CHIA.

Total Medical Expenses (TME) Trends Across Massachusetts Communities, 2023

Summary

Issue: Within Massachusetts, spending on health care services varies across the Commonwealth's municipalities and communities. These variations in community medical spending trends may be influenced by multiple interrelated factors, including individual health status, network adequacy standards and proximity of provider networks, provider price differences, and differences in insurance coverage and affordability. Geographic variation in community medical spending patterns may also be attributed to social and economic risk factors, which can impact access to care.

Objective: To analyze and report on the relationship between community sociodemographic characteristics and medical spending.

Methods: Correlation analysis at the ZIP Code Tabulation Area (ZCTA) geographic level between CHIA's 2023 total medical expenses (TME) data and results from the U.S. Census Bureau's 2023 American Community Survey (ACS). Community medical expenses are presented on an average per member per month (PMPM) basis.

Findings: Overall, average monthly medical spending per person—specifically the amount spent on care provided by primary care and specialty doctors—was higher in communities with higher median family incomes. In contrast, monthly per-person medical and physician spending tended to be lower in communities where there was a higher concentration of residents who:

- Do not speak English well
- Have less than a high school education
- Are between 18 and 64 years old
- Are not U.S. citizens
- Identify as Hispanic or Latino

Implications: Improving population health outcomes requires understanding how community sociodemographic characteristics affect an individual's or family's ability to access health care services. With medical spending varying across Massachusetts communities, higher spending may not reflect better health outcomes, but rather greater access to and utilization of care as well as higher costs of services. Higher spending on primary and specialty physician care also supports prevention and chronic disease management, reducing avoidable emergency department visits, hospitalizations, and overall health care costs. Correlations between community characteristics and medical spending can highlight areas that merit deeper examination, helping policymakers target efforts to improve access to care.

Introduction

Social determinants of health (SDOH) are the conditions in the communities and environments in which people are born, live, work, and play that influence their quality of health and life. These community circumstances or characteristics can affect an individual's ability to access health care resources and potentially create inequities in health outcomes. For this report, CHIA examined variations in medical spending across Massachusetts communities and whether there was a relationship between certain categories of medical spending and community characteristics.

Health care spending trends are driven by the volume and types of services utilized as well as the prices of those services. Variation in community medical spending may be influenced by multiple interrelated factors, including individual health status, network adequacy standards and proximity of provider networks, provider price differences, and differences in insurance coverage and affordability. Geographic variation in community medical claims spending patterns may also be attributed to social and economic risk factors, which can impact access to care.

Although medical spending may vary within the commonwealth, higher spending may not reflect better health outcomes, but rather greater access to and utilization of care as well as higher costs of services. The purpose of this report is to identify potential inequities in medical spending across Massachusetts communities and investigate how these trends may be influenced by community characteristics and issues of access. Correlations between community characteristics and medical spending can highlight areas that merit deeper examination, helping policymakers decide where targeted efforts may improve access to care and ensure health care needs are met to strengthen health outcomes.

Key Findings

- **English language proficiency:** Communities with higher proportions of residents who do not speak English well tended to have lower PMPM spending on services delivered by a primary care or specialty physician, total member cost-sharing, and total medical expenses compared to communities with lower proportions of residents who do not speak English well.

- **Health insurance status:** Communities with higher proportions of uninsured residents tended to have lower levels of spending on services delivered by a primary care or specialty physician as well as total member cost-sharing PMPM compared to communities with lower proportions of uninsured residents.

- **Education:** Communities with higher proportions of residents who have not completed a high school education tended to have lower spending on services delivered by a primary care or specialty physician, total member cost-sharing, and total medical spending PMPM compared to communities with lower proportions of residents who have not completed a high school education.

- **Citizenship status:** Communities with higher proportions of non-U.S. citizens tended to have lower spending on services delivered by a primary care or specialty physician, total member cost-sharing, and total medical spending PMPM compared to communities with lower proportions of non-U.S. citizens.

- **Race and ethnicity:** Communities with higher proportions of Hispanic/Latino and non-Hispanic Black residents tended to have lower spending on services delivered by a primary care or specialty physician as well as total member cost-sharing PMPM compared to communities with lower proportions of Hispanic/Latino and non-Hispanic Black residents.

- **Median family income:** Communities with higher median family incomes tended to have higher levels of spending on services delivered by physicians and other clinical professionals as well as higher total medical spending and member cost-sharing PMPM compared to communities with lower median family incomes.

