

The Time Is Now: The \$5.9 Billion Case for Massachusetts Health Equity Reform

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Darrell J. Gaskin, PhD
Thomas A. LaVeist, PhD
Ani Turner, MA
Samuel Obbin, MS

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Filaine Deronnette
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Lumas Helaire, MS, PhD
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Lindsey Tucker, MS
Health Equity Compact



A message from the Health Equity Compact:

A significant hurdle in tackling health inequities and the subsequent disparities lies in the historical inadequacy of available data to fully comprehend the extent and impact of the problem. This analysis is helpful in revealing the broader consequences of health inequities to all, and a motivation for leaders in both the public and private sectors to initiate proactive measures.

The Health Equity Compact would like to underscore the notion that Massachusetts faces a choice to “pay now or pay greater later,” as demonstrated by this report, which highlights the unacceptable cost being paid by communities of color and ultimately borne by businesses and the Commonwealth. In response to this data, our charge is to effect meaningful change!

Also, special thanks to Sharon Long, PhD, consultant to the Foundation for providing subject matter expertise and methodological guidance on this project. In addition, thanks to Donna Latson Gittens, Ashley Rappa, and Michael Tiedemann of MORE Advertising for their communications support.

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BACKGROUND

Health is fundamental to our quality of life and our ability to participate fully at home, at school, in the workplace, and in our community. But not everyone has the same opportunity for good health. While genetics play a role, one's environment, life circumstances, and access to needed health care services also play a significant role in lifetime health.¹ In Massachusetts, as in all of the nation, health status and the factors that influence health vary substantially by race, ethnicity, socioeconomic status (including education, income, and occupation), and geography, among other factors, causing some groups to experience more illness and disability and have a greater chance of premature death than others. Disparities in health by race and ethnicity are especially persistent and derive from the legacy effects of generations of disadvantage as well as ongoing structural racism and discrimination that is embedded in the political, economic, housing, health care, and criminal justice systems.

Many in Massachusetts feel a moral imperative to correct these racial and ethnic health disparities and see the opportunity to be a leader on this issue as the state has been in other health reform initiatives. The Commonwealth took the lead in expanding health insurance coverage, with more than 97 percent of the population covered by health insurance, the highest rate of coverage in the nation.² The Massachusetts Health Policy Commission was the first state effort to set benchmarks for state health care cost growth and to gather stakeholders to advance health care affordability, a model many states have since followed.³ The Commonwealth consistently scores highly in national rankings of average health status and health outcomes.⁴ These successes, while significant, have not narrowed persistent disparities in health outcomes. The COVID-19 pandemic and the associated disparities in rates of COVID-19 infection, hospitalization, and death highlighted the tragic impact of these disparities and catalyzed recent calls to action from the Massachusetts Attorney General's Office and the Massachusetts Health Equity Task Force to address health disparities and advance health equity in the Commonwealth.⁵

Achieving health equity means the opportunity for the highest level of health is available to all—and does not depend on characteristics such as race, ethnicity, social or economic status, or geographic location. Some people will still be healthier than others, but on average, groups with particular demographic characteristics will not be significantly better or worse off than other groups. To achieve health equity, underlying health disparities by race and ethnicity must be addressed.

Strategies for reducing disparities in health by race and ethnicity will need to include addressing unequal treatment by providers, making environments such as homes and neighborhoods healthier, and closing the remaining gaps in access to health care, including developing a health care workforce that reflects the diversity of the state and demonstrates the cultural responsiveness necessary to serve all residents effectively. But these strategies will require investments of time and resources for which there will always be competing priorities. In understanding the value of investments in health, it is important to recognize that in addition to the human toll, inequities in health represent a significant economic burden that reaches beyond the health and health care system to individuals and families, public and private sector stakeholders, and the overall Massachusetts economy. This study aims to quantify that economic burden in Massachusetts.

DEFINING HEALTH EQUITY AND HEALTH DISPARITY

There is not a standardized set of health equity terminology. This is a persistent barrier to understanding, effectively communicating about, and developing solutions to address racial and ethnic inequities and disparities in health.* This report uses the following definitions, derived from Healthy People 2030:

Health equity is the attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally, with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities.

Health disparity is a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.¹

* Office of Disease Prevention and Health Promotion (2022, March). *Health Equity and Health Disparities Environmental Scan*. <https://health.gov/sites/default/files/2022-04/HP2030-HealthEquityEnvironmentalScan.pdf>.

¹ U.S. Department of Health and Human Services. *Health Equity in Healthy People 2030*. <https://health.gov/healthypeople/priority-areas/health-equity-healthy-people-2030>.

METHODS AND APPROACH

MODELING OVERVIEW

This work was commissioned by the Blue Cross Blue Shield of Massachusetts Foundation (the Foundation) in collaboration with the Health Equity Compact.⁶

The models used to estimate the economic burden of health inequities were pioneered more than 15 years ago by the study's lead researchers. The models recently underwent a comprehensive review and update under a grant from the National Institute on Minority Health and Health Disparities, with results published in the *Journal of the American Medical Association (JAMA)*.⁷ Using this well-established modeling framework, the authors customized the models, the approach, and the health equity goals applied in that study to Massachusetts.⁸ This analysis uses a health equity framework, identifying the optimal level of health for *all* racial and ethnic groups and then measuring the gap between that goal (referred to as the "health equity targets") and current levels of health. Because populations of color⁹ in Massachusetts bear a disproportionate burden of health inequities driven by poorer health and a disproportionate burden of disease, and for the Black population, also a disproportionate burden of premature death (see Exhibit 4), this report focuses particularly on the health inequities faced by populations of color. Reflecting the overall equity framework, for this Massachusetts specific analysis, we also provide the economic burden associated with all major racial and ethnic groups since the White population represents almost 70 percent of the total population in the Commonwealth.¹⁰

The comparison of the current prevalence of health conditions with the health equity target rates was conducted for seven adult age groups and sex and across 13 broad measures of physical and mental health.¹¹ Comparisons of mortality (death) to the health equity target rates were specific to nine age groups of children and adults. A detailed description of the data and methods applied in this study is provided in the Appendix.

