DATA BRIEF

Health in the Commonwealth: Mortality, Premature Mortality, and Life Expectancy by Census Tract, 2012-2021

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Background

The Registry of Vital Records and Statistics (RVRS) plays a vital role in providing data to improve people's lives. RVRS registers life-changing events: birth of a child, marriage, divorce, and death. RVRS sits within the Office of Population Health at the Massachusetts Department of Public Health (MA DPH), underscoring our connection to the health of Massachusetts residents. While many people feel that death is too late of an endpoint for policy, targeted programs, or evaluation of healthcare delivery, examining who is dying and where can provide useful and valuable information on health in the Commonwealth.

Mortality and premature mortality (*i.e.*, deaths before age 75) — how many people are dying — are useful and helpful statistics of population health but can be complex and challenging to apply to the individual. Life expectancy at birth (see Methods) — how long a person might expect to live — is a more readily grasped statistic for individual health but is less easily applied as a population-level statistic. Together, these measures can provide a better picture of those dying too soon in the Commonwealth.

While mortality rates, premature mortality rates (PMR), and life expectancy calculations are published statewide in the annual Massachusetts death reports, it is incredibly important to examine health data at the local and even neighborhood level; there are inequities in the social determinants of health within cities and towns that translate into health inequities.

This geographic specificity has its own challenges, as city and town sizes vary substantially. For example, Gosnold had an estimated 70 residents, while Boston had 675,647 in 2020.[1] Census tracts allow us to compare more similarly sized population areas. They encompass anywhere from 2,000 to 8,000 residents and provide better specificity within large cities and towns. Analyzing data by census tract often leads to small number limitations, but aggregating data over several years can improve the stability of the numbers. This analysis pooled 10 years of mortality data to calculate mortality, premature mortality, and life expectancy at the census tract level to get a better picture of health in Massachusetts.

For this data brief, it is important to keep in mind that mortality and PMR are inversely related to life expectancy: higher mortality and PMR indicate worse health, while higher life expectancy indicates better health.

Place Matters

Key Finding #1: *Large areas of the Commonwealth enjoy above-average health, while poorer health is concentrated in and immediately around cities.*

In this analysis, Dukes County ranked first (*i.e.*, had the best overall health) across mortality, PMR, and life expectancy, followed by Middlesex County and Nantucket. While Dukes and Nantucket Counties are relatively small (approximately 21,000 and 14,000 residents in 2020, respectively), Middlesex County is the largest county in the Commonwealth and home to 1.6 million residents, with some of the best health in the state. It is

[1] Strate S, Renski H, Peake T, Murphy JJ, Zaldonis P. Small area population estimates for 2011 through 2020. [White Paper]. Population Estimates Program, Economic and Public Policy Research, University of Massachusetts Donahue Institute. 2016.

not a coincidence that these counties also had higher socioeconomic status and better health behaviors and other social determinants of health that promote health and well-being.[2] On the lower end of the rankings overall were Hampden, Bristol, and Worcester Counties (Table 1).

Counties with large cities/towns tend to have lower ranking, as poor health seems to be concentrated in urban areas. For example, most census tracts in Springfield had higher mortality and PMR and lower life expectancy than Massachusetts overall and account for more than half of the census tracts with poor health in Hampden County. The city of Worcester and Worcester County were similar (Figures 1, 6, and 11; Tables 2-4; and Supplementary Tables S1-S3).

Table 1. Mortality, Premature Mortality, and Life Expectancy Rankings by County, Massachusetts: 2012-2021

County	Rank			
	Overall	Mortality	Premature Mortality	Life Expectancy
Barnstable	8	5	11	7
Berkshire	5	6	8	5
Bristol	13	13	13	13
Dukes	1	1	1	2
Essex	7	8	6	6
Franklin	6	3	7	9
Hampden	14	14	14	14
Hampshire	9	10	5	10
Middlesex	2	2	3	3
Nantucket	3	7	2	1
Norfolk	4	4	4	4
Plymouth	11	11	9	12
Suffolk	10	9	12	8
Worcester	12	12	10	11

Key Finding #2: *Even within cities and towns, health can change drastically by looking just a few blocks over. Some of these inequities may point to areas where people congregate to seek public health and human services.*

The South End neighborhood of Boston has a census tract with the lowest PMR in the state, and also a tract with one of the highest PMRs in Boston. Suffolk County Tract 711.01, in the South End, had a PMR over seven times higher than its neighbor, Suffolk County Tract 706.00 (457.9 and 63.7 premature deaths per 100,000 residents, respectively: Supplementary Table S2). The higher PMR tract is where Boston Medical Center (formed from the merger of Boston University Medical Center Hospital and Boston City Hospital, the oldest municipal hospital in the country), Health Care for the Homeless, the Woods Mullen Shelter, and many other public health and social services are located. It is also the center of the region's homelessness crises (commonly referred to as Mass and Cass). Those at risk and in need of shelter, substance use treatment, and

[2] Massachusetts. County Health Rankings & Roadmaps. Accessed November 9, 2023. https://www.countyhealthrankings.org/explore-health-rankings/massachusetts?year=2023.

other healthcare come to Mass and Cass to utilize these safety net services. Just three miles away sits the census tract with the highest PMR in the Commonwealth (Suffolk County Tract 9803.00; 1111.6 premature deaths per 100,000 residents), which includes Franklin Park, the Lemuel Shattuck Hospital, and the Pine Street Inn shelter (Figure 2; Supplemental Table S2).

On the Cape in Barnstable, Barnstable County Tract 153.00 residents have a life expectancy at birth of 74.8 years, while their neighbors six miles away, Barnstable County Tract 130.02 residents have a life expectancy at birth of 82.1 years (Supplemental Table S3). The lower life expectancy tract includes commercial shopping, the regional airport, and some apartment buildings, while the higher life expectancy tract is in the wealthier village of Osterville, which is home to country clubs and beach homes. While this may not be connected to any vulnerable group congregating and seeking public health or social services, a stark difference in health status within a town still reinforces the theme: place does matter.

In fact, researchers examined the association between life expectancy and census tract and found that life expectancy was hyper-local: 70.4%-96.8% of the difference in life expectancy in census tracts across the country was associated with census tracts, rather than counties or even states.[3] Where we live has a huge impact on our health, from the accessibility of grocery stores with fresh produce to environmental hazards.[4,5]

History Matters

Key Finding #1: *Many gateway cities are struggling with poor health.*

Gateway cities are midsize cities that serve as the anchor of regional economies across Massachusetts.[6] Gateway cities include Attleboro, Barnstable, Brockton, Chelsea, Chicopee, Everett, Fall River, Fitchburg, Haverhill, Holyoke, Lawrence, Leominster, Lowell, Lynn, Malden, Methuen, New Bedford, Peabody, Pittsfield, Quincy, Revere, Salem, Springfield, Taunton, Westfield, and Worcester. In decades past, these communities offered their residents a "gateway" to the American Dream via solid middle-class jobs, good public education, and vibrant community life. As these jobs have disappeared over time, residents have struggled with increasing living costs, often with less money to spend on stable and healthy housing and nutritious food, and with increases in crime and violence.[7] All these factors lead to overall poor health.[7]

For example, more than two-thirds of census tracts in the gateway city of Lowell had overall mortality rates higher than Massachusetts overall, while comparably sized Cambridge had nearly two-thirds of census tracts

[3] Boing AF, Boing AC, Cordes J, Kim R, Subramanian SV. Quantifying and explaining variation in life expectancy at census tract, county, and state levels in the United States. Proc Natl Acad Sci U S A. 2020 Jul 28;117(30):17688-17694. doi: 10.1073/pnas.2003719117.

[4] Lovasi GS, Johnson NJ, Altekruse SF, Hirsch JA, Moore KA, Brown JR, Rundle AG, Quinn JW, Neckerman K, Siscovick DS. Healthy food retail availability and cardiovascular mortality in the United States: a cohort study. BMJ Open. 2021 Jul 9;11(7):e048390. doi: 10.1136/bmjopen-2020-048390.

[5] Brender JD, Maantay JA, Chakraborty J. Residential proximity to environmental hazards and adverse health outcomes. Am J Public Health. 2011;101 Suppl 1(Suppl 1):S37-S52. doi:10.2105/AJPH.2011.300183.

[6] About the Gateway Cities. MassINC. 2023. Accessed August 9, 2023. https://massinc.org/our-work/policy-center/gateway-cities/about-the-gateway-cities/.