For a more comprehensive view of the data and related metrics, explore CHIA's **interactive dashboard with demographic data at the community level** (municipality and ZIP Code Tabulation Area [ZCTA]).

About the Data Sources

Medical Spending

Each year, pursuant to M.G.L. c. 12C, CHIA collects aggregate total medical expenses (TME) data from commercial and commercially managed health plans and reports on medical spending trends as part of the Annual Report on the Performance of the Massachusetts Health Care System. CHIA's annual analysis and reporting of TME data investigates cost drivers and spending trends and how these vary across payer and provider entities. TME reflects payments made by Massachusetts residents and health plans for health care services covered by insurance.

The medical spending data used throughout this report reflects commercial full claims and Medicaid (MassHealth) ACPP/MCO plans and is reported on a PMPM basis. Commercial full-claim data represents members for whom the payer can access and report all claims expenses, representing 63.7 percent of total commercial member months in 2023. MassHealth ACPPs and MCOs are commercially managed plans and accounted for about 56.0 percent of all MassHealth membership in December 2023.[1] The medical services categories include:

- **Physician:** A service category gathered as part of TME data collection that captures all payments for services provided by a doctor of medicine or osteopathy (MD/DO). Physician spending includes both primary care and specialty care doctors.

- **Other Professional:** A service category gathered as part of TME data collection that captures all payments for services provided by licensed practitioners other than physicians, including occupational and physical therapists, nurse practitioners, physician assistants, and certain behavioral health providers.

- **Hospital Inpatient:** A service category gathered as part of TME data collection that captures all payments made to hospitals for inpatient care.

- **Hospital Outpatient:** A service category gathered as part of TME data collection that captures all payments made to hospitals for outpatient care.

- **Total Hospital:** All payments made to hospitals for both inpatient and outpatient care combined.

- **Member Cost-Sharing (MCS):** Medical expenses allowed under a member's plan but not paid for by a payer, employer, or state cost-sharing reduction subsidy, including costs like deductibles, copayments, and coinsurance. These costs are incurred when members use health services; therefore, member cost-sharing amounts in this report are a function of member utilization, which may be affected by ability to access services. See the **technical appendix**.

American Community Survey (ACS)

Data on community demographics from this annual survey conducted by the U.S. Census Bureau is gathered and made publicly available at **https://data.census.gov/table**. This report utilizes ACS 2023 5-year estimates for the following community characteristics that correlated with at least 1 medical spending category:

English Language Proficiency:
- Residents who speak only English
- Residents who speak English well (includes residents who indicated they speak English "well" or "very well"). May be referred to as residents with high English proficiency.
- Residents who do not speak English well (includes residents who indicated they speak English "not well" or "not at all"). May be referred to as residents with low English proficiency.

Health Insurance Status:
- Residents with no health insurance. May be referred to as uninsured residents.

Resources:
- Households with internet access
- Households with car access
- Households with computer access

Age:
- Residents who are 18 to 64 years old
- Residents who are 65 years or older (65+)

Disability Status:
- Residents with a disability. This includes any type of disability, as defined by the U.S. Census Bureau, which includes six types of disabilities: hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty.

Educational Attainment:
- Residents with less than a high school-level education

Nativity and Citizenship Status:
- Residents who are foreign-born
- Residents who are not U.S. citizens

Race and Ethnicity:

- Residents who identify as Hispanic/Latino

- Residents who identify as Black, non-Hispanic

- Residents who identify as White, non-Hispanic

Income:

- Median Family Income

- Households that received Supplemental Nutrition Assistance Program (SNAP) benefits in the previous 12 months

- Residents who are unemployed

For detailed definitions of the community characteristics included in this publication, see the **technical appendix**.

ACS data is presented at the ZIP Code tabulation area (ZCTA, pronounced *zik-tah*) level throughout this report. ZCTAs are a geographic product of the U.S. Census Bureau created to allow mapping, display, and analysis of the U.S. Postal Service (USPS) Zone Improvement Plan (ZIP) Codes dataset.[2] ZIP Codes available in TME data were linked to ZCTAs available in the ACS data to apply a community lens to TME spending patterns. For more information on ZCTAs and CHIA's approach to linking these data sets, see the **technical appendix**.