TYPES OF ECONOMIC BURDEN

Increased disease and disability and shorter lifespans create burdens that are felt first by the individuals affected and second by all Massachusetts residents and the Massachusetts economy. This study measured three types of economic burden: (1) higher health care spending that arises due to poor health ("avoidable health care spending"), (2) higher costs of doing business due to the impacts of higher rates of poor health on labor productivity ("lost labor productivity"), and (3) an economic valuation of lost life due to premature death.

This study measured the economic burden of inequities in health by comparing health care spending, labor productivity, and premature death associated with the current health of the Commonwealth population, by major racial and ethnic groups, to these three outcomes if all groups in Massachusetts achieved the identified health equity targets for health status and mortality. The major racial and ethnic groups representing populations of color were Black, Hispanic/Latino, and Asian.¹² Estimates are also provided for the White population. It should be noted that the estimates in this study represent a conservative measure of the economic burden of racial and ethnic health inequities in Massachusetts. Also, this analysis specifically focused on assessing costs of racial and ethnic health inequities; the data used in this study did not allow for consideration of how these inequities might be compounded, for example, for the LGBTQ+ community, or for other marginalized groups.

THE HEALTH EQUITY COMPACT

The Health Equity Compact is a group of more than 70 leaders of color from a diverse set of Massachusetts organizations who aim to advance health equity in the state.

For more information, see: <https://healthequitycompact.org/>.

SETTING HEALTH EQUITY TARGETS FOR MASSACHUSETTS MODELING

The health equity targets set for **health status** were the predicted prevalence rates for the top 10th percentile of U.S. states for each of the 13 health conditions and 14 age/sex groups studied. See the Appendix for more details on how these targets were generated.

The health equity targets for **mortality** were the mortality rates for the top performing state in the United States, specific to each of the nine age groups. For example, the health equity target mortality rate for people aged 35 through 39 was the rate achieved by the state that had the lowest mortality rate for this age group.

The health equity targets that were set for this study represent ambitious but feasible targets in that these health outcomes are already being achieved within other states.

WHY IS THIS A CONSERVATIVE ESTIMATE?

The estimates in this study represent a conservative measure of the economic burden of racial and ethnic health inequities in that they reflect gaps in health across many but not all health conditions and do not capture gaps in health status for children (where data are more limited). In addition, the labor productivity burdens are estimated for those of prime working age, ages 25 through 64, so do not include any productivity burdens associated with workers younger or older than this age range. Finally, using Massachusetts data to estimate model parameters better captured Massachusetts-specific relationships between health and other outcomes but precluded modeling the economic burden associated with racial and ethnic groups with smaller population sizes, including American Indians and Alaska Natives, Native Hawaiians and Pacific Islanders, and people of more than one race. While these groups together represent only about two percent of the current Massachusetts population, it is worth noting that other studies point to significant burdens for these groups when measured on a per resident basis.

SOURCE: LaVeist TA, Pérez-Stable EJ, Richard P, et al. The Economic Burden of Racial, Ethnic, and Educational Health Inequities in the US. *JAMA*. 2023;329(19):1682–1692. doi:10.1001/jama.2023.5965.

FINDINGS

DISPROPORTIONATE IMPACT ON POPULATIONS OF COLOR

Populations of color in Massachusetts (and elsewhere) are disproportionately affected by factors referred to as social drivers, or social determinants, of health—housing instability, food insecurity, environmental toxins and stressors, and higher rates of poverty—as a result of longstanding systemic racism in social and economic structures, policies, and practices.¹³ There is evidence that populations of color still experience less access to health coverage and care (e.g., lower levels of insurance coverage, more difficulties finding providers who will see them, more unmet need) and differences in the quality of care received (e.g., less likely to receive pain medications). There are also differences in the experience of care delivery, including legacy effects of mistrust in the health care system due to historical and systemic racism and experiences of continued lack of respect and breaches of trust reported by many.¹⁴

Given the importance of these factors in influencing health, it is not surprising that recent measures of health in Massachusetts reveal disparities by race and ethnicity. For example, with respect to racial and ethnic disparities in Massachusetts:¹⁵

- Black and Hispanic/Latino residents report poorer health status and poorer mental health status than White residents.
- Rates of both pregnancy-associated mortality and severe maternal morbidity are higher for Black residents compared to White, Hispanic/Latino, and Asian residents.
- Black and Hispanic/Latino residents have substantially higher infant mortality rates than White and Asian residents.
- Black and Hispanic/Latino residents report higher rates of diabetes and asthma than do White residents.

These and additional measures from other studies indicate that populations of color bear a disproportionate burden of health disparities driven by their disproportionate burden of disease and poorer health relative to the White population. Therefore, the focus of this study was on estimating the impacts of health inequities on populations of color in Massachusetts. For context and completeness, and as health inequities may be experienced based on income, socioeconomic status, or other characteristics across all racial and ethnic groups, economic burden estimates were also computed for the White population in Massachusetts wherever the health of that group fell below the health equity targets.

THE COST OF HEALTH INEQUITIES EXPERIENCED BY POPULATIONS OF COLOR IN MASSACHUSETTS IS \$5.9 BILLION EACH YEAR

The cost of health inequities experienced by Black, Hispanic/Latino, and Asian populations in Massachusetts total \$5.9 billion each year. Among these populations, about one-quarter of the total economic burden is associated with the cost of **avoidable health care spending due to poorer health (\$1.5 billion)**, roughly another quarter is associated with the **cost of lost labor productivity due to poorer health (\$1.4 billion)**, and just over half of the economic burden of health inequities is associated with the **cost of premature death (\$3.0 billion)**.

