

WHEN THE CLOSEST PHARMACY IS TOO FAR: MAPPING PHARMACY DESERTS IN MASSACHUSETTS

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INTRODUCTION

Pharmacies are vital points of care for patients. Pharmacies dispense prescriptions, offer medication consultations, provide access to over-the-counter medications and may offer diagnostic and preventive medical services. A pharmacy closure may reduce or eliminate access to these services in a geographic area. Pharmacy closures are associated with negative health effects, such as clinically significant declines in adherence to cardiovascular medications among older adults.¹

Pharmacy deserts refer to communities without convenient access to pharmacies, which limit residents' ability to fill medications and access services. A nationwide study found that 46% of U.S. counties have at least one pharmacy desert, and they were significantly more common in high social vulnerability areas.²

OBJECTIVES

This study assesses the number, type and geographic distribution of pharmacies in Massachusetts, and develops a methodology for identifying pharmacy deserts and communities that may be vulnerable to becoming one. Deserts were assessed at a granular geographic level (census block group), and access-related characteristics of the population were incorporated along with distance to determine whether a neighborhood constituted a pharmacy desert. The study also allowed for different distance and access-related criteria based on population density and rural status.

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STUDY DESIGN

Data on pharmacy licensure was obtained from the Massachusetts Bureau of Health Professions Licensure. All active and former retail pharmacies between 2016 and 2025 were included. The analysis excluded compounding, specialty, other and provider-based pharmacies not open to the general public.

Retail pharmacies were categorized into five types: large chain, grocery based, small chain/independent, mass merchant, and provider-based (if open to the general public). Pharmacy locations were geocoded and matched to their underlying census block group. Data from the American Community Survey (ACS) and the Massachusetts State Office of Rural Health were matched to block group, including data on community income, vehicle ownership, and rurality designation.

The analysis allowed for three different geographic levels of analysis and separate distance criteria: rural (5 miles), suburban (2 miles), and urban (1 miles). For communities with low income (20% or more of the population below the federal poverty level) and/or low vehicle ownership (below state median), these distances were halved (2 miles, 1 mile, 1/2 mile) to account for additional access barriers these communities may face beyond distance to the nearest pharmacy. Communities for which at least two-thirds (2/3) of the block group was beyond the relevant distance criteria to any pharmacy were designated as pharmacy deserts. Communities vulnerable to becoming a pharmacy desert were those where if the sole pharmacy within range closed, they would become a pharmacy desert.

As of June 2025, there were 940 active pharmacies in Massachusetts. That figure represented a 17% decline in pharmacies since 2019. Small chain/independent and grocery-based pharmacies each had the largest relative declines during this time (about 20%). Large chains lost the greatest number in absolute terms (~123) but remained about 60% of the pharmacy market.