Methodology

TME data, which represents Massachusetts residents with private commercial or commercially managed MassHealth coverage, was linked with ACS 5-year estimates for calendar year (CY) 2023. Medical spending data reported to CHIA at the member ZIP Code level was first converted to ZCTA, then linked with ACS population demographic data. This analysis allowed CHIA to assess correlations between population characteristics (such as median family income, race, ethnicity, citizenship, and nativity) and aggregate PMPM medical claims spending overall and by TME service category.

Throughout this report, "correlations" refer to the relationship between 2 variables; when both variables increase or decrease in the same direction, this is considered a positive correlation. Conversely, a negative correlation refers to a relationship wherein one variable increases as another decreases. When plotting observed data points on a scatterplot, 2 perfectly correlated variables would be represented with a linear trend line. However, real-world scenarios rarely provide instances of perfect correlation, so a "line of best fit" is utilized instead. A strong correlation means that the data points are

closely clustered around the line of best fit while a weak correlation indicates that the data points are more scattered.

To quantify the strength of 2 variables' correlation, this report uses Pearson's correlation coefficient, or *r*. The *r* value can range from -1 to 1, with -1 being a perfectly linear negative correlation and 1 being a perfectly linear *positive correlation*. If the *r* value is 0, there is no correlation. The focus of this analysis is on the variables with non-negligible correlation values (*r* value greater than or equal to 0.30 or less than or equal to -0.30).[3,4,5,6] This report's correlation results reflect statistically significant findings ($p<0.05$) but may not necessarily reflect strong correlation values. *R* values for results displayed in this report and marked as correlations range from absolute values of 0.30 to 0.76.

R Value	Correlation Indication
-1	Perfectly linear negative correlation
-0.30	Minimum negative correlation for report inclusion
0	No relationship
0.30	Minimum positive correlation for report inclusion
1	Perfectly linear positive correlation

Please see the **databook** for more detailed correlation statistics. For a more comprehensive view of the data and related metrics, explore CHIA's **interactive dashboard with demographic data at the community level** (municipality and ZIP Code Tabulation Area [ZCTA]).

Correlation Between Access Characteristics and Medical Spending

English Language Proficiency

Communication is a key factor that determines a resident's effective access to medical care, so much so that in most health care settings, interpreters are required to be provided to facilitate communication between patients with low English

proficiency and their medical providers.[7,8] A recent study based on data from the 2021 National Survey of Children's Health found that children in Spanish-speaking households reported utilizing fewer health services, particularly specialty and school-based care.[9] In 2023, communities with higher proportions of residents who spoke English well tended to have higher PMPM spending on member cost-sharing. Additionally, communities with higher proportions of residents who speak English well correlated with higher physician services spending PMPM. Communities with higher proportions of residents who do not speak English well tended to have lower PMPM spending for physician services, member cost-sharing, and total medical expenses.

Hospital inpatient, hospital outpatient, and other professional services had no observable correlation with communities' English-proficiency levels.

Resources

Household amenities such as high-speed internet, personal transportation, and digital devices can have a positive impact on access to health care services. Research has shown that broadband internet access enables communities to choose higher quality providers and utilize telehealth services.[10,11] The relationship between medical spending and community-level access to household resources differed by the type of medical service. Among communities with greater proportions of households with internet access, car access, or computer access, physician spending and member cost-sharing PMPM tended to be higher. Household access to the internet, a car, or a computer had no observable relationship with other professional or total medical PMPM spending.

Health Insurance Status

Health insurance status affects a community member's access to health care as uninsured members are less likely to have a primary care provider and may delay care due to costs.[12] Communities with higher proportions of residents who had no health insurance tended to have lower levels of physician spending and member cost-sharing PMPM. There was no observable relationship between community-level uninsurance rates and all remaining medical spending categories, including total medical PMPM spending.

More Context:
The number of primary care providers in a geographic region may affect an individual's or family's ability to access primary care services. In Massachusetts, the average number of primary care providers per county ranged from 0.8 providers to 5.7 providers per 1,000 residents. **Explore more in the accompanying interactive dashboard**.

Characteristic Type	Community Characteristic	Physician PMPM	Other Professional PMPM	Hospital Inpatient PMPM	Hospital Outpatient PMPM	Total Hospital PMPM	Member Cost-Sharing PMPM	Total Medical Expenses PMPM
Access: English Language Proficiency	Residents who do not speak English well	▼	—	—	—	—	▼	▼
	Residents who speak English well	▲	—	—	—	—	▲	—
	Residents who speak only English	—	—	—	—	—	▲	—
Access: Health Insurance Status	Residents with no health insurance	▼	—	—	—	—	▼	—
Access: Resources	Households with internet access	▲	—	—	—	—	▲	—
	Households with car access	▲	—	—	—	—	▲	—
	Households with computer access	▲	—	—	—	—	▲	—

Source: 2023 American Community Survey (ACS) data, payer-reported total medical expenses (TME) data to CHIA.

