals, the Montachusett Regional Planning Commission, UMASS Memorial Health-Alliance Clinton Hospital, and John Snow, Inc.

Quantitative and Qualitative Data Analysis

Montachusett Regional Planning Commission (MPRC) staff: Executive Director Glenn Eaton, Planning and Development Director John Hume, Principal Planner Karen Chapman, Administrative and Human Resource Director Linda Parmenter, Executive Assistance Holly Ford, and Regional Planners Noam Goldstein, Matt Leger, and Molly Belanger. Community Health Assessment (CHA) Advisory Committee: VP Philanthropy and Development Dawn Casavant, Director Resource Development Mary Giannetti, VP Community Health Rebecca Bialecki, VP of Operations Tina Santos, Director of Social Services Barbara Nealon, Director of Psychiatric Services Nora Salovardos, Director of Maternal/Child Services, Karyn Briand, Director of Emergency Services Joan Doyle, CHNAg Executive Director, Chelsey Patriss, North Quabbin Community Coalition Executive Director, Heather Bialecki.

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- **President and CEO**, Winfield S. Brown, MA, MSB, MHA, FACHE
- **VP for Medical Affairs & Chief Medical Officer**, Bruce I. Bertrand, MD
- **VP for Community Health and Chief Change Agent**, Rebecca Bialecki, BS, PhD
- **VP for Development & Chief Philanthropy Officer**, Dawn Casavant, BS
- **Senior VP & Chief Financial Officer**, Robert Crosby, BS
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- **Medical Director, Heywood Medical Group**, Andrew Patterson, MHCDS
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Heywood Healthcare

Athol Hospital / Heywood Hospital

Executive Summary

Abstract

The executive summary section of this report highlights the overview of the methodology of the study and gives a brief summary of the data highlights of each chapter of the report.

Heywood Healthcare – Athol Hospital and Heywood Hospital

In partnership with the Montachusett Regional Planning Commission

Executive Summary

The 2018 Community Health Needs Assessment (CHNA) of Heywood Healthcare's Athol and Heywood Hospitals presents issues related to the health, wellbeing and related factors that impact the health of those living in Heywood Healthcare's catchment area (from here on referred to as the "Service Area"). This study was a collaborative effort conducted by Heywood Healthcare's Heywood Hospital and Athol Hospital; the Montachusett Regional Planning Commission; UMASS Memorial Health Alliance Clinton Hospital; The CHNA 9 Group; and John Snow, Inc. Various other organizations and individuals also contributed to this effort, including community-based organizations and health service partners, as well as advocacy efforts from hospitals, health centers, rehabilitation centers, primary care physician and specialty networks, public health networks 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.

About Us: Heywood Healthcare

Heywood Healthcare is an independent, community-owned healthcare system serving north central Massachusetts and southern New Hampshire. It is comprised of Athol Hospital, a 25-bed not-for-profit, Critical Access Hospital in Athol, MA; Heywood Hospital, a non-profit, 134-bed acute-care hospital in Gardner, MA; Heywood Medical Group with primary care physicians and specialists located throughout the region and Urgent Care in Gardner and Athol. The Quabbin Retreat in Petersham, is the newest development of Heywood Healthcare, and will provide a full continuum of financially accessible substance misuse and mental health care services for adults and adolescents. The Heywood Healthcare organization includes four satellite facilities in MA: Heywood Rehabilitation Center at Heywood; West River Health Center in Orange; Winchendon Health Center and Murdock School-based Health Center in Winchendon.

Purpose

Past CHNAs of Heywood Healthcare's catchment area have been used to launch important initiatives created to address the health care needs identified in each study. This study provides a comprehensive overview of the health status, issues and concerns of residents, 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 catchment area, and even cross over bordering communities. The writing of this report is intended to inform Athol Hospital and Heywood Hospital leadership and staff, local residents, government officials, businesses, community organizations and other relevant stakeholders of the health status of their communities 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. Study researchers were careful to ensure that information and perceptions from under-represented racial/ethnic, socioeconomic and geographic groups were collected from Surveys, Focus Groups, and Healthcare Professional Interviews. Study authors made sure to take all of this insight into full consideration when analyzing data and writing the final report. This report's intent is to provide a comprehensive review of Heywood Healthcare's Athol and Heywood Hospitals catchment areas.

Methodology and 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 Healthcare's Service Area were engaged in focus group sessions, key stakeholder interviews, discussions and surveys that informed perceptions 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 2018 Community Health Needs Assessment (CHNA).

1. Set Agenda

Heywood Healthcare Senior Leadership gathered with MRPC staff in August 2017 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 North Quabbin Community Coalition, the CHNA-9 Group and other relevant community partners.

2. Data Collection

Qualitative and quantitative data was collected by various staff at Heywood Healthcare and the MRPC over the succeeding months. Healthcare Professional interviews and focus groups were conducted by MRPC staff, and an online/hard copy survey was distributed across the Service Area. The data and information collected through these activities, as well as patient discharge data from Athol Hospital and Heywood Hospital Emergency Department, were used to provide public input on health issues facing local residents. Secondary data sources like the U.S. Census, the American Community Survey, the Massachusetts Department of Labor and Workforce Development, and the Massachusetts Department of Public Health 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. A second meeting between MRPC and the CHNA advisory group was held in April 2018 for updates on the progress of the report to highlight findings and comparisons to the previous CHNA from 2015.

4. Draft Report

The analysis done by Heywood and MRPC staff was then written into a narrative by several staff at MRPC. This narrative was meant to put the numbers together into words to help the reader make sense of the large amount of data placed in front of them.

5. Review and Edit

The draft report was then peer reviewed by subject matter experts at Heywood Healthcare and partner organizations for quality assurance and recycled to the MRPC for final edits. This draft was presented to the CHA Advisory group in August 2018 where the Community Health Improvement Plan strategy focus areas and target populations were identified.

6. Public Comment

A draft report was then shared with the Community Benefits Advisory Committee for final review and comment. It was also posted on the websites of Athol and Heywood Hospitals and the MRPC and was distributed to the governing entities of the 15 communities in the Service Area and the CHNA 9 and North Quabbin Community Coalition for distribution to the public and community providers. These findings were left open for several weeks in search of public input and feedback before making the report final.

7. Board Approval

The final draft was then presented to Heywood HealthCare's Board of Trustees at their September meeting for final approval.

8. Report dissemination and Community Health Improvement Plan developed

The final report was posted on the Athol and Heywood Hospital's website and presented to the groups and individuals that contributed to the assessment findings. The CHNA findings and feedback garnered from the presentations informed the Hospital's community benefit target population, priority areas and

implementation strategies. The Community Benefit strategies were aligned with the Hospitals strategic plan and coordinated with the CHNA9 regional community health improvement planning process.

Data Collection

Quantitative data for this report came from Massachusetts Community Health Information Profile (MassCHIP) data from the Massachusetts Department of Public Health (MassDPH); the Youth Risk Behavior Survey (YRBS) data; U.S. 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 17 Focus Groups and 12 Healthcare Professional Interviews hosted by MRPC with individuals representing many diverse communities and populations that live in Heywood Healthcare's catchment area. A survey was also made available online through SurveyMonkey.com and was distributed to 29 locations across the Service Area in hard copy form. Overall, 952 surveys were filled out with a completion rate of about 62.7% (596 completed surveys).

12 Health Professional Interviews	<ul style="list-style-type: none"> • Rebecca Bialecki (1-18-18) • Denise Foresman (1-25-18) • Barbara Nealon (2-27-18) • Nora Salvarados (2-27-18) • Brian Gordon (4-19-18) • Elaine Fluet (5-1-18) • Heather Bialecki-Canning (5-2-18) • Mady Caron (5-2-18) • Jeannette Robichaud (5-3-18) • Alison Smith (5-4-18) • Chuncie Willis (5-4-18) • Renee Eldredge (5-4-18)
17 Focus Groups	<ul style="list-style-type: none"> • North Quabbin Recovery Planning Group (9-11-17) • Jail to Community Task Force (9-14-17) • Children's Health and Wellness (9-27-17) • Multicultural Task Force (9-28-17) • Gardner Area Interagency Team (9-29-17) • Substance Abuse Task Force (10-3-17) • Greater Gardner Religious Council (10-3-17) • Schwartz Center Rounds (10-4-17) • Greater Gardner Chamber of Commerce (10-10-17) • Heywood Senior Team (10-24-17) • Regional Behavioral Health Collaborative (10-31-17) • Gardner MENders Support Group (11-1-17) • Montachusett Suicide Prevention Task Force (11-6-17) • North Quabbin Community Coalition (11-17-17) • Community Health Connections Board (11-27-17) • Montachusett Public Health Network (12-13-17) • CHNA-9 CHIP Breakfast (12-14-17)

30 Survey Access Locations	<ul style="list-style-type: none"> • Café Edesia Chestnut – Gardner • Athol Town Hall • Athol Library • New Salem Town Hall • New Salem Library • Westminster Town Hall • Westminster Library • Gardner Library • Gardner Council on Aging • Templeton Town Hall • Warwick Town Hall • Orange Town Hall • Orange Council on Aging • Orange Library • Winchendon Town Hall • Winchendon Library • Royalston Town Clerk • Royalston Town Hall • Wendell Town Hall • Erving Town Hall • Ashburnham Town Hall • Ashburnham Council on Aging • Ashburnham Library • Athol Council on Aging • Petersham Town Hall • Phillipston Town Hall • Athol YMCA • Winchendon Community Center • Winchendon YMCA • SurveyMonkey.com distributed through Study Partner's email distribution list and via text to Heywood Medical Group's patients
Quantitative Data Sources	<ul style="list-style-type: none"> • 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) • Athol and Heywood Hospital's Emergency Department patient's discharge data

Quantitative Data Sources

Descriptions of the sources drawn upon for data used in this report are provided below. For a full list of sources please refer to **Appendix C**.

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>

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 U.S. 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 (YRBSS) 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

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

YRBSS 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 U.S. 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 U.S. 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/departments-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 Methodology

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 catchment 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. 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. Staff at MRPC held 17 focus groups and 12 Healthcare Professional Interviews with leaders and community members across various Heywood communities. MRPC also crafted and distributed over 1,500 hard copy surveys and an online version on Survey Monkey to focus group participants and community members in English, Spanish, Hmong and Arabic. Overall, there were 952 respondents from people representing all four primary languages. More about the survey methodology will be discussed later in this section. JSI and MRPC held four (4) joint focus groups with organizations that provide services to communities that overlap between Heywood Healthcare's and UMASS Memorial Health Alliance Clinton Hospital's catchment areas. MRPC and JSI shared information with one another to help inform the CHNAs for their respective hospitals.

Qualitative data was only included in this report when mentioned multiple times in the Focus Groups, Interviews, and Surveys. Comments from participants provided qualitative data for the Study's Authors to gain perceptions from the community and to help expand on quantitative findings. Community input can be found throughout the report and will indicated by the following icon:



Focus Groups

Methodology:

Staff at MRPC held 17 focus groups with public/private sector leaders and community members across various Heywood communities. An MRPC staff member typically facilitated questioning and conversation while another took notes on large yellow note pads spread throughout the room. When permitted, an audio recording of the focus group was taken so that more detailed notes could be taken after the meeting. The Focus Group sessions would last anywhere from 30 to 90 minutes.

Collaborating Organization	Participants	Meeting Location
North Quabbin Recovery Planning Group	Provider and Consumer	Petersham
Jail to Community Task Force	Provider	Athol
Children's Health and Wellness	Provider	Athol
Multicultural Task Force	Provider	Gardner
Gardner Area Interagency Team	Provider	Gardner
Substance Abuse Task Force	Provider	Athol
Greater Gardner Religious Council	Consumer	Athol

Schwartz Center Rounds	Provider	Gardner
Greater Gardner Chamber of Commerce	Consumer	Gardner
Heywood Healthcare Senior Team	Provider	Gardner
Regional Behavioral Health Collaborative	Provider	Gardner
Gardner MENders Support Group	Consumer	Gardner
Montachusett Suicide Prevention Task Force	Provider	Gardner
North Quabbin Community Coalition	Provider and Consumer	Orange
Community Health Connections	Provider	Fitchburg
Montachusett Public Health Network	Provider	Westminster
CHNA-9 CHIP Breakfast	Provider	Fitchburg

Facilitation and Content:

Depending on the group being interviewed (providers or consumers) two separate question sets were used to facilitate conversation. 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. The questions sets are as follows:

Provider Focus Group Questions

- What are some of the challenges that you see in your work?
- Are there particular barriers that you face as a provider/policymaker? If so, please explain.
- What are some of the successful strategies being implemented to address the challenges you mentioned at your facility/agency? Nationally?
- What recommendation(s) can you offer for improved services? What is the benefit of improving this existing or new service?
- Is there a particular policy that could be augmented, amended or created? If so, please explain.
- What are some of the area's assets or strengths as they relate to the health and well-being of residents? Are there other issues impacting the health of the community on which the Community Health Needs Assessment (CHNA) should focus?
- Please identify the behavioral/mental health needs or concerns of your community?
- Are you satisfied with Heywood's current capacity?
- What one recommendation can you offer for improved health care services (i.e. programs, resources, policies)?
- Is there one final comment that you would like to make about the health of the people in your community?

Consumer Focus Group Questions

- Do you use a primary care doctor for most of your routine health?
 1. If no, what kind of medical provider do you use for routine care
- What do you see as strengths or assets that contribute to the health and wellbeing of your community?
- What things negatively impact the health of your community?
- What programs or services have a positive impact on your health?
- What one recommendation can you offer for improved health care services (i.e. programs, resources, policies?)
- In past surveys, community members identified the below listed themes or issues. Have these issues changed over the past few years?
 1. Cost of access or utilizing healthcare
 2. Culture
 3. Mental health, substance abuse, depression, stress
 4. Social and cultural isolation
 5. Transportation
 6. Unemployment/poverty
 7. Other – specify
- If you need more information on a health topic, from whom do you obtain information?
 1. PCP
 2. Nurse
 3. Commercial Adv
 4. Online medical resources
 5. Council on aging or senior center
 6. Municipal health agent
 7. Teacher
 8. Other – specify
- If you need more information on a health topic and obtain it from one or more sources identified in the previous questions, how do you obtain the information?
 1. In person communication
 2. Phone
 3. Email
 4. Patient portal
 5. Internet
 6. Social media
 7. Other – please specify
- What services would you like to see offered at Athol or Heywood Hospital
- Is there one final comment that you would like to make about the health of the people in your community?

Analysis and Results:

Following focus group sessions, MPRC staff would take the notes and audio recordings and organize them. Full quotes were recorded and details of the notes were fleshed out. These notes were then used to provide insight for chapters throughout the report where the quotes are directly relevant to their respective chapters.

Healthcare Professional Interviews

Methodology:

Staff at MPRC held 12 interviews with healthcare professionals across various Heywood communities. MPRC staff would meet with healthcare professionals at their place of employment or they would come to the MPRC office for interview sessions lasting from 30 minutes to an hour.

Interviewee	Title	Organization
Barbara Nealon	Director of Social Services & Multicultural Services	Heywood Hospital
Denise Foresman	Director of Nutrition Services	Heywood Hospital
Nora Salvorados	Director of Psychiatric Services	Heywood Hospital
Rebecca Bialecki	VP of Community Health	Heywood Hospital
Brian Gordon	Program Director	Dana Day Treatment Center
Mady Coran	Registered Dietitian	Athol Hospital
Jeannette Robichaud	Executive Director	Athol YMCA
Elaine Fluet	President and CEO	GVNA Healthcare, Inc.
Alison Smith	Community Health Worker	Heywood Hospital ED
Chuncie Willis	ER Clinician	Heywood Hospital ER
Renee Eldredge	School-Based Care Coordinator	Gardner Schools
Heather Bialecki-Canning	Executive Director	North Quabbin Community Coalition (NQCC)

Facilitation and Content:

Being that interviewees were subject matter experts, the same provider questions used in the focus group sessions were used for questioning in these interviews. Some questions may not have applied to the individual being questioned and were omitted during the interviews. When permitted, audio recordings of the interviews were taken.

Interview Questions

- What are some of the challenges that you see in your work?
- Are there particular barriers that you face as a provider/policymaker? If so, please explain.
- What are some of the successful strategies being implemented to address the challenges you mentioned at your facility/agency? Nationally?
- What recommendation(s) can you offer for improved services? What is the benefit of improving this existing or new service?
- Is there a particular policy that could be augmented, amended or created? If so, please explain.
- What are some of the area's assets or strengths as they relate to the health and well-being of residents? Are there other issues impacting the health of the community on which the Community Health Needs Assessment (CHNA) should focus?
- Please identify the behavioral/mental health needs or concerns of your community?
- Are you satisfied with Heywood's current capacity?
- What one recommendation can you offer for improved health care services (i.e. programs, resources, policies)?
- Is there one final comment that you would like to make about the health of the people in your community?

Analysis and Results:

Following interviews, MPRC staff would take the notes and audio recordings and organize them. Full quotes were recorded and details of the note were fleshed out. These notes were then used to provide insight for chapters throughout the report where the quotes are directly relevant to their respective chapters.

Survey Distribution

Methodology:

Staff from Heywood Healthcare and the 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 2018 to May 2018 on SurveyMonkey.com. The survey link was distributed through our study partner's email distribution lists and over 1,500 hard copy surveys were dropped off at 29 locations across the Service Area. At each drop box location, QR codes were printed with links for the online English, Spanish and Hmong versions of the survey so members of the community could respond directly from their smart phone. A hard copy version of the survey was also made available with an Arabic translation and made available to the Arabic community through grassroots efforts that will be discussed further in the next paragraph. Heywood Healthcare also sent a blast text message to over 9,000 Heywood Medical Group patients registered in the patient portal system with links to complete the survey electronically. Athol Hospital, Heywood Hospital, and the MRPC also advertised the survey link on their respective websites.

Heywood Healthcare's Executive team and the MRPC worked with Miguel A. Rodriguez Santana of the Multicultural Coalition at Heywood Hospital and Train Wu, Academic Counselor for the Diversity Workforce Pipeline at Mount Wachusett Community College to hand deliver hard copy surveys to

minority members of the community. They went to local barbershops, churches, and community spaces where Spanish, Hmong and Arabic speaking residents congregate and they worked hand in hand to help them fill out surveys in individual, as well as group settings.

Drop Box Locations:

- Café Edesia Chestnut – Gardner
- Athol Town Hall
- Athol Library
- New Salem Town Hall
- Mew Salem Library
- Westminster Town Hall
- Westminster Library
- Gardner Library
- Gardner Council on Aging
- Templeton Town Hall
- Warwick Town Hall
- Orange Town Hall
- Orange Council on Aging
- Orange Library
- Winchendon Town Hall

- Winchendon Library
- Royalston Town Clerk
- Royalston Town Hall
- Wendell Town Hall
- Erving Town Hall
- Ashburnham Town Hall
- Ashburnham Council on Aging
- Ashburnham Library
- Athol Council on Aging
- Petersham Town Hall
- Phillipston Town Hall
- Athol YMCA
- Winchendon Community Center
- Winchendon YMCA

Analysis and Results:

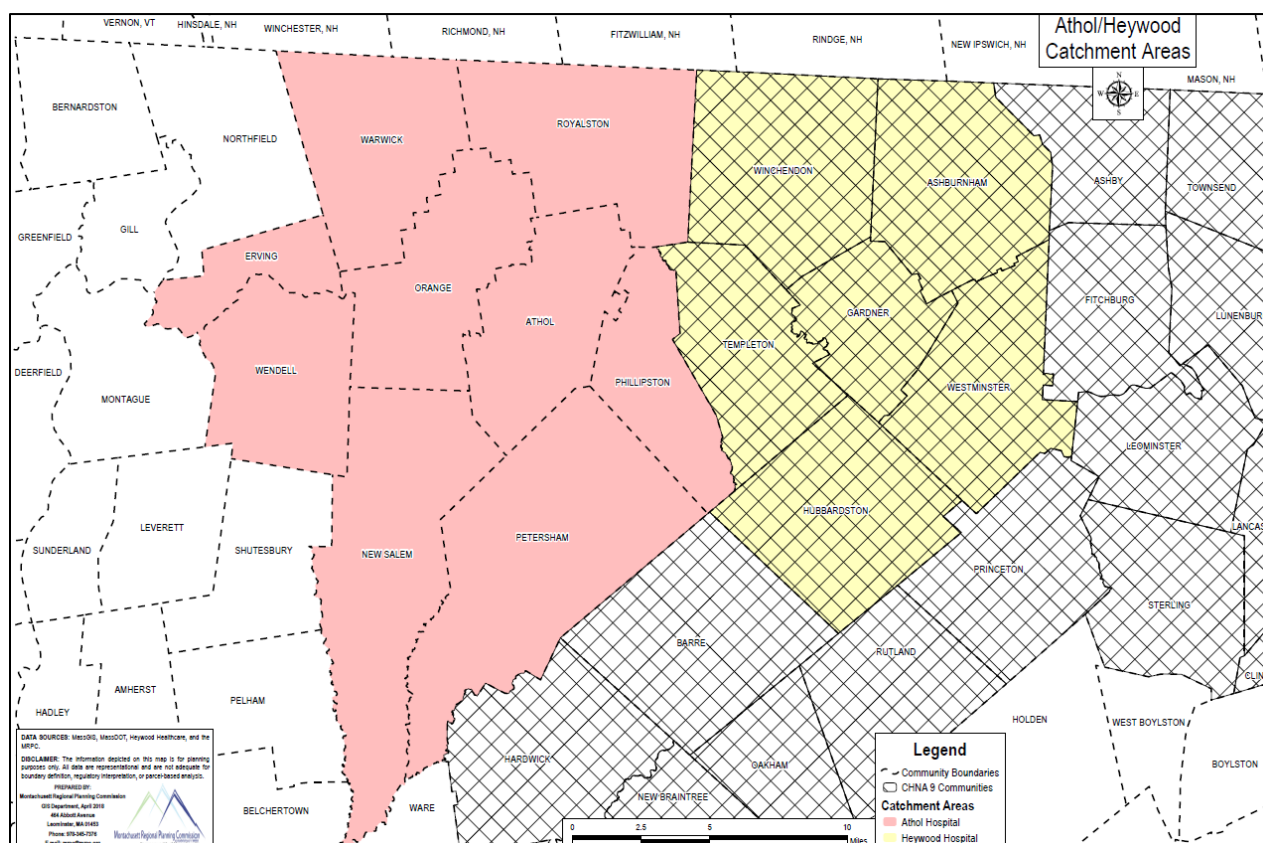
Surveys filled out by community members on SurveyMonkey.com were analyzed using the "Analyze Results" feature on the MRPC's SurveyMonkey profile. Final results can be found in **Appendix B**. Hard copy surveys in all four languages were collected by Miguel and Train and delivered to MRPC where staff entered responses manually into SurveyMonkey.com. Responses left in comment boxes were then dispersed throughout the report and used as contributions to the "Community Perceptions" section of select chapters.

Heywood Healthcare Programs and Services

Through the Focus Group and Stakeholder Interview process, MRPC staff made note of programs and services offered by Heywood Healthcare and other local healthcare providers as they were mentioned. A list of these programs and services are available in **Appendix A**. These programs made the list if they were mentioned on several occasions during Focus Groups or Stakeholder Interviews.

Study Area Overview

The map that follows represents the catchment area analyzed for this study. The area highlighted in pink on the left represents Athol Hospital's nine (9) communities which include Athol, Orange, Phillipston, Petersham, New Salem, Royalston, Warwick, Irving and Wendell. The area highlighted in yellow on the right represents Heywood Hospital's six (6) communities which include Gardner, Templeton, Winchendon, Ashburnham, Westminster and Hubbardston. The cross-hatched area represents the Community Health Network Area (CHNA) 9 communities:



This assessment provides information on 15 communities covered by Heywood Healthcare services, including a few communities that overlap with UMASS Memorial Health Alliance Clinton Hospital's service area; Templeton, Gardner, Hubbardston, Westminster and, Ashburnham. Heywood Healthcare's catchment area analyzed for this report include the 15 municipalities listed below, including **one*** (1) city and (14) towns:

Ashburnham	Phillipston
Athol	Royalston
Erving	Templeton
Gardner*	Warwick
Hubbardston	Wendell
New Salem	Westminster
Orange	Winchendon
Petersham	

Depending upon availability, data on all 15 of these communities is presented throughout this report to help paint a picture of the overall health status of the Service Area.

Summary of Findings

The following chapter summaries highlight major findings from each chapter of the report. For a greater breakdown of chapter highlights, see the blue “Chapter Highlights” text box at the beginning of each chapter.

Chapter 1 - Population Characteristics

- The overall population of the Service Area has grown a modest 6% since 2000. This rate is less than the US overall (9.7%), but double that of the Commonwealth of MA (3.1%).
- It is important to note the change in racial makeup over time and the growth of the Hispanic/Latino population between 2000 and 2016, especially in Gardner and Athol.
- The Service Area has a median age nearly 7 years higher than the State and Nation including a greater number of those age 65 and older living alone and increased 7% between 2010 and 2016.
- The rural nature of Heywood Healthcare’s communities and the social isolation of older adults living alone make it more difficult to access basic daily needs.
- Veterans in the Service Area are better off when compared to the State and Nation when it comes to health-outcomes and financial stability. However, disparities in unemployment and disability compared to non-veterans is prevalent throughout the Service Area.

Chapter 2 – Social and Economic Factors

- The Social and Economic inequities experienced by people in the region vary widely from community to community.
- There are lower poverty rates overall throughout the Service Area compared to the State and Nation, but pockets of poverty persist throughout.
- Gardner, Athol, Wendell, and Orange have the highest poverty rates at 19%, 17%, 16.1%, and 13.7% respectively, compared to MA rate of 11.4%.
- Athol’s and Gardner’s childhood poverty rates have increased 6.4% and 22.6% respectively since the last CHNA in 2015 with data from 2013 and 2016.
- Overall, wages in the Service Area have increased by nearly \$200 million since 2000, but wages have decreased significantly in select communities.
- In four communities in the Service Area, the unemployment rate for veterans reaches beyond 10%; Warwick (10.5%), Athol (10.9%), Orange (11.5%), and Royalston (12.1%) compared to MA (7.3%)
- The Hispanic student population in the Service Area has increased 45.1% over the years, much more than the 29.9% increase in Hispanic students Statewide.
- 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 percent of high needs students.
- The percent of residents that are paying more than 30% of their income on rent greater than the State (50.1%) are Warwick (91.7%), Wendell (74.3%), Orange (67.7%), Templeton (64.5%), and Phillipston (53.6%), with Winchendon tied with the State at 50.1%.

- Every Focus Group and Stakeholder Interview completed cited transportation as a major issue in the Service Area.
- The assault rate for Massachusetts is 8.89 and Winchendon (15.38), Athol (11.37), Erving (10.16), and Orange (9.59) have higher rates than the State.
- On January 1, 2018, 30% of males and 70% of females in MA DOC custody had an open mental health case, and 21% of males and 56% of females were prescribed psychotropic medication.
- As of January 1, 2018, 42% of males and 29% of females entered MA DOC with less than a 9th grade reading level

Chapter 3 – Maternal and Infant Health

- There were 32 teen births throughout the Service Area. Thirteen of those teen births were from Gardner, six (6) were from Orange and five (5) were from Athol.
- There were 32 teen births throughout the Service Area. Thirteen of those teen births were from Gardner, eight (8) were from Winchendon, six (6) were from Orange and five (5) were from Athol.
- The teen birth rates for the Service Area for 2015 and 2016, are 11.25 and 16.6 respectively above the State rates of 9.4 and 8.47 for both years. Orange had the highest teen birth rate per 1,000 at 24.6.
- More than half of child-bearing mothers in six Service Area communities receive Publicly Funded Prenatal Care (PNC)
- Templeton, Westminster and Winchendon had the highest percentage of low birthweight babies in 2016.
- Four (4) of five (5) cases of infant mortality in the Service Area occurred in Heywood Hospital's Service Area communities
- 27.4% of Athol mothers, 20.8% of Gardner mothers, and 35.5% of Orange mothers smoked while pregnant in 2015, far above the overall Massachusetts rate of 5.9%
- With the exception of Wendell, Royalston and Westminster; mothers in all Service Communities breast feed less frequently than the state average of 87%
- Throughout the Service Area in 2016, there were at least 51 preterm births, a 54.5% increase from the 33 in 2015.
- Templeton and Westminster have the highest percentage of preterm births in Heywood Hospital's Service Area communities

Chapter 4 - Environmental Health

- There were four (4) drinking water quality standards violations in the Service Area over the last five (5) years
 - Three (3) in Athol and one (1) in Ashburnham
- Many of the Service Area communities with the lowest percentage of children adequately screened for Blood Lead Levels (BLL) are also the communities with the highest percentage of housing stock built before 1978 (the year lead in paint was banned in Massachusetts)
 - Only 51% of children in the Service Area have been adequately screened for BLL compared to 77% throughout Massachusetts
- According to the State's Environmental Justice (EJ) Policy, the City of Gardner, and the Towns of Orange, Athol and Winchendon qualify as EJ Populations.
 - Gardner qualifies under the Minority and Income standards; Orange, Athol and Winchendon all qualify under the Income standards
- There are 30 Brownfield sites throughout the Service Area.

- 11 are in Gardner, seven (7) are in Winchendon and three (3) are in Athol. The locations of these sites in each community overlap the Environmental Justice populations present in these three communities

Chapter 5 - Infectious Disease

- Gardner, Westminster and Winchendon saw increases in Chlamydia cases from 2014 to 2016. All other communities saw declines. There were significantly more cases of Chlamydia in Heywood Hospital's Service Area than Athol Hospital's
- The Service Area saw an increased rate of Syphilis per 100,000 residents from 2014 to 2016 jumping from 0.0 to 10.7
- Gardner and Athol saw notable increases in Hepatitis C cases from 2014 to 2016 with Gardner jumping from 34 to 60, and Athol jumping from 18 to 23
- From 2014 to 2016, there were only eight (8) reported cases of HIV in the Service Area
- From year to year, Athol (average of 31), Gardner (average of 47), and Winchendon (average of 23.3) had the highest number of flu cases, all experienced increases in flu cases between 2014 and 2016.
- Between 2013 and 2017, incidences of C-difficile have increased 178%.

Chapter 6 - Injuries and Violence

- There were 67 injuries and poisonings deaths in the Service Area in 2014, with 19 coming in Gardner and 16 in Athol; a total of 52% of overall injuries and poisonings deaths.
- The rate of injuries and poisoning deaths for the Service Area is 78.53, which is higher than the State rate of 68.63.
- The death rate due to self-inflicted injuries and poisonings for the Service Area is 19.92 which is considerably higher than the State rate of 9.26.
- Self-inflicted injuries and poisonings deaths were equal to the suicide statistics for each town
- There were just five (5) motor vehicle related deaths in 2014 in the Service Area
- There were 19 weapons-related deaths in the Service Area from 2012 to 2014
 - Athol Hospital's Service Area exhibited a firearms-related death rate of 13.1 per 100,000; nearly four times the Massachusetts rate of 3.4 per 100,000
 - Heywood Hospital's Service Area exhibited a firearms-related death rate of 4.7 per 100,000
- As of the first quarter of FY2016, there were 3,741 children in caseload between both DCF offices, with 2,568 in North Central and 1,172 in Greenfield. Of those children in caseload, only 823 (22%) are in placement.
- 91% of children in placement came from homes where DCF investigations were able to substantiate that abuse or neglect was occurring in the home.
- There was a 26% increase in restraining orders from 2005-2016 in the three district courts in the Service Area – Gardner, Orange and Winchendon District Courts
- Orange District Court had the highest increase in restraining orders in the Service Area at 46% over 12 years compared to the MA rate increase of 37%.

Chapter 7 - Behavioral Health and Substance Misuse

- In 2017, 13,978 (47%) of Heywood Healthcare's combined 29,720 ER patients had a prior mental health diagnosis on their record at discharge.
- Of Athol Hospital's 6,479 patients, 3,284 (50.7%) had mental health problems on their record.

- Of Heywood Hospital's 23,241 ED visitors, 10,694 patients (46%) had mental health problems on their record in 2017.
- Winchendon (72.6 per 100,000), Westminster (60.4 per 100,000) and Athol (44.1 per 100,000) had the highest mental disorder death rates in the Service Area.
- There were 60 suicides in the Service Area from 2012 to March 2018
- There were 21 suicides in Gardner and 10 in Athol from 2012 to March 2018 accounting for just over half of all suicides in the entire Service Area
- Overall there were 17 suicide deaths in Athol Hospital's Service Area and 43 in Heywood Hospital's Service Area from 2012 to March 2018
- Substance misuse diagnoses of ED patients are most common for people in the 25 to 34-year old groups at both Athol (75.9%) and Heywood (60.4%) Hospitals.
- Overall, 35.5% of Athol Hospitals ED patients had substance misuse diagnoses on their record at discharge compared to 27.2% of Heywood Hospital ED patients
- Compared to the MA smoking rate (15.5%), the four (4) communities in our Service Area with the highest smoking rates were Athol (24.4%), Gardner (24.2%), Orange (24.1%) and Winchendon (23.7%). With the exception of the Town of Erving, these four (4) communities with the highest smoking rates also had the four (4) lowest median income levels and are also four (4) of the five (5) most populous communities throughout the Service Area.
- From 2012 to 2016 there were a total of 86 opioid-related fatal overdoses throughout the Service Area communities.
- The annual opioid-related fatal overdose totals more than doubled from 10 in 2012 to 23 in 2016.
- Overall, the overdose rate per 100,000 residents for the entire Service Area increased from 11.86 to 26.96 from 2012 to 2016, comparable to the MA rate increasing from 11.31 to 31.06.
- In 2016, the Heywood Hospital Service Area's overdose rate was 31.8 per 100,000 and Athol Hospital's Service Area was 17.89. Four communities had greater rates: Royalston at 73.75, Templeton at 61.49, Gardner at 44.05, and Ashburnham at 32.41.

Chapter 8 – Wellness, Chronic Disease, and Mortality

- In 2017, 415 patients treated at Athol Hospital Emergency Department (ED) had an obesity diagnoses on their record at discharge, totaling 6.4% of all patients seen and 3,743 patients treated at Heywood Hospital ED had an obesity diagnoses on record, totaling 16.1% of all patients seen.
- According to the Food Access Research Atlas, large areas of Orange, Athol and Gardner qualify as food deserts and according to the USDA's standards, almost the entire city of Gardner is considered a food desert. Recently with the loss of their one grocery store, Winchendon has also become a food desert and Athol had a grocery store developed improving access in that community.
- At Gardner High School, roughly 50% of male students reported meeting the recommended levels of physical activity while just 39% of female students reported the same
- Gardner had the highest diabetes rate at 9.53 per 100 residents
- At Athol Hospital, 78.6% of children younger than five (5) treated in the ED have an Asthma diagnoses on record. At Heywood Hospital ED, 58.4% of children younger than five (5) and 40.2% of children age five (5) to 14 have an Asthma diagnoses on record.
- Throughout the Service Area, eight (8) of the 15 communities have a higher prevalence of asthma among K-8 students when compared to the State (12.2%).

- Athol Hospital's ED discharged 2,753 (42.5% of ED patients) patients and Heywood Hospital's ED discharged 10,931 (47% of ED patients) with a hypertension diagnosis in 2017.
- Gardner's Cerebrovascular Disease (CD) death rate was nearly four times higher than the Massachusetts average in 2015. Winchendon's CD death rate was nearly twice as high as the Massachusetts rate
- Orange had the highest rate of cancer deaths at 291.5 per 100,000, followed by Gardner at 244.0 and Athol 240.1, compared with the MA rate of 152.8.
- The Service Area has a greater rate of lung cancer deaths at 93 pers 100,000 compared with the State rate of 39.0. Orange had the highest lung cancer death rate at 105.9 followed by Westminster (105.7) and Templeton (102.1)
- Overall, the Service Area has a lower mortality rate than the State but four (4) communities have higher rates than the State; Athol (977.3), Gardner (873), Orange (1,040) and Winchendon (887.1).
- Wendell's premature mortality is nearly double that of the Service Area average and more than three (3) times that of the State average.
- Premature mortality rates were higher than the State in nine (9) Service Area communities



Image from the Town of Winchendon

POPULATION CHARACTERISTICS

Chapter 1

Abstract

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

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

Chapter 1 - Population Characteristics

This chapter provides a comprehensive overview of the population characteristics in Heywood Healthcare's 15 communities. Communities in the Service Area vary greatly in terms of their demographic, social and economic factors. Some communities are more rural while others are more urban; others are considered more affluent while others are considered to be economically disadvantaged; and 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

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Demographics

- The overall population of the Service Area has grown a modest 6% since 2000. This rate is less than the US overall (9.7%), but double that of the Commonwealth of MA (3.1%).
- It is important to note the change in racial makeup over time and the growth of the Hispanic/Latino population in the Service Area between 2000 and 2016, especially in Gardner and Athol.
- The Service Area has a median age nearly 7 years higher than the State and Nation including a greater number of those age 65 and older living alone and increased 7% between 2010 and 2016.
- The rural nature of Heywood Healthcare's communities and the social isolation of older adults living alone make it more difficult 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
- Veterans in the Service Area are better off when compared to the State and Nation when it comes to health-outcomes and financial stability. However, disparities in unemployment and disability compared to non-veterans is prevalent throughout the Service Area.

Demographics

The demographics section highlights population characteristics that describe the Service Area's residents including population size, growth, and distribution; age and gender differences; as well as population data quantifying 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 has grown over the last decade and a half. According to US Census data indicated in Table PC-1 below, from 2000 to 2010, Heywood's service area saw growth of 4.7%; from 80,546 to 84,296. This rate is less than half the rate of the US overall (9.7%) but is faster than the Commonwealth of Massachusetts (3.1%). Using this data, the American Community Survey (ACS) 2012-2016 5-year estimates put the current population at 85,310; a 5.9% increase from 2000. The community with the largest population growth from 2000 to ACS's 2016 estimates was Erving at 27.5%, growing from 1,467 in 2000 to 1,871 in 2016. The next highest growth occurred in Templeton where the population grew from 6,799 to 8,131; a 19.6% increase. Eleven (11) of the 15 communities saw some sort of population growth; four others, Gardner (-1.6%), Phillipston (-0.2%), Warwick (-1.1%) and Wendell (-17.5%) were the only communities to experience population decline.

It is important to note here that the population sizes of Heywood's communities' range widely, from as low as 742 in Warwick to as high as 20,430 in Gardner. Therefore, percentage population change alone does not provide an accurate picture of how many people are moving in and out of these communities. However, percentage population growth or decline provides Heywood with an idea of how the population is changing to allow for future changes of service in each community as well as information to help plan for future resource needs in each area.

PC - 1 Population Growth in the Service Area from 2000 to 2016

Community	2000 Census	2010 Census	% change	2012-2016 ACS	% change (from 2000)
Ashburnham	5,546	6,081	9.6%	6,171	11.3%
Athol	11,299	11,584	2.5%	11,625	2.9%
Erving	1,467	1,800	22.7%	1,871	27.5%
Gardner	20,770	20,228	-2.6%	20,430	-1.6%
Hubbardston	3,909	4,382	12.1%	4,537	16.1%
New Salem	929	990	6.6%	1,012	8.9%
Orange	7,518	7,839	4.3%	7,709	2.5%
Petersham	1,180	1,234	4.6%	1,202	1.9%
Phillipston	1,621	1,682	3.8%	1,618	-0.2%
Royalston	1,254	1,258	0.3%	1,356	8.1%
Templeton	6,799	8,013	17.9%	8,131	19.6%
Warwick	750	780	4.0%	742	-1.1%
Wendell	986	848	-14.0%	813	-17.5%
Westminster	6,907	7,277	5.4%	7,480	8.3%
Winchendon	9,611	10,300	7.2%	10,613	10.4%
Service Area Total	80,546	84,296	4.7%	85,310	5.9%
Franklin County*	71,535	71,372	-0.2%	70,382	-1.6%
Worcester County*	750,963	798,552	6.3%	819,589	9.1%
Massachusetts*	6,349,097	6,547,629	3.1%	6,811,779	7.3%
U.S.*	281,421,906	308,745,538	9.7%	323,127,513	14.8%
Sources: 2000 Census; 2010 Census; ACS 2012-2016 5-Year Estimates U.S. Census Bureau					

Tables PC-2 and PC-3 separate population changes in Athol Hospital's Service Area and Heywood Hospital's Service Area. Athol Hospital's Service Area consists of the Towns of Athol, Erving, New Salem, Orange, Petersham, Phillipston, Royalston, Warwick and Wendell. Heywood Hospital's Service Area consists of the City of Gardner and the Towns of Ashburnham, Hubbardston, Templeton, Westminster and Winchendon. Heywood Hospital's Service Area population is two times larger than Athol Hospital's and has experienced greater population increase since 2000 (7.1% vs. 3.5%). Of Athol Hospital's communities, Erving has seen the largest population percentage increase since 2000 at 27.5%, followed by New Salem at 8.9%, and Royalston at 8.1%. Three of the Towns have seen population decline: Phillipston (-0.2%), Warwick (-1.1%), and Wendell (-17.5%). Of Heywood Hospital's communities, only Gardner has seen population decline (-1.6%). On the other end of the spectrum, four of the six communities have seen double digit increases in population since 2000: Ashburnham (11.3%), Hubbardston (16.1%), Templeton (19.6%), and Winchendon (10.4%).

PC - 2 Population Growth in Athol Hospital's Service Area from 2000 to 2016

Community	2000 Census	2010 Census	% change	2012-2016 ACS	% change (from 2000)
Athol	11,299	11,584	2.5%	11,625	2.9%
Erving	1,467	1,800	22.7%	1,871	27.5%
New Salem	929	990	6.6%	1,012	8.9%
Orange	7,518	7,839	4.3%	7,709	2.5%
Petersham	1,180	1,234	4.6%	1,202	1.9%
Phillipston	1,621	1,682	3.8%	1,618	-0.2%
Royalston	1,254	1,258	0.3%	1,356	8.1%
Warwick	750	780	4.0%	742	-1.1%
Wendell	986	848	-14.0%	813	-17.5%
Service Area Total	27,004	28,015	3.7%	27,948	3.5%
Franklin County*	71,535	71,372	-0.2%	70,382	-1.6%
Worcester County*	750,963	798,552	6.3%	819,589	9.1%
Massachusetts*	6,349,097	6,547,629	3.1%	6,811,779	7.3%
U.S.*	281,421,906	308,745,538	9.7%	323,127,513	14.8%
Sources: 2000 Census; 2010 Census; ACS 2012-2016 5-Year Estimates U.S. Census Bureau					

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PC - 3 Population Growth in Heywood Hospital's Service Area from 2000 to 2016

Community	2000 Census	2010 Census	% change	2012-2016 ACS	% change (from 2000)
Ashburnham	5,546	6,081	9.6%	6,171	11.3%
Gardner	20,770	20,228	-2.6%	20,430	-1.6%
Hubbardston	3,909	4,382	12.1%	4,537	16.1%
Templeton	6,799	8,013	17.9%	8,131	19.6%
Westminster	6,907	7,277	5.4%	7,480	8.3%
Winchendon	9,611	10,300	7.2%	10,613	10.4%
Service Area Total	53,542	56,281	5.1%	57,362	7.1%
Franklin County*	71,535	71,372	-0.2%	70,382	-1.6%
Worcester County*	750,963	798,552	6.3%	819,589	9.1%
Massachusetts*	6,349,097	6,547,629	3.1%	6,811,779	7.3%
U.S.*	281,421,906	308,745,538	9.7%	323,127,513	14.8%
Sources: 2000 Census; 2010 Census; ACS 2012-2016 5-Year Estimates U.S. Census Bureau					

Age and Gender Distribution

The ACS's 2012-2016 5-year population estimates recorded in Table PC-4 help paint a picture of the age distribution in Heywood's service area. The largest age group in Heywood's service area is 55 to 64 at 17.9% (15,271), followed by 45 to 54 at 17.3% (14,759). Beginning at age 65, there is a steady decline occurring in older age groups, falling from 10.9% for the 65 to 74 group (9,299) to 1.8% for those 85 and over (1,536). It can also be noted that there is a roughly even concentration between the 5 to 14 (11.5%), 15 to 24 (11.2%) and 35 to 44 (11.1%) age groups, with a slight dip for the 25 to 34 group (9.8%). The largest increase between two consecutive age groups is from 35-44 to 45-54 at 6.2%. The largest drop off between two age groups is from 55-64 to 65-74 at 7.0%.

Within the individual communities of the service area, the overall percentage of population identified as 65 and older, total a combined 16.7% of the population (14,247). Those who identified as 34 or younger, i.e. "Millennials", combined for 37% of the population (31,565). Those aged 35 to 64 accounted for the largest cluster concentration of the population at 46.3%.

Those who 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 to note is the concentration of those aged 45 to 54 and 55 to 64 who were counted in at 2.7% and 3.7% higher than the State, and 4.8% and 5.3% higher than the Nation, respectively. These numbers indicate that Heywood has a greater aging population than other hospital systems across the country.

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PC - 4 Age Group Distribution in the Service Area by Community 2016

Community	< 5	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Ashburnham	3.7%	16.4%	12.2%	8.7%	13.0%	15.9%	17.6%	10.2%	1.4%	0.8%
Athol	5.4%	10.8%	12.9%	11.3%	12.2%	14.6%	17.1%	8.8%	4.7%	2.3%
Erving	2.8%	13.4%	11.0%	11.3%	14.9%	14.6%	14.5%	11.4%	4.4%	1.7%
Gardner	5.9%	11.9%	12.2%	14.8%	12.5%	13.5%	14.3%	7.1%	5.1%	2.7%
Hubbardston	2.6%	15.1%	13.3%	8.9%	10.8%	22.5%	14.7%	7.4%	2.8%	1.9%
New Salem	6.5%	9.6%	7.6%	8.2%	10.2%	14.3%	22.0%	15.6%	4.4%	1.5%
Orange	4.7%	12.4%	11.5%	10.5%	8.5%	17.0%	18.5%	10.3%	4.9%	1.7%
Petersham	4.2%	5.3%	16.1%	3.7%	10.0%	23.0%	15.2%	13.6%	3.9%	4.9%
Phillipston	4.0%	12.8%	10.8%	9.3%	11.5%	20.7%	19.7%	8.4%	2.0%	0.7%
Royalston	2.4%	12.5%	12.4%	9.5%	8.1%	19.7%	20.0%	9.9%	4.6%	1.0%
Templeton	5.0%	10.8%	10.4%	12.2%	13.0%	17.0%	14.3%	10.7%	3.9%	2.7%
Warwick	3.2%	6.1%	10.6%	5.1%	6.7%	18.3%	27.8%	13.3%	7.1%	1.6%
Wendell	5.9%	8.7%	5.2%	11.2%	11.2%	13.8%	23.2%	16.9%	3.7%	0.2%
Westminster	3.4%	14.8%	10.2%	9.6%	12.9%	18.0%	16.9%	10.7%	1.9%	1.7%
Winchendon	7.7%	11.4%	11.7%	13.4%	10.4%	16.5%	13.5%	9.3%	5.2%	1.1%
Service Area Ave.	4.5%	11.5%	11.2%	9.8%	11.1%	17.3%	17.9%	10.9%	4.0%	1.8%
Franklin County	4.5%	10.3%	11.2%	11.7%	11.6%	14.8%	17.6%	11.1%	4.8%	2.4%
Worcester County	5.5%	12.4%	14.1%	12.3%	12.6%	15.6%	13.4%	7.9%	4.1%	2.2%
Massachusetts	5.4%	11.5%	14.1%	13.7%	12.4%	14.6%	13.1%	8.3%	4.4%	2.3%
U.S.	6.2%	12.9%	13.8%	13.6%	12.7%	13.6%	12.6%	8.3%	4.3%	1.9%

Sources: American Community Survey 2012-2016 5-Year Estimates U.S. Census Bureau; * 2016 American Community Survey 1-Year Estimates

In comparing Athol and Heywood Hospital's Service Areas, the age distributions are relatively similar across the board. Most age groups only vary within plus or minus 3% with the exception of the 55-64 age group where Athol Hospital's Service Area has a 19.8% concentration to Heywood's 15.2%. Tables PC-5 and PC-6 break down Athol Hospital's and Heywood Hospital's Age distributions.

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PC - 5 Age Group Distribution in Athol Hospital's Service Area by Community 2016

Community	< 5	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Athol	5.4%	10.8%	12.9%	11.3%	12.2%	14.6%	17.1%	8.8%	4.7%	2.3%
Erving	2.8%	13.4%	11.0%	11.3%	14.9%	14.6%	14.5%	11.4%	4.4%	1.7%
New Salem	6.5%	9.6%	7.6%	8.2%	10.2%	14.3%	22.0%	15.6%	4.4%	1.5%
Orange	4.7%	12.4%	11.5%	10.5%	8.5%	17.0%	18.5%	10.3%	4.9%	1.7%
Petersham	4.2%	5.3%	16.1%	3.7%	10.0%	23.0%	15.2%	13.6%	3.9%	4.9%
Phillipston	4.0%	12.8%	10.8%	9.3%	11.5%	20.7%	19.7%	8.4%	2.0%	0.7%
Royalston	2.4%	12.5%	12.4%	9.5%	8.1%	19.7%	20.0%	9.9%	4.6%	1.0%
Warwick	3.2%	6.1%	10.6%	5.1%	6.7%	18.3%	27.8%	13.3%	7.1%	1.6%
Wendell	5.9%	8.7%	5.2%	11.2%	11.2%	13.8%	23.2%	16.9%	3.7%	0.2%
Service Area Ave.	4.3%	10.2%	10.9%	8.9%	10.4%	17.3%	19.8%	12.0%	4.4%	1.7%
Franklin County*	4.5%	10.3%	11.2%	11.7%	11.6%	14.8%	17.6%	11.1%	4.8%	2.4%
Worcester County*	5.5%	12.4%	14.1%	12.3%	12.6%	15.6%	13.4%	7.9%	4.1%	2.2%
Massachusetts*	5.4%	11.5%	14.1%	13.7%	12.4%	14.6%	13.1%	8.3%	4.4%	2.3%
U.S.*	6.2%	12.9%	13.8%	13.6%	12.7%	13.6%	12.6%	8.3%	4.3%	1.9%

Sources: American Community Survey 2012-2016 5-Year Estimates U.S. Census Bureau; * 2016 American Community Survey 1-Year Estimates

PC - 6 Age Group Distribution in Heywood Hospital's Service Area by Community 2016

Community	< 5	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Ashburnham	3.7%	16.4%	12.2%	8.7%	13.0%	15.9%	17.6%	10.2%	1.4%	0.8%
Gardner	5.9%	11.9%	12.2%	14.8%	12.5%	13.5%	14.3%	7.1%	5.1%	2.7%
Hubbardston	2.6%	15.1%	13.3%	8.9%	10.8%	22.5%	14.7%	7.4%	2.8%	1.9%
Templeton	5.0%	10.8%	10.4%	12.2%	13.0%	17.0%	14.3%	10.7%	3.9%	2.7%
Westminster	3.4%	14.8%	10.2%	9.6%	12.9%	18.0%	16.9%	10.7%	1.9%	1.7%
Winchendon	7.7%	11.4%	11.7%	13.4%	10.4%	16.5%	13.5%	9.3%	5.2%	1.1%
Service Area Ave.	4.7%	13.4%	11.7%	11.3%	12.1%	17.2%	15.2%	9.2%	3.4%	1.8%
Franklin County*	4.5%	10.3%	11.2%	11.7%	11.6%	14.8%	17.6%	11.1%	4.8%	2.4%
Worcester County*	5.5%	12.4%	14.1%	12.3%	12.6%	15.6%	13.4%	7.9%	4.1%	2.2%
Massachusetts*	5.4%	11.5%	14.1%	13.7%	12.4%	14.6%	13.1%	8.3%	4.4%	2.3%
U.S.*	6.2%	12.9%	13.8%	13.6%	12.7%	13.6%	12.6%	8.3%	4.3%	1.9%

Sources: American Community Survey 2012-2016 5-Year Estimates U.S. Census Bureau; * 2016 American Community Survey 1-Year Estimates

In terms of age distribution throughout the service area, the median age of the population (46.12) is notably older than the State (39.4) and National (39.9) medians; a difference of 6.72 and 6.22 years, respectively. The service area communities' average median age in 2010 was 43.12, increasing 7% to 46.12 in 2016. for Table PC-7 displays the age distributions. Important to note here is that the concentration of those aged 65 and older in the region total 16.7%, a larger but less significant difference compared to State (15.1%) and Nation (14.1%).

Also, important to note is the lower percentage of those 65 and older living alone (10.3%) in the service area compared to the State at 11.5%. However, it is important to bear in mind the rural nature of most of

Heywood's communities and the social isolation of those who live in areas that make it more difficult to access basic daily needs (i.e., fresh groceries). It also presents difficulties for Heywood Healthcare and other home care service providers to reach those in need.

The communities with the highest median age were Warwick at 54.9 years, New Salem at 51.5 years, Wendell at 51.3 years and Petersham at 50.5 years. The communities with the lowest median age were Gardner at 39.8 years, Winchendon/Ashburnham at 42.3 years, and Erving at 42.4 years. Fourteen (14) of the 15 communities in Heywood's service area have a median age of at least 40 years; all higher than the State (39.4 years) and National (39.9 years) medians. Warwick and Gardner have a median age difference of 15.1 years, however, Gardner's population (20,430) is 19,688 greater than Warwick's (742). Differences in Median age by community in 2016 are demonstrated below Table PC-7.

PC - 7 Median Age, 65 and Older, and 65 and Older Living Alone in the Service Area 2016

Community	Median age (years)	Percent aged 65 and over	% of 65+ pop living alone	Sex ratio (males per 100 females)
Ashburnham	42.3	12.4%	8.3%	98.3
Athol	43.6	15.8%	13.2%	93.4
Erving	42.4	17.5%	8.9%	92.3
Gardner	39.8	14.9%	10.2%	96.8
Hubbardston	44.5	12.1%	7.7%	98.4
New Salem	51.5	21.5%	11.0%	121
Orange	46.4	16.9%	14.6%	92.3
Petersham	50.5	22.5%	13.1%	85.5
Phillipston	45.6	11.2%	4.8%	92.6
Royalston	48.4	15.4%	9.7%	95.7
Templeton	43.6	17.3%	11.9%	92.3
Warwick	54.9	22.1%	9.2%	88.8
Wendell	51.3	20.8%	11.7%	97.3
Westminster	44.7	14.3%	8.8%	97
Winchendon	42.3	15.5%	11.1%	116
Service Area Ave.	46.12	16.7%	10.3%	97.18
Franklin County	45.4	18.2%	12.6%	95.9
Worcester County	39.9	14.1%	10.6%	97.3
Massachusetts	39.4	15.1%	11.5%	94.1
U.S.	39.9	14.1%	10.4%	97.3
Source: 2012-2016 American Community Survey 5-Year Estimates				

Tables PC-8 and PC-9 show the Median Age in Athol Hospital's Service Area is nearly six years higher than it is in Heywood Hospital's. Given this, it is not surprising that Athol Hospital's population percentage of those aged 65 or older is 4% higher than Heywood's. In Athol Hospital's Service Area, four communities have population of those 65 and older that accounts for one-fifth of the overall population: New Salem (21.5%), Petersham (22.5%), Warwick (22.1%), and Wendell (20.8%). In Heywood's Service Area, the town with the highest percentage of those 65 and older is Templeton (17.3%).

For Athol and Heywood Hospital, the greatest concern here is in those communities where there are individuals who are aged 65 and older and live alone. In communities where there are a higher percentage of such individuals, the demand for elder care services is likely higher and has far reaching implications for service delivery. In Athol's Service Area, Orange (14.6%), Athol (13.2%), and Petersham (13.1%) lead the way in percentage of population 65 and older living alone where Phillipston (4.8%) and Erving (8.9%) fall on the lower end of the spectrum. In Heywood's Service Area, Templeton (11.9%) Winchendon (11.1%) and Gardner (10.2%) lead the way in percentage of population aged 65 and older living alone and Westminster (8.8%), Ashburnham (8.3%) and Hubbardston (7.7%) fall on the lower end of the spectrum.

PC - 8 Median Age, 65 and Older, and 65 and Older Living Alone in the Athol Hospital's Service Area 2016

Community	Median age (years)	Percent aged 65 and over	% of 65+ pop living alone	Sex ratio (males per 100 females)
Athol	43.6	15.8%	13.2%	93.4
Erving	42.4	17.5%	8.9%	92.3
New Salem	51.5	21.5%	11.0%	121
Orange	46.4	16.9%	14.6%	92.3
Petersham	50.5	22.5%	13.1%	85.5
Phillipston	45.6	11.2%	4.8%	92.6
Royalston	48.4	15.4%	9.7%	95.7
Warwick	54.9	22.1%	9.2%	88.8
Wendell	51.3	20.8%	11.7%	97.3
Service Area Ave.	48.29	18.2%	10.7%	95.43
Franklin County*	45.4	18.2%	12.6%	95.9
Worcester County*	39.9	14.1%	10.6%	97.3
Massachusetts*	39.4	15.1%	11.5%	94.1
U.S.*	39.9	14.1%	10.4%	97.3

Source: 2012-2016 American Community Survey 5-Year Estimates

Tables PC-8 and PC-9 highlight one important statistic for the Service Area that has great implications for Heywood Healthcare's services; the percentage of the population aged 65 or over living alone. Overall, the Service Area has a smaller population aged 65 or over living alone compared to the Commonwealth. However, when each community is analyzed individually the population percentages vary widely; from as low as 4.8% in Phillipston, to as high as 14.6% in Orange. Petersham (13.1%) and Athol (13.2%) rank up there with Orange for the largest population of those aged 65 or older living alone. Westminster (8.8%), Hubbardston (7.7%), and Phillipston (4.8%) have the lowest population. Ten (10) of the 15 communities have populations percentages lower than the State. The remaining five rank higher.

These numbers indicate a larger demand for at-home eldercare services, as well as overall healthcare services in the five high population percentage communities. According to the *2017 Commonwealth Fund International Health Policy Survey of Older Adults*, nearly one-quarter of older Americans are considered "high need" which means that they "have three or more chronic conditions or require help with basic tasks of daily living".¹

¹ <http://www.commonwealthfund.org/publications/in-the-literature/2017/nov/older-americans-sicker-and-faced-more-financial-barriers-to-care>

PC - 9 Median Age, 65 and Older, and 65 and Older Living Alone in the Heywood Hospital's Service Area 2016

Community	Median age (years)	Percent aged 65 and over	% of 65+ pop living alone	Sex ratio (males per 100 females)
Ashburnham	42.3	12.4%	8.3%	98.3
Gardner	39.8	14.9%	10.2%	96.8
Hubbardston	44.5	12.1%	7.7%	98.4
Templeton	43.6	17.3%	11.9%	92.3
Westminster	44.7	14.3%	8.8%	97
Winchendon	42.3	15.5%	11.1%	116
Service Area Ave.	42.87	14.4%	9.7%	99.80
Franklin County*	45.4	18.2%	12.6%	95.9
Worcester County*	39.9	14.1%	10.6%	97.3
Massachusetts*	39.4	15.1%	11.5%	94.1
U.S.*	39.9	14.1%	10.4%	97.3
Source: 2012-2016 American Community Survey 5-Year Estimates				

Racial/Ethnic Populations

In order to identify potential barriers or disparities in healthcare access by race and ethnicity, it is important to highlight the concentration of each race/ethnicity throughout the service area. Overall, the Service Area is largely white (96.1%), far above the State (79.3%) and Nation (73.3%). The communities with the largest concentration of White residents are Templeton and Royalston at 98.7% and Petersham at 97.6%. The community with the lowest concentration of White residents is Gardner at 92.2%. All other races/ethnicities throughout the service area identified on US Census reports are far underrepresented throughout the area. Black or African Americans make up 1% of the population compared to 7.3% of the State, and 12.6% of the Nation. Asian Americans make up 0.6% of the population compared to 6.1% of the State and 5.2% of the Nation. One half of one percent of the population identified as "Other" compared to 4.1% of the State and 4.8% of the Nation. Just 1.6% of the population identified as two or more races, less than half of the State (3.0%) and Nation (3.1%). Pacific Islanders are not represented at all in the service area. The only exception in the service area were Native Americans, who make up .2% of the population, the same as the State, but still lower than the Nation at .8%. All of these figures are displayed in Table PC-10.

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PC - 10 Racial Makeup of Service Area Communities 2016

Community	White	Black or African American	Native American	Asian	Other	Two or More Races	Hispanic/Latino
Ashburnham	96.8%	1.0%	0.0%	0.1%	0.5%	1.6%	0.9%
Athol	93.3%	0.5%	0.1%	0.8%	4.0%	1.3%	6.0%
Erving	94.5%	1.5%	0.1%	0.7%	0.2%	2.9%	1.9%
Gardner	92.2%	1.9%	0.3%	0.8%	2.1%	2.7%	7.0%
Hubbardston	96.1%	2.9%	0.0%	0.4%	0.0%	0.6%	1.9%
New Salem	97.4%	0.0%	0.0%	0.9%	0.0%	1.7%	0.0%
Orange	97.5%	0.2%	0.4%	0.5%	0.0%	1.4%	1.8%
Petersham	97.6%	0.7%	0.0%	0.2%	0.0%	1.6%	1.7%
Phillipston	94.4%	1.4%	0.0%	1.1%	0.0%	3.1%	1.6%
Royalston	98.7%	0.1%	0.7%	0.4%	0.0%	0.1%	1.1%
Templeton	98.7%	0.1%	0.2%	0.3%	0.3%	0.4%	0.7%
Warwick	96.9%	0.0%	0.5%	1.1%	0.3%	1.2%	1.8%
Wendell	94.3%	2.5%	0.9%	0.7%	0.1%	1.6%	1.6%
Westminster	97.3%	0.8%	0.0%	0.3%	0.2%	1.3%	2.7%
Winchendon	96.3%	0.9%	0.1%	0.3%	0.5%	1.9%	2.9%
Service Area Ave.	96.1%	1.0%	0.2%	0.6%	0.5%	1.6%	2.2%
Franklin County	93.7%	1.2%	0.2%	1.6%	0.7%	2.4%	3.7%
Worcester County	84.7%	4.8%	0.2%	4.6%	3.0%	2.7%	10.5%
Massachusetts*	79.3%	7.3%	0.2%	6.1%	4.1%	3.0%	10.9%
U.S.*	73.3%	12.6%	0.8%	5.2%	4.8%	3.1%	17.3%

Sources: American Community Survey 2012-2016 5-Year Estimates U.S. Census Bureau; * 2016 American Community Survey 1-Year Estimates

Despite generally having lower numbers of non-white racial groups throughout the Service Area, it is important to note the change in racial/ethnic makeup over time. Table PC-11 shows the racial/ethnic makeup of the Service Area according the 2000 US Census. Compared to the 2016 numbers displayed in Table PC-10, it shows a larger percentage of white residents, and a lower percentage of Black/African American, two or more races, and Hispanic/Latinos back in 2000.

Since 2000, the White population has decreased 0.5% and the Native American population has decreased 0.1%. On the other hand, the Black/African American population has increased 0.2%, the number of residents identifying as two or more races has increased 0.3% and the Hispanic/Latino population has increased 0.7%; the largest percent increase of all racial/ethnic groups during this time period. It is also important to keep in mind here that the population of Hispanic/Latinos has likely increased far more than 0.7% due to the relocation of many Puerto Rican citizens to this area of Massachusetts following the recent Hurricanes that devastated the island.

PC - 11 Racial Makeup of Service Area Communities 2000

Community	White	Black or African American	Native American	Asian	Other	Two or More Races	Hispanic/Latino
Ashburnham	97.7%	0.2%	0.0%	0.6%	0.3%	1.2%	1.7%
Athol	96.3%	0.7%	0.4%	0.4%	0.7%	1.5%	2.0%
Erving	96.8%	0.1%	0.8%	0.1%	0.4%	1.7%	0.9%
Gardner	93.1%	2.3%	0.3%	1.4%	1.2%	1.6%	4.1%
Hubbardston	98.4%	0.2%	0.1%	0.5%	0.3%	0.6%	1.3%
New Salem	95.5%	0.8%	0.5%	0.8%	0.3%	2.2%	0.9%
Orange	96.3%	1.1%	0.2%	0.5%	0.6%	1.3%	1.6%
Petersham	97.2%	0.7%	0.8%	0.3%	0.1%	1.0%	1.1%
Phillipston	97.7%	0.4%	0.1%	0.4%	0.0%	1.4%	0.4%
Royalston	98.6%	0.1%	0.0%	0.6%	0.2%	0.6%	1.1%
Templeton	98.1%	0.4%	0.2%	0.3%	0.4%	0.6%	1.4%
Warwick	96.9%	0.0%	0.3%	0.3%	1.1%	1.5%	0.9%
Wendell	92.5%	3.4%	0.0%	0.4%	1.3%	2.3%	1.4%
Westminster	97.5%	0.5%	0.1%	1.1%	0.1%	0.6%	1.1%
Winchendon	96.0%	0.8%	0.3%	0.6%	0.9%	1.3%	2.0%
Service Area Ave.	96.6%	0.8%	0.3%	0.6%	0.5%	1.3%	1.5%
Franklin County	95.4%	0.9%	0.3%	1.0%	0.7%	1.6%	2.0%
Worcester County	89.6%	2.7%	0.3%	2.6%	2.9%	1.8%	6.8%
Massachusetts*	84.5%	5.4%	0.2%	3.8%	3.7%	2.3%	6.8%
U.S.*	75.1%	12.3%	0.9%	3.6%	5.5%	2.4%	12.5%

Sources: American Community Survey 2012-2016 5-Year Estimates U.S. Census Bureau; * 2016 American Community Survey 1-Year Estimates

While it is important to note the racial makeup of the community, it is equally important to identify the ethnic makeup of those who use Heywood Healthcare services. Table PC-12 shows the ethnic makeup of patients who visited the Emergency Room in 2017 at Athol and Heywood Hospital. As to be expected, a significant majority of patients identified as American at Athol (95.96%) and Heywood (91%) Hospitals. Beyond those who identified as American, there were a great mix of patients from other ethnic groups that came to the ER, particularly at Heywood Hospital as seen in Table PC-12.

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PC - 12 Ethnic Makeup of Heywood Hospital and Athol Hospital ER Patients 2017

ETHNICITY	# ER PATIENTS ATHOL	% ER PATIENTS ATHOL	# ER PATIENTS HEYWOOD	% ER PATIENTS HEYWOOD
African American	12	0.19	99	0.43
American	6,197	95.65	21,147	90.99
Asian	1	0.02	23	0.10
Asian Indian	0	0.00	7	0.03
Brazilian	3	0.05	10	0.04
Cambodian	1	0.02	1	0.00
Canadian	2	0.03	45	0.19
Cape Verdean	2	0.03	6	0.03
Caribbean	1	0.02	9	0.04
Chinese	0	0.00	5	0.02
Cuban	1	0.02	1	0.00
Dominican	0	0.00	18	0.08
Eastern European	2	0.03	21	0.09
European	2	0.03	27	0.12
Filipino	1	0.02	4	0.02
French	1	0.02	34	0.15
Guatemalan	0	0.00	2	0.01
Haitian	0	0.00	2	0.01
Honduran	0	0.00	2	0.01
Japanese	0	0.00	3	0.01
Korean	0	0.00	2	0.01
Laotian	0	0.00	13	0.06
Lithuanian	0	0.00	1	0.00
Mexican	0	0.00	9	0.04
Middle Eastern	0	0.00	8	0.03
Other	42	0.65	275	1.18
Polish	2	0.03	2	0.01
Portuguese	4	0.06	12	0.05
Puerto Rican	11	0.17	154	0.66
Russian	0	0.00	6	0.03
South American	0	0.00	1	0.00
Unknown	194	2.99	1,283	5.52
Vietnamese	0	0.00	6	0.03
TOTAL ER PATIENTS	6,479		23,241	
Source: Heywood Hospital Multicultural Services Department				

Of those ethnic groups that used the ER at Athol or Heywood Hospital in 2017, there were a great diversity of languages spoken as seen in table PC-13 below.

PC - 13 Languages Spoken by Athol Hospital and Heywood Hospital ER Patients 2017

LANGUAGE	# ER PATIENTS ATHOL	% ER PATIENTS ATHOL	# ER PATIENTS HEYWOOD	% ER PATIENTS HEYWOOD
Albanian	1	0.02	3	0.01
Arabic	0	0.00	13	0.06
Armenian	0	0.00	1	0.00
Cambodian	0	0.00	1	0.00
Chinese Mandarin	0	0.00	4	0.02
Creole	0	0.00	1	0.00
English	6,441	99.41	22,572	97.12
Finnish	0	0.00	2	0.01
French	0	0.00	12	0.05
German	0	0.00	2	0.01
Greek	0	0.00	17	0.07
Hebrew	1	0.02	12	0.05
Hindi	0	0.00	7	0.03
Hmong	2	0.03	7	0.03
Indonesian	0	0.00	1	0.00
Japanese	0	0.00	2	0.01
Korean	0	0.00	5	0.02
Laotian	0	0.00	16	0.07
Other	3	0.05	8	0.03
Polish	0	0.00	1	0.00
Portuguese	0	0.00	7	0.03
Russian	0	0.00	4	0.02
Sign Language	3	0.05	16	0.07
Spanish	10	0.15	219	0.94
Thai	0	0.00	1	0.00
Unknown	18	0.28	300	1.29
Urdu	0	0.00	1	0.00
Vietnamese	0	0.00	6	0.03
TOTAL ER PATIENTS	6,479		23,241	

Source: Heywood Hospital Multicultural Services Department

The increasing population numbers of other non-white racial groups and the diverse mix of languages spoken among patients has notable implications for multi-cultural and language interpreter services at Heywood Healthcare facilities across the Service Area. In 2017, Heywood Hospital had a wide variety of language interpreter service requests from American Sign Language (ASL) to Chinese. The top ten language interpreter requests at Heywood Hospital are highlighted in green in Table PC-14. Overall there

were 2,057 language interpreter service requests made at Heywood Hospital in 2017; 1,598 were completed face-to-face, 436 were completed over the phone and 23 were completed over video streaming. All requests made were completed by Heywood Hospital.

PC - 14 Language Interpreter Requests at Heywood Hospital 2017

LANGUAGE	# of Requests	# of Interpretations Completed	# of Face-to-Face	# of Telephonic	# of Video Remote
ASL	149	149	126	0	23
Arabic	213	213	126	87	
Armenian	1	1	1		
Portuguese-Brazilian	34	34	19	15	
Khmer/Cambodian	4	4		4	
Chinese-Cantonese	1	1		1	
Haitian Creole	5	5	1	4	
Portuguese-Continental	19	19	13	6	
German	4	4		4	
Greek	6	6	1	5	
Gujarati	4	4		4	
Hindi	37	37	33	4	
Korean	14	14	10	4	
Laotian	35	35	5	30	
Chinese-Mandarin	20	20		20	
Polish	1	1		1	
Russian	19	19	10	9	
Spanish	1,482	1,482	1,250	232	
Urdu	2	2	2		
Vietnamese	7	7	1	6	
Total	2057	2057	1598	436	23

Source: Mass Department of Public Health - Office of Health Equity

At Athol Hospital, there were 45 language interpreter requests made in three (3) languages; Spanish (40), Chinese-Cantonese (2) and Laotian (3). All 45 requests were completed; 31 were completed face-to-face and 14 were completed over the phone as seen in Table PC-15.

PC - 15 Language Interpreter Requests at Athol Hospital 2017

LANGUAGE	# of Requests	# of Interpretations Completed	# of Face-to-Face	# of Telephonic	# of Video Remote
Spanish	40	40	31	9	0
Chinese-Cantonese	2	2	0	2	0
Laotian	3	3	0	3	0
Total	45	45	31	14	0

Source: Mass Department of Public Health - Office of Health Equity

Marital Status

According to various studies, the mental and physical health of “married people” are better off on average compared to “unmarried people”. For a variety of health threats like cancer or heart attacks, the morbidity and mortality rates of married people are notably lower than their counterparts. Of course, being married in and of itself is not an indicator of better health. In fact, “troubled marriages” are considered a “prime source of stress”. Expanding on that, a 2014 study by Robles et. al. indicated that the relationship between the quality of a marriage and health outcomes was similar to that between exercise/diet and “clinical health outcomes”.²

Overall, 11 of 15 communities in the Service Area have a higher percentage of married couple households when compared to the State (46.9%) and Nation (48.2%). The Service Area average is 53.7% with Phillipston leading the way at 66.3%, followed by Hubbardston (64.9%), and Royalston (63.2%). On the lower end, Gardner has the lowest percentage of married couple households (36.7%), followed by Wendell (43.6%) and Orange (43.7%). Tables PC-16, PC-17 and PC-18 show a complete breakdown of married couple households by community in both service areas.