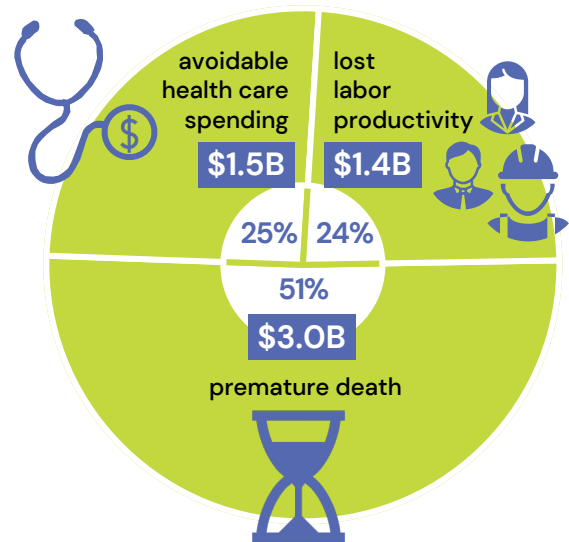
Higher rates of disease and disability in a population require more health care services to treat those conditions and thus result in higher health care spending. By computing the gap between health care spending under the current health status for Massachusetts adults and health care spending if populations of color achieved the health equity target health status, we estimated that avoidable health care spending due to health inequities is **\$1.5 billion each year**, or about 2 percent of total Massachusetts annual health spending.¹⁶

Working age adults (aged 25 to 64) who are less healthy tend to work fewer hours, take more sick days, and tend to be less productive on the job. By comparing productivity outcomes given the current health status of working age populations of color with the outcomes if these populations achieved the health equity target health status, we estimated that health inequities experienced by populations of color today cost Massachusetts **\$1.4 billion each year** in lost labor productivity across industries.¹⁷ Based on this economic burden estimate, the potential gain in labor of achieving health equity for populations of color in Massachusetts corresponds to approximately 27,000 additional full-time workers every year.¹⁸

Finally, by comparing current mortality rates by race and ethnicity at each age with the health equity targets for mortality at each age (based on the lowest mortality rate in the top performing state), we found that health inequities are estimated to lead to premature death for Massachusetts residents of all ages. To convert that number of premature deaths to the associated economic burden, the number of years of life that were lost due to premature death was computed as the difference between the age of premature death and the 2019 U.S. life expectancy of age 79.¹⁹ For example, each premature death occurring in infancy corresponded to 79 lost life years, while each premature death occurring at age 44 corresponded to 35 lost life years. By using a conservative estimate of \$100,000 in economic value for every year of life lost to premature mortality (which is consistent with the cost-effectiveness literature),²⁰ we estimated that premature death among populations of color in Massachusetts cost the state **\$3.0 billion each year**.

The racial and ethnic composition of the Massachusetts population is expected to change significantly over the next 30 years. Therefore, if action is not taken to address health inequities, **the economic burden of health inequities experienced by populations of color in Massachusetts will almost double by 2050, from \$5.9 billion today to \$11.2 billion.**

EXHIBIT 1. ECONOMIC BURDEN OF HEALTH INEQUITIES FOR POPULATIONS OF COLOR IN MASSACHUSETTS, \$5.9 BILLION



THE ECONOMIC BURDEN OF HEALTH INEQUITIES IMPACTS ALL RACIAL AND ETHNIC GROUPS IN MASSACHUSETTS

Exhibit 2 shows the dollar amounts of the estimated economic burden of health inequities broken out by type of burden within each of the major racial and ethnic groups in Massachusetts, including the three populations of color and the White population. These data incorporate the size of the Massachusetts population by race and ethnicity. Since the Massachusetts population is nearly 70 percent White, it is not surprising that the total costs within the White population were significantly larger than those for other groups across all types of economic burden.²¹ At the same time, these numbers obscure underlying racial and ethnic health disparities (this is explained in more detail below).

EXHIBIT 2. ECONOMIC BURDEN OF RACIAL AND ETHNIC HEALTH INEQUITIES IN MASSACHUSETTS (MILLIONS OF 2022 DOLLARS)

TYPE OF ECONOMIC BURDEN	ASIAN	BLACK	HISPANIC/ LATINO	TOTAL FOR POPULATIONS OF COLOR	WHITE	TOTAL FOR ALL GROUPS
Avoidable Health Care Spending (for Adult Residents)	\$72	\$772	\$623	\$1,467	\$3,602	\$5,069
Lost Labor Productivity (for Working Age Residents)	\$309	\$192	\$911	\$1,411	\$1,924	\$3,335
Premature Death (for All Residents)	**	\$1,915	\$1,100	\$3,015	\$12,067	\$15,082
Total Economic Burden (for All Residents)	\$380	\$2,879	\$2,634	\$5,893	\$17,592	\$23,485

**Mortality rates for the Asian population in Massachusetts were below the health equity target rates for each age group so no economic burden due to premature death was estimated for this group. For all other racial and ethnic groups, there is at least one age group that did not reach the national benchmark mortality rate, resulting in an economic burden associated with premature death for that racial and ethnic group.

NOTE: Estimates are shown to the nearest dollar; rows or columns may not sum due to rounding.

Of the \$5.9 billion in economic burden associated with health inequities for populations of color, just under half (49%) was due to health inequities experienced by the Black population, another 44 percent by the Hispanic/Latino population, and about 6 percent by the Asian population in Massachusetts.

The economic burden of health inequities associated with the White population in Massachusetts was estimated to be \$17.6 billion, of which two-thirds (\$12.1 billion) was associated with premature death.

The burden of avoidable health care spending across all racial and ethnic groups was \$5.1 billion, or about 7 percent of all Massachusetts health care spending. The total burden of lost labor productivity across all racial and ethnic groups was \$3.3 billion, corresponding to about 64,000 full-time equivalent workers. The economic burden associated with premature death across all racial and ethnic groups was \$15.1 billion. Across all types of burden and all major racial and ethnic groups, the economic burden of health inequities was estimated at \$23.5 billion.

The size of the total economic burden for each racial and ethnic group shown in Exhibit 2 depends on both the health inequities being experienced by that group and the size of the population in each group. To illustrate the *relative* burden of health inequities within each racial and ethnic group, we divided the burden estimates within each racial and ethnic group in Exhibit 2 by the number of Massachusetts residents in that racial and ethnic group to compute the economic burden on a per resident basis (Exhibit 3).