Notes: TME data reflects spending by commercial full-claim and MassHealth ACPP/MCO plans. Commercial full-claim data represents members for whom payers can access and report on all claims expenses, representing 63.7% of total commercial member months in 2023. According to CHIA's September 2025 **Enrollment Trends** report, MassHealth ACPP/MCO plans accounted for 56.0% of all MassHealth membership in December 2023. Spending for all service categories calculated on a per member per month (PMPM) basis. The strong correlation results (r≥0.30) shown here reflect statistically significant findings (p<0.05). See **databook** for more detailed correlation statistics.

KEY
▲ Strong positive correlation
▼ Strong negative correlation
— No correlation (r<0.30)

Correlation Between Demographic Characteristics and Medical Spending

Age

Residents' age is reported in 2 categories within this publication: 18 to 64 years and 65+ years. Communities with a greater proportion of individuals ages 18 to 64 tended to spend less on total medical PMPM, hospital outpatient PMPM, total hospital PMPM, physician PMPM, and member-cost sharing PMPM. Conversely, communities with a greater proportion of individuals age 65+ tended to have higher PMPM spending on hospital outpatient, total hospital, and member cost-sharing. While adults 65+ typically have more health care needs, they may also have higher financial insecurity. In a 2025 survey of Massachusetts residents, a greater proportion of adults 65+ reported spending a high share of family income on out-of-pocket health care spending compared to adults below age 64.[13] Community-level age demographics had no observable correlation with hospital inpatient and other professional spending.

> **More Context:**
> According to results from the **2025 Massachusetts Health Insurance Survey (MHIS)**, 22.6 percent of residents reported a visit to the emergency department in the past 12 months; nearly a third of these residents reported that their most recent visit was for a non-emergency condition that could have been treated at their usual source of care.

Disability Status

A disability is defined as a long lasting physical, mental, or emotional condition that can make it difficult for a person to do activities such as walking, dressing, or learning.[14] Individuals with disabilities report experiencing systemic barriers to accessing health care, such as insurance coverage challenges and navigating communication issues with providers, which can influence the quality of care they receive and their overall health.[15,16] Communities with higher proportions of residents with a disability correlated with lower physician spending PMPM and member cost-sharing PMPM. There was no observable correlation between community-level disability status and hospital, other professional, and total medical spending.

Educational Attainment

Educational attainment refers to the highest level of education that an individual has completed.[17] Educational attainment has been reported to influence health disparities with adults with a high school degree or less face worse health outcomes than their

college-educated counterparts.[18,19] Communities with a higher proportion of residents who had less than a high school-level education correlated with lower total medical, physician, and member cost-sharing PMPM spending. There was no observable correlation with other professional or hospital-related PMPM spending.

Nativity and Citizenship Status

Nationally, noncitizen immigrants are more likely to experience barriers to accessing health care.[20] Immigrants, both noncitizen and citizen, on average tend to have lower health expenditures than U.S.-born residents.[21] Communities with higher proportions of foreign-born residents correlated with lower member cost-sharing PMPM. There was no observable relationship between communities with a higher proportion of foreign-born residents and PMPM spending in other medical spending categories.

Communities with a higher proportion of non-U.S. citizens tended to have lower total medical PMPM spending, as well as lower physician and member cost-sharing PMPM spending. There was no relationship observed between communities with a higher proportion of non-U.S. citizens and other professional or hospital-related PMPM spending.

Race and Ethnicity

Race and ethnicity are reported for 3 categories: residents identifying as Hispanic/Latino, residents identifying as non-Hispanic Black, and residents identifying as non-Hispanic White.[22] Research suggests that on average, health care spending is generally higher for individuals that self-identify as White, than for individuals of other race groups.[23] Communities with higher proportions of residents identifying as Hispanic/Latino tended to have lower total medical, physician, and member cost-sharing PMPM spending. Communities with higher proportions of residents identifying as non-Hispanic Black also tended to have lower physician spending and member cost-sharing PMPM, while the opposite trend was seen in communities with higher proportions of residents identifying as non-Hispanic White. There was no correlation observed between the racial and ethnic composition of a community and hospital and other professional spending.