The marital status of couples is not just important for the health of those individuals, but for that of their children as well. A 2014 report from the National Institutes of Health (NIH) analyzed the previous three decades of research on the impacts of family structure on the health of children; It found that “children living with their married, biological parents consistently have better physical, emotional, and academic well-being”. Specifically, for children of divorced couples, the health outcomes can be more devastating; the report noted that “divorce has been shown to diminish a child's future competence in all areas of life, including education, emotional well-being, and future earning power”.³

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² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5549103/>

³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4240051/>

PC - 16 Occupied Housing Units with Family and Married Couple Households by Community 2016

Community	% of Occupied Housing Units that are Family Households	% of Occupied Housing Units that are Married Couple Households
Ashburnham	72.1%	61.4%
Athol	60.3%	40.8%
Erving	64.6%	51.0%
Gardner	60.9%	36.7%
Hubbardston	75.9%	64.9%
New Salem	68.0%	51.5%
Orange	62.0%	43.7%
Petersham	64.9%	54.5%
Phillipston	77.1%	66.3%
Royalston	71.5%	63.2%
Templeton	67.7%	57.6%
Warwick	59.1%	50.7%
Wendell	58.9%	43.6%
Westminster	73.8%	60.4%
Winchendon	71.9%	58.5%
Service Area Ave.	70.0%	53.7%
Franklin County*	59.2%	44.8%
Worcester County*	66.1%	49.4%
Massachusetts*	63.6%	46.9%
U.S.*	65.9%	48.2%
Source: American Community Survey 2012-2016 5-Year Estimates		

In comparing Athol and Heywood's Service Areas in Tables PC-17 and PC-18, the percentage of family household are comparable to that of the State and Nation for both Service Areas. In terms of Married Couple Households however, Heywood Hospital's Service Area has a population concentration nearly 9% higher than the National average and 11% higher than the State average.

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PC - 17 Occupied Housing Units with Family and Married Couple Households in Athol's Service Area

Community	% of Occupied Housing Units that are Family Households	% of Occupied Housing Units that are Married Couple Households
Athol	60.3%	40.8%
Erving	64.6%	51.0%
New Salem	68.0%	51.5%
Orange	62.0%	43.7%
Petersham	64.9%	54.5%
Phillipston	77.1%	66.3%
Royalston	71.5%	63.2%
Warwick	59.1%	50.7%
Wendell	58.9%	43.6%
Service Area Ave.	65.2%	51.7%
Franklin County*	59.2%	44.8%
Worcester County*	66.1%	49.4%
Massachusetts*	63.6%	46.9%
U.S.*	65.9%	48.2%
Source: American Community Survey 2012-2016 5-Year Estimates		

PC - 18 Occupied Housing Units with Family and Married Couple Households in Heywood's Service Area

Community	% of Occupied Housing Units that are Family Households	% of Occupied Housing Units that are Married Couple Households
Ashburnham	72.1%	61.4%
Gardner	60.9%	36.7%
Hubbardston	75.9%	64.9%
Templeton	67.7%	57.6%
Westminster	73.8%	60.4%
Winchendon	71.9%	58.5%
Service Area Ave.	70.4%	56.6%
Franklin County*	59.2%	44.8%
Worcester County*	66.1%	49.4%
Massachusetts*	63.6%	46.9%
U.S.*	65.9%	48.2%
Source: American Community Survey 2012-2016 5-Year Estimates		

Persons with Disabilities

In 2015, the US Department of Health and Human Services (HHS) conducted a joint report with the Centers for Disease Control & Prevention (CDC) and the National Institutes of Health (NIH) to draw attention to health disparities for people living with disabilities. Overall, the report found that people

with disabilities generally experience greater disparities in employment, health and health risk behaviors, and lack of access to healthcare services compared to people without disabilities.⁴

The American Community Survey 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 down to the County level. 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 greater percentage of their population living with hearing, cognitive, self-care and independent living difficulties, but not by a significant margin (1% or less). It is also important to note that Franklin County has a much smaller population than Worcester County, likely making the disability population percentages larger.

Table PC-19 presents a representation of the differences in disability status across Franklin and Worcester Counties, the Commonwealth of Massachusetts, and the US.

PC - 19 Disability Status as Percentage of the Population by County, State and Nation 2016

Disability Type	Franklin County	Worcester County	Massachusetts	United States
Hearing Difficulty				
Total Population with Disability	2,816	26,415	218,765	11,089,041
% Population with Disability	4.0%	3.3%	3.3%	3.5%
Vision Difficulty				
Total Population with Disability	1,400	14,543	128,612	7,231,542
% Population with Disability	2.0%	1.8%	1.9%	2.3%
Cognitive Difficulty				
Total Population with Disability	4,038	40,403	316,777	14,806,529
% Population with Disability	6.0%	5.3%	5.0%	5.0%
Ambulatory Difficulty				
Total Population with Disability	4,502	44,925	376,523	20,649,180
% Population with Disability	6.7%	5.9%	6.0%	7.0%
Self-Care Difficulty				
Total Population with Disability	2,106	20,335	157,785	7,877,505
% Population with Disability	3.1%	2.7%	2.5%	2.7%
Independent Living Difficulty				
Total Population with Disability	3,493	36,625	284,43	13,940,629
% Population with Disability	6.1%	5.9%	5.4%	5.8%
Source: American Community Survey 2012-2016 5-Year Estimates				

⁴ <https://www.cdc.gov/ncbddd/disabilityandhealth/features/unrecognizedpopulation.html>

Veteran Status

As a result of their time in service, many veterans come home and live much of their lives with serious health problems. From substance abuse, to mental health disorders, to Post Traumatic Stress Disorder (PTSD), and traumatic brain injuries; veterans experience these health issues at disproportionate rates when compared to non-veterans. As many as 22 veterans (mostly aged 18 to 44) commit suicide every single day in the United States due to a wide range of post-service health problems that reach beyond the scope of those mentioned above, as well as difficulties reintegrating into civilian life.⁵

That being said, it is important that Heywood Healthcare be attentive to the needs of the veteran community throughout the Service Area. Table PC-20 shows that, overall, the Service Area has a notably higher percentage population of those age 18 or older with veteran status (10.9%) than the State (6.4%) and Nation (8.0%). Particularly notable are the veteran populations in New Salem (13.9%), Templeton (12.8%), and Orange (12.4%). All 15 of the Service Area communities have a higher veteran population percentage than the State and Nation.

Additionally, the overall percentage of veterans living with a disability in the Service Area (23.2%) ranks lower than the State (28.1%) and Nation (28.3%). Some veteran communities however, have far more veterans living with a disability than other communities. Athol (40%), Orange (33.2%), and Wendell (31.3%) in particular have far more veterans with a disability than do Gardner (9.5%), Erving (15%) or Phillipston (15.4%).

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⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4671760/>

PC - 20 Veteran Status of Service Area Residents 2016

Community	# of Veterans	% of Civilian Population Over Age 18 w/ Veteran Status	% of Veterans with a Disability
Ashburnham	411	8.8%	24.6%
Athol	840	9.2%	40.0%
Erving	167	11.3%	15.0%
Gardner	1,650	10.3%	9.5%
Hubbardston	337	9.8%	26.4%
New Salem	114	13.9%	15.8%
Orange	761	12.4%	33.2%
Petersham	99	9.6%	24.2%
Phillipston	149	11.5%	15.4%
Royalston	123	11.1%	24.4%
Templeton	831	12.8%	18.7%
Warwick	72	11.1%	23.6%
Wendell	67	9.9%	31.3%
Westminster	574	9.7%	25.1%
Winchendon	916	11.4%	20.5%
Service area avg.	7,111	10.9%	23.2%
Franklin County	5,352	9.2%	28.9%
Worcester County	47,532	7.5%	25.9%
Massachusetts	340,288	6.4%	28.1%
U.S.	19,535,341	8.0%	28.3%
Source: American Community Survey 2012-2016 5-Year Estimates			

As can be seen in Tables PC-21 and PC-22, Athol Hospital's Service Area has a slightly higher percentage of the population with veteran status compared to Heywood (11.1% v. 10.5%); both are notably higher than the State (6.4%) and National averages (8%). In Heywood's Service area, veterans have a lower average percentage living with a disability (20.8% v. 24.8%) despite having nearly three times as many veterans compared to Athol's Service Area. Both Service Areas have a lower average percentage of veterans living with a disability compared to the State and Nation. However, in Athol Hospital's Service Area, Athol (40%), Orange (33.2%), and Wendell (31.3%) individually have higher percentages of veterans with disabilities than both counties, the State and the Nation. This is illustrated in Chart PC-23.

PC - 21 Veteran Status of Residents in Athol Hospital's Service Area 2016

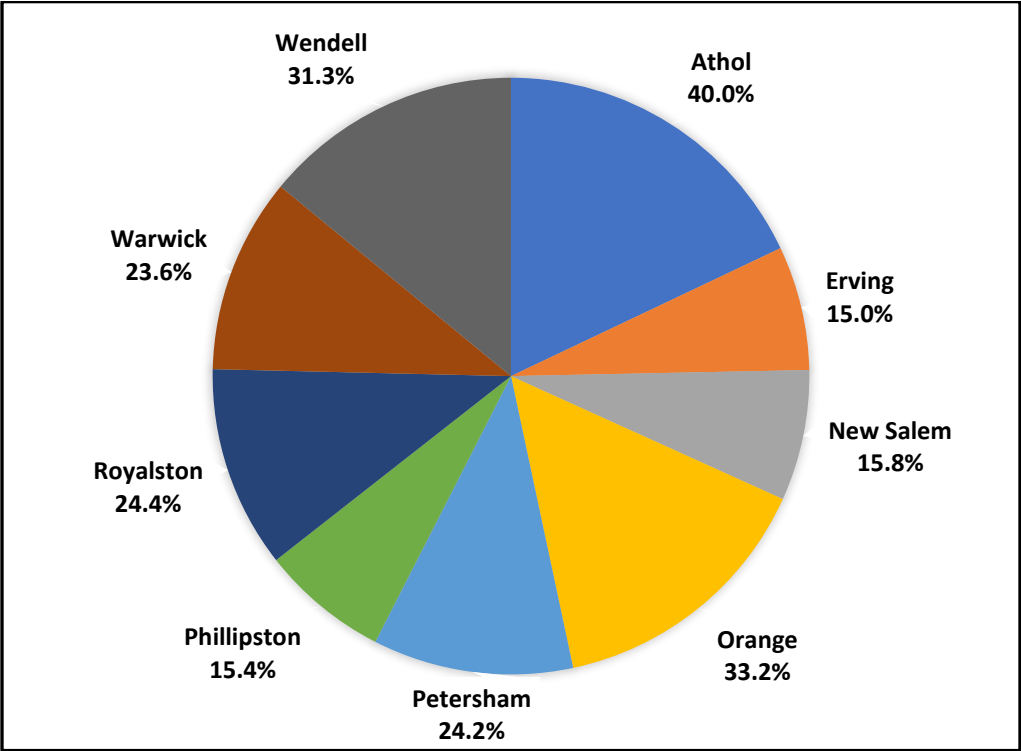
Community	# of Veterans	% of Civilian Population Over Age 18 w/ Veteran Status	% of Veterans with a Disability
Athol	840	9.2%	40.0%
Erving	167	11.3%	15.0%
New Salem	114	13.9%	15.8%
Orange	761	12.4%	33.2%
Petersham	99	9.6%	24.2%
Phillipston	149	11.5%	15.4%
Royalston	123	11.1%	24.4%
Warwick	72	11.1%	23.6%
Wendell	67	9.9%	31.3%
Service Area Ave.	266	11.1%	24.8%
Franklin County*	5,352	9.2%	28.9%
Worcester County*	47,532	7.5%	25.9%
Massachusetts*	340,288	6.4%	28.1%
U.S.*	19,535,341	8.0%	28.3%
Source: American Community Survey 2012-2016 5-Year Estimates			

PC - 22 Veteran Status of Service Area Residents in Heywood Hospital's Service Area 2016

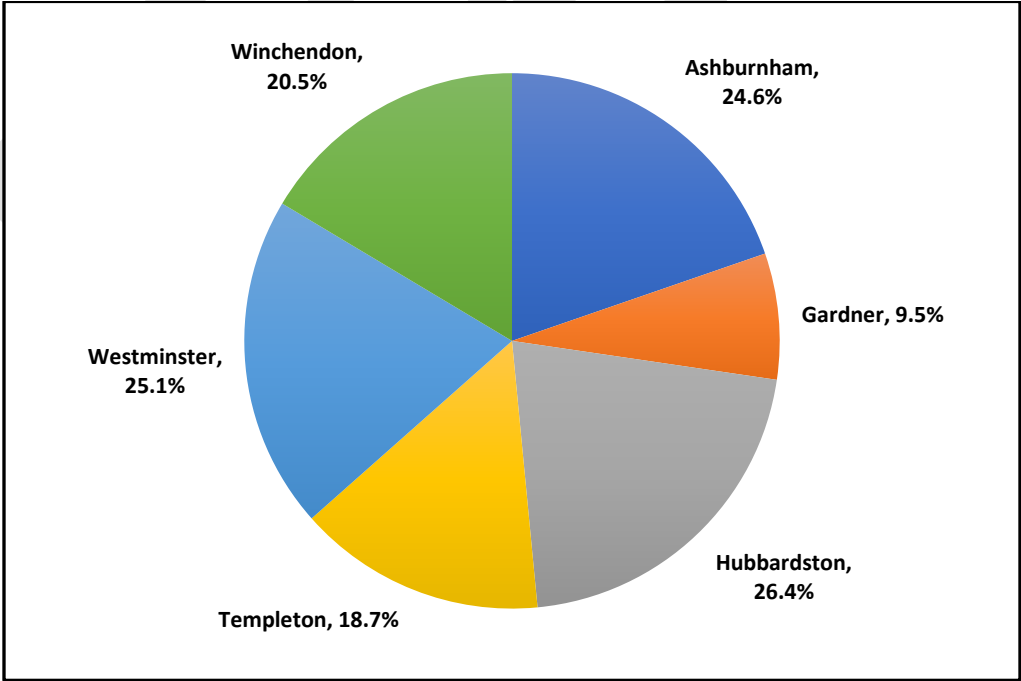
Community	# of Veterans	% of Civilian Population Over Age 18 w/ Veteran Status	% of Veterans with a Disability
Ashburnham	411	8.8%	24.6%
Gardner	1,650	10.3%	9.5%
Hubbardston	337	9.8%	26.4%
Templeton	831	12.8%	18.7%
Westminster	574	9.7%	25.1%
Winchendon	916	11.4%	20.5%
Service Area Average	787	10.5%	20.8%
Franklin County*	5,352	9.2%	28.9%
Worcester County*	47,532	7.5%	25.9%
Massachusetts*	340,288	6.4%	28.1%
U.S.*	19,535,341	8.0%	28.3%
Source: American Community Survey 2012-2016 5-Year Estimates			

Charts PC-23 and PC-24 show the percentage of veterans who are disabled out of all veterans in Athol and Heywood Hospital's Service Areas.

PC – 23 Percentage of Veterans Who are Disabled in Athol Hospital’s Service Area



PC – 24 Percentage of Veterans Who are Disabled in Heywood Hospital’s Service Area





Community Perceptions

"Organizations and businesses in the area exploit the socioeconomic and demographic characteristics of the area for grant funding but do not actually use the money to serve the community...."

"There is a lack of education about other cultures and religions that exist in the region often making some people misunderstood in the eyes of some in the community... we need programs and training to help fix this problem and there is none..."

"Minority members of the community who feel targeted by current events are experiencing high levels of anxiety.... Particularly brown and black people of all backgrounds as well as women and immigrants... they do not trust healthcare providers and it takes years to build up that trust..."

"We need more interpretive services in hospitals...at least in the ER..."



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's 15 communities. Communities in the Service Area vary greatly in terms of their social and economic factors; some communities are more rural while others are more urban; others are considered more affluent while some are considered to be economically disadvantaged; still others have more businesses, while some have little to no businesses supporting the tax base and providing employment. Due to these and other factors, the health disparities and inequities experienced by people in the region vary widely from community to community.

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

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

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Income and Employment

- There are wide-ranging disparities in per capita, as well as median family and household incomes across the Service Area
- Unemployment rates are at their lowest since before the Great Recession in all 15 communities
- Education, Health & Social Services jobs (25% of 41,000 employees) dominate employment numbers throughout the region followed by Manufacturing and Retail jobs (16%)
- Overall, wages in the Service Area have increased by nearly \$200 million since 2000, but wages have decreased significantly in select communities
- Gardner, Athol, Wendell, and Orange have the highest poverty rates at 19%, 17%, 16.1%, and 13.7%
- Athol has poverty rates for those under 18 of 24.8% and those under 5 of 25.4% at higher rates than the State (14.9% and 16.7%) and Nation (21.2% and 23.6%). Gardner rates are even higher with 30.4% of children under 18 and 25.4% of children under five living below poverty.
- Athol's and Gardner's childhood poverty rates have increased 6.4% and 22.6% respectively since the last CHNA in 2015 with data from 2013 and 2016.

- 5.5% of households have single women with children under 18 throughout the Service Area with higher percentages noted in Gardner (9.3%), Athol (8.2%), Orange (7.4%) and Winchendon (7.1%)
- The unemployment rates of veterans in either Service Area are higher than the unemployment rate for non-veterans everywhere else.
- In four communities in the Service Area, the unemployment rate for veterans reaches beyond 10%; Warwick (10.5%), Athol (10.9%), Orange (11.5%), and Royalston (12.1%).

Education

- There are twenty elementary schools, seven middle schools and fourteen high schools that are public in the Service Area
- More than 95% of all students in the Service Area attend public schools, with the exception of Petersham, Wendell, and Winchendon
- The Hispanic student population in the Service Area has increased 45.1% over the years, much more than the 29.9% increase in Hispanic students Statewide.
- The percent change of Multi-Race Non-Hispanic students is an average of 53% in the Service Area
- 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 percent of high needs students.
- The three districts with the highest percentages of chronically absent students are Athol-Royalston (23.8%), Gardner (19.3%), and Gill-Montague (18.4%)
- There are six (6) communities with higher percentages of residents with no high school diploma compared to the State (10%); Gardner (13.7%), Athol (13.5%), Orange/Winchendon (11.9%), Royalston (11%) and Warwick (10.4%).

Housing and Homelessness

- As of 2010, 8.4% of households in the Service Area consisted of 65+ year old individuals living alone, lower than the State (10.7%) and Nation (9.4%). Some communities have more than others; the highest being in Gardner and Orange both with 12.8%.
- Gardner, Athol, Orange and Winchendon qualify as Environmental Justice (EJ) Populations according to the Commonwealth's EJ Policy
- The communities with the highest percent of residents paying more than 30% of their income on a mortgage and higher than the State average (32.7%) are Warwick (46.7%), Orange (43.4%), Wendell (42.9%), Winchendon (36%), Gardner (33.9%), and Petersham (33.2%)
- The residents that are paying more than 30% of their income on rent greater than the State (50.1%) are Warwick (91.7%), Wendell (74.3%), Orange (67.7%), Templeton (64.5%), and Phillipston (53.6%), with Winchendon tied with the State at 50.1%.

Transportation

- Service Area residents have greater access to vehicles for personal and professional use, but have longer commute times overall when compared to the State and National averages
- Each community in the Service Area has transportation provided by the Regional Transit Authority for seniors in that community to travel to appointments and shopping
- MassHealth provides medical transportation for its members through a PT-1 form submitted by the members to the Regional Transit Authorities.

- Every Focus Group and Stakeholder Interview completed cited transportation as a major issue in the Service Area.
- In FY17, Athol Hospital provided transportation for 87 patients and Heywood Hospital provided 156 rides for patients.
- According to the Food Access Research Atlas large areas of Orange, Athol and Gardner qualify as Low Income and Low Access at one (1) and 10 miles, one (1) in 20 miles and using vehicle access.

Crime Statistics:

- Erving has a higher rate than the State in eight out of ten crime categories presented, Athol and Gardner have higher rates in seven out of ten categories, Winchendon has six out of ten higher, Orange has five out of ten higher, Ashburnham has three out of ten higher and Templeton and Westminster are only higher than the State in one out of ten categories.
- All eight of the Service Area communities listed have higher sex offenses rates than the State (0.28). with the exception of Westminster (0.26)
- The assault rate for Massachusetts is 8.89 and Winchendon (15.38), Athol (11.37), Erving (10.16), and Orange (9.59) have higher rates than the State.

Massachusetts Department of Corrections

- On January 1, 2018, 30% of males and 70% of females in MA DOC custody had an open mental health case, and 21% of males and 56% of females were prescribed psychotropic medication.
- As of January 1, 2018, 42% of males and 29% of females entered MA DOC with less than a 9th grade reading level
- As of April 1, 2018, 95% of males and 64% of females were serving a sentence of more than three years
- Regular monthly reentry meetings continue to be held throughout the agency to ensure that inmates being released to the community have a comprehensive and realistic plan, to include housing, aftercare services, health coverage, and other related information that may assist them upon release.

Income

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

As depicted in Table SE-1, the per capita income for the State of Massachusetts in 2016 was \$38,069; while that of the service area was \$30,527 (a difference of \$7,542). The highest per capita income in the region came from Westminster where individual workers earned \$41,812 on average (roughly 37% higher than the service area average), followed by Ashburnham at \$35,860 (18% higher), and New Salem at \$35,585 (17%). The lowest per capita incomes came from Orange at \$21,854 (28% lower than the service area average), Gardner at \$24,680 (19% lower), and Athol at \$24,962 (18% lower). Warwick (3%) was the only community to actually hold a per capita income within plus or minus 5% of the service area average. Westminster (37%), and Orange (-28%) were outliers on the higher and lower end of the spectrum. 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 (\$29,829).

In comparing per capita income levels from the previous CHNA (2013 data), incomes have gone up overall throughout the Service Area. As seen in Table SE – 1, Westminster saw the largest increase in per capita income at \$6,952; followed by Templeton at \$4,805 and New Salem at \$3,705. On average, per capita income increased by nearly \$2,000. In only two communities did per capita incomes decrease; Phillipston (-\$312) and Warwick (-\$2,215).

SE - 1 Average Per Capita Income in the Service Area Compared to Massachusetts 2013 vs. 2016

Community	Average per capita income by town compared to Mass (2013)	Average per capita income by town compared to Mass (2016)
Ashburnham	\$34,454	\$35,860
Athol	\$23,036	\$24,962
Erving	\$25,165	\$27,169
Gardner	\$23,327	\$24,680
Hubbardston	\$33,730	\$34,042
New Salem	\$31,880	\$35,585
Orange	\$21,203	\$21,854
Petersham	\$31,904	\$35,322
Phillipston	\$28,307	\$27,995
Royalston	\$27,999	\$28,335
Templeton	\$27,657	\$32,462
Warwick	\$33,803	\$31,588
Wendell	\$27,575	\$28,709
Westminster	\$34,860	\$41,812
Winchendon	\$27,204	\$27,530
Service Area Average	\$28,807	\$30,527
Franklin County	\$30,584	\$31,689
Worcester County	\$32,284	\$33,272
Massachusetts	\$35,763	\$38,069
U.S.	\$28,930	\$29,829
Source: 2012-2016 American Community Survey 5-Year Estimates		

Overall, Athol Hospital's Service Area residents have lower per capita income levels than Heywood by nearly \$4,000. Here it is important to breakdown the difference in each Service Area by community because the rates vary greatly. As shown in Table SE-2 for Athol's Service Area, three communities in particular have significantly lower per capita income rates compared to the Service Area overall (\$29,058) that drive down the average; Athol (\$24,963), Erving (\$27,169) and Orange (\$21,854). There are two communities that have notably higher rates that raise per capita income rates in the other direction; New

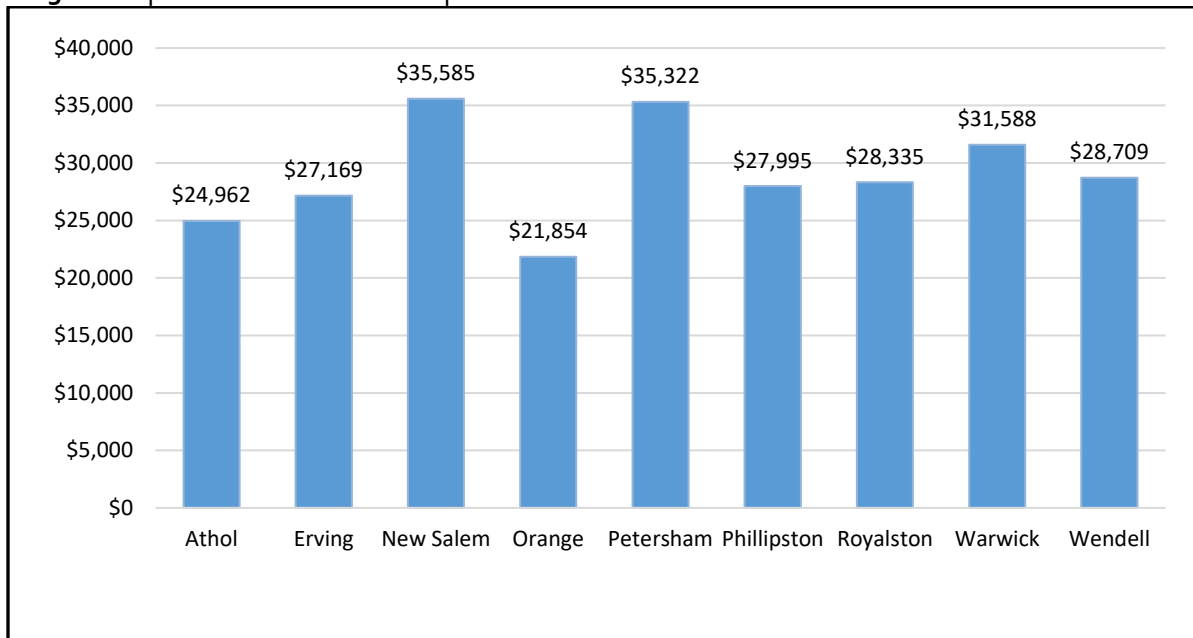
Salem (\$35,585) and Petersham (\$35,322). In Table SE-4, Heywood's Service Area has a similar pattern of per capita income differences with two communities that drag the overall average (\$32,731) down; Gardner (\$24,680) and Winchendon (\$27,530). On the opposite side of the spectrum, three communities pull the area average up; Hubbardston (\$34,042), Ashburnham (\$35,860) and Westminster (\$41,812). Two of Athol Hospital's communities saw per incomes decline as noted above in Phillipston (-\$312) and Warwick (-\$2,215). All of Heywood Hospital's communities saw increases in per capita incomes from 2013 to 2016. It is clear from Charts SE-3 and SE-5 that income distributions are uneven across both Service Areas, creating challenges in anticipating healthcare affordability for both Service Area's communities.

SE - 2 Per Capita Income in Athol Hospital's Service Area Compared to Massachusetts 2013 vs. 2016

Community	Average per capita income by town compared to Mass (2013)	Average per capita income by town compared to Mass (2016)
Athol	\$23,036	\$24,962
Erving	\$25,165	\$27,169
New Salem	\$31,880	\$35,585
Orange	\$21,203	\$21,854
Petersham	\$31,904	\$35,322
Phillipston	\$28,307	\$27,995
Royalston	\$27,999	\$28,335
Warwick	\$33,803	\$31,588
Wendell	\$27,575	\$28,709
Service Area Average	\$27,875	\$29,058
Franklin County	\$30,584	\$31,689
Worcester County	\$32,284	\$33,272
Massachusetts	\$35,763	\$38,069
U.S.	\$28,930	\$29,829
Source: 2012-2016 American Community Survey 5-Year Estimates		

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SE – 3 Per Capita Income in Athol Hospital's Service Area 2016 Estimates

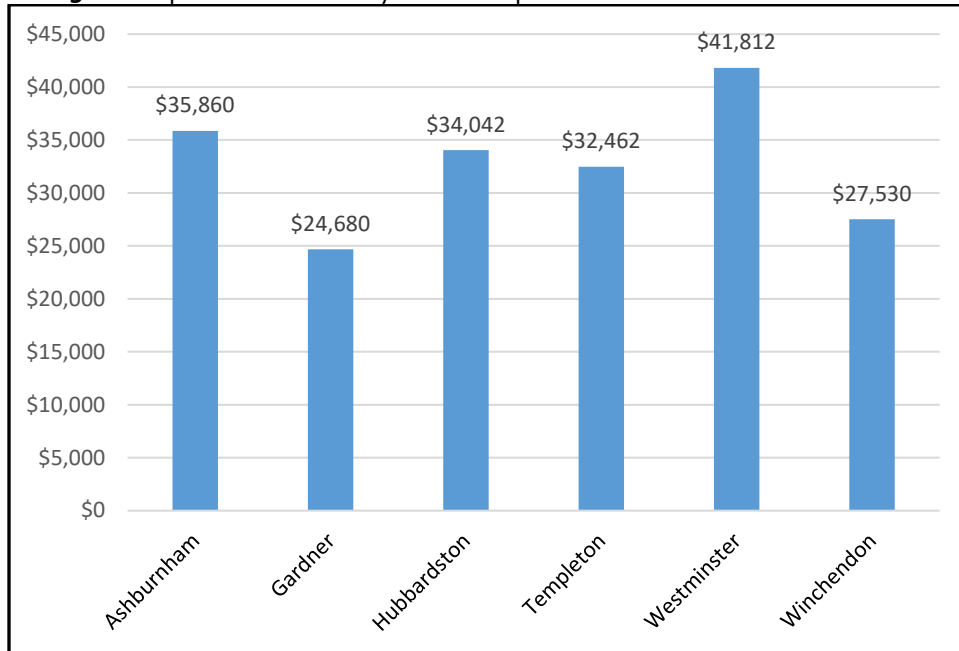


SE - 4 Per Capita Income in Heywood Hospital's Service Area Compared to Massachusetts 2013 vs. 2016

Community	Average per capita income by town compared to Mass (2013)	Average per capita income by town compared to Mass (2012-2016 Estimates)
Ashburnham	\$34,454	\$35,860
Gardner	\$23,327	\$24,680
Hubbardston	\$33,730	\$34,042
Templeton	\$27,657	\$32,462
Westminster	\$34,860	\$41,812
Winchendon	\$27,204	\$27,530
Service Area Average	\$30,205	\$32,731
Franklin County	\$30,584	\$31,689
Worcester County	\$32,284	\$33,272
Massachusetts	\$35,763	\$38,069
U.S.	\$28,930	\$29,829

Source: 2012-2016 American Community Survey 5-Year Estimates

SE – 5 Per Capita Income in Heywood Hospital's Service Area 2016 Estimates



Another measure of wealth in a community is its median household income. In Table SE-6, 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 2012-2016 Estimates, the Service Area's average median household income (\$64,649) is higher than the Nation (\$55,322), but lower than the State (\$70,954). Household income varies from community to community with Westminster leading the pack at \$96,953 per year; Orange ranks lowest at \$37,183 per year. The remaining seven communities have median household incomes lower than the Service Area average. In comparing 2013 median household incomes, the Service Area saw an average of a nearly \$500 increase across communities. Westminster saw the largest increase in median household income at over \$13,000 and Orange saw the largest decrease at nearly -\$15,000. Despite overall increases, the average median household income grew less than the Commonwealth as well as Franklin and Worcester Counties.

Additionally, the region's median family income ranges vastly from community to community, ranging from \$55,920 in Orange to \$106,273 in Westminster as indicated in Table SE-4 below. Just three of the communities in Heywood's service area have median family incomes higher than the Commonwealth (\$90,180): Ashburnham (\$105,106), Westminster (\$106,273), and Hubbardston (\$94,512). The lowest median family incomes are in Orange (\$55,920), Gardner (\$59,007), Wendell (\$60,625), and Athol (\$60,716). Median family incomes increased by an average of just over \$4,000 across the Service Area with Westminster seeing the largest increase at just over \$12,000 and Petersham seeing the largest decrease at nearly -\$10,500.

SE - 6 Median Household and Family Incomes in the Service Area by Community 2013 v. 2016

Community	Median Household Income (2013)	Median Family Income (2013)	Median Household Income (2016)	Median Family Income (2016)
Ashburnham	\$83,532	\$99,159	\$86,219	\$105,106
Athol	\$46,946	\$59,688	\$47,642	\$60,716
Erving	\$54,735	\$63,333	\$62,171	\$75,139
Gardner	\$48,843	\$63,184	\$46,410	\$59,007
Hubbardston	\$86,973	\$93,615	\$84,805	\$94,512
New Salem	\$72,656	\$73,063	\$71,373	\$79,432
Orange	\$52,099	\$52,598	\$37,183	\$55,920
Petersham	\$72,917	\$89,167	\$65,774	\$78,750
Phillipston	\$71,989	\$76,857	\$73,750	\$79,338
Royalston	\$60,750	\$67,237	\$68,068	\$77,625
Templeton	\$65,165	\$77,912	\$67,515	\$89,046
Warwick	\$55,859	\$72,344	\$56,838	\$79,844
Wendell	\$48,000	\$60,000	\$43,036	\$60,625
Westminster	\$83,840	\$94,232	\$96,953	\$106,273
Winchendon	\$58,288	\$78,969	\$61,998	\$80,060
Service Area Average	\$64,173	\$74,757	\$64,649	\$78,760
Worcester County	\$65,223	\$81,519	\$67,005	\$85,560
Franklin County	\$53,663	\$67,785	\$56,347	\$73,782
Massachusetts	\$66,866	\$84,900	\$70,954	\$90,180
United States	\$53,046	\$64,719	\$55,322	\$67,871

Source: 2012-2016 American Community Survey 5-Year Estimates

Athol Hospital's Service Area household and family incomes vary greatly from Heywood Hospital's. Overall, the average Median Household Income (MHI) for Athol's service area is \$58,426 compared to Heywood's \$73,983; and Median Family Income (MFI) for Athol's is \$71,932 compared to Heywood's \$89,001. The communities with the highest MHI in Athol's Service Area are Phillipston (\$73,750) and New Salem (\$71,373); those with the lowest MHI are Wendell (\$43,036) and Orange (\$37,183). Phillipston (\$79,338) and New Salem (\$79,432) also have two of the highest MFI's just behind Warwick (\$79,844). The communities with the highest MHI in Heywood's Service Area are Westminster (\$96,953) and Ashburnham (\$86,219); and the lowest MHI by far was 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 MFI's 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 largest increase in MHI. Median Family Income increased by nearly \$4,000 overall. In Heywood Hospital's Service Area, there was a nearly \$3,000 increase in MHI and \$5,000 increase in MFI. All communities saw an increase in MFI throughout Heywood Hospital's Service Area. The household and family income distributions of Athol Hospital's and Heywood Hospital's Service Areas are depicted in Tables SE-7 and SE-8.

SE - 7 Median Household and Family Incomes in Athol Hospital's Service Area 2016

Community	Median Household Income (2013)	Median Family Income (2013)	Median Household Income (2016)	Median Family Income (2016)
Athol	\$46,946	\$59,688	\$47,642	\$60,716
Erving	\$54,735	\$63,333	\$62,171	\$75,139
New Salem	\$72,656	\$73,063	\$71,373	\$79,432
Orange	\$52,099	\$52,598	\$37,183	\$55,920
Petersham	\$72,917	\$89,167	\$65,774	\$78,750
Phillipston	\$71,989	\$76,857	\$73,750	\$79,338
Royalston	\$60,750	\$67,237	\$68,068	\$77,625
Warwick	\$55,859	\$72,344	\$56,838	\$79,844
Wendell	\$48,000	\$60,000	\$43,036	\$60,625
Service Area Average	\$59,550	\$68,254	\$58,426	\$71,932
Worcester County	\$65,223	\$81,519	\$67,005	\$85,560
Franklin County	\$53,663	\$67,785	\$56,347	\$73,782
Massachusetts	\$66,866	\$84,900	\$70,954	\$90,180
United States	\$53,046	\$64,719	\$55,322	\$67,871

Source: 2012-2016 American Community Survey 5-Year Estimates

SE - 8 Median Household and Family Incomes in Heywood Hospital's Service Area 2016

Community	Median Household Income (2013)	Median Family Income (2013)	Median Household Income (2016)	Median Family Income (2016)
Ashburnham	\$83,532	\$99,159	\$86,219	\$105,106
Gardner	\$48,843	\$63,184	\$46,410	\$59,007
Hubbardston	\$86,973	\$93,615	\$84,805	\$94,512
Templeton	\$65,165	\$77,912	\$67,515	\$89,046
Westminster	\$83,840	\$94,232	\$96,953	\$106,273
Winchendon	\$58,288	\$78,969	\$61,998	\$80,060
Service Area Average	\$71,107	\$84,512	\$73,983	\$89,001
Worcester County	\$65,223	\$81,519	\$67,005	\$85,560
Franklin County	\$53,663	\$67,785	\$56,347	\$73,782
Massachusetts	\$66,866	\$84,900	\$70,954	\$90,180
United States	\$53,046	\$64,719	\$55,322	\$67,871

Source: 2012-2016 American Community Survey 5-Year Estimates

It is also important to highlight the economic status and well-being of Service Area veterans to identify disparities in social determinants of health. Table SE-9 compares median incomes and unemployment rates of veterans compared to the overall community in 2016. The median income of veterans in some areas like Orange are as low as \$19,985 while they are as high as \$77,823 in Westminster. The unemployment rates are notably higher for veterans as well when compared to the community overall in nearly every community. In four communities in the Service Area, the unemployment rate for veterans

reaches beyond 10%: Warwick (10.5%), Athol (10.9%), Orange (11.5%), and Royalston (12.1%). There are five communities that reportedly have 0% unemployment rates for veterans, however; the ACS Estimates require sample sizes of a particular size in order to make the most accurate predictions. In the five communities that say 0%, the margins of error ranged from 12.6% (Westminster) to as high as 60.5% (Wendell) indicating that the sample sizes for these communities were too small to get a true unemployment figure.

Interesting to note here is the median income of veterans on average compared to the Service Area where it appears that veterans make more money on average than the community overall. While that can seem like a great thing, there is a large income gap among veterans depending on the community; it can be as high as \$77,823 in Westminster, but as low as \$19,985 in Orange. There are nine (9) communities in which veterans have a higher median income than the community they reside in, and six (6) where they do not.

SE - 9 Economic Well-Being of Service Area Veterans 2016

Community	Median Income of Veterans	Overall Median Income	Unemployment Rate of Veterans	Overall Unemployment Rate 2016*
Ashburnham	\$63,272	\$45,341	7.3%	3.6%
Athol	\$30,570	\$34,928	10.9%	5.0%
Erving	\$40,417	\$32,349	0.0%	3.0%
Gardner	\$34,750	\$31,446	5.2%	5.2%
Hubbardston	\$41,125	\$41,320	9.0%	3.3%
New Salem	\$49,167	\$41,188	8.6%	3.0%
Orange	\$19,985	\$29,309	11.5%	4.8%
Petersham	\$30,625	\$37,230	0.0%	3.4%
Phillipston	\$53,958	\$36,103	0.0%	4.0%
Royalston	\$44,464	\$35,331	12.1%	4.4%
Templeton	\$35,292	\$38,145	5.2%	4.1%
Warwick	\$36,000	\$32,125	10.5%	2.6%
Wendell	\$31,250	\$25,100	0.0%	4.4%
Westminster	\$77,823	\$50,384	0.0%	3.5%
Winchendon	\$35,811	\$34,107	5.5%	4.2%
Service Area Average	\$41,634	\$36,294	5.7%	3.9%
Franklin County	\$34,041	\$32,404	4.2%	6.1%
Worcester County	\$37,565	\$37,697	8.1%	6.7%
Massachusetts	\$40,109	\$38,792	7.3%	4.6%
U.S.	\$38,175	\$31,334	6.4%	7.4%

Source: American Community Survey 2012-2016 5-Year Estimates *Overall Unemployment Rates for 2016 from MA Department of Labor and Workforce Development

In Heywood's Service area, veterans have a lower unemployment rate (5%) than Athol's Service Area (6%) and higher per capita income (\$48,012 v. \$37,382) despite having nearly three times as many veterans compared to Athol Hospital's Service Area. Important to note here is the communities in Athol

Hospital's Service Area that have a veteran population with double digit unemployment rates: Athol (10.9%), Orange (11.5%), Royalston (12.1%) and Wendell (10.5%). No communities in Heywood's Service Area has a veteran population with double digit unemployment rates. Regardless, the unemployment rates of veterans in either Service Area is higher than the unemployment rate for non-veterans everywhere else. Tables SE-10 and SE-11 break down each Service Area's veteran medium income and unemployment.

SE - 10 Economic Well-Being of Athol Hospital Service Area Veterans 2016

Community	Median Income of Veterans	Overall Median Income	Unemployment Rate of Veterans	Overall Unemployment Rate 2016*
Athol	\$30,570	\$34,928	10.9%	5.0%
Erving	\$40,417	\$32,349	0.0%	3.0%
New Salem	\$49,167	\$41,188	8.6%	3.0%
Orange	\$19,985	\$29,309	11.5%	4.8%
Petersham	\$30,625	\$37,230	0.0%	3.4%
Phillipston	\$53,958	\$36,103	0.0%	4.0%
Royalston	\$44,464	\$35,331	12.1%	4.4%
Warwick	\$36,000	\$32,125	10.5%	2.6%
Wendell	\$31,250	\$25,100	0.0%	4.4%
Service Area Average	\$37,382	\$33,740	6.0%	3.8%
Franklin County*	\$34,041	\$32,404	4.2%	6.1%
Worcester County*	\$37,565	\$37,697	8.1%	6.7%
Massachusetts*	\$40,109	\$38,792	7.3%	4.6%
U.S.*	\$38,175	\$31,334	6.4%	7.4%
Source: American Community Survey 2012-2016 5-Year Estimates *Overall Unemployment Rates for 2016 from MA Dept of Labor and Workforce Development				

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SE - 11 Economic Well-Being of Heywood Hospital Service Area Veterans 2016

Community	Median Income of Veterans	Overall Median Income	Unemployment Rate of Veterans	Overall Unemployment Rate 2016*
Ashburnham	\$63,272	\$45,341	7.3%	3.6%
Gardner	\$34,750	\$31,446	5.2%	5.2%
Hubbardston	\$41,125	\$41,320	9.0%	3.3%
Templeton	\$35,292	\$38,145	5.2%	4.1%
Westminster	\$77,823	\$50,384	0.0%	3.5%
Winchendon	\$35,811	\$34,107	5.5%	4.2%
Service Area Average	\$48,012	\$40,124	5.4%	4.0%
Franklin County*	\$34,041	\$32,404	4.2%	6.1%
Worcester County*	\$37,565	\$37,697	8.1%	6.7%
Massachusetts*	\$40,109	\$38,792	7.3%	4.6%
U.S.*	\$38,175	\$31,334	6.4%	7.4%
Source: American Community Survey 2012-2016 5-Year Estimates *Overall Unemployment Rates for 2016 from MA Dept of Labor and Workforce Development				

Poverty

Another measure of wealth in a community is the poverty rate. Table SE-12 shows that there is less poverty in the service area overall (9.7%) when compared to the State (11.4%), Nation (15.1%) and even Franklin (11.3%) and Worcester (11.4%) Counties. However, the poverty rates do vary greatly between the city and towns in the Service Area. Gardner, Athol, Wendell, and Orange have the highest poverty rates at 19%, 17%, 16.1%, and 13.7%. On the other end of the spectrum; Westminster, Petersham/Phillipston and Hubbardston have the lowest poverty rates at 2.8%, 4.7% (Petersham/Phillipston) and 4.9% respectively. Eight communities in the area have poverty rates lower, and seven have poverty rates higher than the 9.9% average for the Service Area. Gardner, Athol and Wendell have poverty rates higher than the national average.

Childhood poverty rates are significantly higher in some of these cities and towns than the overall poverty rates. In 2016, just under one-third of Gardner residents under age 18 (30.4%) lived below the poverty line. Other notable towns include Athol (24.8%), Erving (20.7%) and Winchendon (18%). All of these communities hold poverty rates higher than the State (14.9%), and some are higher than the Nation overall (21.2%). Perhaps more disheartening is the poverty rate in some communities of those less than 5 years of age; Gardner (27.9%) and Athol (25.4%) have incredibly higher rates of poverty for this age group when compared to the State (16.7%) and Nation (23.6%). Winchendon has an alarmingly high poverty rate for those less than 5 years old at 44.2%. Table SE-12 provides the full spectrum of poverty throughout the Service Area.

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 fully develop and avoid future health problems. 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”.⁶ Furthermore, “poverty begets poverty”; those born into it are very likely to remain in it and pass it down to the next generation.⁷ Such a high percentage of young people living in poverty in cities like Gardner are 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.

SE - 12 Poverty Rates in the Service Area by Community 2016

Community	% of pop below 100% of poverty level by town	% of under 18 years old below poverty level in 2016	% of under 5 years old below poverty level in 2016	% of population 65+ years living below 100% of the poverty level in 2016
Ashburnham	6.2%	0.0%	0.0%	6.6%
Athol	17.0%	24.8%	25.4%	7.1%
Erving	11.2%	20.7%	17.0%	5.2%
Gardner	19.0%	30.4%	27.9%	8.0%
Hubbardston	4.9%	6.1%	7.5%	4.4%
New Salem	5.8%	1.0%	0.0%	6.9%
Orange	13.7%	16.2%	10.7%	12.7%
Petersham	4.7%	4.0%	8.0%	4.8%
Phillipston	4.7%	4.0%	10.8%	3.3%
Royalston	10.4%	12.4%	20.0%	3.3%
Templeton	8.7%	11.3%	9.6%	8.2%
Warwick	8.9%	13.5%	0.0%	7.9%
Wendell	16.1%	15.2%	4.2%	6.5%
Westminster	2.8%	2.3%	0.0%	0.0%
Winchendon	11.8%	18.0%	44.2%	6.1%
Service Area Ave.	9.7%	12.0%	12.4%	6.1%
Franklin County	11.3%	15.8%	15.5%	6.5%
Worcester County	11.4%	14.7%	17.4%	9.0%
Massachusetts	11.4%	14.9%	16.7%	9.0%
U.S.	15.1%	21.2%	23.6%	9.3%

Source: 2012-2016 American Community Survey 5-Year Estimates

Across the board for both Athol and Heywood Hospital’s Service Areas, the poverty rates are notably lower than the State and National averages as depicted in Tables SE-13 and SE-14. That being said, the levels of poverty vary greatly from community to community in both Service Areas. In Athol’s Service Area, Athol (17%), Wendell (16.1%) and Orange (13.7%) have the highest poverty rates overall with Petersham and Phillipston having significantly lower rates at 4.7% each. In Heywood’s Service Area, Gardner (19%) and Winchendon (11.8%) have the highest poverty rates overall and Westminster (2.8%) and Hubbardston (4.9%) fall on the lower end of the spectrum. Particularly concerning for Heywood Healthcare is the childhood poverty rates across both Service Areas. For example, the Town of Athol has poverty rates for those under 18 (24.8%) and those under five (25.4%) at higher rates than the State

⁶ http://www.who.int/tobacco/research/economics/publications/oecd_dac_pov_health.pdf

⁷ http://opencommons.uconn.edu/cgi/viewcontent.cgi?article=1544&context=srhonors_theses

(14.9% and 16.7%) and the Nation (21.2% and 23.6%). This is also a slight increase from the Athol 2013 childhood poverty rate of 23.3% in the 2015 CHNA. Rates in the City of Gardner are even higher with 30.4% of children under 18 and 25.4% of children under five living below poverty. This rate in Gardner is significantly higher than the 2013 rate of 24.8% in the 2015 CHNA. Conversely, since 2010 and the last CHNA, the percent of the population over 65 living below the 100% poverty level has decreased in Templeton, from 16.8% to 8.2%; in Gardner, from 12.5% to 8.0%; and in Westminster, from 8.3% to 0%.

SE - 13 Poverty Rates in Athol Hospital's Service Area by Community 2016

Community	% of pop below 100% of poverty level by town	% of under 18 years old below poverty level in 2016	% of under 5 years old below poverty level in 2016	% of population 65+ years living below 100% of the poverty level in 2016
Athol	17.0%	24.8%	25.4%	7.1%
Erving	11.2%	20.7%	17.0%	5.2%
New Salem	5.8%	1.0%	0.0%	6.9%
Orange	13.7%	16.2%	10.7%	12.7%
Petersham	4.7%	4.0%	8.0%	4.8%
Phillipston	4.7%	4.0%	10.8%	3.3%
Royalston	10.4%	12.4%	20.0%	3.3%
Warwick	8.9%	13.5%	0.0%	7.9%
Wendell	16.1%	15.2%	4.2%	6.5%
Service Area Ave.	10.3%	12.4%	10.7%	6.4%
Franklin County	11.3%	15.8%	15.5%	6.5%
Worcester County	11.4%	14.7%	17.4%	9.0%
Massachusetts	11.4%	14.9%	16.7%	9.0%
U.S.	15.1%	21.2%	23.6%	9.3%

Source: 2012-2016 American Community Survey 5-Year Estimates

SE - 14 Poverty Rates in Heywood Hospital's Service Area by Community 2016

Community	% of pop below 100% of poverty level by town	% of under 18 years old below poverty level in 2016	% of under 5 years old below poverty level in 2016	% of population 65+ years living below 100% of the poverty level in 2016
Ashburnham	6.2%	0.0%	0.0%	6.6%
Gardner	19.0%	30.4%	27.9%	8.0%
Hubbardston	4.9%	6.1%	7.5%	4.4%
Templeton	8.7%	11.3%	9.6%	8.2%
Westminster	2.8%	2.3%	0.0%	0.0%
Winchendon	11.8%	18.0%	44.2%	6.1%
Service Area Ave.	8.9%	11.4%	14.9%	5.6%
Franklin County	11.3%	15.8%	15.5%	6.5%
Worcester County	11.4%	14.7%	17.4%	9.0%
Massachusetts	11.4%	14.9%	16.7%	9.0%
U.S.	15.1%	21.2%	23.6%	9.3%

Source: 2012-2016 American Community Survey 5-Year Estimates

In comparison to 2013 poverty levels, the Service Area has seen a slight decline in poverty overall from 10% to 9.7%. Despite this, seven communities have seen an increase in poverty rates. Most notably, Gardner saw an increase from 14.4% to 19% and Erving saw an increase from 8.3% to 11.2%. The remaining eight communities saw declines in poverty with Westminster dropping from 4.4% to 2.8%, Royalston dropping from 14.2% to 10.4% and Templeton dropping from 12.5% to 8.7%. Changes in poverty rates are displayed in Table SE-15.

SE - 15 Percentage of Service Area population living below poverty 2013 v. 2016

Community	% of pop below 100% of poverty level by town 2013	% of pop below 100% of poverty level by town 2016
Ashburnham	7.0%	6.2%
Athol	15.8%	17.0%
Erving	8.3%	11.2%
Gardner	14.4%	19.0%
Hubbardston	6.1%	4.9%
New Salem	7.2%	5.8%
Orange	12.7%	13.7%
Petersham	7.9%	4.7%
Phillipston	3.7%	4.7%
Royalston	14.2%	10.4%
Templeton	12.5%	8.7%
Warwick	11.1%	8.9%
Wendell	15.2%	16.1%
Westminster	4.4%	2.8%
Winchendon	10.2%	11.8%
Service Area Average	10.0%	9.7%
Franklin County	12.1%	11.3%
Worcester County	11.2%	11.4%
Massachusetts	11.4%	11.4%
U.S.	15.4%	15.1%

Source: 2012-2016 American Community Survey 5-Year Estimates

Household Composition

As can be seen in Table SE-16, communities with the highest percentages of households with married couples in 2010 include Hubbardston (67.4%), Ashburnham (63.9%), Westminster (62.3%), and Phillipston (62.1%). Throughout the Service Area, about 55% of households have married couples. Of those married couple households, 20.3% of them have children under 18, slightly higher than the State (19.7%) and Nation (20.2%). Important for Heywood Healthcare to be aware of, 5.5% of households have single women with children under 18 throughout the Service Area with higher percentages noted in Gardner (9.3%), Athol (8.2%), Orange (7.4%) and Winchendon (7.1%). This Service Area rate is lower than the State (6.8%) and Nation (7.2%). In the 2015 CHNA, Gardner also had the highest percentage of single

households. Gardner, Athol and Winchendon each also have the highest percentage of children under 18 living in poverty at 27.9%, Athol 25.4% and 44.2% respectively.

Equally important to Heywood Healthcare is the percentage of the population aged 65 or older that is living alone. As of 2010, 8.4% of households in the Service Area consisted of 65+ year old individuals living alone, lower than the State (10.7%) and Nation (9.4%). Some communities have more than others; the highest being in Gardner and Orange both with 12.8%, and the lowest being in Phillipston and Ashburnham at 5.1% and 5.7%, respectively.

SE - 16 Household Composition in the Service Area by Community 2010

Community	Percentage of Households Composed of Married Couples in 2010	Households Composed of Married Couples with Children Under Age 18 (2010)	Percentage of Households Composed of Single Women and Children Under Age 18 (2010)	Percentage of Population Aged 65 and Older Living Alone
Ashburnham	63.9	27.5	4.7	5.7
Athol	44.9	16.5	8.2	11.3
Erving	49.5	19.1	5.5	10.3
Gardner	41.7	15.1	9.3	12.8
Hubbardston	67.4	29.2	4.3	6.1
New Salem	57.4	18.3	5.0	6.7
Orange	46.1	16.6	7.4	12.8
Petersham	59.6	21.1	3.4	9.5
Phillipston	62.1	23.4	3.8	5.1
Royalston	55.6	19.1	6.4	8.2
Templeton	58.3	24.2	5.7	8.7
Warwick	55.0	15.2	2.4	6.4
Wendell	42.2	11.3	4.9	6.4
Westminster	62.3	25.7	4.5	6.7
Winchendon	52.5	21.8	7.1	9.2
Service Area Ave.	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: 2010 U.S. Census

In comparing Athol and Heywood Hospitals' Service Areas in Tables SE-17 and SE-18, household composition is similar across the board. Athol Hospital has a slightly smaller percentage of married couple households (57.7% v. 52.5%), married couple households with children (17.8% vs. 23.9%), and single mother households (5.2% vs. 5.9%), with a slightly higher percentage of those aged 65 or older living alone (8.5% vs. 8.2%). Overall, there are more family households in the Service Area and there are lower rates of those 65 and older living alone when compared to the State and Nation.

SE-17 Household Composition in Athol Hospital's Service Area by Community 2010

Community	% of Married Couple Households (2010)	Married Households with Children Under Age 18 (2010)	% of Single Mother Households with Children Under Age 18 (2010)	% of Population Aged 65 and Older Living Alone
Athol	44.9	16.5	8.2	11.3
Erving	49.5	19.1	5.5	10.3
New Salem	57.4	18.3	5.0	6.7
Orange	46.1	16.6	7.4	12.8
Petersham	59.6	21.1	3.4	9.5
Phillipston	62.1	23.4	3.8	5.1
Royalston	55.6	19.1	6.4	8.2
Warwick	55.0	15.2	2.4	6.4
Wendell	42.2	11.3	4.9	6.4
Service area avg.	52.5	17.8	5.2	8.5
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: 2010 U.S. Census

SE - 18 Household Composition in Heywood Hospital's Service Area by Community 2010

Community	% of Married Couple Households (2010)	Married Households with Children Under Age 18 (2010)	% of Single Mother Households with Children Under Age 18 (2010)	% of Population Aged 65 and Older Living Alone
Ashburnham	63.9	27.5	4.7	5.7
Gardner	41.7	15.1	9.3	12.8
Hubbardston	67.4	29.2	4.3	6.1
Templeton	58.3	24.2	5.7	8.7
Westminster	62.3	25.7	4.5	6.7
Winchendon	52.5	21.8	7.1	9.2
Service Area Total	57.7	23.9	5.9	8.2
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: 2010 U.S. Census

Labor Force and Unemployment

The size of the labor forces in each of Heywood's communities are displayed in Table SE-19 below and they range from 459 in Wendell to 9,681 in Gardner. Seven (7) of the 15 communities have a labor force smaller than 1,000.

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".⁸ That being said, it is important for Heywood Healthcare to take note of the unemployment rates among the communities it serves. The unemployment rates of the Service Area communities are as low as 2.9% (New Salem) and as high as 5.2% (Athol). Eight (8) of the 15 communities have unemployment rates higher than the Commonwealth, and typically the highest unemployment occurs in communities with the largest labor forces; Athol (Labor Force of 5,675; unemployment of 5.2% = 297 people), Gardner (Labor Force of 9,681; unemployment of 4.6% = 444 people), Orange (Labor Force of 3,502; unemployment of 4.8% = 168 people), and Winchendon (Labor Force of 5,619; unemployment of 4.0% = 224 people).

SE - 19 Labor Force and Unemployment Rates in the Service Area by Community 2017

Community	Labor Force	Employed	Unemployed	Unemployment Rate
Ashburnham	3,644	3,509	135	3.7%
Athol	5,675	5,413	297	5.2%
Erving	972	943	29	3.0%
Gardner	9,681	9,237	444	4.6%
Hubbardston	2,584	2,498	86	3.3%
New Salem	591	574	17	2.9%
Orange	3,502	3,334	168	4.8%
Petersham	668	646	22	3.3%
Phillipston	981	939	42	4.3%
Royalston	727	698	29	4.0%
Templeton	4,375	4,215	160	3.7%
Warwick	501	486	15	3.0%
Wendell	459	444	15	3.3%
Westminster	4,550	4,384	166	3.6%
Winchendon	5,619	5,395	224	4.0%
Service Area Total	44,529	42,715	1,849	4.2%
Massachusetts	3,657,425	3,521,425	135,975	3.7%

Source: MA Department of Labor and Workforce Development

In separating Athol and Heywood Hospital's Service Areas in Tables SE-20 and SE-21, the unemployment patterns when compared to the State vary between each. Athol Hospital's Service Area residents tend to have higher unemployment rates than the State with four (4) of the nine (9) communities having rates above 3.7%: Athol (5.2%), Orange (4.8%), Phillipston (4.3%), and Royalston (4.0%). New Salem has an unemployment rate of 2.9%, the lowest rate in Athol's Service Area. Four (4) of Heywood Hospital's six (6) Service Area communities have unemployment rates equal to or lower than the State's 3.7%. Gardner (4.6%) and Winchendon (4%) are the only two communities with unemployment rates higher than the State. However, since the last CHNA in 2015, the unemployment rate for Athol and Gardner have

⁸ <https://ami.group.uq.edu.au/unemployment-found-make-us-age-prematurely>

decreased from 8.5% in 2013 to 5.2% in 2017 and from 7.0% in 2013 to 4.6% in 2017 respectively. This trend follows the state and the nation for the same time period.

SE - 20 Labor Force and Unemployment Rates in Athol Hospital's Service Area 2017

Community	Labor Force	Employed	Unemployed	Unemployment Rate
Athol	5,675	5,413	297	5.2%
Erving	972	943	29	3.0%
New Salem	591	574	17	2.9%
Orange	3,502	3,334	168	4.8%
Petersham	668	646	22	3.3%
Phillipston	981	939	42	4.3%
Royalston	727	698	29	4.0%
Warwick	501	486	15	3.0%
Wendell	459	444	15	3.3%
Service Area Total	14,076	13,477	634	4.5%
Massachusetts	3,657,425	3,521,425	135,975	3.7%
Source: MA Department of Labor and Workforce Development				

SE - 21 Labor Force and Unemployment Rates in Heywood Hospital's Service Area 2017

Community	Labor Force	Employed	Unemployed	Unemployment Rate
Ashburnham	3,644	3,509	135	3.7%
Gardner	9,681	9,237	444	4.6%
Hubbardston	2,584	2,498	86	3.3%
Templeton	4,375	4,215	160	3.7%
Westminster	4,550	4,384	166	3.6%
Winchendon	5,619	5,395	224	4.0%
Service Area Total	30,453	29,238	1,215	4.0%
Massachusetts	3,657,425	3,521,425	135,975	3.7%
Source: MA Department of Labor and Workforce Development				

Table SE-22 shows the distribution of the nearly 41,000 workers in the region who are employed. A few industries stand out as having the highest number employed: Education/Health and Social Services came in at number one with just under 11,000 employees; Manufacturing rated number two with over 6,600 jobs; Retail accounted for nearly 5,000; and Professional, Science, Management and Waste Management came in fourth with nearly 3,500 jobs. Combined, these four industries take up 63.19% of employment in the region. Extremely important to note is 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 workers in Heywood's Service Area, 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 - 22 Employment by Sector in the Service Area by Community 2016

Community	AGR/ FOR/ FIS/ MIN	CONS	MFG	WS	RT	TRN/ WAR/ UTL	INFO	FIN/ INS/ RE	PRO, SCI, MGN/ WMS	EDU/ HLTH/ SS	ART/ ENT/ REC/ FDS	OTHR	PA	Total by Community
Ashburnham	14	223	351	20	414	76	78	368	266	944	348	96	182	3,380
Athol	34	288	1,180	36	771	228	108	119	298	1,386	315	121	232	5,116
Erving	6	42	188	23	126	53	3	51	28	319	38	47	45	969
Gardner	41	533	1,579	252	1,079	179	70	264	726	2,249	891	330	409	8,602
Hubbardston	10	265	409	35	165	89	36	103	224	730	137	43	95	2,341
New Salem	13	27	54	10	79	22	3	21	52	181	30	12	47	551
Orange	66	162	475	39	338	83	79	273	181	881	247	234	182	3,240
Petersham	30	47	87	4	50	16	15	18	81	172	30	23	20	593
Phillipston	8	90	127	22	78	55	9	30	50	241	47	46	63	866
Royalston	12	53	69	1	67	41	3	17	56	160	62	30	72	643
Templeton	1	322	474	34	572	204	86	135	444	1,074	312	169	283	4,110
Warwick	4	25	54	7	28	13	6	8	32	145	15	17	36	390
Wendell	21	42	34	2	19	15	16	2	40	173	31	42	16	453
Westminster	18	364	680	63	375	149	34	214	608	1,025	336	187	226	4,279
Winchendon	177	332	895	56	597	138	59	317	371	1,300	483	394	258	5,377
Region Total	455	2,815	6,656	604	4,758	1,361	605	1,940	3,457	10,980	3,322	1,791	2,166	40,910
Region Average	30	188	444	40	317	91	40	129	230	732	221	119	144	2,727
Region Percent Employed by Sector	1.11%	6.88%	16.27%	1.48%	11.63%	3.33%	1.48%	4.74%	8.45%	26.84%	8.12%	4.38%	5.29%	
State Percent Employed by Sector	0.40%	5.41%	9.18%	2.37%	10.78%	3.61%	2.32%	7.57%	13.23%	27.95%	8.77%	4.43%	3.98%	
National Percent Employed by Sector	1.96%	6.19%	10.41%	2.72%	11.55%	4.96%	2.12%	6.57%	11.03%	23.15%	9.60%	4.94%	4.80%	
Franklin County	749	2,186	3,881	927	3,783	1,475	864	1,672	2,353	13,107	2,900	1,766	1,555	37,218
Worcester County	1,698	23,132	51,665	10,530	47,739	15,277	7,724	26,125	44,194	110,428	32,046	17,664	15,297	403,519
Massachusetts	13,750	184,928	313,474	81,114	368,117	123,362	79,113	258,699	452,017	954,668	299,467	151,201	136,065	3,415,975
U.S.	2,852,402	9,027,391	15,171,260	3,968,627	16,835,942	7,226,063	3,094,143	9,578,175	16,074,502	33,739,126	13,984,957	7,198,201	6,996,990	145,747,779

Source: American Community Survey 2012-2016 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 = Professional	EDU = Education	ENT = Entertainment	

As many of the communities in the Service Area are considered rural in nature, it is important to point out the surprisingly low population of residents who work in the “rural sector”; those who work in Agriculture, Forestry, Fishing, or Mining as reported in Table SE-23. Throughout the United States, just 1.96% of the workforce works in the rural sector which is low in and of itself, but some communities in the Service Area are even lower. For instance, Templeton (.02%), Ashburnham (.41%), Westminster (.42%), and Hubbardston (.43%) have significantly lower rural sector workers than the National average. All but one of these communities have a rural sector worker population higher than the State (0.40%). On the other hand, some towns in the region have a significantly higher percentage of the workforce population in the rural sector than the State and National averages; Petersham at 5.06%, Wendell at 4.64%, and Winchendon at 3.29% are the most notable. These three towns and New Salem (2.36%) are the only towns in the Service Area that have a rural sector worker population higher than the national average. However, it is important to keep in mind that the workforce populations of these towns are particularly low overall.

SE - 23 Percentage of Population Working in the Rural Sector 2016

Community	% Population Working in the Rural Sector
Ashburnham	0.41%
Athol	0.66%
Erving	0.62%
Gardner	0.48%
Hubbardston	0.43%
New Salem	2.36%
Orange	2.04%
Petersham	5.06%
Phillipston	0.92%
Royalston	1.87%
Templeton	0.02%
Warwick	1.03%
Wendell	4.64%
Westminster	0.42%
Winchendon	3.29%
Service Area Average	1.62%
Franklin County	2.01%
Worcester County	0.42%
Massachusetts	0.40%
U.S.	1.96%

Source: American Community Survey 2012-2016 5-Year Estimates

Tables SE-24, SE-25 and SE-26 present the changes that took place in the region’s local economy from 2001 to 2016. The number of establishments in Heywood’s Service Area increased during this period by 477 establishments (29.9%). All but one of the communities in Heywood’s service area (Hubbardston - 1.4% = -1 establishment) gained establishments during this time period. Establishment percentage growth was highest in Warwick where they grew nearly 86% (+6), followed by New Salem at 60% (+12),

and Orange at 51% (+87). Despite an increase in establishments in places like Warwick, job growth has not necessarily equated to higher wages. In fact, Warwick's total wages decreased 56.2% during this same time period. Another example includes Wendell, where they experienced a 13% increase in total establishments but saw a nearly 75% decrease in total wages. On the other end of the spectrum, Phillipston and New Salem added 6 (+27%) and 12 (+60%) new establishments since 2001, and saw wages explode by more than double their 2001 levels (+126.7% and +114.1% respectively). Four communities in the service area saw total wages go down, the remaining 11 saw increases between 10% and 127%. Total wages increased in the Service Area by just over \$180 million (23.6%) region-wide.

SE - 24 Employment and Wages in the Service Area by Community 2001 v. 2016

Community	# of Establishments			Total Wages			Average Monthly Employment			Average Weekly Wage		
	2001	2016	% Change	2001	2016	% Change	2001	2016	% Change	2001	2016	% Change
Ashburnham	105	131	24.8%	\$34,610,406	\$48,640,097	40.5%	1,064	1,096	3.0%	\$626	\$853	36.3%
Athol	235	333	41.7%	\$102,953,479	\$133,258,801	29.4%	3,628	3,664	1.0%	\$546	\$699	28.0%
Erving	25	35	40.0%	\$11,743,257	\$16,071,667	36.9%	359	416	15.9%	\$630	\$743	17.9%
Gardner	452	526	16.4%	\$261,384,725	\$384,302,813	47.0%	8,463	8,657	2.3%	\$594	\$854	43.8%
Hubbardston	69	68	-1.4%	\$18,497,583	\$14,262,887	-22.9%	632	387	-38.8%	\$563	\$709	25.9%
New Salem	20	32	60.0%	\$2,938,421	\$6,291,674	114.1%	160	190	18.8%	\$353	\$637	80.5%
Orange	172	259	50.6%	\$53,822,875	\$65,266,783	21.3%	2,071	1,785	-13.8%	\$500	\$703	40.6%
Petersham	30	37	23.3%	\$2,251,727	\$3,324,707	47.7%	140	126	-10.0%	\$309	\$507	64.1%
Phillipston	22	28	27.3%	\$2,264,687	\$5,134,332	126.7%	178	246	38.2%	\$244	\$401	64.3%
Royalston	22	21	-4.5%	\$2,533,989	\$2,796,832	10.4%	152	103	-32.2%	\$320	\$522	63.1%
Templeton	105	146	39.0%	\$55,759,529	\$64,080,037	14.9%	1,667	1,380	-17.2%	\$643	\$893	38.9%
Warwick	7	13	85.7%	\$2,705,557	\$1,183,769	-56.2%	112	51	-54.5%	\$466	\$446	-4.3%
Wendell	15	17	13.3%	\$4,919,521	\$1,276,611	-74.1%	228	100	-56.1%	\$414	\$246	-40.6%
Westminster	148	216	45.9%	\$158,406,240	\$134,944,206	-14.8%	3,266	2,584	-20.9%	\$933	\$1,004	7.6%
Winchendon	170	212	24.7%	\$48,517,453	\$62,490,438	28.8%	1,840	1,690	-8.2%	\$507	\$711	40.2%
Service Area Total	1,597	2,074	n/a	\$763,309,449	\$943,325,654	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Service Area Average	106	138	29.9%	\$50,887,297	\$62,888,377	23.6%	1,597	1,498	-11.5%	\$510	\$662	33.8%
Massachusetts	193,547	249,802	29.1%	\$147,345,755,224	\$235,645,425,456	59.9%	3,276,103	3,494,564	-12.5%	\$865	\$1,297	33.6%

Source: Massachusetts Division of Unemployment Assistance

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SE - 25 Employment and Wages in Athol Hospital's Service Area by Community 2001 v. 2016

	# of Establishments			Total Wages			Average Monthly Employment			Average Weekly Wage		
	2001	2016	% Change	2001	2016	% Change	2001	2016	% Change	2001	2016	% Change
Athol	235	333	41.7%	\$102,953,479	\$133,258,801	29.4%	3,628	3,664	1.0%	\$546	\$699	28.0%
Erving	25	35	40.0%	\$11,743,257	\$16,071,667	36.9%	359	416	15.9%	\$630	\$743	17.9%
New Salem	20	32	60.0%	\$2,938,421	\$6,291,674	114.1%	160	190	18.8%	\$353	\$637	80.5%
Orange	172	259	50.6%	\$53,822,875	\$65,266,783	21.3%	2,071	1,785	-13.8%	\$500	\$703	40.6%
Petersham	30	37	23.3%	\$2,251,727	\$3,324,707	47.7%	140	126	-10.0%	\$309	\$507	64.1%
Phillipston	22	28	27.3%	\$2,264,687	\$5,134,332	126.7%	178	246	38.2%	\$244	\$401	64.3%
Royalston	22	21	-4.5%	\$2,533,989	\$2,796,832	10.4%	152	103	-32.2%	\$320	\$522	63.1%
Warwick	7	13	85.7%	\$2,705,557	\$1,183,769	-56.2%	112	51	-54.5%	\$466	\$446	-4.3%
Wendell	15	17	13.3%	\$4,919,521	\$1,276,611	-74.1%	228	100	-56.1%	\$414	\$246	-40.6%
Service Area Total	548	775	n/a	\$186,133,513	\$234,605,176	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Service Area Average	61	86	41.4%	\$20,681,501	\$26,067,242	26.0%	781	742	-10.3%	\$420	\$545	34.9%
Massachusetts	193,547	249,802	29.1%	\$147,345,755,224	\$235,645,425,456	59.9%	3,276,103	3,494,564	-10.3%	\$865	\$1,297	34.9%

Source: Massachusetts Division of Unemployment Assistance

SE - 26 Employment and Wages in Heywood Hospital's Service Area by Community 2001 v. 2016

	Establishments			Total Wages			Average Monthly Employment			Average Weekly Wage		
	2001	2016	% Change	2001	2016	% Change	2001	2016	% Change	2001	2016	% Change
Ashburnham	105	131	24.8%	\$34,610,406	\$48,640,097	40.5%	1,064	1,096	3.0%	\$626	\$853	36.3%
Gardner	452	526	16.4%	\$261,384,725	\$384,302,813	47.0%	8,463	8,657	2.3%	\$594	\$854	43.8%
Hubbardston	69	68	-1.4%	\$18,497,583	\$14,262,887	-22.9%	632	387	-38.8%	\$563	\$709	25.9%
Templeton	105	146	39.0%	\$55,759,529	\$64,080,037	14.9%	1,667	1,380	-17.2%	\$643	\$893	38.9%
Westminster	148	216	45.9%	\$158,406,240	\$134,944,206	-14.8%	3,266	2,584	-20.9%	\$933	\$1,004	7.6%
Winchendon	170	212	24.7%	\$48,517,453	\$62,490,438	28.8%	1,840	1,690	-8.2%	\$507	\$711	40.2%
Service Area Total	1,049	1,299	n/a	\$577,175,936	\$708,720,478	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Service Area Average	175	217	23.8%	\$96,195,989	\$118,120,080	22.8%	2,822	2,632	-13.3%	\$644	\$837	32.1%
Massachusetts	193,547	249,802	29.1%	\$147,345,755,224	\$235,645,425,456	59.9%	3,276,103	3,494,564	-16.5%	\$865	\$1,297	31.3%

DRAFT

Education

Public Schools Available

There are 15 public school districts covering the 15 communities in the Service Area, with 41 individual schools contained within those 15 districts. There are twenty elementary schools, seven middle schools and fourteen high schools. In Table SE - 27 there is a listing of all the individual schools, along with the grades served, location, enrollment total, and Service Area communities included. All of the communities in the Service Area have access to nine traditional academic high schools, as well as 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 that are exclusively their own school districts and include traditional academic high schools that are not regional. The remaining 13 communities' students in the Service Area attend regional high schools.