[7] Broadbent P, Thomson R, Kopasker D, et al. The public health implications of the cost-of-living crisis: outlining mechanisms and modelling consequences. Lancet Reg Health Eur. 2023;27:100585. doi:10.1016/j.lanepe.2023.100585

with lower overall mortality rates compared to Massachusetts overall (Figure 1, Supplemental Table S1). The life expectancy in one Lowell census tract is **18.1 years lower** than that in the highest life expectancy tract in Cambridge (Supplemental Table S3). What drives these stark differences? The social determinants of health include access to health care, education, high-paying job opportunities, and healthy built and natural environments. For example, according to the 2022 Greater Lowell Community Health Needs Assessment, just over a quarter of adults have a college education and the median household income was approximately $62,000.[8] In comparison, in Cambridge, nearly four in five residents had a college education and the median household income was approximately $103,000.[9,] Additionally, according to the Massachusetts Department of Public Health Environmental Public Health Tracking Tool, children in Lowell tested positive for elevated blood lead levels at nearly three times the rate of children in Cambridge; exposure to lead occurs primarily through lead paint and drinking water traveling through lead pipes in older homes.[10]

Key Finding #2: *The health of residents of color depends on more than just place.*

Inequities in health between residents of color and white residents point to the history of populations, where communities of color have been impacted by institutionalized racism, which manifests itself both in material conditions (*i.e.*, differential access to quality education, stable and healthy housing, gainful employment, quality healthcare, and a clean environment) and access to power (*i.e.*, differential access to information including one's own history; resources including wealth and organizational infrastructure; and voice including voting rights, representation in government, and control of the media).[11] The patterns of disease and health inequities we see are direct consequences of the ways marginalized groups have to live and work differently than groups of higher socioeconomic status.[11]

In Boston's Dorchester neighborhood, Hispanic residents in Suffolk County Tract 915.00 had higher overall mortality than Hispanic residents statewide, whereas White non-Hispanic residents had similar mortality to White non-Hispanic residents statewide. Additionally, the Hispanic mortality rate in that census tract was nearly twice that of White non-Hispanic residents living there. While PMR was similar for Hispanic and White non-Hispanic residents, there was an **11.8-year life expectancy gap**, with White non-Hispanic residents living longer (Figures 4, 5, 9, 10, 14, and 15; Tables S1-S3).

In Newton, findings were similar for Asian/Pacific Islander non-Hispanic residents in Middlesex County Tract 3739.00. Asian/Pacific Islander non-Hispanic residents in this tract had higher overall mortality and PMR and lower life expectancy than Asian/Pacific Islander non-Hispanic residents statewide. In contrast, their White non-Hispanic neighbors had better health than White non-Hispanic residents statewide. Additionally, mortality and PMR were roughly twice as high for Asian/Pacific Islander non-Hispanic residents compared to

[8] Tello H, D'Entremont K, Clermont A, Goldberg D. *2022 Greater Lowell Community Health Needs Assessment*. Tufts Medicine Lowell General Hospital; 2022. Accessed November 9, 2023. https://www.tuftsmedicine.org/sites/default/files/2023-11/2022-greater-lowell-community-health-needs-assessment-v6a_0.pdf.

[9] *Cambridge Health Alliance 2022 Regional Wellbeing Assessment: Cambridge Community Data Profile*. Cambridge Health Alliance; 2022. Accessed November 9, 2023. https://drive.google.com/file/d/1SQqRqMxHUVgTrv6ckODDpVpqs4bS7Bdh/view.

[10] Cambridge, Lowell. Massachusetts Environmental Public Health Tracking. Accessed December 22, 2023. https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html

[11] Krieger N. Proximal, distal, and the politics of causation: what's level got to do with it?. Am J Public Health. 2008;98(2):2 21-230. doi:10.2105/AJPH.2007.111278

White non-Hispanic residents in this tract. There was an **11.1-year gap in life expectancy** between these two groups, with White non-Hispanic residents living longer (Figures 2, 5, 7, 10, 12, and 15; Tables S1-S3).

In Milton, Black non-Hispanic residents of Norfolk County Tract 4161.02 had higher mortality and PMR than Black non-Hispanic residents statewide. In contrast, White non-Hispanic residents had better health than White non-Hispanic residents statewide. Additionally, mortality and PMR were roughly twice as high for Black non-Hispanic residents compared to White non-Hispanic residents, and there was an **8.3-year gap** in life expectancy between the two groups, with White non-Hispanic residents living longer (Figures 3, 5, 8, 10, 13, and 15; Tables S1-S3).

In communities like Dorchester, for example, residential segregation and limited and under-resourced services limit residents' opportunities for better health.[12,13] According to County Health Rankings, certain Suffolk County neighborhoods experienced intentional disinvestment through Federal HOLC Redlining between 1935 and 1940.[2,14,15] Research shows that this institutional racism has health impacts: redlining during the mid-20th century in Baltimore was associated with lower present-day life expectancy.[16]

But moving to opportunity does not guarantee better health. Milton and Newton are two wealthy communities that have health-promoting characteristics. Still, these do not seem to be accessible to all residents of the community, reflecting the need for policies that target the systemic racism and roots of inequities, particularly in communities of color.

Key Finding #3: *There are places where residents of color achieve better health.*

For Black non-Hispanic residents, census tracts in Brockton and Randolph had better health, compared to Black non-Hispanic residents statewide and compared to their White non-Hispanic neighbors (Figures 3, 5, 8, 10, 13, and 15; Tables S1-S3). This could be partly due to the so-called healthy immigrant effect, immigrant health paradox, and the immigrant health advantage where immigrants are healthier than native-born residents of similar sociodemographic traits.[17] Better health may also be due to lower smoking rates and the tight social networks that form when living in an immigrant community.[17] Brockton and Randolph have large

[12] Joshi A, Wilson LE, Pinheiro LC, Judd S, Akinyemiju T. Association of racial residential segregation with all-cause and cancer-specific mortality in the reasons for geographic and racial differences in stroke (REGARDS) cohort study. SSM Popul Health. 2023;22:101374. Published 2023 Mar 31. doi:10.1016/j.ssmph.2023.101374

[13] Schwartz GL, Wang G, Kershaw KN, McGowan C, Kim MH, Hamad R. The long shadow of residential racial segregation: Associations between childhood residential segregation trajectories and young adult health among Black US Americans. Health Place. 2022;77:102904. doi:10.1016/j.healthplace.2022.102904

[14] Joshi A, Wilson LE, Pinheiro LC, Judd S, Akinyemiju T. Association of racial residential segregation with all-cause and cancer-specific mortality in the reasons for geographic and racial differences in stroke (REGARDS) cohort study. SSM Popul Health. 2023;22:101374. Published 2023 Mar 31. doi:10.1016/j.ssmph.2023.101374

[15] Schwartz GL, Wang G, Kershaw KN, McGowan C, Kim MH, Hamad R. The long shadow of residential racial segregation: Associations between childhood residential segregation trajectories and young adult health among Black US Americans. Health Place. 2022;77:102904. doi:10.1016/j.healthplace.2022.102904

[16] Huang SJ, Sehgal NJ. Association of historic redlining and present-day health in Baltimore. PLoS One. 2022;17(1):e0261028. Published 2022 Jan 19. doi:10.1371/journal.pone.0261028.

[17] Zheng H, Yu WH. Diminished Advantage or Persistent Protection? A New Approach to Assess Immigrants' Mortality Advantages Over Time. Demography. 2022;59(5):1655-1681. doi:10.1215/00703370-10175388

populations of Black immigrants, which might contribute to the better health seen in some of the census tracts.

For Hispanic residents, many census tracts in the neighborhood of East Boston, as well as tracts in neighboring Revere, Lynn, and Everett, had better health than Hispanic residents statewide and better health than their White non-Hispanic neighbors (Figures 4, 5, 9, 10, 14, and 15; Tables S1-S3). The healthy immigrant effect might also contribute to these health effects: East Boston, Revere, Lynn, and Everett have large populations of Hispanic immigrants.

More research is needed to explore the unique factors that promote the health of residents of color in these communities.

Conclusions

Place-based and historically based health inequities are widespread throughout the Commonwealth. It is important to investigate what is and is not working to promote the health of Commonwealth residents so that we all may achieve our best health.

Methods

Geocoded mortality data from 2012-2021 closed files were obtained from RVRS. Population estimates for 2012-2019 were obtained from the University of Massachusetts Donahue Institute and DPH; 2019 estimates were used for 2020 and 2021.[18] Ten-year average annual age-adjusted mortality rates, age-adjusted premature mortality rates (PMR; *i.e.*, death before age 75 years), and life expectancies at birth for Massachusetts residents were constructed at the census tract level. Age-adjusted rates are calculated by weighting the age-specific rates for a given year by the age distribution of the U.S. 2000 standard population. The weighted age-specific rates are then added to produce the adjusted rate for all ages combined. Life expectancy at birth — how long a person might expect to live if exposed throughout the rest of their life to the mortality rates observed at one particular *period* — was calculated using the Chiang II method, including the calculation of 95% confidence intervals for the life expectancies.[19] 95% confidence intervals (CIs) were constructed for overall mortality and PMR following recommended methods by the Center for Disease Control: 1) the normal distribution method for tracts with a large number of deaths (*i.e.*, at least 100 deaths) and 2) the Poisson distribution method for tracts with 5 to 99 deaths over the time period.[20] CIs at the census tract were then compared to the CI for the state overall and assigned to lower, similar, and higher comparison categories. CIs for each racial/ethnic group at the census tract level were compared to the corresponding racial/ethnic group state CI and assigned to lower, similar, and higher comparison categories. Tables of the results are presented in the appendix and include county and city/town information, although not all census

[18] Strate S, Renski H, Peake T, Murphy JJ, Zaldonis P. Small area population estimates for 2011 through 2020. [White Paper]. Population Estimates Program, Economic and Public Policy Research, University of Massachusetts Donahue Institute. 2016.
[19] 1. Chiang CL, World Health Organization. Life table and mortality analysis / Chin Long Chiang. Published online 1979. https://apps.who.int/iris/handle/10665/62916
[20] Xu J, Murphy SL, Kochanek KD, Arias E. Deaths: Final Data for 2019. National Center for Health Statistics. Published July 26, 2021. Volume 70(8). Accessed April 26, 2023. https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-07-508.pdf.

tracts fit within a single town's boundaries. Rankings were determined by ranking the percentage of census tracts in a county with the lowest mortality, lowest PMR, and highest life expectancy. All analyses were conducted using SAS Studio. Data maps were generated using ArcGIS with county and city/town boundaries.