Characteristic Type	Community Characteristic	Physician PMPM	Other Professional PMPM	Hospital Inpatient PMPM	Hospital Outpatient PMPM	Total Hospital PMPM	Member Cost-Sharing PMPM	Total Medical Expenses PMPM
Age	Ages 18-64 years	▼	—	—	▼	▼	▼	▼
	Age 65+ years	—	—	—	▲	▲	▲	—
Disability Status	Residents with a disability	▼	—	—	—	—	▼	—
Educational Attainment	Residents with less than a high school-level education	▼	—	—	—	—	▼	▼
Nativity and Citizenship Status	Residents who are foreign-born	—	—	—	—	—	▼	—
	Residents who are not U.S. citizens	▼	—	—	—	—	▼	▼
Race and Ethnicity	Residents identifying as Hispanic/Latino	▼	—	—	—	—	▼	▼
	Residents identifying as Black, Non-Hispanic	▼	—	—	—	—	▼	—
	Residents identifying as White, Non-Hispanic	▲	—	—	—	—	▲	—

Source: 2023 American Community Survey (ACS) data, payer-reported total medical expenses (TME) data to CHIA.

Notes: TME data reflects spending by commercial full-claim and MassHealth ACPP/MCO plans. Commercial full-claim data represents members for whom payers can access and report on all claims expenses, representing 63.7% of total commercial member months in 2023. According to CHIA's September 2025 **Enrollment Trends** report, MassHealth ACPP/MCO plans accounted for 56.0% of all MassHealth membership in December 2023. Spending for all service categories calculated on per member per month (PMPM) basis. The strong correlation results (r≥0.30) shown here reflect statistically significant findings (p<0.05). See **databook** for more detailed correlation statistics.

KEY
▲ Strong positive correlation
▼ Strong negative correlation
— No correlation (r<0.30)

Correlation Between Income Characteristics and Medical Spending

Median Family Income

Although Massachusetts boasts the highest rate of health insurance coverage in the nation, Massachusetts families and individuals continue to report issues with affording health care. More specifically, those with a family income below 400 percent of the federal poverty level (FPL) ($120,000 annually for a family of 4 in 2023) are disproportionately burdened, and are more likely to forgo necessary health care due to cost.[24,25] In 2025, 29.1% of Massachusetts residents between 300 and 399% of the FPL had forgone care due to cost. This percentage only increased for those between 139 and 299% FPL (39.7%) and less than 139% FPL (34.3%).[26]

In 2023, the state median family income was just above $128,000. Within individual communities, the median family income ranged from $22,000 to over $250,000. The correlation of median family income with community spending trends differed by medical spending category. Communities with a higher median family income tended to have higher levels of physician, other professional, total medical, and member cost-sharing PMPM spending.

Financial Assistance

In Massachusetts, 2 in 5 residents reported they or a family member experienced issues affording health care in 2025.[27] As Massachusetts health care costs continue to rise faster than regional inflation and wages and salaries, households with lower income may continue to face challenges with affording health care.[28] Moreover, the rising cost of other basic household necessities, like food expenditures, can further strain household budgets. To ease this burden, federal and state programs exist to provide financial assistance to eligible households, such as the Supplemental Nutrition Assistance Program (SNAP).[29] Communities with higher proportions of households that received Supplemental Nutrition Assistance Program (SNAP) benefits in the previous 12 months tended to have lower physician spending and member cost-sharing PMPM.

Employment Status

Employment is one of the most common avenues for individuals and families to access health care coverage with nearly 4 million members enrolled in an employer-sponsored insurance plan in 2023.[30] As a result, losing employment may affect individuals' and

families' abilities to both access and afford health care services, in addition to the social and psychological outcomes associated with unemployment.[31,32,33] Analysis of the relationship between community-level unemployment and medical spendings suggests that communities with higher proportions of unemployed residents tended to have lower physician spending PMPM.

More Context:
Massachusetts professional physician spending averaged $143 PMPM for commercial members and $50 PMPM for Medicaid ACPP/MCO members. By region, Western Massachusetts had the lowest commercial average ($105 PMPM) and the Cape and Islands had the lowest Medicaid ACPP/MCO spending ($41 PMPM). **Explore more in the accompanying interactive dashboard**.