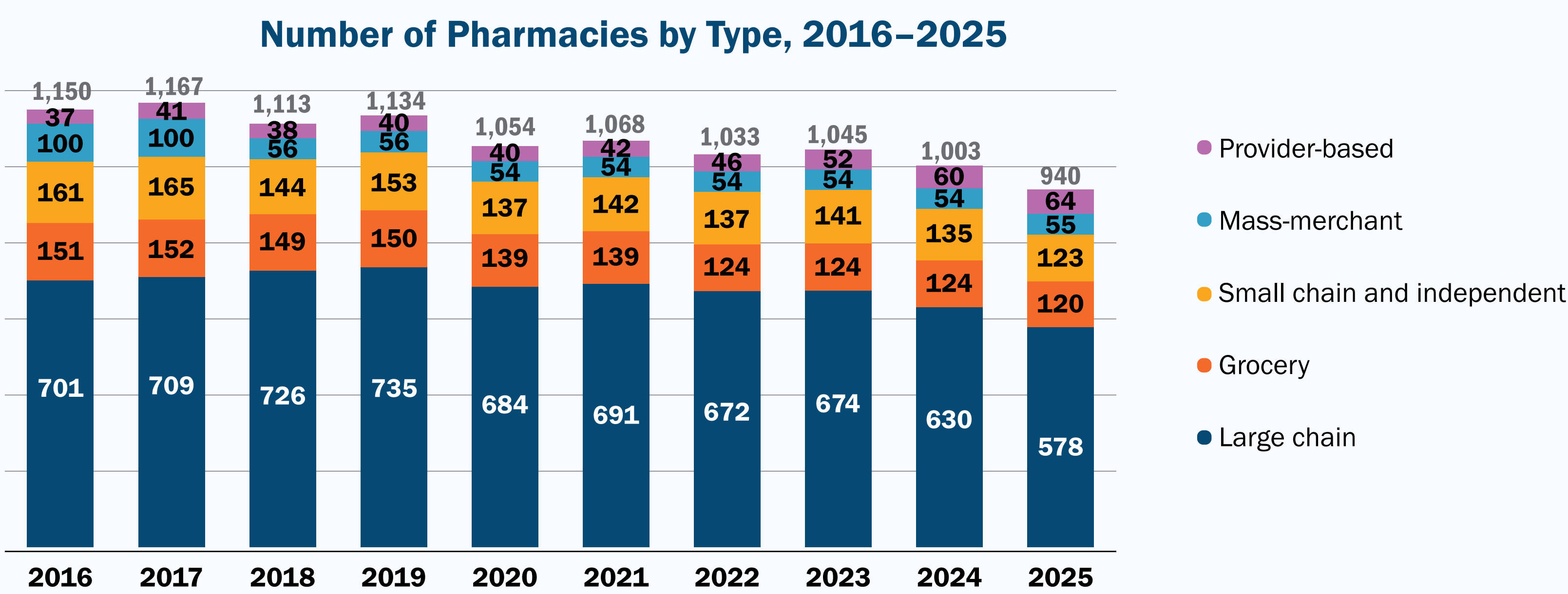
About 8% of Massachusetts residents, or about 580,000 people, live in a pharmacy desert. This is an increase of roughly 90,000 people since 2019. Another 7.5% of residents, about 525,000 people, live in an area that would become a desert if the sole pharmacy in their area closed. Table 1 shows that those living in pharmacy deserts tend to be in areas with lower population density and a higher proportion of families in poverty (for urban deserts only), and a higher proportion of residents over age 65.