Note that data on American Indian/Alaska Native non-Hispanic residents is presented in Supplementary Tables S1-S3 but not in the brief narrative due to small numbers and relative sparsity of presentable census tracts. Note also that race/ethnicity data reflects what is collected on the death certificate and may, in some instances, reflect assumed race/ethnicity.

Acknowledgements

Special thanks to the efforts of the Registry of Vital Records and Statistics staff, who ensure complete, accurate, and timely data; and to the DPH Bureau of Climate and Environmental Health staff, who performed geocoding and assisted in constructing population denominator files.

Appendix

Table 2. Comparison[1] of Census Tract Mortality Rates by County, Massachusetts: 2012-2021

County	Census Tracts	Lower		Similar		Higher		Not Presented[2]	Rank
	Number	Number	%	Number	%	Number	%	Number	
Massachusetts	**1472**	**525**	**36%**	**546**	**37%**	**385**	**26%**	**16**	**N/A**
Barnstable	56	26	46%	20	36%	10	18%	0	5
Berkshire	39	16	41%	11	28%	12	31%	0	6
Bristol	125	21	17%	46	37%	58	46%	0	13
Dukes	4	3	75%	1	25%	0	0%	0	1
Essex	162	59	36%	58	36%	45	28%	0	8
Franklin	18	9	50%	5	28%	4	22%	0	3
Hampden	103	14	14%	37	36%	52	50%	0	14
Hampshire	36	10	28%	18	50%	6	17%	2	10
Middlesex	318	172	54%	106	33%	39	12%	1	2
Nantucket	5	2	40%	3	60%	0	0%	0	7
Norfolk	130	61	47%	43	33%	26	20%	0	4
Plymouth	100	24	24%	34	34%	42	42%	0	11
Suffolk	204	69	34%	93	46%	31	15%	11	9
Worcester	172	39	23%	71	41%	60	35%	2	12

Table 3. Comparison[1] of Census Tract Premature Mortality Rates by County, Massachusetts: 2012-2021

County	Census Tracts	Lower		Similar		Higher		Not Presented[2]	Rank
	Number	Number	%	Number	%	Number	%	Number	
Massachusetts	**1472**	**490**	**33%**	**556**	**38%**	**406**	**28%**	**20**	**N/A**
Barnstable	56	13	23%	31	55%	11	20%	1	11
Berkshire	39	12	31%	14	36%	13	33%	0	8
Bristol	125	15	12%	49	39%	61	49%	0	13
Dukes	4	**4**	**100%**	0	0%	0	0%	0	1
Essex	162	58	36%	59	36%	45	28%	0	6
Franklin	18	6	33%	7	39%	5	28%	0	7
Hampden	103	12	12%	32	31%	**58**	**56%**	1	14
Hampshire	36	15	42%	13	36%	5	14%	3	5
Middlesex	318	175	55%	110	35%	32	10%	1	3
Nantucket	5	3	60%	2	40%	0	0%	0	2
Norfolk	130	66	51%	42	32%	22	17%	0	4
Plymouth	100	28	28%	35	35%	37	37%	0	9
Suffolk	204	41	20%	100	49%	51	25%	12	12
Worcester	172	42	24%	62	36%	66	38%	2	10

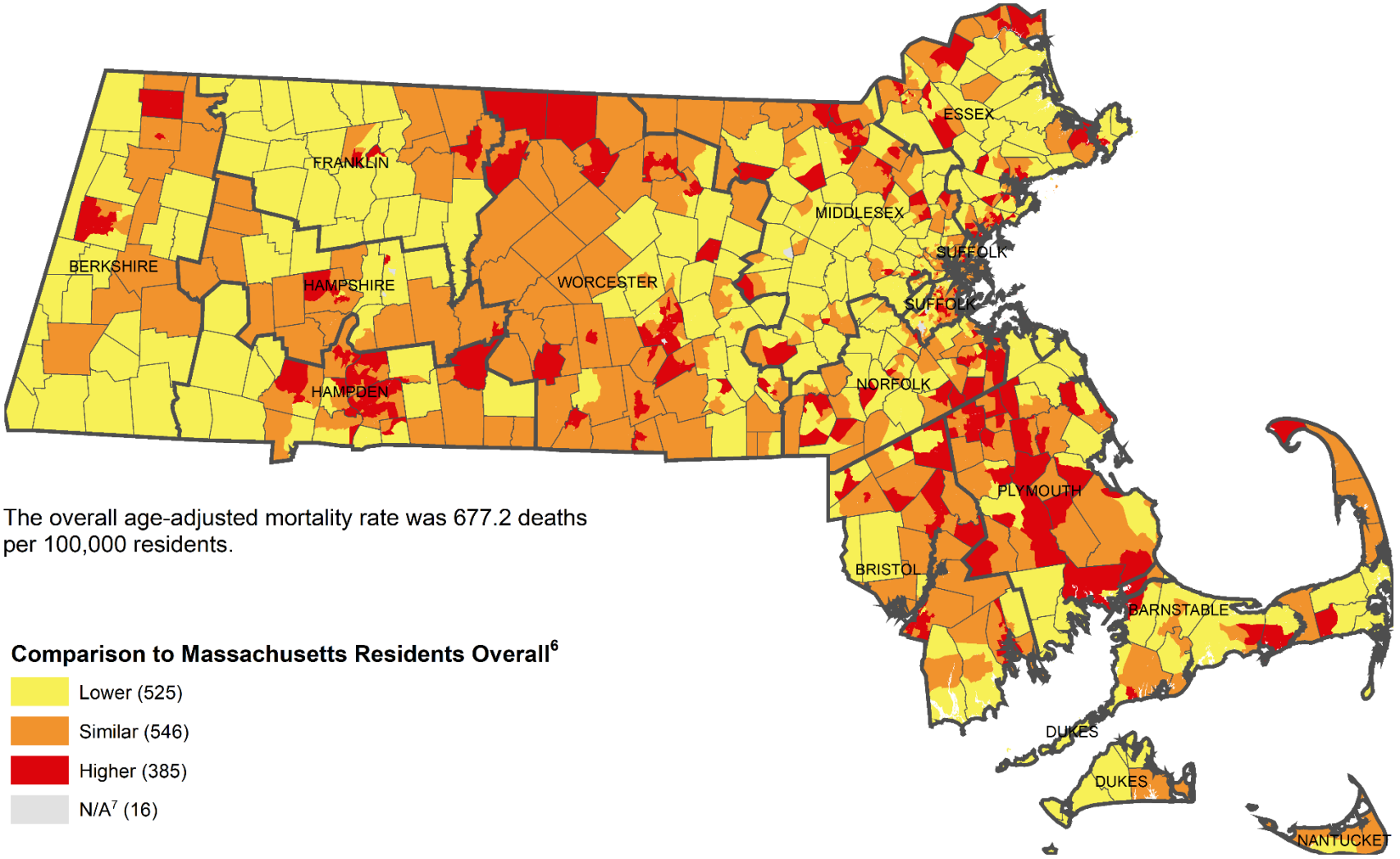
NOTES: 1. Comparisons to residents overall were based on 95% confidence intervals (see Methods). 2. Rates and comparisons not calculated for tracts with fewer than 5 deaths.