Characteristic Type	Community Characteristic	Physician PMPM	Other Professional PMPM	Hospital Inpatient PMPM	Hospital Outpatient PMPM	Total Hospital PMPM	Member Cost-Sharing PMPM	Total Medical Expenses PMPM
Income	Median family income	▲	▲	—	—	—	▲	▲
	Households that received SNAP benefits in the previous 12 months	▼	—	—	—	—	▼	—
	Residents who are unemployed	▼	—	—	—	—	—	—

Source: 2023 American Community Survey (ACS) data, payer-reported total medical expenses (TME) data to CHIA.

Notes: TME data reflects spending by commercial full-claim and MassHealth ACPP/MCO plans. Commercial full-claim data represents members for whom payers can access and report on all claims expenses, representing 63.7% of total commercial member months in 2023. According to CHIA's September 2025 **Enrollment Trends** report, MassHealth ACPP/MCO plans accounted for 56.0% of all MassHealth membership in December 2023. Spending for all service categories calculated on per member per month (PMPM) basis. The strong correlation results (r≥0.30) shown here reflect statistically significant findings (p<0.05). See **databook** for more detailed correlation statistics.

KEY
▲ Strong positive correlation
▼ Strong negative correlation
— No correlation (r<0.30)

Report Notes

1. Center for Health Information and Analysis, "Enrollment in Health Insurance," accessed February 5, 2026, (Boston, September 2025), **https://www.chiamass.gov/enrollment-in-health-insurance**.

2. United Status Census Bureau, "ZIP Code Tabulation Areas (ZCTA)," accessed February 5, 2026, **https://www.census.gov/programs-surveys/geography/guidance/geo-areas/zctas.html**.

3. Thresholds for meaningful correlation will vary widely by the field of study. The social sciences tend to have lower thresholds.

4. K. K. V. Mate, D. M. Bushnell, M. Anatchkova, J. Martin-Delgado, O.M.Y. Ahmed, V. Williams, and C. Daskalopoulou, "What is with all these different correlation thresholds?" *Quality of Life Research* 31: S42-S42, **https://www.rti.org/publication/what-all-these-different-correlation-thresholds**.

5. Kozak, Marcin, "What Is Strong Correlation?" *Teaching Statistics* 31, no. 3 (2009): 85–86, **https://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2009.00387.x**.

6. Center for Improving Value in Health Care, "Health Equity Analysis", accessed February 3, 2026, **https://civhc.org/get-data/public-data/health-equity-analysis/#**.

7. Office of Health Equity and Community Engagement, "Learn about your right to an interpreter," accessed February 5, 2026, **https://www.mass.gov/info-details/learn-about-your-right-to-an-interpreter**.

8. KFF, "Overview of Health Coverage and Care for Individuals with Limited English proficiency," accessed February 5, 2026, **https://www.kff.org/racial-equity-and-health-policy/overview-of-health-coverage-and-care-for-individuals-with-limited-english-proficiency/**.

9. Lauren E Zaylskie, Joseph S Zickafoose, Ashley A Leech, Bruce Jennings, Natalie M Curcio, Kevin N Griffith, "Health Care Access, Utilization, and Quality for Children in English versus Spanish-Speaking Households," *Health Affairs Scholar* 3, No. 3 (2025), **https://doi.org/10.1093/haschl/qxaf039**.

10. Jessica Van Parys, and Zach Y. Brown, "Broadband Internet Access and Health Outcomes: Patient and Provider Responses in Medicare," *National Bureau of Economic Research* 31579 (2023), **https://www.nber.org/papers/w31579**.

11. Stephen A. Rains, "Health at High Speed: Broadband Internet Access, Health Communication, and the Digital Divide," *Communication Research* 35, no. 3 (2008): 283–297, **https://journals.sagepub.com/doi/10.1177/0093650208315958**.

12. Office of Disease Prevention and Health Promotion, "Health Care Access and Quality," accessed February 4, 2026, **https://odphp.health.gov/healthypeople/objectives-and-data/browse-objectives/health-care-access-and-quality**.

13. Center for Health Information and Analysis, *Findings From the 2025 Massachusetts Health Insurance Survey* (Boston, December 2025), **https://www.chiamass.gov/assets/docs/r/survey/MHIS-2025/2025-MHIS-Report.pdf**.

14. United States Census Bureau, "Glossary of Terms," accessed February 5, 2026, **https://www.census.gov/glossary/?term=Disability**.