The Town of Erving has its own elementary school or they 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 located 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 have their own individual school districts for elementary grades PK – 6, but after that attend the Ralph C. Mahar Regional High School. Hubbardston is the only Service Area community to be included in the Quabbin School District. Hubbardston 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.

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SE - 27 Public Schools Available in the Service Area Including Enrollment Totals (2017-2018)

School District	Schools Available	Grades	Location	Enrollment Total	Service Area Communities Included
Ashburnham-Westminster	John Briggs Elementary School Meetinghouse Elementary School Westminster Elementary School Overlook Middle School Oakmont High School	PK-5 K-1 2-5 6-8 9-12	Ashburnham Westminster Westminster Ashburnham Ashburnham	553 162 377 573 719	Ashburnham Westminster
Athol-Royalston	Royalston Community Elementary Athol Community Elementary Athol-Royalston Middle School Athol High School	PK-4 K-4 5-8 9-12	Royalston Athol Athol Athol	139 602 391 368	Athol Royalston
Erving	Erving Elementary School	PK-6	Erving	142	Erving
Franklin County Technical School	Franklin County Technical School	9-12	Turner's Falls	487	Erving, New Salem Orange, Warwick, Wendell
Gardner	Waterford Street School Elm Street School Gardner Middle School Gardner High School Gardner Academy for Learning & Tech.	PK-1 2-4 5-7 8-12 9-12	Gardner	468 552 543 690 73	Gardner
Gill-Montague	Great Falls Middle School Turner's Falls High School	6-8 9-12	Montague Montague	245 219	Erving (Grade 7-12)
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School	9-12	Fitchburg	1424	Ashburnham, Athol Gardner, Hubbardston, Petersham, Royalston, Templeton, Westminster, Winchendon, Phillipston
Narragansett	Phillipston Memorial School Baldwinville Elementary School Templeton Center Elementary Narragansett Middle School Narragansett Regional High School	PK-4 2-4 K-1 5-8 9-12	Phillipston Baldwinville Templeton Baldwinville Baldwinville	169 289 170 457 345	Templeton Phillipston
New Salem-Wendell	Swift River School	PK-6	New Salem	152	Erving, New Salem, Wendell
Orange Elementary	Fisher Hill School Dexter Park School	PK-2 3-6	Orange	279 313	Orange
Petersham	Petersham Center School	K-6	Petersham	116	Petersham

School District	Schools Available	Grades	Location	Enrollment Total	Service Area Communities Included
Pioneer Valley	Warwick Community School Pioneer Valley Regional School	K-6 7-12	Warwick Northfield	59 360	Warwick
Quabbin	Hubbardston Center School Quabbin Regional Middle School Quabbin Regional High School	K-6 7-8 9-12	Hubbardston Barre Barre	319 396 657	Hubbardston
Ralph C. Mahar	Ralph C. Mahar Regional Pathways Early College Innovation	7-12 11-12	Orange Gardner	641 36	New Salem, Orange, Petersham, Wendell. All communities (choice in)
Winchendon	Winchendon Preschool Program Memorial School Toy Town Elementary School Murdock Middle School Murdock Academy for Success Murdock High School	PK K-2 3-5 6-8 6-12 9-12	Winchendon	79 307 294 273 29 304	Winchendon

Source: MA Department of Elementary and Secondary Education (DESE)

Table SE-28 shows what types of schools the students in each Service Area community and the State as a whole attend. 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, with the exception of 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 percent 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 (10%). This tends to be an indication of the level of lack of confidence local parents have in their own school systems.

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SE - 28 Type of Schools Attended by Students by Community in the Service Area (2016-2017)

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

Tables SE-29 and SE-30 categorize student enrollment by race/ethnicity from the 2010-2011 and 2017-2018 school years for each of the school districts in the Service Area communities. Currently, five (5) of the school districts have greater than ninety percent white students and all of the districts have a greater 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 Table SE-29, the numbers of minority populations are increasing.

SE - 29 Student Enrollment by Race/Ethnicity in the Service Area School Districts (2010-2011)

School District	% African American	% Asian	% Hispanic	% White	% Native American	% Native Hawaiian, Pacific Islander	% Multi-Race, Non-Hispanic
Ashburnham-Westminster	0.9	1.2	3.4	92.4	0.1	0.0	1.8
Athol-Royalston	1.7	0.7	4.7	89.8	0.2	0.1	2.7
Erving	0.0	0.0	3.7	93.3	0.0	0.0	3.0
Franklin County Regional Vocational Technical School	0.2	0.6	3.2	93.4	0.2	0.4	2.0
Gardner	3.3	2.1	11.0	80.6	0.3	0.0	2.7
Gill-Montague	1.9	0.7	6.2	88.2	0.2	0.2	2.6
Montachusett Regional Vocational Technical School	1.7	2.1	12.9	78.7	0.1	0.1	4.4
Narragansett	0.5	0.3	2.2	94.1	0.3	0.3	2.3
New Salem-Wendell	0.0	2.1	0.7	94.5	0.0	0.0	2.8
Orange	0.9	0.8	5.1	91.0	0.1	0.0	2.2
Petersham	0.9	0.9	8.0	85.8	0.0	0.0	4.4
Pioneer Valley School District	0.5	0.4	2.4	94.8	0.1	0.1	1.7
Quabbin	0.7	0.5	3.3	92.7	0.2	0.0	2.6
Ralph C. Mahar	1.3	1.3	2.9	89.9	0.1	0.0	4.4
Winchendon	1.6	1.7	4.6	89.7	0.2	0.0	2.1
Service Area Average	1.1	1.0	5.0	89.9	0.1	0.1	2.8
Massachusetts	8.2	5.5	15.4	68.0	0.2	0.1	2.4
Source: MA DESE							

SE – 30 Student Enrollment by Race/Ethnicity in the Service Area School Districts (2017-2018)

School District	% African American	% Asian	% Hispanic	% White	% Native American	% Native Hawaiian, Pacific Islander	% Multi-Race, Non-Hispanic
Ashburnham-Westminster	0.6	0.8	4.2	92.6	0.0	0.0	1.8
Athol-Royalston	1.5	1.1	8.7	85.0	0.0	0.0	3.7
Erving	0.0	0.0	3.5	85.9	0.0	0.0	10.6
Franklin County Regional Vocational Technical School	1.2	0.2	2.7	95.7	0.0	0.0	0.2
Gardner	2.7	1.7	17.6	70.0	0.2	0.0	7.8
Gill-Montague	1.0	0.3	11.0	80.6	0.2	0.2	6.7
Montachusett Regional Vocational Technical School	1.7	1.1	14.3	79.2	0.1	0.0	3.6
Narragansett	1.0	0.2	6.6	88.8	0.1	0.1	3.1
New Salem-Wendell	0.0	2.0	5.3	87.5	0.0	0.0	5.3
Orange	1.4	0.5	7.6	87.2	0.3	0.0	3.0
Petersham	0.0	0.9	4.3	90.5	0.0	0.0	4.3
Pioneer Valley School District	0.6	0.4	2.0	93.1	0.1	0.0	3.8
Quabbin	0.5	0.7	4.9	91.5	0.1	0.1	2.2
Ralph C. Mahar	2.0	1.7	8.6	83.9	0.0	0.0	3.8
Winchendon	1.5	2.6	6.5	85.2	0.2	0.1	3.9
Service Area Average	1.0	0.9	7.2	86.4	0.1	0.03	4.3
Massachusetts	9.0	6.9	20.0	60.1	0.2	0.1	3.6
Source: MA DESE							

Table SE-31 shows the percent changes in race/ethnicity for the student population in the Service Area school districts between 2010 and 2018. The largest percent change in the Service Area is Native Hawaiian, Pacific Islanders, with a decrease of 58.3%. There is a tiny population of this group so even a small decline in numbers creates a large percent change. The same can be said for the Native American population, with a decline of 38.1%. The White, African American, and Asian student populations in the Service Area have declined over the seven years; however, in comparison to the Statewide student populations of these groups there has been an increase in both the African American (9.8%) and Asian (25.5%) student populations and an 11.6% decrease in White students. The percent change of Multi-Race Non-Hispanic students is an average of 53% in the Service Area, and the school districts with the greatest increase in this group are Erving (253.3%); Gardner (188.9%); Gill-Montague (157.7%), which includes Erving high schoolers; and Pioneer Valley (123.5%). In the State as a whole, there was an increase of 50% of Multi-Race students. The Hispanic student population in the Service Area has increased 45.1% over the years, much more than the 29.9% increase in Hispanic students Statewide. The districts with the highest percent change of Hispanic students are New Salem-Wendell (657.1%), Narragansett (200%), Ralph C. Mahar (196.6%), and Athol-Royalston (85.1%).

In comparison to the change in racial makeup of the general population of the Service Area communities, as can be shown in Tables PC-10 and PC-11 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 numbers are an estimate done by the US 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.

SE – 31 Percent Change in Race/Ethnicity in Service Area School Districts 2010-2011 v. 2017-2018

School District	African American % Change	Asian % Change	Hispanic % Change	White % Change	Native American % Change	Native Hawaiian, Pacific Islander % Change	Multi-Race, Non-Hispanic % Change
Ashburnham-Westminster	-33.3	-33.3	23.5	0.2	-100.0	0.0	0.0
Athol-Royalston	-11.8	57.1	85.1	-5.3	-100.0	-100.0	37.0
Erving	0.0	0.0	-5.4	-7.9	0.0	0.0	253.3
Franklin County Regional Vocational Technical School	500.0	-66.7	-15.6	2.5	-100.0	-100.0	-90.0
Gardner	-18.2	-19.0	60.0	-13.2	-33.3	0.0	188.9
Gill-Montague	-47.4	-57.1	77.4	-8.6	0.0	0.0	157.7
Montachusett Regional Vocational Technical School	0.0	-47.6	10.9	0.6	0.0	-100.0	-18.2
Narragansett	100.0	-33.3	200.0	-5.6	-66.7	-66.7	34.8
New Salem-Wendell	0.0	-4.8	657.1	-7.4	0.0	0.0	89.3
Orange	55.6	-37.5	49.0	-4.2	200.0	0.0	36.4
Petersham	-100.0	0.0	-46.3	5.5	0.0	0.0	-2.3
Pioneer Valley School District	20.0	0.0	-16.7	-1.8	0.0	-100.0	123.5
Quabbin	-28.6	40.0	48.5	-1.3	-50.0	0.0	-15.4
Ralph C. Mahar	53.8	30.8	196.6	-6.7	-100.0	0.0	-13.6
Winchendon	-6.3	52.9	41.3	-5.0	0.0	0.0	85.7
Service Area Average	-2.5	-7.8	45.1	-3.9	-38.1	-58.3	53.0
Massachusetts	9.8	25.5	29.9	-11.6	0.0	0.0	50.0

Table SE-32 presents the percentage of students who are English Language Learner (ELL), that are disabled, that are economically disadvantaged, and that are high needs. ELL is a student whose first language is a language other than English who is unable to 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), or 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. The school district in the Service Area with the highest average percentage of students with disabilities is Franklin County Technical School (31.6), followed by Orange (25.8) and Athol-Royalston (24.4). Eight out of the fifteen school districts in the Service Area fall 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 determining whether students need resources. The Orange School District has the highest percent 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 students who are low income (pre-2015) or economically disadvantaged (post 2015), disabled, and ELL and 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.

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SE - 32 Student Enrollment by English Language Learning, Disability, Economic Disadvantage, and High Needs (2017-2018)

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	1.0	18.0	15.9	31.8
	Oakmont High School	9-12	1.0	14.7	13.9	24.8
Athol-Royalston	Royalston Community Elementary	PK-4	0.7	16.5	37.4	46.0
	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	47.0	57.9
Erving	Erving Elementary School	PK-6	1.4	17.5	29.6	42.0
Franklin County Technical School	Franklin County Technical School	9-12	0.2	31.6	37.0	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	26.0	64.4	72.6
Gill-Montague	Great Falls Middle School	6-8	3.7	26.5	43.7	58.0
	Turner's Falls High School	9-12	2.7	21.0	31.1	42.0
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School (Monty Tech)	9-12	0.6	15.1	26.0	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	37.0
	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	27.0	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	PK	1.3	22.8	53.2	63.3
	Memorial School	K-2	1.3	16.9	48.2	54.7
	Toy Town Elementary School	3-5	1.0	15.3	39.8	47.3
	Murdock Middle School	6-8	0.7	13.9	37.7	43.6
	Murdock Academy for Success	6-12	0	34.5	62.1	75.9
	Murdock High School	9-12	0.7	22.0	39.1	52.0
Massachusetts			10.2	17.7	32.0	46.6
United States				12.9		

Sources: MA DESE; National Center for Education Statistics (NCES)

Attendance, Discipline, Graduation, and Drop-out Rates

Table SE-33 shows the attendance and retention rates for all of 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 99.2%, followed by Ashburnham-Westminster (96.1) and Pioneer Valley (95.8). Athol-Royalston District has the lowest attendance rate at 92.7%, with Winchendon (93.7) and Gardner (93.8) close behind. There are six districts whose attendance rate is below that of the State (94.6).

Chronically absent (10% or more) is the percentage of students who were 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. Eight of the fifteen Districts have a higher chronically absent rate than the State (13.5). The three highest rates are Athol-Royalston at 23.8%, Gardner (19.3), and Gill-Montague (18.4). The districts with the lowest rates are Petersham (0%), Ashburnham-Westminster (5.2), and Pioneer Valley (6.7).

The unexcused absences >9 rate is calculated based on the number of students with unexcused absences for more than 9 days, divided by the end of the year enrollment (including transfers, dropouts, etc.) for the school year being reported. The definition of unexcused absence is based on the local school district definition. The District with the highest rate of unexcused absences >9 is Gardner at 33.8%, followed by Winchendon (26.1), and Athol-Royalston (23.6). A total of five out of fifteen districts have a greater rate than the State (15.6). The Districts with the best rates are Petersham (0), Orange Elementary (0.2), and Ralph C. Mahar (1.7).

Retention rate is the percentage of enrolled students in grades 1-12 who were repeating the grade in which they were enrolled the previous year. Ralph C. Mahar (3.6), Gardner (3.0), and Quabbin (2.3) have the largest rates of students who repeat grades. The lowest rated districts are New Salem-Wendell (0), Erving (0), and Monty Tech (0.2). Only five of the districts have a rate greater than the State (1.3).

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SE - 33 Attendance and Retention Rates of School Districts in the Service Area (2016-2017)

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	96.1	6.8	22.9	5.2	17.4	0.5
Athol-Royalston	92.7	12.2	48.5	23.8	23.6	1.4
Erving	94.8	8.9	29.5	15.1	14.6	0
Franklin County Technical School	94.3	9.9	42.7	15.4	6.9	0.8
Gardner	93.8	10.4	40.3	19.3	33.8	3
Gill-Montague	94	10.3	35.3	18.4	16.3	1.1
Montachusett Regional Vocational Technical School	95.3	8.5	30	9	14	0.1
Narragansett	95.2	8.3	31	8.9	14.3	1.1
New Salem-Wendell	94.8	9.4	34.5	12.3	9.4	0
Orange Elementary	94.2	9.9	40.6	16.8	0.2	0.4
Petersham	99.2	1.4	0.8	0	0	1
Pioneer Valley	95.8	7.2	25.2	6.7	2.3	0.5
Quabbin	93.9	10.6	39.2	16.9	14.4	2.3
Ralph C. Mahar	95.4	7.7	24.4	10.4	1.7	3.6
Winchendon	93.7	10.5	35.6	17.1	26.1	2.2
Massachusetts	94.6	9.3	33.3	13.5	15.8	1.3

Source: MA DESE

In Table SE-34 are 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. Franklin County Tech has the highest in-school suspension rate at 7.6, far above the other school districts and the State, but close to the national percentage of 6.8. The Ashburnham-Westminster, Athol-Royalston, and Gill-Montague Districts have the lowest in-school suspension rates at 0.3.

The district with the highest out-of-school suspension rate is Gardner at 2.7, followed by Quabbin (3.6), and Ralph C. Mahar (2.8); all equal to or above the State rate of 2.8%. The lowest rates are in Ashburnham-Westminster (0), Athol-Royalston (0.2), and Narragansett (1.1). All of the districts are below the national rate of 6.4% and twelve of the fifteen districts are below the State rate of 2.8%. A reminder that every school district has different policies and procedures regarding discipline, so comparing them may not be equal.

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SE - 34 Student Suspensions by School District in the Service Area (2016-2017)

School District	% In-School Suspension*	% Out-of-School Suspension*
Ashburnham-Westminster	0.3	0
Athol-Royalston	0.3	0.2
Erving	no data	no data
Franklin County Technical School	7.6	2.7
Gardner	0.6	3.9
Gill-Montague	0.3	1.7
Montachusett Regional Vocational Technical School	no data	no data
Narragansett	1.1	1.1
New Salem-Wendell	no data	no data
Orange Elementary	no data	no data
Petersham	no data	no data
Pioneer Valley	2.3	1.6
Quabbin	1.9	3.6
Ralph C. Mahar	1.7	2.8
Winchendon	1.6	2.1
Massachusetts	1.7	2.8
United States	6.8	6.4

Sources: MA DESE; NCES

Table SE-35 presents the graduation and dropout rates for each Service Area school district. 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 are the students who did not graduate within the four years. Non-Grad Completer includes 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 are Monty Tech at 98%, with Pioneer Valley (95.8) and Ashburnham-Westminster (94.2) following. The lowest percent graduated can be found in Athol-Royalston (74.4), Winchendon (76.8), and Ralph C. Mahar (77.9). Only four of the school districts have a greater percent graduated than the State (88.3) and only six are greater than the United States percentage (84). According to the 2015 CHNA, the graduation rate for Gardner increased from 71.6% in 2013 to 81.6% in 2017; a 14% increase over four years. In contrast, Athol-Royalston and Winchendon graduation rates decreased 3.5% and 10% respectively over the same four-year period.

The percent of students who dropped out of high school is highest in Winchendon (11%), Quabbin (10.9%), and Gill-Montague (10%). The districts with the lowest percent of students dropping out are Pioneer Valley (0%), Monty Tech (0.8%), and Ashburnham-Westminster (1.7%). The percentage of students dropping out in the State as a whole is 4.9% and all but the top three school districts listed above are higher than that number. Similarly, all of the districts except the top three have dropout percentages greater than the United States, which is 5.9%. Fortunately, no students in any of the school districts were permanently excluded from school.

SE - 35 Student Graduation and Drop-out Rates by School District in the Service Area (2017)

School District	School	# in Cohort	% Graduated	% Still in School	% Non-Grad Completers	% H.S. Equiv.	% Dropped Out	% Permanently Excluded
Ashburnham-Westminster	Oakmont High School	173	94.2	3.5	0	0.6	1.7	0
Athol-Royalston	Athol High School	82	74.4	11	2.4	2.4	9.8	0
Franklin County Technical School	Franklin County Technical School	123	88.6	3.3	0	0.8	7.3	0
Gardner	Gardner High School	152	81.6	6.6	4.6	0	7.2	0
Gill-Montague (Erving)	Turner's Falls High School	60	85	3.3	0	1.7	10	0
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School	356	98	1.1	0	0	0.8	0
Narragansett	Narragansett Regional High	89	84.3	4.5	1.1	3.4	6.7	0
Pioneer Valley	Pioneer Valley Regional School	72	95.8	2.8	1.4	0	0	0
Quabbin	Quabbin Regional High School	192	83.3	3.1	0	2.6	10.9	0
Ralph C. Mahar	Ralph C. Mahar Regional	149	77.9	10.7	0	2	9.4	0
Winchendon	Murdock High School	82	76.8	9.8	1.2	1.2	11	0
Massachusetts		73,249	88.3	5	1.2	0.7	4.9	0
United States			84				5.9	

Sources: MA DESE; NCES

Table SE-36 shows the plans of students after high school graduation in the Service Area districts. 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 less 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 (88%), Gill-Montague (86%), and Ralph C. Mahar (82%). The districts with the lowest percent of students attending college, with the exception of the two technical schools are Winchendon (70%), Pioneer Valley (72%), and Gardner and Quabbin both with 78%. Winchendon and Pioneer Valley

are the only school districts to fall below the State percent of graduated students attending college (75.9%).

SE - 36 Plans of High School Graduates by School District in the Service Area (2016-2017)

School District	# of Graduates	% Attending Coll./Univ.	% 2 Year Private College	% 4 Year Private College	% 2 Year Public College	% 4 Year Public College	% Other Post-Secondary	Work	Military	Other	Unk
Ashburnham-Westminster	169	88	0	31	18	39	4	8	1	0	1
Athol-Royalston	67	79	2	19	46	12	5	12	3	2	0
Franklin County Technical School	112	44	1	4	36	3	5	36	2	0	14
Gill-Montague (Erving)	57	86	0	16	51	19	2	7	2	0	4
Gardner	131	78	0	14	44	20	0	2	4	2	15
Montachusett Regional Vocational Technical School	353	59	1	13	21	24	7	28	5	1	1
Narragansett	76	79	0	17	37	25	0	0	1	0	20
Pioneer Valley	69	72	0	30	13	29	0	23	3	1	0
Quabbin	168	78	1	27	18	32	1	13	6	2	1
Ralph C. Mahar	133	82	0	21	36	25	2	8	2	2	4
Winchendon	70	64	0	13	34	11	6	30	4	1	0
Massachusetts	67,061	75.9	1	30	19	31	2	9	2	1	5

Source: MA DESE

Table SE-37 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 is required to supply a comprehensive report of revenues and expenditures to the State each fiscal year. The two technical high schools have high total expenditure per pupil due to the fact that these school districts are spending much more money on capital outlay to ensure their technical programs are up-to-date with industry standards.

The traditional school districts with the highest per pupil expenditure are Erving (\$21,499), Pioneer Valley (\$17,719), and Gill-Montague (\$16,418). The districts with the lowest expenditure per pupil are Gardner (\$12,450), Ashburnham-Westminster (\$12,713) and Orange (\$12,767) with Narragansett a close 4th. All of the Service Area school districts are spending more per pupil than the United States, with the exception of Gardner, and ten of the fifteen districts are spending more than the State average of \$15,545.

SE - 37 Per Pupil Expenditure Per School District in the Service Area (2016)

School District	Total Expenditure per pupil
Ashburnham-Westminster	\$12,713
Athol-Royalston	\$14,028
Erving	\$21,499
Franklin County Technical School	\$23,717
Gardner	\$12,450
Gill-Montague	\$16,418
Montachusett Regional Vocational Technical School	\$18,751
Narragansett	\$12,807
New Salem-Wendell-Erving	\$15,352
Orange Elementary	\$12,767
Petersham	\$14,281
Pioneer Valley	\$17,719
Quabbin	\$14,578
Ralph C. Mahar	\$15,765
Winchendon	\$13,934
Massachusetts	\$15,545
United States	\$12,509

Sources: MA DESE; NCES

Teacher Demographics

Table SE-38 shows the percentage of teachers according to race, ethnicity and gender for the Service Area school districts. Overall, the teachers are white females, with only the technical high schools having higher percentages of male teachers due to the technical programs offered being traditionally male dominated fields. All of the districts have higher percentages of white teachers than the State (90.3%) and the nation (81.9%). With the growing population of Hispanic and Multi-Race students, the teacher race/ethnicity should keep up with the population trends of the students.

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SE - 38 Teacher Race/Ethnicity/Gender by Percentage by School District in the Service Area (2016-2017)

School District	African American	Asian	Hispanic	White	Native American	Native Hawaiian, Pacific Islander	Multi-Race, Non-Hispanic	Females	Males
Ashburnham-Westminster	1.1	0	2	96.1	0	0	0.9	78.6	21.4
Athol-Royalston	1.3	0	0.5	97.7	0.5	0	0	81.3	18.7
Erving	0	0	0	95.7	0	0	4.3	87.7	12.2
Franklin County Technical School	1.2	0	0	97.6	0	0	1.2	42.9	57.1
Gardner	1.7	1	1	93.3	0	0	3	80.7	19.3
Gill-Montague	0.5	0.5	2.2	95.7	0	0	1.1	81.2	18.8
Montachusett Regional Vocational Technical School	1.6	0	3.7	93.6	1.1	0	0	57.5	42.5
Narragansett	0	0.6	0	99.4	0	0	0	81.6	18.4
New Salem-Wendell-Erving	0	0	2.8	95.6	0	0	1.7	97.2	2.8
Orange Elementary	0	0	1.2	98.8	0	0	0	90.4	9.6
Petersham	0	0	0.54	99.46	0	0	0	86.9	13.1
Pioneer Valley	0	0	0	100	0	0	0	91.3	8.7
Quabbin	0.76	0.72	0.34	97.2	0	0.38	0.61	85.1	14.9
Ralph C. Mahar	0.93	0.93	2.8	95.4	0	0	0	66.3	33.7
Winchendon	1.7	0	0.58	97.7	0	0	0	83.6	16.4
Massachusetts	3.80	1.40	3.90	90.30	0.08	0.06	0.52	79.90	20.10
United States (2011-2012)	6.8	1.8	7.8	81.9	0.5	0.1	1	76.3	23.7

Sources: MA DESE; NCES

Table SE-39 shows the number of teachers and student/teacher ratio in each school in the Service Area school districts. The districts with the highest overall student/teacher ratio are Quabbin, Ashburnham-Westminster, and Narragansett; with the exception of Winchendon two one-teacher schools. Those with the lowest ratio are Erving, Franklin County, and Pioneer Valley. Seven of the fifteen districts fall above the State ratio of 13.2 to 1 and only Quabbin falls above the national ratio of 16.3 to 1.

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SE - 39 Student/Teacher Ratio per School District in the Service Area (2016-2017)

School District	School	Grades	# of Teachers	Student/Teacher Ratio
Ashburnham-Westminster	John Briggs Elementary School	PK-5	36	15.1 to 1
	Meetinghouse Elementary School	K-1	11	15 to 1
	Westminster Elementary School	2-5	22	17.3 to 1
	Overlook Middle School	6-8	37	15.4 to 1
	Oakmont High School	9-12	45	15.5 to 1
Athol-Royalston	Royalston Community Elementary	PK-4	11	13.3 to 1
	Athol Community Elementary	PK-4	36	16 to 1
	Athol-Royalston Middle School	5-8	30	12.8 to 1
	Athol High School	9-12	29	12.4 to 1
Erving	Erving Elementary School	PK-6	18	7.5 to 1
Franklin County Technical School	Franklin County Regional Vocational Technical School	9-12	52	9.4 to 1
Gardner	Waterford Street School	PK-1	27	16.9 to 1
	Elm Street School	2-4	39	14.7 to 1
	Gardner Middle School	5-7	38	14.4 to 1
	Gardner High School	8-12	58	12.3 to 1
	Gardner Academy for Learning	9-12	8	11.6 to 1
Gill-Montague	Great Falls Middle School	6-8	21	11.2 to 1
	Turner's Falls High School	9-12	24	9.7 to 1
Montachusett Regional Vocational Technical School	Montachusett Regional Vocational Technical School	9-12	112	12.8 to 1
Narragansett	Phillipston Memorial School	PK-4	11	14.8 to 1
	Baldwinville Elementary School	2-4	16	17.5 to 1
	Templeton Center Elementary	K-1	11	14.5 to 1
	Narragansett Middle School	5-8	26	16.0 to 1
	Narragansett Regional High School	9-12	27	13.7 to 1
New Salem-Wendell	Swift River School	PK-6	12	14.1 to 1
Orange Elementary	Fisher Hill School	PK-2	21	14.4 to 1
	Dexter Park School	3-6	26	12.7 to 1
Petersham	Petersham Center School	K-6	11	10.8 to 1
Pioneer Valley	Warwick Community School	K-6	6	10 to 1
	Pioneer Valley Regional School	7-12	42	9.7 to 1
Quabbin	Hubbardston Center School	K-6	17	18.7 to 1
	Quabbin Regional Middle School	7-8	25	17.2 to 1
	Quabbin Regional High School	9-12	46	14.6 to 1
Ralph C. Mahar	Ralph C. Mahar Regional	7-12	59	10.9 to 1
	Pathways Early College Innovation	11-12	n/a	n/a
Winchendon	Winchendon Preschool Program	PK	1	27.7 to 1
	Memorial School	K-2	20	13.8 to 1
	Toy Town Elementary School	3-5	21	13.4 to 1
	Murdock Middle School	6-8	26	11.6 to 1
	Murdock Academy for Success	6-12	1	40.1 to 1
	Murdock High School	9-12	28	10.5 to 1
Massachusetts			72,090	13.2 to 1
United States (2013-2014)				16.3 to 1

Sources: MA DESE; NCES

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”.⁹ As shown in Table SE-40, all but two of the communities in Heywood’s service area (Westminster at 21% and Wendell at 25%) have a population percentage with a high school diploma higher than the State’s 25.1% average. More than 40% of the populations of Erving (43.2%), Royalston (40.7%) and Orange (41.4%) have a high school diploma, the highest of all communities in the area. There are six (6) communities with higher percentages of residents with no high school diploma compared to the State: Gardner (13.7%), Athol (13.5%), Orange/Winchendon (11.9%), Royalston (11%) and Warwick (10.4%). Of these six communities, all but Warwick also have higher than the State dropout rates.

Fourteen (14) of the 15 communities have populations with a greater percentage of residents with “at least some college, no degree” compared to the State. Thirteen (13) of 15 communities have populations with a greater percentage of residents with an “associate’s 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); and three communities have a higher percentage of the population with a “professional or graduate degree” compared to the State (Petersham, Wendell and New Salem).

One likely reason so many people in the area have at least some college or an associate’s degree is because of the accessibility of Mount Wachusett Community College (MWCC) in Gardner 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 compared to other options across the State and even the Nation.

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⁹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3188849/>

SE - 40 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's Degree	Bachelor's Degree	Graduate or Professional Degree
Ashburnham	3.9%	25.9%	19.2%	12.5%	26.4%	12.2%
Athol	13.5%	38.1%	19.1%	11.6%	12.6%	5.0%
Erving	6.1%	43.2%	19.6%	17.1%	9.3%	4.7%
Gardner	13.7%	36.9%	20.8%	11.0%	11.0%	6.6%
Hubbardston	5.9%	33.0%	23.3%	10.8%	16.3%	10.7%
New Salem	5.1%	27.2%	19.4%	8.0%	21.5%	18.7%
Orange	11.9%	41.4%	21.0%	10.0%	9.0%	6.7%
Petersham	2.5%	28.0%	22.8%	10.1%	17.1%	19.5%
Phillipston	6.7%	38.9%	21.9%	10.9%	13.5%	8.1%
Royalston	11.0%	40.7%	21.8%	9.8%	8.9%	8.0%
Templeton	9.5%	37.5%	22.9%	11.7%	12.0%	6.5%
Warwick	10.4%	26.3%	21.2%	7.6%	22.2%	12.3%
Wendell	8.9%	25.0%	14.1%	7.4%	23.9%	20.7%
Westminster	5.9%	21.0%	16.3%	13.4%	27.6%	15.8%
Winchendon	11.9%	36.5%	20.6%	12.8%	11.7%	6.5%
Service Area Average	8.5%	33.3%	20.3%	11.0%	16.2%	10.8%
Worcester County	10.0%	28.9%	17.4%	8.9%	21.3%	13.6%
Franklin County	7.2%	27.6%	18.5%	10.8%	18.6%	17.3%
Massachusetts	10.0%	25.1%	16.0%	7.7%	23.1%	18.2%
United States	13.0%	27.5%	21.0%	8.2%	18.8%	11.5%

Source: 2012-2016 American Community Survey 5-Year Estimates

Between Athol and Heywood Hospitals' Service Areas as seen in Tables SE-41 and SE-42, educational attainment is relatively equal across the board. Athol's Service Area has a slightly higher percentage of the population with a high school diploma (34.3% vs. 31.8%) and equal percentage of those with no high school diploma (8.5%). Heywood's Service Area has a slightly higher percentage of those with some college but no degree (20.5% vs. 20.1%), slightly higher percentage of those with an associate's degree (12% vs. 10.3%), and a slightly higher percentage of those with a bachelor's degree (17.5% vs. 15.3%). 11.5% of Athol's Service Area has a Graduate or Professional degree compared to 9.7% in Heywood.

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SE - 41 Educational Attainment in Athol Hospital's Service Area for Population 25 Years and Over

Community	No High School Diploma	High School Graduate	Some College, No Degree	Associate's Degree	Bachelor's Degree	Graduate or Professional Degree
Athol	13.5%	38.1%	19.1%	11.6%	12.6%	5.0%
Erving	6.1%	43.2%	19.6%	17.1%	9.3%	4.7%
New Salem	5.1%	27.2%	19.4%	8.0%	21.5%	18.7%
Orange	11.9%	41.4%	21.0%	10.0%	9.0%	6.7%
Petersham	2.5%	28.0%	22.8%	10.1%	17.1%	19.5%
Phillipston	6.7%	38.9%	21.9%	10.9%	13.5%	8.1%
Royalston	11.0%	40.7%	21.8%	9.8%	8.9%	8.0%
Warwick	10.4%	26.3%	21.2%	7.6%	22.2%	12.3%
Wendell	8.9%	25.0%	14.1%	7.4%	23.9%	20.7%
Service Area Average	8.5%	34.3%	20.1%	10.3%	15.3%	11.5%
Worcester County	10.0%	28.9%	17.4%	8.9%	21.3%	13.6%
Franklin County	7.2%	27.6%	18.5%	10.8%	18.6%	17.3%
Massachusetts	10.0%	25.1%	16.0%	7.7%	23.1%	18.2%
United States	13.0%	27.5%	21.0%	8.2%	18.8%	11.5%

Source: 2012-2016 American Community Survey 5-Year Estimates

SE - 42 Educational Attainment in Heywood Hospital's Service Area for Population 25 and Over

Community	No High School Diploma	High School Graduate	Some College, No Degree	Associate's Degree	Bachelor's Degree	Graduate or Professional Degree
Ashburnham	3.9%	25.9%	19.2%	12.5%	26.4%	12.2%
Gardner	13.7%	36.9%	20.8%	11.0%	11.0%	6.6%
Hubbardston	5.9%	33.0%	23.3%	10.8%	16.3%	10.7%
Templeton	9.5%	37.5%	22.9%	11.7%	12.0%	6.5%
Westminster	5.9%	21.0%	16.3%	13.4%	27.6%	15.8%
Winchendon	11.9%	36.5%	20.6%	12.8%	11.7%	6.5%
Service Area Average	8.5%	31.8%	20.5%	12.0%	17.5%	9.7%
Franklin County*	10.0%	28.9%	17.4%	8.9%	21.3%	13.6%
Worcester County*	7.2%	27.6%	18.5%	10.8%	18.6%	17.3%
Massachusetts*	10.0%	25.1%	16.0%	7.7%	23.1%	18.2%
U.S.*	13.0%	27.5%	21.0%	8.2%	18.8%	11.5%

Source: 2012-2016 American Community Survey 5-Year Estimates

Housing and Homelessness

Poor housing conditions and homelessness can lead to serious health problems. In particular, poor housing conditions have been linked to a “broad range of infectious and chronic diseases, injuries, childhood development and nutrition issues, as well as mental health”. For example, poor ventilation systems, pest infestation and water leaks in homes has been linked to development and/or worsening of chronic respiratory conditions like asthma.¹⁰ Homeless individuals experience higher premature mortality from injury, unintentional overdose, and extreme weather. They also experience “chronic pains associated with poor sleeping conditions and limited access to medications and other salutary resources”.¹¹ With that, it is important that Heywood Healthcare be aware of the homeless problem in the Service Area and help target programs towards aiding those in poor housing or homeless conditions.

According to the U.S. Department of Housing and Urban Development’s 2017 Annual Homeless Assessment Report to Congress, the number of people experiencing homelessness in Massachusetts as of January 2017 was 17,565 (0.2% of the population). Of those 17,565 homeless individuals; 11,298 were people in families with children, 6,267 were unaccompanied adults, 469 were unaccompanied youth, 853 were veterans, and 1,238 were experiencing chronic homelessness. While these numbers seem low in comparison to the overall population in Massachusetts (nearly 6.5 million), homelessness numbers have nearly doubled since 1990. As of September 2017, there were “3,580 families with children and pregnant women in the Massachusetts Emergency Assistance shelter program” with 53 of those families living in Motels as of December 2017. During the 2017 fiscal year, Massachusetts assisted nearly 5,000 families with emergency shelters or HomeBASE aversion, but 3,314 families who applied were denied assistance (total of 9,124 families applied for a 47% denial rate).¹²

The McKinney-Vento Homeless Assistance Act of 1987 sought to define “homeless children and youth” so that federal money could be targeted at assisting children defined as such nationwide. It established the federal Education for Homeless Children and Youth Program and guaranteed the right to a public education for all “McKinney-Vento” eligible pupils. According to the latest 2016-2017 data collected from the Massachusetts Department of Elementary and Secondary Education using McKinney-Vento criteria; 21,112 students across Massachusetts Public Schools are “McKinney-Vento eligible”.

Of those 21,112 homeless students:

- 7,289 live in shelters,
- 9,221 are “doubled up” meaning they share housing with others,
- 1,038 are unaccompanied youth living without their legal guardian,
- 154 are unsheltered,
- 1115 live in hotels/motels, and;
- 2,295 are awaiting foster care.¹³

In 2016, the US Conference of Mayors found the leading cause of homelessness to be a lack of affordable housing. The Citizens’ Housing and Planning Association estimated that Massachusetts is short of meeting affordable housing rental demand for extremely low-income residents by as much as 158,769 units.¹⁴ The Center on Budget and Policy Priorities analyzed the Housing Choice Voucher Program in

¹⁰ <https://www.bu.edu/sph/2017/02/12/housing-and-the-health-of-the-public/>

¹¹ <https://www.bu.edu/sph/2016/02/28/homelessness-its-consequences-and-its-causes/>

¹² <https://www.mahomeless.org/about-us/basic-facts>

¹³ <http://www.doe.mass.edu/mv/2016-17districtdata.html>

¹⁴ <https://www.mahomeless.org/about-us/basic-facts>

Massachusetts and reviewed the cost of housing for low-income Massachusetts residents in 2014. They found that over 134,000 “poor households in Massachusetts pay more than half their monthly income for housing costs”, a sharp (22.1%) increase from 110,000 at the start of the Great Recession in 2007.¹⁵

Tables SE-43, SE-44, and SE-45 show the housing characteristics in each of the Service Area communities. Gardner (979) has the greatest number of vacant housing units, as well as the most public housing units (1,356) of all the communities. All of the communities have a lower median housing cost per month than the State (\$2,067) and the Service Area average is (\$1,490), considerably lower than the State. The average median rental costs per month for the Service Area (\$948), which include utilities, are also lower than the State (\$1,129). However, Hubbardston (\$1,263), Phillipston (\$1,229), and Royalston (\$1,164) have higher average rents than the State. These three communities are very rural and that probably accounts for the higher rents in this area. The communities with the highest percent of residents paying more than 30% of their income on a mortgage and higher than the State average (32.7%) are Warwick (46.7%), Orange (43.4%), Wendell (42.9%), Winchendon (36%), Gardner (33.9%), and Petersham (33.2%). The residents that are paying more than 30% of their income on rent greater than the State (50.1%) are Warwick (91.7%), Wendell (74.3%), Orange (67.7%), Templeton (64.5%), and Phillipston (53.6%), with Winchendon tied with the State at 50.1%. Thirteen of the fifteen communities have more than 20% of their residents paying more than 30% of their income on rent and utilities. More alarming is that in every Service Area community more than 20% of its residents spend more than 30% of their income on housing.

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¹⁵ https://www.mahomeless.org/images/CBPP_report_MA_data_3-14.pdf

SE – 43 Housing Characteristics in the Service Area 2016

Community	Total Housing Units	Number of Vacant Housing Units	Home-owner Vacancy Rate	Rental Vacancy Rate	Median Housing Costs/mos. w/ Mortgage	Median Rental Costs/mos.	% Paying >30% of Income for Mortgage	% Paying >30% of Income for Rent	Number of Public Housing Units Available*
Ashburnham	2,723	528	2.0	0.0	\$1,710	\$961	24.8	15.4	29
Athol	5,517	743	3.2	4.1	\$1,355	\$754	27.2	47.8	310
Erving	818	67	0.0	1.6	\$1,318	\$767	22.9	47.5	0
Gardner	9,194	979	2.2	4.7	\$1,534	\$767	33.9	43.6	1,356
Hubbardston	1,759	133	0.0	0.0	\$1,682	\$1,263	24.7	19.4	49
New Salem	478	41	1.0	0.0	\$1,463	\$1,047	21.9	41.0	0
Orange	3,638	367	5.4	2.2	\$1,459	\$733	43.4	67.7	405
Petersham	544	63	0.0	10.5	\$1,655	\$734	33.2	46.3	0
Phillipston	781	217	0.5	0.0	\$1,498	\$1,229	31.3	53.6	8
Royalston	615	110	3.8	0.0	\$1,398	\$1,164	24.5	23.1	3
Templeton	3,507	256	1.2	7.1	\$1,534	\$963	25.0	64.5	238
Warwick	477	120	3.8	0.0	\$1,353	\$1,088	46.7	91.7	0
Wendell	392	25	0.0	0.0	\$1,164	\$763	42.9	74.3	5
Westminster	3,102	238	0.7	0.0	\$1,805	\$1,113	24.3	24.2	87
Winchendon	4,515	660	2.1	16.6	\$1,416	\$879	36.0	50.1	331
Service Area Total/Average	38,060	4,547	1.7	3.1	\$1,490	\$948	30.8	47.3	2,821
Franklin County	33,864	3,295	1.9	3.8	\$1,527	\$857	33.8	51.2	
Worcester County	329,285	26,491	1.5	5.4	\$1,859	\$955	29.8	49.0	
Massachusetts	2,836,658	277,769	1.1	4.1	\$2,067	\$1,129	32.7	50.1	262,223

Sources: US Census Bureau ACS 2012-2016 5-year Estimates; * MA DHCD Chapter 40B Subsidized Housing Inventory (SHI) as of 9/14/17

SE – 44 Housing Characteristics in the Athol Hospital Service Area 2016

Community	Total Housing Units	Number of Vacant Housing Units	Home-owner Vacancy Rate	Rental Vacancy Rate	Median Housing Costs/mos. w/ Mortgage	Median Rental Costs/mos.	% Paying >30% of Income for Mortgage	% Paying >30% of Income for Rent	Number of Public Housing Units Available*
Athol	5,517	743	3.2	4.1	\$1,355	\$754	27.2	47.8	310
Erving	818	67	0.0	1.6	\$1,318	\$767	22.9	47.5	0
New Salem	478	41	1.0	0.0	\$1,463	\$1,047	21.9	41.0	0
Orange	3,638	367	5.4	2.2	\$1,459	\$733	43.4	67.7	405
Petersham	544	63	0.0	10.5	\$1,655	\$734	33.2	46.3	0
Phillipston	781	217	0.5	0.0	\$1,498	\$1,229	31.3	53.6	8
Royalston	615	110	3.8	0.0	\$1,398	\$1,164	24.5	23.1	3
Warwick	477	120	3.8	0.0	\$1,353	\$1,088	46.7	91.7	0
Wendell	392	25	0.0	0.0	\$1,164	\$763	42.9	74.3	5
Service Area Total/Average	13,260	1,753	2.0	2.0	\$1,407	\$920	32.7	54.8	731
Franklin County	33,864	3,295	1.9	3.8	\$1,527	\$857	33.8	51.2	
Worcester County	329,285	26,491	1.5	5.4	\$1,859	\$955	29.8	49.0	
Massachusetts	2,836,658	277,769	1.1	4.1	\$2,067	\$1,129	32.7	50.1	262,223

Sources: US Census Bureau ACS 2012-2016 5-year Estimates; * MA DHCD Chapter 40B Subsidized Housing Inventory (SHI) as of 9/14/17

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SE – 45 Housing Characteristics in the Heywood Hospital Service Area

Community	Total Housing Units	Number of Vacant Housing Units	Home-owner Vacancy Rate	Rental Vacancy Rate	Median Housing Costs/mos. w/ Mortgage	Median Rental Costs/mos.	% Paying >30% of Income for Mortgage	% Paying >30% of Income for Rent	Number of Public Housing Units Available*
Ashburnham	2,723	528	2.0	0.0	\$1,710	\$961	24.8	15.4	29
Gardner	9,194	979	2.2	4.7	\$1,534	\$767	33.9	43.6	1,356
Hubbardston	1,759	133	0.0	0.0	\$1,682	\$1,263	24.7	19.4	49
Templeton	3,507	256	1.2	7.1	\$1,534	\$963	25.0	64.5	238
Westminster	3,102	238	0.7	0.0	\$1,805	\$1,113	24.3	24.2	87
Winchendon	4,515	660	2.1	16.6	\$1,416	\$879	36.0	50.1	331
Service Area Total/Average	24,800	2,794	1.4	4.7	\$1,614	\$991	28.1	36.2	2,090
Franklin County	33,864	3,295	1.9	3.8	\$1,527	\$857	33.8	51.2	
Worcester County	329,285	26,491	1.5	5.4	\$1,859	\$955	29.8	49.0	
Massachusetts	2,836,658	277,769	1.1	4.1	\$2,067	\$1,129	32.7	50.1	262,223
Sources: US Census Bureau ACS 2012-2016 5-year Estimates; * MA DHCD Chapter 40B Subsidized Housing Inventory (SHI) as of 9/14/17									

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Built Environment Influences

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.

Open Spaces

According to a 2016 report from the World Health Organization (WHO), green spaces have numerous benefits for the health and well-being of people who utilize them. Green spaces can be parks and sports fields, woods, trails and meadows, or anything of the like. The report concluded that use of green spaces can lead to "improved mental health, reduced cardiovascular morbidity and mortality, obesity and risk of type 2 diabetes, and improved pregnancy outcomes".¹⁶

According to MassGIS data, the Service Area is chock full of open space parcels defined for the purposes of this report as any conservation land or outdoor recreational facility owned by federal, state, county, municipal or nonprofit entities and 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 of this land is open for public use but that they contribute in some way to the health and well-being of area residents.

Table SE-46 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 40, followed by Templeton (63) and Phillipston (97).

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-47 shows there is an ample number of public trails for area residents to hike and play on. Warwick residents have access to over 128 miles of trails, far surpassing any other community in the Service Area. Wendell (93.75 miles) and Petersham (75.32 miles) have the second and third most trail miles. The remaining communities have between 9.19 (New Salem) and 46.79 miles (Winchendon) of trails accessible to the public. In total, Service Area residents have access to over 600 miles (41 miles per community on average) of trails they can use to help improve health outcomes for themselves and their families.

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¹⁶ http://www.euro.who.int/_data/assets/pdf_file/0005/321971/Urban-green-spaces-and-health-review-evidence.pdf?ua=1

SE-46 Number of Open Space Parcels per Community

Community	# of Open Space Parcels
Ashburnham	119
Athol	154
Erving	40
Gardner	129
Hubbardston	284
New Salem	170
Orange	148
Petersham	252
Phillipston	97
Royalston	215
Templeton	63
Warwick	101
Wendell	145
Westminster	109
Winchendon	198
Service Area Ave.	148
Source: MassGIS	

SE-47 Trail Length Per Community

Community	Total Trail Length (miles)
Ashburnham	17.63
Athol	42.33
Erving	33.89
Gardner	25.07
Hubbardston	15.16
New Salem	9.19
Orange	17.62
Petersham	75.32
Phillipston	18.39
Royalston	33.86
Templeton	19.58
Warwick	128.03
Wendell	93.75
Westminster	33.27
Winchendon	46.79
Service Area Ave.	40.66
Service Area Total	609.88
Sources: MassGIS, MRPC GIS Data	

Food Deserts

The US Department of Agriculture (USDA) defines a "food desert" as "parts of the country void 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 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".¹⁷

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.¹⁸ The map also tracks which of those areas 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)".¹⁹

¹⁷ <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>

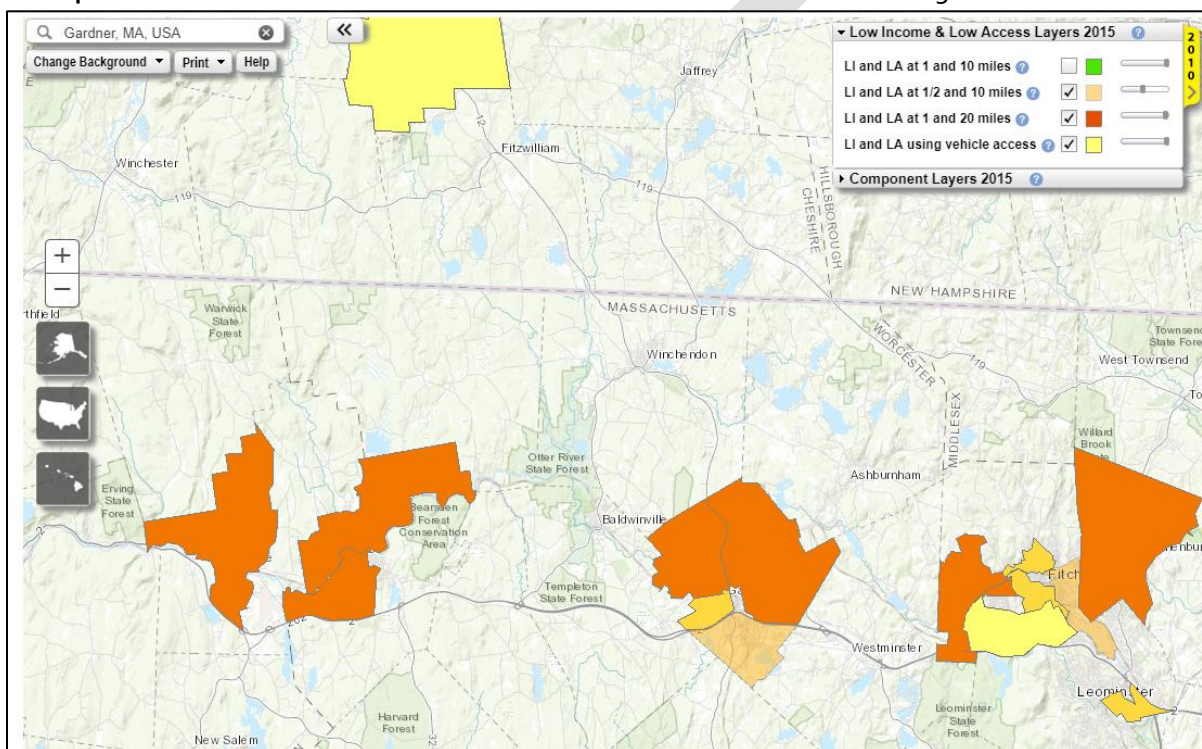
¹⁸ <https://www.ers.usda.gov/data/fooddesert/>

¹⁹ <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>

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. In SE-48 map, the dark orange highlighted areas are those that qualify as LI and LA at one (1) and 20 miles, the areas highlighted in the darker shade of yellow qualify as LI and LA using vehicle access and the light tan sections are those that qualify as LI and LA at 1/2 and 10 miles. According to the USDA's standards, almost the entire city of Gardner is considered a food desert as seen in Map SE-49.

Note: The USDA Food Atlas is only updated as of 2015 and has not accounted for any changes that may have occurred since then. Important to note for this section is the opening of Market Basket in Athol and the closing of IGA in Winchendon that has changed the Food Desert status of both of these communities in the last couple of years.

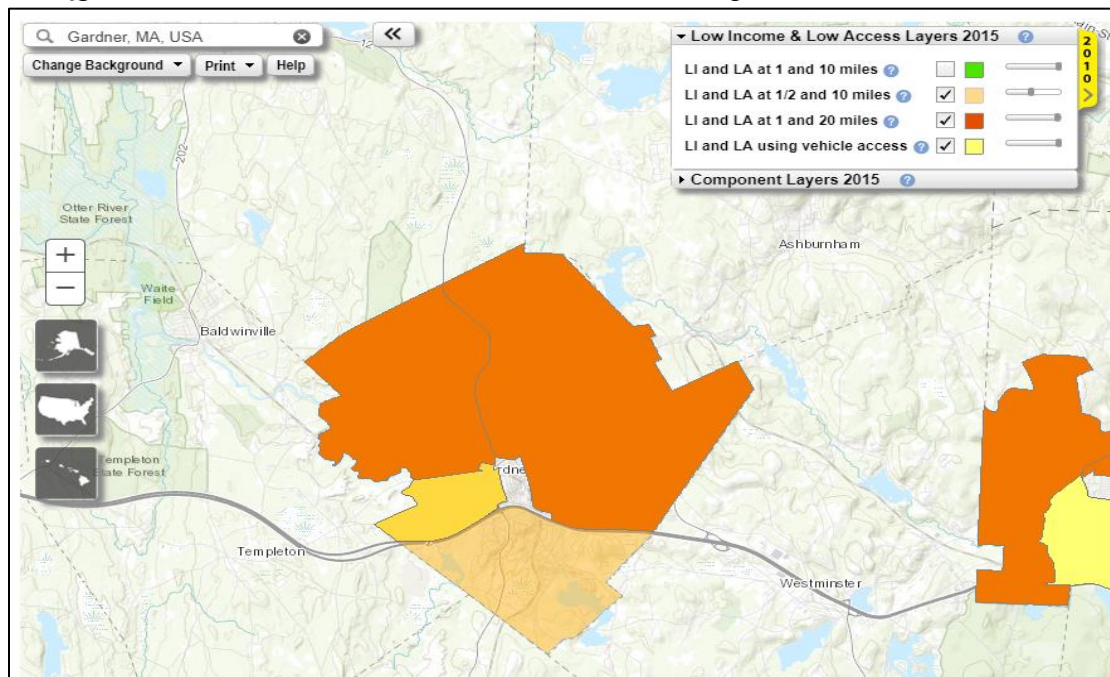
SE - 48 LI and LA and limited vehicle access in Service Area communities 2015



Source: USDA Food Access Research Atlas 2018

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SE - 49 LI and LA and Limited Vehicle Access in Gardner 2015



Source: USDA Food Access Research Atlas 2018

Transportation

In the post-World War II era, carpooling to work became a very popular routine for Americans. After the War, through to the 1960s and 70s, one-fifth of Americans carpoled. Since then, the story has changed in the US as vehicle ownership has skyrocketed.²⁰ According to the ACS 2016 estimates, 76.4% of Americans drive to work alone, 9.3% carpool, 5.1% use public transportation and the remaining 9.2% walk, bike, take a taxi/motorcycle, or work from home. Being that the Service Area is more rural in nature, many residents have fewer alternatives to driving alone to work compared to the rest of the State and Nation. According to Table SE-50, on average nearly 83% of Service Area workers drive alone to their place of work, nearly 12% higher than the State (71.1%) and 7% higher than the National (76.4%) averages. About 8.6% of Service Area workers did carpool which is slightly higher than the State's 7.5%, however, considerably less workers in the Service Area used public transportation (.9%) compared to the State (9.9%) and Nation (5.1%). Table SE-50 breaks down the means of travel to work for Service Area residents by community.

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²⁰ <http://www.govtech.com/transportation/7-Strategies-to-Maximize-Ride-Sharings-Potential.html>

SE - 50 Means of Travel to Work by Community 2016

Community	Drove Alone	Carpooled	Public Transportation	Walked	Bicycle	Taxicab, motorcycle, or other	Worked from Home
Ashburnham	84.6%	7.6%	1.2%	2.6%	0.0%	0.0%	4.0%
Athol	81.2%	10.8%	1.0%	2.5%	0.0%	1.2%	3.3%
Erving	88.1%	8.5%	0.7%	0.4%	0.0%	0.6%	1.7%
Gardner	82.3%	8.5%	0.4%	3.9%	0.1%	0.9%	3.8%
Hubbardston	89.4%	5.6%	0.8%	0.0%	0.0%	0.0%	4.2%
New Salem	81.6%	9.3%	1.4%	2.6%	0.0%	0.6%	4.6%
Orange	75.0%	11.2%	1.0%	4.0%	0.4%	0.5%	7.8%
Petersham	75.9%	11.2%	0.3%	3.4%	0.0%	0.0%	9.2%
Phillipston	83.6%	6.1%	0.0%	1.2%	0.0%	0.6%	5.1%
Royalston	87.0%	6.1%	0.0%	1.2%	0.0%	0.6%	5.1%
Templeton	85.2%	10.9%	0.0%	1.2%	0.0%	0.4%	2.3%
Warwick	80.0%	9.1%	0.0%	0.6%	0.0%	0.9%	9.4%
Wendell	71.0%	11.2%	3.1%	2.8%	0.0%	0.0%	12.0%
Westminster	89.1%	2.5%	2.9%	0.4%	0.0%	0.5%	4.6%
Winchendon	84.6%	9.8%	0.0%	3.1%	0.0%	0.6%	1.9%
Service Area Average	82.6%	8.6%	0.9%	2.0%	0.0%	0.5%	5.3%
Massachusetts	71.1%	7.5%	9.9%	4.9%	0.8%	1.1%	4.7%
U.S.	76.4%	9.3%	5.1%	2.8%	0.6%	1.2%	4.6%
Source: 2012-2016 American Community Survey 5-Year Estimates							

In comparing commuters in Athol and Heywood Service Areas in Tables SE-51 and SE-52, the rates at which people use public transportation, walk, bike, taxi, or ride a motorcycle to work are relatively equal. The large majority of workers across the Services Areas drive themselves to work with Athol's workforce driving themselves 80.4% of the time, compared to 85.9% of Heywood's workers driving themselves. Athol commuters carpool a bit more often than Heywood commuters (9.3% vs. 7.5%) and work from home 6.5% of the time compared to Heywood's 3.5%.

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SE - 51 Means of Travel to Work by Community in Athol Hospital's Service Area 2016

Community	Drove Alone	Carpooled	Public Transportation	Walked	Bicycle	Taxicab, motorcycle, or other	Worked from Home
Athol	81.2%	10.8%	1.0%	2.5%	0.0%	1.2%	3.3%
Erving	88.1%	8.5%	0.7%	0.4%	0.0%	0.6%	1.7%
New Salem	81.6%	9.3%	1.4%	2.6%	0.0%	0.6%	4.6%
Orange	75.0%	11.2%	1.0%	4.0%	0.4%	0.5%	7.8%
Petersham	75.9%	11.2%	0.3%	3.4%	0.0%	0.0%	9.2%
Phillipston	83.6%	6.1%	0.0%	1.2%	0.0%	0.6%	5.1%
Royalston	87.0%	6.1%	0.0%	1.2%	0.0%	0.6%	5.1%
Warwick	80.0%	9.1%	0.0%	0.6%	0.0%	0.9%	9.4%
Wendell	71.0%	11.2%	3.1%	2.8%	0.0%	0.0%	12.0%
Service Area Average	80.4%	9.3%	0.8%	2.1%	0.0%	0.6%	6.5%
Massachusetts	71.1%	7.5%	9.9%	4.9%	0.8%	1.1%	4.7%
U.S.	76.4%	9.3%	5.1%	2.8%	0.6%	1.2%	4.6%
Source: 2012-2016 American Community Survey 5-Year Estimates							

SE - 52 Means of Travel to Work by Community in Heywood Hospital's Service Area 2016

Community	Drove Alone	Carpooled	Public Transportation	Walked	Bicycle	Taxicab, motorcycle, or other	Worked from Home
Ashburnham	84.6%	7.6%	1.2%	2.6%	0.0%	0.0%	4.0%
Gardner	82.3%	8.5%	0.4%	3.9%	0.1%	0.9%	3.8%
Hubbardston	89.4%	5.6%	0.8%	0.0%	0.0%	0.0%	4.2%
Templeton	85.2%	10.9%	0.0%	1.2%	0.0%	0.4%	2.3%
Westminster	89.1%	2.5%	2.9%	0.4%	0.0%	0.5%	4.6%
Winchendon	84.6%	9.8%	0.0%	3.1%	0.0%	0.6%	1.9%
Service Area Average	85.9%	7.5%	0.9%	1.9%	0.0%	0.4%	3.5%
Massachusetts	71.1%	7.5%	9.9%	4.9%	0.8%	1.1%	4.7%
U.S.	76.4%	9.3%	5.1%	2.8%	0.6%	1.2%	4.6%
Source: 2012-2016 American Community Survey 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. A 2014 report from the Urban Institute titled "Driving to Opportunity" found evidence of this link. Among the findings are the following:

- “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”

That being said, a higher percentage of Service Area residents have access to two vehicles (44.9%), or three or more vehicles (38.6%) compared to the State (42.7% and 27.6%, respectively) and Nation (41.5% and 32.9%, respectively) as shown in Table SE-53. Additionally, notably fewer Service Area residents have no access to any vehicle (1.5%) compared to the State (5.9%) and Nation (4.4%). While no access to a vehicle is lower than the State, there are a few communities like Gardner (4.2%) and Wendell (3.6%) that stick out among the other Service Area communities. Those residents in these communities have a significantly higher chance of experiencing healthcare disparities due to the inability to get around for their healthcare needs and is important for Heywood Healthcare leadership to address.

Being that public transportation is limited, many area residents are forced to find alternative means to get to work and fortunately, far more Service Area residents have access to personal transportation than is typical in the State and Nation overall. This allows them to find and sustain employment, as suggested by the Urban Institute report mentioned above. Tables SE-54 and SE-55 on the following pages break down vehicle access in the Service Area overall, as well as a comparison between Athol Hospital and Heywood Hospital Services Areas.

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 that have no super markets, and Royalston that have no gas stations.

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SE – 53 Number of Vehicles Available for those Aged 16 and Over in Households 2016

Community	No Vehicle	1 Vehicle	2 Vehicles	3 or more Vehicles
Ashburnham	2.1%	12.9%	43.7%	41.3%
Athol	1.7%	21.6%	47.3%	29.4%
Erving	0.3%	13.0%	47.8%	38.8%
Gardner	4.2%	27.2%	45.5%	23.1%
Hubbardston	0.0%	8.4%	48.3%	43.4%
New Salem	1.8%	17.2%	45.3%	35.6%
Orange	2.7%	20.1%	44.2%	33.0%
Petersham	0.6%	11.8%	40.9%	46.8%
Phillipston	0.0%	10.1%	50.5%	39.3%
Royalston	1.8%	8.2%	36.8%	53.2%
Templeton	1.4%	12.8%	36.0%	49.8%
Warwick	0.0%	19.7%	44.0%	36.3%
Wendell	3.6%	17.2%	47.9%	31.3%
Westminster	0.8%	11.9%	52.7%	34.6%
Winchendon	2.1%	12.5%	42.2%	43.2%
Service Area Average	1.5%	15.0%	44.9%	38.6%
Massachusetts	5.9%	23.7%	42.7%	27.6%
U.S.	4.4%	21.2%	41.5%	32.9%
Source: 2012-2016 American Community Survey 5-Year Estimates				

SE – 54 Number of Vehicles Available for those Aged 16 and Over in Athol Hospital Service Area Households 2016

Community	No Vehicle	1 Vehicle	2 Vehicles	3 or more Vehicles
Athol	1.7%	21.6%	47.3%	29.4%
Erving	0.3%	13.0%	47.8%	38.8%
New Salem	1.8%	17.2%	45.3%	35.6%
Orange	2.7%	20.1%	44.2%	33.0%
Petersham	0.6%	11.8%	40.9%	46.8%
Phillipston	0.0%	10.1%	50.5%	39.3%
Royalston	1.8%	8.2%	36.8%	53.2%
Warwick	0.0%	19.7%	44.0%	36.3%
Wendell	3.6%	17.2%	47.9%	31.3%
Service Area Average	1.4%	15.4%	45.0%	38.2%
Massachusetts	5.9%	23.7%	42.7%	27.6%
Source: 2012-2016 American Community Survey 5-Year Estimates				

SE - 55 Number of Vehicles Available for those Aged 16 and Over in Heywood Hospital Service Area Households 2016

Community	No Vehicle	1 Vehicle	2 Vehicles	3 or more Vehicles
Ashburnham	2.1%	12.9%	43.7%	41.3%
Gardner	4.2%	27.2%	45.5%	23.1%
Hubbardston	0.0%	8.4%	48.3%	43.4%
Templeton	1.4%	12.8%	36.0%	49.8%
Westminster	0.8%	11.9%	52.7%	34.6%
Winchendon	2.1%	12.5%	42.2%	43.2%
Service Area Average	1.8%	14.3%	44.7%	39.2%
Massachusetts	5.9%	23.7%	42.7%	27.6%
Source: 2012-2016 American Community Survey 5-Year Estimates				

In terms of health outcomes, Heywood Healthcare's concerns lie primarily with commute times of Service Area residents. According to various studies, longer commute times to work have a detrimental effect on health and well-being. According to a TIME Health 2014 article, longer commutes can lead to rising blood sugar/pressure and cholesterol levels, increased risk of depression and anxiety, and a decline in happiness and life satisfaction (which in turn leads to other worse health outcomes).²¹ As can be seen in Table SE-56, 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 35.9 minutes) and others between 8 and 9 minutes (Petersham 29.6 minutes to 37.9 minutes; Templeton 25.2 minutes to 33.6 minutes; Warwick 27.8 minutes to 36.3 minutes). Commute times were reduced in four communities; New Salem, Orange, Royalston, and Westminster. Increasing commute times in many of these areas suggests that local jobs are becoming scarce, forcing people to seek employment outside of the region.

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²¹ <http://time.com/9912/10-things-your-commute-does-to-your-body/>

SE - 56 Mean Travel Time to Work by Community 2000-2016

Community	2000 (minutes)	2012-2016 (minutes)
Ashburnham	31.4	35.0
Athol	24.6	28.6
Erving	22.6	25.5
Gardner	24.1	25.2
Hubbardston	35.5	35.4
New Salem	32.2	31.5
Orange	25.1	23.1
Petersham	29.6	36.4
Phillipston	29.4	31.7
Royalston	35.1	33.2
Templeton	25.2	31.3
Warwick	27.8	37.1
Wendell	31.6	33.3
Westminster	28.7	28.5
Winchendon	29.5	32.4
Service Area Average	28.8	31.2
Franklin County	23.7	23.7
Worcester County	25.8	28.3
Massachusetts	27.0	28.7
U.S.	25.5	26.1
Source: U.S. Census 2000 and 2012-2016 American Community Survey 5-Year Estimates		

Commute times for residents in both Athol and Heywood Hospital Service Areas are virtually the same with Athol commuters taking 31.2 minutes to get to work and Heywood commuters taking 31.3 minutes to get to work as shown in Tables SE-57 and SE-58. In Athol's Service Area, Warwick residents have the longest commute at 37.1 minutes, followed by Petersham at 36.4 minutes and Wendell at 33.3 minutes. The shortest commute for Athol Hospital commuters is in Orange where it takes an average of just 23.1 minutes to get to work. Commute times in six of Athol's nine communities have increased since 2000.

In Heywood Hospital's Service Area, commutes are longest in Hubbardston (35.4 minutes) and Ashburnham (35 minutes), and shortest in Gardner (25.2 minutes). Commutes have gotten longer in four of Heywood's six communities since 2000.

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SE - 57 Mean Travel Time to Work in Athol Hospital's Service Area 2000-2016

Community	2000 (minutes)	2012-2016 (minutes)
Athol	24.6	28.6
Erving	22.6	25.5
New Salem	32.2	31.5
Orange	25.1	23.1
Petersham	29.6	36.4
Phillipston	29.4	31.7
Royalston	35.1	33.2
Warwick	27.8	37.1
Wendell	31.6	33.3
Service Area Average	28.7	31.2
Franklin County	23.7	23.7
Worcester County	25.8	28.3
Massachusetts	27.0	28.7
U.S.	25.5	26.1
Source: U.S. Census 2000 and 2012-2016 American Community Survey 5-Year Estimates		

SE - 58 Mean Travel Time to Work in Heywood Hospital's Service Area 2000-2016

Community	2000 (minutes)	2012-2016 (minutes)
Ashburnham	31.4	35.0
Gardner	24.1	25.2
Hubbardston	35.5	35.4
Templeton	25.2	31.3
Westminster	28.7	28.5
Winchendon	29.5	32.4
Service Area Average	29.1	31.3
Franklin County	23.7	23.7
Worcester County	25.8	28.3
Massachusetts	27.0	28.7
U.S.	25.5	26.1
Source: U.S. Census 2000 and 2012-2016 American Community Survey 5-Year Estimates		

Tables SE-59 and SE-60 show the numbers of transports each of the hospitals provided to patients in fiscal year 2017 by month for the period October 1, 2016 – September 30, 2017, and how much it cost for each month.

SE – 59 Athol Hospital Provided Transports

Month	# of Transports	Cost
Oct	7	\$569.00
Nov	11	\$615.00
Dec	6	\$314.00
Jan	11	\$416.00
Feb	6	\$164.00
Mar	11	\$588.00
Apr	6	\$290.00
May	5	\$159.00
Jun	7	\$203.00
Jul	4	\$168.00
Aug	6	\$165.00
Sep	7	\$261.00
Total	87	\$3,912.00

Source: Athol Hospital Data FY17

SE – 60 Heywood Hospital Provided Transports

Month	# of Transports	Cost
Oct	4	\$233.00
Nov	5	\$247.00
Dec	2	\$84.00
Jan	2	\$114.00
Feb	16	\$900.27
Mar	22	\$1,130.00
Apr	14	\$605.00
May	13	\$862.10
Jun	11	\$366.00
Jul	22	\$1,106.53
Aug	19	\$903.00
Sep	26	\$952.00
Total	156	\$7,502.90

Source: Heywood Hospital Data FY17

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 there are many factors that 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. Rankings ignore the uniqueness of each locale. Some factors that are known to affect the volume and type of crime occurring from place to place are:

- Population density and degree of urbanization.
- Variations in composition of the population, particularly youth concentration.
- Stability of the population with respect to residents; mobility, commuting patterns, and transient factors.
- Economic conditions, including median income, poverty level, and job availability.
- Modes of transportation and highway systems.
- Cultural factors and educational, recreational, and religious characteristics.
- Family conditions with respect to divorce and family cohesiveness.
- Climate.
- Effective strength of law enforcement agencies.
- Administrative and investigative emphases on law enforcement

- Policies of other components of the criminal justice system (i.e., prosecutorial, judicial, correctional, and probational).
- Citizens' attitudes toward crime.
- Crime reporting practices of the citizenry.

In Table SE-61 are selected crime statistics for some of the communities in the Service Area. As is mentioned above, comparison of communities is not recommended as different socio-economic circumstances occur in each community. However, comparison of the Service Area communities' crime rates to the overall State rates can be beneficial. This is done in Table SE-62. Some of the communities' data was not available and so are not listed in the table.