Table 4. Comparison[1] of Census Tract Life Expectancy at Birth by County, Massachusetts: 2012-2021

County	Census Tracts	Lower		Similar		Higher		Not Presented[2]	Rank
	Number	Number	%	Number	%	Number	%	Number	
Massachusetts	**1472**	**403**	**27%**	**501**	**34%**	**544**	**37%**	**24**	**N/A**
Barnstable	56	11	20%	23	41%	21	38%	1	7
Berkshire	39	14	36%	10	26%	15	38%	0	5
Bristol	125	62	50%	39	31%	24	19%	0	13
Dukes	4	0	0%	1	25%	3	75%	0	2
Essex	162	46	28%	55	34%	61	38%	0	6
Franklin	18	5	28%	7	39%	6	33%	0	9
Hampden	103	**53**	**51%**	35	34%	14	14%	1	14
Hampshire	36	5	14%	18	50%	10	28%	3	10
Middlesex	318	38	12%	88	28%	189	59%	3	3
Nantucket	5	0	0%	1	20%	**4**	**80%**	0	1
Norfolk	130	23	18%	42	32%	65	50%	0	4
Plymouth	100	41	41%	36	36%	22	22%	1	12
Suffolk	204	38	19%	85	42%	68	33%	13	8
Worcester	172	67	39%	61	35%	42	24%	2	11

NOTES: 1. Comparisons to residents overall were based on 95% confidence intervals (see Methods). 2. Life expectancy not calculated for tracts with fewer than 5 deaths or with no estimated population in a particular age group.

Figure 1. Age-Adjusted Mortality Rates by Census Tract, Massachusetts: 2012-2021[1-5]



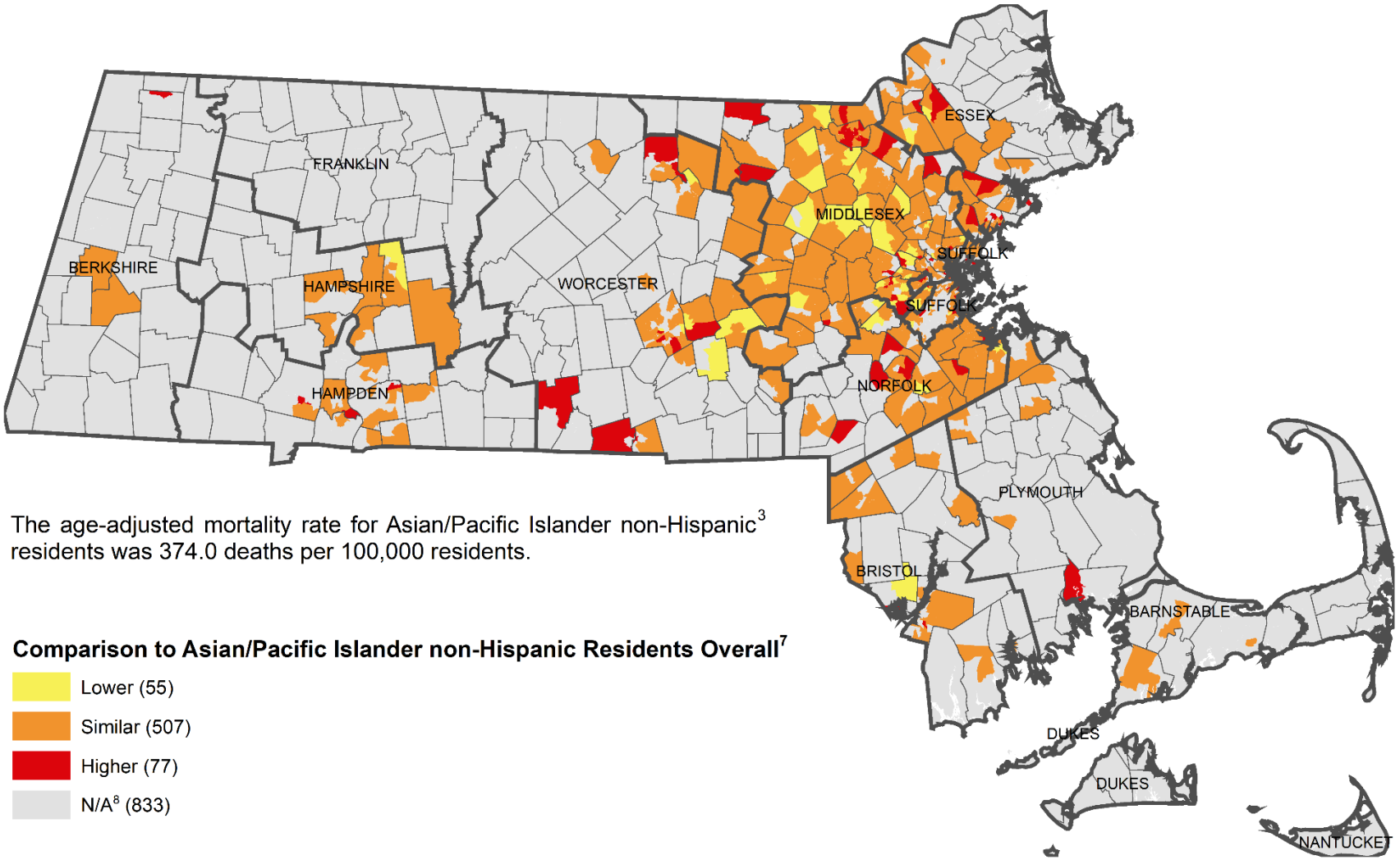
The overall age-adjusted mortality rate was 677.2 deaths per 100,000 residents.

Comparison to Massachusetts Residents Overall[6]

- Lower (525)
- Similar (546)
- Higher (385)
- N/A[7] (16)

NOTES: 1. Rates were age-adjusted per 100,000 residents using the 2000 US standard population. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. U.S. Census Bureau 2010 Census Tracts. 4. Data presented is of Massachusetts residents. 5. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 6. Comparisons to residents overall were based on 95% confidence intervals. 7. Rates not calculated for tracts with fewer than 5 deaths.

Figure 2. Age-Adjusted Mortality Rates for Asian/Pacific Islander non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



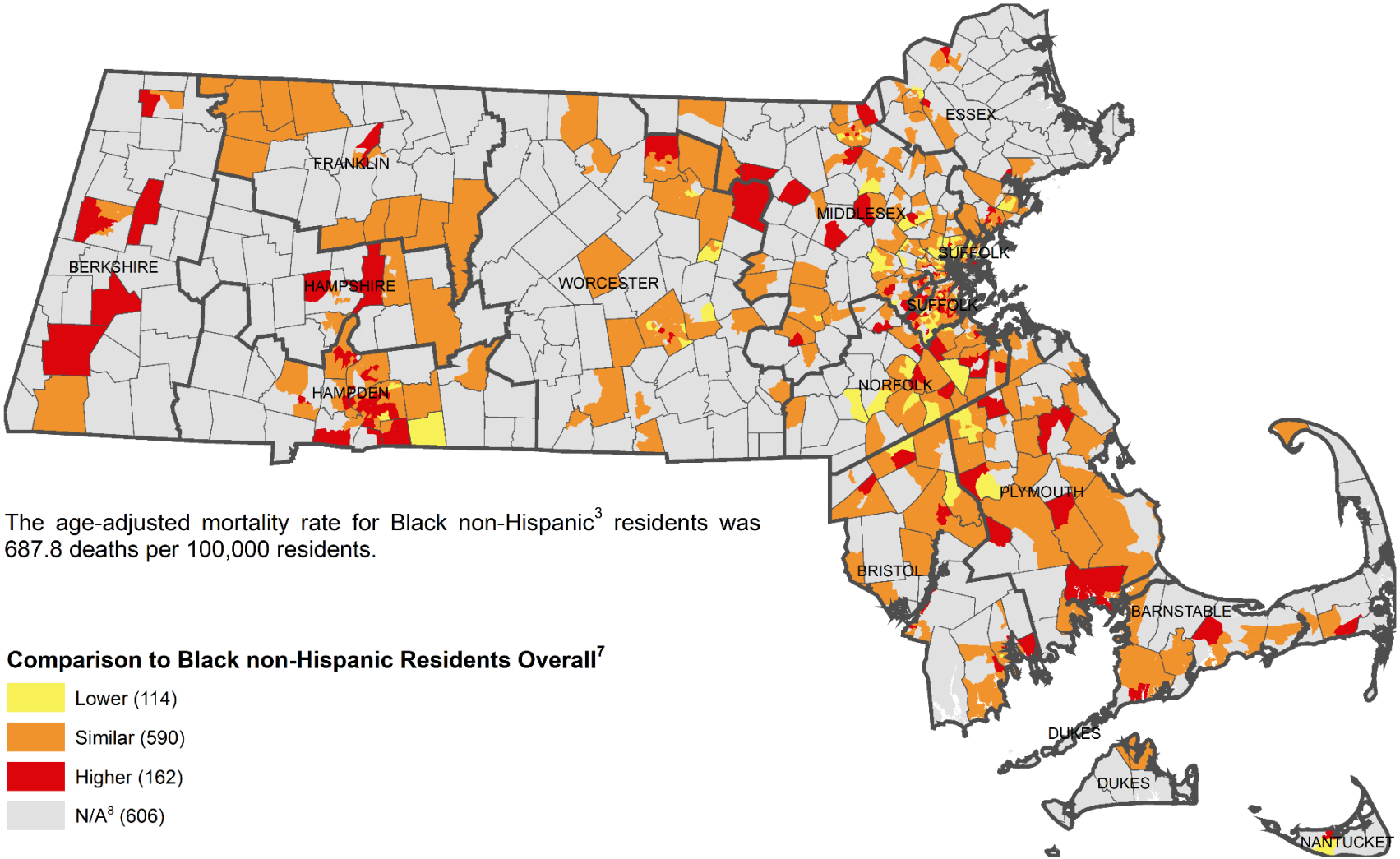
The age-adjusted mortality rate for Asian/Pacific Islander non-Hispanic[3] residents was 374.0 deaths per 100,000 residents.