These per resident estimates do not represent the share of total economic costs borne by individuals, but rather the societal costs associated with health inequities within each racial and ethnic group expressed **on an average per resident basis** for that group. Examining the economic burden per resident within each racial and ethnic group highlights the groups that are disproportionately impacted by health inequities.

EXHIBIT 3. ECONOMIC BURDEN OF RACIAL AND ETHNIC HEALTH INEQUITIES IN MASSACHUSETTS COMPUTED PER RESIDENT (2022 DOLLARS)

TYPE OF ECONOMIC BURDEN	ASIAN	BLACK	HISPANIC/ LATINO	POPULATIONS OF COLOR	WHITE	ALL RACIAL AND ETHNIC GROUPS
Avoidable Health Care Spending (per Adult Resident)	\$188	\$2,057	\$1,047	\$1,085	\$891	\$939
Lost Labor Productivity (per Working Age Resident)	\$1,100	\$715	\$2,112	\$1,440	\$740	\$932
Premature Death (per Resident)	\$0	\$3,924	\$1,288	\$1,663	\$2,490	\$2,265
Total Economic Burden (per Resident)	\$1,288	\$6,697	\$4,448	\$4,188	\$4,121	\$4,136

NOTE: Estimates are shown to the nearest dollar; rows or columns may not sum due to rounding.

The economic burden of avoidable health care spending due to health inequities was \$1,085 per resident per year on average for populations of color, and \$939 per resident per year on average for all racial and ethnic groups combined (including the White population). **Inequities associated with avoidable health care spending were disproportionately experienced by the Black population** in Massachusetts, with a burden of just over \$2,000 per resident per year on average, or the equivalent of one-quarter of the average individual health insurance premium for employer-sponsored coverage in Massachusetts.²² The group associated with the next highest cost of avoidable health care spending burden was the Hispanic/Latino population, with a burden of just over \$1,000 per resident per year on average.

The economic burden of lost labor productivity corresponded to \$1,440 per resident per year for populations of color and \$932 per resident per year for all racial and ethnic groups combined. **Lost labor productivity due to health inequities were disproportionately experienced by the Hispanic/Latino population** in Massachusetts, with a burden of \$2,112 in lost labor productivity per resident per year. The group with the next highest burden of lost labor productivity was the Asian population, at \$1,100 per resident per year.

The economic burden of premature death corresponded to \$1,663 per resident per year for populations of color and \$2,265 for all racial and ethnic groups. **The economic burden of premature death was disproportionately experienced by the Black population** in Massachusetts, corresponding to nearly \$4,000 per resident per year. The group with the next highest burden of premature death was the White population at \$2,490 per resident per year. The study estimated no additional economic burden due to premature death for the Asian population in Massachusetts.

To help understand the findings on the burden of premature death, Exhibit 4 shows the number of deaths per 100,000 people in each age group in Massachusetts, by all major racial and ethnic groups. The rightmost column in the exhibit shows the health equity target mortality rate—the lowest rate across all states—for that age group. **As shown, mortality rates were highest for the Black population for every age group except the 30–39 age group, where the rate for the White population was slightly higher. The rates for the Black population were higher than the health equity target rates at every age.** Black mortality rates were especially high relative to other groups and to the health equity target rates for infants (less than one year old), children (1–9 years old), and adolescents (10–17 years old). The Hispanic/Latino population in Massachusetts, as in other parts of the country, experienced relatively less premature mortality than the Black or White populations. The mortality rate for the Hispanic/Latino population was lower than the Black rate for all ages, lower than the White rate for all ages older than 9 years old, and lower even than the health equity target rate for ages 10 through 17 and ages 50 through 59. The mortality rates for the Asian population across all age groups were lower than the health equity target rates, explaining why no premature death-related economic burden was estimated for this group.

EXHIBIT 4. MASSACHUSETTS MORTALITY RATES PER 100,000 BY AGE AND RACIAL AND ETHNIC GROUP, 2016–2019

	ASIAN	BLACK	HISPANIC/ LATINO	WHITE	HEALTH EQUITY TARGET RATE
<1 YEARS	**	352	206	139	47
1–9 YEARS	**	26	15	13	11
10–17 YEARS	**	22	12	12	14
18–29 YEARS	18	130	96	110	72
30–39 YEARS	24	164	144	174	111
40–49 YEARS	52	270	226	234	193
50–59 YEARS	140	611	418	493	453
60–69 YEARS	376	1,223	845	1,014	858
70–78 YEARS	971	2,491	1,804	2,409	1,803

▲
The darker the color, the further from the healthy equity target.

**Data are suppressed by the National Center for Health Statistics due to the small numbers of deaths reported.

THE ECONOMIC BURDEN OF HEALTH INEQUITIES IMPACTS ALL ASPECTS OF THE MASSACHUSETTS ECONOMY

The economic burden associated with health inequities in Massachusetts impacts all aspects of the Massachusetts economy. It is not limited to a few population groups or business sectors but has broad implications for all residents and all businesses in Massachusetts.

Avoidable health care spending is borne by Massachusetts residents and by both public (MassHealth and Medicare) and private entities (employers, health insurance companies) in the health care system (Exhibit 5). The economic burden by type of health insurance was roughly proportional to the share of coverage in the Commonwealth in 2021,²³ with more than 60 percent of avoidable health care spending associated with the populations covered under private health insurance, another 18 percent associated with those covered under MassHealth (the Medicaid program in Massachusetts), 19 percent associated with Medicare enrollees, and two percent associated with the small number of uninsured in the Commonwealth. Avoidable health care spending due to poorer health increases the cost of health insurance premiums for those with private health insurance through employers or the Health Connector, increases out of pocket spending on deductibles and copayments for all insured residents, and increases the cost to state and federal governments, and ultimately taxpayers, to fund public coverage and services for people without health insurance.