15. University of Michigan Institute for Healthcare Policy & Innovation, "Health Care Access Gaps for People With Disabilities: Insights From IHPI Research," accessed February 5, 2026, **https://ihpi.umich.edu/news-events/news/health-care-access-gaps-people-disabilities-insights-ihpi-research?pk_vid=9bed99b9b0c097b31770302162607368**.

16. United States Government Accountability Office, "Further Efforts Needed to Address Barriers for People with Disabilities," accessed February 5, 2026, **https://files.gao.gov/reports/GAO-26-107120/index.html?_gl=1*1nqeh0u*_ga*MTQ5MTc2NTE3Ny4xNzcwMzAxODYw*_ga_V393SNS3SR*czE3NzAzMDE4NjAkbzEkZzAkdDE3NzAzMDE4NjAkajYwJGwwJGgw#_Toc216873937**.

17. United States Census Bureau, "Educational Attainment," accessed February 5, 2026, **https://www.census.gov/topics/education/educational-attainment.html**.

18. Jacob H. Bor, David M. Cutler, Edward L. Glaeser, and Ljubica Ristovska, "Human Capital Spillovers and Health: Does Living Around College Graduates Lengthen Life?," *National Bureau of Economic Research Working* Paper 32346 (2024), **https://doi.org/10.3386/w32346**.

19. McMorrow, Stacey, Lukasz Skopec, and Timothy W. Thomas. "Education and Health: Long-Term Trends by Race, Ethnicity, and Geography, 1997–2017," *Urban Institute and Robert Wood Johnson Foundation* (2016), **https://www.rwjf.org/en/insights/our-research/2019/05/education-and-health-long-term-trends-by-race-ethnicity-and-geography.html**.

20. Leighton Ku, "Health Insurance Coverage and Medical Expenditures of Immigrants and Native-Born Citizens in the United States," *American Journal of Public Health* 99 (2009): 1322–1328, **https://doi.org/10.2105/AJPH.2008.144733**.

21. KFF, "Key Facts on Health Coverage of Immigrants," accessed February 5, 2026, **https://www.kff.org/racial-equity-and-health-policy/key-facts-on-health-coverage-of-immigrants/**.

22. Although the ACS publishes data on many ethnic and racial populations, this analysis presents the 3 population groups that correlated with at least one medical spending category (Hispanic/Latino; White, Non-Hispanic; and Black, Non-Hispanic).

23. Dieleman JL, Chen C, Crosby SW, et al. US Health Care Spending by Race and Ethnicity, 2002-2016. JAMA. 2021;326(7):649–659. **https://jamanetwork.com/journals/jama/fullarticle/2783068**.

24. See note 13.

25. Income limit for 400% FPL for a family of four is calculated by multiplying the 2023 poverty guideline (for the 48 contiguous states and the district of Columbia) for a family of four by 4.
Federal Register, Annual Update of the HHS Poverty Guidelines, accessed February 4, 2026, **https://www.federalregister.gov/documents/2023/01/19/2023-00885/annual-update-of-the-hhs-poverty-guidelines**.

26. See note 13.

27. Ibid.

28. Center for Health Information and Analysis, *2025 Annual Report on the Performance of the Massachusetts Health Care System* (Boston, March 2025), **https://www.chiamass.gov/assets/2025-annual-report/2025-Annual-Report.pdf**.

29. Massachusetts households may receive benefits from the Supplemental Nutrition Assistance Program (SNAP) depending on several eligibility requirements, including income limits. In general, eligible households earn less than 200% of the Federal Poverty Level (FPL) before taxes, or less than 165% of the FPL before taxes if all members of the household are disabled or 65 years or older.

30. See note 28.

31. Office of Disease Prevention and Health Promotion, "Employment - Healthy People 2023," accessed February 10, 2026, **https://odphp.health.gov/healthypeople/priority-areas/social-determinants-health/literature-summaries/employment**.

32. Matteo Picchio, Michele Ubaldi, "Unemployment and health: A meta-analysis," J*ournal of Economic Surveys*. 2023; 38: 1437-1472. **https://doi.org/10.1111/joes.12588**.

33. Sharon R. Silver, Jia Li, Brian Quay, "Employment status, unemployment duration, and health-related metrics among US adults of prime working age: Behavioral Risk Factor Surveillance System, 2018-2019," *American Journal of Industrial Medicine*. 2022; 65: 59-71. **https://pubmed.ncbi.nlm.nih.gov/34748231/**.