Comparison to Asian/Pacific Islander non-Hispanic Residents Overall[7]

- Lower (55)
- Similar (507)
- Higher (77)
- N/A[8] (833)

NOTES: 1. Rates were age-adjusted per 100,000 residents using the 2000 US standard population. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Asian/Pacific Islander non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 3. Age-Adjusted Mortality Rates for Black non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



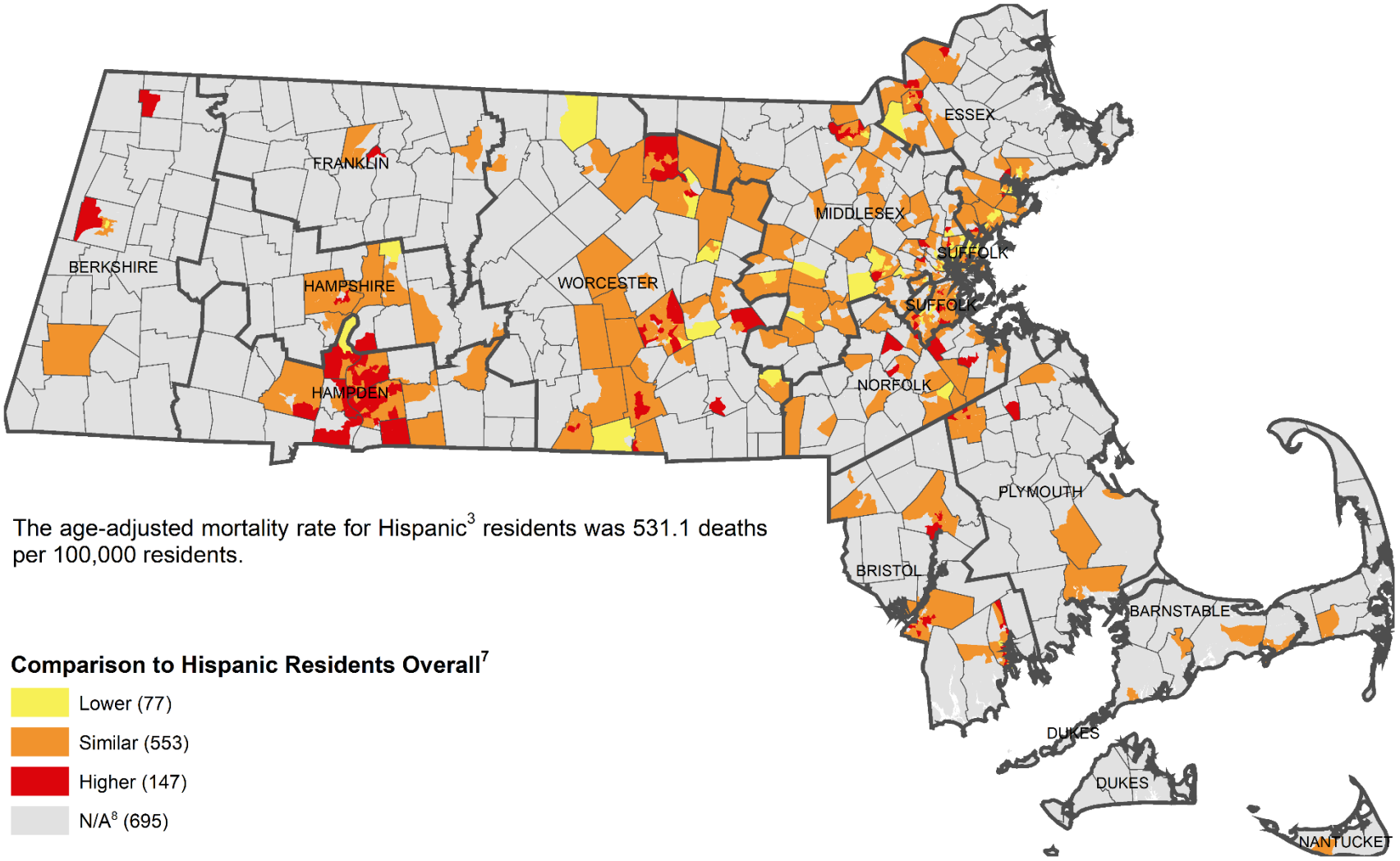
The age-adjusted mortality rate for Black non-Hispanic[3] residents was 687.8 deaths per 100,000 residents.

Comparison to Black non-Hispanic Residents Overall[7]

- Lower (114)
- Similar (590)
- Higher (162)
- N/A[8] (606)

NOTES: 1. Rates were age-adjusted per 100,000 residents using the 2000 US standard population. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Black non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 4. Age-Adjusted Mortality Rates for Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



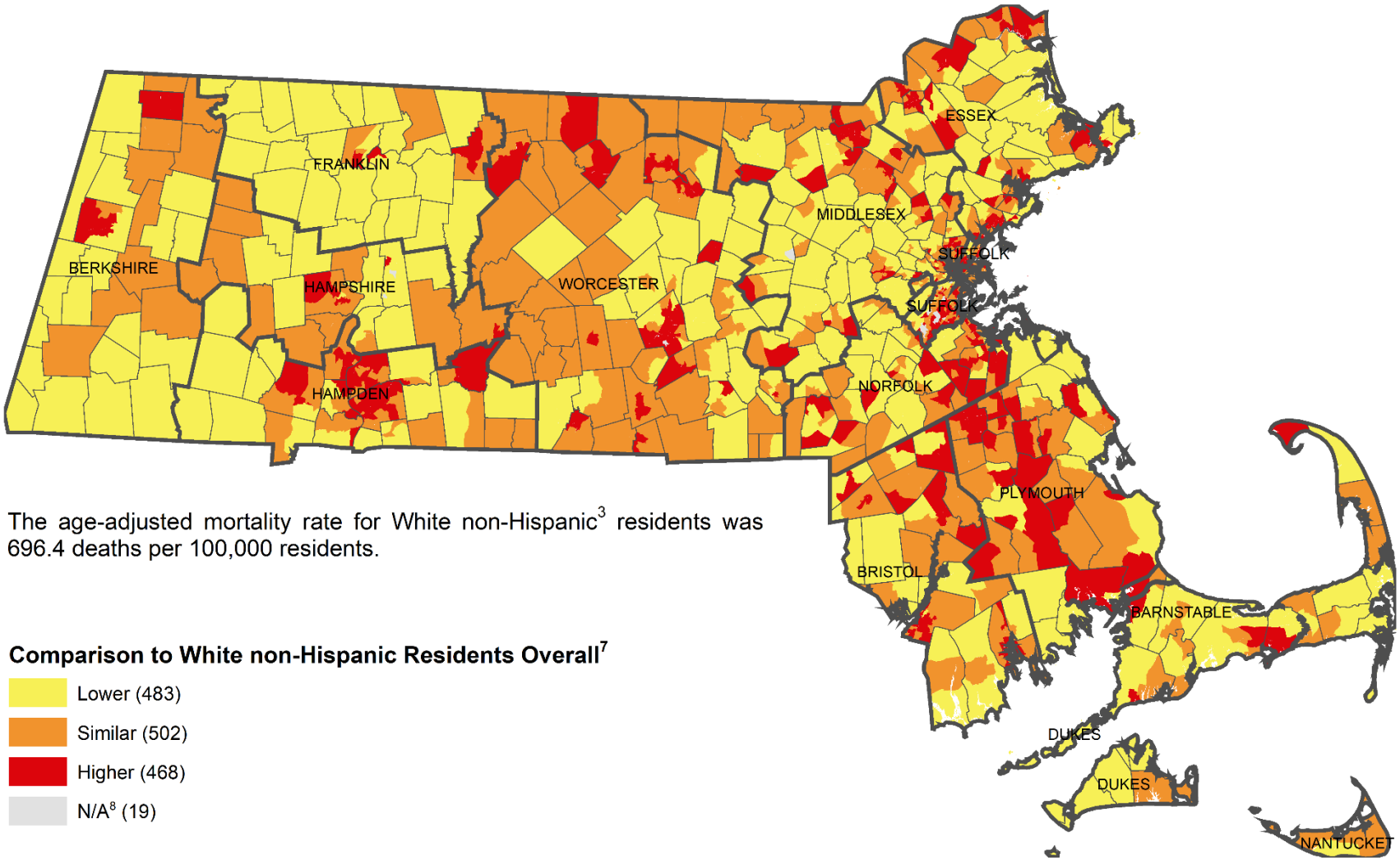
The age-adjusted mortality rate for Hispanic[3] residents was 531.1 deaths per 100,000 residents.