EXHIBIT 5. ECONOMIC BURDEN OF AVOIDABLE HEALTH CARE SPENDING FOR ADULT RESIDENTS BY HEALTH INSURANCE TYPE (MILLIONS OF 2022 DOLLARS)

TYPE OF HEALTH INSURANCE	AVOIDABLE HEALTH CARE SPENDING	SHARE OF ECONOMIC BURDEN	SHARE OF COVERAGE
Private Insurance	\$3,124	62%	61%
MassHealth	\$908	18%	23%
Medicare	\$947	19%	13%
Uninsured	\$90	2%	3%
Total	\$5,069	100%	100%

NOTE: Columns may not sum to 100% due to rounding.

Similarly, the burden of lost labor productivity due to health inequities impacts all major industry categories in Massachusetts. The impact of poorer health among working age adults on labor productivity affects the cost of doing business across the Massachusetts economy, including in manufacturing, retail, transportation, information services, finance and business services, education, health care, and social services (Exhibit 6). For comparison, Exhibit 6 shows the share of

the burden of lost labor productivity along with the share of jobs in that industry group in Massachusetts. For example, 19 percent of the economic burden of lost labor productivity was seen in the natural resources, mining, construction, and manufacturing sectors, which represent 11 percent of all jobs in the state.

EXHIBIT 6. ECONOMIC BURDEN OF LOST LABOR PRODUCTIVITY FOR WORKING AGE RESIDENTS BY MAJOR INDUSTRY (MILLIONS OF 2022 DOLLARS)

INDUSTRY	LOST LABOR PRODUCTIVITY	SHARE OF ECONOMIC BURDEN	SHARE OF JOBS
Natural Resources, Mining, Construction, and Manufacturing	\$627	19%	11%
Wholesale and Retail Trade, Transportation, and Utilities	\$393	12%	15%
Information, Financial Activities, and Professional and Business Services	\$741	22%	26%
Education, Health and Social Services, and Public Administration	\$1,095	33%	22%
All Other Industries	\$478	14%	25%
Total	\$3,335	100%	100%

NOTE: Estimates are shown to the nearest dollar. Columns may not sum due to rounding.

CONCLUSION: THE TIME TO ACT IS NOW

Health inequities in Massachusetts represent billions of dollars in loss of life, avoidable health care spending, and lost labor productivity every year and these burdens are increasing over time. The populations of color who are heavily impacted by health inequities are also the populations that are driving population growth; in a generation, these groups will represent nearly half of the Massachusetts population compared to the less than one-third of the share they represent today.²⁴

If action is not taken to reduce health inequities, the economic burden of health inequities experienced within the Black, Hispanic/Latino, and Asian populations in the Commonwealth will almost double by 2050 through population growth alone, from \$5.9 billion each year to \$11.2 billion a year. Lessening the burdens from health inequities and the underlying health disparities represents an opportunity for improving the health and well-being of all people in the state and for improving the Commonwealth’s economic outlook. Massachusetts will do better when all Massachusetts residents have better health.

Attention to advancing health equity and eliminating health disparities in Massachusetts has been high in recent years. A report issued by the Foundation in December 2022, *A Focus on Health Care: Five Key Priorities for the Next Administration*, identified addressing systemic racism and inequities in health as one of the top five health care priorities for the next administration, based on a series of interviews with a wide range of stakeholders. In 2021, Blue Cross Blue Shield of Massachusetts became the first health plan in Massachusetts to incorporate equity measures into its incentive payment models. A 2020 report by the Massachusetts Attorney General’s Office on building toward racial justice and equity in health called for a focus on social determinants of health and tackling the root causes of health inequities, along with better data to track disparities, more equitable distribution of health care resources, expanding telehealth, and greater health care workforce diversity.²⁵ In June of 2020, the Massachusetts Legislature created the Health Equity Task Force to make recommendations for reducing disparities in COVID-19 outcomes and reducing health inequities for communities of color, low-income communities, and among vulnerable populations. The Task Force’s Blueprint for Health Equity provides detailed recommendations in six focus areas, including addressing social factors in health, strengthening the local and state public health systems, and strengthening access to quality, affordable health care.²⁶ The Massachusetts Department of Public Health has published a Racial Equity Data Road Map providing guiding questions, tools, and resources to assist programs in taking concrete steps to better identify, understand, and act to address racial inequities in health.²⁷ In early 2023, the Health

Equity Compact filed *An Act to Advance Health Equity*, legislation aimed at prioritizing health equity in state government, standardizing and reporting on health equity data, and improving access to and quality of care.²⁸

Now is the time to shift from calling attention to this issue to taking action. The findings from this study document the significant economic burden of health inequities that reach beyond the health care system to individuals and families, public and private sector stakeholders, and the overall Massachusetts economy. In addition to the tragic human toll of premature death, the families not built, and milestones not celebrated, racial and ethnic health disparities cause a major drain on the Commonwealth's economy, compromising the ability to invest in areas such as housing, education, transportation, and other sectors vital to the health of the state's residents and economy.

Massachusetts led the way in successfully implementing the national model for expanding health insurance coverage and in bringing together a broad range of stakeholders to tackle health care affordability and health care spending. Massachusetts now has the opportunity to lead the way in the next stage of building the strongest (and healthiest) state possible, by making meaningful progress toward achieving health equity and eliminating health disparities.

APPENDIX: DATA AND METHODS

OVERALL APPROACH TO ESTIMATING THE ECONOMIC BURDEN OF HEALTH INEQUITIES

This study seeks to estimate the economic burden of health inequities in Massachusetts. The economic burden of health inequities includes costs associated with excess morbidity (higher prevalence of disease and disability compared to target rates) and costs associated with excess mortality (premature death compared to target mortality rates). Two types of costs were estimated to represent the economic burden of excess morbidity—the direct costs of avoidable health care spending and the indirect costs associated with lost labor productivity. The economic burden of excess mortality was estimated in terms of the economic value of years of life lost due to premature death. An incremental costs approach was used to estimate avoidable health care spending and lost labor productivity, while a willingness to pay approach was used to estimate the costs of premature death.