SE - 61 Selected Crime Statistics in the Service Area Communities 2016

Community	Population	Assault	Homicide	Sex Offenses	Robbery	Burglary/ Breaking & Enter	Larceny/ Theft	Destruction/ Damage/ Vandalism	Arson	Drug/ Narcotic Offenses	Weapon Law Violation
Ashburnham	6,206	30	0	4	0	12	35	26	1	1	3
Athol	11,612	132	0	10	1	46	158	74	3	10	5
Erving	1,771	18	0	3	0	11	23	12	2	40	4
Gardner	20,277	373	1	27	7	146	362	213	1	45	11
New Salem	n/a	5	n/a	0	15	3	7	7	n/a	3	2
Orange	7,615	73	1	8	3	28	68	33	1	9	0
Petersham	n/a	1	n/a	n/a	n/a	4	7	1	0	n/a	n/a
Templeton	8,169	43	0	6	0	17	47	31	0	4	1
Westminster	7,595	36	0	2	0	11	61	27	1	9	2
Winchendon	10,727	165	0	23	2	18	169	83	2	7	9
Massachusetts	5,849,105	59,919	86	1,890	3,399	16,473	66,871	31,886	426	10,299	2,772

Sources: FBI Uniform Crime Reporting Program 2016 Data; American Community Survey 2012-2016 Estimates.

In table SE-62, the rates per 1,000 residents is given for the Service Area communities and the State overall. Only eight of the fifteen Service Area communities with data in the national FBI database have rates given. Populations are from the American Community Survey 2012-2016 Estimates. The assault rate for Massachusetts is 8.89 and Winchendon (15.38), Athol (11.37), Erving (10.16), and Orange (9.59) have higher rates than the State. Only Orange (0.13) and Gardner (0.05) have higher homicide rates than the State (0.01) as a whole; with no other Service Area

communities having homicides. All eight of the Service Area communities listed have higher sex offenses rates than the State (0.28). with the exception of Westminster (0.26). None of the Service Area communities have robbery rates higher than the State. Burglary and breaking and entering rates are higher than the State (2.44) in Gardner (7.20), Erving (6.21), Athol (3.96), and Orange (3.68). Another crime against property, destruction/damage/vandalism, has a higher rate than the State (4.73) in Gardner (10.50), Winchendon (7.74), Erving (6.78), and Athol (6.37).

The arson rate for the State is 0.06, which is lower than Erving (1.13), Athol (0.26), Winchendon (0.19), Ashburnham (0.16), Orange (0.13), and Westminster (0.13). The rate of drug and narcotic offenses in the State is 1.53 which is greater than all but Erving (22.59) and Gardner (2.26). The weapons law violation rate for the State is 0.41, with all but Orange (0.00) and Templeton (0.12) being higher.

By comparing the Service Area communities with the State, Erving has a higher rate than the State in eight out of ten crime categories presented, Athol and Gardner have higher rates in seven out of ten categories, Winchendon has six out of ten higher, Orange has five out of ten higher, Ashburnham has three out of ten higher and Templeton and Westminster are only higher than the State in one out of ten categories.

SE - 62 Rates Per 1000 Residents of Selective Crime Statistics in the Service Area Communities and Massachusetts 2016

Community	Population	Assault Rate	Homicide Rate	Sex Offenses Rate	Robbery Rate	Burglary/ B&E Rate	Larceny/ Theft Rate	Destruction/ Damage/ Vandalism Rate	Arson Rate	Drug/ Narcotic Offenses Rate	Weapon Law Violation Rate
Ashburnham	6,206	4.83	0.00	0.64	0.00	1.93	5.64	4.19	0.16	0.16	0.48
Athol	11,612	11.37	0.00	0.86	0.09	3.96	13.61	6.37	0.26	0.86	0.43
Erving	1,771	10.16	0.00	1.69	0.00	6.21	12.99	6.78	1.13	22.59	2.26
Gardner	20,277	NA*	0.05	1.33	0.35	7.20	17.85	10.50	0.05	2.22	0.54
Orange	7,615	9.59	0.13	1.05	0.39	3.68	8.93	4.33	0.13	1.18	0.00
Templeton	8,169	5.26	0.00	0.73	0.00	2.08	5.75	3.79	0.00	0.49	0.12
Westminster	7,595	4.74	0.00	0.26	0.00	1.45	8.03	3.55	0.13	1.18	0.26
Winchendon	10,727	15.38	0.00	2.14	0.19	1.68	15.75	7.74	0.19	0.65	0.84
Massachusetts	6,742,143	8.89	0.01	0.28	0.50	2.44	9.92	4.73	0.06	1.53	0.41

Sources: FBI Uniform Crime Reporting Program 2016 Data; American Community Survey 2012-2016 Estimates. *NA=data error for Gardner in that category.

A primary objective of the Massachusetts Department of Corrections (MA DOC) is to rehabilitate offenders and prepare them for successful reentry into society. Offenders are assessed and those identified as being the highest risk offenders are enrolled in programs designed to target their specific criminogenic need areas with the goal of deterring future criminality. To measure success, offender recidivism rates are used to determine an offender's ability to abstain from criminal behavior after release from prison. When an offender transitions from prison to the community he often faces obstacles known to be associated with: higher rates of criminality; substance abuse (Travis & Visser, 2006); unstable living arrangements or homelessness (Grunwald, Lockwood, Harris, & Mennis, 2010; Halsey, 2007); releasing to neighborhoods where known associates have delinquent attitudes or behaviors (Megens & Weerman 2011); or returning to an area of low economic opportunities (Weiman, 2007). Mental health issues are also a concern as correctional facilities across the country are managing a growing number of offenders with mental health disorders. On January 1, 2016, 30% of males and 70% of females in MA DOC custody had an open mental health case, and 21% of males and 56% of females were prescribed psychotropic medication (MA DOC, 2016).

According to data from the MA DOC website, as of April 1, 2018, the male inmate population had:

- 8,594 total males in the jurisdiction population: 7,978 criminally sentenced, 79 pre-trial detainees, and 537 civil commitments
- Average age of male inmates was 42 years old (youngest inmate was 18 years old and oldest inmate was 94 years old)
- 95% were serving a sentence of more than three years
- 71% had a violent governing offense
- 775 were serving a governing mandatory drug sentence

As of January 1, 2018, the MA DOC website states the following regarding male inmates:

- 42% entered MA DOC with less than a 9th grade reading level
- 44% entered the Massachusetts DOC with less than a 6th grade math level
- The 2014 three-year recidivism rate was 32% for the total male population
- 31% were open mental health cases, 7% had a serious mental illness (SMI), and 22% were on psychotropic medication. Note: Information provided by Health Services Division

According to data from the MA DOC website, as of April 1, 2018, the female inmate population had:

- 545 total females in the jurisdiction population: 365 criminally sentenced, 173 pre-trial detainees, and 7 civil commitments
- Average age of female inmates was 38 years old (youngest inmate was 19 years old and oldest inmate was 73 years old)
- 64% were serving a sentence of more than three years
- 56% had a violent governing offense
- 20 were serving a governing mandatory drug sentence

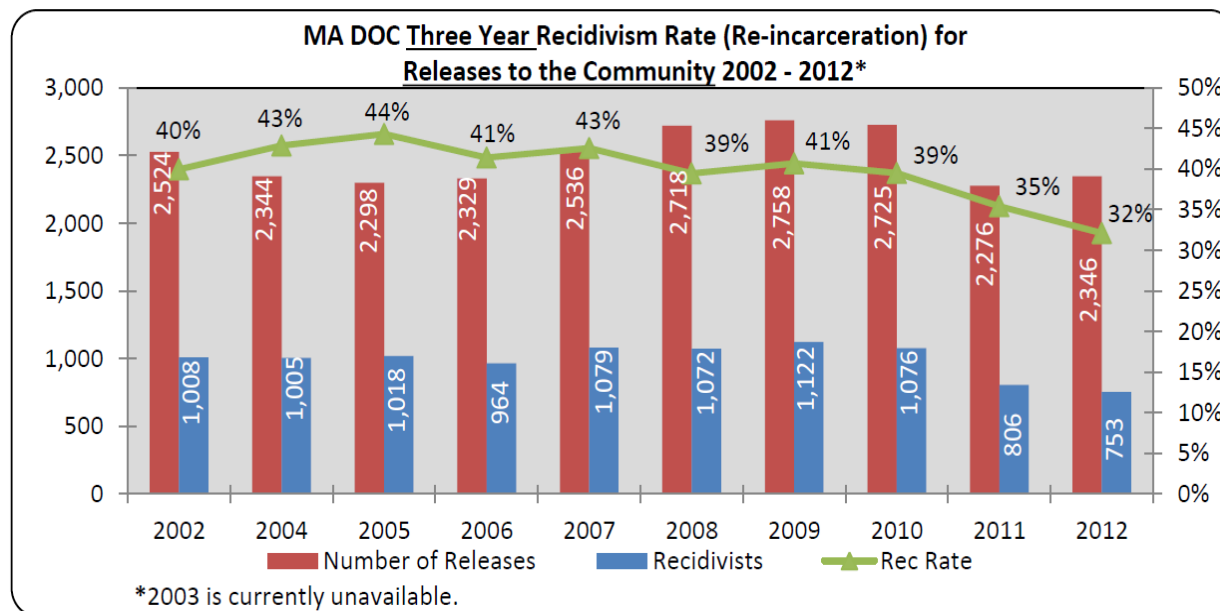
As of January 1, 2018, the MA DOC website states the following regarding female inmates:

- 29% entered the MA DOC with less than a 9th grade reading level
- 34% entered the Massachusetts DOC with less than a 6th grade math level
- The 2014 three-year recidivism rate was 32% for the total female population
- 79% were open mental health cases, 12% had a serious mental illness (SMI), and 55% were on psychotropic medication. Note: Information provided by Health Services Division

Most women who are under MA DOC custody are placed at MCI Framingham or South Middlesex Correctional Center, also in Framingham. These placements are disadvantageous for women who have children or family that visit due to the distance to travel and potential transportation issues.

Figure SE-63 illustrates the recidivism rates from 2002-2012 for all inmate releases in Massachusetts. The recidivism rate is calculated by dividing the number of offenders reconvicted within two years of release by the number of offenders in the release cohort. During the Great Recession, recidivism rates were high, but since that time, the rates appear to be decreasing.

SE - 61 Massachusetts Recidivism Rate (2002-2012)



Source: Massachusetts Department of Corrections Annual Report 2015

According to the Department of Corrections 2015 Annual Report, in an effort to reduce recidivism, the Classification Division worked closely with the Program Services Division to identify and classify inmates to Correctional Recovery Academy (CRA) sites to increase the levels of participation.

The North Central Correctional Institution (NCCI) in Gardner is the only prison located in the Service Area. This prison only houses males and is comprised of separate medium and minimum-security facilities. NCCI minimum provides inmates employment opportunities through supervised community work crews. NCCI medium offers a full range of academic and vocational education programs, sex offender treatment and residential substance use treatment services. It provides inmates employment opportunities through institutional job assignments, and the community service program National Education for Assistance Dogs Services. Additional employment opportunities are offered through the state-of-the-art correctional industries optical shop run by MassCOR. An average of 88 inmates participate in MassCOR at NCCI.

The Optical Shop is a full-scale eyewear laboratory providing services to many providers throughout Massachusetts. The offenders working at this site grind, polish, and assemble eyeglasses for a number of customers. The Industrial Instructors at NCCI Gardner facilitate the process of testing offenders working in the Optical Shop to gain a certification from the American Board of Optometry, a nationally

recognized organization. The test is designed to assess the competency in the optical field and their overall knowledge. The individual taking this exam will obtain a certification from the American Board of Opticianry. This, in turn, will allow the offender to show qualifications and a work history to potential employers. These efforts enhance an offender's employability upon release.



Community Perceptions

"MART won't go get seniors in remote areas"

"Poverty leads to lack of employment, education, nutrition, transportation, food access and traps children in this endless cycle and they almost never make it out"

"Access to affordable, healthy food is limited and food pantries are often places in remote locations that are difficult to get to"

"Literacy and language barriers are prevalent"

"Some patients, particularly elderly, disabled and mentally ill patients, are dependent on their caregivers' schedules to get to necessary appointments because public transportation is inadequate"

"We need more homeless/emergency housing and shelters...the YMCA does not have enough space for everyone...In fact there aren't any homeless shelters in the catchment area"

"We need school-based health centers"

"There is definitely a need for more ADA accessibility in hospital facilities."

"We need more public education programs for the public and local businesses on healthcare needs of the area"

"Teens are using the internet to self-diagnose and treat themselves and this is becoming very dangerous"

"Many moderate-income people do not go for the medical treatment they need because their deductibles are so high"

"A 'one-stop-shop' location for all healthcare needs would be amazing, we need to bring all healthcare providers and organizations under one roof so people are not running all over the place for different things"

"Local healthcare providers need more support...many healthcare providers are burning out because there is so much to do and not enough time to do it so they feel like their work isn't really helping"

"The tax conversation on the federal level does not address economic inequality... we need to try and shift the focus of the conversation to that so we can have better public health outcomes"

"If you can stay in your home, health outcomes are better... we need to do more to reach out to isolated elders to gain their trust so we can help and prove to them that we want to help keep them in their homes"

"Senior centers are great for reaching out to elderly population but does nothing to help reach those elders who do not use those services"

"24 to 64-year-old white, middle class males are dying at higher than normal rates from preventable stuff like underemployment or unemployment, low paying jobs and substance abuse due to stresses of life and being the head of household unable to provide for their families"

"There is a lack of meaningful employment opportunities in the area"

"The public transportation system does not jive with local work shifts so people have a hard time getting to work"

"There is a lack of workforce training programs in the area to help develop the local workforce"

"There are no solid jobs that are 'life sustaining'"

"We need more specialty providers"

"People are living in unsafe and unhealthy housing conditions"

"People are refusing to call the local Board of Health to report unsafe living conditions for fear of repercussions from landlords"

"Lack of alternative transportation options inhibits access to jobs, childcare and healthcare"

"There are programs available but people do not take advantage of them"

"There is a lack of skills and work ethic of people in the area"

"The use of ambulances by former inmates is an increasing trend"

"Some inmates will not go to a medical care facility until their condition is so bad that they need an ambulance and emergency care"

"There is a lack of transportation to access medical care, required probation officer visits in Worcester for Worcester County residents, jobs - resulting in job losses"

"The Access to Commitment and Therapy (ACT) Group has been so successful that, the guys don't want to leave the meeting when it ends"

"The Court has restorative justice and probation is flexible and they have anger management treatment"

"More employers are being receptive to accepting criminal records of employees. The situation is getting better"

"Recreation opportunities play a huge role in reducing recidivism of former inmates; lack of transportation is a barrier; It's, 'easier to walk to a bar than to get to a Quabbin Reservoir gate and go for a bike ride'."

"Franklin County House of Corrections services are great in their approach and ACT program"

"Franklin County sheriffs dept is providing job skills training for incarcerated persons so when they are released they are job ready"

"Jail to Community Task Force run by NOCC helps inmates and whole family systems with reentry into the community"

According to Survey responses, 44% of respondents cite lack of money and 33.6% cite lack of insurance as reasons to delay healthcare.

67% of people surveyed said they receive healthcare locally, but 32.51% do not; citing they don't stay locally due to Specialty Care Doctor not in their area (88.77%), Primary Care Physician not in their area (27.81%), Urgent Care Facility not in their area (16.58%), Emergency Department not in their area (13.9%), and other reasons (16%).



MATERNAL AND INFANT HEALTH

Chapter 3

Abstract

This chapter provides a comprehensive overview of the trends, disparities and resources surrounding wellness, chronic disease, and the mortality of residents in Heywood Healthcare's 15 communities.

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

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's 15 communities.

This chapter highlights important findings from the data gathered from the various quantitative sources listed in the introduction of this report around the following topics:

- Maternal and Child Health

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Maternal and Child Health

- There were 837 babies born in the Service Area in 2016, including 230 in Gardner, 124 in Athol, and 119 in Winchendon
- Fertility rates vary widely from community to community throughout the Service Area
- There were 32 teen births throughout the Service Area. Thirteen of those teen births were from Gardner, eight (8) were from Winchendon, six (6) were from Orange and five (5) were from Athol.
- The teen birth rates for the Service Area for 2015 and 2016, are 11.25 and 16.6 respectively above the State rates of 9.4 and 8.47 for both years. Orange had the highest teen birth rate per 1,000 at 24.6.
- More than half of child-bearing mothers in six Service Area communities receive Publicly Funded Prenatal Care (PNC)
- Templeton, Westminster and Winchendon had the highest percentage of low birthweight babies in 2016.
- Four (4) of five (5) cases of infant mortality in the Service Area occurred in Heywood Hospital's Service Area communities
- 27.4% of Athol mothers, 20.8% of Gardner mothers, and 35.5% of Orange mothers smoked while pregnant in 2015, far above the overall Massachusetts rate of 5.9%
- With the exception of Wendell, Royalston and Westminster; mothers in all Service Communities breast feed less frequently than the state average of 87%
- Throughout the Service Area in 2016, there were at least 51 preterm births, a 54.5% increase from the 33 in 2015.
- Templeton and Westminster have the highest percentage of preterm births in Heywood Hospital's Service Area communities

Maternal and Infant Health

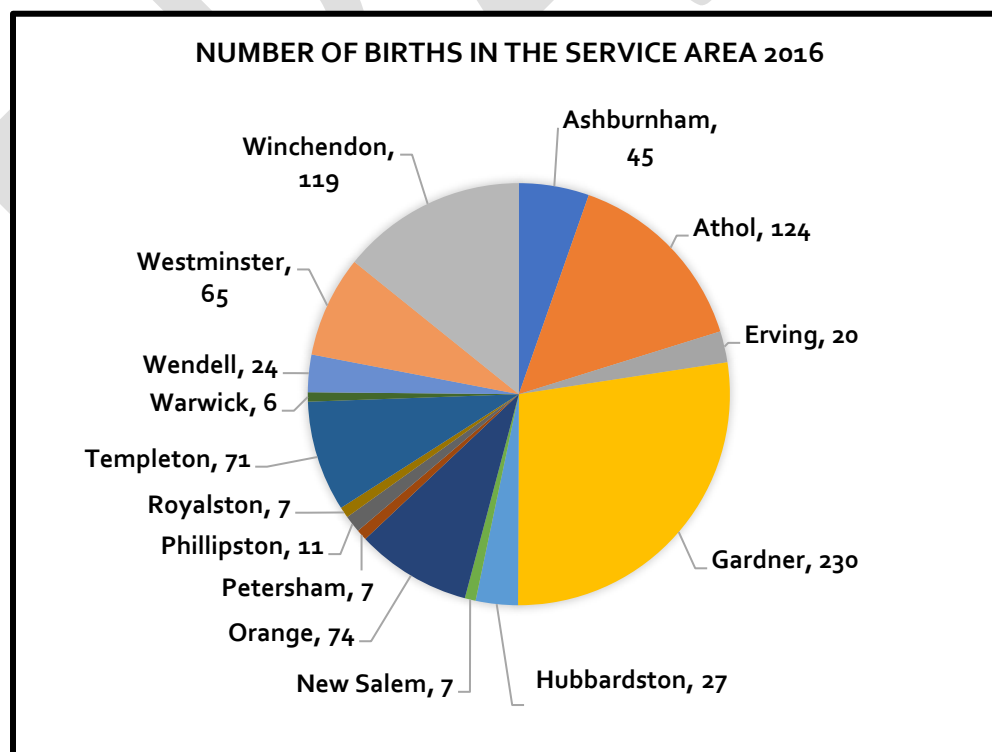
The maternal and infant health section of this report focuses on highlighting critical data points relevant to the health of mothers and their children. Some important data points include things like birth, fertility, teen pregnancy and infant mortality rates, prenatal care, and child nutrition.

Overall Births and Births by Race/Ethnicity

According to the Massachusetts Birth Reports from 2015 and 2016, there were 768 and 837 babies born respectively in 2015 and 2016 throughout the Service Area. In 2016, the most births occurred in Gardner (27.5% or 230), Athol (14.8% or 124), and Winchendon (14.2% or 119). Other notable communities include Orange (8.84% or 74) and Templeton (8.5% or 71). Chart HS-1 presents the distribution of 2016 births in the communities of the Service Area. Table HS-2 displays the number of births in each Service Area community and the percent change in numbers of births from 2015 to 2016, as well as the same statistics for Massachusetts and the United States. The percent of all births in the State from the Service Area increased from 1.07% to 1.17% in one year or 6.88%. In 2016, Franklin County consisted of 0.8% of all births in the State, less than the Service Area, and Worcester County accounted for 12.2% of all State births, much more than the Service Area (1.17%).

From 2015 to 2016, Erving (233%) and New Salem (133%) had the greatest increase in numbers of births, while Royalston (-36.4%) and Phillipston (-26.7%) had the greatest decrease in numbers of births. While the Service Area overall births increased 6.88% in one year, five (5) communities saw decreases in births and the State decreased in number of births by -2.31%. The United States overall saw a -0.82% decline in births from 2015 to 2016.

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



HS - 2 Overall Births in Athol and Heywood Hospital's Service Areas 2015 & 2016

Community	Number of Births 2015	Percentage of Service Area Births 2015	Percentage of All Births 2015 (MA Overall N=71,484)	Number of Births 2016	Percentage of Service Area Births 2016	Percentage of All Births 2016 (MA Overall N=71,319)	% Change 2015-2016
Ashburnham	39	5.1%	0.05%	45	5.4%	0.06%	15.4%
Athol	113	14.7%	0.16%	124	14.8%	0.17%	9.73%
Erving	6	0.8%	0.01%	20	2.4%	0.03%	233.3%
Gardner	229	29.8%	0.32%	230	27.5%	0.32%	0.44%
Hubbardston	33	4.3%	0.05%	27	3.2%	0.04%	-18.2%
New Salem	3	0.39%	0.004%	7	0.84%	0.01%	133.3%
Orange	78	10.2%	0.11%	74	8.84%	0.10%	-5.13%
Petersham	9	1.2%	0.01%	7	0.84%	0.01%	-22.2%
Phillipston	15	2.0%	0.02%	11	1.3%	0.02%	-26.7%
Royalston	11	1.4%	0.02%	7	0.84%	0.01%	-36.4%
Templeton	62	8.1%	0.09%	71	8.5%	0.10%	14.5%
Warwick	3	0.39%	0.004%	6	0.72%	0.01%	100%
Wendell	12	1.6%	0.02%	24	2.9%	0.03%	100%
Westminster	62	8.1%	0.09%	65	7.8%	0.09%	4.84%
Winchendon	99	12.9%	0.14%	119	14.2%	0.17%	20.2%
Service Area Total	768	100%	1.07%	837	100%	1.17%	8.98%
Franklin County	581		0.81%	621		0.87%	6.88%
Worcester County	8,590		12.0%	8,683		12.2%	1.08%
Massachusetts	71,484		100%	71,319		100%	-2.31%
United States	3,978,497			3,945,875			-0.82%

Source: 2015 MA DPH Data, 2015 US CDC Data, 2016 MA DPH Birth Report

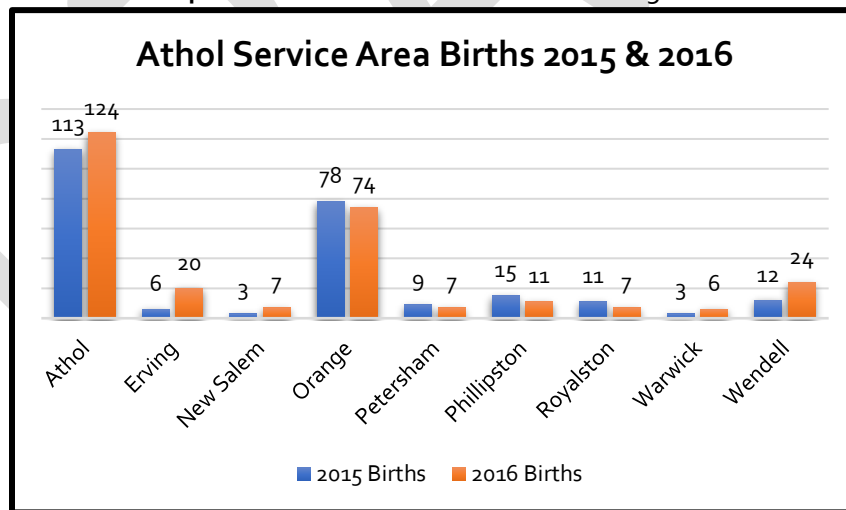
In Athol Hospital's Service Area there were 280 total births in 2016 with 124 or 44.3% of those coming from Athol and 74 or 31.2% from Orange. Athol's number of births increased just 9.73% from 2015, whereas Erving, New Salem, Warwick and Wendell had increases of 100% or more, with Erving having a 233% increase. Four of the Athol Hospital Service Area communities had a decrease in births from 2015 to 2016, with Royalston (-36.4%) and Phillipston (-26.7%) having the largest decrease in births. The State had a minimal decrease at -2.31% making half the Athol Hospital Service Area communities above the State and half below the State in changes in births from 2015 to 2016. Table HS-3 and Chart HS-4 illustrate the numbers of births and the changes from one year to the next.

HS - 3 Athol Service Area Overall Births 2016

Community	Number of Births 2015	Percentage of Service Area Births 2015	Percentage of All Births 2015 (MA Overall N=71,484)	Number of Births 2016	Percentage of Service Area Births	Percentage of All Births 2016 (MA Overall N=71,484)	% Change 2015-2016
Athol	113	45.2%	0.16%	124	44.3%	0.17%	9.73%
Erving	6	2.4%	0.01%	20	7.1%	0.03%	233.3%
New Salem	3	1.2%	0.004%	7	2.5%	0.01%	133.3%
Orange	78	31.2%	0.11%	74	26.4%	0.10%	-5.13%
Petersham	9	3.6%	0.01%	7	2.5%	0.01%	-22.2%
Phillipston	15	6.0%	0.02%	11	3.9%	0.02%	-26.7%
Royalston	11	4.4%	0.02%	7	2.5%	0.01%	-36.4%
Warwick	3	1.2%	0.004%	6	2.1%	0.01%	100%
Wendell	12	4.8%	0.02%	24	8.6%	0.03%	100%
Service Area Total	250	100%	0.35%	280	100%	0.39%	12%
Franklin County	581		0.81%	621		0.87%	6.88%
Worcester County	8,590		12.0%	8,683		12.2%	1.08%
Massachusetts	71,484		100%	71,319		100%	-2.31%

Source: 2015 and 2016 MA DPH Birth Reports

HS - 4 Athol Service Area Overall Births 2015 & 2016



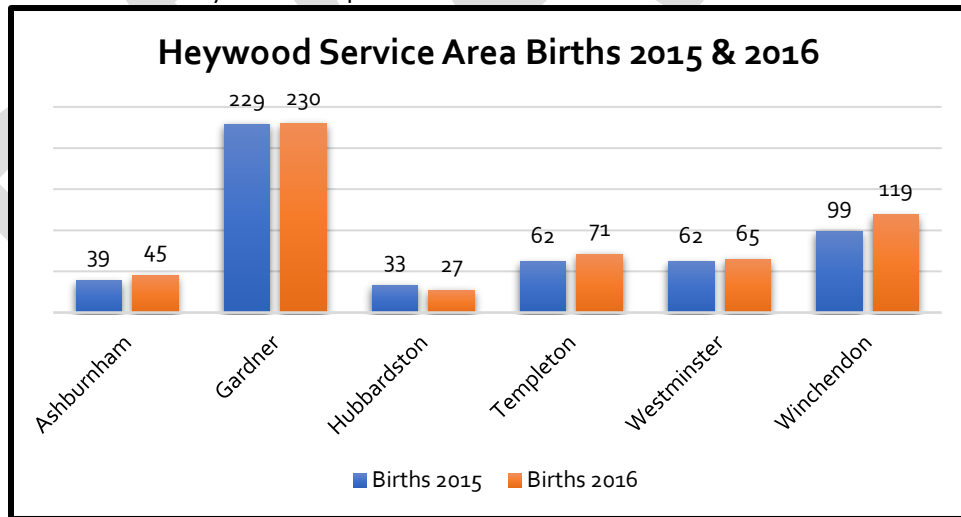
In Heywood Hospital's Service Area, there were 557 births in 2016. Of those, 230 were from Gardner representing 43.7% of the births in Heywood's Service Area and 119 from Winchendon representing 18.9%. The remaining four towns had between 27 and 71 births as seen in Table HS-5 and Chart HS-6. Five of the six communities had an increase in births from 2015 to 2016, with Winchendon (20.2%), Ashburnham (15.4%) and Templeton (14.5%) with the greatest increase. Hubbardston had the largest decrease in one year at -18.2%. All but Hubbardston had a greater increase in numbers of births than the State (-2.31%).

HS - 5 Heywood Service Area Overall Births 2015

Community	Number of Births 2015	Percentage of Service Area Births 2015	Percentage of All Births 2015 (MA Overall N=71,484)	Number of Births 2016	Percentage of Service Area Births 2016	Percentage of All Births 2016 (MA Overall N=71,319)	% Change 2015-2016
Ashburnham	39	7.4%	0.05%	45	8.1%	0.06%	15.4%
Gardner	229	43.7%	0.32%	230	41.3%	0.32%	0.44%
Hubbardston	33	6.3%	0.05%	27	4.8%	0.04%	-18.2%
Templeton	62	11.8%	0.09%	71	12.7%	0.10%	14.5%
Westminster	62	11.8%	0.09%	65	11.7%	0.09%	4.84%
Winchendon	99	18.9%	0.14%	119	21.4%	0.17%	20.2%
Service Area Total	524	100%	1.07%	557	100%	1.17%	8.98%
Franklin County	581		0.81%	621		0.87%	6.88%
Worcester County	8,590		12.0%	8,683		12.2%	1.08%
Massachusetts	71,484		100%	71,319		100%	-2.31%

Source: 2015 MA DPH Birth Report, 2015 US CDC Data, 2016 MA DPH Birth Report

HS - 6 Heywood Hospital Service Area Overall Births 2015 & 2016



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-7. The percent of non-Hispanic white births in the Service Area are at 88.3%, much higher than the State percentage of 60.5%. In addition, all of the non-White races and ethnicity births in the Service Area represent much less than the State and the Nation. Any double dashes represent a number from 1-4 as the data is suppressed to respect confidentiality.

HS - 7 Births by Race/Ethnicity in the Service Area 2015

Community	Total Number of Births	Total Non-Hispanic White Births	Total Non-Hispanic Black Births	Total Non-Hispanic Asian/Pacific Islander Births	Total American Indian Births*	Total Hispanic Births
Ashburnham	39	36	0	0		--
Athol	113	99	--	--		8
Erving	6	5	0	0		0
Gardner	229	192	6	6		23
Hubbardston	33	33	0	0		0
New Salem	--	--	0	0		0
Orange	78	72	0	--		--
Petersham	9	9	0	0		0
Phillipston	15	14	0	--		0
Royalston	11	10	0	0		--
Templeton	62	60	0	--		0
Warwick	--	--	0	0		0
Wendell	12	11	0	--		0
Westminster	62	52	0	--		--
Winchendon	99	85	--	6		5
Service Area Total	768	678	6	12		36
Percentage of Total Service Area Births	100%	88.3%	0.8%	1.6%		5.3%
Massachusetts	71,484	43,255	6,949	6,473	212	12,927
Percentage of Total MA Births	100%	60.5%	9.7%	9.1%	0.30%	18.1%
United States	3,978,497	2,920,690	569,728	251,846	36,657	887,854
Percentage of Total U.S. Births	100%	73.4%	14.3%	6.3%	0.92%	22.3%
Source: 2015 MA DPH Data, 2015 US CDC Data; *American Indian data unavailable from MA DPH						

General Fertility Rate

The fertility rate is a measurement of the ratio of total live births per 1,000 people. Of all 15 communities in the Service Area, Wendell had the highest fertility rate of 88.2 per 1,000. Following Wendell was Gardner at 61.2 per 1,000. Most of the remaining communities hovered between 42 and 55 per 1,000 with the exception of Irving who displayed a fertility rate of just 18.5 per 1,000. Table HS-8 displays this data. The Service Area average fertility rate is 50.1, which is only a little less than the State fertility rate of 52.

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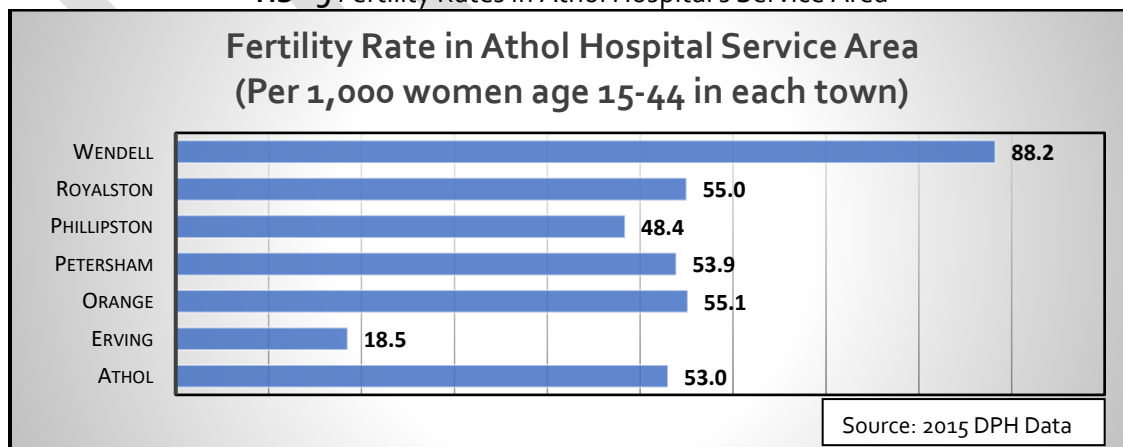
HS – 8 Fertility Rates in the Service Area 2015

Community	Fertility Rate (Per 1,000 women age 15-44 in each town)
Ashburnham	35.1
Athol	53.0
Erving	18.5
Gardner	61.2
Hubbardston	42.5
New Salem	--
Orange	55.1
Petersham	53.9
Phillipston	48.4
Royalston	55.0
Templeton	42.9
Warwick	--
Wendell	88.2
Westminster	49.5
Winchendon	48.6
Service Area Average	50.1
Massachusetts*	52.0

Source: 2015 Mass DPH Data *CDC 2015

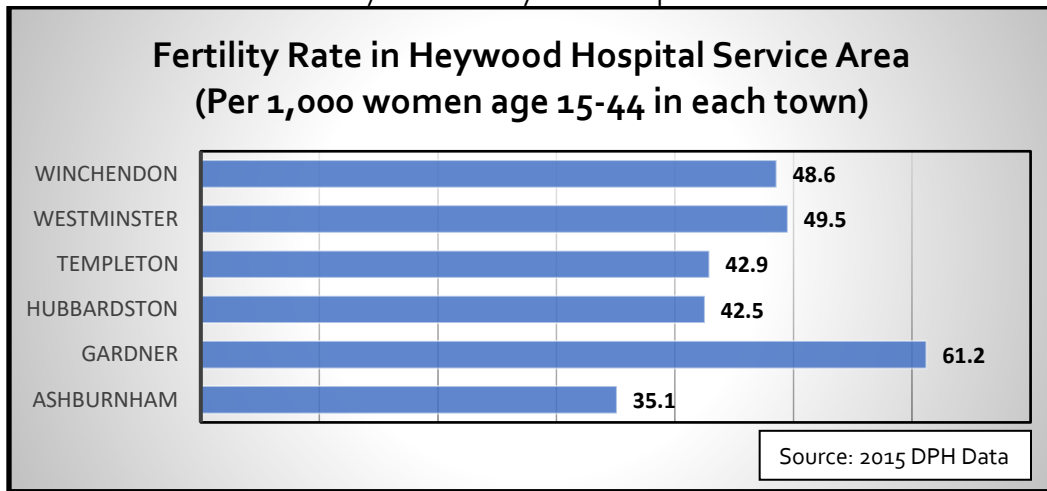
Fertility rates in Athol Hospital's Service Area vary widely with Wendell (88.2) having the highest rate and Erving (18.5) having the lowest. Athol, Orange, Petersham, Phillipston and Royalston all had fertility rates between 48 and 55 per 1,000 as seen in Chart HS-9.

HS - 9 Fertility Rates in Athol Hospital's Service Area



In Heywood Hospital's Service Area, Gardner has the highest fertility rate at 61.2 per 1,000 as seen in Chart HS-10; Hubbardston, Templeton, Westminster and Winchendon ranged between 42.5 and 49.5 per 1,000. Ashburnham had the lowest fertility rate at 35.1 per 1,000.

HS – 10 Fertility Rates in Heywood Hospital's Service Area



Teen Births and Teen Births by Race/Ethnicity

According to DoSomething.org, nearly three (3) in 10 American females will become pregnant before the age of 20 for a total of nearly 750,000 teen mothers. More than half of teen moms do not graduate from high school and less than two percent of mothers who became pregnant as teens earn a college degree by age 30.²² According to the Massachusetts Birth Report from 2016, there were 32 teen births throughout the Service Area. Thirteen of those teen births were from Gardner, six (6) were from Orange and five (5) were from Athol as seen in Table HS-11. Double dashes represent birth numbers from 1-4 and are suppressed due to confidentiality. Orange had the highest teen birth rate per 1,000 at 24.6 but stayed the same from 2015 to 2016. The teen birth rate for Winchendon increased the most, with Athol and Gardner close behind. The teen birth rates for the Service Area for 2015 and 2016, excluding the communities with suppressed numbers, are 11.25 and 16.6 respectively. These rates are both above the State rates for both years and above the rates for Franklin (11.6) and Worcester (10.4) Counties in 2016. Service Area birth rates are calculated based on the communities with actual numbers represented and only those communities' populations are considered.

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²² <https://www.dosomething.org/us/facts/11-facts-about-teen-pregnancy>

HS - 11 Teen Births in the Service Area 2015 & 2016

Community	Number of Teen Births (15-19 yrs.) 2015	*Teen Birth Rate per 1,000 Female Teens 2015	Number of Teen Births (15-19 yrs.) 2016	*Teen Birth Rate per 1,000 Female Teens 2016
Ashburnham	5	19.5	--	--
Athol	6	16.3	5	13.6
Erving	--	--	--	--
Gardner	11	18.2	13	21.5
Hubbardston	0	0.0	0	0.0
New Salem	--	--	--	--
Orange	6	24.6	6	24.6
Petersham	0	0.0	0	0.0
Phillipston	0	0.0	0	0.0
Royalston	0	0.0	--	--
Templeton	--	--	--	--
Warwick	0	0.0	0	0.0
Wendell	0	0.0	--	--
Westminster	0	0.0	--	--
Winchendon	--	--	8	18.6
Service Area Total	28	11.25	32	16.6
Franklin County	20	9.65	24	11.6
Worcester County	344	12.0	300	10.4
Massachusetts	2140	9.4	1,931	8.47
Source: 2015 MA DPH Birth Report, 2016 MA DPH Birth Report. *Rate based on 2010 Census Population				

As seen in Table HS-12, 11 of Athol Hospital's Service Area births in 2016 are from Orange (6) and Athol (5), with Erving, New Salem, Royalston, and Wendell having between one and four teen births due to suppression rules, and the remaining communities having no teen births. From 2015 to 2016, Royalston and Wendell increased their teen births because their number was zero in 2015 and were somewhere between one and four births in 2016. Both Athol's (13.6) and Orange's (24.6) rates are greater than Franklin County (11.6), Worcester County (10.4) and the State (8.47). Calculations of Service Area Total rates are only completed using communities with unsuppressed data.

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HS - 12 Teen Births in Athol Hospital's Service Area 2015 & 2016

Community	Number of Teen Births (15-19 yrs.) 2015	*Teen Birth Rate per 1,000 Female Teens 2015	Number of Teen Births (15-19 yrs.) 2016	*Teen Birth Rate per 1,000 Female Teens 2016
Athol	6	16.3	5	13.6
Erving	--	--	--	--
New Salem	--	--	--	--
Orange	6	24.6	6	24.6
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	--	--
Service Area Total	12	1.52	11	1.51
Franklin County	20	9.65	24	11.6
Worcester County	344	12.0	300	10.4
Massachusetts	2140	9.4	1,931	8.47
Source: 2015 Mass DPH Data, 2016 MA DPH Birth Report *Rate based on 2010 Census Population				

In Heywood Hospital's Service Area there were 16 total teen births with 11 in Gardner and five (5) in Ashburnham. Data for Templeton and Winchendon were suppressed due to confidentiality rules with each community experiencing one to four teen births. The Service Area total birth rate (17.5) only contains Gardner, Hubbardston and Winchendon and is greater than Franklin County, Worcester County and the State.

HS - 13 Teen Births in Heywood Hospital's Service Area 2015 & 2016

Community	Number of Teen Births (15-19 yrs.) 2015	*Teen Birth Rate per 1,000 Female Teens 2015	Number of Teen Births (15-19 yrs.) 2016	*Teen Birth Rate per 1,000 Female Teens 2016
Ashburnham	5	19.5	--	--
Gardner	11	18.2	13	21.5
Hubbardston	0	0.0	0	0.0
Templeton	--	--	--	--
Westminster	0	0.0	--	--
Winchendon	--	--	8	18.6
Service Area Total	16	12.5	21	17.5
Franklin County	20	9.65	24	11.6
Worcester County	344	12.0	300	10.4
Massachusetts	2140	9.4	1,931	8.47
Source: 2015 Mass DPH Data, 2016 MA DPH Birth Report *Rate based on 2010 Census Population				

Table HS-14 displays available data about teen births by race/ethnicity to identify disparities between ethnic groups. The numbers of teen births by race/ethnicity indicated with a double dash were suppressed due to confidentiality rules with each community experiencing between one and four teen births by race ethnicity. Of the available data, 17 teen births were from white teenage girls and the remaining nine (9) teen births were suppressed for non-Hispanic black, Asian/Pacific Islander and Hispanic teenage girls if they were between one and four individually. The percent of white teen births in the Service Area (60.7%) was much higher than the State's (33.7).

HS - 14 Teen Births by Race/Ethnicity in the Service Area 2015

Community	Number NH White of Teen Births	% NH White Teen Births*	Number NH Black of Teen Births	% NH Black Teen Births	Number of NH Asian/PI Teen Births	% NH Asian/PI Teen Births	Number of Hispanic Teen Births	% Hispanic Teen Births
Ashburnham	5	13.9	0	0.0	0	0.0	0	0.0
Athol	--	--	--	--	0	0.0	--	--
Erving	--	--	0	0.0	0	0.0	0	0.0
Gardner	7	3.6	--	--	0	0.0	--	--
Hubbardston	0	0.0	0	0.0	0	0.0	0	0.0
New Salem	--	--	0	0.0	0	0.0	0	0.0
Orange	5	6.9	0	0.0	0	0.0	--	--
Petersham	0	0.0	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
Templeton	--	--	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
Westminster	0	0.0	0	0.0	0	0.0	0	0.0
Winchendon	--	--	0	0.0	0	0.0	0	0.0
Service Area Total	17	60.7	0	--	0	0.0	0	--
Massachusetts	721	33.7	291	13.6	49	2.29	1,058	49.4
Source: 2015 Mass DPH Data *Percentages of total teen births								

Prenatal Care

The Kessner Index measures adequacy of prenatal care for patients by measuring the number of prenatal care hospital visits a patient makes while pregnant. For example, a patient 13 week pregnant or less that has made one prenatal care visit or more is considered adequate; and patient 14 to 17 weeks pregnant that has made two or more prenatal care visits has received adequate care, etc. On the other end of the spectrum, a patient 14 to 21 weeks pregnant that has not been to the hospital for a prenatal care appointment has not received adequate care.²³ Throughout the Service Area, four communities have boasted a 100% prenatal care adequacy rating according to the most recent Birth Report: Erving,

²³ <http://everywomanncc.org/wp-content/uploads/2017/02/Kessner-and-Kotelchuck-overview-provider-handout.pdf>

Petersham, Royalston, and Wendell. Most other communities for which data could be displayed had prenatal care adequacy rates in the low to high 80 percent rate. Athol had the lowest prenatal care adequacy rate at 76.9% as seen in Table HS-15. Athol, Orange and Phillipston had PNC adequacy rates lower than the state.

HS - 15 Adequacy of Prenatal Care in Service Area Communities 2015

Community	Number of Adequate PNC	Adequate PNC Percentage
Ashburnham	32	82.1%
Athol	83	76.9%
Erving	6	100.0%
Gardner	188	82.5%
Hubbardston	29	87.9%
New Salem	--	--
Orange	62	80.5%
Petersham	9	100.0%
Phillipston	11	78.6%
Royalston	11	100.0%
Templeton	54	87.1%
Warwick	--	--
Wendell	12	100.0%
Westminster	54	88.5%
Winchendon	82	82.8%
Massachusetts	49,185	81.8%
Source: 2010 Kessner Index, MA DPH Data 2015		

All four communities with 100% prenatal care adequacy rates fall under Athol Hospital's Service Area. At the same time, the two lowest prenatal care adequacy rate communities also fall under Athol Hospital's Service Area; Athol (76.9%) and Phillipston (78.6%).

HS - 16 Adequacy of Prenatal Care in Athol Hospital's Service Area Communities 2015

Community	Number of Adequate PNC	Adequate PNC Percentage
Athol	83	76.9%
Erving	6	100.0%
New Salem	--	--
Orange	62	80.5%
Petersham	9	100.0%
Phillipston	11	78.6%
Royalston	11	100.0%
Warwick	--	--
Wendell	12	100.0%
Source: 2010 Kessner Index		

All of Heywood Hospital's Service Area communities have prenatal care adequacy rates in the low to high 80 percent rates. The highest rated community was Westminster at 88.5% and the lowest was Ashburnham at 82.1% as seen in Table HS-17.

HS - 17 Adequacy of Prenatal Care in Heywood Hospital's Service Area Communities

Community	Number of Adequate PNC	Adequate PNC Percentage
Ashburnham	32	82.1%
Gardner	188	82.5%
Hubbardston	29	87.9%
Templeton	54	87.1%
Westminster	54	88.5%
Winchendon	82	82.8%
Source: 2010 Kessner Index		

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Table HS-18 displays the percentage of adequate prenatal care (PNC) for pregnant patients by race/ethnicity. This was meant to highlight disparities in adequate prenatal care between ethnic groups. The Service Area average percent of adequate prenatal care is 76.5% which is less than the percent of the State as a whole at 81.8%. The numbers for the races/ethnicities other than white are suppressed because the numbers are too low. However, if the State numbers are any indication, Non-Hispanic Black and Hispanic women receive the least amount of adequate prenatal care at 69% and 78% respectively.

HS - 18 Adequacy of Prenatal Care by Race/Ethnicity in the Service Area 2015

Community	# Mothers who receive Publicly Funded PNC	% Mothers who receive Publicly Funded PNC	# NH White Mothers who receive Publicly Funded PNC	% NH White Mothers who receive Publicly Funded PNC	# NH Black Mothers who receive Publicly Funded PNC	% NH Black Mothers who receive Publicly Funded PNC	# NH Asian/PI Mothers who receive Publicly Funded PNC	% NH Asian-PI Mothers who receive Publicly Funded PNC	# Hispanic Mothers who receive Publicly Funded PNC	% Hispanic Mothers who receive Publicly Funded PNC
Ashburnham	14	38.9%	12	36.4%	0	0.0%	0	0.0%	--	--
Athol	65	59.1%	57	58.8%	--	--	0	0.0%	7	87.5%
Erving	--	--	--	--	0	0.0%	0	0.0%	0	0.0%
Gardner	118	52.2%	93	48.7%	5	83.3%	--	--	15	71.4%
Hubbardston	7	21.2%	7	21.2%	0	0.0%	0	0.0%	0	0.0%
New Salem	--	--	--	--	0	0.0%	0	0.0%	0	0.0%
Orange	40	52.6%	37	52.9%	0	0.0%	--	--	0	--
Petersham	5	55.6%	5	55.6%	0	0.0%	0	0.0%	0	0.0%
Phillipston	8	53.3%	7	50.0%	0	0.0%	--	--	0	0.0%
Royalston	6	54.5%	5	50.0%	0	0.0%	0	0.0%	0	--
Templeton	17	28.3%	17	28.8%	0	0.0%	0	0.0%	0	0.0%
Warwick	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wendell	--	--	--	--	0	0.0%	--	--	0	0.0%
Westminster	14	22.6%	9	17.3%	0	0.0%	--	--	0	--
Winchendon	38	39.2%	32	38.6%	--	--	--	--	0	--
Massachusetts	29,929	38.1%	10,778	25.2%	4,431	64.1%	1,699	26.4%	9,307	72.4%

Source: 2015 Mass DPH Data

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Prenatal Care Funding

Of those pregnant patients in the Service Area, 332 received publicly funded prenatal care (PNC) in 2015. Publicly funded prenatal care is government funded programming aimed at assisting pregnant mothers obtain the healthcare needs they require during pregnancy. Of those, 118 were in Gardner, 65 were in Athol and 40 were in Orange. Nearly 60% of pregnant patients in Athol received publicly funded prenatal care with Gardner (52.2%), Orange (52.6%), Petersham (55.6%), Phillipston (53.3%) and Royalston (54.5%) not far behind. Of the communities with data, only Westminster, Templeton, and Hubbardston have less mothers receiving publicly funded prenatal care than the State at 38.1%. The full distribution of publicly funded prenatal care can be found in Table HS-19.

HS - 19 Publicly Funded Prenatal Care in Service Area Communities 2015

Community	# Mothers who received Publicly Funded PNC	% Mothers who received Publicly Funded PNC
Ashburnham	14	38.9%
Athol	65	59.1%
Erving	--	--
Gardner	118	52.2%
Hubbardston	7	21.2%
New Salem	--	--
Orange	40	52.6%
Petersham	5	55.6%
Phillipston	8	53.3%
Royalston	6	54.5%
Templeton	17	28.3%
Warwick	0	0.0%
Wendell	--	--
Westminster	14	22.6%
Winchendon	38	39.2%
Service Area Total		
Massachusetts	26,929	38.10%

Source: 2015 Mass DPH Data

In Athol Hospital's Service Area, 124 pregnant patients received publicly funded prenatal care 65 coming in Athol and 40 in Orange. As seen in Table HS-20, five (5) of the six (6) communities with greater than 50% of mothers receiving publicly funded prenatal care fall under Athol Hospital's Service Area.

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HS - 20 Publicly Funded Prenatal Care in Athol Hospital's Service Area Communities 2015

Community	# Mothers who received Publicly Funded PNC	% Mothers who received Publicly Funded PNC
Athol	65	59.1%
Erving	--	--
New Salem	--	--
Orange	40	52.6%
Petersham	5	55.6%
Phillipston	8	53.3%
Royalston	6	54.5%
Warwick	0	0.0%
Wendell	--	--
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, Gardner is the only community to have more than half of mothers receive publicly funded prenatal care. Ashburnham and Winchendon have just under 40% of mothers receive publicly funded prenatal care. There was a total of 208 mothers to receive such assistance in 2014 as seen in Table HS-21.

HS - 21 Publicly Funded Prenatal Care in Heywood Hospital's Service Area Communities 2015

Community	# Mothers who receive Publicly Funded PNC	% Mothers who receive Publicly Funded PNC
Ashburnham	14	38.9%
Gardner	118	52.2%
Hubbardston	7	21.2%
Templeton	17	28.3%
Westminster	14	22.6%
Winchendon	38	39.2%
Source: 2015 Mass DPH Data		

Table HS-22 displays the disparities in publicly funded prenatal care by race/ethnicity in each Service Area community according to the most recently available data through Mass DPH. Due to the low volume of births by other non-white ethnic groups, data for almost all communities around non-white groups was suppressed to protect confidentiality.

HS - 22 Publicly Funded Prenatal Care in Service Area Communities by Race/Ethnicity 2015

Community	# Mothers who receive Publicly Funded PNC	% Mothers who receive Publicly Funded PNC	# NH White Mothers who receive Publicly Funded PNC	% NH White Mothers who receive Publicly Funded PNC	# NH Black Mothers who receive Publicly Funded PNC	% NH Black Mothers who receive Publicly Funded PNC	# NH Asian/PI Mothers who receive Publicly Funded PNC	% NH Asian-PI Mothers who receive Publicly Funded PNC	# Hispanic Mothers who receive Publicly Funded PNC	% Hispanic Mothers who receive Publicly Funded PNC
Ashburnham	14	38.9%	12	36.4%	0	0.0%	0	0.0%	--	--
Athol	65	59.1%	57	58.8%	--	--	0	0.0%	7	87.5%
Erving	--	--	--	--	0	0.0%	0	0.0%	0	0.0%
Gardner	118	52.2%	93	48.7%	5	83.3%	--	--	15	71.4%
Hubbardston	7	21.2%	7	21.2%	0	0.0%	0	0.0%	0	0.0%
New Salem	--	--	--	--	0	0.0%	0	0.0%	0	0.0%
Orange	40	52.6%	37	52.9%	0	0.0%	--	--	0	--
Petersham	5	55.6%	5	55.6%	0	0.0%	0	0.0%	0	0.0%
Phillipston	8	53.3%	7	50.0%	0	0.0%	--	--	0	0.0%
Royalston	6	54.5%	5	50.0%	0	0.0%	0	0.0%	0	--
Templeton	17	28.3%	17	28.8%	0	0.0%	0	0.0%	0	0.0%
Warwick	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wendell	--	--	--	--	0	0.0%	--	--	0	0.0%
Westminster	14	22.6%	9	17.3%	0	0.0%	--	--	0	--
Winchendon	38	39.2%	32	38.6%	--	--	--	--	0	--
Massachusetts	29,929	38.1%	10,778	25.2%	4,431	64.1%	1,699	26.4%	9,307	72.4%
Source: 2015 Mass DPH Data										

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Low Birth Weight

According to the US Centers for Disease Control (CDC), a baby born weighing less than five and one-half pounds is considered "low birth weight". This measure is true regardless of whether the baby was born early or on time and can occur for many reasons (i.e. smoking while pregnant). Low birth weight babies are at greater risk for many health problems in the short and long term.²⁴

In 2016, low birth weight babies were born in 10 of the 15 Service Area communities. Data for five (5) of these communities were suppressed as there were fewer than five (5), but more than zero, cases in each community making it difficult to determine an accurate total for the entire Service Area. Winchendon had the greatest number of low birth weight cases with 11, followed by 10 in Athol, seven (7) in Westminster, and six (6) in Gardner as seen in Table HS-23.

HS - 23 Low Birth Weight in Service Area Communities 2015 & 2016

Community	Number of Low Birthweight Births 2015	Low Birthweight Percentage 2015	Number of Low Birthweight Births 2016	Low Birthweight Percentage 2016
Ashburnham	--	--	--	--
Athol	10	8.8%	10	8.1%
Erving	--	--	--	--
Gardner	15	6.6%	6	2.6%
Hubbardston	--	--	--	--
New Salem	0	0.0%	--	--
Orange	7	9.0%	--	--
Petersham	--	--	0	0.0%
Phillipston	0	0.0%	0	0.0%
Royalston	--	--	0	0.0%
Templeton	--	--	8	11.3%
Warwick	0	0.0%	0	0.0%
Wendell	0	0.0%	0	0.0%
Westminster	--	--	7	10.85
Winchendon	--	--	11	9.2%
Service Area Total	32		42	
Franklin County	32		37	
Worcester County	675		630	
Massachusetts	5,321	7.5%	5,341	7.5%
Source: 2015 Mass DPH Data, 2016 MA DPH Birth Report Less than 2,500 grams (5.5 lbs.) -- Due to small numbers (n=1-4), exact count not provided.				

In Athol Hospital's Service Area in 2016, four (4) of the nine (9) communities saw cases of low birth weight, and three (3): Erving, New Salem and Orange had numbers suppressed because they were between one and four instances. Athol had 10 babies with low birthweight and the remaining communities who were not suppressed had zero low birthweight babies. Even with the suppression, it can be determined that Orange, Petersham, and Royalston decreased in numbers of low birthweight babies and New Salem

²⁴ <https://ephtracking.cdc.gov/showRbLBWGrowthRetardationEnv.action>

decreased. Athol, Phillipston, Warwick and Wendell had no change from 2015 to 2016 and Erving is indeterminable because of data suppression. The Athol Hospital Service Area decreased 41% in the number of low birthweight babies from 2015 to 2016 when considering unsuppressed data. Data can be found in Table HS-24.

HS - 24 Low Birth Weight in Athol Hospital's Service Area Communities 2015

Community	Number of Low Birthweight Births 2015	Low Birthweight Percentage 2015	Number of Low Birthweight Births 2016	Low Birthweight Percentage 2016
Athol	10	8.8%	10	8.1%
Erving	--	--	--	--
New Salem	0	0.0%	--	--
Orange	7	9.0%	--	--
Petersham	--	--	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%	0	0.0%
Service Area Total	17		10	
Source: 2015 Mass DPH Data, 2016 MA DPH Birth Report Less than 2,500 grams (5.5 lbs.) -- Due to small numbers (n=1-4), exact count not provided.				

All six (6) of Heywood Hospital's Service Area communities experienced at least one case of low birth weight in 2016 as seen in Table HS-25. Winchendon (11), Templeton (8), and Westminster all increased their numbers from 2015 to 2016; Gardner (6) was the only community to experience a decrease and it is undeterminable whether Ashburnham and Hubbardston increased or decreased due to suppression. The Heywood Hospital Service Area increased 113% in the number of low birthweight babies from 2015 to 2016 when considering unsuppressed data.

HS - 25 Low Birth Weight in Heywood Hospital's Service Area Communities 2015

Community	Number of Low Birthweight Births 2015	Low Birthweight Percentage 2015	Number of Low Birthweight Births 2016	Low Birthweight Percentage 2016
Ashburnham	--	--	--	--
Gardner	15	6.6%	6	2.6%
Hubbardston	--	--	--	--
Templeton	--	--	8	11.3%
Westminster	--	--	7	10.85
Winchendon	--	--	11	9.2%
Service Area Total	15		32	
Source: 2015 Mass DPH Data, 2016 MA DPH Birth Report Less than 2,500 grams (5.5 lbs.) -- Due to small numbers (n=1-4), exact count not provided.				

Table HS-26 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.

HS - 26 Low Birth Weight in Heywood Hospital's Service Area Communities by Race/Ethnicity 2015

Community	Number of NH White Low Birthweight Births	NH White Low Birthweight Percentage	Number of NH Black Low Birthweight Births	NH Black Low Birthweight Percentage	Number of NH Asian/PI Low Birthweight Births	NH Asian- PI Low Birthweight Percentage	Number of Hispanic Low Birthweight Births	Hispanic Low Birthweight Percentage
Ashburnham	--	--	--	--	0	0.0%	0	0.0%
Athol	8	8.1%	0	0.0%	--	--	--	--
Erving	--	--	--	--	0	0.0%	0	0.0%
Gardner	13	6.8%	0	0.0%	0	0.0%	--	--
Hubbardston	--	--	--	--	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%
Templeton	--	--	--	--	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%
Westminster	--	--	--	--	0	0.0%	0	0.0%
Winchendon	--	--	0	0.0%	0	0.0%	0	0.0%
Massachusetts	5,321	7.4%	734	10.6%	553	8.5%	1,071	8.3%
Source: 2015 Mass DPH Data								

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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 his or her first birthday".²⁵ 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-27. 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.

HS - 27 Infant Mortality Rate in Service Area Communities 2015

Community	Number of Infant Deaths	Infant Mortality Rate per 1,000
Ashburnham	0	0.0
Athol	0	0.0
Erving	0	0.0
Gardner	0	0.0
Hubbardston	0	0.0
New Salem	0	0.0
Orange	0	0.0
Petersham	0	0.0
Phillipston	0	0.0
Royalston	1	--
Templeton	2	--
Warwick	0	0.0
Wendell	0	0.0
Westminster	2	--
Winchendon	0	0.0
Service Area Total	5	6.5
Massachusetts	315	4.4

Source: 2015 Mass DPH Data

In Athol Hospital's Service Area, Royalston was the only community to experience a case of infant mortality in 2015 as seen in Table HS-28.

HS - 28 Infant Mortality Rate in Athol Hospital's Service Area Communities 2015

Community	Number of Infant Deaths	Infant Mortality Rate per 1,000	Community	Number of Infant Deaths	Infant Mortality Rate per 1,000
Athol	0	0.0	Phillipston	0	0.0
Erving	0	0.0	Royalston	1	--
New Salem	0	0.0	Warwick	0	0.0
Orange	0	0.0	Wendell	0	0.0
Petersham	0	0.0	Service Area Total	1	--

Source: 2015 Mass DPH Data

²⁵ <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>

Four (4) of the five (5) cases of infant mortality in the Service Area occurred in Heywood Hospital's Service Area; two (2) each in Templeton and Westminster as seen in Table HS-29.

HS – 29 Infant Mortality Rate in Heywood Hospital's Service Area Communities 2015

Community	Number of Infant Deaths	Infant Mortality Rate per 1,000
Ashburnham	0	0.0
Gardner	0	0.0
Hubbardston	0	0.0
Templeton	2	--
Westminster	2	--
Winchendon	0	0.0
Service Area Total	4	--
Source: 2015 Mass DPH Data		

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). Nationwide, 10% of mothers reported smoking tobacco during the last trimester of pregnancy in 2011 according to the CDC.

Throughout the Service Area, over 125 pregnant mothers reported smoking while pregnant in 2015. Of those, 47 were from Gardner, 29 were from Athol and 27 were from Orange. On the other end of the spectrum; Erving, New Salem and Warwick were the only three communities to report no mothers who smoked during pregnancy. 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. Overall, six (6) Service Area communities had a higher rate of cigarette smoking during pregnancy than the State average. Table HS-30 presents the data regarding smoking during pregnancy in the Service Area.

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HS - 30 Cigarette Smoking During Pregnancy in Service Area Communities 2015

Community	# of Mothers that Smoked Cigarettes During Pregnancy	% of Mothers that Smoked Cigarettes During Pregnancy
Ashburnham	5	13.2%
Athol	29	27.4%
Erving	0	0.0%
Gardner	47	20.8%
Hubbardston	--	--
New Salem	0	0.0%
Orange	27	35.5%
Petersham	--	--
Phillipston	--	--
Royalston	--	--
Templeton	7	11.3%
Warwick	0	0.0%
Wendell	--	--
Westminster	--	--
Winchendon	11	11.3%
Massachusetts	4,043	5.9%
Source: 2015 Mass DPH Data		

Two of the three leading communities in the Service Area with the most pregnant mothers who smoked while pregnant in 2015 fall under Athol Hospital's Service Area (Athol and Orange). Petersham, Phillipston, Royalston and Wendell each reported mother who smoked while pregnant but accurate numbers could not be reported due to suppression rules. Table HS-31 shows that data.

HS – 31 Cigarette Smoking During Pregnancy in Athol Hospital's Service Area Communities 2015

Community	# of Mothers that Smoked Cigarettes During Pregnancy	% of Mothers that Smoked Cigarettes During Pregnancy
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	--	--
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, all six (6) communities reported having mothers that smoked during pregnancy. Gardner reported the most by far with 47 and Winchendon being the next closest community to report 11. Table HS-32 shows the data relevant to Heywood Hospital.

HS – 32 Cigarette Smoking During Pregnancy in Heywood Hospital's Service Area Communities 2015

Community	# of Mothers that Smoked Cigarettes During Pregnancy	% of Mothers that Smoked Cigarettes During Pregnancy
Ashburnham	5	13.2%
Gardner	47	20.8%
Hubbardston	--	--
Templeton	7	11.3%
Westminster	--	--
Winchendon	11	11.3%
Source: 2015 Mass DPH Data		

Baby's Breath Grant – A special thanks to Elaine Fluet, Executive Director of GVNA Healthcare in Gardner, MA for providing the Grant Project Summary Report for the "Baby's Breath Grant". This was a joint effort by GVNA Healthcare and Heywood Health Center for Women to work with pregnant mothers who were smoking cigarettes to help them quit and find healthier alternative coping methods. Outcomes and findings can be found in HS-33.

HS – 33 Baby's Breath Grant program outcomes and findings

In 2015, the Health Foundation of Central Mass, Inc (THFCM) provided a grant to the Heywood Health Center for Woman to work directly with pregnant mothers who were smoking cigarettes while pregnant. The goals of the project were as follows:

1. Reduce risks for negative pregnancy outcomes through cessation/reduction in smoking for women using tobacco while pregnant.
2. Sustainability of this initiative as service provided is reimbursable through insurance.
3. Positively influence smoking decisions among adolescence in the Gardner area.
4. Work with the Gardner Housing Authority properties to support their smoke free public housing initiative.
5. Health Center for Women will help to support the Tobacco Treatment Specialist position.

The grant helped identify 200 women within the Heywood Health Center for Women who could potentially participate in the program. Of those, 73 were actually referred to the program and 36 of the participants were pregnant woman. For those who participated, smoking reduction was reported for all women and there was a 25% participation success rate in the smoking healthcare cessation intervention.

The ability of the program to change the smoking behaviors of pregnant women was unfortunately not as successful as hoped. Despite this, there was an unexpected discovery that is critically important to take into consideration.... grant administrators discovered that many of the **pregnant mothers who were smoking cigarettes were in recovery from addiction to opioids and or heroin, and cigarettes were used as a coping method to prevent from relapsing**. Many of these women had also previously lost children to the Department of Children and Families (DCF).

Upon making this discovery, grant administrators helped these women find alternative coping methods like therapeutic breathing, guided imagery, health education and instruction in self-care. They then worked with these women to develop a portfolio to present to DCF to show self-improvement and motivation in achieving sobriety.

Unfortunately, funding for this program could not be sustained and the program abruptly ended after just about nine (9) months. The grant administrators felt that this was not enough time to truly help change the smoking behaviors of participants and these women were ultimately left out of a critical health service that could make an impactful difference in their lives.

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Table HS-34 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%. Particularly notable were the smoking rates of white mothers in Athol (28.1%), Gardner (22.6%) and Orange (37.1%).

HS – 34 Cigarette Smoking During Pregnancy in Service Area Communities by Race/Ethnicity 2015

Community	# of NH White Mothers that Smoked Cigarettes During Pregnancy	% of NH White Mothers that Smoked Cigarettes During Pregnancy	# of NH Black Mothers that Smoked Cigarettes During Pregnancy	% of NH Black Mothers that Smoked Cigarettes During Pregnancy	# of NH Asian/PI Mothers that Smoked Cigarettes During Pregnancy	% of NH Asian/PI Mothers that Smoked Cigarettes During Pregnancy	# of Hispanic Mothers that Smoked Cigarettes During Pregnancy	% of Hispanic Mothers that Smoked Cigarettes During Pregnancy
Ashburnham	5	14.3%	0	0.0%	0	0.0%	0	0.0%
Athol	27	28.1%	--	--	0	0.0%	--	--
Erving	0	0.0%	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%
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%
Templeton	7	11.7%	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%
Westminster	0	0.0%	0	0.0%	0	0.0%	--	--
Winchendon	10	11.7%	0	0.0%	--	--	0	0.0%
Massachusetts	3,173	7.5%	263	3.9%	71	1.1%	485	3.9%

Source: 2015 Mass DPH Data

Breastfeeding

According to the National Institutes of Health (NIH), breastfeeding can save infant lives and reduce the possibility of disease. Currently in the US, 75% of mothers breastfeed but not enough of them continue to breastfeed for the duration recommended by doctors.

Throughout the Service Area, breastfeeding is very common and, in all communities, where data was not suppressed, the percentage of breastfeeding mothers ranks from 74.4% (Orange) to 100% (Wendell) as can be seen in Table HS-35 below. Behind Wendell, nearly 91% of mothers in Royalston breastfed followed by 87% of mothers in Westminster and Phillipston. On average, 87% of Massachusetts mothers breastfed their children in 2015. Overall, nine (9) communities in the Service Area have lower breastfeeding rates than the State average.

HS- 35 Mother's Breastfeeding During Hospital Stay in Service Area Communities 2015

Community	Number of Breastfeeding During Hospital Stay	Breastfeeding Percentage
Ashburnham	30	76.9%
Athol	86	76.1%
Erving	--	--
Gardner	181	79.4%
Hubbardston	26	78.8%
New Salem	--	--
Orange	58	74.4%
Petersham	7	77.8%
Phillipston	13	86.7%
Royalston	10	90.9%
Templeton	52	83.9%
Warwick	--	--
Wendell	12	100.0%
Westminster	54	87.1%
Winchendon	77	77.8%
Massachusetts	60,515	87.0%
Source: 2015 Mass DPH Data		

In Athol Hospital's Service Area, the percentage of breastfeeding mothers varies greatly from community to community as seen in Table HS-36. Orange ranks the lowest at 74.4% and Wendell ranks the highest at 100%. It is important to note here that there were far more pregnancies in Orange when compared to Wendell. The range in breastfeeding frequency has far reaching implications for the health status of infants in Orange when 25% of them may not be getting the proper nutritional benefits typically received from breastmilk. Erving had six births in 2015 and the suppression means that one to four of the six breastfed. There were three births each in New Salem and Warwick in 2015 and the suppression number is between one and four, so most likely at least a third of New Salem and Warwick mothers breastfed.

HS- 36 Mother's Breastfeeding During Hospital Stay in Athol Hospital Service Area Communities 2015

Community	Number of Breastfeeding During Hospital Stay	Breastfeeding Percentage
Athol	86	76.1%
Erving	--	--
New Salem	--	--
Orange	58	74.4%
Petersham	7	77.8%
Phillipston	13	86.7%
Royalston	10	90.9%
Warwick	--	--
Wendell	12	100.0%
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, Westminster is the only community to have a breastfeeding average comparable to the State average of 87%. All other communities have rates below the State average but no fewer than 76.9% (Ashburnham) as seen in Table HS-37.

HS- 37 Mother's Breastfeeding During Hospital Stay in Heywood Hospital Service Area Communities 2015

Community	Number of Breastfeeding During Hospital Stay	Breastfeeding Percentage
Ashburnham	30	76.9%
Gardner	181	79.4%
Hubbardston	26	78.8%
Templeton	52	83.9%
Westminster	54	87.1%
Winchendon	77	77.8%
Source: 2015 Mass DPH Data		

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Table HS-38 displays disparities among breastfeeding mothers by race/ethnicity. Due to suppression rules, data could only be displayed for white mothers in all communities except Erving, New Salem and Warwick. Only in Athol (8), Gardner (18) and Winchendon (5) could breastfeeding among Hispanic mothers be displayed with Athol and Winchendon Hispanic mothers boasting 100% breastfeeding rates in 2015.

HS- 38 Mother's Breastfeeding During Hospital Stay by Race/Ethnicity in Service Area Communities 2015

Community	Number of NH White Breastfeeding During Hospital Stay	NH White Breastfeeding Percentage	Number of NH Black Breastfeeding During Hospital Stay	NH Black Breastfeeding Percentage	Number of NH Asian/PI Breastfeeding During Hospital Stay	NH Asian/PI Breastfeeding Percentage	Number of Hispanic Breastfeeding During Hospital Stay	Hispanic Breastfeeding Percentage
Ashburnham	27	75.0%	0	0.0%	0	0.0%	--	--
Athol	74	74.7%	--	--	--	--	8	100.0%
Erving	--	--	0	0.0%	0	0.0%	0	0.0%
Gardner	155	80.7%	--	--	--	--	18	81.8%
Hubbardston	26	78.8%	0	0.0%	0	0.0%	0	0.0%
New Salem	--	--	0	0.0%	0	0.0%	0	0.0%
Orange	53	73.6%	0	0.0%	--	--	--	--
Petersham	7	77.8%	0	0.0%	0	0.0%	0	0.0%
Phillipston	12	85.7%	0	0.0%	--	--	0	0.0%
Royalston	9	90.0%	0	0.0%	0	0.0%	--	--
Templeton	52	86.7%	0	0.0%	0	0.0%	0	0.0%
Warwick	--	--	0	0.0%	0	0.0%	0	0.0%
Wendell	11	100.0%	0	0.0%	--	--	0	0.0%
Westminster	44	84.6%	0	0.0%	--	--	--	--
Winchendon	66	77.6%	--	--	5	83.3%	5	100.0%
Massachusetts	36,100	86.2	6,009	87.9	5,858	91.7	11,040	86.7
Source: 2015 Mass DPH Data								

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". In the US, roughly one (1) in 10 babies are born prematurely.²⁶

Throughout the Service Area in 2016, there were at least 51 preterm births, a 54.5% increase from the 33 in 2015. A completely accurate total could not be gathered due to suppression rules at Mass DPH. Calculations of percentages were only performed for known quantities of preterm births. The Service Area percentage of preterm births overall in 2015 (3.2%) was lower than Franklin (6.2%) and Worcester (9.3%) Counties, as well as the State (8.4%). In 2016, the Service Area percentage was 7.1%, almost equal to Franklin County (7.2%) and close to Worcester County (8.1%) and the State (8.6%).