Comparison to Hispanic Residents Overall[7]

- Lower (77)
- Similar (553)
- Higher (147)
- N/A[8] (695)

NOTES: 1. Rates were age-adjusted per 100,000 residents using the 2000 US standard population. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 5. Age-Adjusted Mortality Rates for White non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



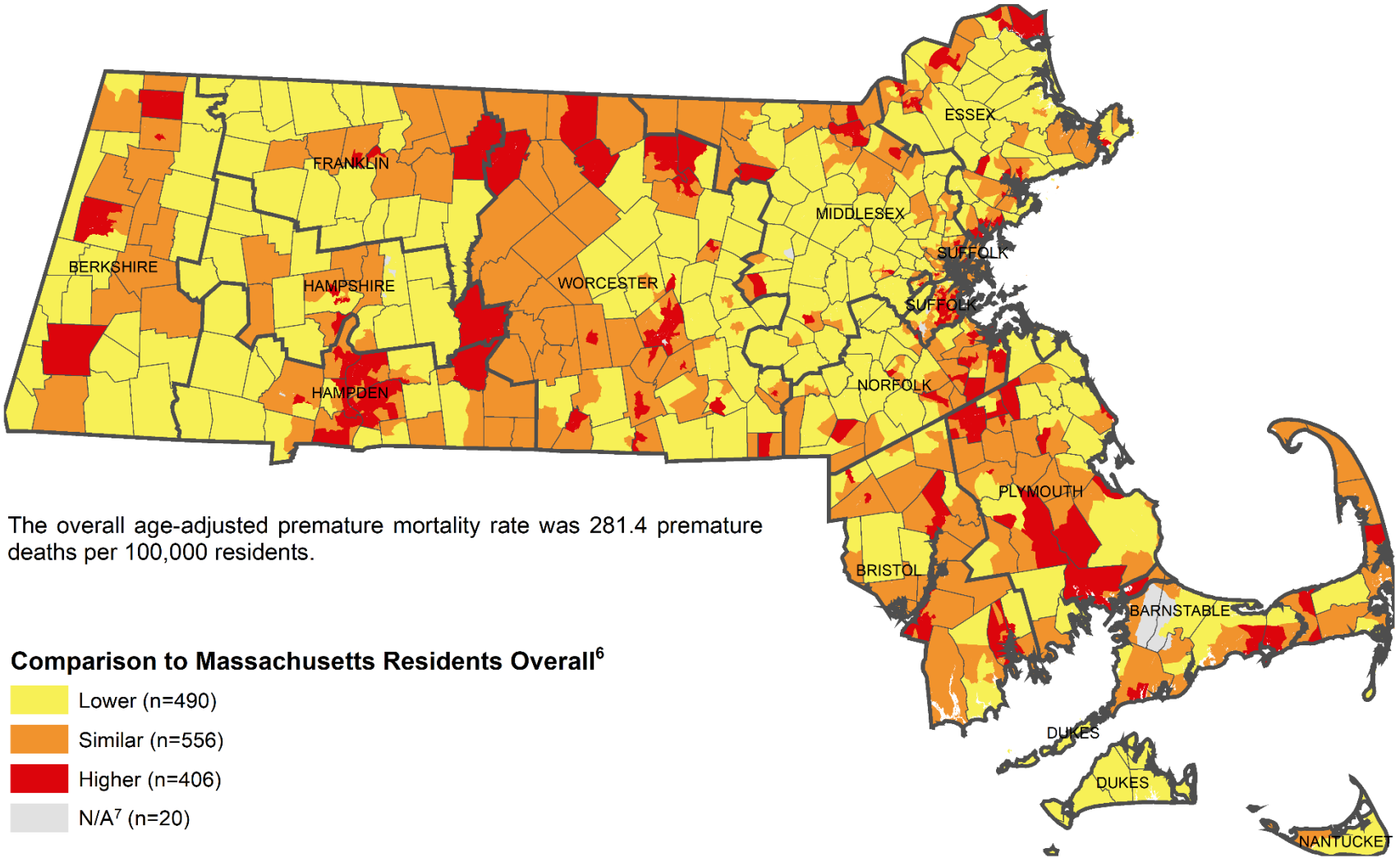
The age-adjusted mortality rate for White non-Hispanic[3] residents was 696.4 deaths per 100,000 residents.

Comparison to White non-Hispanic Residents Overall[7]

- Lower (483)
- Similar (502)
- Higher (468)
- N/A[8] (19)

NOTES: 1. Rates were age-adjusted per 100,000 residents using the 2000 US standard population. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to White non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 6. Age-Adjusted Premature Mortality Rates by Census Tract, Massachusetts: 2012-2021[1-5]



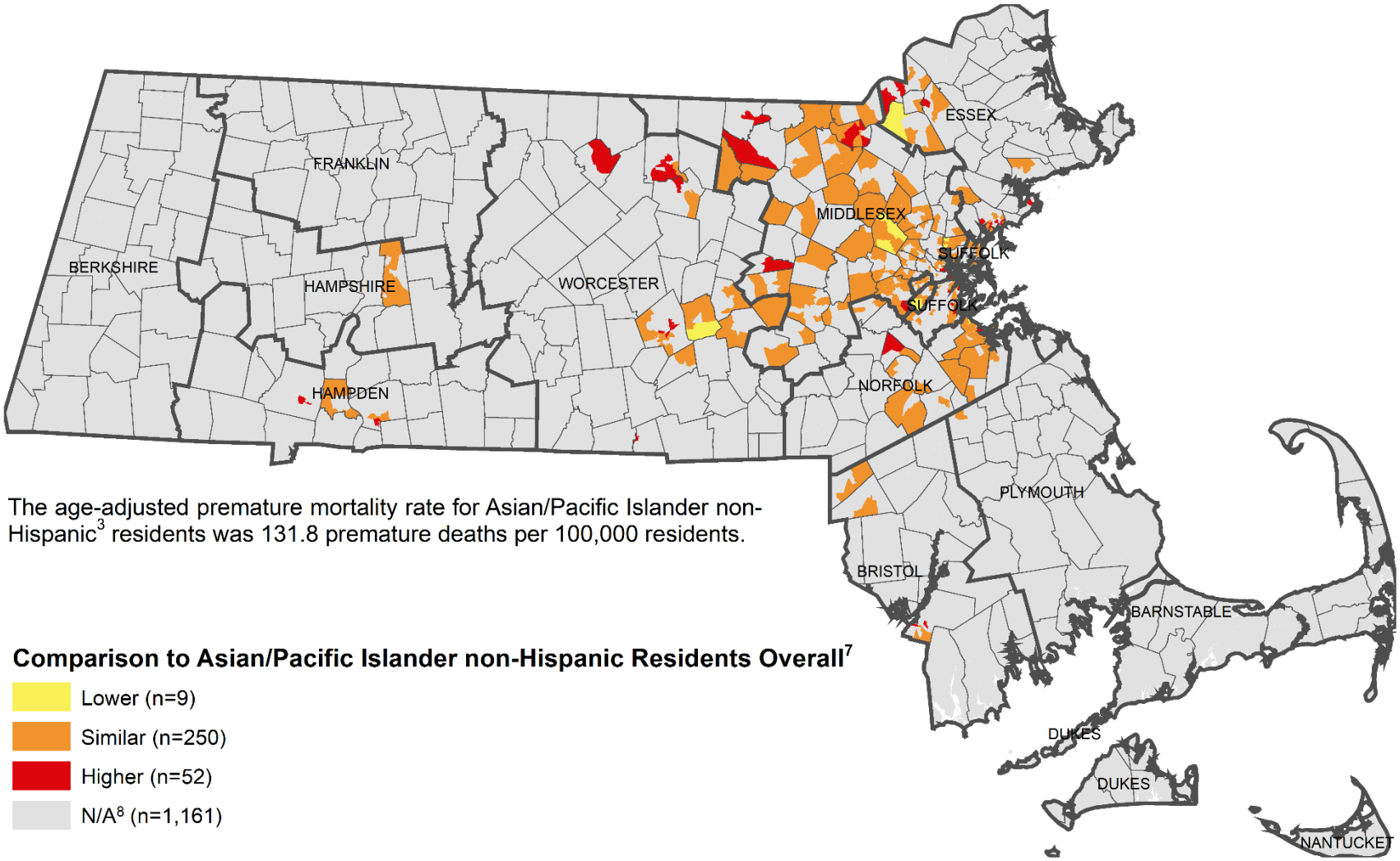
The overall age-adjusted premature mortality rate was 281.4 premature deaths per 100,000 residents.

Comparison to Massachusetts Residents Overall[6]

- Lower (n=490)
- Similar (n=556)
- Higher (n=406)
- N/A[7] (n=20)

NOTES: 1. Premature Mortality Rate is deaths that occur before the age of 75 years per 100,000, age-adjusted to the 2000 US standard population under 75 years of age. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. U.S. Census Bureau 2010 Census Tracts. 4. Data presented is of Massachusetts residents. 5. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 6. Comparisons to residents overall were based on 95% confidence intervals. 7. Rates not calculated for tracts with fewer than 5 deaths.