A health equity versus health disparities framework: Early applications of the modeling framework used in this study used a health disparities framework, comparing the health outcomes of historically racially or economically “disadvantaged” populations to the health outcomes of “advantaged” populations such as the non-Hispanic White population and using rates for the advantaged group as the target for computing the gap in health outcomes and the associated economic burden. With input from a technical expert panel of economists, demographers, and clinicians, the recently updated application of these models for the National Institute on Minority Health and Health Disparities transitioned the application of these models to a health equity framework. A health equity framework sets health equity target prevalence rates of health conditions and crude death rates based on aspirational targets that are consistent across all racial and ethnic groups. This is consistent with cost of illness studies’ methodologies, where the cost of diabetes or breast cancer is based on comparing current costs to costs under the total absence of disease, not simply a reduced rate of disease.

This study used a health equity approach to set aspirational targets for health status and longevity that did not depend on the current health of particular groups in Massachusetts. Specifically, the prevalence rates for each health condition for each major racial and ethnic group and age-sex cohort were compared to the risks of these health conditions at the 10th percentile for the nation, for the corresponding age-sex cohort. The crude death rates for each major racial and ethnic group and age group were compared to the crude rates of the highest ranked state (lowest death rate) for that age group.

Defining health equity target prevalence rates: To obtain the target prevalence rates for the health conditions, prevalence models were estimated for each of the health conditions using the entire Medical Expenditure Panel Survey (MEPS) adult sample. Prevalence was estimated for the following 13 health conditions: being in fair/poor health, having depressive symptoms, any functional limitation, hypertension, high cholesterol, diabetes, coronary heart disease/angina, heart attack, stroke, asthma, emphysema/chronic bronchitis, joint pain/arthritis, and cancer. The dependent variable was a dichotomous variable indicating whether the respondent had the condition. The independent variables, whose effects on the prevalence of health conditions were controlled for, were age, sex, marital status, educational attainment, poverty status, health insurance status, and census region of the country. For each respondent, the risk of having each health condition was estimated. The sample was divided into seven age groups: 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, and 75 and over. Sex was self-reported biological sex (i.e., male or female). Marital status had four categories: married, single/never married, divorced/separated, and widowed. There were four educational attainment categories: less than high school diploma, high school diploma/graduate equivalency diploma, an associate degree or some college but less than a four-year college degree, and a four-year college degree or more. For poverty status, there were three categories: poor/near poor (<125 percent of the federal poverty level [FPL]), low income (125–<200 percent FPL), middle (200–400 percent FPL), and high income (>400 percent FPL). The health insurance variable had three categories: private insurance, public insurance (Medicare or Medicaid), and uninsured. The census region variable had four categories: North, South, Midwest, and West. Within each cohort, the risk of each health condition was identified at the 10th percentile. This is the probability of having the health condition. These prevalence rates became target prevalence rates for each condition for each age-sex cohort across each of the major racial and ethnic groups.

Defining health equity target death rates: To obtain the health equity target crude death rates, the state with the best crude death rate was used for each age category. For each age category, states were ordered from lowest to highest crude death rate and the highest ranked state (the state with the lowest death rate) was identified. The crude death rate for the best state was set as the health equity target for that age category. The health equity mortality targets were not sex specific, consistent with other cost-illness studies that use the absence of disease as the standard for both sexes.

ESTIMATING THE ECONOMIC BURDEN OF AVOIDABLE HEALTH CARE SPENDING

The study team used data from the 2016–2019 Medical Expenditure Panel Survey (MEPS) for Massachusetts to estimate avoidable health care spending. For the health care spending model, a two-part estimation technique was used, which has been shown to predict values that are unbiased.²⁹ The first part was a logistic regression model that estimated the impact of health conditions on the probability of having any type of health care expenditures. The second part was a generalized linear model (GLM) that estimated the impact of health conditions on levels of expenditures for individuals with positive expenditures. Models were built using Massachusetts MEPS data and resulting model coefficients were compared to coefficients estimated using the national MEPS data developed under a grant from the National Institute on Minority Health and Health Disparities. There was enough difference in the coefficients to suggest that the relationship between health care spending and the predictor variables differed significantly for Massachusetts, so the model coefficients developed using the Massachusetts data were used in this study. This approach produced results that were likely to better reflect prevalence and costs for Massachusetts but, due to smaller sample sizes at the state level, did not support estimation of health inequity burdens for smaller racial and ethnic groups in the Commonwealth, including American Indian and Alaska Native (about 0.2 percent of the 2020 Massachusetts population), Native Hawaiian and Other Pacific Islander (about 0.04 percent of the population), and people of more than one race (about 1.9 percent of the population). The major racial and ethnic groups modeled were Black, Hispanic/Latino, Asian, and White, representing about 98 percent of the current population.

The dependent variable was total health care spending. Total health care spending in MEPS includes out-of-pocket and third-party payments to health care providers but does not include health insurance premiums. Spending for hospital-based services includes inpatient, emergency room, outpatient (hospital, clinic, and office-based visits), prescription drugs, and other services (e.g., home health services, vision care services, dental care, ambulance services, and medical equipment). Prescription drug spending does not include over-the-counter purchases.

The predictor variables of interest were indicators of whether the respondent had any of the following health conditions: being in fair/poor health, having depressive symptoms, any functional limitation, hypertension, high cholesterol, diabetes, coronary heart disease/angina, heart attack, stroke, asthma, emphysema/chronic bronchitis, joint pain/arthritis, and cancer. The 13 health conditions include the following 10 Agency for Healthcare Research and Quality (AHRQ) priority health conditions: hypertension, high cholesterol, diabetes, coronary heart disease/angina, myocardial infarction/heart attack, stroke, asthma, emphysema/chronic bronchitis, joint pain/arthritis, and cancer. AHRQ designated these conditions as “priority conditions” based on their prevalence, treatment expense, and policy relevance. Three additional health status measures were included—being in fair/poor health, having depressive symptoms, and having any functional limitation—to capture undiagnosed health problems and the severity of reported health conditions.