Pharmacy deserts were widespread and found in every area of the state. At each geographic level, pharmacy deserts represent about 8% or 9% of block groups. Near deserts were also widespread but varied more across geographic levels (from about 6% to 11% of block groups).

Notes: All mapping and geocoding conducted in ArcMap 10.8/ArcGIS Pro. Conducted using the NAD1983 geographic coordinate system. Population data is based on 2020 Census block groups.

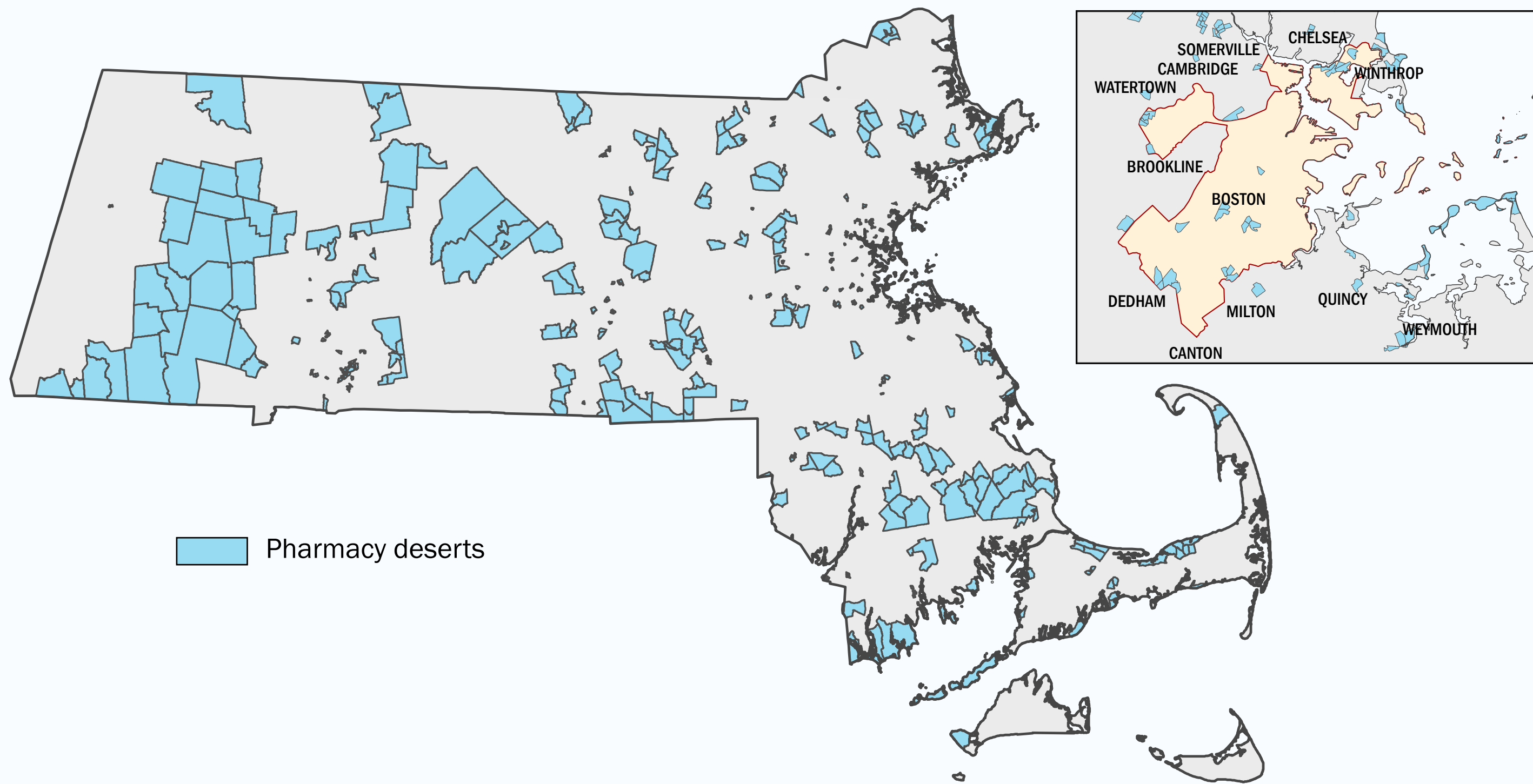
Sources: EOHS Massachusetts Health Professions License Verification site. Latest update: June 16, 2025. Rural definition from State Office of Rural Health (2023). American Community Survey (ACS), 2023 5-year estimates.