HS – 39 Preterm Births in Service Area Communities 2015 and 2016

Community	Number of Preterm Births 2015	Preterm Percentage 2015	Number of Preterm Births 2016	Preterm Percentage 2016
Ashburnham	--	--	--	--
Athol	11	9.7%	9	7.3%
Erving	--	--	--	--
Gardner	17	7.4%	10	4.3%
Hubbardston	--	--	--	--
New Salem	0	0.0%	--	--
Orange	--	--	5	6.8%
Petersham	--	--	0	0.0%
Phillipston	0	0.0%	0	0.0%
Royalston	0	0.0%	0	0.0%
Templeton	--	--	14	19.7%
Warwick	0	0.0%	0	0.0%
Wendell	0	0.0%	--	--
Westminster	5	8.2%	7	10.8%
Winchendon	--	--	6	5.0%
Service Area Total	33	3.2%	51	7.1%
Franklin County	36	6.2%	45	7.2%
Worcester County	800	9.3%	707	8.1%
Massachusetts	6,001	8.4%	6,167	8.6%
Source: 2015 Mass DPH Data, Less than 37 weeks gestation -- Due to small numbers (n=1-4), exact count not provided				

As seen in Table HS-40, four communities in Athol's Service Area had preterm births occur in 2015 and five communities had occurrences in 2016, however, in 2015 only Athol had enough preterm birth cases to accurately display the data and in 2016 only Athol and Orange had no suppression of numbers. Athol and Petersham had decreases in the number of preterm births, while New Salem, Orange, and Wendell

²⁶ <https://www.marchofdimes.org/complications/long-term-health-effects-of-premature-birth.aspx>

had increases in the number of preterm births. With suppression rules, there is no way to tell if Erving had an increase or a decrease, but there are at least one to four preterm births in each of the two years. Calculating the percent of preterm births in Athol's Service Area only using known data, it appears there was a decline from 7.0% to 6.1%. Be aware however, the three communities with suppressed data in 2015 and 2016 could have one to four preterm births which would increase the percentage.

HS – 40 Preterm Births in Athol Hospital Service Area Communities 2015 and 2016

Community	Number of Preterm Births 2015	Preterm Percentage 2015	Number of Preterm Births 2016	Preterm Percentage 2016
Athol	11	9.7%	9	7.3%
Erving	--	--	--	--
New Salem	0	0.0%	--	--
Orange	--	--	5	6.8%
Petersham	--	--	0	0.0%
Phillipston	0	0.0%	0	0.0%
Royalston	0	0.0%	0	0.0%
Warwick	0	0.0%	0	0.0%
Wendell	0	0.0%	--	--
Service Area Total	11	7.0%	14	6.1%
Massachusetts	6,001	8.4%	6,167	8.6%
Source: 2015 Mass DPH Data, Less than 37 weeks gestation -- Due to small numbers (n=1-4), exact count not provided				

In Heywood Hospital's Service Area, all six communities saw preterm births occur in both 2015 and 2016 as shown in Table HS-41. Calculations for percentages of preterm births were only completed for communities with known quantities. Service Area Totals are accurate only for the communities with no suppression of data. Templeton had the greatest increase with one to four occurrences in 2015 to 14 in 2016. Gardner had a 41.2% decrease in number of preterm births from 17 to 10. Ashburnham and Hubbardston are suppressed both years and Westminster and Winchendon had slight increases from 2015 to 2016.

HS – 41 Preterm Births in Heywood Hospital Service Area Communities 2015 and 2016

Community	Number of Preterm Births 2015	Preterm Percentage 2015	Number of Preterm Births 2016	Preterm Percentage 2016
Ashburnham	--	--	--	--
Gardner	17	7.4%	10	4.3%
Hubbardston	--	--	--	--
Templeton	--	--	14	19.7%
Westminster	5	8.2%	7	10.8%
Winchendon	--	--	6	5.0%
Service Area Total	22	7.6%	37	7.6%
Massachusetts	6,001	8.4%	6,167	8.6%
Source: 2015 Mass DPH Data, Less than 37 weeks gestation -- Due to small numbers (n=1-4), exact count not provided				

Table HS-42 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.

HS – 42 Preterm Births in Service Area Communities by Race/Ethnicity 2015

Community	NH White Number of Preterm Births	NH White Preterm Percentage	NH Black Number of Preterm Births	NH Black Preterm Percentage	NH Asian/PI Number of Preterm Births	NH Asian/PI Preterm Percentage	Hispanic Number of Preterm Births	Hispanic Preterm Percentage
Ashburnham	--	--	0	0.0%	0	0.0%	0	0.0%
Athol	9	9.1%	0	0.0%	--	--	--	--
Erving	--	--	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%
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%
Templeton	--	--	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%
Westminster	--	--	0	0.0%	0	0.0%	0	0.0%
Winchendon	--	--	0	0.0%	0	0.0%	0	0.0%
Service Area Total	21	--	0	--	0	--	0	--
Massachusetts	3,365	7.80%	723	10.40%	527	8.10%	1,192	9.20%
Source: 2015 Mass DPH Data								



Community Perceptions

"Evening hours for services would make services more accessible for people who work during the day and kids as well"

"DCF services are not voluntary and so there are pockets of people who do not get help...Isolated people in far out areas definitely do not get the help they need"

"Some don't want (DCF) services and often adamantly refuse services...Outreach efforts are ineffective at pulling these people in for help"

"Adoptive/ foster parents are often not educated on how to deal with or understand child trauma.... they may not understand a child's trauma and assume they are just misbehaving. They don't understand how to treat child who has trauma and that lack of treatment can lead to mental illness"

"The prenatal population has limited access to healthcare services locally...They need connection with a health network early on in their pregnancy to get adequate prenatal care"

"I think some medical staff need training when dealing with a special needs child..."

"More post-partum care options, was unable to get VNA services due to overload of agencies after giving birth and would have definitely benefited from those services."



Image from Mass.gov

ENVIRONMENTAL HEALTH

Chapter 4

Abstract

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

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

Chapter 4 - Environmental Health

This chapter provides a comprehensive overview of the environmental health of Heywood Healthcare's 15 communities. Communities in the Service Area are exposed to a range of environmental hazards that have the potential to adversely impact health.

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

1. Ambient Air Quality
2. Water Quality
3. Childhood Lead Exposure
4. Climate Health
5. Environmental Justice Populations
6. Brownfield Sites

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Environmental Exposures

- Ambient Air Quality in Worcester and Franklin Counties have not violated EPA air quality standards for Fine Particles and Ozone over the past three (3) years
- There were four (4) drinking water quality standards violations in the Service Area over the last five (5) years
 - Three (3) in Athol and one (1) in Ashburnham
- Many of the Service Area communities with the lowest percentage of children adequately screened for Blood Lead Levels (BLL) are also the communities with the highest percentage of housing stock built before 1978 (the year lead in paint was banned in Massachusetts)
 - Only 51% of children in the Service Area have been adequately screened for BLL compared to 77% throughout Massachusetts
- According to the State's Environmental Justice (EJ) Policy, the City of Gardner, and the Towns of Orange, Athol and Winchendon qualify as EJ Populations.
 - Gardner qualifies under the Minority and Income standards; Orange, Athol and Winchendon all qualify under the Income standards
- There are 30 Brownfield sites throughout the Service Area.
 - 11 are in Gardner, seven (7) are in Winchendon and three (3) are in Athol. The locations of these sites in each community overlap the Environmental Justice populations present in these three communities

Environmental Exposures

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 important 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 have an impact on the health of residents in the Service Area: ambient air quality, childhood and adult lead exposure, climate health, and environmental justice populations and health.

Ambient Air Quality

The US 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. These are meant to prevent exposure to pollutants that can damage the cardiovascular and respiratory systems of people living in the US.

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 (PM_{2.5}) and are not to exceed 35 µg/m³ in a 24-hour period. According to Mass DEP Air Assessment Branch's 2011-2015 measures, there were zero days from 2013 to 2015 in both Worcester and Franklin Counties where air quality standards for fine particles and ozone exceeded the NAAQS minimum standards.

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 tracking water quality throughout the Commonwealth and enforcing EPA standards.

Tables EH-1 and EH-2 that follow track incidences of violations reported by water service providers in each service area community and is tracked by the EPA. In the last four (4) years there were four (4) major water quality violations in the Service Area. As seen Table EH-1 below, one (1) violation occurred in Ashburnham in 2017 and three (3) occurred in Athol between 2014 and 2016. The violation in Ashburnham was related to high levels of chlorine in the water and has since been returned to compliance. The 2014 and 2015 Consumer Confidence violations in Athol refer to the failure of the Athol Department of Public Works to report levels of contaminants and the 2016 violation referred to the levels of Coliform in the water; all three violations have been returned to compliance. Table EH-2 notes 19 non-major water quality violations that occurred throughout the Service Area over the last five (5) years; all violations have either been returned to compliance or are in the process of being returned to compliance as of the writing of this report. Communities that denote zero violations may not have a water supply district in their community or they had no violations between 2013 and 2018.

EH-1 Major Drinking Water Violations in the Service Area Over the Last 5 Years

Community	# of Major Water System Violations Reported in Community Drinking Source Over Last 5 Years	Name of Contaminant and Type of Violation	Year of Violation	Compliance Status	Violating Agency
Ashburnham	1	Chlorine (2017)	2017	Known	Ashburnham Water Department
Athol	3	Consumer Confidence	2014	Returned to Compliance	Athol DPW Water Division
		Consumer Confidence	2015	Returned to Compliance	Athol DPW Water Division
		Coliform (TCR)	2016	Returned to Compliance	Athol DPW Water Division
Erving	0				
Gardner	0				
Hubbardston	0				
New Salem	0				
Orange	0				
Petersham	0				
Phillipston	0				
Royalston	0				
Templeton	0				
Warwick	0				
Wendell	0				
Westminster	0				
Winchendon	0				
Service Area Total	4				

Source: US Environmental Protection Agency SDWIS Federal Reporting Services System

EH – 2 Non-Major Health-Related Drinking Water Violations in the Service Area Over the Last 5 Years

Community	# of (Non-Major) Health-Related Drinking Water Violations in Community Drinking Sources Over Last 5 Years	Name of Contaminant and Type of Violation	Year of Violation	Compliance Status	Violating Agency
Ashburnham	2	Coliform (TCR) - Max Contaminant Level	2014	Returned to Compliance	Ashburnham Water Department
		Coliform (TCR) - Max Contaminant Level	2014	Returned to Compliance	Ashburnham Water Department
Athol	1	Coliform (TCR) - Max Contaminant Level	2015	Returned to Compliance	Athol DPW Water Division
Erving	2	Coliform (TCR) - Max Contaminant Level	2014	Returned to Compliance	Erving Water Department
		Coliform (TCR) - Max Contaminant Level	2015	Returned to Compliance	Erving Water Department
Gardner	0				
Hubbardston	2	Nitrate - Max Contaminant Level	2015	Known	Hubbardston House Apartments
		Nitrate - Max Contaminant Level	2017	Known	Hubbardston House Apartments
New Salem	0				
Orange	4	Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	Orange Water Department
		Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	Orange Water Department
		Coliform (TCR) - Max Contaminant Level	2014	Known	Orange Water Department
		Coliform (TCR) - Max Contaminant Level	2015	Known	Orange Water Department
Petersham	0				
Phillipston	0				
Royalston	5	Coliform (TCR) - Max Contaminant Level	2013	Known	South Royalston Improvement Corp
		Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	South Royalston Improvement Corp
		Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	South Royalston Improvement Corp
		Coliform (TCR) - Max Contaminant Level	2013	Known	South Royalston Improvement Corp
		Coliform (TCR) - Max Contaminant Level	2014	Known	South Royalston Improvement Corp
Templeton	0				
Warwick	0				
Wendell	0				
Westminster	1	Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	Holmes Park Water District
Winchendon	2	Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	Winchendon Water Department
		Coliform (TCR) - Max Contaminant Level	2013	Returned to Compliance	Winchendon Water Department
Service Area Total	19				

Source: US Environmental Protection Agency SDWIS Federal Reporting Services System

DRAFT

Childhood Lead Exposure

For children, lead poisoning has been known to damage the brain, kidney and nervous systems and has the potential to slow growth, and can cause behavioral problems and learning disabilities. Many older homes have lead paint in them and when the paint chips, peels or is removed during remodeling efforts, lead dust can be released throughout the home and ingested by unsuspecting children causing lead poisoning. Lead paint was outlawed in 1978 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 they turn three to monitor lead poisoning in children. The Massachusetts Department of Public Health (Mass DPH) Bureau of Environmental Health (BEH) Childhood Lead Poisoning Prevention Program (CLPPP) tracks lead-related activity throughout the Commonwealth including the percentage of children age nine (9) months to 48 months who have been adequately screened for BLL, estimated confirmed cases of greater than or equal to 5 µg/dL, confirmed cases of elevated BLL greater than or equal to 10 µg/dL, and determines whether or not a community is considered a "high risk lead community". 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-3 shows the percent of children under 48 months that have been screened, 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.

Note: Cells with double dash marks are considered "suppressed data". Data is suppressed because there were greater than one (1) but less than five (5) cases and could not be reported by the State for confidentiality purposes.

Throughout the Service Area, only 51% of children on average have been adequately screened for BLL compared to the State average of 77%. From community to community, the percentage of children adequately screened varies widely with Westminister leading the way at 96%, followed by Winchendon at 70% and Royalston at 64%. On the lower end of the spectrum, seven (7) of the 15 communities have less than 50% of children screened for BLL; Athol (38%), Erving (38%), New Salem (38%), Orange (31%), Petersham (31%), Phillipston (35%) and Templeton (48%).

It is concerning to note that in many of the communities where children have been inadequately screened for BLL also are communities with the highest percentage of housing units built before 1978 as seen in Table EH-3. In spite of this, it is important to note here that none of the Service Area communities were considered high risk lead communities as of 2016.

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EH - 3 Childhood Lead Screening and pre-1978 Housing Units in the Service Area 2016

Community	% of Children 9 to <48 months Screened for Lead	Estimated Confirmed $\geq 5 \mu\text{g/dL}$	Confirmed Elevated Blood Lead Levels (BLL) $\geq 10 \mu\text{g/dL}$	Percentage of Housing Units Built Before 1978	Considered a High-Risk Lead Community in 2016
Ashburnham	52.0%	--	0	60.0%	No
Athol	38.0%	6	--	77.0%	No
Erving	38.0%	--	0	68.0%	No
Gardner	51.0%	15	6	78.0%	No
Hubbardston	59.0%	0	0	35.0%	No
New Salem	38.0%	0	0	55.0%	No
Orange	31.0%	7	--	69.0%	No
Petersham	31.0%	--	--	67.0%	No
Phillipston	35.0%	0	0	49.0%	No
Royalston	64.0%	--	0	58.0%	No
Templeton	48.0%	--	0	52.0%	No
Warwick	58.0%	0	0	65.0%	No
Wendell	57.0%	--	0	49.0%	No
Westminster	96.0%	--	--	60.0%	No
Winchendon	70.0%	--	0	59.0%	No
Service Area Ave.	51.1%			60.1%	
Massachusetts	77.00%	3,500	651	71.00%	
Source: MDPH BEH Childhood Lead Poisoning Prevention Program (CLPPP) 2016; ACS 2016 5-Year Estimates					

Tables EH-4 and EH-5 display wide disparities in childhood lead screening between Athol and Heywood Hospitals' Service Areas. In Athol's Service Area, just 43.3% of children aged 9 to 48 months have been adequately screened for BLL. In Heywood Hospital's Service Area, nearly 63% of children have been adequately screened. Both fall behind the State total of 77%. Perhaps most concerning, six (6) of Athol Hospital's communities have just a third of their children adequately screened for BLL and each of those communities have between a pre-1978 housing stock of between 50% and 80%. Those communities are Athol, Erving, New Salem, Orange, Petersham and Phillipston.

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EH - 4 Childhood Lead Screening and pre-1978 Housing Units in Athol Hospital's Service Area 2016

Community	% of Children 9 to <48 months Screened for Lead	Estimated Confirmed $\geq 5 \mu\text{g/dL}$	Confirmed Elevated Blood Lead Levels (BLL) $\geq 10 \mu\text{g/dL}$	Percentage of Housing Units Built Before 1978	Considered a High-Risk Lead Community in 2016
Athol	38.0%	6	--	77.0%	No
Erving	38.0%	--	0	68.0%	No
New Salem	38.0%	0	0	55.0%	No
Orange	31.0%	7	--	69.0%	No
Petersham	31.0%	--	--	67.0%	No
Phillipston	35.0%	0	0	49.0%	No
Royalston	64.0%	--	0	58.0%	No
Warwick	58.0%	0	0	65.0%	No
Wendell	57.0%	--	0	49.0%	No
Service Area Ave.	43.3%			61.9%	
Massachusetts	77.00%	3,500	651	71.00%	

Source: MDPH BEH Childhood Lead Poisoning Prevention Program (CLPPP) 2016 and ACS 2016 5-Year Estimates

As noted previously, on average 77% of children in Heywood Hospital's Service Area have been adequately screened for BLL, however, that number can be misleading. In Westminster, 96% of children have been adequately screened and in Winchendon 70% of children have been adequately screened. These higher percentages skew the average as the other four (4) communities have just around 50% of their children adequately screened. Of the four (4) communities hanging around the 50% mark, two (2) have a pre-1978 housing stock of between 60 and 80%; Ashburnham (60%) and Gardner (78%). Despite these concerns, it is important to point out again that no community was deemed a high-risk lead community by the MDPH BEH CLPPP.

EH - 5 Childhood Lead Screening and pre-1978 Housing Units in Heywood Hospital's Service Area 2016

Community	% of Children 9 to <48 months Screened for Lead	Estimated Confirmed $\geq 5 \mu\text{g/dL}$	Confirmed Elevated Blood Lead Levels (BLL) $\geq 10 \mu\text{g/dL}$	Percentage of Housing Units Built Before 1978	Considered a High-Risk Lead Community in 2016
Ashburnham	52.0%	--	0	60.0%	No
Gardner	51.0%	15	6	78.0%	No
Hubbardston	59.0%	0	0	35.0%	No
Templeton	48.0%	--	0	52.0%	No
Westminster	96.0%	--	--	60.0%	No
Winchendon	70.0%	--	0	59.0%	No
Service Area Ave.	62.7%			57.3%	
Massachusetts	77.00%	3,500	651	71.00%	

Source: MDPH BEH Childhood Lead Poisoning Prevention Program (CLPPP) 2016 and ACS 2016 5-Year Estimates

Climate Health

The effects of climate change are being felt in many communities across Massachusetts, the U.S., and the world. Mass DPH is helping local health providers prepare for the public health impacts of extreme weather events to build resiliency in each community. They are doing this by helping to implement the Center for Disease Control's (CDC) Building Resilience Against Climate Effects (BRACE) framework so hospitals and health providers are better equipped to respond to and recover from climate change effects.

One measure of the impact from climate change is the increase in the number of days over 90 degrees Fahrenheit, a typical indicator of heat stress which can lead to fatigue, cramps, dehydration and heat stroke. The Mass Environmental Public Health Tracking (EPHT) program tracks the number of Emergency Department (ED) visits related to heat stress, with the latest publicly available data coming from 2012. Table EH-6 displays the number of heat stress-related ED visits in each community separated by males, females and total ED visits. For Service Area communities, no community had greater than four (4) heat stress ED visits in 2012, meaning an exact number of heat stress ED visits could not be determined for this report. Only six (6) of the 15 communities had any heat stress ED visits that year with the rest having zero as seen in Table EH-6.

The low number of heat stress-related ED visits is likely due to the abundance of natural resources in the area that help keep the Service Area cooler than more urbanized areas of the State. This is particularly beneficial to the elderly population that is often adversely impacted by hotter temperatures.

EH - 6 Number of Heat Stress-Related ED Visits in Service Area Communities 2012

Community	# of Heat Stress ED Visits per 100,000 - Male 2012	# of Heat Stress ED Visits per 100,000 - Female 2012	Total # of Heat Stress ED Visits per 100,000 - 2012
Ashburnham	--	--	--
Athol	0	--	--
Erving	0	0	0
Gardner	0	0	0
Hubbardston	0	0	0
New Salem	0	0	0
Orange	0	--	--
Petersham	0	0	0
Phillipston	0	0	0
Royalston	0	0	0
Templeton	--	0	--
Warwick	0	0	0
Wendell	0	0	0
Westminster	--	0	--
Winchendon	--	--	--
Service Area Total	--	--	--
Source: Mass Center for Health Information and Analysis (CHIA) 2012			

Note: Cells with double dash marks are considered "suppressed data". Data is suppressed because there were greater than one (1) but less than five (5) cases and could not be reported by the State for confidentiality purposes.

Environmental Justice Populations

According to the Environmental Justice (EJ) Policy of the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), environmental justice is based on the principle 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 community as an "Environmental Justice Community" if at least one or all of the following are true:

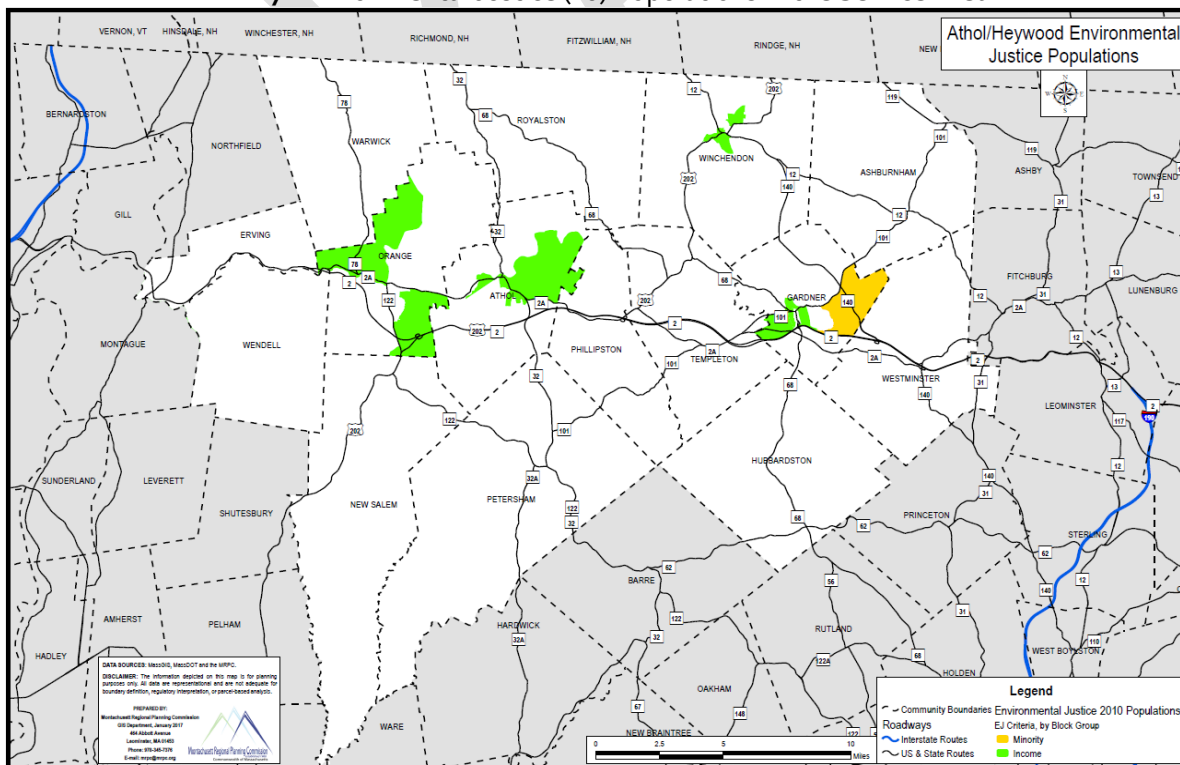
1. The community is a "block group whose annual median household income is equal to or less than 65% of the Statewide median"
2. 25% or more of the community residents identify as minority; or,
3. "25% or more of households having no one over the age of 14 who speaks English only or very well - Limited English Proficiency (LEP)"

More on the Massachusetts Environmental Justice Populations can be found at the following links:

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

According to the State's EJ Policy, the City of Gardner, and the Towns of Orange, Athol and Winchendon qualify as EJ Populations. Gardner qualifies under the Minority and Income standards; Orange, Athol and Winchendon all qualify under the Income standards. 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 who meet those standards. Map EH-7 breaks down the EJ Population qualifications in Heywood's Service Area.

EH - 7 Environmental Justice (EJ) Populations in the Service Area

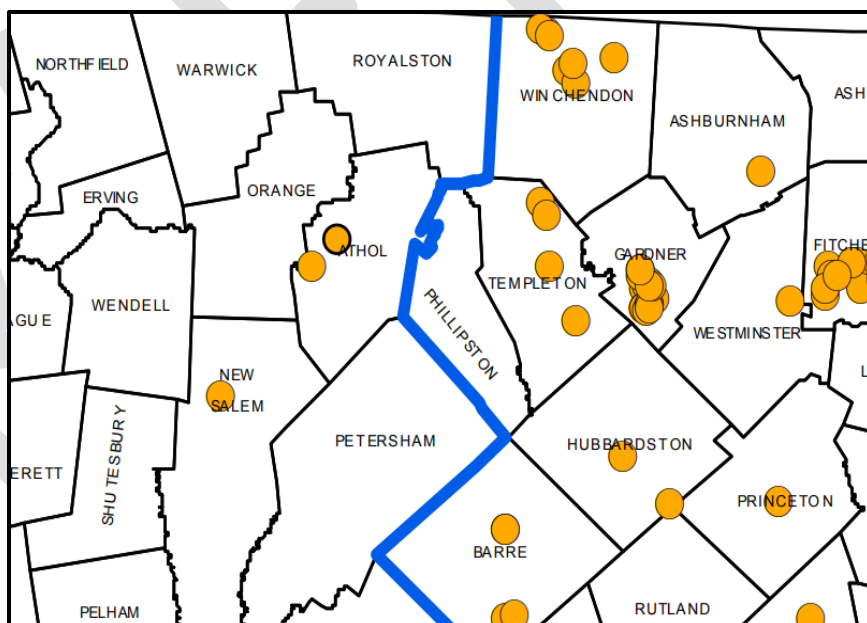


Brownfield Sites

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".²⁷ The Massachusetts Department of Environmental Protection tracks Brownfield Sites in Massachusetts and maintains a database on the Mass.gov website. According to that database, there are 30 Brownfield sites throughout the Service Area with 11 in Gardner, seven (7) in Winchendon, three (3) in Athol and four (4) in Templeton.²⁸ As noted in the previous section, certain areas of Gardner, Athol and Winchendon all qualify as EJ populations and each have Brownfield sites, increasing the chances of exposure to environmental hazards for low income minorities in their communities. Table EH-8 lists the number of Brownfield sites in each community. Erving, Orange, Petersham, Phillipston, Royalston, Warwick and Wendell were not included in the database on the Mass.gov website.

EH - 8 Brownfield Sites throughout the Service Area 2014²⁹

Community	Brownfield Sites #
Ashburnham	1
Athol	3
Erving	--
Gardner	11
Hubbardston	1
New Salem	1
Orange	--
Petersham	--
Phillipston	--
Royalston	--
Templeton	4
Warwick	--
Wendell	--
Westminster	2
Winchendon	7
Service Area Ave.	30
Massachusetts	1,012
Source: Mass Department of Environmental Protection 2018	



In addition to the database, the Mass DEP also maintains a spot map of Brownfield sites throughout the Commonwealth. As seen above, Brownfield sites throughout the Service Area are often clustered in concentrated areas on each town. Even more concerning is the correlation between Brownfield sites and EJ populations as shown on Map EH-7 in the EJ Populations section of this report where the locations of each nearly overlap with one another.

²⁷ <https://www.epa.gov/brownfields/overview-brownfields-program>

²⁸ <https://www.mass.gov/service-details/find-brownfields-sites>

²⁹ <https://www.mass.gov/files/documents/2016/08/rt/bfmap1014.pdf>



Community Perceptions

"People are living in unsafe/unhealthy housing conditions; people do not call Board of Health regarding living conditions due to fear of repercussions from their landlords; landlord also not keeping properties up to code."

"There is a lot of outdoor green space available to people but we don't see that many using it"

"I think people would use the outdoor recreational space more if they had the proper equipment"

"The area is rich in natural resources but people are not really using it...I am not sure if they just aren't aware of what's out there or not but their overall health could drastically improve if they used it"

"There really isn't any community events space that's adequate"

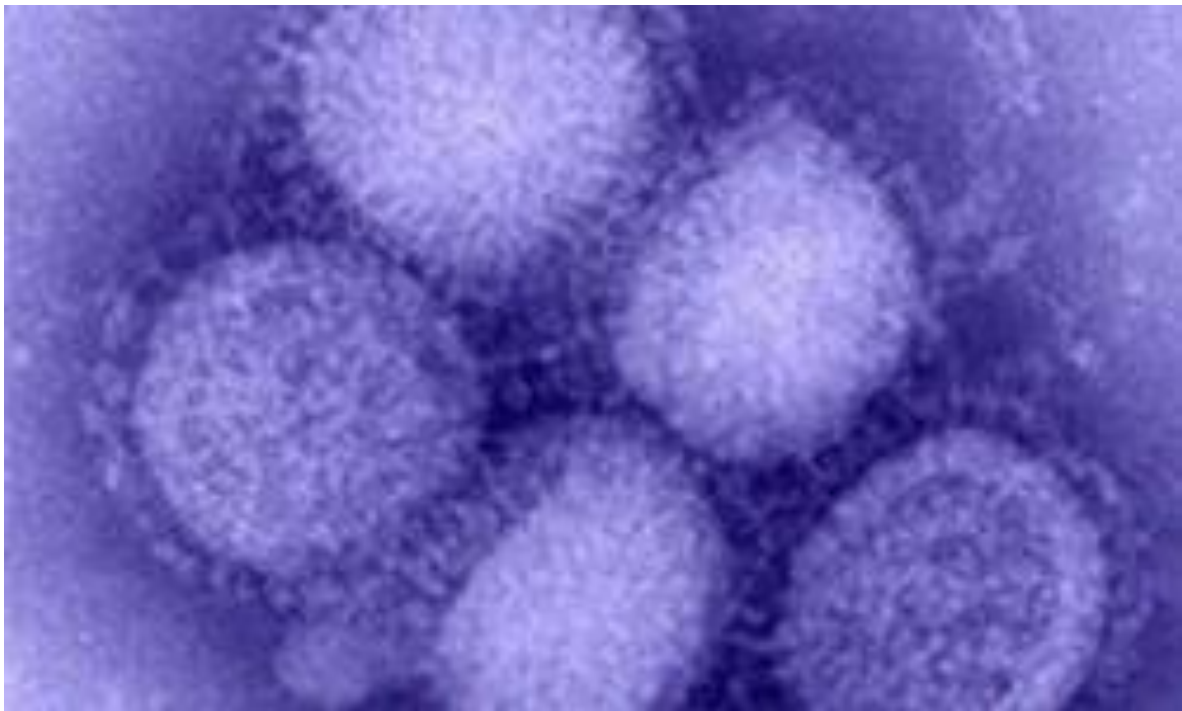


Image from the US Centers for Disease Control

INFECTIOUS DISEASE

Chapter 5

Abstract

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

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

Chapter 5 - Infectious Disease

This chapter provides information on the prevalence of infectious diseases in Heywood Healthcare's 15 communities and highlights trends and disparities among residents. The following infectious disease topics are addressed:

- Sexually Transmitted Infections (STI)
- Influenza
- C-Difficile
- Tickborne Disease

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Sexually Transmitted Infections (STIs)

- Gardner, Westminster and Winchendon saw increases in Chlamydia cases from 2014 to 2016. All other communities saw declines. There were significantly more cases of Chlamydia in Heywood Hospital's Service Area than Athol Hospital's
- There were very few cases of Gonorrhea in the Service Area from 2014 to 2016, with only Gardner reporting enough cases in 2014 and 2015 (5) to display numbers without the data being suppressed
- The Service Area saw an increased rate of Syphilis per 100,000 residents from 2014 to 2016 jumping from 0.0 to 10.7
- From 2014 to 2016, there were only eight (8) reported cases of HIV in the Service Area
- Gardner and Athol saw notable increases in Hepatitis C cases from 2014 to 2016 with Gardner jumping from 34 to 60, and Athol jumping from 18 to 23

Influenza

- From year to year, Athol (average of 31), Gardner (average of 47), and Winchendon (average of 23.3) had the highest number of flu cases, all experienced increases in flu cases between 2014 and 2016.
- Heywood's Service Area saw far greater cases of the flu when compared to Athol Hospital's Service Area

C-Difficile

- Between 2013 and 2017, incidences of C-difficile have increased 178%.

Sexually Transmitted Infections (STI)

The Sexually Transmitted Infections (STIs) section of this chapter highlights the prevalence of several STIs in the Service Area including Chlamydia, Gonorrhea, Syphilis, HIV, Viral Hepatitis, and Hepatitis C. STIs are infections spread through sexual activity that can infect and 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 but are suppressed to protect confidentiality. "Suppressed" data means that the data for that cell cannot be displayed due to aforementioned confidentiality rules. Suppressed data is still included in the overall count for a specific dataset. Throughout this chapter, there are many instances where data is suppressed.

Chlamydia

According to the Centers for Disease Control (CDC), Chlamydia is a common STI experienced frequently by both men and women that can cause serious 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)".³⁰

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. For the entire Service Area in 2014, Gardner reported the highest number of reported Chlamydia cases but had just the third highest rate (217.5 per 100,000). Phillipston reported the highest rate of Chlamydia cases at 297.3 per 100,000 but saw just five actual cases. The reason for this difference in rate is the larger population present in Gardner and the smaller population present in Phillipston; communities with smaller populations are likely to have higher rates than larger communities. Seven (7) of the 15 communities reported greater than zero but less than five cases of Chlamydia in their communities, leading to the suppression of their data for this report.

Through 2015 and 2016, Phillipston reported greater than zero but less than five cases of Chlamydia, dropping them from the highest rated community in the Service Area. Gardner's reported cases jumped to 63 in 2015, which ranked them highest in the Service Area at 311.5 cases per 100,000; far higher than any other community. In 2016, reported cases in Gardner dropped down to 53, placing them third on the list at 262 per 100,000. Meanwhile, eight (8) communities maintained zero to five reported cases of Chlamydia from 2014 to 2016; Erving, Hubbardston, New Salem, Petersham, Phillipston, Royalston, Warwick, and Wendell. On the other hand, Winchendon climbed the ranks from one of the lowest Chlamydia counts and rates in 2014 (14 cases at 135.9 per 100,000) to the second highest count and highest rate in 2016 (34 cases at 330.1 per 100,000). A breakdown of Chlamydia cases in the Service Area can be found in Table ID-1.

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³⁰ <https://www.cdc.gov/std/chlamydia/stdfact-chlamydia.htm>

ID – 1 Reported Cases of Chlamydia in the Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Ashburnham	--	--	13	213.8	8	131.6
Athol	30	259.0	27	233.1	26	224.5
Erving	--	--	--	--	--	--
Gardner	44	217.5	63	311.5	53	262.0
Hubbardston	--	--	5	114.1	5	114.1
New Salem	--	--	0	0.0	--	--
Orange	15	191.4	13	165.8	17	216.9
Petersham	--	--	--	--	--	--
Phillipston	5	297.3	--	--	--	--
Royalston	--	--	--	--	--	--
Templeton	11	137.3	10	124.8	8	99.8
Warwick	0	0.0	0	0.0	--	--
Wendell	--	--	--	--	0	0.0
Westminster	12	164.9	12	164.9	21	288.6
Winchendon	14	135.9	25	242.7	34	330.1
Massachusetts	21,271	315.3	24,100	354.7	26,807	394.5
Service Area Total/Rate	146	173.2	181	214.7	182	216.0
Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data. The total counts and rates for Massachusetts uses yearly data from the Center for Disease Control.						

In Athol Hospital's Service Area, seven of the nine communities reported zero to five cases of Chlamydia annually from 2014 to 2016. Athol and Orange were the only two communities to report higher numbers of Chlamydia cases. Athol maintained the highest rates from year to year but saw a slight decline in Chlamydia cases. Orange saw a slight dip in cases from 2014 to 2015 (15 to 13) but saw a jump to 17 cases in 2016.

ID – 2 Reported Cases of Chlamydia in Athol Hospital's Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Athol	30	259.0	27	233.1	26	224.5
Erving	--	--	--	--	--	--
New Salem	--	--	0	0.0	--	--
Orange	15	191.4	13	165.8	17	216.9
Petersham	--	--	--	--	--	--
Phillipston	5	297.3	--	--	--	--
Royalston	--	--	--	--	--	--
Warwick	0	0.0	0	0.0	--	--
Wendell	--	--	--	--	0	0.0
Service Area Total/Rate	--	--	--	--	--	--
Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data						

In Heywood Hospital's Service Area, four of the six communities reported five or more cases of Chlamydia in 2014 but all six reported five or more cases in 2015 to 2016. Gardner reported far higher rates than any other community, which is to be expected due to the size of its population in comparison to the other five communities. However, Winchendon and Westminster were the only two communities to experience an increase in reported cases from year to year, Winchendon ranking highest at 330.1 cases per 100,000 and Westminster ranking second highest at 288.6 cases per 100,000 in 2016. Ashburnham, Hubbardston and Templeton saw their rates decline from 2014 to 2016. A breakdown of Chlamydia cases in Heywood Hospital's Service Area can be found in Table ID-3.

ID – 3 Reported Cases of Chlamydia in Heywood Hospital's Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Ashburnham	--	--	13	213.8	8	131.6
Gardner	44	217.5	63	311.5	53	262.0
Hubbardston	--	--	5	114.1	5	114.1
Templeton	11	137.3	10	124.8	8	99.8
Westminster	12	164.9	12	164.9	21	288.6
Winchendon	14	135.9	25	242.7	34	330.1
Service Area Total/Rate	--	--	128	--	129	--
Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data						

Gonorrhea

The CDC reports that Gonorrhea is an STI that "can cause infections in the genitals, rectum and throat".³¹ The STI can be easily treated and cured with medication but can cause serious complications like pelvic inflammatory disease (PID) in women and can cause a man to become sterile.

Throughout the Service Area, there are a very small number of Gonorrhea cases. From 2014 to 2016, only Gardner reported enough cases of Gonorrhea where the data would not be suppressed, and still only five cases were reported there in 2014 and 2015. Overall, the number of cases of Gonorrhea in the Service Area have increased slightly from 2014 to 2016 from 7 to 10, however, the number of cases declined from 16 in 2015 to 10 in 2016. A breakdown of Gonorrhea cases in the Service Area can be found in Table ID-4.

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³¹ <https://www.cdc.gov/std/gonorrhea/stdfact-gonorrhea.htm>

ID – 4 Reported Cases of Gonorrhea in the Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Ashburnham	0	0	--	--	--	--
Athol	0	0	--	--	0	0
Erving	0	0	--	--	0	0
Gardner	5	24.7	5	24.7	--	--
Hubbardston	0	0	--	--	0	0
New Salem	0	0	0	0	0	0
Orange	--	--	--	--	0	0
Petersham	0	0	0	0	0	0
Phillipston	0	0	0	0	0	0
Royalston	0	0	0	0	0	0
Templeton	0	0	--	--	--	--
Warwick	0	0	0	0	0	0
Wendell	0	0	0	0	0	0
Westminster	--	--	--	--	--	--
Winchendon	0	0	0	0	--	--
Massachusetts	3,817	56.2	3,817	56.2	4,900	73.3
Service Area Total/Rate	7	8.3	16	19	10	11.9
Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data. The total counts and rates for Massachusetts uses yearly data from the Center for Disease Control.						

In Athol's Service Area, a few communities reported greater than zero but less than five cases of Gonorrhea in 2014 and 2015 but saw zero cases throughout their Service Area in 2016. Due to confidentiality rules, a total number of cases throughout Athol's Service Area in 2014 and 2015 could not be determined.

ID – 5 Reported Cases of Gonorrhea in Athol Hospital's Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Athol	0	0	--	--	0	0
Erving	0	0	--	--	0	0
New Salem	0	0	0	0	0	0
Orange	--	--	--	--	0	0
Petersham	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
Wendell	0	0	0	0	0	0
Service Area Total/Rate	--	--	--	--	0	0
Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data						

In Heywood's Service Area, all six communities reported great than zero but less than five cases of Gonorrhea at some point from 2014 to 2016. Gardner lead all communities in 2014 and 2015 but reported just five cases. All 10 cases of Gonorrhea reported throughout all of Heywood Healthcare's Service Area in 2016 were found in Heywood Hospital's Service Area communities. A breakdown of Gonorrhea cases in Heywood Hospital's Service Area can be found in Table ID-6.

ID – 6 Reported Cases of Gonorrhea in Heywood Hospital's Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Ashburnham	0	0	--	--	--	--
Gardner	5	24.7	5	24.7	--	--
Hubbardston	0	0	--	--	0	0
Templeton	0	0	--	--	--	--
Westminster	--	--	--	--	--	--
Winchendon	0	0	0	0	--	--
Service Area Total/Rate	--	--	--	--	10	11.9

Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data

Syphilis

Syphilis is a treatable and curable STI that can cause serious health problems if left untreated. Syphilis is divided into stages; primary, secondary, latent, and tertiary. At any stage, syphilis can infect brain and nervous systems or the eyes, causing further complications.³²

Throughout the Service Area, no community reported enough cases to determine which community reported the highest syphilis rates. It is important to note however, that the rate has increased from 2014 to 2016. In 2014 there were no cases of Syphilis in the Service Area; in 2015, there were greater than zero but less than five cases for a rate of 1.2 per 100,000; and in 2016 there were nine cases for a rate of 10.7 per 100,000. Those ten cases were spread out between Ashburnham, Athol, Gardner, Hubbardston and Orange as shown in Table ID-7.

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³² <https://www.cdc.gov/std/syphilis/stdfact-syphilis.htm>

ID – 7 Reported Cases of Syphilis in the Service Area from 2014 to 2016

Community	2014		2015		2016	
	Count	Rate	Count	Rate	Count	Rate
Ashburnham	0	0	0	0	--	--
Athol	0	0	0	0	--	--
Erving	0	0	0	0	0	0
Gardner	0	0	0	0	--	--
Hubbardston	0	0	0	0	--	--
New Salem	0	0	0	0	0	0
Orange	0	0	0	0	--	--
Petersham	0	0	0	0	0	0
Phillipston	0	0	0	0	0	0
Royalston	0	0	0	0	0	0
Templeton	0	0	0	0	0	0
Warwick	0	0	0	0	0	0
Wendell	0	0	0	0	0	0
Westminster	0	0	--	--	0	0
Winchendon	0	0	0	0	0	0
Service Area Total/Rate	0	0	--	1.2	9	10.7

Source: Count data uses yearly data from Mass DPH, Rates were calculated using 2010 census population data

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 can be transferred by semen, vaginal fluid, blood or breastmilk but not by tears, sweat, feces or urine. Once infected, the Virus takes over the body's T-cells that are responsible for powering the body's immune system in defense against other pathogens. The Virus turns the T-cell into a "virus factory... forcing the cell to produce thousands of copies of the virus".³³ Over time, HIV weakens the body's immune system, making it very difficult for the infected individual to stay healthy.

Throughout the Service Area, five communities reported greater than zero but less than five cases of HIV; Athol, Gardner, Orange, Templeton, and Westminster. In 2015, there was a total of eight HIV cases. The State recorded 20,715 cases of HIV cases in the same period.

In Athol Hospital's Service Area, Athol and Orange were the only two communities to report greater than zero but less than five cases of HIV. The remaining communities reported zero cases.

In Heywood Hospital's Service Area, Gardner, Templeton and Westminster reported greater than zero but less than five cases of HIV. The remaining communities reported zero cases.

³³ <https://www.hiv.va.gov/patient/basics/what-is-HIV.asp>

Hepatitis B

According to WebMD, Hepatitis B "is a virus that infects the liver" and most who contract it are typically only sick for a short amount of time.³⁴ Those who experienced sickness for short periods of time had "acute Hepatitis B". In rare cases when an individual is infected for a long period of time, they are experiencing "chronic Hepatitis B" and over time can cause serious damage to the liver. The virus is spread through "contact with blood and bodily fluids of an infected person".³⁵

Throughout the Service Area, there were very few cases of Hepatitis B from 2014 to 2016. During this time frame, no community reported a high enough number of cases of Hepatitis B where the data could not be suppressed. Only Ashburnham, Athol, Gardner and Orange reported any cases in 2016, the remaining communities reported zero cases. Total Hepatitis B cases could not be recorded due to confidentiality rules. The State reported 1,939 cases in 2014, 1,844 cases in 2015 and 1979 cases in 2016.

In Athol Hospital's Service Area, only two communities (Athol and Orange) reported any cases of Hepatitis B in 2016, up from just one community in 2014 (Wendell) but down from three communities in 2015 (Athol, Erving and Orange). The following table displays this breakdown.

In Heywood Hospital's Service Area, only two communities (Ashburnham and Gardner) reported any cases of Hepatitis B in 2016, the same two communities that reported cases in 2014. 2016 saw a reduction in communities reporting Hepatitis B, down from three in 2015 (Gardner, Westminster and Winchendon).

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.³⁶

Of those communities who could report the number of cases of Hepatitis C cases accurately; Athol (18 to 23), Gardner (34 to 60) and Templeton (20 to 21) saw increases in Hepatitis C cases from 2014 to 2016. All other communities reported decreases in Hepatitis C cases as seen in Table ID-8. The overall number of Hepatitis C cases in the Service Area was not shared when requested from Mass DPH and could not be obtained in time for the writing of this report.

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³⁴ <https://www.webmd.com/hepatitis/hepb-guide/hepatitis-b-topic-overview#1>

³⁵ <https://www.webmd.com/hepatitis/hepb-guide/hepatitis-b-topic-overview#1>

³⁶ <http://www.who.int/mediacentre/factsheets/fs164/en/>

ID – 8 Reported Cases of Hepatitis C in the Service Area from 2014 to 2016

Community	2014	2015	2016
Ashburnham	5	8	--
Athol	18	20	23
Erving	--	--	0
Gardner	34	56	60
Hubbardston	--	10	--
New Salem	0	--	0
Orange	14	15	9
Petersham	0	--	--
Phillipston	--	--	0
Royalston	--	--	--
Templeton	20	8	21
Warwick	--	--	0
Wendell	--	--	0
Westminster	--	9	--
Winchendon	20	12	19
Service Area Total	--	--	--
Massachusetts	8,898	8,998	7,738
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

In Athol Hospital's Service Area, Athol and Orange reported the greatest number of Hepatitis C cases but Athol was the only community to see an increase in cases from 2014 to 2016 (18 to 23). Orange saw a decrease in cases from 14 to 9. All other communities reported zero cases, or greater than zero but less than five cases as shown in Table ID-9.

ID – 9 Reported Cases of Hepatitis C in Athol Hospital's Service Area from 2014 to 2016

Community	2014	2015	2016
Athol	18	20	23
Erving	--	--	0
New Salem	0	--	0
Orange	14	15	9
Petersham	0	--	--
Phillipston	--	--	0
Royalston	--	--	--
Warwick	--	--	0
Wendell	--	--	0
Service Area Total	--	--	--
Massachusetts	8,898	8,998	7,738
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

In Heywood Hospital's Service Area, Gardner saw significant increases in Hepatitis C from 2014 (34 cases) to 2016 (60), nearly doubling its total cases. Templeton saw an increase of just one case from 2014 to 2016. The remaining communities saw declines in cases from of Hepatitis C from 2014 to 2016 as shown in Table ID-10.

ID – 10 Reported Cases of Hepatitis C in Heywood Hospital's Service Area from 2014 to 2016

Community	2014	2015	2016
Ashburnham	5	8	--
Gardner	34	56	60
Hubbardston	--	10	--
Templeton	20	8	21
Westminster	--	9	--
Winchendon	20	12	19
Service Area Total	--	--	--
Massachusetts	8,898	8,998	7,738
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

Influenza

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

Throughout the Service Area, reported cases of the flu are relatively small. From 2014 to 2016, typically half of the communities reported so few cases that the data was suppressed for confidentiality purposes. From year to year, Athol (average of 31), Gardner (average of 47), and Winchendon (average of 23.3) had the highest number of flu cases, all experiencing increases in flu cases between 2014 and 2016. Athol and Gardner saw decreases in flu cases from 2015 to 2016. Orange, Templeton, Ashburnham, Westminster and Winchendon all saw increases in flue cases from 2015 to 2016. The overall number of flu cases in the Service Area was not shared when requested from Mass DPH and could not be obtained in time for the writing of this report. A breakdown of all flu cases in the Service Area can be found in Table ID-11.

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ID – 11 Reported Cases of Influenza in the Service Area from 2014 to 2016

Community	2014	2015	2016
Ashburnham	--	6	12
Athol	14	42	37
Erving	--	--	--
Gardner	37	57	47
Hubbardston	6	8	8
New Salem	--	--	--
Orange	6	12	23
Petersham	--	--	--
Phillipston	--	5	--
Royalston	--	--	--
Templeton	13	13	18
Warwick	0	--	0
Wendell	--	--	--
Westminster	--	10	12
Winchendon	23	18	29
Service Area Total	--	--	--
Massachusetts	13,484	15,869	13,165
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

In Athol Hospital's Service Area, only Athol and Orange consistently reported higher numbers of the flu the rest of the Service Area. Each year, Athol reported the highest number of cases, the remaining communities all reported five or less cases of the flu from 2014 to 2016 as seen in Table ID-12.

ID – 12 Reported Cases of Influenza in Athol Hospital's Service Area from 2014 to 2016

Community	2014	2015	2016
Athol	14	42	37
Erving	--	--	--
New Salem	--	--	--
Orange	6	12	23
Petersham	--	--	--
Phillipston	--	5	--
Royalston	--	--	--
Warwick	0	--	0
Wendell	--	--	--
Service Area Total	--	--	--
Massachusetts	13,484	15,869	13,165
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

In Heywood Hospital's Service Area, Gardner reported a significantly higher number of flu cases between 2014 and 2016. This is to be expected given their larger population when compared to the other five

communities. All six communities saw increases in the number of flu cases from 2014 to 2016. Only Gardner saw a decrease in cases from 2015 to 2016. Overall flu cases in Heywood's Service Area can be found in Table ID-13.

ID – 13 Reported Cases of Influenza in Heywood Hospital's Service Area from 2014 to 2016

Community	2014	2015	2016
Ashburnham	--	6	12
Gardner	37	57	47
Hubbardston	6	8	8
Templeton	13	13	18
Westminster	--	10	12
Winchendon	23	18	29
Service Area Total	--	--	--
Massachusetts	13,484	15,869	13,165
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

C-Difficile

Clostridium difficile, often called C. difficile or C. diff, is a bacterium that can cause symptoms ranging from diarrhea to life-threatening inflammation of the colon. Illness from C. difficile most commonly affects older adults in hospitals or in long-term care facilities and typically occurs after use of antibiotic medications. However, studies show increasing rates of C. difficile infection among people traditionally not considered high risk, such as younger and healthy individuals without a history of antibiotic use or exposure to health care facilities. Each year in the United States, about a half million people get sick from C. difficile, and in recent years, C. difficile infections have become more frequent, severe and difficult to treat.³⁷ Table ID-14 shows the increasing incidences in the Service Area since 2013. Between 2013 and 2017, incidences of C-difficile have increased 178%.

ID – 14 Incidences of C-difficile 2013 - 2017

	2013	2014	2015	2016	2017
C-difficile Cases	83	143	169	147	231
Source: Heywood Healthcare Laboratory Department					

Tickborne Disease

Tickborne diseases are diseases spread from tick bites. Ticks can carry a wide range of pathogens that can transmit diseases like Lyme's Disease and Anaplasmosis to humans. Tickborne diseases are very common in New England.

Anaplasmosis is a tickborne disease that can cause fever, headache, muscle pain, malaise, and rash among other symptoms. If not treated correctly, Anaplasmosis can be fatal.³⁸ Throughout the Service Area, there were very few cases between 2014 and 2016. In 2016, only two communities (Erving and

³⁷ <https://www.mayoclinic.org/diseases-conditions/c-difficile/symptoms-causes/syc-20351691>

³⁸ <https://www.cdc.gov/anaplasmosis/symptoms/index.html>

Orange) reported greater than zero but less than five cases of Anaplasmosis, a decrease from four communities in 2015 (Hubbardston, Orange, Templeton and Wendell). The overall number of Anaplasmosis cases in the Service Area was not shared when requested from Mass DPH and could not be obtained in time for the writing of this report. The breakdown of Anaplasmosis cases by community from 2014 to 2016 can be found in Table ID-15.

ID – 15 Reported Cases of Anaplasmosis in the Service Area from 2014 to 2016

Community	2014	2015	2016
Ashburnham	0	0	0
Athol	0	0	0
Erving	0	0	--
Gardner	0	0	0
Hubbardston	0	--	0
New Salem	0	0	0
Orange	0	--	--
Petersham	0	0	0
Phillipston	--	0	0
Royalston	0	0	0
Templeton	0	--	0
Warwick	0	0	0
Wendell	0	--	0
Westminster	0	0	0
Winchendon	--	0	0
Service Area Total	--	--	--
Massachusetts	675	771	873
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

In Athol Hospital's Service Area, only Erving and Orange reported greater than zero but less than five cases of Anaplasmosis in 2016. Each year, only two communities have reported any cases at all. As displayed in Table ID-16, Orange was the only community to report cases in two consecutive years.

ID – 16 Reported Cases of Anaplasmosis in Athol Hospital's Service Area from 2014 to 2016

Community	2014	2015	2016
Athol	0	0	0
Erving	0	0	--
New Salem	0	0	0
Orange	0	--	--
Petersham	0	0	0
Phillipston	--	0	0
Royalston	0	0	0
Warwick	0	0	0
Wendell	0	--	0
Service Area Total	--	--	--
Massachusetts	675	771	873
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			

In 2016, no communities in Heywood Hospital's Service Area reported any cases of Anaplasmosis. From 2014 to 2016, only Winchendon (2014), Hubbardston (2015) and Templeton (2015) reported any cases of Anaplasmosis as seen in Table ID-17.

ID – 17 Reported Cases of Anaplasmosis in Heywood Hospital's Service Area from 2014 to 2016

Community	2014	2015	2016
Ashburnham	0	0	0
Gardner	0	0	0
Hubbardston	0	--	0
Templeton	0	--	0
Westminster	0	0	0
Winchendon	--	0	0
Service Area Total	--	--	--
Massachusetts	675	771	873
Source: Mass DPH Bureau of Infectious Disease and Laboratory Sciences			



Community Perceptions

"The incidence of Legionella has been increasing in communities potentially from the increased use of C-PAP machines for sleep apnea."



Image from L.D Russo, Inc.

INJURIES AND VIOLENCE

Chapter 6

Abstract

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

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

Chapter 6 - Injuries and Violence

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

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

- Injuries and Poisonings
- Motor-Vehicle-Related Mortality Rates
- Violence

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Injuries and Poisonings Mortality

- There were 67 injuries and poisonings deaths in the Service Area in 2015, with 19 coming in Gardner and 16 in Athol; a total of 52% of overall injuries and poisonings deaths.
- The rate of injuries and poisoning deaths for the Service Area is 78.53, which is higher than the State rate of 68.83.
- The death rate due to self-inflicted injuries and poisonings for the Service Area is 19.92, which is considerably higher than the State rate of 9.26.
- Self-inflicted injuries and poisonings deaths were equal to the suicide statistics for each town

Motor Vehicle-Related Mortality

- There were just five (5) motor vehicle related deaths in 2014 in the Service Area

Violence

- There were no homicides in the Service Area in 2014
- There were 497 assaults in the Service Area in 2016
- There were 19 weapons-related deaths in the Service Area from 2012 to 2014
 - Athol Hospital's Service Area exhibited a firearms-related death rate of 13.1 per 100,000; nearly four times the Massachusetts rate of 3.4 per 100,000
 - Heywood Hospital's Service Area exhibit a firearms-related death rate of 4.7 per 100,000
- As of the first quarter of FY2016, there were 3,741 children in caseload between both DCF offices, with 2,568 in North Central and 1,173 in Greenfield. Of those children in caseload, only 823 (22%) are in placement.
- 91% of children in placement came from homes where DCF investigations were able to substantiate abuse or neglect was occurring in the home.
- There was a 26% increase in restraining orders from 2005-2016 in the three district courts in the Service Area – Gardner, Orange and Winchendon District Courts
- Orange District Court had the highest increase in restraining orders in the Service Area at 46% over 12 years, compared to the MA rate increase of 37%.

Injuries and Poisonings

Injuries and Poisonings Deaths

Throughout the Service Area, there were 67 injuries and poisonings deaths in 2014. Thirty-five (35) of those 67 were in Athol (16) and Gardner (19). The next leading community was Orange with eight (8). Athol had the highest rate of injuries and poisonings deaths per 100,000 at 116.5 and Orange was the second leading community with 93.8 per 100,000. Four (4) communities had zero injuries and poisonings deaths; New Salem, Phillipston, Royalston, and Warwick. The rate of injuries and poisoning deaths for the Service Area is 78.53, which is higher than the State rate of 68.63. The injuries and poisonings deaths disparities are displayed in Table IV-1.

IV-1 Injuries and Poisonings Deaths and Death Rates in Service Area Communities 2015

Community	Injuries and Poisoning Deaths	Injuries and Poisoning Death Rates Per 100,000
Ashburnham	4	64.8
Athol	16	116.5
Erving	1	53.4
Gardner	19	83.6
Hubbardston	3	66.1
New Salem	0	0.0
Orange	8	93.8
Petersham	1	98.8
Phillipston	0	0.0
Royalston	0	0.0
Templeton	5	55.3
Warwick	0	0.0
Wendell	2	24.6
Westminster	3	40.1
Winchendon	5	46.0
Service Area Total/Average	67	78.53
Massachusetts*	4675	68.63
Source: 2015 Mass DPH Data, *2016 CDC WISQARS		

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In Athol Hospital's Service Area there were a total of 28 injuries and poisonings deaths with 24 of them coming from Athol (16) and Orange (8). Wendell experienced two (2); Erving and Petersham each experienced one (1). All remaining communities had zero as shown in Table IV-2.

IV-2 Injuries and Poisonings Deaths and Death Rates in Athol Hospital's Service Area Communities 2015

Community	Injuries and Poisoning Deaths	Injuries and Poisoning Death Rates Per 100,000
Athol	16	116.5
Erving	1	--
New Salem	0	0.0
Orange	8	93.8
Petersham	1	--
Phillipston	0	0.0
Royalston	0	0.0
Warwick	0	0.0
Wendell	2	--
Service Area Total/Average	28	--
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, there were a total of 39 injuries and poisonings deaths in 2015. Nineteen (19) of those 39, or nearly 50%, were in Gardner. Despite a larger population, Gardner still had the highest injuries and poisonings death rate at 83.6 per 100,000. Templeton had the second highest rate at 55.3, followed by Winchendon at 46.0. Ashburnham, Hubbardston and Westminster each had a rate of greater than zero but less than one per 100,000. Table IV-3 breaks down the disparities in Heywood Hospital's Service Area.

IV-3 Injuries and Poisonings Deaths and Death Rates in Heywood Hospital's Service Area Communities 2015

Community	Injuries and Poisoning Deaths	Injuries and Poisoning Death Rates Per 100,000
Ashburnham	4	--
Gardner	19	83.6
Hubbardston	3	--
Templeton	5	55.3
Westminster	3	--
Winchendon	5	46.0
Service Area Total/Average	39	45.71
Source: 2015 Mass DPH Data		

Self-Inflicted Injuries and Poisonings Deaths

The death rate due to self-inflicted injuries and poisonings for the Service Area is 19.92 which is considerably higher than the State rate of 9.26 as seen in Table IV-4.

IV-4 Self-Inflicted Injuries and Poisonings Deaths and Death Rates in Service Area Communities 2015

Community	Self-Inflicted Injuries and Poisoning Deaths	Self-Inflicted Injuries and Poisoning Death Rates per 100,000
Ashburnham	1	--
Athol	6	42.2
Erving	1	--
Gardner	4	--
Hubbardston	1	--
New Salem	0	0.0
Orange	1	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Templeton	0	0.0
Warwick	0	0.0
Wendell	2	--
Westminster	0	0.0
Winchendon	1	--
Service Area Total/Average	17	19.92
Massachusetts*	631	9.26
Source: 2015 Mass DPH Data, *2016 CDC WISQARS		

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Motor Vehicle-Related Mortality Rates

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.

Throughout the Service Area, there were just five (5) motor vehicle related deaths in 2014. Two (2) occurred in Athol and one (1) occurred in Ashburnham, Gardner and Winchendon. The rate of vehicle related deaths for the Service Area is 5.86 per 100,000 which is lower than the State rate of 6.86. This distribution is displayed in Table IV-5.

IV-5 Vehicle-Related Deaths and Death Rates in Service Area Communities 2015

Community	Vehicle Related Deaths	Vehicle Related Deaths, Rate
Ashburnham	1	--
Athol	2	--
Erving	0	0.0
Gardner	1	--
Hubbardston	0	0.0
New Salem	0	0.0
Orange	0	0.0
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Templeton	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Westminster	0	0.0
Winchendon	1	--
Service Area Total/Average	5	5.86
Massachusetts*	467	6.86
Source: 2015 Mass DPH Data, *2016 CDC WISQARS		

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In Athol Hospital's Service Area, there were just two (2) motor vehicle related deaths. Both occurred in Athol as displayed in Table IV-6.

IV-6 Vehicle-Related Deaths and Death Rates in Athol Hospital's Service Area Communities 2015

Community	Vehicle Related Deaths	Vehicle Related Deaths, Rate
Athol	2	--
Erving	0	0.0
New Salem	0	0.0
Orange	0	0.0
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Service Area Total/Average	2	--
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, there were a total of three (3) motor vehicle related deaths. One (1) occurred in Ashburnham, Gardner and Winchendon. Table IV-7 displays this data.

IV-7 Vehicle-Related Deaths and Death Rates in Heywood Hospital's Service Area Communities 2015

Community	Vehicle Related Deaths	Vehicle Related Deaths, Rate
Ashburnham	1	--
Gardner	1	--
Hubbardston	0	0.0
Templeton	0	0.0
Westminster	0	0.0
Winchendon	1	--
Service Area Total/Average	3	--
Source: 2015 Mass DPH Data		

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Violence

Violence is a notable public health issue across the United States and the Commonwealth, including the Heywood Healthcare 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.

Homicide

From 2010 to 2016, there were a total of three (3) homicides throughout the Service Area. The first occurred in 2010 in Athol and the next two (2) did not occur until 2016 when one (1) occurred in Gardner and another in Orange as seen in Table IV-8. It is important to note that data for certain communities were not available in the FBI database and were noted as "NA" in their respective cells. The homicide rate in 2016 for the Service Area was 0.023 which is equal to the State rate.

IV-8 Homicides and Homicide Rates in Service Area Communities 2010-2016

Community	2010 Homicides	2010 Homicide Rates per 1,000	2011 - 2015 Homicides	2011 - 2015 Homicide Rates per 1,000	2016 Homicides	2016 Homicide Rates per 1,000
Ashburnham	0	0.0	0	0.0	0	0.0
Athol	1	0.09	0	0.0	0	0.0
Erving	0	0.0	0	0.0	0	0.0
Gardner	0	0.0	0	0.0	1	0.05
Hubbardston	0	0.0	0	0.0	NA	NA
New Salem	NA	NA	0	0.0	NA	NA
Orange	NA	NA	0	0.0	1	0.13
Petersham	NA	NA	0	0.0	NA	NA
Phillipston	NA	NA	0	0.0	NA	NA
Royalston	NA	NA	0	0.0	NA	NA
Templeton	NA	NA	0	0.0	0	0.0
Warwick	NA	NA	0	0.0	NA	NA
Wendell	NA	NA	0	0.0	NA	NA
Westminster	0	0.0	0	0.0	0	0.0
Winchendon	0	0.0	0	0.0	0	0.0
Service Area Total/Rate	1	0.012	0	0.00	2	0.023
Massachusetts*					137	0.023

Source: <https://ucr.fbi.gov/crime-in-the-u.s> *2016 CDC WISQARS

Assaults

Tables IV-9, IV-10 and IV-11 below present the number of assaults in the Service Area communities and the State for 2016. Data for the smaller communities was unavailable on the FBI's website and so are listed as NA and because of that, assault rates per 1,000 could not be calculated for those communities. The City of Gardner's data was reported incorrectly in 2016, so the data presented in Table IV-9 and IV-11 is from 2015. Athol (11.37) and Winchendon's (15.28) assault rates are higher than the State's assault rate of 10.24 per 1,000 residents.

IV - 9 Assaults and Assault Rates in the Service Area 2016

Community	2016 Assaults	2016 Assault Rate per 1,000
Ashburnham	30	4.83
Athol	132	11.37
Erving	18	10.16
Gardner*	173	8.47
Hubbardston	NA	NA
New Salem	NA	NA
Orange	73	9.59
Petersham	NA	NA
Phillipston	NA	NA
Royalston	NA	NA
Templeton	43	5.26
Warwick	NA	NA
Wendell	NA	NA
Westminster	36	4.74
Winchendon	165	15.28
Service Area Total/Rate	670	--
Massachusetts	59,919	10.24
Source: https://ucr.fbi.gov/crime-in-the-u.s		
*There was a reporting error in Gardner in 2016, so Gardner's rates are from 2015		

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There were 223 assaults in Athol Hospital's Service Area in 2016 combined between Athol (132), Erving (18), and Orange (73); the only three (3) communities for which data was available.

IV - 10 Assault and Assault Rates in Athol Service Area

Community	2016 Assaults	2016 Assault Rate per 1,000
Athol	132	11.37
Erving	18	10.16
New Salem	NA	NA
Orange	73	9.59
Petersham	NA	NA
Phillipston	NA	NA
Royalston	NA	NA
Warwick	NA	NA
Wendell	NA	NA
Service Area Total/Rate	223	--
Source: Source: https://ucr.fbi.gov/crime-in-the-u.s		

There were 447 assaults in Heywood Hospital's Service Area in 2016 with 173 in Gardner and 165 in Winchendon alone. Hubbardston was the only community for which assault data was unavailable.

IV - 11 Assault and Assault Rates for Heywood Service Area

Community	2016 Assaults	2016 Assault Rate per 1,000
Ashburnham	30	4.83
Gardner*	173	8.47
Hubbardston	NA	NA
Templeton	43	5.26
Westminster	36	4.74
Winchendon	165	15.28
Service Area Total/Rate	447	--
Source: https://ucr.fbi.gov/crime-in-the-u.s		
*There was a reporting error in Gardner in 2016, so Gardner's rates are from 2015		

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.³⁹ 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 raised in stable, single-parent families".⁴⁰ 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.⁴¹

Unfortunately, child maltreatment is a pervasive problem throughout the Service Area. 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 FY2016 (the most recent available data), there were 3,741 children in caseload between both DCF offices with 2,568 in North Central and 1,173 in Greenfield. Of those children in caseload, only 823 (22%) are in placement with an average of 90 clinical cases opening up each month, and 190 clinical cases closing each month between July 2015 and September 2015. The caseload is 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- 12 DCF Caseload at Greenfield and North Central Offices FY16 Quarter 1

	Greenfield		North Central	
Caseload	FY16 - Q1	FY18 - Q1	FY16 - Q1	FY18 - Q1
Ave Clinical Cases Opened per Month	32	33	58	65
Ave Clinical Cases Closed per Month	49	42	60	74
Children <18 Pending Response	119	98	167	145
Children <18 in Caseload	1,173	1,293	2,568	2,462
Children <18 in Placement	328	348	495	577
% of Child Caseload in Placement	28%	27%	19%	23%
Clinical Cases	674	703	1,262	1,233
Adoption Cases	100	87	123	156
Clinical Cases w/Child <18 in Placement	140	153	204	226
% Clinical Cases that are Placement Cases	21%	22%	16%	18%
Adoptions Legalized	6	6	6	10
Guardianships Legalized	5	2	7	5
Source: Mass Department of Child and Families Quarterly Profile FY16Q1=7/1/15-9/30/15, FY18Q1=7/1/17-9/30/17				

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. As is shown in Table IV-13, as of Q1 of FY2016, 4,049 (52%) DCF consumers were white, 1,715 (22%) were Hispanic/Latino, and 393 (5%) were Black. We

³⁹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3806110/>

⁴⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3171291/>

⁴¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3869039/>

are unable to relate these statistics directly to the Service Area as the Greenfield and North Central DCF offices service more communities than the Heywood Service Area.

IV- 13 Racial/Ethnic Makeup on DCF Consumers (Adults and Children) at Greenfield and North Central Offices

Race	Greenfield	North Central	Total
White	1,525	2524	4,049
Hispanic/Latino	278	1437	1,715
Black	105	288	393
Asian	11	35	46
Native Americans	8	6	14
Pacific Islander	0	1	1
Multi-Racial	72	139	211
Unknown	141	170	311
Missing	385	663	1,048
Total	2,525	5,263	7,788

Source: Mass Department of Child and Families Quarterly Profile FY 2016 Q1

Of those 823 children in placement mentioned previously, 179 were zero (0) to two (2) years old, 178 were three (3) to five (5) years old, 223 were six (6) to 11 years old, and 243 were 12 to 17 years old as seen in Table IV-14. At the DCF Greenfield office, the older the age group, the more children there are in placement. At the DCF North Central office, the number of children in the three (3) to five (5) age group (104) is actually lower than those in the zero (0) to two (2) age group (120) and the number of children in the six (6) to 11 age group (135) and 12 to 17 age group (136) are virtually the same.

IV- 14 Total Children in Placement at Greenfield and North Central DCF Offices by Age FY16 Quarter 1

Age Group	Greenfield	North Central	Total
0-2 Years	59	120	179
3-5 Years	74	104	178
6-11 Years	88	135	223
12-17 Years	107	136	243
Total	328	495	823

Source: Mass Department of Child and Families Quarterly Profile FY 2016 Q1

Of the 823 children in placement between the Greenfield and North Central offices, 749 are in placement for protective services, meaning 91% 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).⁴² The remaining 6% of cases were voluntary request (18), CFA referral (11), court referral (7) or other (7) as seen in Table IV-15.

⁴² <https://www.childwelfare.gov/topics/systemwide/assessment/approaches/alternative/>

IV- 15 Children in Placement at Greenfield and North Central DCF Offices by Case Type FY16 Quarter 1

Most Recent Intake (9/30/15)	Greenfield	North Central	Total
Protective	283	466	749
Alternative Response	22	9	31
Voluntary Request	7	11	18
CFA Referral (Children Requiring Assistance)	9	2	11
Court Referral	2	5	7
Other/Unspecified	5	2	7
Total	328	495	823

Source: Mass Department of Child and Families Quarterly Profile FY 2016 Q1

Of those children in placement, nearly one (1) quarter in the Greenfield and North Central offices stay in placement for half of one (1) year or less (204). The greatest number of children (221) are in placement from one (1) to two (2) years. However, more than half (57%) of children coming through these two (2) DCF offices are in placement from anywhere between one (1) and four (4) or more years (467) as can be seen in Table IV-16

IV- 16 Average Time in Placement for Children at Greenfield and North Central DCF Offices FY16 Quarter 1

Time in Placement	Greenfield	North Central	Total
.5 years or less	68	136	204
>.5 years to 1 year	64	88	152
>1 year to 2 years	88	133	221
>2 years to 4 years	82	111	193
>4 years	26	27	53
Total	328	495	823

Source: Mass Department of Child and Families Quarterly Profile FY 2016 Q1

As of the first quarter of FY2016, there were 2,932 children not in placement from the Greenfield (845) and North Central (2,087) 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 (1,011). Those aged zero (0) to five (5) accounted for a little more than a third of children not in placement for a total of 1,130 children as seen in Table IV-17.