Age, sex, race/ethnicity, marital status, educational attainment, census region, income, and health insurance status were included as control variables. The models were estimated for all adults (ages 18 and over). Models were estimated separately for males and females. In the models for females, the models also controlled for pregnancy status, given its impact on health care expenditures. The models were estimated using the survey regression procedures in STATA 15, which appropriately incorporate the design factors and sample weights.

Using data from the 2016–2019 MEPS for Massachusetts, health care spending was simulated using the reported health conditions. Health care spending was then simulated by assigning each group the target prevalence rate for each health condition within each age/sex cohort. The respondents in each cohort were randomly assigned the health conditions using a uniform distribution so that the prevalence in the cohort was assigned the target prevalence rate for the condition at the

10th percentile. The observed or reported health condition for a specific cohort was used if it was better than the target health condition for that cohort. The excess health care spending due to inequities was computed as the difference between the predicted outcomes using the actual health conditions and predicted outcomes with the simulated health conditions based on the health equity targets.

The predicted values were computed for health care spending using Monte Carlo simulations for the different racial/ethnic groups (Blacks, Hispanics/Latinos, Asians, and Whites) and the model (the health equity target prevalence) using the model coefficients. We randomly chose “1,000” samples to get “one” predicted probability and “one” predicted mean for the models. This exercise was repeated 1,000 times, to produce 1,000 predicted probabilities and 1,000 predicted means by race and ethnicity. Costs by insurance status were allocated using the Massachusetts MEPS respondents’ source of insurance payment (i.e., uninsured, Medicare, Medicaid/other public coverage, and private insurance).

ESTIMATING THE ECONOMIC BURDEN OF LOST LABOR PRODUCTIVITY

The analysis of lost labor productivity focused on working-age adults (ages 25–64). To compute the value of lost labor productivity, three separate two-part labor market models were built. The impacts of disability and illness were estimated on three outcomes related to labor productivity: sick days, annual hours of work, and wages for working-age adults. Disability days measured time lost from work because of a physical illness or injury, or a mental or emotional problem. Hours and wages were reported or imputed for the main job of survey respondents. These models also employed two-part estimation techniques. The model specification depended upon the dependent variables. For missed days of work, logistic regression was used to estimate the impact of health conditions on the probability of missing a workday during the year followed by GLM to predict the number of days of work missed for individuals with positive days of work missed. Two-part models were used for hours worked and wages as well. The first part estimated the impact of health conditions on the probability that an adult is working. The second part estimated the impact of health conditions on hours worked and hourly wages. It has been shown that results from this approach are similar to those of a standard Heckman two-step estimator for labor supply that employs inverse mills ratios to account for potential selection bias.³⁰

The key predictor variables were the health conditions. We used the same health conditions as those in the health care spending models. Control variables included age, sex, race/ethnicity, marital status, educational attainment, census region, health insurance status, and industry. We defined five industry categories: (1) natural resources, mining, construction, and manufacturing, (2) wholesale and retail trade, transportation, and utilities, (3) information, financial activities, and professional and business services, (4) education, health and social services, and public administration, and (5) all other. Models were estimated separately for men and women. Similar to the health care spending models, a comparison of the parameter estimates using Massachusetts-specific data and estimates using the national MEPS data suggested that there were Massachusetts-specific differences in the relationships.

Using the 2016–2019 MEPS data, disability days off from work, annual hours worked, and hourly wages were predicted using the reported health conditions. Labor productivity outcomes were then simulated by assigning each race and ethnicity group the target prevalence rate for the health conditions, i.e., eliminating inequities in health in the corresponding age-sex cohort. The objective was to compute the value of changing the health conditions of Massachusetts residents from their actual health profile to the target health profile on disability days, annual hours worked, and the hourly wage. Using the disability days model, the disability days were simulated using actual health conditions and the health equity target health profiles using the predicted value at the 10th percentile for a specific cohort. The difference in disability days off from work was valued using the predicted wage. Similarly, annual hours worked and the hourly wages were computed for the actual health profile and the target health profile. The difference in annual hours was valued at the predicted wage and the difference in wages at the predicted hours worked. Results were combined from these three two-part models to compute the total labor productivity costs associated with health inequities. The labor productivity models were estimated using the survey regression procedures in STATA 15, which appropriately incorporate the design factors and sample weights. Similar to the health care spending models, Monte Carlo simulations were used to generate the estimates and standard errors. The MEPS respondents’ industry of employment was used to assign the lost labor productivity costs by industry type.

ESTIMATING THE ECONOMIC BURDEN OF PREMATURE DEATH

Premature deaths are deaths that may be preventable through addressing critical social determinants of health such as food and housing, as well as supporting lifestyle modifications, and better access to health care. This study estimated premature deaths due to health inequities as the difference between the number of deaths that occurred using actual mortality rates by age group and the number of deaths that would have occurred under the health equity target mortality rates, with the target for each age group set to the best (lowest) mortality rate. Typical measures of premature death estimate potential years of life lost when death occurs before one would expect according to population average death rates. For this analysis, 79 years was used as the benchmark, reflecting average life expectancy at birth reported by the Centers for Disease Control and Prevention for the year 2019, the latest year of data used in the modeling for this study.

Data from the National Vital Statistics System (NVSS) and the Massachusetts Department of Public Health Registry of Vital Records and Statistics were used to obtain the number of deaths and crude death rates by age and race for 2016–2019 (the data included nine age groups: under 1, 1–9, 10–17, 18–29, 30–39, 40–49, 50–59, 60–69, 70–78). Data from the 2019 American Community Survey 5-year estimates were used to obtain population size estimates for each cohort in Massachusetts. All counts under 10 observations were suppressed in accordance with the data use agreement with the National Center for Health Statistics and to improve the reliability of the crude death rate estimates.