RESULTS

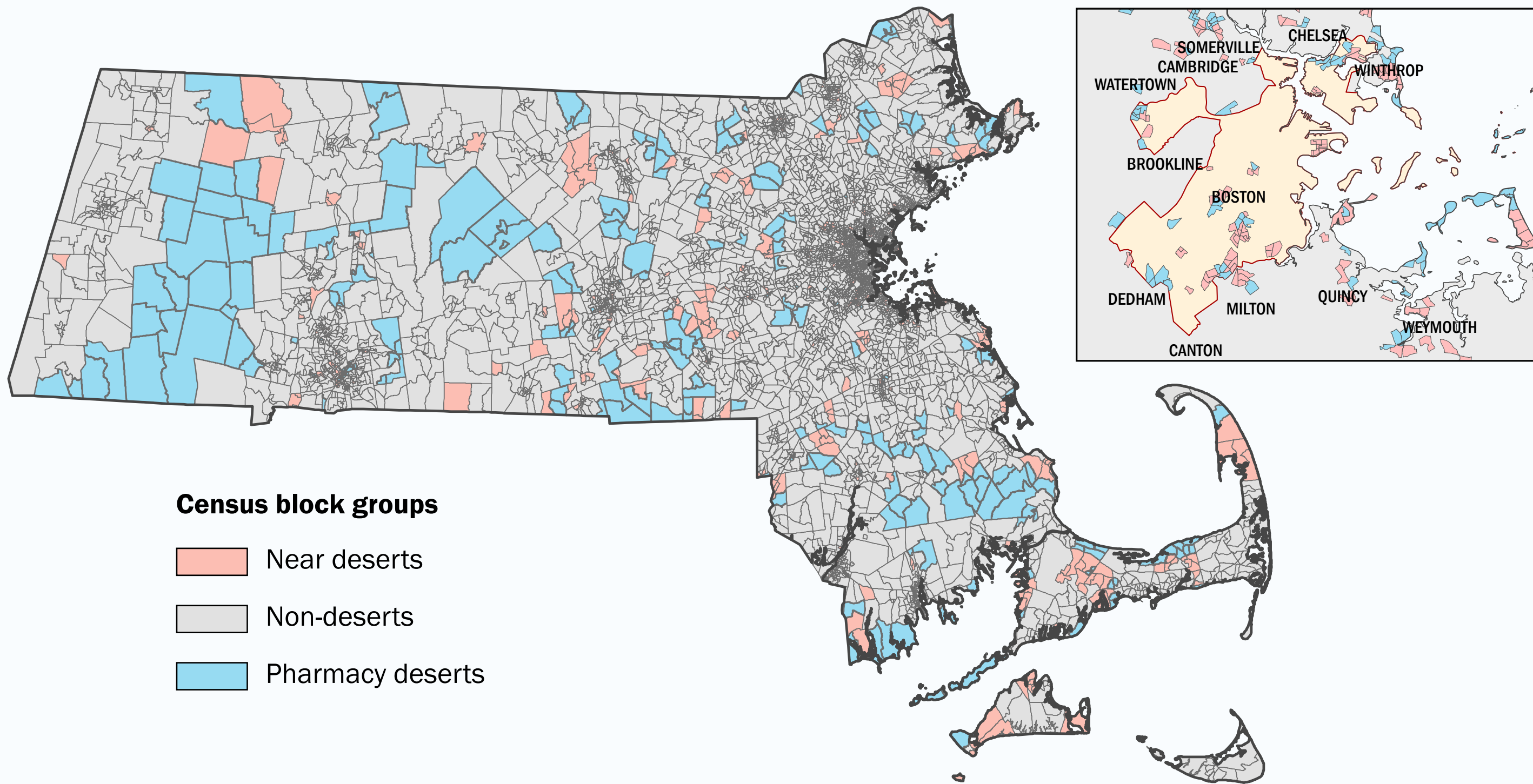


Characteristics of the Population Living in a Pharmacy Desert									
Category	No. of block groups (% of region)	Population (% of state)	Area in sq. miles	Pop. per sq. mile	Share of households without a vehicle	Share of households below the FPL	Share non-white	Share of population above 65	Median income
RURAL									
Non-desert	398 (85.2%)	523,870 (7.5%)	7.41	784.6	5.0%	4.7%	11.3%	22.3%	\$109,241
Near desert	26 (5.6%)	25,166 (0.4%)	8.47	834.0	8.3%	5.4%	10.8%	28.3%	\$82,685
Pharmacy desert	43 (9.2%)	46,399 (0.7%)	25.48	119.8	3.5%	4.6%	7.5%	24.5%	\$101,789
SUBURBAN									
Non-desert	2,113 (85.8%)	3,125,274 (44.5%)	1.72	1,989.6	5.7%	4.6%	20.9%	19.9%	\$129,115
Near desert	162 (6.6%)	230,350 (3.3%)	2.29	1,222.7	4.5%	3.8%	15.2%	20.0%	\$132,250
Pharmacy desert	187 (7.6%)	288,798 (4.1%)	4.48	794.7	3.6%	3.1%	12.8%	21.6%	\$142,098
URBAN									
Non-desert	1,750 (80.3%)	2,272,099 (32.3%)	0.13	19,533.5	21.2%	10.8%	44.7%	13.8%	\$100,635
Near desert	228 (10.5%)	270,444 (3.8%)	0.12	15,599.7	18.9%	11.7%	48.8%	14.7%	\$89,912
Pharmacy desert	202 (9.3%)	247,517 (3.5%)	0.14	12,876.5	19.1%	12.3%	43.6%	13.8%	\$85,089

Pharmacy Deserts in Massachusetts, 2025 (with inset map of Boston)



Pharmacy Desert and “Near-Desert” Neighborhoods, 2025 (with inset map of Boston)



CONCLUSIONS

Pharmacy closures, and the deserts that can result, can threaten access to an important health care access point and exacerbate existing disparities. While all types of pharmacies provide critical access across Massachusetts and face pressures, small chain and independent pharmacies face particular financial challenges.

Currently, 8.3% of the Massachusetts population, about 580,000 people, live in a pharmacy desert. This represents an increase of approximately 90,000 people living in a pharmacy desert since 2019, which is a direct consequence of the closure of nearly 200 pharmacies (on net) between 2019 and 2025. Another 7.5% of the population, about 525,000 people, lives in an area that would become a desert if the sole pharmacy in the area closed.

POLICY IMPLICATIONS

Timely action is needed to increase and sustain equitable pharmacy access in Massachusetts and across the nation.

See an interactive version of this report at: <https://masshpc.gov/publications/datapoints-series/issue-31-when-closest-pharmacy-too-far-mapping-pharmacy-deserts>

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Explore an interactive version of this research on the HPC's website.



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1. Qato et al. (2019). "Association Between Pharmacy Closures and Adherence to Cardiovascular Medications Among Older US Adults." JAMA Network Open (April 19, 2019).

2. Catalano et al. (2024). "Pharmacy Accessibility and Social Vulnerability." JAMA Network Open (August 23, 2024). <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2822776>