IV- 17 Total Children Not in Placement at Greenfield and North Central DCF Offices by Age FY16 Quarter 1

Age Group	Greenfield	North Central	Total
0-2 Years	170	380	550
3-5 Years	173	407	580
6-11 Years	290	721	1,011
12-17 Years	212	578	790
Unspecified	0	1	1
Total	845	2,087	2,932

Source: Mass Department of Child and Families Quarterly Profile FY 2016 Q1

For those children not in placement, 77% (2,266) are those in the protective category where they are under investigation or awaiting investigation of abuse or neglect. Nearly 20% (577) of children are also awaiting alternative response services as seen below in Table IV-18.

IV- 18 Children Not in Placement at Greenfield and North Central DCF Offices by Case Type FY16 Quarter 1

Most Recent Intake (9/30/15)	Greenfield	North Central	Total
Protective	614	1,652	2,266
Alternative Response	207	370	577
Voluntary Request	2	36	38
CFA Referral (Children Requiring Assistance)	10	18	28
Court Referral	8	11	19
Other/Unspecified	4	0	4
Total	845	2,087	2,932
Source: Mass Department of Child and Families Quarterly Profile FY 2016 Q1			

Interpersonal Violence

Table IV-19 below shows that restraining orders for interpersonal violence (formerly known as Domestic Violence or Intimate Partner Violence) have increased significantly over the past 12 years, in some cases like Orange District Court, as much as 46% which is greater than the State change of 37%. Winchendon (28%) and Gardner (10%) District Courts have had lower increases in number of filings than the state as a whole. 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.

IV - 19 Restraining Orders Filed in the Service Area District Courts FY05-FY17

	ABUSE PREVENTION FILED		*RESTRAINING ORDERS FILED			
District Court Location	FY05	FY08	FY11	FY14	FY17	Percent Change FY05-FY17
Gardner	273	224	368	321	301	10%
Orange	198	178	283	293	289	46%
Winchendon	150	153	230	239	192	28%
Massachusetts	26,927	27,076	38,865	36,809	36,985	37%
*Abuse Prevention was renamed Restraining Order by FY2010						
Source: Massachusetts Probate and Family Court Department Website						

According to the 2017 Annual Report on the State of the Massachusetts Court System the Trial Court's internet-based e-Learning Center enabled more than 5,400 judges and employees to complete five mandatory, online training modules on topics related to interpersonal violence, including the impact of interpersonal violence on victims, the impact of exposure to interpersonal violence on children, risk assessment, and information about interpersonal violence.

Weapons-related Injuries

Throughout the Service Area, there were a total of 19 firearms-related deaths from 2012 to 2014. The Commonwealth of Massachusetts overall saw 677 firearm-related deaths. Data was suppressed for every

community in the Service Area because they reported greater than zero but less than five cases of firearm-related deaths during that timeframe.

Mass DPH was able to provide the total number of firearm-related death for each respective Service Area overall without sharing the rates for each community individually. In Athol Hospital's Service Area, there were a total of 11 firearm-related deaths from 2012 to 2014 for a rate of 39.3 per 100,000. This is significantly higher than the Massachusetts rate of 3.4 as displayed in Table IV-20.

Heywood Hospital's Service Area saw eight (8) firearm-related deaths from 2012 to 2014 for a rate of 14.2 per 100,000; notably lower than Athol Hospital's Service Area rate but still four times higher than the State rate.

IV - 20 Firearms-Related Deaths and Death Rates in Athol and Heywood Hospital's Service Area from 2012-2014

Community	Firearm Related Deaths	Firearm Related Death Rates
Athol's Service Area Total/Rate	11	39.3
Heywood's Service Area Total/Rate	8	14.2
Service Area Total/Rate	19	22.5
Massachusetts	677	3.4
Source: 2014 Mass DPH Data *Service Area rates calculated using 2010 census population data		



Community Perceptions

"There is a lack of Domestic Violence support groups in Athol"

"There is a high suicide rate among people in abusive relationships"

"More funding and services are needed from domestic violence prevention and assistance"

"There are no timely appointments for victims of DV... people are getting hurt and even dying while waiting for appointments"

"There is a lack of education about other cultures and religions that exist in the region often making some people misunderstood in the eyes of some in the community... we need programs and training to help fix this problem and there is none"

"Having a sense of hopelessness is the number one cause determining an individual's proximity to towards suicide"

"Violence towards elders is a major problem and there are no existing programs or research being done to address this problem"

"Patients with mental illness are strongly affected by racism... we are frequently seeing racism in the community among community members and even care providers"

"Racism and discrimination seems to be emboldened and is a growing issue due to our political leaders"

"The hospital is collaborating with the Council on Aging in communities to aid in the decrease/end of older adult violence"

"We have some of the highest child abuse rates in the State and that plays into the long-term employments, suicide and substance use problems we have experienced for generations"

"Anxiety from current events (immigration, racism, etc.) may be causing more domestic violence issues"

DRAFT



Image from Heywood.org

BEHAVIORAL HEALTH & SUBSTANCE MISUSE

Chapter 7

Abstract

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

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

Chapter 7 - Behavioral Health and Substance Misuse

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

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

- Mental Health
- Mental Disorder Mortality Rate
- Self-Inflicted Injuries & Suicide
- Substance Use

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Mental Health

- Of Athol Hospital's 6,479 Emergency Department (ED) patients, 3,284 (50.7%) had mental health problems on their record.
- Of Heywood Hospital's 23,241 ED patients, 10,694 (46%) had mental health problems on their record in 2017.
 - In 2017, 13,978 (47%) of Heywood Healthcare's combined 29,720 ER patients had a mental health diagnosis at discharge.

Mental Disorder Mortality

- According to the most recent available data in 2014, there were 44 deaths as a result of mental disorders throughout the Service Area.
- Athol (8), Gardner (7) and Winchendon (6) saw the most total mental disorder deaths
- Winchendon (72.6 per 100,000), Westminster (60.4 per 100,000) and Athol (44.1 per 100,000) had the highest mental disorder death rates in the Service Area.

Self-Inflicted Injuries & Suicide

- There were 60 suicides in the Service Area from 2012 to March 2018: 17 suicide deaths in Athol Hospital's Service Area and 43 in Heywood Hospital's Service Area.
- There were 21 suicides in Gardner and 10 in Athol from 2012 to March 2018 accounting for just over half of all suicides in the entire Service Area
- Wendell had the highest suicide rate per 1,000 residents at 2.46, followed by Erving at 1.07 and Gardner at 1.03
- 2014 and 2015 were the deadliest years for suicide throughout the Service Area with 13 occurring in each of those years

Substance Misuse

- Substance Use Emergency Department (ED) Discharges
 - Substance use diagnoses of ED patients are most common for people in the 25 to 34-year old groups at both Heywood (60.4%) and Athol (75.9%) Hospitals.

- For those aged 15 to 64 years old, substance misuse is a highly notable issue for all ages in both Service Areas.
- Substance misuse diagnoses are more prevalent among those ER patients at Athol Hospital when compared to Heywood ER patients for all ages with the exception of those 14 or younger.
- Overall, 35.5% of Athol Hospitals ED patients had substance misuse diagnoses on their record at discharge compared to 27.2% of Heywood Hospital ED patients
- Service Area communities with the highest prevalence of substance use ED discharges are mostly consistent with the communities with the highest mental health-related ED discharges

Tobacco Use

- The average smoking rates for all Service Area communities was 18.2% in 2015; nearly three percent higher than the State average of 15.5%.
- Compared with the MA smoking rate (15.5%), the four (4) communities in our Service Area with the highest smoking rates were Athol (24.4%), Gardner (24.2%), Orange (24.1%) and Winchendon (23.7%). With the exception of the Town of Erving, these four (4) communities with the highest smoking rates also had the four (4) lowest median income levels and are also four (4) of the five (5) most populous communities throughout the Service Area.
- The four (4) communities with the highest smoking rates also have 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 is related to the North Central Boards of Health Tobacco Control Alliance targeting efforts at high need communities.

Opioid-Related Fatal Overdose

- From 2012 to 2016 there were a total of 86 opioid-related fatal overdoses throughout the Service Area communities.
- The annual opioid-related fatal overdose totals more than doubled from 10 in 2012 to 23 in 2016.
- Gardner saw the most incidences of OD with 26, followed by Athol with 12, Templeton with 11 and Orange with 10. Wendell was the only community that did not experience an opioid-related fatal OD during those years.
- In 2012, Phillipston had the highest rate of opioid-related OD at 51.52 per 100,000 residents. Winchendon had the second highest rate of 29.03 and Orange was not far behind them at 25.54 per 100,000. In 2016, those community's OD rates actually decreased significantly to 0.00, 9.42 and 12.97 per 100,000; respectively. In 2016, Royalston had the highest rate of opioid-related OD at 73.75 per 100,000 followed by Templeton at 61.49 and Gardner at 44.05 per 100,000. Those community's rates increased significantly from 2012 levels of 0.00, 12.55 and 4.94; respectively.
- Gardner had the highest percent increase in incidences of opioid-related fatal OD from 2012 to 2016 with an 800% increase. Templeton saw a 400% increase and Athol saw a 50% increase.
- Overall, the overdose rate per 100,000 residents for the entire Service Area increased from 11.86 to 26.96 from 2012 to 2016 and is comparable to the MA rate increases from 11.31 to 31.06.

Mental Health

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 on Emergency Department (ED) visitors on an annual basis to track the health issues on the records of patients that are coming to the hospital for treatment. In 2017, Athol Hospital saw a total of 6,479 and Heywood Hospital saw a total of 23,241 ED visitors. Of those who went to Athol Hospital ED, 3,284 patients (50.7%) had mental health diagnoses. Of those who went to Heywood Hospital ED, 10,694 patients (46%) had mental health diagnoses on their record. Combined, Heywood Healthcare's ED patients with prior mental health diagnoses were 13,978 (47%) of their 29,720 total ER patients in 2017.

Table BHA-1 breaks down ED discharges by age group in both Athol and Heywood Hospitals in 2017. The "Mental Health" column provides the total number of patients seen with a mental health problem diagnosed for that age group and the "Mental Health %" column is the percentage of patients seen with mental health problems compared to the total number of people in that age group. For example, at Heywood Hospital 547 total children between the ages of five (5) and 14 visited the ED in 2017; of those 547 children, 300 had mental health problems on their record for a total of 54.8% of five (5) to 14-year-olds.

At Heywood Hospital, 59.6% of children under five (5), 54.8% of five (5) to 14-year old's, 77% of 15 to 24-year old's, 79.8% of 25 to 34-year old's, and 64.8% of 35 to 44-year-olds had a record of mental health problems. Although the percentage of patients seen with mental health problems start to decline for the subsequent age groups, not a single age group at Heywood Hospital saw less than 25% of its patients with mental health problems on record.

At Athol Hospital, 28.6% of children under five (5), 62.1% of five (5) to 14-year old's, 82% of 15 to 24-year old's, 86.1% of 25 to 34-year old's, 74.6% of 35 to 44-year old's, and 57.6% of 45 to 54-year olds had mental health problems on record. The percentage of patients seen with prior mental health problems finally starts to decline for the subsequent age groups, however, only 75 to 84-year old's (21.1%) at Athol Hospital saw less than 25% of its patients with mental health problems on record.

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BHA - 1 Emergency Department Discharges at Heywood and Athol Hospitals with Mental Health Diagnoses by Age Group 2017

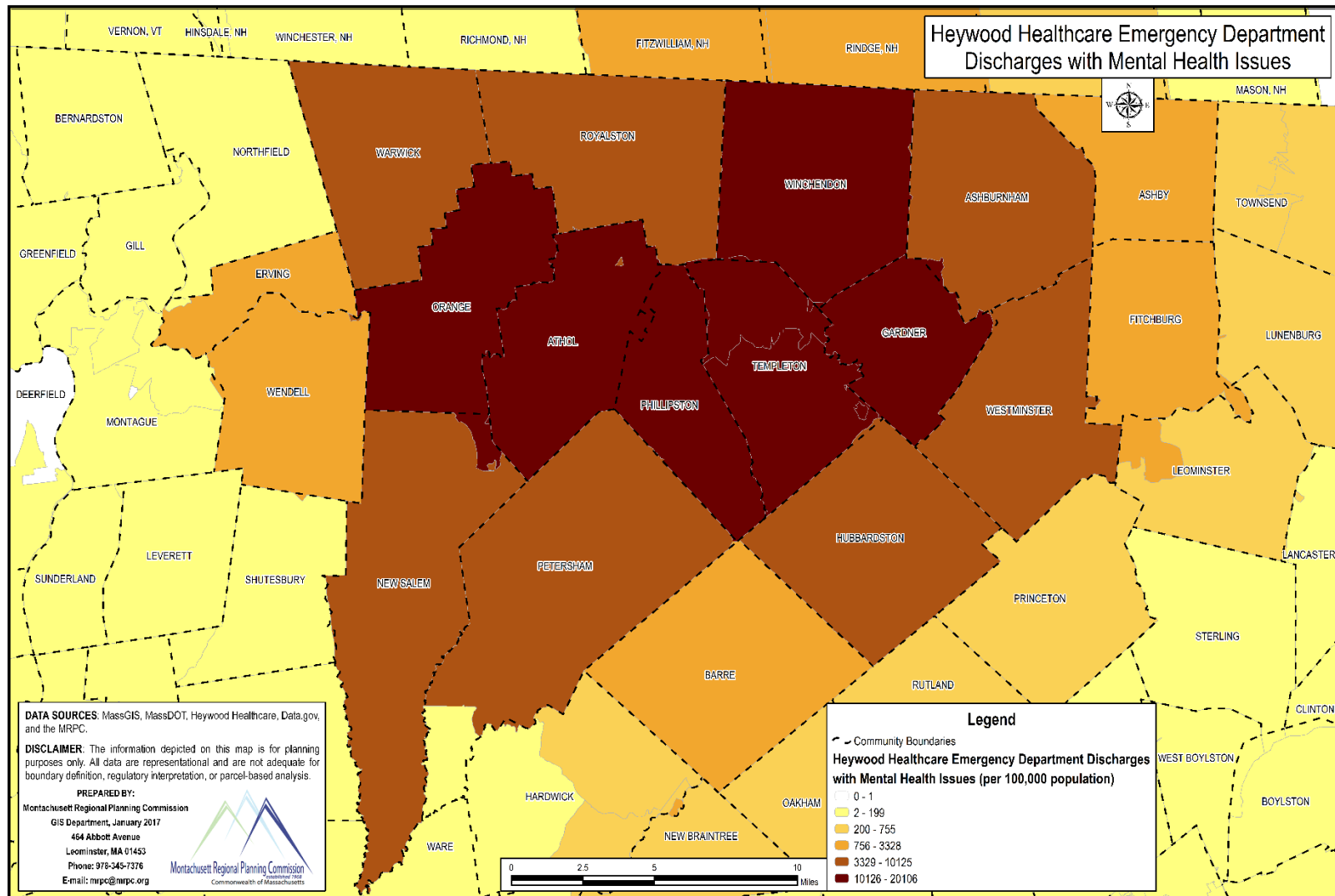
AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	MENTAL HEALTH	% MENTAL HEALTH	# OF PATIENTS	% OF PATIENTS	MENTAL HEALTH	% MENTAL HEALTH
85+	1,508	6.49	501	33.2	426	6.58	125	29.3
75-84	2,402	10.34	637	26.5	701	10.82	148	21.1
65-74	4,015	17.28	1,011	25.2	969	14.96	257	26.5
55-64	4,560	19.62	1,668	36.6	1,206	18.61	475	39.4
45-54	3,536	15.21	1,684	47.6	938	14.48	540	57.6
35-44	2,344	10.09	1,518	64.8	714	11.02	533	74.6
25-34	2,471	10.63	1,973	79.8	698	10.77	601	86.1
15-24	1,697	7.30	1,306	77.0	532	8.21	436	82.0
5-14	547	2.35	300	54.8	253	3.90	157	62.1
<5	161	0.69	96	59.6	42	0.65	12	28.6
TOTAL	23,241	100.00	10,694	46.0	6,479	100.00	3,284	50.7

Source: Athol and Heywood Hospital's ED Discharge Data 2017

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Map BHA-2 highlights Service Area communities with the highest prevalence of prior mental health-related diagnoses of 2017 ED discharges. The map reveals the heavy concentration of prior mental health-related diagnoses of ED discharges in the central communities that make up the Service Area.

BHA - 2 Emergency Department Discharges at Athol and Heywood Hospitals with Prior Mental Health Diagnoses 2017



Mental Disorder Mortality Rate

Of those who suffer from mental health challenges and disorders, some victims sadly lose their battle and die as a result of complications from their health status. According to the most recent available data in 2014, there were 44 deaths as a result of mental disorders throughout the Service Area. Athol (8), Gardner (7) and Winchendon (6) saw the most mental disorder deaths; however, Winchendon (72.6 per 100,000), Westminster (60.4 per 100,000) and Athol (44.1 per 100,000) had the highest mental disorder death rates in the Service Area. The full distribution of mental disorder deaths and death rates can be seen in Tables BHA-3, BHA-4, and BHA-5.

It is important to note that cells that portray double dash marks (" - "), the rates are equal to or greater than zero but less than one but are suppressed to protect confidentiality. Rates are per 100,000 people and are calculated using the most recent mortality data (2014) and 2010 US Census population data.

BHA - 3 Mental Disorder Deaths and Death Rates by Service Area Community 2014

Community	Mental Disorder Deaths	Mental Disorder Death Rates
Ashburnham	4	--
Athol	8	44.1
Erving	1	--
Gardner	7	23.6
Hubbardston	1	--
New Salem	1	--
Orange	5	55.2
Petersham	2	--
Phillipston	1	--
Royalston	0	0.0
Templeton	3	--
Warwick	0	0.0
Wendell	0	0.0
Westminster	5	60.4
Winchendon	6	72.6
Service Area Total/Average	44	--
Source: 2015 Mass DPH Data		

In Athol Hospital's Service Area, there were a total of 18 deaths as a result of mental disorder complications in 2014. Thirteen (13) of those 18 came from Athol (8) and Orange (5) alone which were two (2) of the leading communities throughout the entire Service Area to experience mental disorder deaths. Three (3) of the nine (9) communities experienced zero (0) mental disorder deaths in 2014; Royalston, Warwick and Wendell. Table BHA-4 displays the full distribution.

BHA - 4 Mental Disorder Deaths and Death Rates by Athol Hospital Service Area Community 2015

Community	Mental Disorder Deaths	Mental Disorder Death Rates
Athol	8	44.1
Erving	1	--1
New Salem	1	--1
Orange	5	55.2
Petersham	2	--1
Phillipston	1	--1
Royalston	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Service Area Total/Average	18	--
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, each of the six (6) communities experienced at least one (1) mental disorder-related death in 2014. As mentioned above, Westminster and Winchendon displayed the highest rates of mental disorder deaths throughout the entire Service Area and both communities are served by Heywood Hospital. Although Gardner had one of the lower rates of mental disorder deaths, they had the most mental disorder deaths throughout the entire Service Area and also falls under Heywood Hospital's Service Area. Table BHA-5 displays this data.

BHA - 5 Mental Disorder Deaths and Death Rates by Heywood Hospital Service Area Community 2015

Community	Mental Disorder Deaths	Mental Disorder Death Rates
Ashburnham	4	--1
Gardner	7	23.6
Hubbardston	1	--1
Templeton	3	--1
Westminster	5	60.4
Winchendon	6	72.6
Service Area Total/Average	26	--
Source: 2015 Mass DPH Data		

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Self-Inflicted Injuries & Suicide

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.

It is important to note that in cells that portray double dash marks followed by the number one (" -1"), the rates are equal to or greater than zero but less than one. Rates are per 100,000 people and are calculated using the most recent mortality data (2014) and 2010 US Census population data.

From 2012 to March 2018 there were 60 suicide deaths throughout all Service Area communities. Gardner had 21 total suicide deaths during this time frame and Athol had 10 making up just over half of all suicides in the Service Area. The Town of Wendell, despite having only two (2) suicide deaths during this time frame, had the highest suicide rate per 1,000 residents at 2.46. Erving was the next leading community with 1.07 per 1,000 followed by Gardner 1.03 and New Salem at 0.99 per 1,000. 2014 and 2015 were the deadliest years in terms of suicides during this time frame with 13 occurring in each of those years. Table BHA-6 shows the full distribution for all Service Area communities with rates per 100 persons.

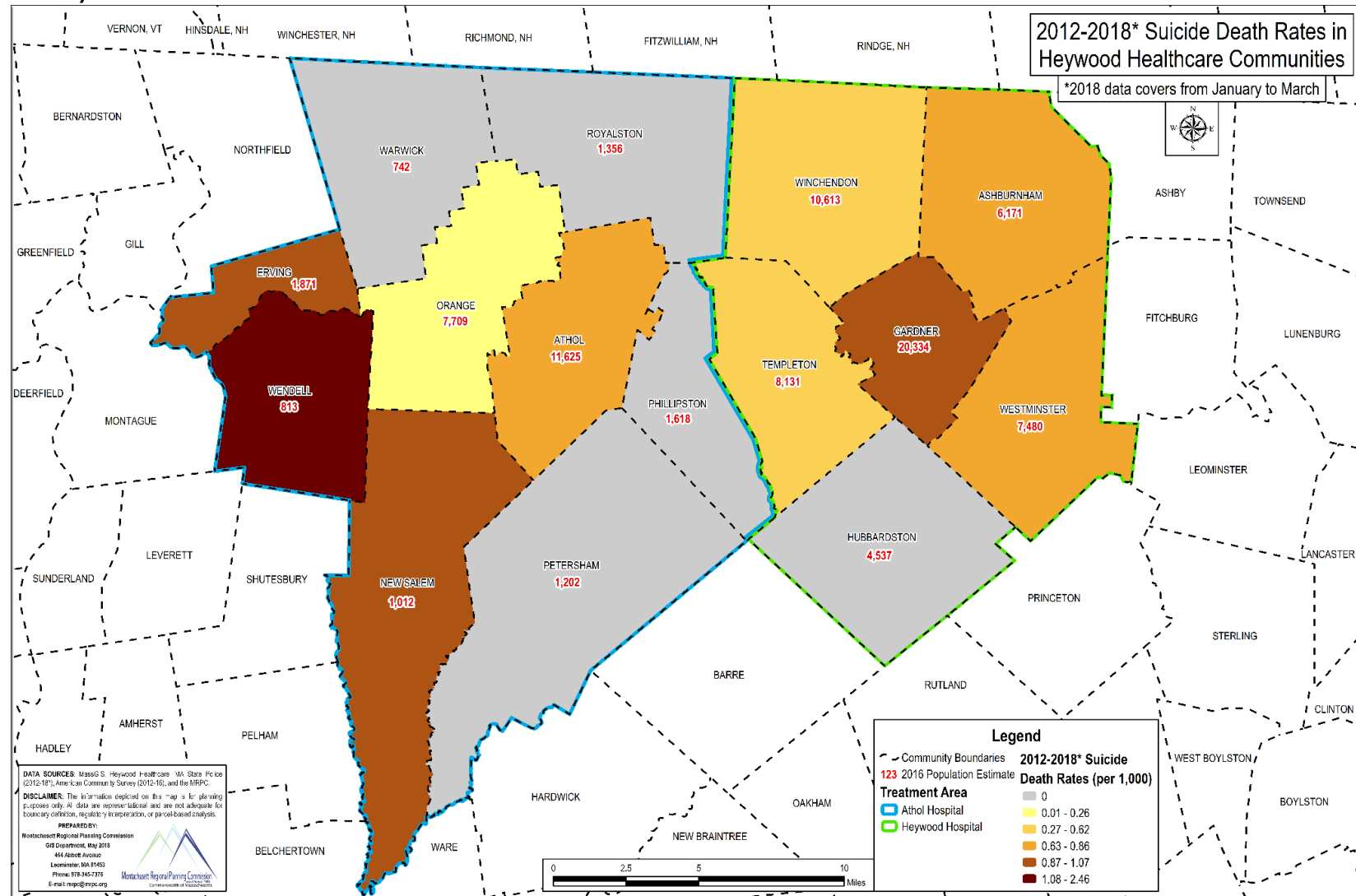
BHA - 6 Suicide Deaths in Service Area Communities from 2012-2018

Community	2012	2012 Rate	2013	2014	2015	2016	2016 Rate	Change in Rate 2012-2016	2017	2018*
Ashburnham	1	0.02	1	1	0	1	0.02	0	1	0
Athol	0	0.0	0	2	3	1	0.009	**	3	1
Erving	0	0.0	0	1	1	0	0.0	0	0	0
Gardner	6	0.03	3	5	4	2	0.01	-67%	0	1
Hubbardston	0	0.0	0	0	0	0	0.0	0	0	0
New Salem	0	0.0	0	0	1	0	0.0	0	0	0
Orange	0	0.0	0	1	1	0	0.0	0	0	0
Petersham	0	0.0	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
Templeton	1	0.01	1	0	1	0	0.0	-100%	1	1
Warwick	0	0.0	0	0	0	0	0.0	0	0	0
Wendell	0	0.0	0	2	0	0	0.0	0	0	0
Westminster	1	0.01	1	1	2	1	0.01	0	0	0
Winchendon	0	0.0	1	0	0	1	0.009	**	2	2
Service Area Total	9		7	13	13	6			7	5
Massachusetts	624	0.01	595	616	647	631	0.01	0	--	--

Source: MA State Police. *2018 numbers cover from January to March. MA suicides for 2017 and 2018 are not yet available publicly

Map BHA-7 is a visual representation of the suicide death rates in the Service Area from 2012 to 2018 as noted in Table BHA-6. The higher the suicide rate, the darker the fill color for that community. This map sheds light on two pockets of the Service Area where suicide is most prevalent.

BHA - 7 Suicide Death Rates in Service Area Communities from 2012-2018



In Athol Hospital's Service Area there were 17 suicide deaths from 2012 to March 2018 as seen in Table BHA-8. Ten (10) were in the Town of Athol alone and then Erving, Orange and Wendell each endured two (2) suicide deaths.

BHA - 8 Suicide Deaths in Athol Hospital Service Area Communities from 2012-2018

Community	Total Suicide Deaths							Total	Rate
	2012	2013	2014	2015	2016	2017	2018		
Athol	0	0	2	3	1	3	1	10	0.86
Erving	0	0	1	1	0	0	0	2	1.07
New Salem	0	0	0	1	0	0	0	1	0.99
Orange	0	0	1	1	0	0	0	2	0.26
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	2	0	0	0	0	2	2.46
Service Area Total	0	0	6	6	1	3	1	17	1
Source: MA State Police *2018 numbers cover from January to March **division by zero									

In Heywood Hospital's Service Area, there were 43 suicide deaths from 2012 to March 2018. Nearly half of these suicide deaths were in Gardner (21), then Westminster and Winchendon each suffered six (6) and Templeton and Ashburnham each had five (5) as seen in Table BHA-9.

BHA - 9 Suicide Deaths in Heywood Hospital Service Area Communities from 2012-2018

Community	Total Suicide Deaths							Total	Rate
	2012	2013	2014	2015	2016	2017	2018		
Ashburnham	1	1	1	0	1	1	0	5	0.81
Gardner	6	3	5	4	2	0	1	21	1.03
Hubbardston	0	0	0	0	0	0	0	0	0
Templeton	1	1	0	1	0	1	1	5	0.62
Westminster	1	1	1	2	1	0	0	6	0.8
Winchendon	0	1	0	0	1	2	2	6	0.57
Service Area Total	9	7	7	7	5	4	4	43	1
Source: MA State Police *2018 numbers cover from January to March									

For students who participated in the Franklin-County/North Quabbin Youth Risk Behavior Surveillance (YRBS) from 2016, a series of questions were asked related to their mental health and stability. Among respondents asked if they hurt themselves recently, 43% of LGBTQ students had hurt themselves compared to just 11% of heterosexual students. In fact, LGBTQ students were also significantly more likely to report showing signs of depression, seriously considering suicide, planning a suicide attempt or attempting suicide than their heterosexual counterparts. Lower income students as well as students of color were also more likely to report having these mental health problems than their higher income and/or white counterparts as seen in Table BHA-10.

BHA - 10 Self-Reported Mental Health Responses from 2016 North Quabbin YRBS

	Income		Sexual Orientation		Race/Ethnicity		MA*	
Mental Health	Lower Income Students	Higher Income Students	LGBTQ	Hetero-sexual	Students of Color	White Students	LGBTQ	Hetero-sexual
Hurt self on purpose in past 12 months	18%	14%	43%	11%	20%	15%	NA	NA
Signs of depression in past 12 months	31%	24%	54%	24%	35%	27%	56%	28.7%
Seriously considered suicide in past 12 months	16%	14%	38%	11%	20%	14%	35.6%	9.4%
Planned suicide attempt in past 12 months	11%	9%	29%	8%	16%	10%	26%	8.8%
Suicide with injury in past 12 months	2%	1%	5%	1%	2%	1%	12.8%	3.5%
Source: 2016 Franklin County/North Quabbin YRBS; *2016 MA YRBS								

Students who participated in Gardner High School's 2016 YRBS were also asked similar questions related to their mental health. Among respondents, female students in all grades were more likely to report having hurt themselves recently, feeling sad or hopeless, seriously considered suicide, and have planned or attempted suicide recently than their male counterparts. Students of color were also far more likely to report feeling sad or hopeless or that they have recently planned a suicide attempt than white students as seen in Table BHA-11.

BHA - 11 Mental Health Responses from 2016 Gardner High School YRBS

	Gender		Race		MA*	
Mental Health	Average % of all Grades Male	Average % of all Grades Female	Students of Color	White Students	Average % of all Grades Male	Average % of all Grades Female
Hurt self on purpose in past 12 months	13%	29%	19%	20%	NA	NA
Felt sad or hopeless	25%	41%	38%	32%	19%	36%
Seriously considered suicide in past 12 months	13%	29%	18%	20%	9.2%	15.7%
Planned suicide attempt in past 12 months	10%	17%	21%	12%	9.7%	12.2%
Attempted suicide in past 12 months	6%	10%	9%	8%	4.4%	6.2%
Source: 2016 Gardner YRBS; 2016 MA YRBS						

Substance Misuse

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 including binge drinking, smoking, and opioid/heroin use, including mortality rates and number of Emergency Department (ED) visitors.

Substance Misuse

As seen in Table BHA-12, patients discharged from the ED with a substance misuse diagnoses on their record are most common for people in the 25 to 34-year old groups at both Athol (75.9%) and Heywood (60.4%) Hospitals. In fact, for those aged 15 to 64 years old, substance misuse is a highly notable issue for all ages in both Service Areas. It is important to note here that substance misuse is more prevalent among those treated at Athol Hospital when compared to Heywood for all ages with the exception of those 14 or younger. As seen in Table BHA-12, Athol's substance misuse for those 25 to 34, 35 to 44, and 45 to 54 are actually significantly higher as a percentage of overall patients for each age group when compared to Heywood Hospital. Overall, 35.5% of Athol Hospitals ED patients were discharged with a prior substance misuse diagnosis compared to 27.2% at Heywood Hospital ED.

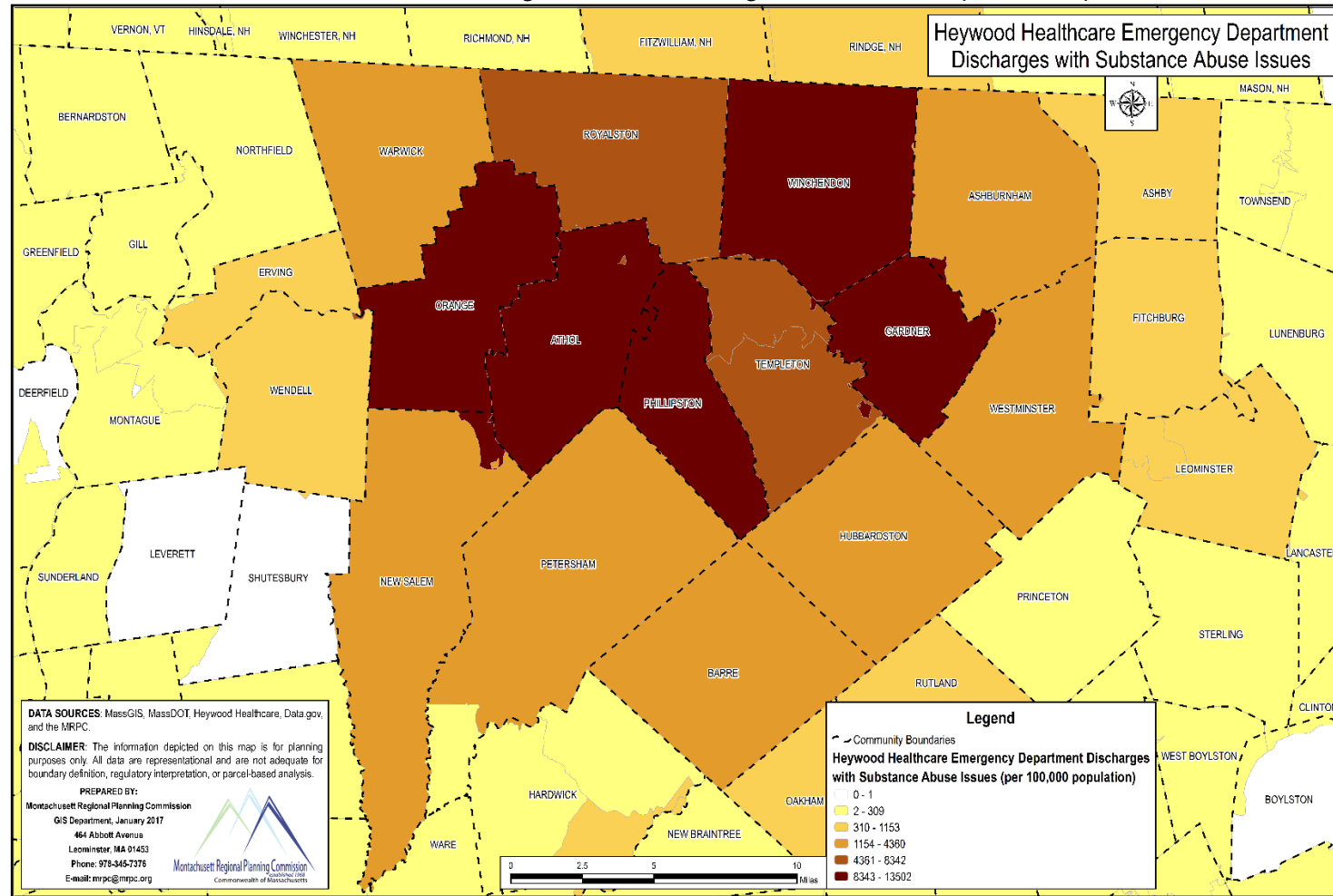
BHA - 12 Substance Use ED Discharges at Athol and Heywood Hospitals by Age Group 2017

AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	SUBSTANCE ABUSE	SUBSTANCE ABUSE %	# OF PATIENTS	% OF PATIENTS	SUBSTANCE ABUSE	SUBSTANCE ABUSE %
85+	1,508	6.49	38	2.5	426	6.58	11	2.6
75-84	2,402	10.34	175	7.3	701	10.82	55	7.8
65-74	4,015	17.28	513	12.8	969	14.96	167	17.2
55-64	4,560	19.62	1,120	24.6	1,206	18.61	372	30.8
45-54	3,536	15.21	1,179	33.3	938	14.48	448	47.8
35-44	2,344	10.09	1,057	45.1	714	11.02	450	63.0
25-34	2,471	10.63	1,492	60.4	698	10.77	530	75.9
15-24	1,697	7.30	738	43.5	532	8.21	268	50.4
5-14	547	2.35	6	1.1	253	3.90	2	0.8
<5	161	0.69	0	0.0	42	0.65	0	0.0
TOTAL	23,241	100.00	6,318	27.2	6,479	100.00	2,303	35.5

Source: Athol and Heywood ED Discharge Data 2017

Map BHA-13 highlights the prevalence of prior diagnoses of substance use in ED discharges in 2017 as noted in Table BHA-12 above. This map reveals the heavier concentration of prior substance use diagnoses of ED discharges in the central communities that make up the Service Area. It is important to note here the co-occurrence of ED patients with prior substance use *and* prior mental health diagnoses mentioned at the beginning of this chapter is significant. Heywood Healthcare is dedicating its efforts to combating these issues concurrently and this data was critical to highlight for this report.

BHA - 13 Prior Substance Use Diagnosis of ED Discharges at Athol and Heywood Hospitals 2017



Tobacco Use

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 most updated map includes community population, median incomes from the 2010 census and smoking rates using Massachusetts' 2011-2015 Behavioral Risk Factor Surveillance System (BRFSS) data.

According to this map, the average smoking rates for all Service Area communities was 18.2% in 2015; nearly three percent higher than the State average of 15.5%. Smoking rates for New Salem and Royalston were omitted from this calculation because their rates were not available in the database. Only four (4) of the 13 communities in the Service Area for which smoking rates were available had rates lower than the Massachusetts average; Ashburnham (12.4%), Erving (13.8%), Hubbardston (14%) and Petersham (14.6%). The four (4) communities with the highest smoking rates were Athol (24.4%), Gardner (24.2%), Orange (24.1%) and Winchendon (23.7%). With the exception of the Town of Erving, these four (4) communities with the highest smoking rates also had the four (4) lowest median income levels and are also four (4) of the five (5) most populous communities throughout the Service Area. Table BHA-14 shows the details of this data.

BHA - 14 Population, Median Income and Smoking Rates in Service Area Communities 2011-2015

Community	Total Population*	Median Income*	Smoking Rates**
Ashburnham	6,081	\$80,000	12.4%
Athol	11,584	\$47,099	24.4%
Erving	3,032	\$51,458	13.8%
Gardner	20,228	\$48,333	24.2%
Hubbardston	4,382	\$82,443	14.0%
New Salem	990	\$61,471	NA
Orange	7,839	\$42,809	24.1%
Petersham	1,234	\$62,441	14.6%
Phillipston	1,682	\$70,493	17.4%
Royalston	1,258	\$60,385	NA
Templeton	8,013	\$66,138	17.8%
Warwick	780	\$67,554	17.3%
Wendell	848	\$59,500	17.1%
Westminster	7,277	\$79,073	16.1%
Winchendon	10,300	\$58,582	23.7%
Area Total/Average	85,528	\$62,519	18.2%
Massachusetts	6,547,629	\$74,532	15.5%
Source: Mass DPH 2011-2015 Adult Smoking Rates - Make Smoking History * Median Income and Population from 2010 Census **Smoking Rates calculated using Small Area Estimates from the 2011-2015 Mass BRFSS			

Map BHA-15 illustrates the highest prevalence of smoking rates throughout Service Area communities as noted in Table BHA-14 above. The map reveals a wide and inconsistent spread of smoking rates throughout the Service Area.

BHA - 15 Smoking Rates in Service Area Communities 2011-2015

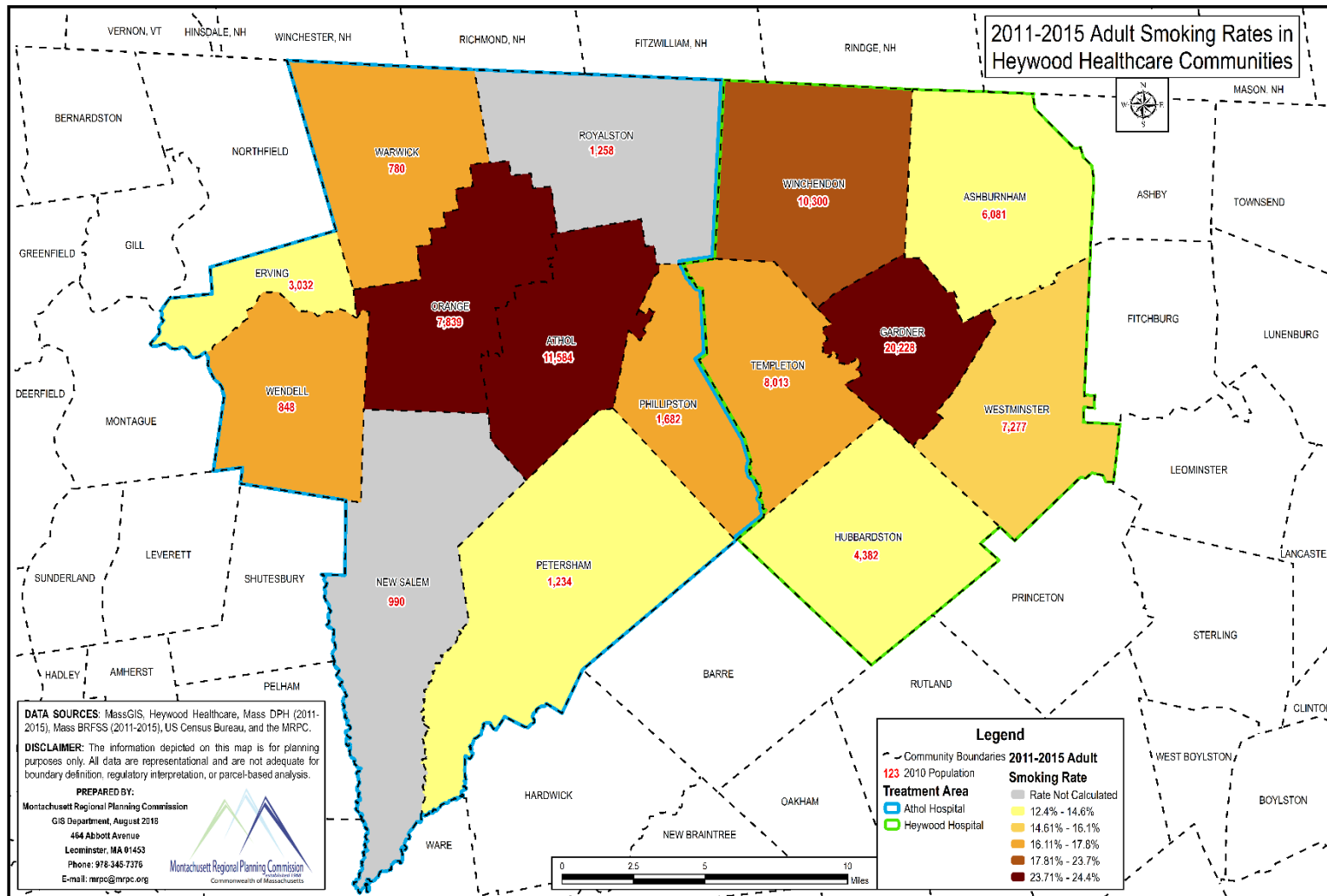


Table BHA-16 is a checklist of all retail tobacco policies implemented by Service Area communities according to the Mass DPH Make Smoking History Program. As seen below, the four (4) communities with the highest smoking rates also have the most stringent retail tobacco sale policies, while some of the communities with the lowest smoking rates have absolutely no retail tobacco policies implemented. It is important to note that many of the communities that have implemented tobacco retail policies are in those with some of the highest smoking rates in the Service Area. Many of these policies have been implemented, through the efforts of the North Central Boards of Health Tobacco Control, in response to high smoking rates in these areas and are being used to help combat smoking habits of area residents.

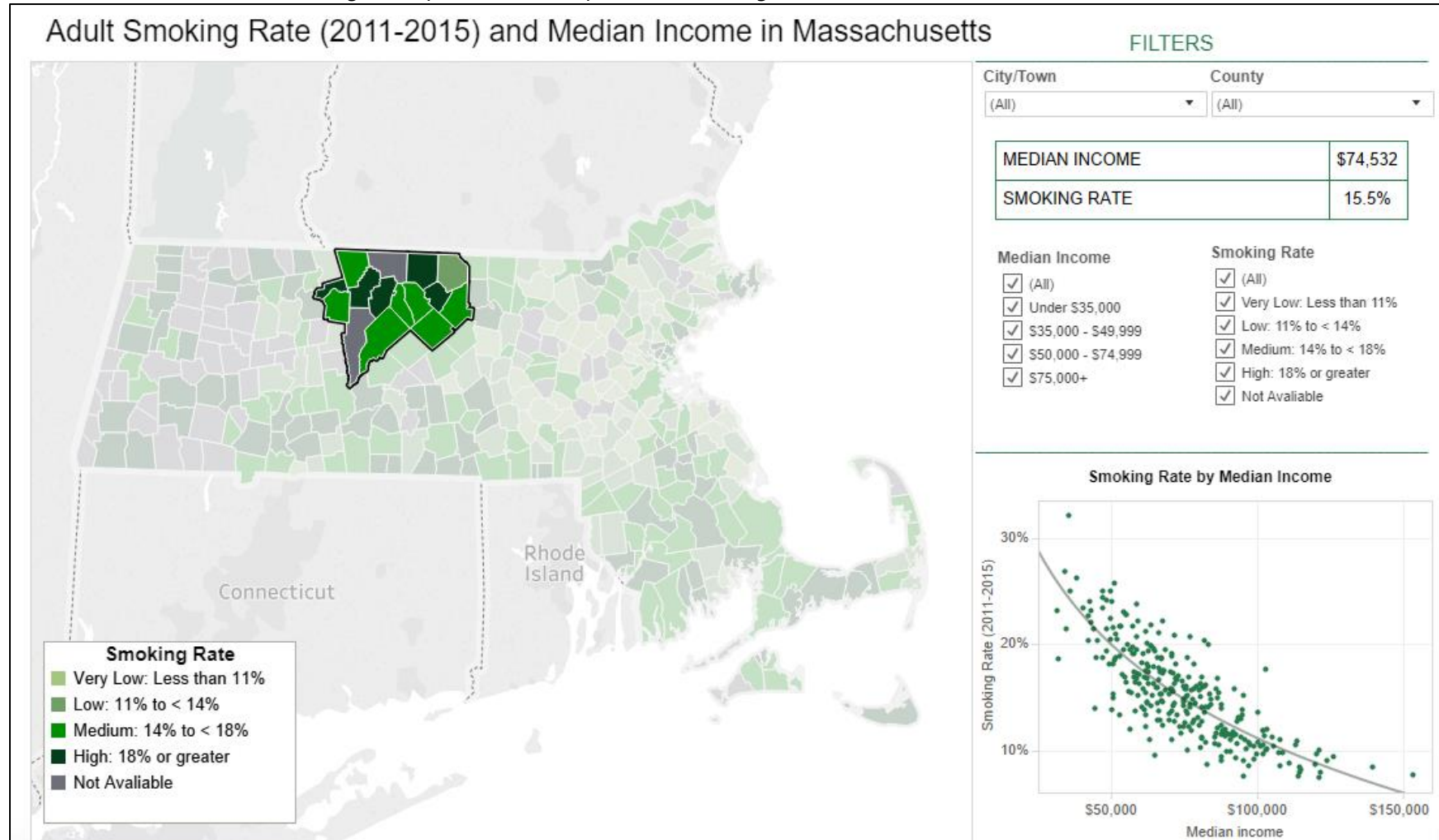
BHA - 16 Retail Tobacco Policies by Service Area Community

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
Ashburnham	✓	✓		✓		
Athol	✓	✓		✓		
Erving						✓
Gardner	✓			✓	✓	
Hubbardston	✓	✓		✓		
New Salem						✓
Orange	✓	✓		✓	✓	
Petersham						✓
Phillipston						✓
Royalston						✓
Templeton	✓	✓		✓		
Warwick						✓
Wendell		✓		✓		
Westminster						✓
Winchendon	✓	✓		✓		
Source: Mass DPH Make Smoking History - Local Tobacco Regulations in Massachusetts						

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Map BHA-17 is a screenshot of Mass DPH's Make Smoking History interactive map mentioned previously. All 15 Service Area communities are highlighted in the North Central Region of the map where all communities (except New Salem and Royalston highlighted in grey) rank from medium to high for smoking rates compared to the State overall.

BHA - 17 Mass DPH Make Smoking History Interactive Map – Adult Smoking Rates and Median Income



In Athol Hospital's Service Area, the average smoking rate is 18.4%, slightly higher than Heywood Hospital's Service Area average of 18%. It is important to remember here that the smoking rates for two (2) of Athol Hospital's communities (New Salem and Royalston) were not available in the DPH database which impacts the true average smoking rate for this Service Area. Table BHA-18 shows Athol Hospital's Service Area smoking rates by community.

BHA - 18 Population, Median Income and Smoking Rates in Athol Hospital's Service Area Communities 2011-2015

Community	Total Population*	Median Income*	Smoking Rates**
Athol	11,584	\$47,099	24.4%
Erving	3,032	\$51,458	13.8%
New Salem	990	\$61,471	NA
Orange	7,839	\$42,809	24.1%
Petersham	1,234	\$62,441	14.6%
Phillipston	1,682	\$70,493	17.4%
Royalston	1,258	\$60,385	NA
Warwick	780	\$67,554	17.3%
Wendell	848	\$59,500	17.1%
Area Total/Average	29,247	\$58,134	18.4%
Massachusetts	6,547,629	\$74,532	15.5%
Source: Mass DPH 2011-2015 Adult Smoking Rates - Make Smoking History * Median Income and Population from 2010 Census **Smoking Rates calculated using Small Area Estimates from the 2011-2015 Mass BRFSS			

In Heywood Hospital's Service Area, the average smoking rate is 18% with the three (3) most populous communities displaying the highest smoking rates and lowest median incomes. Table BHA-19 displays the full distribution across each community.

BHA - 19 Population, Median Income and Smoking Rates in Heywood Hospital's Service Area Communities 2011-2015

Community	Total Population*	Median Income*	Smoking Rates**
Ashburnham	6,081	\$80,000	12.4%
Gardner	20,228	\$48,333	24.2%
Hubbardston	4,382	\$82,443	14.0%
Templeton	8,013	\$66,138	17.8%
Westminster	7,277	\$79,073	16.1%
Winchendon	10,300	\$58,582	23.7%
Area Total/Average	56,281	\$69,095	18.0%
Massachusetts	6,547,629	\$74,532	15.5%
Source: Mass DPH 2011-2015 Adult Smoking Rates - Make Smoking History * Median Income and Population from 2010 Census **Smoking Rates calculated using Small Area Estimates from the 2011-2015 Mass BRFSS			

Mass DPH developed the QuitWorks program as part of its Make Smoking History initiative to help clinicians refer their patients to the Massachusetts Smokers' Helpline. QuitWorks 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”.⁴³ Table BHA-20 displays the number of smokers from each Service Area community that enrolled in QuitWorks from January 2015 to December 2017. Overall 290 smokers enrolled in QuitWorks throughout the Service Area with 170 coming from Gardner (65), Athol (62) and Orange (43) alone. The communities with the highest percentage of smokers that enrolled in the program were Orange (3.05%), Athol (2.8%) and Templeton (2.76%).

BHA - 20 Number of Smokers in Service Area Communities that enrolled in QuitWorks 2015-2017

Community	2015-2017	
	Count	Rate
Ashburnham	9	1.59%
Athol	62	2.80%
Erving	4	--
Gardner	65	1.78%
Hubbardston	16	--
New Salem	0	--
Orange	43	3.05%
Petersham	2	--
Phillipston	4	--
Royalston	5	--
Templeton	29	2.76%
Warwick	0	--
Wendell	2	--
Westminster	14	1.60%
Winchendon	35	--
Service Area Total/Rate	290	2.26%
Source: Make Smoking History		

One inhibitor to the ability of a community to limit tobacco use is access to a tobacco retail store for area residents. According to the Make Smoking History program, there are a total of 90 tobacco retail stores through the Service Area as of 2017. Gardner had the most of any community with 23, followed by Athol with 15 and Orange with 12. While Orange had the third highest number of tobacco retail stores, they had the highest rate of tobacco retail stores per 1,000 residents at 1.99 followed by Athol at 1.68 and Phillipston at 1.54 as seen in Table BHA-21.

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⁴³ <http://quitworks.makesmokinghistory.org/about/welcome-to-quitworks.html>

BHA - 21 Number and Rate of Tobacco Retail Stores in Service Area Communities 2017

Community	2017	
	Count	Rate
Ashburnham	6	1.32
Athol	15	1.68
Erving	2	1.43
Gardner	23	1.43
Hubbardston	2	0.61
New Salem	1	0
Orange	12	1.99
Petersham	1	0
Phillipston	2	1.54
Royalston	1	0
Templeton	6	0.99
Warwick	1	0
Wendell	1	0
Westminster	8	1.44
Winchendon	9	1.16
Service Area Total/Rate	90	0.91
Source: Make Smoking History		

Opioid-Related Fatal Overdose

As mentioned previously in this chapter, prior substance use diagnoses of ED patients are highly prevalent throughout the Service Area. One form of this substance use is the unprescribed use of opioids which has become an epidemic in Massachusetts and across the U.S.. In some instance, the illicit use of opioids can result in fatal overdose (OD).

Mass DPH releases quarterly reports on opioid-related fatal overdoses for each town throughout Massachusetts. The most recent report released in February 2018 highlights the number of overdoses from 2012 to 2016. Table BHA-22 presents overdose totals for each year from 2012 to 2016; including the total number of overdoses and the percent change over the five-year period, as well as a comparison of overdose rates per 100,000 residents for 2012 and 2016.

From 2012 to 2016 there were a total of 86 opioid-related fatal overdoses throughout the Service Area communities. The annual totals more than doubled from 10 in 2012 to 23 in 2016, including steady increases from year to year. Gardner saw the most incidences of OD with 26, followed by Athol with 12, Templeton with 11 and Orange with 10. Wendell was the only community that did not experience an opioid-related fatal OD during those years.

In 2012, Phillipston had the highest rate of opioid-related OD at 51.52 per 100,000 residents. Winchendon had the second highest rate of 29.03 and Orange was not far behind them at 25.54 per 100,000. In 2016, those community's OD rates actually decreased significantly to 0.00, 9.42 and 12.97 per 100,000; respectively. In 2016, Royalston had the highest rate of opioid-related OD at 73.75 per 100,000 followed

by Templeton at 61.49 and Gardner at 44.05 per 100,000. Those community's rates increased significantly from 2012 levels of 0.00, 12.55 and 4.94; respectively.

Gardner had the highest percent increase in incidences of opioid-related fatal OD from 2012 to 2016 with an 800% increase. Templeton saw a 400% increase and Athol saw a 50% increase. Note that calculating percent change when the first year's total was zero is not possible, so it is important to point out that all communities that had zero opioid-related fatal ODs in 2012 experienced at least one (1) by 2016 with the exception of Wendell.

NOTE: Due to the small populations in the Service Area, small changes in incidents can create large percentage changes.

Overall, the OD rate per 100,000 residents for the entire Service Area increased from 11.86 to 26.96 from 2012 to 2016. This was a slower rate increase compared to the State as seen in Table BHA-22 below.

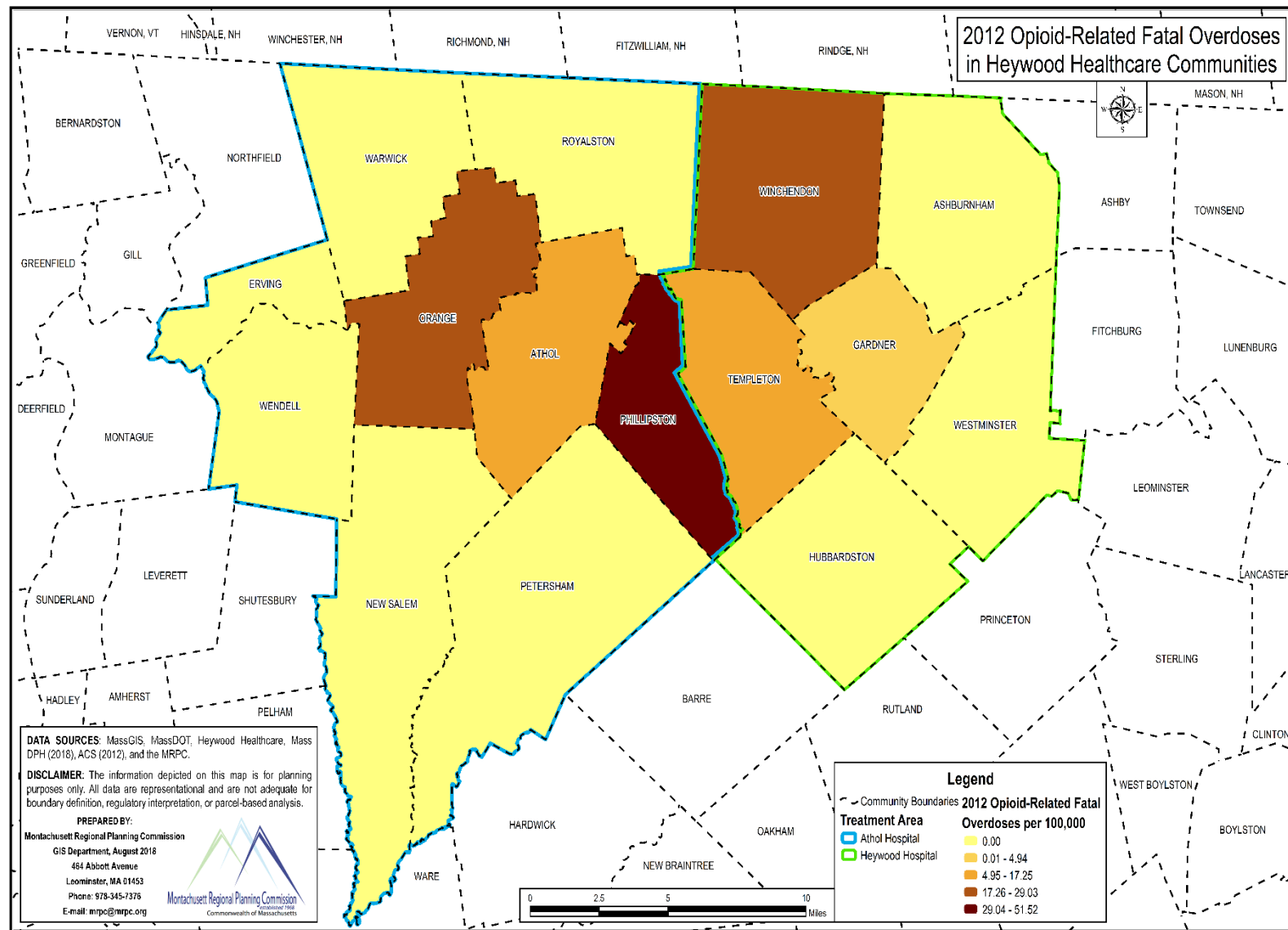
BHA - 22 Opioid-Related Fatal Overdoses in Service Area Communities 2012-2016

Total Opioid-Related Fatal Overdoses									
Community	2012	2013	2014	2015	2016	Total	% Change 2012 - 2016	OD Rate per 100,000 - 2012	OD Rate per 100,000 - 2016
Ashburnham	0	0	1	1	2	4	*	0.00	32.41
Athol	2	2	2	3	3	12	50%	17.25	25.81
Erving	0	1	0	0	0	1	*	0.00	0.00
Gardner	1	4	6	6	9	26	800%	4.94	44.05
Hubbardston	0	0	2	2	1	5	*	0.00	22.04
New Salem	0	0	0	1	0	1	*	0.00	0.00
Orange	2	2	2	3	1	10	-50%	25.54	12.97
Petersham	0	1	0	0	0	1	*	0.00	0.00
Phillipston	1	0	0	0	0	1	-100%	51.52	0.00
Royalston	0	2	0	0	1	3	*	0.00	73.75
Templeton	1	1	2	2	5	11	400%	12.55	61.49
Warwick	0	0	0	1	0	1	*	0.00	0.00
Wendell	0	0	0	0	0	0	*	0.00	0.00
Westminster	0	0	1	0	0	1	*	0.00	0.00
Winchendon	3	1	2	2	1	9	-67%	29.03	9.42
Service Area Total	10	14	18	21	23	86	130%	11.86	26.96
Massachusetts	742	961	1364	1687	2094	6848	182%	11.31	31.06

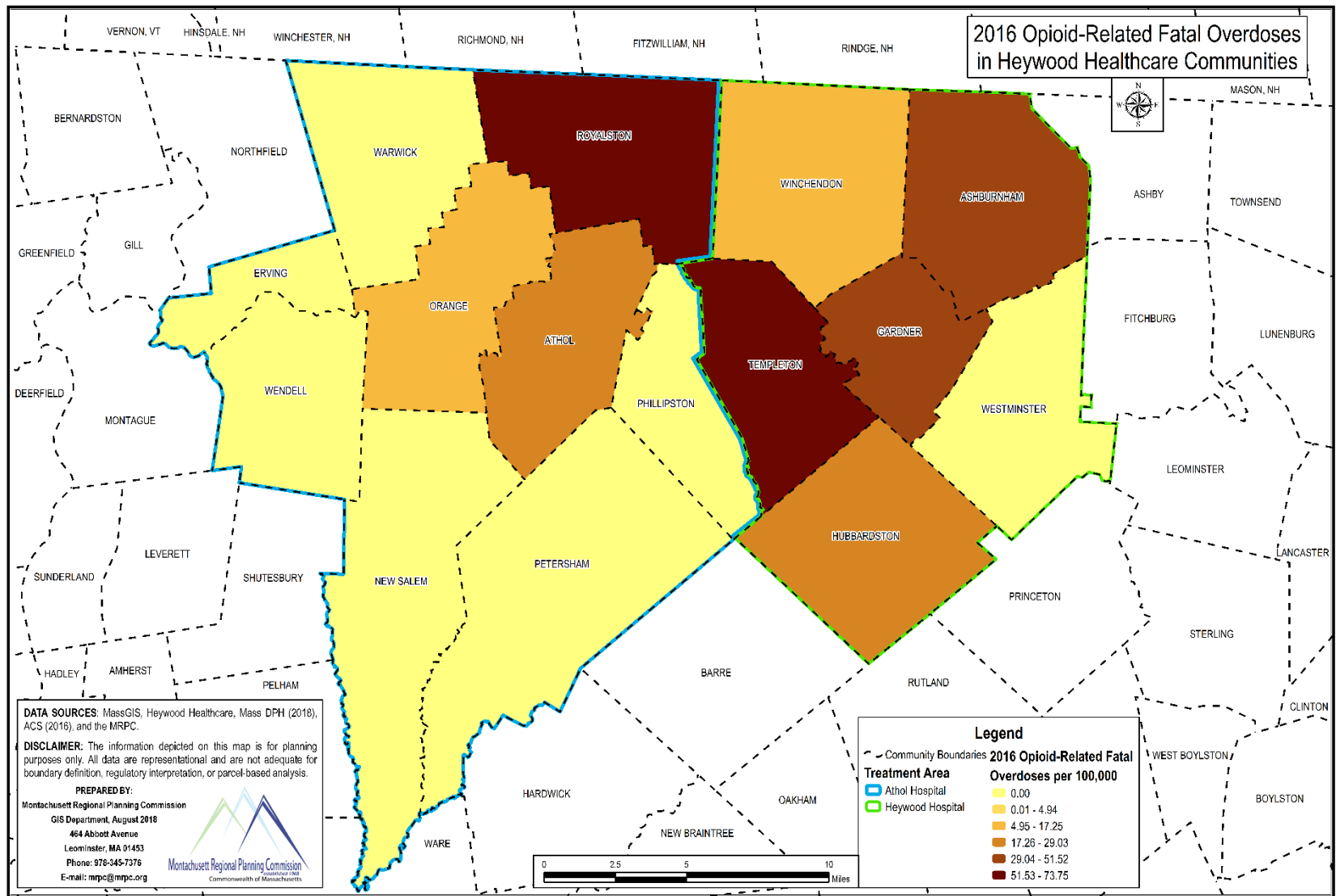
Source: Mass DPH February 2018 Quarterly Report of Opioid-Related Fatal Overdose Deaths by City/Town - *OD Rates for 2012 and 2016 were calculated using ACS population estimates for those respective years

Maps BHA-23 and BHA-24 represent opioid-related fatal OD in Service Area communities in 2012 and 2016 to highlight the increase and concentration of cases. As seen below, opioid-related fatal OD's have not only become more prevalent but have also spread to other communities.

BHA - 23 Opioid-Related Fatal Overdoses in Service Area Communities 2012



BHA - 24 Opioid-Related Fatal Overdoses in Service Area Communities 2016



In Athol Hospital's Service Area, there were a total of 30 opioid-related fatal ODs from 2012 to 2016, with 12 in Athol and 10 in Orange. All other communities experienced at least one with the exception of Wendell. Overall, the OD rate for Athol Hospital's Service Area only increased by 0.07 per 100,000 from 2012 to 2016 from 17.82 to 17.89. Table BHA-25 presents data for Athol Hospital's Service Area.

BHA - 25 Opioid-Related Fatal Overdoses in Athol Hospital Service Area Communities 2012-2016

Total Opioid-Related Fatal Overdoses						Total	% Change 2012 - 2016	OD Rate per 100,000 2012	OD Rate per 100,000 2016
Community	2012	2013	2014	2015	2016				
Athol	2	2	2	3	3	12	50%	17.25	25.81
Erving	0	1	0	0	0	1	*	0.00	0.00
New Salem	0	0	0	1	0	1	*	0.00	0.00
Orange	2	2	2	3	1	10	-50%	25.54	12.97
Petersham	0	1	0	0	0	1	*	0.00	0.00
Phillipston	1	0	0	0	0	1	-100%	51.52	0.00
Royalston	0	2	0	0	1	3	*	0.00	73.75
Warwick	0	0	0	1	0	1	*	0.00	0.00
Wendell	0	0	0	0	0	0	*	0.00	0.00
Service Area Total	5	8	4	8	5	30	--	17.82	17.89

Source: Mass DPH February 2018 Quarterly Report of Opioid-Related Fatal Overdose Deaths by City/Town - *OD Rates for 2012 and 2016 were calculated using ACS population estimates for those respective years

In Heywood Hospital's Service Area, there were a total of 56 opioid-related fatal ODs from 2012 to 2016 with 26 in Gardner and 11 in Templeton. Both communities saw percent increases of 800% and 400% respectively between 2012 and 2016. The OD rates for Ashburnham, Gardner, Hubbardston and Templeton increased dramatically from 2012 to 2016 as seen in Table BHA-26. Overall, the OD rate for Heywood Hospital's Service Area nearly quadrupled over the five-year span from 8.89 per 100,000 to 31.38 per 100,000.

BHA - 26 Opioid-Related Fatal Overdoses in Heywood Hospital Service Area Communities 2012-2016

Total Opioid-Related Fatal Overdoses						Total	% Change 2012 - 2016	OD Rate per 100,000 - 2012	OD Rate per 100,000 - 2016
Community	2012	2013	2014	2015	2016				
Ashburnham	0	0	1	1	2	4	*	0.00	32.41
Gardner	1	4	6	6	9	26	800%	4.94	44.05
Hubbardston	0	0	2	2	1	5	*	0.00	22.04
Templeton	1	1	2	2	5	11	400%	12.55	61.49
Westminster	0	0	1	0	0	1	*	0.00	0.00
Winchendon	3	1	2	2	1	9	-67%	29.03	9.42
Service Area Total	5	6	14	13	18	56	--	8.89	31.38

Source: Mass DPH February 2018 Quarterly Report of Opioid-Related Fatal Overdose Deaths by City/Town - *OD Rates for 2012 and 2016 were calculated using ACS population estimates for those respective years



Community Perceptions

"Patients feel judged by medical professionals for their substance abuse problems"

"We need a better understanding of true behavioral, mental health and addiction needs so we can better help people before they reach their low point"

"We need more coaches in recovery programs"

"Communication between doctors and treatment facilities needs to improve"

"We need more training on behavioral medications"

"We need a more holistic approach to treating those with addiction...lets treat the person too rather than just the addiction"

"Deaths rates from overdose are on their rise and there is nowhere to send families for therapeutic help"

"There is a lack of mental health providers and facilities in the area and that is a major problem"

"There still exists a stigma around mental health...particularly for people of color"

"There is a long wait time for patients seeking assistance so they often travel out-of-state for help"

"There are not many mental health services available for children"

"Patients with private insurance are often prioritized, leaving those with public insurance at the bottom of the to-do list and they are often the ones in need of the most help"

"Local law enforcement are committed to treating addiction as a disease and not a crime"

"Addiction has a ripple effect on the community...not just for those dealing with the disease"

"Changing the culture to make these communities 'recovery friendly communities' can make a world of difference"

"Call-backs alone as a follow up to OD cases is ineffective...we need to do better in reaching out to OD patients after sending them home before they relapse...we often miss the window of opportunity to intervene"

"We need a needle exchange program"

"Depression and mental health issues are prevalent in the area due to high levels of trauma in the community...particularly for children"

"There is a lack of specialists in the area to help deal with addiction and substance abuse issues"

"Those who are poverty stricken, mentally ill and depressed are highly susceptible to addiction"

"There is a very high level of teen drug use in the area and local schools are flat out denying that there is any problem"

"Our community is in dire need of more child psychiatry services, adolescent SA services (placement / recovery & support groups) as well as child / adolescent partial hospitalization programs; this last service would assist with ED being over crowded with youth in need of mental health placement services while keeping the youth local."

"I believe there needs to be more programming for youth and adolescents regarding mental health supports. Hospitals need to consider a pediatric area to assist youth with mental health needs vs keeping in the ER while awaiting hospitalization."

"There needs to be more emphasis on the detrimental effects of tobacco use at mental health centers, hospitals, and treatment facilities"

"Children are losing their parents or guardians to suicide or drug addiction and it is causing them to lash out in violence"

"There are plenty of available programs but there is no consistency, no collaboration...we need to work together to address these issues"

"All hospitals should mandate substance abuse or mental health training of their staff"

"Schools, non-profits, towns, hospitals should all have one pipeline so not to duplicate efforts"

"Teachers should be better trained to identify addiction and mental health issues in students"

"Youth support groups are nonexistent"

"There is plenty of information online for these programs but that creates a barrier to those without broadband access or have language or literacy barriers"

"The Quabbin Retreat has a fantastic alumni support group that helps newly released patients maintain a support group outside of the treatment program"

"People with prescription drug dependencies have no problem making it into the hospital for appointments because they won't get their drugs without it"

"There is a great lack of services and capacity for existing services for the needs of the community around homelessness, drug abuse, alcohol abuse, mental illness, poverty and problem gambling"

"There are simply not enough resources locally to effectively treat all mental health patients in the community...and the failure to meet those needs contributes to the suicide rates, substance misuse rates and others health issues"

"There are essentially no mental health services for kids"

"The turnaround time to see a psychiatrist can be up to 2 months and that is just way too long"

"We need to look more holistically at mental health problems (social determinants, insurance, etc.) before we can stop the dominoes from falling"

"The process patients need to go through to get mental health treatment is ridiculous and discouraging largely thanks to health insurance parity issues...until the insurance issues are corrected, none of these problems can be fixed"

"There are not enough properly trained, licensed practitioners locally because of the cost of higher education and the low-pay that comes with working this kind of job.... There just aren't enough incentives to attract people to the mental health field"

"We have had job vacancies open for years because of the lack of workforce qualified to work in this field... we don't even have enough trained interpreters... local high schools should start training kids for interpreter roles because it is definitely in demand"

"The influx of Puerto Ricans coming to the area after the hurricanes is making it difficult to meet the demand for interpreters"

"Suicide is not confined to a particular age group or demographic... we have had kids as young as 12 and elderly as old as 93 commit suicide...we need to treat mental health problems at every age group"

"Whatever resources are out there, we have exhausted them because we have no choice with such limited options...we have to be very resourceful and creative"

"We are sadly bound by insurance parity and workforce training...nothing will change if we don't address these issues first"

"Working with patient's post-treatment is challenging because it is a constant battle for the patient to fight their urges moving forward"

"Licensing for substance use and mental health treatment are separated and they often go hand in hand.... We need to combine training programs so not to make it more difficult for people to get properly trained in this field"

"We need to be more persistent with patients who fail to come to appointments...we should be doing everything in our power to get them in rather than punishing them"

"We need a community-based social worker"

"Hoarding is a major issue locally but that is not very well known and subsequently it's not prioritized"

"We need to expand telemedicine services...It would make a drastic difference in helping reaching those patients in the most isolated areas"

"The executives at Heywood have amazing hearts and they do amazing things but we cannot rely solely on their big hearts to maintain programs for these people...it's just not sustainable"

"The ER is constantly filled with people with behavioral problems...particularly children"
"There is not enough support for LGBTQ youth in the area"

"Opioid and drug addiction is highly prevalent in the area and makes it difficult to employ people"

"There are job training programs for people recovering from addiction but the turnover rate is high and many either fail drug tests or disappear when they discover they will be drug tested"

"There is a negative impact on hospitals when they are used as detox centers as opposed to an addiction treatment facility"

"There is a severe lack of treatment centers close to the area"

"Support network is absent for substance abusers"

"The Emergency Department staff is not meant to also act as 'social workers' but that is what they have become due to a lack of alternative services in the area"

"Hospital staff are not trained to treat long-term addiction issues... not do they have the bed capacity to treat those who truly need the help"

"There is a tremendous lack of PCPs in the North Quabbin region"

"Doctors need training for sensitivity, compassion, and active listening for patients to help better understand their needs"

"Too much time is spent waiting for appointments"

"We have to treat veterans for their mental health needs beyond just the first two years after service"

"Families need support too not just the patient"

"We need to stop being so reactive to mental health needs and be more proactive... it is hard to get people to pay for prevention services but that is what it will take to effectively treat these kinds of mental health problems that steam roll into greater health issues"

"We need more incentive programs to attract a more robust workforce"

"Transportation is a major barrier to getting patients in for the substance use treatment they need"

"The gap between inpatients and outpatient treatment is far too large in the case of substance misuse...we need to close the gap"

"Dealing with insurance companies is the most difficult part of the whole process"

"Referrals often don't get to the proper provider fast enough"

"The power of the group is unbelievable"

DRAFT



Image from Heywood Hospital

WELLNESS, CHRONIC DISEASE AND MORTALITY

Chapter 8

Abstract

This chapter provides a comprehensive overview of the trends, disparities and resources surrounding wellness, chronic disease, and the mortality of residents in Heywood Healthcare's 15 communities.