Figure 7. Age-Adjusted Premature Mortality Rates for Asian/Pacific Islander non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



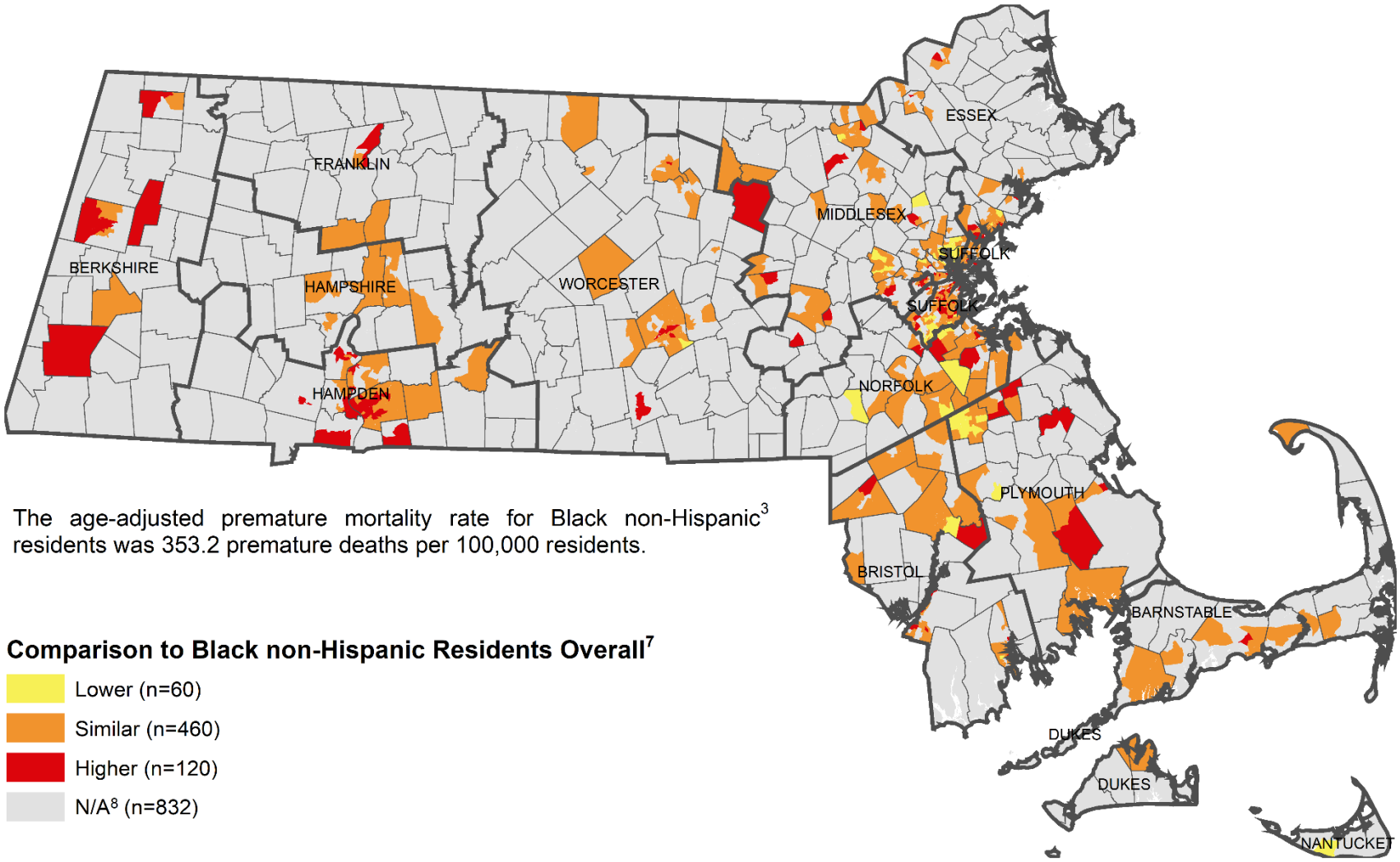
The age-adjusted premature mortality rate for Asian/Pacific Islander non-Hispanic[3] residents was 131.8 premature deaths per 100,000 residents.

Comparison to Asian/Pacific Islander non-Hispanic Residents Overall[7]

- Lower (n=9)
- Similar (n=250)
- Higher (n=52)
- N/A[8] (n=1,161)

NOTES: 1. Premature Mortality Rate is deaths that occur before the age of 75 years per 100,000, age-adjusted to the 2000 US standard population under 75 years of age. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Asian/Pacific Islander non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 8. Age-Adjusted Premature Mortality Rates for Black non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



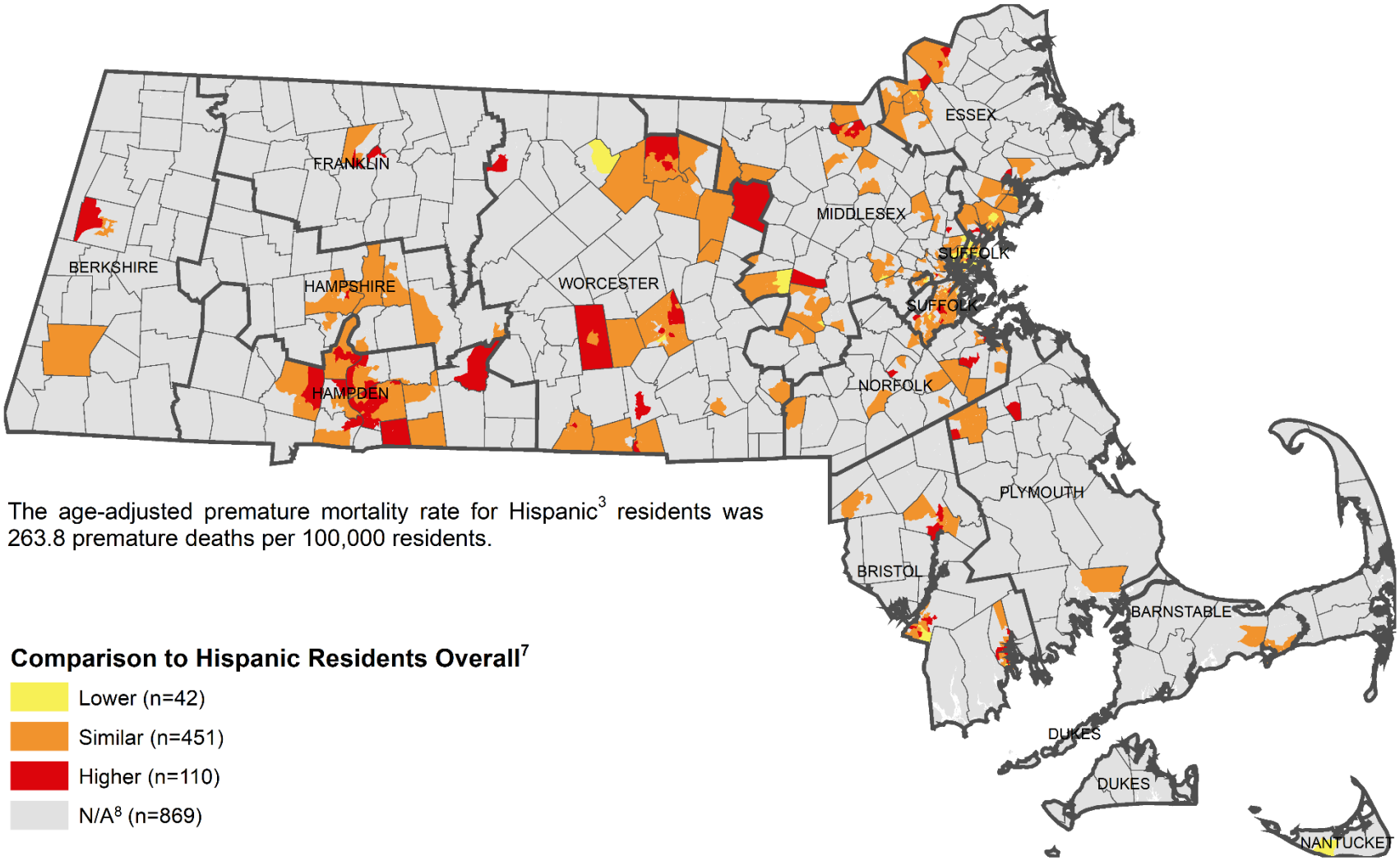
The age-adjusted premature mortality rate for Black non-Hispanic[3] residents was 353.2 premature deaths per 100,000 residents.