For each racial and ethnic group, the number of deaths that would have occurred was computed assuming that every group's death rate was equal to that of the health equity target death rate within each age/sex cohort (i.e., the crude rate for the top ranked state). The difference between the actual number of deaths and the estimated deaths represented the estimate of the number of premature deaths due to health inequities.

For each racial and ethnic group, there were two additional steps in translating the number of premature deaths to an economic burden estimate. First, the number of premature deaths estimated in each age group was converted to an estimate of the number of years of life that were lost due to premature death. The number of years of life lost was computed by assuming that all persons would have lived to the average U.S. 2019 life expectancy of age 79 had they not died prematurely. For each of the nine age ranges through age 79 (excluding ages 80–84 and 85 and older), the midpoint of the age range was subtracted from 79 to estimate the number of years of life lost, and that figure was multiplied by the number of premature deaths in that age range to estimate life years lost.

The second step in computing the economic burden was multiplying the number of lost life years by an economic valuation of a life year under a “willingness to pay” approach. Willingness to pay is a comprehensive measure of the private valuation individuals place on small reductions in risk (probability) of death. Conceptually, the measure captures everything that would contribute to a person's well-being, including time preference reflecting the weight given to future benefits of living, non-labor income, the value of leisure, and the value of pain and suffering.³¹ Generally, an individual's willingness to pay has been assessed using surveys and revealed preferences. For calculating the cost of inequities in premature death, this study used a conservative value of \$100,000 per life year lost, reflecting recent estimates that have valued willingness to pay at \$95,000 to up to \$264,000.³²

CONVERSION OF MODEL ESTIMATES TO 2022 DOLLARS

Model results for the three types of economic burdens were expressed as 2019 dollars, the latest year of data used in the modeling. Results were converted to 2022 dollars for presentation in this brief using the annual gross domestic product implicit price deflator.³³

ENDNOTES

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- 6 The Health Equity Compact (the Compact) is a coalition of over 70 Massachusetts leaders of color who seek to dismantle systemic barriers to equitable health outcomes for all residents of the Commonwealth. Compact members are high-level executives and experts from a diverse set of health, business, labor, and philanthropic organizations, including hospitals, health centers, payers, academic institutions, and local public health. The Compact's vision is the elimination of systemic barriers and creation of new structures and processes that will lead to equitable health care and health outcomes for all in Massachusetts. The Compact's mission is to realize bold statewide policy and institutional practice changes that center racial justice and health equity. The Compact is committed to leveraging its members' lived experiences and professional expertise to advance health equity in Massachusetts. For more information, see: <https://healthequitycompact.org/>.
- 7 LaVeist, T.A., Pérez-Stable, E.J., Richard, P., et al. (2023). The Economic Burden of Racial, Ethnic, and Educational Health Inequities in the US. *JAMA*, 329(19), 1682–1692. <https://jamanetwork.com/journals/jama/fullarticle/2804818>.
- 8 Massachusetts-specific population counts, demographic characteristics, and population projections were used. Model parameters were estimated using Massachusetts-specific data on the prevalence of health conditions, health care spending, and measures of labor productivity. Massachusetts-specific death rates by age and major racial and ethnic group were used. Additional detail was developed for several dimensions of the model outputs, including health care spending by payer type and labor productivity by major industry. Finally, the health equity targets used to compare to current health outcomes were set to a higher standard than what was used in the published national work, including for mortality rates.
- 9 For purposes of this report, the term “populations of color” includes individuals who identify as Asian, Black, or Hispanic/Latino.
- 10 U.S. Census Bureau. *Massachusetts: 2020 Census*. [https://www.census.gov/library/stories/state-by-state/massachusetts-population-change-between-census-decade.html#:~:text=Race%20and%20ethnicity%20\(White%20alone,%25%2C%20up%20from%2054.9%25\)](https://www.census.gov/library/stories/state-by-state/massachusetts-population-change-between-census-decade.html#:~:text=Race%20and%20ethnicity%20(White%20alone,%25%2C%20up%20from%2054.9%25)).
- 11 The measures of physical and mental health included the following 10 conditions designated as priority conditions based on their prevalence, cost, and policy relevance by the Agency for Healthcare Research and Quality (AHRQ): hypertension, high cholesterol, diabetes, coronary heart disease/angina, myocardial infarction/heart attack, stroke, asthma, emphysema/chronic bronchitis, joint pain/arthritis, and cancer. To capture undiagnosed health conditions and the severity of reported conditions, the study also included three additional health status measures: being in fair/poor health, having depressive symptoms, and having any functional limitation.
- 12 Black, Asian, and White groups in this report exclude those of Hispanic or Latino ethnicity.
- 13 Anthony, S., Boozang, P., Elam, L., & McAvey, K. (2021). *Racism and Racial Inequities in Health: A Data-Informed Primer on Health Disparities in Massachusetts*. Blue Cross Blue Shield of Massachusetts Foundation and Manatt Health. <https://www.bluecrossmafoundation.org/publication/racism-and-racial-inequities-health-data-informed-primer-health-disparities>.
- 14 Massachusetts Health Quality Partners (February 2023). *Black, Hispanic, and Asian Patients Report Worse Patient Experiences than White Patients in Massachusetts*. <https://www.mhqp.org/2023/01/31/black-hispanic-and-asian-patients-report-worse-patient-experiences-than-white-patients-in-massachusetts/>.
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- 16 Computed as a share of total health spending for 2021 from the *Annual Report on the Performance of the Massachusetts Health Care System* (March 2023), accessed April 7, 2023, at <https://www.chiamass.gov/annual-report/>. Spending in 2021 was inflated by four percent, the average of Massachusetts health spending growth over the previous three years (2019 to 2021), to approximate 2022 total health spending for comparison to the 2022 burden estimate.
- 17 All economic estimates in this report are expressed in 2022 dollars.
- 18 The estimate of numbers of workers was computed as the economic burden of lost productivity divided by the average hourly wage in Massachusetts from the U.S. Census Bureau (\$25 per hour), multiplied by 2,080 work hours per year.
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