Heywood Health Care – Athol Hospital and Heywood Hospital
In partnership with the Montachusett Regional Planning Commission

Chapter 8 – Wellness, Chronic Disease and Mortality

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

This chapter highlights the following wellness and chronic disease topics that affect the health of Service Area residents:

- Health and Wellness
- Chronic Disease
- Mortality

This chapter concludes with a section highlighting Community Perceptions related to these topics and a list of related programs and resources available at Heywood Healthcare facilities and other organizations throughout the Service Area can be found in Appendix A.

Chapter Highlights

Health & Wellness

- According to the Food Access Research Atlas large areas of Orange, Athol and Gardner qualify as food deserts.
- According to the USDA's standards, almost the entire city of Gardner is considered a food desert.
- The opening of Market Basket in Athol and the closing of IGA in Winchendon has changed the Food Desert status of both of these communities in the last couple of years.
- Students at North Quabbin revealed that just one-third of lower income and students of color were eating breakfast daily while higher income students were eating breakfast daily 44% of the time.
- In 2017, 3,743 patients treated at Heywood Hospital Emergency Department (ED) had an obesity diagnoses on record totaling 16.1% of all patients seen and at Athol Hospital ED 415 patients had an obesity diagnoses totaling 6.4% of all patients seen.
- At Gardner High School, roughly 50% of male students reported meeting the recommended levels of physical activity while just 39% of female students reported the same.

Chronic Disease

- Gardner had the highest diabetes rate at 9.53 per 100 residents compared with the MA rate of 8.07.
- Athol (6) and Orange (4) accounted for 10 of the 15 diabetes deaths in the Service Area in 2015.
- Throughout the Service Area, eight (8) of the 15 communities have a higher prevalence of asthma among K-8 students when compared to the State (12.2%).
- At Heywood Hospital, 58.4% of children younger than five (5) and 40.2% of children age five (5) to 14 have an Asthma diagnoses on record. At Athol Hospital, 78.6% of children younger than five (5) have an Asthma diagnoses on record.
- Heywood Hospital's ED discharged 10,931 (47% of ED patients) and Athol Hospital discharged 2,753 (42.5% of ED patients) patients with a hypertension diagnosis in 2017.

- The Service Area stroke rate of 2.01 per 100 residents is greater than the MA rate of 0.9.
- Gardner's Cerebrovascular Disease (CD) death rate was nearly four times higher than the Massachusetts average in 2015. Winchendon's CD death rate was nearly twice as high as the Massachusetts rate
- Orange had the highest rate of cancer deaths at 291.5 per 100,000, followed by Gardner at 244.0 and Athol 240.1, compared to the MA rate of 152.8.
- The Service Area has a greater rate of lung cancer deaths at 93 per 100,000 compared with the State at 39. Orange had the highest lung cancer death rate at 105.9 followed by Westminster (105.7) and Templeton (102.1)
- The overall cancer death rates for seven (7) communities in the Service Area was higher than the Massachusetts average and six (6) communities had higher lung cancer rates than the State

Mortality

- Injuries and Poisonings, as well as Mental Disorder deaths are two leading causes of death in the Service Area that are not seen among top ten causes of death throughout the State
- Overall, the Service Area has a lower mortality rate than the State but four (4) communities have higher rates than the State; Athol (977.3), Gardner (873), Orange (1,040) and Winchendon (887.1).
- Wendell's premature mortality is nearly double that of the Service Area average and more than three (3) times that of the State average.
- Premature mortality rates were higher than the State in nine (9) Service Area communities as seen in the following table

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Health and Wellness

Nutrition

Proper nutrition is a key determinant of health status and health outcomes for all humans. Poor diets have been linked to several chronic conditions and illnesses that could be prevented with better eating habits including type 2 diabetes, cancer, and obesity. This section discusses the nutritional determinants of health relevant to the health status of Service Area residents including access to healthy foods.

A. Adults

As noted in chapter 1 of this report, 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 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".⁴⁴

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.⁴⁵ 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)".⁴⁶

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. In Map WCD-1, the dark orange highlighted areas are those that qualify as LI and LA at one (1) and 20 miles, the areas highlighted in the darker shade of yellow qualify as LI and LA using vehicle access and the light tan sections are those that qualify as LI and LA at 1/2 and 10 miles. According to the USDA's standards, almost the entire city of Gardner is considered a food desert as seen in Map WCD-2.

Note: The USDA Food Atlas is only updated as of 2015 and has not accounted for any changes that may have occurred since then. Important to note for this section is the opening of Market Basket in Athol and the closing of IGA in Winchendon that has changed the Food Desert status of both of these communities in the last couple of years.

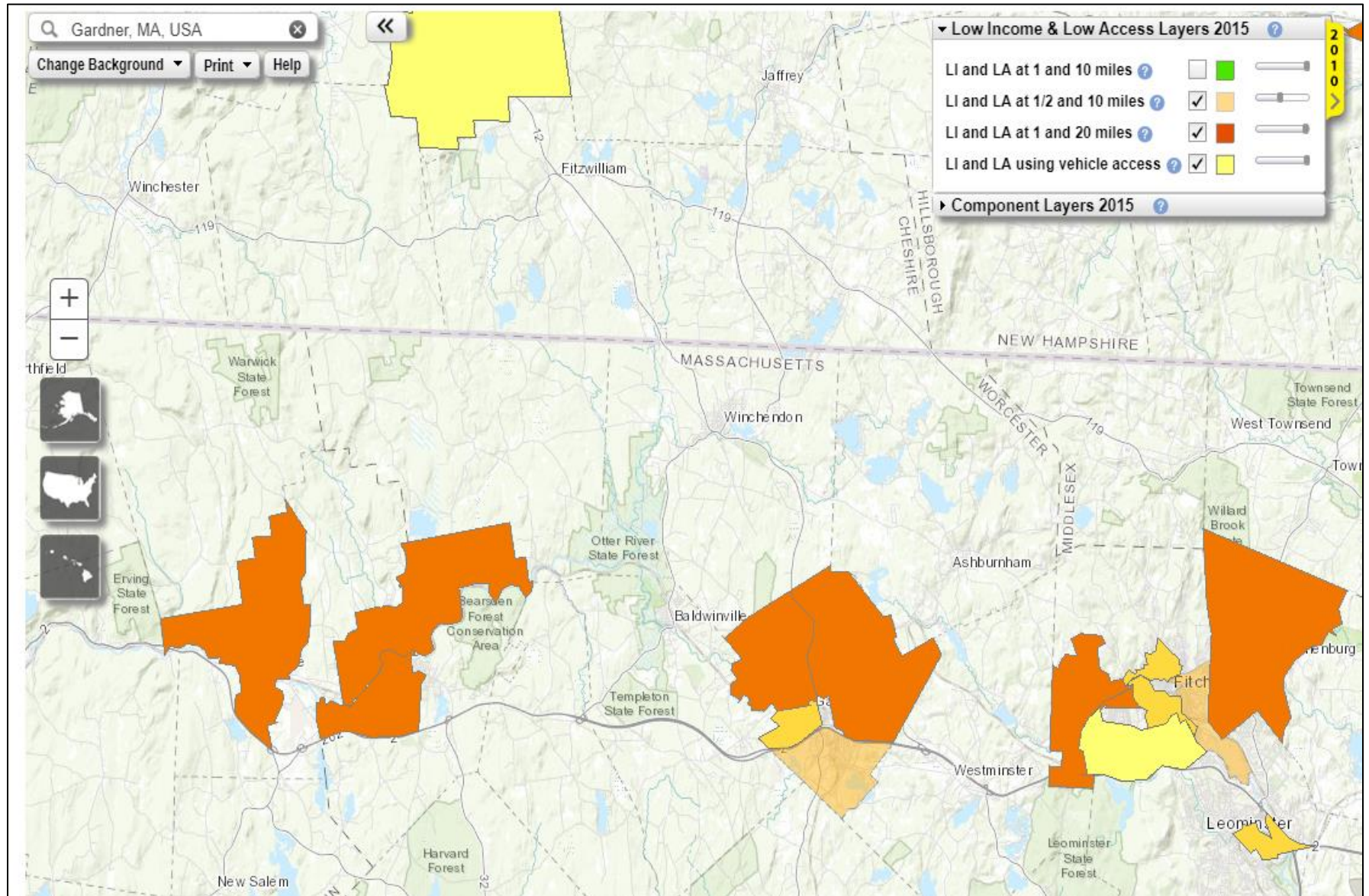
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⁴⁴ <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>

⁴⁵ <https://www.ers.usda.gov/data/fooddesert/>

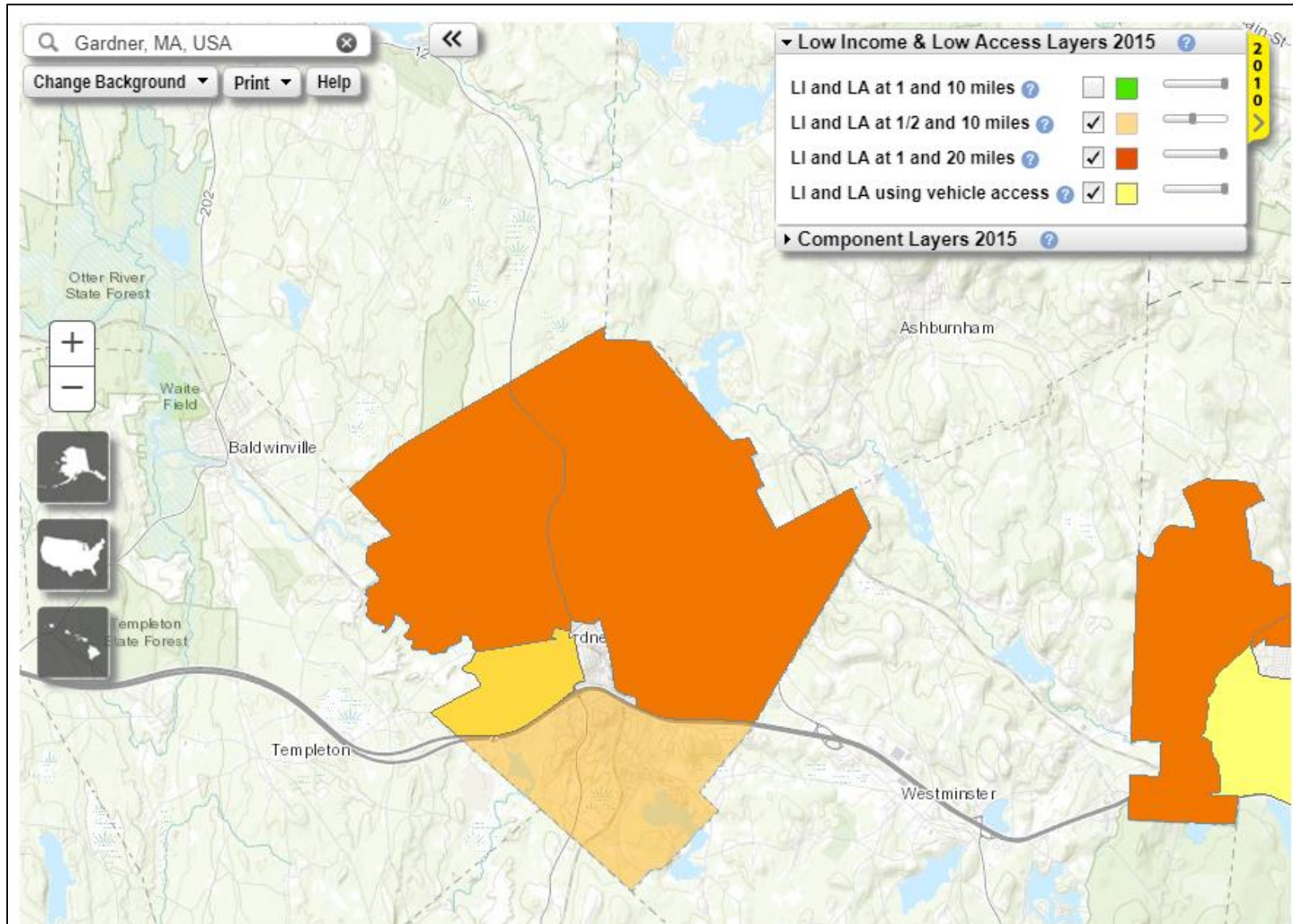
⁴⁶ <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>

WCD – 1 LI and LA and limited vehicle access in Service Area communities 2015



Source: USDA Food Access Research Atlas 2018

WCD – 2 LI and LA and limited vehicle access in Gardner 2015



Source: USDA Food Access Research Atlas 2018

As noted, the data used by the USDA in WCD-1 and WCD-2 above only cover food deserts present as of 2015. What it does not cover is the closing of the IGA Supermarket in Winchendon in 2016 that now classifies the entire Town of Winchendon as a food desert.

B. Children

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 2016 and the Gardner High School YRBS from 2016 shown in Tables WCD-3 and WCD-4

The Franklin County-NQ YRBS study showed that 86% of low income students, 91% of higher income students, 91% of students of color and 88% of white students were eating at least one fruit or vegetable daily but just over half of them for all four categories were getting at least three (3) servings daily. The study also revealed that just one-third of lower income and students of color were eating breakfast daily while higher income students were eating breakfast daily 44% of the time. White students were eating breakfast daily 39% of the time.

WCD - 3 Child Nutrition for Franklin County-North Quabbin 2016 YRBS

	Income		Race	
Child Nutrition	Lower Income Students	Higher Income Students	Students of Color	White Students
Ate at least one fruit/vegetable yesterday	86%	91%	91%	88%
Ate fruits and veggies at least 3+ times yesterday	52%	57%	55%	54%
Eat breakfast most days of the week	56%	70%	55%	65%
Eat breakfast everyday	33%	44%	33%	39%
Source: 2016 Franklin County/North Quabbin YRBS				

The Gardner YRBS study from 2016 asked a different set of questions related to nutritional habits of students to include habits that contributed to losing or keeping off weight. At Gardner High School, nearly half of female students deliberately ate less food to lose or keep off weight while 28% of male students said the same thing. Only 8% and 7% of male and female students said they took diet pills or supplements to lose and keep from gaining weight but 16% of students of color said they did. In fact, students of color were far more likely than their white counterparts to take diet pills, vomit or take laxatives to lost weight and go 24 hours or more without eating in order to lose weight. All of these behaviors can be very detrimental to the full development of Gardner High School youth.

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WCD – 4 Child Nutrition for Gardner High School 2016 YRBS

Wellness Category	Gender		Race	
	Average % of all Grades - Male	Average % of all Grades - Female	Students of Color	White Students
Ate less food to lose weight or keep from gaining	28%	46%	37%	38%
Took diet pills or supplements to keep off weight	8%	7%	16%	5%
Vomited/took laxatives to lose weight	6%	8%	11%	7%
Went without eating for 24+ hours to lose weight	12%	15%	24%	13%
Source: 2016 Gardner YRBS				

Overweight and Obesity

In the US, over one-third of adults are considered obese. Complications from obesity include "heart disease, stroke, type 2 diabetes and certain types of preventable cancer".⁴⁷ On average, the medical costs of obese people in the US are \$1,429 higher than those of average weight. The annual medical costs of obesity in the US total nearly \$150 billion per year.⁴⁸

A. Adults

In 2017, Athol Hospital treated 415 patients with a prior obesity diagnosis totaling 6.4% of all patients seen at the Emergency Department (ED). Heywood Hospital treated 3,743 patients with a prior obesity diagnosis on record totaling 16.1% of all patients seen in the ED. Obesity diagnoses are far more prevalent at Heywood Hospital across all age groups when compared to Athol Hospital as seen in Table WCD-5. At no point does any age group with an obesity diagnosis at Athol Hospital reach higher than 9.4%, while it reaches as high as 21.6% for Heywood Hospital patients (45 to 54-year-old's).

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⁴⁷ <https://www.cdc.gov/obesity/data/adult.html>

⁴⁸ IBID

**WCD - 5 Emergency Department Discharges with Obesity Diagnoses at Heywood and Athol Hospitals
by Age Group 2017**

AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	OBESITY	OBESITY %	# OF PATIENTS	% OF PATIENTS	OBESITY	OBESITY %
85+	1,508	6.49	60	4.0	426	6.58	9	2.1
75-84	2,402	10.34	273	11.4	701	10.82	36	5.1
65-74	4,015	17.28	665	16.6	969	14.96	65	6.7
55-64	4,560	19.62	925	20.3	1,206	18.61	103	8.5
45-54	3,536	15.21	765	21.6	938	14.48	85	9.1
35-44	2,344	10.09	445	19.0	714	11.02	67	9.4
25-34	2,471	10.63	357	14.4	698	10.77	29	4.2
15-24	1,697	7.30	193	11.4	532	8.21	14	2.6
5-14	547	2.35	57	10.4	253	3.90	7	2.8
<5	161	0.69	3	1.9	42	0.65	0	0.0
TOTAL	23,241	100.00	3,743	16.1	6,479	100.00	415	6.4

Source: Heywood and Athol Hospital ED Discharge Data 2017

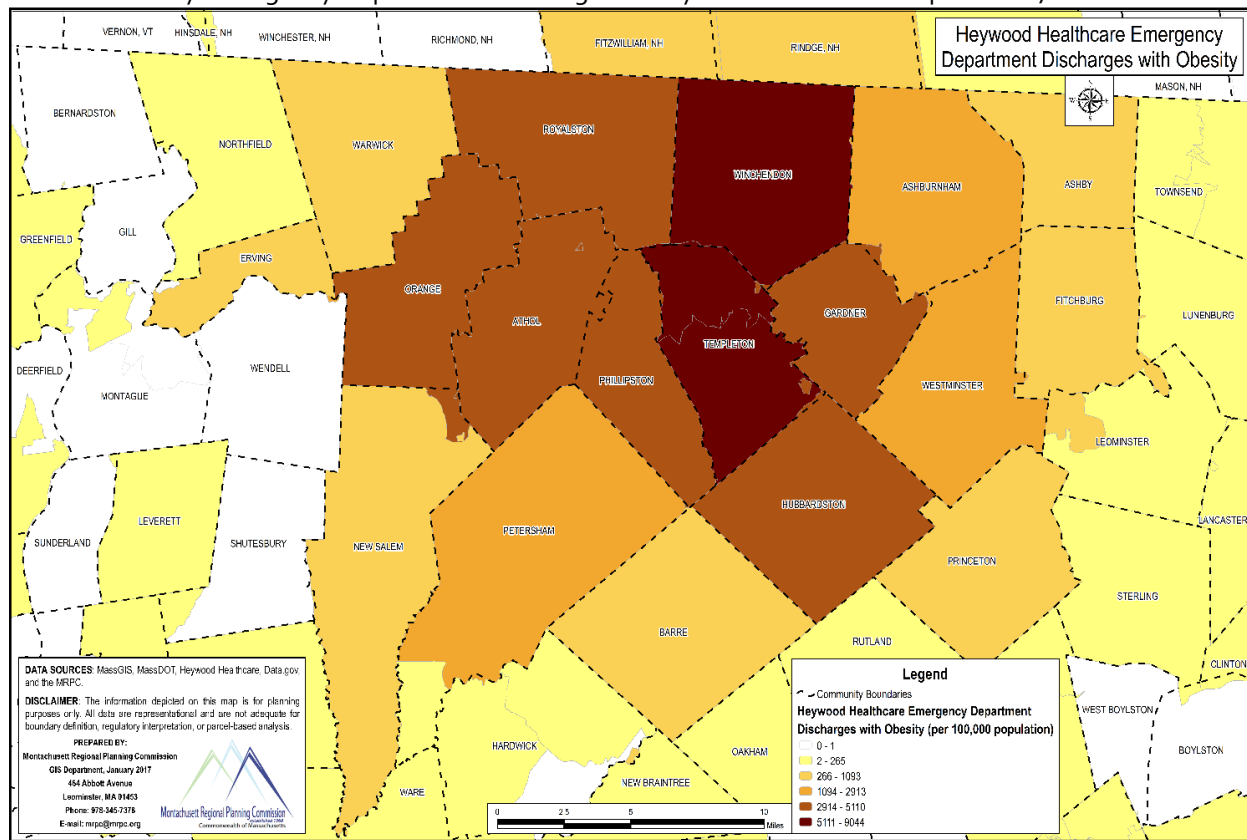
B. Children

At Athol Hospital ED, seven (7) children between the ages of five and 14 were seen with a prior diagnosis of obesity. At Heywood Hospital, 60 children age 14 or younger had an obesity diagnoses on record in 2017. Emergency Department Discharge Data is shown in Table WCD-5 above.

Map WCD-6 illustrates the rate of obesity of patients seen in both Athol and Heywood Hospital Emergency Departments by town of origin of the patient. Winchendon and Templeton had the highest rates of all 15 communities in the Service Area.

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WCD - 6 Obesity Emergency Department Discharges at Heywood and Athol Hospitals 2017



Student respondents for the Franklin County-North Quabbin 2016 YRBS study self-reported how they felt about their weight. Higher income students felt they were normal weight 75% of the time, while lower income students reported they were normal weight just 66% of the time. White students more often reported they considered themselves normal weight (72%) than students of color (67%). This is shown in Table WCD-7 below.

WCD - 7 Franklin County-North Quabbin 2016 YRBS Self-Reported Weight

Wellness Category	Income Level		Race	
	Lower Income Students	Higher Income Students	Students of Color	White Students
Normal Weight (Self-Reported Height and Weight)	66%	75%	67%	72%
Described self as being about right weight	65%	73%	68%	69%

Source: 2016 Franklin County/North Quabbin YRBS

Gardner High School's 2016 YRBS did not ask the same question related to weight as Franklin County-North Quabbin, but it did ask if the student "described self as being overweight". Female students at Gardner High School reported being overweight 42% of the time compared to just 27% of male students. White students reported being overweight 45% of the time compared to 36% of students of color as seen in Table WCD-8.

WCD - 8 Gardner High School 2016 YRBS Self-Reported Weight

Wellness Category	Gender		Race	
	Average % of all Grades - Male	Average % of all Grades - Female	Students of Color	White Students
Described self as being overweight	27%	42%	36%	45%
Source: 2016 Gardner YRBS				

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.⁴⁹

The North Quabbin 2016 YRBS reported physical activity rates for children in the school systems. More often than their lower income counterpart, higher income students reported being active for 60 or more minutes every day, attending PE class at least once per week, playing on at least one sports team per year and sleeping eight (8) or more hours. Students of color and white students were similarly likely to be as physically active as one another with white students outreporting non-white students by just a few percentage points in each category as can be seen in Table WCD-9.

WCD - 9 Child Physical Activity for Franklin County-North Quabbin 2016 YRBS

Child Physical Activity	Income Level		Race	
	Lower Income Students	Higher Income Students	Students of Color	White Students
Active for 60+ minutes 7 days/week	59%	67%	60%	64%
Play on computer less than >3 hours on school days	53%	59%	52%	55%
Attend PE class at least once per week	70%	73%	66%	69%
Attend PE class daily	24%	15%	23%	22%
Played on at least one sports team this past year	53%	69%	61%	63%
Sleep 8 or more hours on average school night	29%	37%	32%	33%
Source: 2016 Franklin County/North Quabbin YRBS				

At Gardner High School, roughly 50% of male students reported meeting the recommended levels of physical activity while just 39% of female students reported the same. White students reported meeting the recommended physical activity levels 47% of the time compared to 42% of students of color. Students of color were 4% more likely to report watching TV more than three (3) hours per day but were 4% less likely to report playing video games more than three (3) hours per day. Students of color also

⁴⁹ <https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm>

reported playing on at least one (1) sports team 59% of the time compared to 56% of white students. These statistics are shown in Table WCD-10 below.

WCD – 10 Child Physical Activity for Gardner High School 2016 YRBS

Child Physical Activity	Gender		Race	
	Average % of all Grades - Male	Average % of all Grades - Female	Students of Color	White Students
Met recommended levels of physical activity	50%	39%	42%	47%
Watched TV >3 hours/day	25%	31%	31%	27%
Play video/computer games >3 hours per day	50%	43%	43%	47%
Played on at least one sports team this past year	58%	55%	59%	56%
Source: 2016 Gardner YRBS				

Chronic Illness

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:

- Type 1 diabetes is caused by an autoimmune reaction (the body attacks itself by mistake) that stops your body from making insulin. About 5% of the people who have diabetes have type 1. Symptoms of type 1 diabetes often develop quickly. It's usually diagnosed in children, teens, and young adults. If you have type 1 diabetes, you'll need to take insulin every day to survive. Currently, no one knows how to prevent type 1 diabetes.
- Type 2 diabetes, your body doesn't use insulin well and is unable to keep blood sugar at normal levels. Most people with diabetes—9 in 10—have type 2 diabetes. It develops over many years and is usually diagnosed in adults (though increasingly in children, teens, and young adults). You may not notice any symptoms, so it's important to get your blood sugar tested if you're at risk. Type 2 diabetes can be prevented or delayed with healthy lifestyle changes, such as losing weight if you're overweight, healthy eating, and getting regular physical activity.
- Gestational diabetes develops in pregnant women who have never had diabetes. If you have gestational diabetes, your baby could be at higher risk for health complications. Gestational diabetes usually goes away after your baby is born but increases your risk for type 2 diabetes later in life. Your baby is more likely to become obese as a child or teen, and more likely to develop type 2 diabetes later in life too.

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%.⁵⁰ According to the Centers for Disease Control (CDC), Diabetes is the seventh leading cause of death.⁵¹

Note: The CDC's Behavior Risk Surveillance Survey (BRFSS) tracks SAEs, or Small Area Estimates, for Towns with small populations to get a relative idea of the area rates for particular chronic conditions. Sometimes, these estimates are based on a relatively small number of respondents or have larger than average standard errors meaning that the confidence interval can be pretty large. However, this is the most accurate data available to date to measure these chronic conditions.

Cells with double dash marks (" - ") represent communities that reported very few cases of that chronic disease, resulting in suppression of the data to protect confidentiality of patients.

Data representing diabetes prevalence for eight (8) of the Service Area's 15 communities was suppressed due to the small number of reported cases in those communities. Of those that were reported, Gardner had the highest diabetes rate at 9.53 per 100 residents according to the CDC's SAEs. Five (5) Service Area communities had rates between seven and 7.5: Ashburnham (7.16), Orange (7.17), Templeton (7.52), Westminster (7.43) and Winchendon (7.08). Athol had the lowest reported Diabetes rate at 6.36 per 100 as seen in Table WCD-11.

WCD – 11 Diabetes Rates per 100 Residents in the Service Area 2012-2014

Community	Diabetes Rates per 100 Residents
Ashburnham	7.16
Athol	6.36
Erving	--
Gardner	9.53
Hubbardston	--
New Salem	--
Orange	7.17
Petersham	--
Phillipston	--
Royalston	--
Templeton	7.52
Warwick	--
Wendell	--
Westminster	7.43
Winchendon	7.08
Service Area Total/Average	7.46
Massachusetts	8.07
Source: 2012 - 2014 Mass DPH Data	

⁵⁰ <https://www.diabetesresearch.org/what-is-diabetes>

⁵¹ <https://www.cdc.gov/nchs/fastats/diabetes.htm>

Data for seven (7) of Athol Hospital's nine (9) Service Area communities was suppressed, making it difficult to present an accurate Service Area average. Orange (7.17) and Athol (6.36) were the only two communities with enough cases to report an SAE as seen in Table WCD-12.

WCD – 12 Diabetes Rates per 100 Residents in Athol Hospital's Service Area 2012-2014

Community	Diabetes Rates per 100 Residents
Athol	6.36
Erving	--
New Salem	--
Orange	7.17
Petersham	--
Phillipston	--
Royalston	--
Warwick	--
Wendell	--
Service Area Rate	--
Source: 2012 - 2014 Mass DPH Data	

In Heywood Hospital's Service Area, Hubbardston was the only community to report too few cases to display an SAE. Gardner was the leading community with 9.53 cases per 100 residents. The other four (4) communities saw rates between seven (7) and 7.52 per 100 as seen in Table WCD-13.

WCD – 13 Diabetes Rates per 100 Residents in Heywood Hospital's Service Area 2012-2014

Community	Diabetes Rates per 100 Residents
Ashburnham	7.16
Gardner	9.53
Hubbardston	--
Templeton	7.52
Westminster	7.43
Winchendon	7.08
Service Area Rate	7.74
Source: 2012 - 2014 Mass DPH Data	

In the Service Area, 23 people died of diabetes complications in 2014. Athol alone had six (6) deaths, just over a quarter of all diabetes deaths in the area. Orange (4) and Gardner (3) had the second and third most cases; followed by Wendell (2) and Westminster (2). All other communities had just one case with the exception of Hubbardston, New Salem, Phillipston and Royalston who all had zero (0). Diabetes deaths in the Service Area can be found in Table WCD-14.

WCD – 14 Diabetes Deaths in the Service Area in 2015

Community	Diabetes Death Rates per 100 Residents
Ashburnham	1
Athol	6
Erving	1
Gardner	3
Hubbardston	--
New Salem	--
Orange	4
Petersham	1
Phillipston	--
Royalston	--
Templeton	1
Warwick	1
Wendell	2
Westminster	2
Winchendon	1
Service Area Rate	2.1
Massachusetts	12.02
Source: 2012 - 2015 Mass DPH Data	

In Athol Hospital's Service Area, there were a total of 15 residents who died of diabetes constituting 65% of all diabetes deaths in the Service Area. Athol (6) and Orange (4) accounted for 10 of the 15 diabetes deaths. Table WCD-15 displays the spread of diabetes deaths in Athol Hospital's Service Area. In Massachusetts there were 3,971 deaths with diabetes as the underlying or as a contributing factor.

WCD – 15 Diabetes Deaths in Athol Hospital's Service Area in 2015

Community	Diabetes Deaths	Diabetes Death Rate
Athol	6	51.6
Erving	1	--
New Salem	0	0.0
Orange	4	--
Petersham	1	--
Phillipston	0	0.0
Royalston	0	0.0
Warwick	1	--
Wendell	2	--
Service Area Total/Rate	15	--
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, there were a total of eight (8) diabetes deaths in 2014. Gardner had the most diabetes deaths with three (3) and Westminster had two (2). Hubbardston was the only community to not experience a diabetes death in 2014 as displayed in Table WCD-16.

WCD – 16 Diabetes Deaths in Heywood Hospital's Service Area in 2015

Community	Diabetes Deaths	Diabetes Death Rate
Ashburnham	1	--
Gardner	3	--
Hubbardston	0	0.0
Templeton	1	--
Westminster	2	--
Winchendon	1	--
Service Area Total/Rate	8	--
Source: 2015 Mass DPH Data		

Table WCD-17 displays the number and percentage of Emergency Department (ED) Discharges for patients with prior diabetes diagnoses by age group in both Athol and Heywood Hospitals in 2017. For both hospitals, the percentage of ED discharges with diabetes by age group increases progressively from group to group with the largest percentage coming from the 65 to 74-year-old group.

WCD - 17 Diabetes Emergency Department at Heywood and Athol Hospitals 2017

AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	DIABETES	DIABETES %	# OF PATIENTS	% OF PATIENTS	DIABETES	DIABETES %
85+	1,508	6.49	404	26.8	426	6.58	122	28.6
75-84	2,402	10.34	810	33.7	701	10.82	259	36.9
65-74	4,015	17.28	1,435	35.7	969	14.96	382	39.4
55-64	4,560	19.62	1,335	29.3	1,206	18.61	382	31.7
45-54	3,536	15.21	742	21.0	938	14.48	218	23.2
35-44	2,344	10.09	270	11.5	714	11.02	102	14.3
25-34	2,471	10.63	116	4.7	698	10.77	41	5.9
15-24	1,697	7.30	53	3.1	532	8.21	26	4.9
5-14	547	2.35	7	1.3	253	3.90	6	2.4
<5	161	0.69	0	0.0	42	0.65	0	0.0
TOTAL	23,241	100.00	5,172	22.3	6,479	100.00	1,538	23.7

Source: Heywood and Athol Hospital ED Discharge Data 2017

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.⁵²

As demonstrated in Table WCD-18, prior asthma diagnoses for Athol and Heywood Hospital patients reduce in frequency as people in the Service Area age. In 2017, adults aged 25 or older constituted no greater than 13.8% (35 to 44) of patients for any age group at Heywood Hospital and no greater than 19.5% (35 to 34) at Athol Hospital. As they age, the percentage of adult patients with asthma reduces to as low as 3.2% at Heywood and as low as 2.1% in Athol.

Asthma diagnoses are most prevalent for young children at both Athol and Heywood Hospitals as seen in Table WCD-23. At Athol hospital, 78.6% of children younger than five (5) have an asthma diagnosis on record; a greater than 20% increase when compared to Heywood Hospital. At Heywood hospital, 58.4% of children younger than five (5) and 40.2% of children age five (5) to 14 have an asthma diagnosis on record.

WCD - 18 Asthma Diagnoses of ED Discharges at Heywood and Athol Hospitals by Age Group

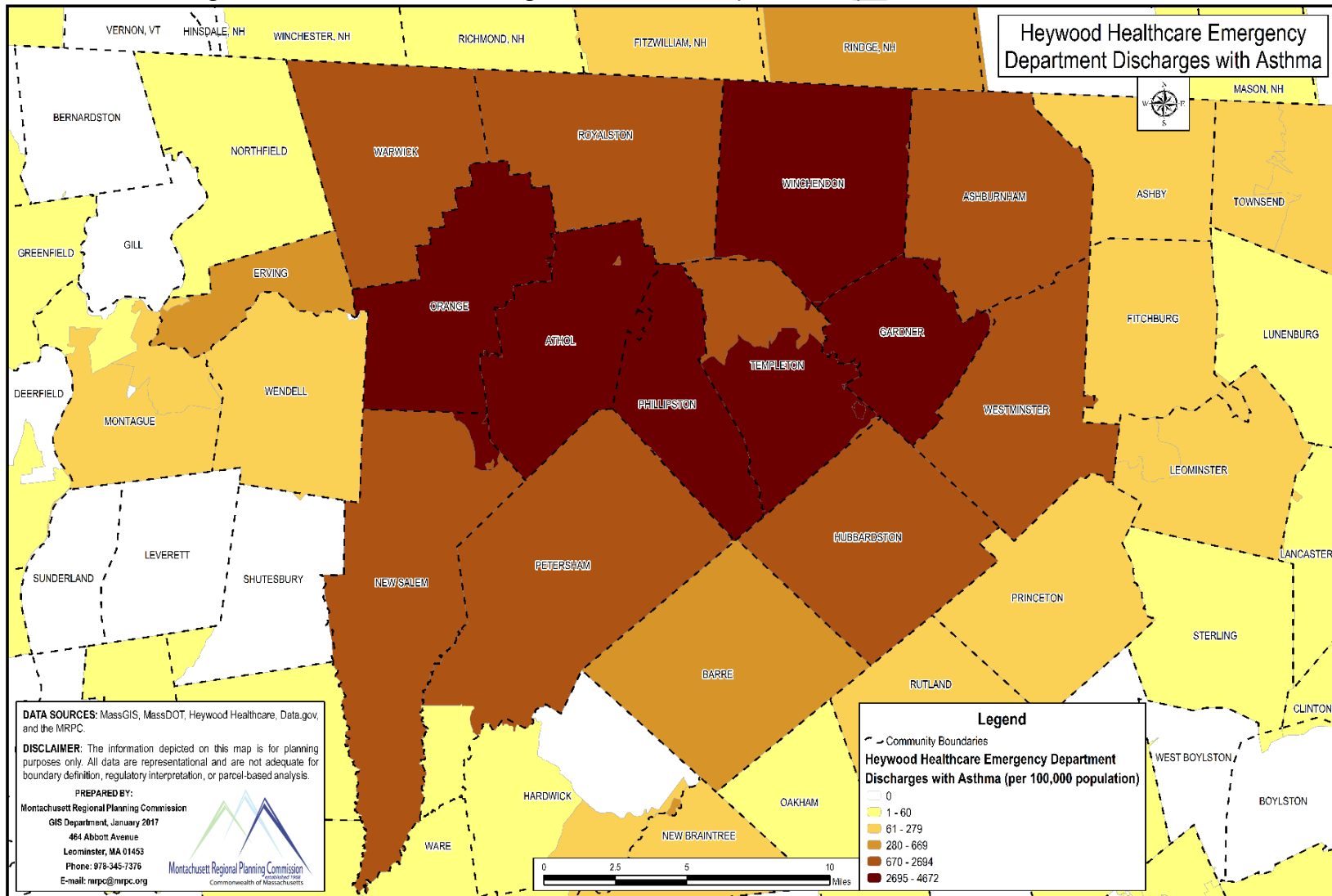
AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	# WITH ASTHMA	% ASTHMA	# OF PATIENTS	% OF PATIENTS	ASTHMA	% ASTHMA
85+	1,508	6.49	49	3.2	426	6.58	16	3.8
75-84	2,402	10.34	102	4.2	701	10.82	15	2.1
65-74	4,015	17.28	213	5.3	969	14.96	42	4.3
55-64	4,560	19.62	333	7.3	1,206	18.61	68	5.6
45-54	3,536	15.21	358	10.1	938	14.48	106	11.3
35-44	2,344	10.09	323	13.8	714	11.02	106	14.8
25-34	2,471	10.63	339	13.7	698	10.77	136	19.5
15-24	1,697	7.30	355	20.9	532	8.21	121	22.7
5-14	547	2.35	220	40.2	253	3.90	98	38.7
<5	161	0.69	94	58.4	42	0.65	33	78.6
TOTAL	23,241	100.00	2,386	10.3	6,479	100.00	741.0	11.4

Source: Heywood and Athol Hospital ED Discharge Data 2017

⁵² <http://acaai.org/asthma/about>

Map WCD-19 represents the prevalence of patient ED discharges with prior asthma diagnoses at Athol and Heywood Hospitals. It shows high concentrations in the central communities. with slight declines in ED discharges from the immediate surrounding communities.

WCD – 19 Prior Diagnoses of Asthma ED Discharges at Athol and Heywood Hospitals 2017



Mass DPH maintains the Environmental Public Health Tracking (EPHT) profiles of all Massachusetts communities. These profiles highlight demographic information and environment hazards in the community including lead poisoning, heart attack, asthma, air quality, drinking water quality and climate change. For asthma, EPHT profiles display graphs that break down the number of emergency department (ED) visits and prevalence among K-8 students in the town. K-8 prevalence is measured as a percentage of all students enrolled in each grade.

Throughout the Service Area, eight (8) of the 15 communities have a higher prevalence of asthma among K-8 students when compared to the State (12.2%). Athol (19%), Gardner/Orange (18.3%) and Templeton (17.5%) have a notably higher prevalence of asthma among K-8 students; Hubbardston (5.2%) and New Salem (7.1%) fall well below the State average. In all communities that have data non-suppressed data, boys have a higher prevalence of asthma than girls. Table WCD-20 displays the full distribution among all Service Area communities. Due to suppression of select data, averages for the entire service area could not be calculated.

WCD - 20 K-8 Asthma Prevalence in Service Area Communities 2014-2015

Community	K-8 Asthma Prevalence - Male	K-8 Asthma Prevalence - Female	Total K-8 Asthma Prevalence
Ashburnham	11.6%	10.4%	11.5%
Athol	21%	16.7%	19.0%
Erving	16.9%	9.5%	13.4%
Gardner	21.1%	16.3%	18.3%
Hubbardston	5.9%	5.1%	5.2%
New Salem	--	--	7.1%
Orange	21.3%	15.2%	18.3%
Petersham	--	--	8.4%
Phillipston	14.7%	--	8.9%
Royalston	17.1%	14.3%	15.6%
Templeton	18.3%	16.1%	17.5%
Warwick	--	--	13.6%
Wendell	--	--	12.7%
Westminster	12.6%	11.9%	12%
Winchendon	13.5%	8.3%	10.4%
Service area avg.	15.8%	12.3%	12.8%
Massachusetts	14.2%	10.4%	12.2%

Source: Mass Center for Health Information and Analysis (CHIA) 2014-15

In Athol Hospital's Service Area, six (6) of the nine (9) communities have a higher prevalence of asthma among K-8 students when compared to the State average. Male K-8 students for all towns whose data could be presented displayed a higher prevalence of asthma when compared to the State and females in three of towns had a higher prevalence of asthma than the State. Male and female prevalence for four (4) communities were suppressed due to the small number of reported cases, however town-wide averages were able to be presented as displayed in Table WCD-21.

WCD - 21 K-8 Asthma Prevalence in Athol Hospital's Service Area Communities 2014-2015

Community	K-8 Asthma Prevalence - Male	K-8 Asthma Prevalence - Female	Total K-8 Asthma Prevalence
Athol	21%	16.7%	19%
Erving	16.9%	9.5%	13.4%
New Salem	--	--	7.1%
Orange	21.3%	15.2%	18.3%
Petersham	--	--	8.4%
Phillipston	14.7%	--	8.9%
Royalston	17.1%	14.3%	15.6%
Warwick	--	--	13.6%
Wendell	--	--	12.7%
Service area avg.	18.3%	13.9%	13%
Source: Mass Center for Health Information and Analysis (CHIA) 2014-15			

In Heywood Hospital's Service Area, two (2) of six (6) communities had a higher prevalence of asthma among K-8 students when compared to the State average; Gardner (18.3%) and Templeton (17.5%). Male K-8 students for three towns displayed a higher prevalence of asthma when compared to the State and females in four of the towns had an asthma prevalence equal to or greater than the State. Data can be found in Table WCD-22 below.

WCD - 22 K-8 Asthma Prevalence in Heywood Hospital's Service Area Communities 2014-2015

Community	K-8 Asthma Prevalence - Male	K-8 Asthma Prevalence - Female	Total K-8 Asthma Prevalence
Ashburnham	11.6%	10.4%	11.5%
Gardner	21.1%	16.3%	18.3%
Hubbardston	5.9%	5.1%	5.2%
Templeton	18.3%	16.1%	17.5%
Westminster	12.6%	11.9%	12%
Winchendon	13.5%	8.3%	10.4%
Service area avg.	13.8%	11.3%	12.4%
Source: Mass Center for Health Information and Analysis (CHIA) 2014-15			

Alzheimer's

Alzheimer's is a neurodegenerative disease that affects memory, thinking and behavior and is eventually fatal. It is the most common form of dementia, accounting for anywhere from 60% to 80% of dementia cases. The disease comes on generally and worsens over time with no cure currently found; although there are treatments to help with certain symptoms of the disease. There are five (5) million Americans

currently living with Alzheimer's, costing families \$259 billion annually. Since 2000, the number of deaths from Alzheimer's have increased 89%, making it the sixth leading cause of death in the US.⁵³

In the Service Area there were a total of 12 Alzheimer's deaths in 2015 as displayed in Table WCD-23. Of those 12, five (5) were in Gardner, and two (2) were in Athol and Orange. The remaining three (3) cases were in Ashburnham, Westminster and Winchendon. All other communities had zero.

WCD - 23 Alzheimer's Deaths in the Service Area in 2015

Community	Alzheimer's Deaths	Alzheimer's Death Rates
Ashburnham	1	--
Athol	2	--
Erving	0	0.0
Gardner	5	16.9
Hubbardston	0	0.0
New Salem	0	0.0
Orange	2	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Templeton	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Westminster	1	--
Winchendon	1	--
Service Area Total/Rate	12	--
Massachusetts	1,815	20.2
Source: 2015 Mass DPH Data		

In Athol Hospital's Service Area, only two (2) communities experienced Alzheimer's deaths, Athol (2) and Orange (2) for a total of four (4). All other communities had zero as displayed in Table WCD-24.

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⁵³ <https://www.alz.org/facts/>

WCD - 24 Alzheimer's Deaths in Athol Hospital's Service Area in 2015

Community	Alzheimer's Deaths	Alzheimer's Death Rates
Athol	2	--
Erving	0	0.0
New Salem	0	0.0
Orange	2	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Service Area Total/Rate	4	0
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area, there were eight (8) Alzheimer's deaths in 2014, 75% of all Alzheimer's deaths in the Service Area that year as seen in Table WCD-25. Gardner was the leading community with five (5) Alzheimer's deaths. Ashburnham, Westminster and Winchendon each had one (1).

WCD - 25 Alzheimer's Deaths in Heywood Hospital's Service Area in 2014

Community	Alzheimer's Deaths	Alzheimer's Death Rates
Ashburnham	1	--
Gardner	5	16.9
Hubbardston	0	0.0
Templeton	0	0.0
Westminster	1	--
Winchendon	1	--
Service Area Total/Rate	8	--
Source: 2015 Mass DPH Data		

Parkinson's

Like Alzheimer's, Parkinson's Disease (PD) is a neurodegenerative disorder that develops progressively over several years. PD adversely affects the dopamine-producing neurons in the area of the brain called substantia nigra. While symptoms and severity of the disease varies from person to person, people with PD typically experience tremors, slowness of movements, limb rigidity and problems balancing. While PD in and of itself is not fatal, complications from PD can cause serious health problems; complications of PD are the 14th leading cause of death in the US according to the CDC.⁵⁴ According to Parkinson.org, one million Americans live with PD today and nearly 10 million have PD worldwide. In the US alone, American households spend \$25 billion per year in healthcare costs to treat PD.⁵⁵

⁵⁴ <http://www.parkinson.org/understanding-parkinsons/what-is-parkinsons>

⁵⁵ <http://parkinson.org/Understanding-Parkinsons/Causes-and-Statistics/Statistics>

In the Service Area in 2014, there were seven (7) deaths from complications with Parkinson's Disease. There were two (2) PD deaths in Athol, Gardner and Winchendon and one (1) in Westminster as seen in Table WCD-26.

WCD - 26 Parkinson's Deaths in the Service Area in 2015

Community	Parkinson's Deaths	Parkinson's Death Rates
Ashburnham	0	0.0
Athol	2	--
Erving	0	0.0
Gardner	2	--
Hubbardston	0	0.0
New Salem	0	0.0
Orange	0	0.0
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Templeton	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Westminster	1	--
Winchendon	2	--
Service Area Total/Rate	7	0
Massachusetts	571	--
Source: 2015 Mass DPH Data		

In Athol Hospital's Service Area, there were two PD deaths, both came in Athol as seen in Table WCD-27.

WCD - 27 Parkinson's Deaths in Athol Hospital's Service Area in 2015

Community	Parkinson's Deaths	Parkinson's Death Rates
Athol	2	--
Erving	0	0.0
New Salem	0	0.0
Orange	0	0.0
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Service Area Total/Rate	2	0
Source: 2015 Mass DPH Data		

There were five (5) PD deaths in Heywood Hospital's Service Area in 2014. Two (2) were in Gardner and Winchendon and one (1) was in Westminster as seen in Table WCD-28.

WCD - 28 Parkinson's Deaths in Heywood Hospital's Service Area in 2015

Community	Parkinson's Deaths	Parkinson's Death Rates
Ashburnham	0	0.0
Gardner	2	--
Hubbardston	0	0.0
Templeton	0	0.0
Westminster	1	--
Winchendon	2	--
Service Area Total/Rate	5	0
Source: 2015 Mass DPH Data		

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.⁵⁶

According to Athol and Heywood Hospital's 2017 ED Discharge data, Athol Hospital discharged 2,753 (42.5%) patients and Heywood Hospital's ED discharged 10,931 (47%) patients with a hypertension diagnosis. The number of patients with hypertension increased significantly starting in the 35 to 44 age groups for both hospitals and steadily increases as patients age as seen in Table WCD-29. At Heywood and Athol nearly 80% of patients 75 to 84 and 85 or older had hypertension.

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⁵⁶ http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/LearnHowHBPHarmsYourHealth/Health-Threats-From-High-Blood-Pressure_UCM_002051_Article.jsp#.WpBzlejwaUk

**WCD - 29 Prior Hypertension Diagnoses for Patients of ED Discharges at Heywood and Athol Hospital
by Age Group 2017**

AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	HYPERTENSION	HYPERTENSION %	# OF PATIENTS	% OF PATIENTS	HYPERTENSION	HYPERTENSION %
85+	1,508	6.49	1,205	79.9	426	6.58	334	78.4
75-84	2,402	10.34	1,862	77.5	701	10.82	515	73.5
65-74	4,015	17.28	2,772	69.0	969	14.96	634	65.4
55-64	4,560	19.62	2,708	59.4	1,206	18.61	665	55.1
45-54	3,536	15.21	1,541	43.6	938	14.48	377	40.2
35-44	2,344	10.09	595	25.4	714	11.02	163	22.8
25-34	2,471	10.63	182	7.4	698	10.77	51	7.3
15-24	1,697	7.30	63	3.7	532	8.21	13	2.4
5-14	547	2.35	3	0.5	253	3.90	1	0.4
<5	161	0.69	0	0.0	42	0.65	0	0.0
TOTAL	23,241	100.00	10,931	47.0	6,479	100.00	2,753	42.5

Source: Athol and Heywood Hospital's ED Discharge Data 2017

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".⁵⁷ 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.⁵⁸

Table WCD-30 displays the number of patients treated at Heywood and Athol Hospitals with a CHF diagnosis on record in 2017. At Heywood Hospital, 1,217 patients had CHF totaling just 5.2% of all patients; 363 patients at Athol Hospital had CHF for a total of 5.6% of all their patients. At both hospitals, the majority of patients seen with CHF are those aged 65 or older with the largest number of patients coming from the 75 to 84, and 85+ age groups.

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⁵⁷ http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure_UCM_002044_Article.jsp#.WpB1OjwaUk

⁵⁸ http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure_UCM_002044_Article.jsp#.WpB1OjwaUk

WCD – 30 CHF Emergency Department Discharges in Heywood and Athol Hospitals by Age Group 2017

AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	# WITH CHF	CHF %	# OF PATIENTS	% OF PATIENTS	# WITH CHF	CHF %
85+	1,508	6.49	398	26.4	426	6.58	101	23.7
75-84	2,402	10.34	347	14.4	701	10.82	106	15.1
65-74	4,015	17.28	243	6.1	969	14.96	73	7.5
55-64	4,560	19.62	146	3.2	1,206	18.61	59	4.9
45-54	3,536	15.21	67	1.9	938	14.48	19	2.0
35-44	2,344	10.09	13	0.6	714	11.02	3	0.4
25-34	2,471	10.63	2	0.1	698	10.77	2	0.3
15-24	1,697	7.30	1	0.1	532	8.21	0	0.0
5-14	547	2.35	0	0.0	253	3.90	0	0.0
<5	161	0.69	0	0.0	42	0.65	0	0.0
TOTAL	23,241	100.00	1,217	5.2	6,479	100.00	363	5.6

Source: Heywood and Athol Hospital ED Discharge Data 2017

C. 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".⁵⁹ 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 BRFSS 2012-2014 SAEs, the Service Area averaged 2.01 incidences of Stroke per 100 residents. Of all communities, Warwick had the highest rate at 2.35 per 100, followed by Petersham at 2.33 and Orange at 2.29. On the other end of the spectrum, Phillipston had 1.74 per 100 for the lowest rates in the Service Area followed by Ashburnham at 1.83 and Westminster at 1.85. The full distribution can be seen in Table WCD-31.

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⁵⁹ <https://www.medicalnewstoday.com/articles/184601.php>

WCD – 31 Stroke Rates per 100 Residents in the Service Area 2012-2014

Community	Stroke Rates per 100 Residents
Ashburnham	1.83
Athol	1.97
Erving	1.97
Gardner	1.95
Hubbardston	1.86
New Salem	2.1
Orange	2.29
Petersham	2.33
Phillipston	1.74
Royalston	1.96
Templeton	2.07
Warwick	2.35
Wendell	1.99
Westminster	1.85
Winchendon	1.92
Service Area Rate	2.01
Massachusetts	0.9
Source: 2012 - 2014 CDC BRFSS Data	

Athol Hospital's Service Area experienced a slightly higher rate of Stroke per 100 residents when compared to Heywood Hospital's Service Area at 2.08 vs. 1.91 per 100, respectively. The three highest rates by town mentioned above (Warwick, Petersham and Orange) are all in Athol Hospital's Service Area and all communities with the exception of Phillipston (1.74) have stroke rates near or higher than two (2) as seen in Table WCD-32.

WCD – 32 Stroke Rates per 100 Residents in Athol Hospital's Service Area 2012-2014

Community	Stroke Rates per 100 Residents
Athol	1.97
Erving	1.97
New Salem	2.1
Orange	2.29
Petersham	2.33
Phillipston	1.74
Royalston	1.96
Warwick	2.35
Wendell	1.99
Service Area Rate	2.08
Source: 2012 - 2014 CDC BRFSS Data	

Heywood Hospital's Service Area communities have slightly lower rates of Stroke per 100 residents when compared to Athol Hospital's communities. Templeton (2.07) is the only town that has a Stroke rate higher than two (2) per 100 as seen in Table WCD-33 below.

WCD – 33 Stroke Rates per 100 Residents in Heywood Hospital's Service Area 2012-2014

Community	Stroke Rates per 100 Residents
Ashburnham	1.83
Gardner	1.95
Hubbardston	1.86
Templeton	2.07
Westminster	1.85
Winchendon	1.92
Service Area Rate	1.91
Source: 2012 - 2014 CDC BRFSS Data	

Throughout the Service Area, there were a total of 52 CD deaths in 2014, with 28 (54%) of those occurring in Gardner for a rate of 94.7 per 100,000. Athol and Winchendon were the next leading communities with just five (5) CD deaths that same year, for a rate of 25.8 and 49.5 per 100,000 respectively. Five (5) of the 15 communities had zero CD deaths; Erving, Petersham, Phillipston, Warwick and Wendell. Gardner's CD death rate was nearly four times higher than the Massachusetts average. Winchendon's CD death rate was nearly twice as high as the Massachusetts rate. Table WCD-34 below gives a full breakdown of CD deaths in the Service Area in 2015.

WCD - 34 Cerebrovascular Disease Deaths in the Service Area in 2015

Community	Cerebrovascular Deaths	Cerebrovascular Death Rates
Ashburnham	2	--
Athol	5	25.8
Erving	0	0.0
Gardner	28	94.7
Hubbardston	2	--
New Salem	1	--
Orange	3	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	1	--
Templeton	4	--
Warwick	0	0.0
Wendell	0	0.0
Westminster	1	--
Winchendon	5	49.5
Service Area Total/Rate	52	--
Massachusetts	2,474	28.4
Source: 2015 Mass DPH Data		

Athol Hospital's Service Area, experienced just 10 of the 52 CD deaths in 2014 with half of those coming from Athol alone. Orange was the next leading community with three (3). New Salem and Royalston each made up the remaining two CD deaths as seen in Table WCD-35.

WCD - 35 Cerebrovascular Disease Deaths in Athol Hospital's Service Area in 2015

Community	Cerebrovascular Deaths	Cerebrovascular Death Rates
Athol	5	25.8
Erving	0	0.0
New Salem	1	--
Orange	3	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	1	--
Warwick	0	0.0
Wendell	0	0.0
Service Area Total/Rate	10	--
Source: 2015 Mass DPH Data		

Heywood Hospital's Service Area experienced 81% of all CD deaths in the Service Area (52) in 2015. The City of Gardner significantly skewed the data with 28 of the 42 (67%) CD deaths. All communities experienced at least one CD death with Winchendon having the second highest number of CD deaths with five (5) and Westminster experiencing just one (1) as seen in Table WCD-36.

WCD - 36 Cerebrovascular Disease Deaths in Heywood Hospital's Service Area in 2015

Community	Cerebrovascular Deaths	Cerebrovascular Death Rates
Ashburnham	2	--
Gardner	28	94.7
Hubbardston	2	--
Templeton	4	--
Westminster	1	--
Winchendon	5	49.5
Service Area Total/Rate	42	--
Source: 2015 Mass DPH Data		

D. 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".⁶⁰ This plaque buildup narrows the arteries and slows blood

⁶⁰ <https://www.nhlbi.nih.gov/health-topics/coronary-heart-disease>

flow to the heart, which can lead to blood clots which can completely block blood flow to the heart and can be fatal.

Overall, all Service Area communities averaged 5.3 cases of heart disease per 100 residents from 2011 to 2014. Petersham (6.37) and Warwick (6.06) had the highest rates among all communities; Hubbardston (4.59) and Phillipston (4.46) had the lowest. The full distribution is displayed in the Table WCD-37.

WCD - 37 Coronary Heart Disease Rates per 100 Residents in the Service Area 2011-2014

Community	Heart Disease Rates per 100 Residents
Ashburnham	5.11
Athol	5.14
Erving	5.32
Gardner	5.38
Hubbardston	4.59
New Salem	5.45
Orange	5.53
Petersham	6.37
Phillipston	4.64
Royalston	5.17
Templeton	5.58
Warwick	6.06
Wendell	5.14
Westminster	4.93
Winchendon	5.03
Service Area Rate	5.30
Massachusetts	84.0
Source: 2011 - 2014 Mass DPH Data	

Athol Hospital's Service Area communities averaged a slightly higher rate of Heart Disease than Heywood Hospital's at 5.42 and 5.1, respectively. The two communities with the highest rate of Heart Disease (Petersham and Warwick) both fall under Athol Hospital's Service Area and all but one community has a rate below five (5) per 100 residents as seen in Table WCD-38.

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WCD - 38 Coronary Heart Disease Rates per 100 Residents in Athol Hospital's Service Area 2011-2014

Community	Heart Disease Rates per 100 Residents
Athol	5.14
Erving	5.32
New Salem	5.45
Orange	5.53
Petersham	6.37
Phillipston	4.64
Royalston	5.17
Warwick	6.06
Wendell	5.14
Service Area Rate	5.42
Source: 2011 - 2014 Mass DPH Data	

In Heywood Hospital's Service Area, Templeton exhibited the highest rate of heart disease at 5.58 per 100 with Gardner just behind at 5.38 per 100. Hubbardston had the lowest rate of heart disease at 4.49 per 100 as seen in Table WCD-39.

WCD - 39 Coronary Heart Disease Rates per 100 Residents in Heywood Hospital's Service Area 2011-2014

Community	Heart Disease Rates per 100 Residents
Ashburnham	5.11
Gardner	5.38
Hubbardston	4.59
Templeton	5.58
Westminster	4.93
Winchendon	5.03
Service Area Rate	5.10
Source: 2011 - 2014 Mass DPH Data	

In the Service Area, there were a total of 195 CHD deaths in 2014. Gardner (52), Athol (40), Orange (22) and Winchendon (22) had the highest number of CHD deaths with rates of 193.2, 247.7, 226.4, and 231.9 per 100,000, respectively. Despite the higher totals in these communities, Hubbardston had the highest rate of CHD deaths at 295.6 per 100,000 with their nine (9) total deaths in 2014. For all communities where CHD deaths could be displayed, the rate of CHD deaths was higher than the State rate of 137.5 per 100,000. Table WCD-40 displays this data.

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WCD - 40 Coronary Heart Disease Deaths in the Service Area in 2015

Community	Heart Disease Deaths	Heart Disease Death Rates
Ashburnham	9	209.6
Athol	40	247.7
Erving	3	--
Gardner	52	193.2
Hubbardston	9	295.6
New Salem	1	--
Orange	22	226.4
Petersham	2	--
Phillipston	3	--
Royalston	3	--
Templeton	14	151.3
Warwick	1	--
Wendell	2	--
Westminster	12	159.7
Winchendon	22	231.9
Service Area Total/Rate	195	214.4
Massachusetts	--	137.5
Source: 2015 Mass DPH Data		

Seventy-seven (77) of the 195 CHD deaths in the Service Area (40%) came from Athol Hospital's Service Area. Of those 77, 62 (81%) were in Athol (40) and Orange (22). All other communities had three or less as displayed in Table WCD-41.

WCD - 41 Coronary Heart Disease Deaths in Athol Hospital's Service Area in 2015

Community	Heart Disease Deaths	Heart Disease Death Rates
Athol	40	247.7
Erving	3	--
New Salem	1	--
Orange	22	226.4
Petersham	2	--
Phillipston	3	--
Royalston	3	--
Warwick	1	--
Wendell	2	--
Service Area Total/Rate	77	--
Source: 2015 Mass DPH Data		

Heywood Hospital's Service Area saw 118 (60%) of the CHD deaths in 2014. Gardner accounted for 52 of the 118 CHD deaths, with Winchendon, Templeton and Westminster following with 22, 14, and 12 deaths, respectively. Despite the highest number of CHD deaths, Gardner (193.2) had the third highest rate of CHD deaths behind Hubbardston (295.6) and Winchendon (231.9). This data is displayed in Table WCD-42.

WCD - 42 Coronary Heart Disease Deaths in Heywood Hospital's Service Area in 2015

Community	Heart Disease Deaths	Heart Disease Death Rates
Ashburnham	9	209.6
Gardner	52	193.2
Hubbardston	9	295.6
Templeton	14	151.3
Westminster	12	159.7
Winchendon	22	231.9
Service Area Total/Rate	118	206.8
Source: 2015 Mass DPH Data		

E. Angina

Angina is a form of chest pain that can serve as a warning sign for heart disease and future heart attacks. Effectively treating Angina early can help prevent both.⁶¹ Angina occurs when the heart muscle fails to get enough oxygen-rich blood which can cause pressure in the "chest, shoulders, arms, neck, jaw, or back". Angina in itself is not a disease, rather it is symptom of another underlying heart problem such as CHD.⁶²

Service Area communities on average say 3.53 cases per 100 residents according to the CDC's BRFSS SAEs. The three communities with the highest Angina rates were Petersham (4.27), Gardner (4.18) and Warwick (4.1) and they were the only communities to experience a rate higher than four (4) per 100 residents. Phillipston (3.01), Hubbardston (3.06) and Ashburnham/Winchendon (3.09) had the lowest Angina rates as seen in Table WCD-43.

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⁶¹ http://www.heart.org/HEARTORG/Conditions/HeartAttack/WarningSignsofaHeartAttack/Angina-in-Women-Can-Be-Different-Than-Men_UCM_448902_Article.jsp#.WpQgr-jwaUk

⁶² http://www.heart.org/HEARTORG/Conditions/HeartAttack/DiagnosingaHeartAttack/Angina-Chest-Pain_UCM_450308_Article.jsp#.WpQhrOjwaUk

WCD – 43 Angina Rates per 100 Residents in Service Area Communities 2012-2014

Community	Angina/CHD Rates per 100 Residents
Ashburnham	3.09
Athol	3.46
Erving	3.56
Gardner	4.18
Hubbardston	3.06
New Salem	3.65
Orange	3.73
Petersham	4.27
Phillipston	3.01
Royalston	3.5
Templeton	3.54
Warwick	4.1
Wendell	3.45
Westminster	3.26
Winchendon	3.09
Service Area Rate	3.53
Massachusetts	--
Source: 2012 - 2014 CDC BRFSS Data	

Athol Hospital's Service Area communities averaged a slightly higher Angina rate when compared to Heywood Hospital's Service Area at 3.64 vs. 3.37. Petersham (4.27) and Warwick (4.1) were the leading communities in Athol's Service Area and most other communities saw a rate between 3.5 and 3.75 as seen in Table WCD-44.

WCD – 44 Angina Rates per 100 Residents in Athol Hospital's Service Area Communities 2012-2014

Community	Angina/CHD Rates per 100 Residents
Athol	3.46
Erving	3.56
New Salem	3.65
Orange	3.73
Petersham	4.27
Phillipston	3.01
Royalston	3.5
Warwick	4.1
Wendell	3.45
Service Area Rate	3.64
Source: 2012 - 2014 CDC BRFSS Data	

As shown in Table WCD-45, five (5) of Heywood Hospital's six (6) Service Area communities saw 3.5 or less Angina cases per 100 residents with Gardner being the only exception at 4.18 per 100.

WCD – 45 Angina Rates per 100 Residents in Heywood Hospital's Service Area Communities 2012-2014

Community	Angina/CHD Rates per 100 Residents
Ashburnham	3.09
Gardner	4.18
Hubbardston	3.06
Templeton	3.54
Westminster	3.26
Winchendon	3.09
Service Area Rate	3.37
Source: 2012 - 2014 CDC BRFSS Data	

F. Heart Attack

According to the CDC, a person in the US experiences a heart attack every 40 seconds.⁶³ Also known as myocardial infarction, a heart attack occurs "when the heart muscle doesn't receive enough blood flow". When gone untreated, over time the damage to the heart intensifies. Nearly 800,000 Americans experience a heart attack every year; nearly 600,000 of those are experiencing heart attack for the first time. One (1) in five (5) heart attacks are silent, meaning that the damage to the heart has occurred but the victim is unaware.⁶⁴

According to the CDC's 2012-2014 SAEs, there were nearly 3.5 heart attacks per 100 residents in the Service Area on average. Gardner had the highest rate of all communities at 4.29 per 100 and most other communities had from 3.01 to less than 3.5. Warwick was the only other community to have higher than four (4) heart attacks per 100 residents at 4.01. The full distribution can be seen in Table WCD-46.

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⁶³ https://www.cdc.gov/heartdisease/heart_attack.htm

⁶⁴ IBID

WCD – 46 Heart Attack Rates per 100 Residents in Service Area Communities 2012-2014

Community	Heart Attack Rates per 100 Residents
Ashburnham	3.45
Athol	3.31
Erving	3.37
Gardner	4.29
Hubbardston	2.99
New Salem	3.58
Orange	3.67
Petersham	3.84
Phillipston	3.15
Royalston	3.39
Templeton	3.44
Warwick	4.01
Wendell	3.31
Westminster	3.14
Winchendon	3.21
Service Area Rate	3.48
Massachusetts	
Source: 2012 - 2014 CDC BRFSS Data	

Athol and Heywood Hospital's Service Areas overall averaged very similar Heart Attack rates at 3.51 and 3.42, respectively. In Athol's Service Area, Warwick had the highest rate at 4.01 followed by Petersham at 3.84 and Orange at 3.67. Phillipston had the lowest rate at 3.15 per 100 residents as seen in Table WCD-47.

WCD – 47 Heart Attack Rates per 100 Residents in Athol Hospital's Service Area Communities 2012-2014

Community	Heart Attack Rates per 100 Residents
Athol	3.31
Erving	3.37
New Salem	3.58
Orange	3.67
Petersham	3.84
Phillipston	3.15
Royalston	3.39
Warwick	4.01
Wendell	3.31
Service Area Rate	3.51
Source: 2012 - 2014 CDC BRFSS Data	

Gardner had the highest heart attack rate in Heywood Hospital's Service Area at 4.29 per 100; by far the highest rate of all other Heywood communities with the next highest being Ashburnham at 3.45 per 100. Hubbardston had the lowest Heart Attack rate at 2.99 per 100 as seen in Table WCD-48.

WCD – 48 Heart Attack Rates per 100 Residents in Heywood Hospital's Service Area Communities 2012-2014

Community	Heart Attack Rates per 100 Residents
Ashburnham	3.45
Gardner	4.29
Hubbardston	2.99
Templeton	3.44
Westminster	3.14
Winchendon	3.21
Service Area Rate	3.42
Source: 2012 - 2014 CDC BRFSS Data	

G. 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".⁶⁵ With COPD comes an increased risk of heart disease and lung cancer. Thankfully, COPD is very treatable if given the proper medical care early on.

In 2017, there were 1,981 patients discharged from the ED at Heywood Hospital and 654 patients discharged from the ED at Athol Hospital with a prior COPD diagnosis on record. This is equal to 8.5% and 10.1% of their patients, respectively. Through the age of 44, patients discharged with COPD are very uncommon in both hospitals (as to be expected); however, there is a sudden jump in COPD cases from 45 to 54 and up. The largest number of COPD patients for any age group at Heywood Hospital were 573 for the 75 to 84 age group; the largest at Athol Hospital was 172 for the 55 to 64 age group, only one more patient than that 65 to 74 age group as can be seen in Table WCD-49.

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⁶⁵ <https://www.mayoclinic.org/diseases-conditions/copd/symptoms-causes/syc-20353679>

WCD – 49 COPD Emergency Department Discharges at Heywood and Athol Hospitals 2017

AGE	Heywood				Athol			
	# OF PATIENTS	% OF PATIENTS	# COPD	COPD %	# OF PATIENTS	% OF PATIENTS	# COPD	COPD %
85+	1,508	6.49	200	13.3	426	6.58	77	18.1
75-84	2,402	10.34	409	17.0	701	10.82	118	16.8
65-74	4,015	17.28	573	14.3	969	14.96	171	17.6
55-64	4,560	19.62	532	11.7	1,206	18.61	172	14.3
45-54	3,536	15.21	204	5.8	938	14.48	93	9.9
35-44	2,344	10.09	43	1.8	714	11.02	18	2.5
25-34	2,471	10.63	16	0.6	698	10.77	5	0.7
15-24	1,697	7.30	3	0.2	532	8.21	0	0.0
5-14	547	2.35	0	0.0	253	3.90	0	0.0
<5	161	0.69	1	0.6	42	0.65	0	0.0
TOTAL	23,241	100.00	1,981	8.5	6,479	100.00	654	10.1

Source: Heywood and Athol Hospital ED Discharge Data 2017

Chronic Liver Disease

Chronic Liver Disease (CLD), otherwise known as "Cirrhosis", refers to the buildup of scar tissue over healthy liver tissue. This build up occurs over a long period of time, progressively limiting the livers' ability to function properly. This can cause a series of complications including portal hypertension, enlarged blood vessels, kidney or liver failure, type 2 diabetes and liver cancer.

Throughout the Service Area, there were very few CLD deaths in 2014 with just eight (8). Gardner and Templeton each had three (3) with New Salem and Orange making up the remaining two as seen in Table WCD-50.

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WCD – 50 Chronic Liver Disease Deaths in the Service Area in 2015

Community	Chronic Liver Disease Deaths	Chronic Liver Disease Death Rates
Ashburnham	0	0.0
Athol	0	0.0
Erving	0	0.0
Gardner	3	--
Hubbardston	0	0.0
New Salem	1	--
Orange	1	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Templeton	3	--
Warwick	0	0.0
Wendell	0	0.0
Westminster	0	0.0
Winchendon	0	0.0
Service Area Total/Rate	8	0.0
Massachusetts	671	.08
Source: 2015 Mass DPH Data		

Athol Hospital's Service Area had just two (2) of the CLD deaths in 2014, one (1) occurring in New Salem and the other in Orange as seen in Table WCD-51.

WCD - 51 Chronic Liver Disease Deaths in Athol Hospital's Service Area in 2015

Community	Chronic Liver Disease Deaths	Chronic Liver Disease Death Rates
Athol	0	0.0
Erving	0	0.0
New Salem	1	--
Orange	1	--
Petersham	0	0.0
Phillipston	0	0.0
Royalston	0	0.0
Warwick	0	0.0
Wendell	0	0.0
Service Area Total/Rate	2	0
Source: 2015 Mass DPH Data		

Heywood Hospital's Service Area had six (6) of the CLD deaths in 2014, three (3) occurring in Gardner and the other three (3) in Templeton as seen in Table WCD-52.

WCD - 52 Chronic Liver Disease Deaths in Heywood Hospital's Service Area in 2015

Community	Chronic Liver Disease Deaths	Chronic Liver Disease Death Rates
Ashburnham	0	0.0
Gardner	3	--
Hubbardston	0	0.0
Templeton	3	--
Westminster	0	0.0
Winchendon	0	0.0
Service Area Total/Rate	6	0
Source: 2015 Mass DPH Data		

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 US\$1.16 trillion".⁶⁶ According to 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 2012.⁶⁷

In the Service Area, Gardner (62), Athol (32) and Orange (27) had the highest numbers and Erving (3), Petersham/Phillipston/Wendell (2), New Salem (1) and Royalston (0) had the lowest numbers of cancer deaths in 2015. Orange had the highest rate of cancer deaths at 291.5 per 100,000, followed by Gardner at 244.0 and Athol 240.1. Six (6) of the 15 communities had suppressed rates given the instability of the data. There was a total of 208 cancer deaths; 76 of them were lung cancer deaths and 15 were breast cancer deaths.

In keeping with this trend, Gardner had the highest number of lung cancer (21) and breast cancer (3) deaths of all Service Area communities followed by Athol with 14 and three (3) and Orange with 10 and zero (0). Orange had the highest lung cancer death rate at 105.9 followed by Westminster (105.7) and Templeton (102.1). Breast cancer rates were either zero (0) in most communities or suppressed. The overall cancer death rates for seven (7) communities in the Service Area was higher than the Massachusetts average and six (6) communities had higher lung cancer rates than the State. Table WCD-53 displays this data.

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⁶⁶ <http://www.who.int/mediacentre/factsheets/fs297/en/>

⁶⁷ <https://www.wcrf.org/int/cancer-facts-figures/worldwide-data>

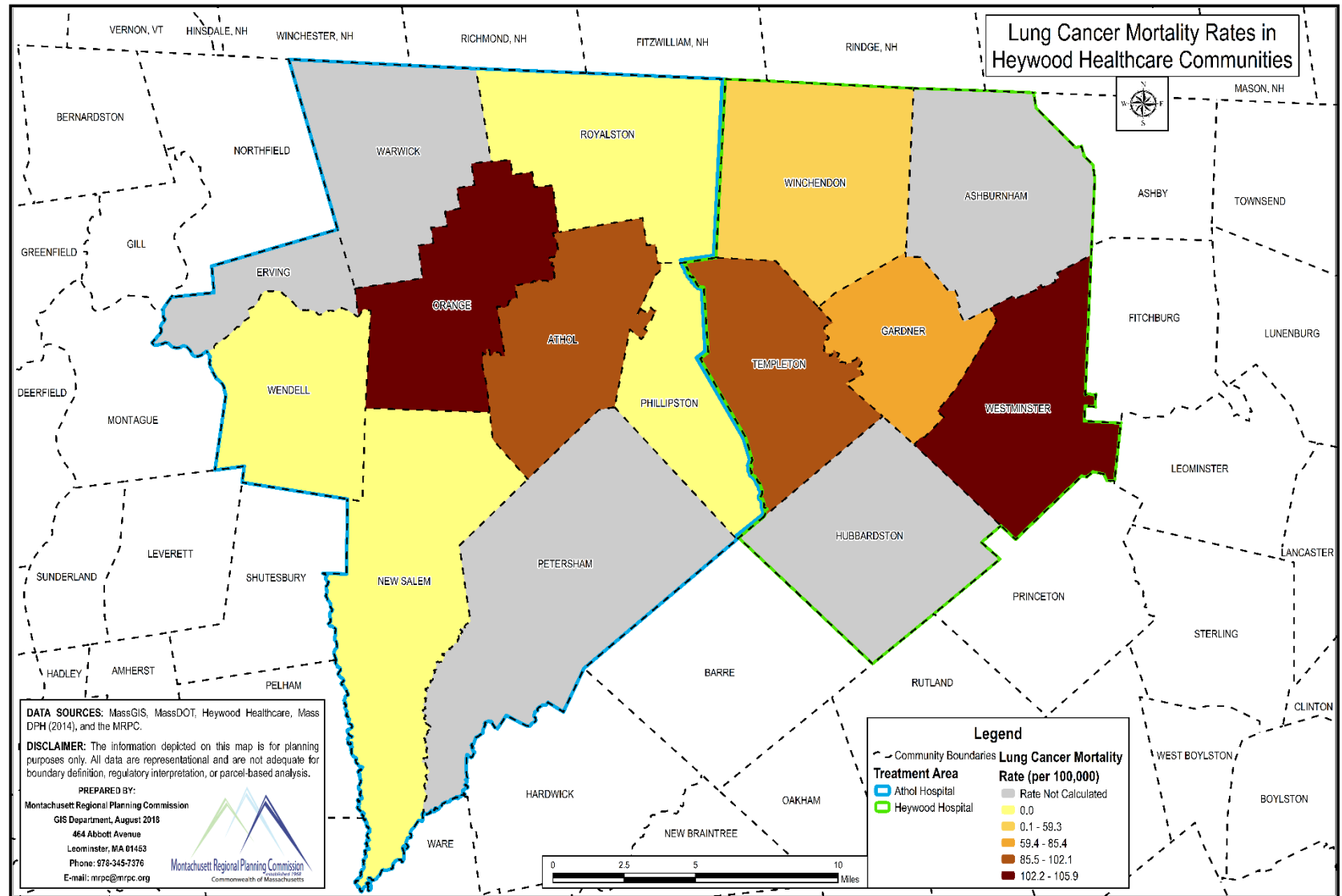
WCD - 53 Cancer Deaths and Death Rates in the Service Area in 2015

Community	Cancer Deaths	Cancer Death Rates	Lung Cancer Deaths	Lung Cancer Death Rates	Breast Cancer (Female) Deaths	Breast Cancer (Female) Death Rates
Ashburnham	8	139.5	4	--	0	0.0
Athol	32	240.1	14	99.6	3	--
Erving	3	--	1	--	1	--
Gardner	62	244.0	21	85.4	3	--
Hubbardston	7	211.3	1	--	2	--
New Salem	1	--	0	0.0	0	0.0
Orange	27	291.5	10	105.9	0	0.0
Petersham	2	--	1	--	0	0.0
Phillipston	2	--	0	0.0	0	0.0
Royalston	0	0.0	0	0.0	0	0.0
Templeton	23	242.7	10	102.1	3	--
Warwick	4	--	1	--	0	0.0
Wendell	2	--	0	0.0	0	0.0
Westminster	16	219.8	7	105.7	2	--
Winchendon	19	192.5	6	59.3	1	--
Service Area Total/Rates	208	222.6	76	93	15	0
Massachusetts	12,742	152.8	3,241	39.0	815	17.7
Source: 2015 Mass DPH Data						

Map WCD-54 represents the prevalence of lung cancer deaths in the Service Area according to Mass DPH. The darker colored communities have a higher prevalence of lung cancer deaths and the lighter shades suggest a lower prevalence of lung cancer deaths compared to the other Service Area communities. From this map, there is no discernable pattern of lung cancer death prevalence in the Service Area, with rates that vary across communities.

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WCD - 54 Lung Cancer Death Rates in the Service Area in 2015



There was a total of 73 cancer deaths in Athol Hospital's Service Area in 2015 with 59 coming from Athol (32) and Orange (27). All other communities had no more than four (4) cancer deaths in 2014 as seen in Table WCD-55. Athol (14) and Orange (10) accounted for 24 of the 27 lung cancer deaths. Athol (3) and Erving (1) made up the four (4) breast cancer deaths.

WCD - 55 Cancer Deaths and Death Rates in Athol Hospital's Service Area in 2015

Community	Cancer Deaths	Cancer Death Rates	Lung Cancer Deaths	Lung Cancer Death Rates	Breast Cancer (Female) Deaths	Breast Cancer (Female) Death Rates
Athol	32	240.1	14	99.6	3	--
Erving	3	--	1	--	1	--
New Salem	1	--	0	0.0	0	0.0
Orange	27	291.5	10	105.9	0	0.0
Petersham	2	--	1	--	0	0.0
Phillipston	2	--	0	0.0	0	0.0
Royalston	0	0.0	0	0.0	0	0.0
Warwick	4	--	1	--	0	0.0
Wendell	2	--	0	0.0	0	0.0
Service Area Total/Rates	73	--	27	--	4	--
Source: 2015 Mass DPH Data						

Heywood Hospital's Service Area saw 135 (65%) of the Service Area's overall cancer deaths. Gardner made up nearly half of that count with 62, followed by Templeton (23), Winchendon (19) and Westminster (16). Gardner (21 and three (3)) and Templeton (10 and three (3)) had the two highest number of lung cancer and breast cancer deaths. Westminster had the highest rate of lung cancer deaths at 105.7 despite having the fourth highest number of lung cancer deaths and Templeton had the second higher rate while also having the second highest number of lung cancer deaths. Table WCD-56 displays these disparities in Heywood Hospital's Service Area.

WCD - 56 Cancer Deaths and Death Rates in Heywood Hospital's Service Area in 2015

Community	Cancer Deaths	Cancer Death Rates	Lung Cancer Deaths	Lung Cancer Death Rates	Breast Cancer (Female) Deaths	Breast Cancer (Female) Death Rates
Ashburnham	8	139.5	4	--	0	0.0
Gardner	62	244.0	21	85.4	3	--
Hubbardston	7	211.3	1	--	2	--
Templeton	23	242.7	10	102.1	3	--
Westminster	16	219.8	7	105.7	2	--
Winchendon	19	192.5	6	59.3	1	--
Service Area Total/Rates	135	208.3	49	88.1	11	--
Source: 2015 Mass DPH Data						

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.

Leading Causes of Death

The Commonwealth of Massachusetts 2014 Death Report ranks the top ten leading causes of death among Massachusetts residents. Throughout the Service Area, the ten leading causes of deaths are displayed in Table WCD-57 in order from one (1) to 10. Cancer (208) and Heart Disease (195) were the two leading causes of death and combined for half of all deaths in 2014. The top three leading causes of death in the Service Area are consistent with the State. Overall, eight (8) of the leading causes of death in the Service Area are also among the top 10 causes of death throughout the State. Injuries and Poisonings as well as Mental Disorder deaths are what stand out in the Service Area as leading causes of death that are not seen among top ten causes of death throughout the State.

WCD - 57 Top Ten Causes of Death in the Service Area 2015

RANK	Mortality Cause	Number of Deaths	% of Deaths
1	Cancer	208	26
2	Heart Disease	195	24
3	Lung Cancer	76	9.5
4	Injuries and Poisoning	67	8.4
5	Cerebrovascular	52	6.5
6	Mental Disorders	44	5.5
7	Diabetes	23	2.9
8	Suicide	17	2.1
9	Breast Cancer	15	1.9
9	Opioid Related	15	1.9
Source: 2015 Mass DPH Data, Death Report			

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Table WCD-58 displays the top ten leading causes of death in Massachusetts according to the State's 2014 death report.

WCD - 58 Top Ten Causes of Death in Massachusetts 2015

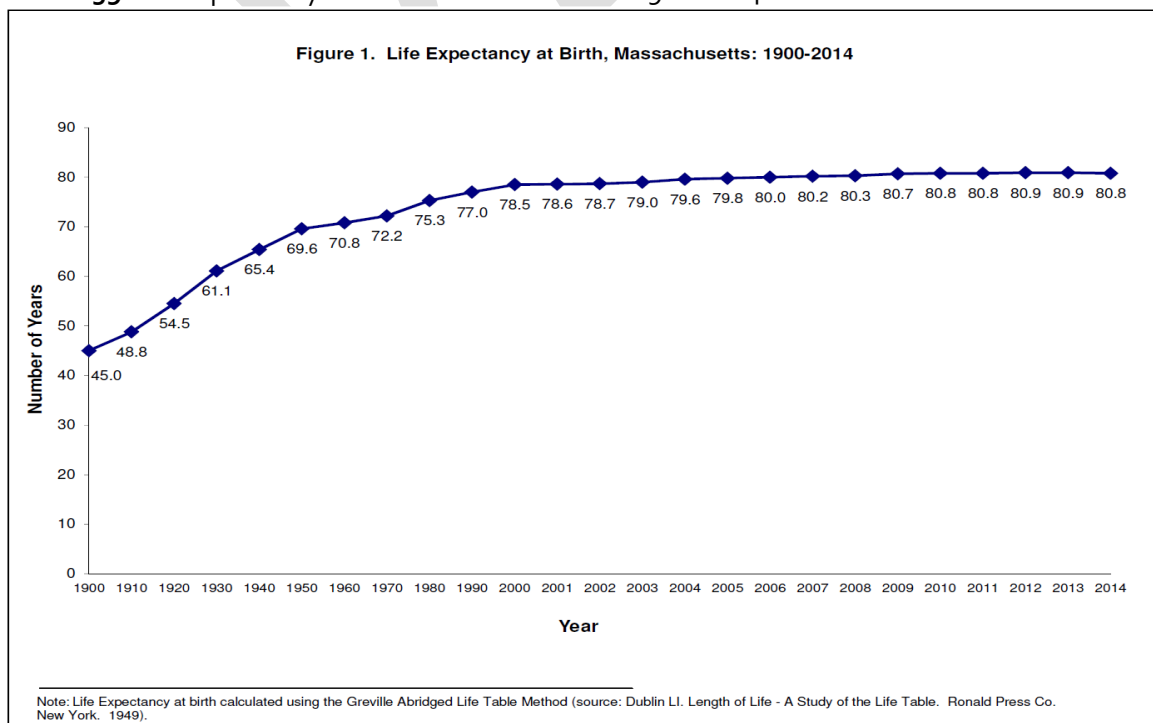
RANK	Mortality Cause	Number of Deaths	% of Deaths
1	Cancer	12,797	23
2	Heart Disease	11,845	21
3	Lung Cancer	3,309	6
4	CLRD*	2,596	4.7
5	Cerebrovascular	2,459	4.5
6	Opioid Related	1,337	2.4
7	Diabetes	1,214	2.2
8	Breast Cancer	820	1.5
9	Suicide	616	1.1
10	Motor Vehicle Accident	393	0.7

Source: 2015 Mass DPH Data, Death Report

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 80.8 years in 2014 as seen in Figure WCD-59.

WCD - 59 Life Expectancy at Birth in Massachusetts 1900-2014



Source: Massachusetts Death Report 2015, November 2016.

Overall Mortality Rates

Table WCD-60 displays the overall mortality rates among Service Area communities in 2015. The mortality rate is calculated as the number of deaths per 100,000 residents for all causes of mortality. In 2014, there were a total of 800 residents that passed away with Gardner, Athol and Orange experiencing the most at 229, 145, and 97 respectively. While this is to be expected given the higher population in each of these communities compared to others in the Service Area, it is important to note that they also have the highest mortality rates in the Service Area. Gardner has a mortality rate of 873 per 100,000; Athol has a mortality rate of 977.3 per 100,000; and Orange has a mortality rate of 1,040 per 100,000. On the other end of the spectrum, Erving (539.8 per 100,000) and Royalston (426.4 per 100,000) have the lowest mortality rates in the Service Area.

Overall, the Service Area has a lower mortality rate than the State but four (4) communities have higher rates than the State; Athol (977.3), Gardner (873), Orange (1,040) and Winchendon (887.1).

WCD - 60 Mortality Rates in Service Area Communities 2015

Community	Mortality (All Causes)	Mortality Rate (All Causes)
Ashburnham	38	813.0
Athol	145	977.3
Erving	11	539.8
Gardner	229	873.0
Hubbardston	25	824.6
New Salem	7	777.8
Orange	97	1,040.0
Petersham	10	759.9
Phillipston	10	808.8
Royalston	5	426.4
Templeton	74	811.3
Warwick	7	648.1
Wendell	8	783.3
Westminster	50	688.7
Winchendon	84	887.1
Service Area Total/Rates	800	777.3
Massachusetts	57,785	850.5
Source: 2015 Mass DPH Data		

Map WCD-61 below differentiates the mortality rates of Service Area communities by color coding. The darker-shaded communities represent those with the highest mortality rates and the lighter shades represent those communities with lower mortality rates compared to the rest of the Service Area. Athol and Orange together make up the two communities with the highest mortality rates followed by Winchendon and Gardner. Both pairs are clustered alongside one another and all surrounding communities have comparatively lower mortality rates.

WCD - 61 Mortality Rates in Service Area Communities 2015

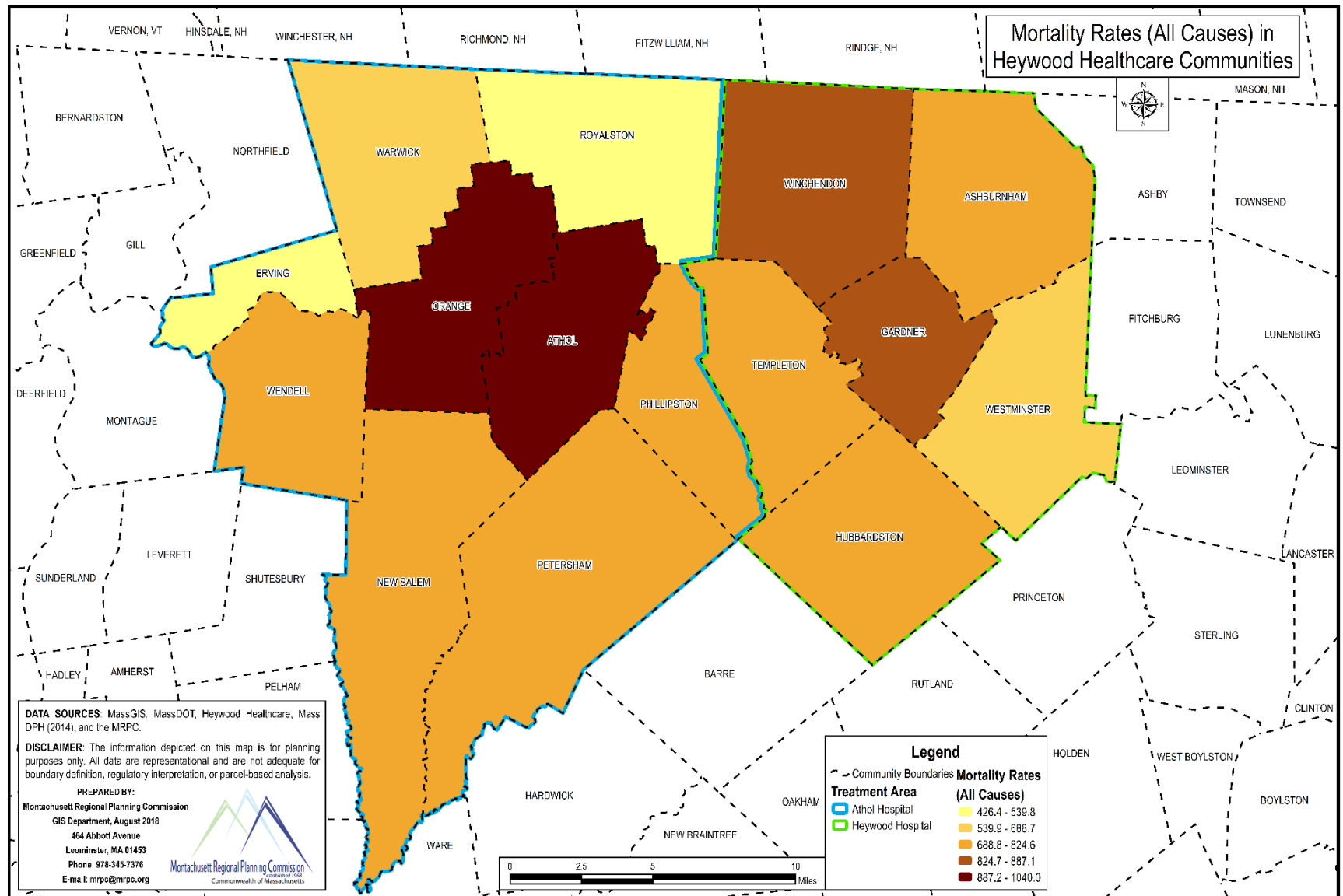


Table WCD-62 represents the mortality rates of Athol Hospital's Service Area communities. As noted previously, Athol and Orange have the highest mortality rates throughout the entire Service Area but the mortality rates vary greatly among communities the Athol Hospital services. Rates are as low as 426.4 per 100,000 in Royalston and as high as 1,040 per 100,000 in Orange.

WCD - 62 Mortality Rates in Athol Hospital Service Area Communities 2015

Community	Mortality (All Causes)	Mortality Rate (All Causes)
Athol	145	977.3
Erving	11	539.8
New Salem	7	777.8
Orange	97	1,040.0
Petersham	10	759.9
Phillipston	10	808.8
Royalston	5	426.4
Warwick	7	648.1
Wendell	8	783.3
Service Area Total/Rates	300	751.3
Source: 2015 Mass DPH Data		

Mortality rates in Heywood Hospital's Service Area are higher on average than Athol Hospital. Winchendon had the highest mortality rate at 887.1 per 100,000 and Westminster had the lowest at 688.7 per 100,000 as seen in Table WCD-63.

WCD - 63 Mortality Rates in Heywood Hospital Service Area Communities 2015

Community	Mortality (All Causes)	Mortality Rate (All Causes)
Ashburnham	38	813.0
Gardner	229	873.0
Hubbardston	25	824.6
Templeton	74	811.3
Westminster	50	688.7
Winchendon	84	887.1
Service Area Total/Rates	500	816.3
Source: 2015 Mass DPH Data		

Premature Mortality Rates

Premature mortality is the "measure of unfulfilled life expectancy".⁶⁸ Premature mortality is measured in "Potential Years of Life Lost" or "PYLL" and is calculated by "adding together the total number of years

⁶⁸ <http://www.conferenceboard.ca/hcp/Details/Health/premature-mortality-rate.aspx?AspxAutoDetectCookieSupport=1>

that people who died before a specified age would have lived if they lived to that age".⁶⁹ In the US, some of the leading causes of PYLL include cancer and tumors, circulatory complications and injuries.⁷⁰

Table WCD-65 represents the total number of premature deaths and the premature mortality rates of each Service Area community in 2014. Overall, there were 385 premature deaths among Service Area residents with the largest amount coming from Gardner (107), Athol (71) and Orange (51). Petersham and Royalston each had just two (2) premature deaths.

Despite only having eight (8) premature deaths in 2014, Wendell had the highest premature mortality rate among Service Area communities at 833.6 per 100,000 residents. Athol had the second highest rate at 573.4 per 100,000. Wendell's premature mortality is nearly double that of the Service Area average and more than three (3) times that of the State average. Premature mortality rates were higher than the State in nine (9) Service Area communities as seen in Table WCD-64.

WCD - 64 Premature Mortality Rates in Service Area Communities 2015

Community	Premature Mortality (All Causes)	Premature Mortality Rate (All Causes)
Ashburnham	16	286.1
Athol	71	573.4
Erving	3	--
Gardner	107	509.0
Hubbardston	10	244.6
New Salem	4	--
Orange	51	565.1
Petersham	2	--
Phillipston	5	227.1
Royalston	2	--
Templeton	39	424.6
Warwick	5	389.6
Wendell	8	833.6
Westminster	25	316.3
Winchendon	37	352.9
Service Area Total/Rates	385	429.3
Massachusetts	21,809	279.6
Source: 2015 Mass DPH Data		

⁶⁹ <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>

⁷⁰ <https://www.healthsystemtracker.org/chart-collection/mortality-rates-u-s-compare-countries/#item-cancer-circulatory-diseases-leading-causes-years-life-lost-u-s>

In Athol Hospital's Service Area, there were a total of 151 premature deaths in 2014. Of those, 122 came from just Athol (71) and Orange (51). The remaining seven (7) communities had between two (2) and eight (8) premature deaths as seen in Table WCD-65.

WCD - 65 Premature Mortality Rates in Athol Hospital Service Area Communities 2015

Community	Premature Mortality (All Causes)	Mortality Rate (All Causes)
Athol	71	573.4
Erving	3	--
New Salem	4	--
Orange	51	565.1
Petersham	2	--
Phillipston	5	227.1
Royalston	2	--
Warwick	5	389.6
Wendell	8	833.6
Service Area Total/Rates	151	517.8
Source: 2015 Mass DPH Data		

In Heywood Hospital's Service Area there were 234 premature deaths in 2014 as seen in Table WCD-66. Nearly half of those were in Gardner (107). Hubbardston had the fewest number of premature deaths with 10. Despite having more premature deaths than Athol Hospital's Service Area, Heywood Hospital's communities had a lower average premature death rate.

WCD - 66 Premature Mortality Rates in Heywood Hospital Service Area Communities 2015

Community	Premature Mortality (All Causes)	Mortality Rate (All Causes)
Ashburnham	16	286.1
Gardner	107	509.0
Hubbardston	10	244.6
Templeton	39	424.6
Westminster	25	316.3
Winchendon	37	352.9
Service Area Total/Rates	234	355.6
Source: 2015 Mass DPH Data		



Community Perceptions

"There is a desperate need for a COPD clinic in Gardner due to high rate of smoking"

"There is a high rate of uncontrolled diabetics due to lack of education, cultural barriers, unhealthy eating habits, etc."

"Access to affordable, healthy food is limited (food pantries in odd, often remote locations); No food pantry engagement efforts with local school departments"

"Need monthly preventative/proactive health care clinic for health/eye care/dental and hearing for inhabitants in the region"

"Cost of prescriptions prohibitive to patients taking medications"

"Need loan forgiveness and other incentive programs to bring practitioners to rural areas...This has been tried (successfully) several times with help from federal and state government"

"Doctor's should prescribe gym memberships... we should create partnerships with gyms in the area where insurance pays and exercise will result in less doctor visits, less cost because of better health, eating better and feeling better"

"I would love to see more collaboration between hospitals, senior centers, nursing homes, police departments and homeless shelters"

"The area is very rural and it makes transportation and access to healthcare services very difficult"

"We lack the population density that could help diversify the workforce"

"we have tried (with little success) to get creative in attracting a more qualified workforce"

"Those we hire are the most qualified we could ever wish to have but there's just simply not enough qualified people"

"We do everything we can to continuously train those we do hire to ensure they have the most recent qualifications needed to address the community's needs"

"Constantly changing regulations poses a challenge for non-profit care providers because it comes at an enormous cost to our institutions that don't have much money to spare"

"We have had some success working with state level regulators but for drastic change to occur we need help on the federal level and that needle is much harder to move"

"In terms of achieving 'Quality – Cost – Access' goals, the federal government is the most important partner but we aren't getting anything from them"

"We must continually work to educate our legislators about our field of work in order to find the right solutions for this region"

"Preventative programs are truly the best way to avoid larger healthcare costs in the long run"

"The healthcare workforce needs more holistic training... We don't all have to be mental health experts but we should have workers in various health fields that are able to identify mental health problems in those they treat"

"Whether we like to admit it or not... we all played a role in emboldening the opioid crisis... we weren't educated enough... we didn't study the issue enough until it became an epidemic... We must use what we know now to fight this problem and it will take all of our efforts collectively to do it"

"We need to do better in identifying the underlying cause of public health problems before trying to solve it.... Pregnant mothers in our area who smoke cigarettes often do so because they were once addicted to worse substances like heroin and are using cigarettes to cope with that but we never would have known that had we not worked directly with them to find that out"

"Insurance drives care for people...if we don't get ahold of the problems with the insurance system... people will continue to be left behind"

"There is a tremendous lack of PCPs in the N. Quabbin region"

"Doctors need training for sensitivity, compassion, listening to patients- better understanding their needs"

"Senior community relies mostly on PCP and occasionally urgent care centers"

"There is really no contact with patients between appointments and we need better attempts to reach out to ensure patients (particularly low-income patients) are having their needs met"

"There are not enough Urgent Care centers in the area"

"We need more programs for the Latino community and other cultural groups"

"The cost of prescription drugs are prohibitive to patients most in need"

"A lot of employees of local employers don't have health insurance because the employer's options are too expensive and even when they do have insurance, finding a PCP can be difficult"

"Employers that offer incentives for employees to participate in wellness programs makes for a more productive workforce and a healthier community overall"

"Transportation to different health services is limited and all providers should work together to try and provide more adequate transportation"

"Mental health and substance use cannot be treated as separate issues"

"We have to work more with younger children to take preventative measures if we ever want to stop these generational problems from recurring"

"Food insecurity is a major issue for families locally... particularly those in lower income brackets"

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Appendix A – Programs and Services

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Heywood Healthcare Supported Programs and Services

General Services:

- Heywood Hospital boasts a number of [Centers of Excellence](#). These areas include the LaChance Maternity Center, the Heywood Cardiovascular Center, the Transitional Care Center, Watkins Center for Emergency and Acute Care, Center for Digestive & Urologic Health, Diabetes Center and The Imaging Center. The Hospital has focused particular time, attention and resources on these centers in recent years in order to better meet community needs and to continuously improve our care and services. These are not the only services the Hospital provides that would qualify as Centers of Excellence -- others such as Oncology, Surgery, Heywood Rehab and Mental Health, for example, are also outstanding services provided by the Hospital. Centers of Excellence will continue to evolve and expand at Heywood Hospital in the coming years.
- [Pearson Boulevard Rehabilitation Center](#) offers an array of physical and occupational therapy services as well as speech and language pathology and audiology treatments. Onsite at Heywood Hospital, physical therapy is available for all inpatients seven days a week. Occupational therapy is available to all patients in our Geriatric Psych and Mental Health Units.
- The [Case Management Department](#) is comprised of a director, registered nurses, social workers and an administrative assistant. The department has four primary functions of assessment, planning, facilitation and advocacy as set forth by the standards of practice for Case Managers. Through the use of an evidence-based criteria set, each patient is reviewed on admission to determine whether they meet the appropriate severity of illness & intensity of service for acute hospital level of care or are in an observation status. Families can request the assistance of Case Management at any time.

Patients are screened on admission and based on a variety of high risk criteria are determined to be appropriate for case management services. Based on the nursing admission assessment patients may also be referred for case management/social worker intervention. If appropriate a case manager (RN or SW) will be assigned to work together with the patient, family and the multidisciplinary team to facilitate the patient's next transition as well as needed services & equipment.

Each patient that is determined to need home services, durable medical equipment or a skilled nursing facility/short term rehab services will be given a listing of all skilled nursing facilities and home care/DME companies within a 25-mile radius from which to choose. It is always the patient's choice as to where they choose to go or company they choose to use, based on availability. Our team is there to help bridge the transition from hospital to home.

- Heywood Hospital offers comprehensive [Pediatric Services](#) and referrals for children, newborns through adolescents. Caring for children and their families is the focus of our dedicated, experienced pediatrics staff, including nurses accredited in Pediatric Advanced Life Support. Our goal is to help children get well by offering the most current technologies and treatments and to make the hospital stay as safe and comfortable as possible. Our focus is on personalization, putting children and their parents at ease by providing compassionate care in a warm and comforting environment.

The **Pediatric Sub-unit** is located in Watkins II and offers five inpatient beds. Each room is private and provides a sleeping couch to allow for a parent to stay overnight with the child. A playroom is available with age appropriate toys, DVD and a Wii.

We offer a **Pediatric Hospitalist Program** – a small group of experienced pediatricians who are available to provide care 24/7 to children during their hospital stay. This group of pediatricians is available, if needed, for all children admitted to the hospital.

Children undergoing same day surgery are also cared for by our trained **Pediatric Nurses**, who help to prepare the child for surgery and upon completion of the first phase of recovery, will then care for them until discharged.

- The Heywood [Heart & Vascular Center](#) offers comprehensive cardiology and vascular care. With state-of-the art equipment, highly trained physicians and staff, and a compassionate, caring approach, Heywood Heart & Vascular Center offers outstanding care and services. The Center is pleased to be an affiliate of the renowned Heart and Vascular Center of Excellence at UMass Memorial Health Care in Worcester. Ranked as the Number 1 Hospital in Massachusetts for surviving a heart attack, the UMass Memorial Heart and Vascular Center is a leader in providing tertiary care and services such as cardiac catheterization, bypass surgery and more.

In the ever-changing world of healthcare, we are dedicated to our patients in providing the most comprehensive care to improve or support the patients' quality of life. Our team of experts understands the educational needs of their patients and the community as a whole. All our dietitians are registered by the Academy of Nutrition and Dietetics and licensed in the state of Massachusetts. Our diabetes educators are certified by the American Diabetes Association, including our registered nurse on staff who is the coordinator of the diabetes program.

- The [Pulmonary Rehabilitation Program](#) attempts to break the cycle of hospitalizations and restore the patients to their highest level of function. Over 30 million people in the U.S. suffer from chronic bronchitis, asthma, emphysema, and other fibrotic lung diseases. These diseases can cause severe limitations in activity, frequent hospitalization, emotional stress, progressive deconditioning and disability.

Multidisciplinary medical management and comprehensive rehabilitation helps the patient remain independent in their homes and community. Patients learn to modify their breathing patterns, to learn adaptive techniques, and to use their pulmonary medications properly. In learning to manage their disease, patients overcome panic and fear of activity. Upon completing the program most patients return to more independent lives.

- The [Sleep Disorders Center](#) provides testing in a state-of-the-art lab, focusing on quality of care, patient comfort and convenience, and responsiveness to referring physicians. The Center consists of a 4-bed state of the art sleep lab and is located on the third floor of the Hospital. Patient rooms are equipped to monitor patients during sleep and to provide non-invasive ventilation. The center offers diagnostics and treatment for Insomnia, Snoring & Obstructive Sleep Apnea, Restless Legs

Syndrome and other sleep disorders. Our sleep studies include digital audio and video recordings to monitor for movement disorders during sleep.

- The [Center for Wound Care and Hyperbaric Medicine](#) at Heywood Hospital uses the most up-to-date approaches to wound healing and remains current in new scientific advances in wound care. At any given time, almost seven million Americans suffer from chronic, non-healing wounds. Some are associated with complications from diabetes and other related vascular disorders. Other types include pressure sores and traumatic wounds. The Center for Wound Care and Hyperbaric Medicine is a hospital-based outpatient service.
- The [Heywood Center for Weight Loss and Bariatric Surgery](#) provides options for those individuals who are overweight. Obesity is a serious health issue, which can lead to many related conditions, and often dieting alone is not the answer. At the Heywood Center for Weight Loss and Bariatric Surgery, we understand your weight loss challenges. From our highly experienced bariatric surgeon to nutritional and behavioral counseling to exercise and lifestyle changes, our comprehensive program helps support you in achieving your weight loss goals. As a proven tool, Bariatric Surgery can be the first step in a journey which will help you to adopt many healthy lifestyle changes, so you can lose the weight you need and keep it off long-term.
- The [Social Service Department](#) is primarily responsible for the provision of Social Work conducted on the following inpatient nursing units: Watkins I, Watkins II, ICU, OB/Pediatrics and Behavioral Health Units - Geri Psych and Mental Health as well as outpatient areas including the Emergency Department, Special Procedures, Surgical Day Care, Oncology and the Wound Care Center. We are also involved in hospital wide and community outreach initiatives.

Community Outreach Initiatives includes coordinating community events, fairs, legislative events, and community resource directory. We host a variety of programs internally and externally for outreach and educational opportunities. We provide information and referral services, Advanced Directives/Health Care Proxies to the community free of charge. The director is also responsible for the Multicultural Service Department which is responsible for diversity initiatives, interpreter services and spiritual services.

We coordinate hospital wide programs such as Schwartz Center Rounds, lead the Gardner Area Interagency Team GAIT, Support Intervention Team, Workplace Violence Task Force, Multicultural Task Force, Greater Gardner Religious Council, Co-lead the Suicide Prevention Task Force, Nursing Home STAAR initiative, Team Leader for the Heywood Hospital Team the Walk to End Alzheimer's program and lead the hospital's United Way Campaign to name a few.

We serve on the multidisciplinary teams on each unit, Patient/Family Advisory Council, Medical Ethics Committee, Utilization Review Committee, Corporate Compliance as well as participate in community activities and boards such as:

Suicide Prevention Task Force, Spanish American Center, Multicultural Task Force, Northern Worcester County Alzheimer's Partnership, Blaire House of Worcester, Advisory Board, Baldwinville

Nursing Home Board of Directors, North Central Mass Minority Coalition, CHNA 9 Steering Committee, Community Health Foundation's Community Outreach Committee, Gardner VNA's Professional Advisory Board, and GAAMHA's Human Rights Committee.

The Social Service Department is readily available to assist the patient, the patient's family and other persons significant to the patient with the issues which may develop as a result of illness and hospitalization and services patients of all ages. The Social Worker counsels the patient and family to help with the impact of illness or disability. The Social Worker considers the patient's emotional, social, environmental and psychological needs and helps the patient with establishing a service plan in accordance with the identified needs.

The provision of Social Work services is based on individual patient need, but generally includes an assessment, planning, and follow-up of each patient through an organized multi-disciplinary team approach. This approach helps a patient following discharge. In accordance with accepted social work practice, the department functions in cooperation with administration, the medical and nursing staff as well as other departments within the Hospital to help the patient obtain maximum benefit from medical and psychiatric care.

- The [Winchendon Health Center](#) (WHC) is a Heywood Hospital affiliated family practice health center. The Health Center currently operates by appointment only providing quality patient care on an individual basis. The mission of the WHC is to provide outpatient ambulatory care for the residents of Winchendon and the surrounding communities. "We believe that patient care means not only caring for patients but caring about patients." Services at WHC include primary care/medical services for all ages, patient education, health promotion/preventative services, digital radiology services, laboratory services, and EKG. We offer these services in a professional and caring manner to any person who needs them regardless of the person's race, creed, color, condition or financial status. We respect the dignity of those we serve and provide care in a conscientious and confidential manner.
- **Murdock School-based Health Center** provides onsite health care services to Murdock Middle High School students in Winchendon, is located in the School Nurse's Suite, and is operated by Heywood Hospital. Primary health care is offered during the school day, as well as emotional support and mental health services students may need. Their goal is to provide healthcare in school to keep students healthy, keep students in school, educate & empower teens to make healthy lifestyle choices, and support families.

The Center works collaboratively with students, parents, doctors and the Winchendon Public Schools. Parental/guardian consent and notice to the student's doctor occurs before most treatments. (There are some exceptions as allowed by law.) The primary health services offered at the Health Center include: Treatment for acute & chronic illnesses, asthma, headaches, sinus infections, skin rashes, sore throats, medication is prescribed when needed, preventive health care/sports physicals, reproductive health services, oral health screenings and fluoride varnishes.

Other services include classroom education and hosting special programs and guest speakers. Onsite mental health services along with individual emotional support services are available to students when needed. Group workshops are also offered to students on topics such as: anger Management (self-control or controlling emotions); motivational/drop-out prevention; life and social skills; self-esteem; and leadership. The Nurse Practitioner also coordinates referrals for students who may benefit from emotional or behavioral health services.

- **[Multicultural and Interpreter Services:](#)** As Heywood Healthcare expands to meet the needs and expectations of increasingly culturally and ethnically varied populations, a better understanding of cultural differences and their relationship to quality service, respect, inclusiveness and sensitivity becomes essential. Diversity includes all differences, not only those that indicated racial and ethnic distinctions. In addition to addressing the needs and concerns of specific populations such as African American, Alaskan Native, American Indian, Asian, Black, Hawaiian, Hispanic, Latino, Pacific Islander, diversity also accounts for the needs of others, such as the elderly, the disabled, and the lesbian, gay, bisexual, and transgender {LGBT communities, for example.

Interpreter Services are available 24 hours a day, 7 days a week. As a healthcare provider, we have an obligation to our patients to provide them with appropriate interpreter services at no cost. This service is provided to our patients/residents and families at no cost, and we will not apply surcharges under any circumstances.

Interpreter services are available for all those non- English speaking and/or Limited English Proficiency and for those individuals who speak ASL (American Sign Language). These populations are to be provided access to interpreter services at any point of entry into the Heywood system and throughout their care tenure.

- **[Support Groups](#)** are held frequently at Heywood Hospital. Some of them are: [Alcoholics Anonymous](#), [Better Breathers Club](#), [Breastfeeding Support Group](#), [Cancer Support Group](#), [Caregiver Support Group](#), [Community Birth/Loss Support Group](#), [Gardner MENder's Support Group](#), [Learn to Cope Support Group](#), [Military Family Support Group](#), [NAMI Connection Recovery Support Group](#), [Suicide Survivor Support Group](#).

BEHAVIORAL HEALTH/SUBSTANCE USE:

- The adult inpatient [Mental Health Unit](#) at Heywood Hospital services patients 16 years of age and up focusing on acute, short-term treatment. The Heywood Mental Health Unit (MHU) prides itself on combining professional understanding of the emotional aspects of psychiatric illness with the most current and clinical standards of care, provided in a warm and inviting environment.

Heywood's MHU has been designated as a Best Practice site by the Massachusetts Department of Mental Health, the Mass. Association of Behavioral Health Services, and the Mass. Behavioral Health Partnership (MBHP). The Heywood MHU has a contract with MBHP to provide care for Mass Health patients, and with many other insurers.

Heywood's MHU has been recognized for achieving excellent outcomes for patients as evidenced by measures such as the Average Length of Stay (ALOS) of 6.54 days versus a predicted rate of 7.31 and a 7-day recidivism rate of 5.91% versus a predicted rate of 7.31%. Low recidivism means that fewer patients leave our facility and then have to be readmitted within 7 days for further treatment.

- The [Geriatric Psychiatry Unit](#) is a specialized unit that focuses on the older population. The unit is designed to evaluate and treat psychiatric patients with and without concurrent medical issues. The goal of the unit is to return an individual to an optimal level of functioning in a timely manner with a plan of continued care after discharge. The Unit, at Heywood Hospital, admits patients 24 hours a day and provides short term, individualized treatment by a team of professionals including psychiatrists, internists, psychologists, nurses, social workers, mental health therapists, nutritionist, occupational therapists and physical therapists. After a complete evaluation, a treatment plan will be developed.
- **School-Based Care Coordinators** (SBCC) work alongside school personnel to help students and families to access a variety of services and resources. The SBCC program helps students remain in the school setting and academically focused, and to help with accessing supports. Each Care Coordinator provides case management, ensuring students and families receive the help they need. Heywood Healthcare has partnered with the [Gardner](#) and [Narragansett](#) School Districts to provide on-site access to behavioral health services and off -site services as appropriate. They also provide family outreach and assistance utilizing community-based resources.
- The [Quabbin Retreat](#) was envisioned to address the critical need for behavioral health and substance abuse services in the North Central and North Quabbin regions. Heywood Healthcare is in the process of converting an 82-acre property in Petersham, MA into a comprehensive center for treating patients with mental health and addiction issues. This innovative solution transforms the property into an 86-bed facility that will provide outpatient, residential and inpatient services for adults and adolescents struggling with behavioral health and substance abuse problems. The Quabbin Retreat offers a continuity of substance abuse and mental healthcare and will be completed in three phases. Phase One entails The Dana Day Treatment Center (opened June 2017) and the McLean-Naukeag at Prescott Adult Residential Treatment Center (opened May 2018). Phase Two of this project will encompass a residential adolescent substance abuse treatment program (planned to open November 2019), while Phase Three will include an inpatient detox center (planned to open January 2020).

The Quabbin Retreat will also offer a wide array of services to augment treatment and support recovery, including group-based supportive therapies, life skills training, family education and support and vocational assistance. Heywood Healthcare has received overwhelming support from Petersham and the surrounding towns, as residents also understand that revitalizing the property will provide new local employment opportunities including well-paying jobs for healthcare professionals, construction and renovation workers, and administrative and service personnel.

- The [Dana Day Treatment Center](#) at Quabbin Retreat, Phase One of the four-pronged Quabbin Retreat Project is now accepting patients, providing intensive outpatient services for adults with dual

diagnosis of mental illness and substance abuse disorders, offering a much-needed resource for individuals struggling with these serious health issues. The program is run by Masters'-level educated Therapists and offers care coordination and family support in small group settings to address specific patient concerns and needs through evidence-based curriculum. Local transportation is provided, and most insurance plans are accepted. The Dana Day Treatment Center is a non-smoking facility, but smoking cessation resources are available to all participants.

- The [McLean-Naukeag at Prescott Adult Residential Treatment Center](#) is located northwest of Boston in Petersham, Massachusetts. Highly-skilled staff provides residential and partial hospital care to adults and has an expertise in treating individuals whose substance use disorder is complicated by psychiatric illness. Naukeag is nestled in a quiet community. The program facilities offer comfortable bedrooms, common areas for groups and conversation, and beautiful grounds.
- [Montachusett Suicide Prevention Task Force](#) servicing the City of Gardner and surrounding towns including: Ashburnham, Athol, Barre, Erving, Fitchburg, Gardner, Leominster, Lunenburg, Hardwick, Hubbardston, New Braintree, New Salem, Oakham, Orange, Petersham, Phillipston, Royalston, Templeton, Warwick, Wendell, Westminster, Winchendon. Their mission is to prevent suicide, and to provide education and resources to help those who struggle with depression, survivors of suicide, and those who have lost loved ones to suicide. The Task Force is sponsored by Heywood Hospital and the Commonwealth of Massachusetts, Executive Office of Health and Human Services, Department of Public Health's Suicide Prevention Program.
- The [Youth Suicide Prevention Group](#) (YSP) works within Gardner High School (GHS), Gardner Alternative for Learning and Technology (GALT), and Mount Wachusett Community College (MWCC) to create awareness and promote prevention in the community. This group, comprised of like-minded teens, works to provide information about youth suicide prevention in a safe, friendly environment. Working both with students and administration, the YSP is here to shape the future of youth suicide prevention in our community. Our groups will focus on positive relations, safe talk, and create a safe culture for our peers. Guidance counselors will be available if needed. YSP raises awareness in schools and community; volunteers for various community projects; takes part in the Montachusett Suicide Prevention Task Force Youth Coalition; supports Gardner Community Action Team (GCAT); provides suicide prevention gatekeeper training to members; and works in collaboration with Heywood Hospital to create a suicide free community.
- Athol, HealthAlliance, and Heywood Hospitals, in collaboration with mental health, behavioral health, substance and alcohol treatment providers, and social service agencies throughout North Central Massachusetts and the North Quabbin Area have joined together in a **Regional Behavioral Health Collaborative (RBHC)** to address the serious issues concerning our mental health and access to services.

FOOD/NUTRITION:

- [Weekend Backpack Food Program](#) supports 250 youth and their families from the Gardner and Athol Elementary Schools with nutritious, non-perishable, easy-to-prepare food choices over the

weekend. A backpack full of food is distributed to the participating students as they leave school on Friday for the weekend. The backpack food items provided help to supplement what families have at home.

- The [Nutrition & Diabetes Team](#) provides an array of services and programming within the hospital and in the community. Inpatient nutrition services conduct comprehensive nutritional assessments for inpatients to identify goals and implement individualized education and care plans to meet the patient's specific medical needs. Outpatient services for medical nutrition therapy and diabetes education are individual counseling sessions to assist patients in managing their nutritional diagnosis and provide education that is tailored to meet their needs. Community outreach programs involves our team conducting a variety of activities to increase awareness of nutrition and health such as cooking classes, healthy snacks and fitness for children, support groups, and various nutrition-related presentations for both corporations and the surrounding communities.
- With partnering organizations, the nutrition and diabetes department at Heywood lead [Off Our Rockers](#), a civic initiative to address the issue of childhood obesity. Through a program of physical activity, nutritional messaging and healthy snacks, it is our intention to provide the foundation for a healthy lifestyle for children in the city of Gardner, MA.
- A **Farmer's Market** is held in the Heywood Hospital Dining Room and is open to the public. You'll find seasonal local vegetables, fruit, farm fresh eggs, meats and more. The Farmer's Market accepts cash, WIC, Senior Coupons, and SNAP.

Community Based Organizations, Resources, and Programs

NOTE: This is not an exhaustive list of all the organizations, resources, and programs in the Service Area, but were included here because they were mentioned multiple times as assets during the focus groups and interviews.

- The [North Quabbin Community Coalition](#) (NQCC) has provided a community-wide alliance committed to improving the quality of life for all those living and working within the nine-town North Quabbin region for over 29 years. The model for this Coalition was developed in response to community-identified issues and is focused on developing solutions that are community driven. In a region often referred to as "resource poor", the network of health and human service providers needed to pay even more attention to the issue of collaboration in order to maximize all existing resources. The spirit of collaboration has allowed the area to develop several unique partnerships, to secure many additional resources and supports and has developed a strong coalition that fosters this growth. The Coalition serves three primary purposes within the community as follows: Advocacy and Response to Emergent Community Issues; Addressing Community Priorities; Information Dissemination & Networking. NQCC has an extensive [Community Support and Advocacy Directory](#).
- [Valuing Our Children](#) (VOC) was established in 1993 by the North Quabbin Community Coalition (NQCC) through a multi-year grant provided by the John Boynton Fund. The organization was established for the purpose of addressing the needs of children in the area by providing primary prevention of child abuse through family support, parenting education, and community

development. The mission of VOC is to strengthen families by responding to the expressed needs of parents, addressing barriers to individual family involvement (i.e. childcare, transportation), and building on existing strengths in families and in the community.

- [North Quabbin Patch and Family Resource Center](#), a program of Valuing Our Children, is located at 423 Main Street in Athol, Massachusetts. Patch is not an acronym but a place that means neighborhood. The program opened its doors in 1999, the product of collaboration between Valuing Our Children, the North Quabbin Community Coalition, the Department of Children and Families, the Department of Youth Services, other area service providers, and local residents. The focus of the program has been to help develop and understand family centered and strength-based practice as well as support and enhance continued collaborations among families and providers. In addition, the program has worked to support the availability of services that have been difficult for families to access.

The program provides a comprehensive, multidisciplinary approach that includes milieu treatment, individual and group treatment, psychiatric evaluation, medication monitoring, and case management. It is a time-limited, focused approach with emphasis on psycho-education, stabilization and relapse prevention.

- The [Substance Abuse Prevention Task Force](#) is a community-wide alliance with a diverse membership representing the entire region. The group has been involved in the Drug Take Back events to raise to reduce access to prescription drugs, sponsored the local National Night Out events in both Athol and Orange and has worked in advocating for tighter controls on over the counter products being marketed to youth. The group is now planning parent education workshops and is working with local schools and law enforcement to build prevention efforts and to promote access to treatment for residents of all ages.
- The [Children's Health and Wellness Task Force](#) (CHWTF) focuses on coordinating local efforts to promote wellness for children. Areas of health include nutrition, physical activity, oral health and overall wellness. The Task Force works with community partners to build capacity for promoting resilient families and children. The CHWTF also coordinates the annual Munch & Move family dinner event during the February vacation.
- The [North Quabbin Jail to Community Task Force](#) (NQJCTF) is the newest of the NQCC task forces. The task force partners with providers, the Franklin County Sheriff's Office, Orange District Court, law enforcement and area residents. The mission of this group is to build a network of support and opportunity for North Quabbin residents returning to the community, post incarceration, to promote productive engagement in society, healthy families, and community.
- The [Community Health Network of North Central Massachusetts](#) (CHNA 9) is one of 27 CHNAs across Massachusetts, created by the 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, the Central MA Center for Healthy Communities, residents, hospitals, local service agencies, schools, faith communities, businesses, boards of health, municipalities, and other concerned citizens working together to: 1) Identify the health needs of member communities; 2) Find ways to address those needs; and 3) Improve a broad scope of health in these communities.

- The [Gardner Area Interagency Team](#) (GAIT) is committed to the coordination and improvement of health and human services in the Greater Gardner Area. Their purpose is to provide an opportunity for networking, communication and collaborations between area concerned citizens and the Community at large; to promote the development and enhancement of health and human services in our area; to advocate on behalf of consumers seeking, receiving or in need of health and human services in our area; and to promote CLAS: Culturally and Linguistically Appropriate Services standards within the Greater Gardner Service Area.
- [LUK](#) is a not-for-profit social service agency located in central Massachusetts dedicated to improving the lives of youth and their families. We offer a full spectrum of programs addressing mental and behavioral health, trauma, addiction and substance abuse prevention, and homelessness.

LUK was established on the belief that all people have inherent worth and every community is empowered to make changes to ensure the well-being of its members. LUK has a long-standing reputation of being person-centered, with qualified, caring and compassionate professionals working with community members 'where they are at.' Each individual is met with qualified staff who provide personalized services to help people meet immediate needs.

- The [Gardner Community Action Team](#) (GCAT) is a program of LUK that is comprised of residents, business owners, public officials, city employees, and stakeholders all of which come together to make up the city of Gardner. These coalition members work to educate the community on underage drinking and help prevent youth from gaining access to it. The community members, educators, business owners, stakeholders, city officials etc. that make up the Gardner Community Action Team work closely with all of its community partners to coordinate, plan and implement activities and learning opportunities for the community as a whole. These activities and learning opportunities include but are not limited to multi-media campaigns, health fairs, conducting compliance checks in partnership with the Gardner License Commission and the Gardner Police Department.
- [Montachusett Home Care](#) assists elders and disabled persons to remain safely in their own homes through the provision of in-home and community-based services. Montachusett Home Care offers comprehensive assessments and coordination of quality long-term care, which is consumer-oriented, cost-effective, and supports the autonomy and well-being of the elderly and disabled.
- [Life Path Home Care](#) is a non-profit organization that helps elders and persons with disabilities maintain independence and quality of life in their own homes and communities. They help busy caregivers to find relief and help loved ones to choose the right path. Life Path serves all of Franklin County and Athol, Petersham, Royalston and Phillipston, Massachusetts. Some of our programs are available in Hampden, Hampshire, and Berkshire counties.

- [GVNA HealthCare, Inc.](#) is a not-for-profit home healthcare agency dedicated to providing quality care to the community, regardless of their ability to pay. They believe that ALL people have the right to the best healthcare possible, whatever their circumstances, and that they deserve to receive that care in the comfort and security of their homes whenever possible. GVNA offers an array of services to meet the needs of the community. Their goal is to help patients receive the care they need where they live, whether it's nursing, therapy, end-of-life care or private care. In addition, we offer educational and corporate flu clinics and support groups.
- The [Voices of Truth Inc.](#) was organized exclusively for charitable, religious, and educational purposes. We strive to prevent and break the cycle of domestic violence in our community by providing educational services, collaboration and resources. We promote the importance of self-worth, self-empowerment and dignity. Through collaboration with individuals and organizations we aim to increase and intensify public awareness about this pervasive health risk in our midst. We envision Gardner and surrounding towns with a strong local network of individuals, businesses and faith communities dedicated and proactive toward making our City a Safer Place by greatly reducing incidents of domestic abuse.
- The [Gardner Community Action Committee](#) (CAC) serves the needs of the economically disadvantaged in the Greater Gardner community (Ashburnham, Westminster, Templeton, Hubbardston, Otter River and Baldwinville). A single mother, a two-parent household, or an elderly individual living on a fixed income are all susceptible to the effects of poverty. On site, the CAC has a full food pantry, access to donated clothing and children's literature, dispatching for the Medical Transportation Program, advocacy, Holiday Program sign-ups, On-line MA Health/Food Stamp applications, Bonnie Brae applications, Fuel Assistance satellite office, and information and referral service through a case manager. Off-site, we host a free weekly congregate meal open to the public.
- [Community Action Pioneer Valley](#) holds a long-term vision of safe, just, and prosperous communities throughout Franklin and Hampshire Counties and the North Quabbin region in western Massachusetts. We are committed to upholding the common good by offering leadership, advocacy, and concrete resources that support children, youth, individuals, families, and local communities to thrive.
- The [Gardner Emergency Housing Mission](#) provides short-term emergency shelter for families with children, for up to 30 days. GEHM eliminates a need for families to split up to receive shelter and keeps families in their established, local community, supporting school and work-life consistency in their time of need. During their time in the shelter, families collaborate with a Gardner school-based care coordinator to assist with resources to find safe housing and get on a path to self-sufficiency.
- [Alyssa's Place](#) is a Peer Recovery and Resource Center to provide assistance to people seeking help for substance use, people in recovery, and people affected by the substance use of a friend or loved one. Unlike traditional substance use programs, Alyssa's Place is governed by the people it serves. Their model of peer recovery has been proven effective and fills the massive void that exists between

active substance use and clinical treatment. They offer weekly mutual aid groups of all kinds and are also seeking to offer more.

- The [North Quabbin Recovery Center](#) is a project of the North Quabbin Community Coalition in partnership with the Franklin County Sheriff's Office and the Opioid Task Force of Franklin County and the North Quabbin Region. The mission of the center is to provide a compassionate safe space to offer peer support to allow multiple paths of recovery for all.
- [GAAMHA](#) is an organization dedicated to providing a wide range of services to individuals throughout Massachusetts and New Hampshire. Our local service area includes Gardner, Fitchburg, Leominster, Athol, Orange, Winchendon, Ashburnham, Westminster, Templeton, Hubbardston, Lunenburg, Rutland, and Barre. The mission of GAAMHA, Inc. is to provide meaningful support, training, treatment, avenues to employment, and personalized opportunities to individuals with disabilities and substance use disorders; and to offer quality transportation services to the people who live in the communities we serve.
- The [Youth Venture Program](#) of the Mount Wachusett Community College is cultivating and equipping an eco-system that supports youth to be changemakers. Youth are powerfully and confidently solving the issues they uniquely face through activating pathways of Empathy, Sophisticated Teamwork Collaborative Leadership and Changemaking as they embark upon their journey to become changemakers.
- The [North Central Massachusetts Minority Coalition](#) is a strategic alliance between the region's five minority-led agencies (Spanish American Center, Hmong-Lao Foundation, Three Pyramids Inc., Twin Cities Latino Coalition, and the Cleghorn Neighborhood Center. The minority Coalition also includes faith-based and agency representatives, who are working within the coalition to organize, empower and support local racial, linguistic and ethnic minorities, as well as people with disabilities and other disadvantaged poor and working-class people.
- The [Devens TaraVista Behavioral Health Center](#) provides compassionate, effective, sustainable care for those suffering from psychiatric distress and co-occurring substance abuse. The organization was built on the premises of person-centered care.
- [YOU INC](#) is a leading child welfare, behavioral health and education agency dedicated to helping children and families to flourish and reach their potential. With 45 years of experience, YOU INC has helped over 14,000 youth and families in Central Massachusetts.
- [Adventure Challenge Experience](#) (ACE) through YOU INC began in 2007. Today, the ACE is a highly successful therapeutic recreation program. ACE helps their clients to overcome the deep-seated trust issues that can result from trauma and abuse, while developing problem solving and communication skills.
- The [Massachusetts Child Psychiatry Access Program](#) (MCPAP) is a system of regional children's behavioral health consultation teams designed to help primary care providers and their practices to

promote and manage the behavioral health of their pediatric patients as a fundamental component of overall health and wellness. MCPAP supports the integration of behavioral and physical health. Their teams are available to consult with behavioral health clinicians working in the primary care setting as well as the primary care provider and other members of the primary care team.

- [Parent/Professional Advocacy League](#) (PPAL) is a statewide, grassroots family organization that advocates for improved access to mental health services for children, youth and their families. PPAL's goals are to support families, nurture parent leaders and work for systems change. PPAL is the only Massachusetts organization whose work focuses solely on the interests of families who children have mental health needs. Founded in 1991, PPAL continues to work on behalf of children, youth and families as a critical voice shaping policy and practice.
- [Family TIES of Massachusetts](#) provides information of referral services, emotional support, and trainings to parents of children and youth with special needs. Family TIES Parent-to-Parent program allows parents to aid other parents in need of advice on caring for special needs children. This program is a proud Alliance Member of the P2PUSA network. The P2PUSA Leadership Institute brought together P2P programs from 30 states plus 1 national organization.
- [Community Health Connections](#) of Fitchburg and Gardner provides preventative dental care on-site at schools throughout the region with their Caring for Kids program. Services include cleaning, screenings, x-rays, fluoride varnish and education about oral hygiene. The program is especially helpful for children who have difficulty accessing dental care.
- [Youth Mobile Crisis Intervention](#) (YMCI) is a mobile, community-based resource for youth under 21 years of age in crisis and their families by providing assessments, interventions, stabilization, and community resources. YMCI professionals travel to the youth's home, school, residential program, or other community setting as well as emergency departments at local hospitals. Eligible children and families are those enrolled in Medicaid/Mass Health or are uninsured.

Massachusetts Department of Corrections (MA DOC) Resources and Programs

According to the MA DOC 2015 Annual Report, the following steps have been taken to improve inmate rehabilitation:

- Case conferences are held on certain seriously mentally ill inmates and other challenging cases involving inmates with mental health and medical issues to determine the most appropriate placement.
- A 42-bed unit was opened at Plymouth County Correctional Facility (PCCF) for civil commitments due to an increase in admissions that exceeded the number of beds at **Massachusetts Alcohol and Substance Abuse Center (MASAC)**.
- The MASAC significantly increased its inmate library inventory to include additional books and educational materials. Books were also added to the visiting room for children to improve their experience.

- Regular monthly reentry meetings continue to be held throughout the agency to ensure that inmates being released to the community have a comprehensive and realistic plan, to include housing, aftercare services, health coverage, and other related information that may assist them upon release.
- With approval by the Commissioner, all emergency bags now contain Narcan, Epi-pens and Glucogen. These medications, when administered, are life-saving depending on the situation (overdose, allergic reaction, or diabetic shock, respectively).
- A one-way e-mail system has been implemented at all facilities which allows inmates to receive e-mails from family and friends via a kiosk. Increasing communication enhances the chances for successful reentry.
- In an attempt to address the number of outside hospital trips, the healthcare vendor implemented a **Suturist Program**. Physicians and advanced practitioners received specialized training on suturing. An on-call schedule allows staff to contact the on-call suturist to report to a facility when sutures are required to close a wound. This practice has been well received and has resulted in cost savings via the elimination of outside hospital trips.

Two programs mentioned on the MA DOC website related to substance use are:

- The Parole Board's **Substance Abuse Coordinator Program** is a collaborative initiative between the Parole Board and the Department of Public Health's (DPH) Bureau of Substance Abuse Services (BSAS). In 2014, there were eight full-time Substance Abuse Coordinators (SAC), from licensed DPH service vendors, placed and working at each of Parole's regional field offices. Some of the basic duties of the SAC include parolee intake, triage and referral functions, providing outreach to service providers and DPH, and tracking and monitoring the progress of clients and treatment providers. The SAC's services assist parolees in making a successful transition to communities across the state.
- The primary mission of the Massachusetts Parole Board's **Reentry Housing Program (RHP)** is to enhance public safety by supporting the successful reentry of state and county offenders back into the community. The RHP strives to provide a structured setting to address chronic homelessness, substance abuse issues, and an opportunity to address other important barriers such as employment and education. Treating the offender in the community is cost-effective and reduces recidivism. The Parole Board maintains housing contracts with vendors who provide appropriate services to transitioning parolees. The RHP has the following goals and objectives:
 - To reduce recidivism.
 - To provide offenders with the opportunity to access beds strategically placed in the communities where the offenders are returning.
 - To ensure that education, vocational training and substance abuse/mental health programs are an essential part of each housing vendor's reentry plan.
 - To enhance self-sufficiency including the ability to obtain sustainable housing.
 - To boost employment rates at the time of discharge from program.
 - To improve access to health care insurance, medical services, and other public assistance programs.
- The MA DOC, under the **Massachusetts Correctional Industries (MassCOR)**, operates the manufacturing of various products at its facilities to instill a positive work ethic in offenders by

providing training and skills for a successful reentry into the community through work opportunities, while ensuring the highest level of customer service by providing a quality product at a competitive price. With acquired on-the-job training and the work ethic gained through MassCOR, released offenders have a greater chance of being gainfully employed and succeeding after their release.

According to the MA DOC Program Description Booklet dated October 2017, the following practices, procedures and programs have been implemented at the North Central Correctional Institution in Gardner to improve inmate conditions and successful reentry into the community:

- MassHealth and the Department of Correction continue to partner to ensure releasing offenders are provided with medical coverage upon release. This partnership creates a continuum of care that allows for a smoother transition to the community and enables discharge planners to schedule medical and mental health appointments prior to an inmate's release.
- The **Criminal Thinking Program** is a vendor facilitated program designed to focus on altering the pro-criminal thinking patterns that have been identified as separating those who are serious repeat offenders from those who are not. The program focuses specifically on criminal sentiments and how to develop pro-social alternatives for them. The program assists the offender in developing pro-social alternatives to past activities and associates.
- The **Violence Reduction Program** targets cognitions that contribute to violent behavior. The goals of the program are to decrease violent behavior and the likelihood of institutional disturbances. During the program inmates identify the specific cognitions which have led to their violent behavior. Once identified, they are taught pro-social strategies and skills to diminish the likelihood of continued violence. The program is facilitated by staff two to three times per week.
- **General Population Criminal Thinking/Violence Reduction Maintenance Program** is for offenders who have completed the Violence Reduction and/or Criminal Thinking program. The program is intended to provide an opportunity for inmates who have completed either of these programs to remain engaged in treatment to practice and internalize learned skills. The program meets once per week for two hours per session.
- **Medication Assisted Treatment Reentry Initiative (MATRI)** provides pre-release treatment and post-release referral for opioid-addicted and alcohol-addicted inmates. This program involves prison-based residential substance abuse treatment and collaboration with community-based clinics to provide aftercare treatment. The goal is to facilitate transition into an outpatient substance abuse treatment program which employs a multi-faceted approach to treatment including the use of the medication Vivitrol/Naltrexone, counseling, and aftercare referral to community-based providers. This program is available to offenders who have a documented opioid or alcohol addiction and have completed or are enrolled in a Substance Abuse Treatment program.
- A Memorandum of Understanding between the Department of Correction and the Social Security Administration was developed to establish a process for offenders to secure a replacement social security card prior to release.
- Assessment and Treatment Introduction is the first phase of the **Sex Offender Treatment Program (SOTP)**. The primary focus of this program is motivation and engagement in the treatment process, which includes an introduction to treatment concepts and education and information about the benefits of treatment.

- **Sex Offender Maintenance Program** has the goal of upholding treatment gains, continuing to make positive changes in dynamic factors, and maximizing successful reintegration. All completers are encouraged to participate in a maintenance treatment program. By the time offenders engage in the maintenance treatment program they have a fully developed Successful Reintegration Plan to help identify their individualized primary goals, appropriate means to attain these goals, internal capabilities, external opportunities, self-regulation strategies, and risk management strategies.
- **Project Peer Connection** is a statewide reentry mentoring project providing one-to-one peer support to higher risk individuals who complete substance abuse treatment while incarcerated to help them lead drug-free, crime-free lives. The peer mentoring program is available to offenders releasing anywhere in Massachusetts. The goals of the program include providing experienced guidance in planning for reentry, overcoming obstacles to successful community living and providing a bridge from pre-release reentry services to community-based resources.
- **Money Management and Career Strategy** is a program designed to instruct inmates and teach them basic skills in key areas that will afford them a better opportunity of success during their re-entry into society and post incarceration life.
- **National Education for Assistant Dog Services-Puppy Program (NEADS)** is a non-profit service dog organization established to provide Hearing, Service and Assistance Dogs for veterans, adults and children. This is an 18-month program designed to utilize inmate handlers to teach dogs basic obedience and other skills needed to prepare them for future “careers” as Service Dogs assisting people who are physically disabled. Following their training with the inmates, the dogs will then learn the more advanced Service Dog skills at NEADS’ National Assistance Dog Training Campus in Princeton, MA.
- **Project Youth / Project Wake Up** is a staff supervised program in which inmates discuss with high school students their personal experiences and consequences that resulted in incarceration.

Appendix B - Survey Methodology and Response

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Survey Methodology

Heywood Healthcare staff and the MRPC finalized 22 survey questions for public distribution that allowed local residents to comment on the healthcare environment in the Service Area. The MRPC finalized English, Spanish and Hmong versions of the survey on SurveyMonkey.com and opened them up from January to May 2018. The MRPC's goal was to get 400 respondents to complete surveys during this time.

The survey was advertised on the Heywood Hospital, Athol Hospital and MRPC websites, the *Athol Daily News* and *The Gardner News*, and at local town halls, libraries, restaurants, senior centers and other public locations. Over 1,500 hard copy surveys were distributed to 29 different locations across the service area with pens and a drop box available on site. QR codes with links to the online English, Spanish and Hmong versions of the survey were attached to the drop boxes so that local residents can take the survey directly on their smart phones.

A hard copy version of the survey was also translated in Arabic and made available to the Arabic speaking community through grassroots efforts. Heywood Healthcare also sent a blast text message to over 9,000 Heywood Healthcare patients registered in the patient portal system with links to complete the survey electronically.

Heywood Healthcare's Executive team and the MRPC worked with Miguel A. Rodriguez Santana of the Multicultural Coalition at Heywood Hospital and Train Wu, Academic Counselor for the Diversity Workforce Pipeline at Mount Wachusett Community College to hand deliver hard copy surveys to minority members of the community. They went to local barbershops, churches, and community spaces where Spanish, Hmong and Arabic speaking residents congregate and worked hand in hand to help them fill out surveys in individual, as well as group settings.

Some members of the Spanish, Hmong and Arabic communities were unable to fill out the surveys independently because they were not translated in their respective dialects. To make sure their thoughts and concerns were recorded, Miguel and Train worked to translate their responses onto the English version of the surveys so that the MRPC could use their responses for the report.

Hard copy surveys were then collected by the MRPC and entered into Survey Monkey manually. Because some Hmong, Spanish and Arabic surveys were completed in English, a total number of surveys completed in each language were not quantifiable. There was no Arabic version available on Survey Monkey.

Survey Responses

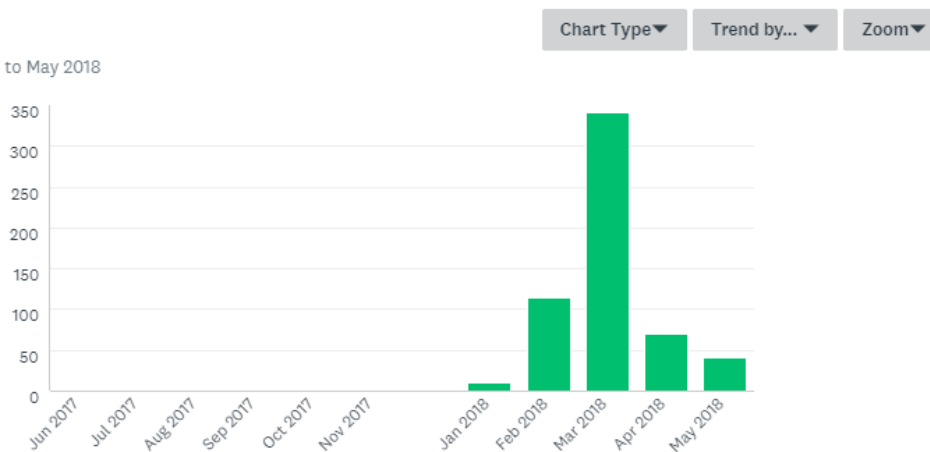
The following image is a screen shot of the total number of responses for the survey by language on SurveyMonkey.com and includes the completion rate, as well as the average time spent completing the survey. Overall, there were 952 people who opened the survey with 596 who completed the survey in its entirety; almost 200 more responses than the MRPC's original stated goal. About 100 hard copy surveys were filled out by local residents at drop box locations or by locals that were contacted by Miguel or Train. The remaining surveys were completed online.

OPEN	2018 Heywood Athol Health Survey Created: 01/05/2018 Modified: 05/09/2018	936 Responses	62% Completion rate	5 mins Typical time spent
OPEN	Heywood Athol Daim Ntawv Ntsuam Xyuas Txog Kev Noj Qab Haus Huv Xyoo 2018 Created: 02/16/2018 Modified: 05/04/2018	13 Responses	100% Completion rate	3 mins Typical time spent
OPEN	Encuesta de Salud 2018 de Heywood Athol Created: 02/16/2018 Modified: 03/22/2018	3 Responses	100% Completion rate	13 mins Typical time spent

The most survey responses were completed in March shortly after Heywood sent the blast text message to those registered in the patient portal system.

Responses (by month)

First: 1/9/2018 Zoom: Jun 2017 to May 2018



The following pages break down the total responses for each question on the survey for all 596 respondents and was used by MRPC staff to include perceptions from the community into the report.

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