Comparison to Black non-Hispanic Residents Overall[7]

- Lower (n=60)
- Similar (n=460)
- Higher (n=120)
- N/A[8] (n=832)

NOTES: 1. Premature Mortality Rate is deaths that occur before the age of 75 years per 100,000, age-adjusted to the 2000 US standard population under 75 years of age. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Black non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 9. Age-Adjusted Premature Mortality Rates for Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



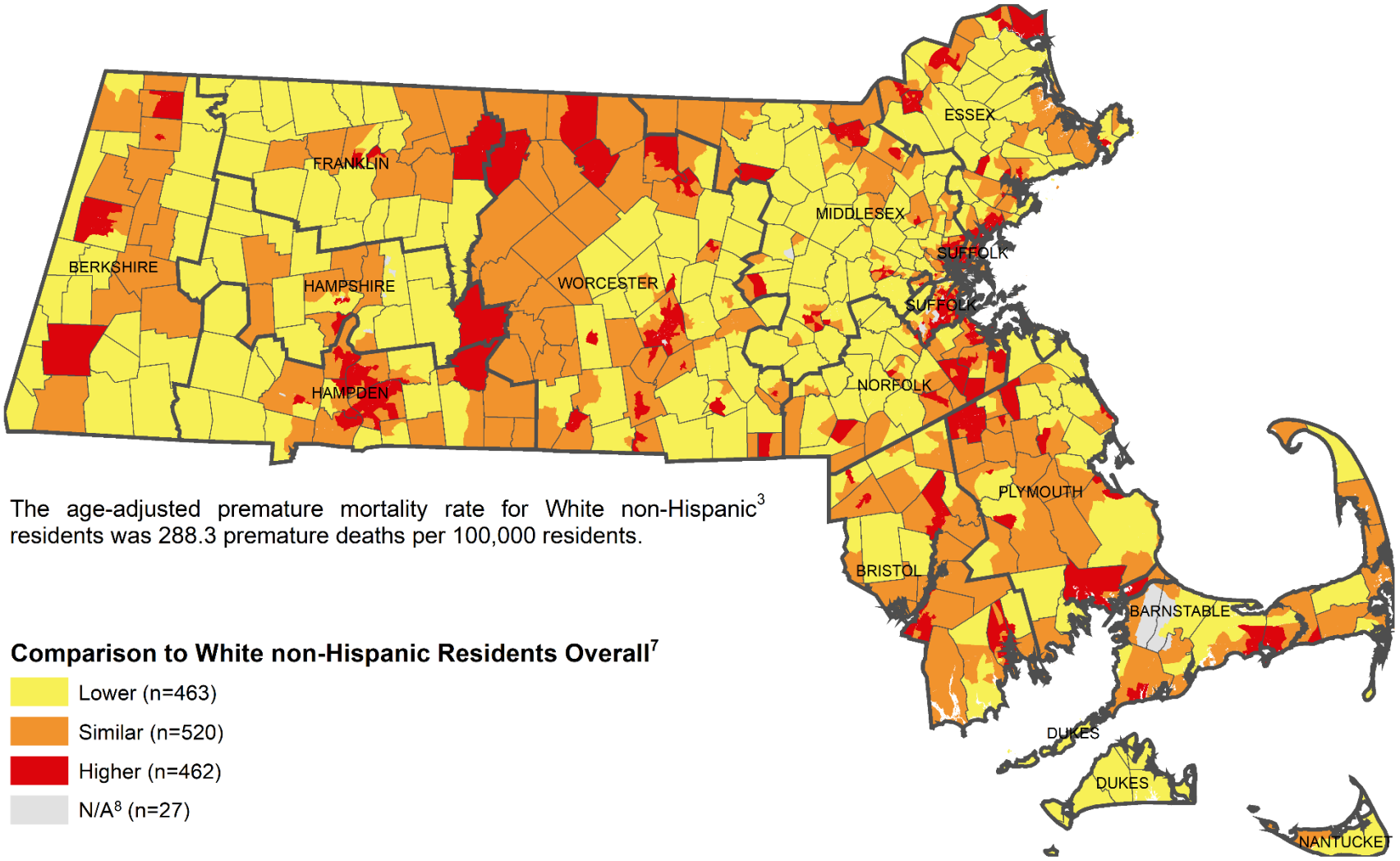
The age-adjusted premature mortality rate for Hispanic[3] residents was 263.8 premature deaths per 100,000 residents.

Comparison to Hispanic Residents Overall[7]

- Lower (n=42)
- Similar (n=451)
- Higher (n=110)
- N/A[8] (n=869)

NOTES: 1. Premature Mortality Rate is deaths that occur before the age of 75 years per 100,000, age-adjusted to the 2000 US standard population under 75 years of age. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Black non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 10. Age-Adjusted Premature Mortality Rates for White non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



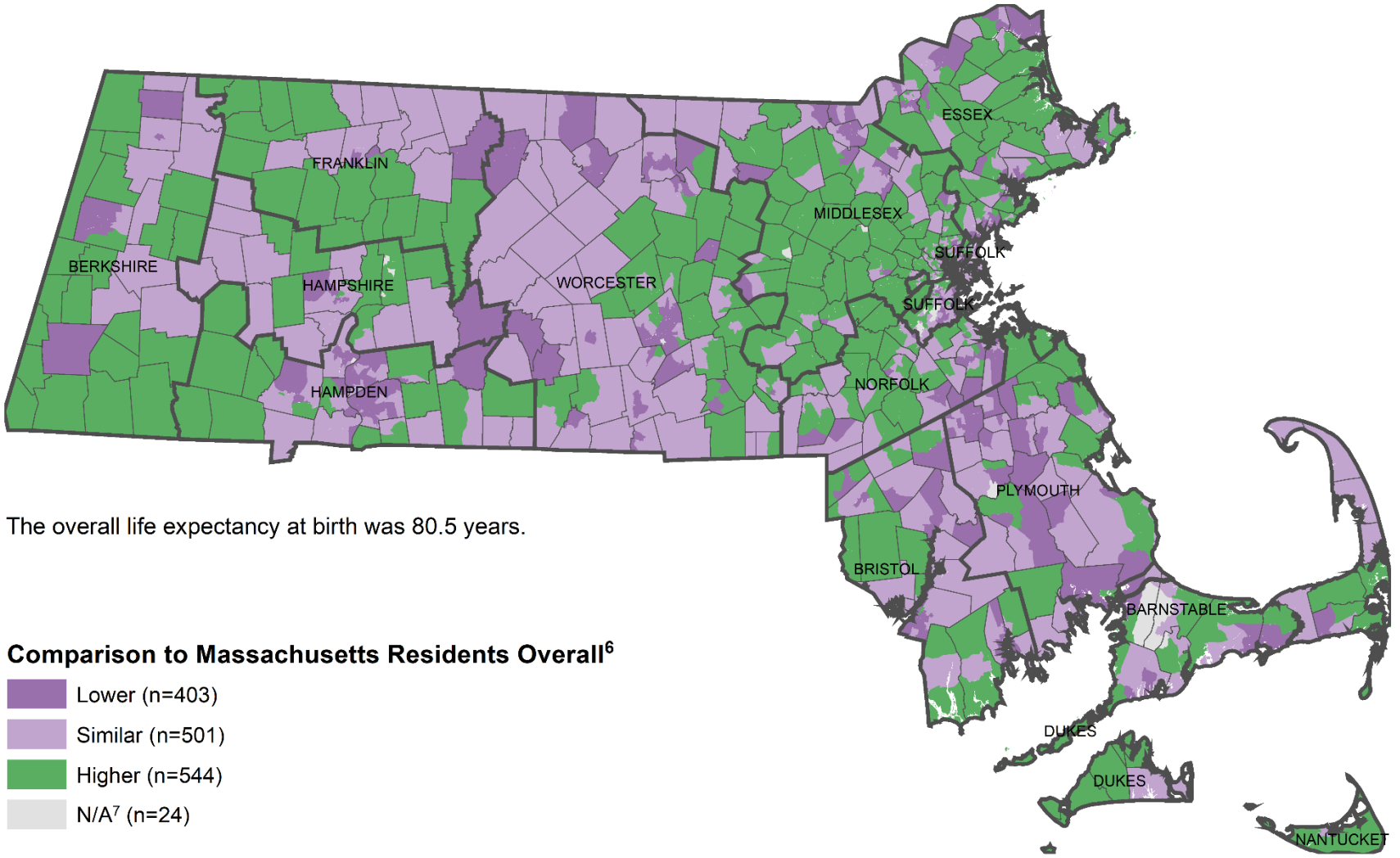
The age-adjusted premature mortality rate for White non-Hispanic[3] residents was 288.3 premature deaths per 100,000 residents.

Comparison to White non-Hispanic Residents Overall[7]

- Lower (n=463)
- Similar (n=520)
- Higher (n=462)
- N/A[8] (n=27)

NOTES: 1. Premature Mortality Rate is deaths that occur before the age of 75 years per 100,000, age-adjusted to the 2000 US standard population under 75 years of age. 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to White non-Hispanic residents overall were based on 95% confidence intervals. 8. Rates not calculated for tracts with fewer than 5 deaths.

Figure 11. Life Expectancy at Birth by Census Tract, Massachusetts: 2012-2021[1-5]



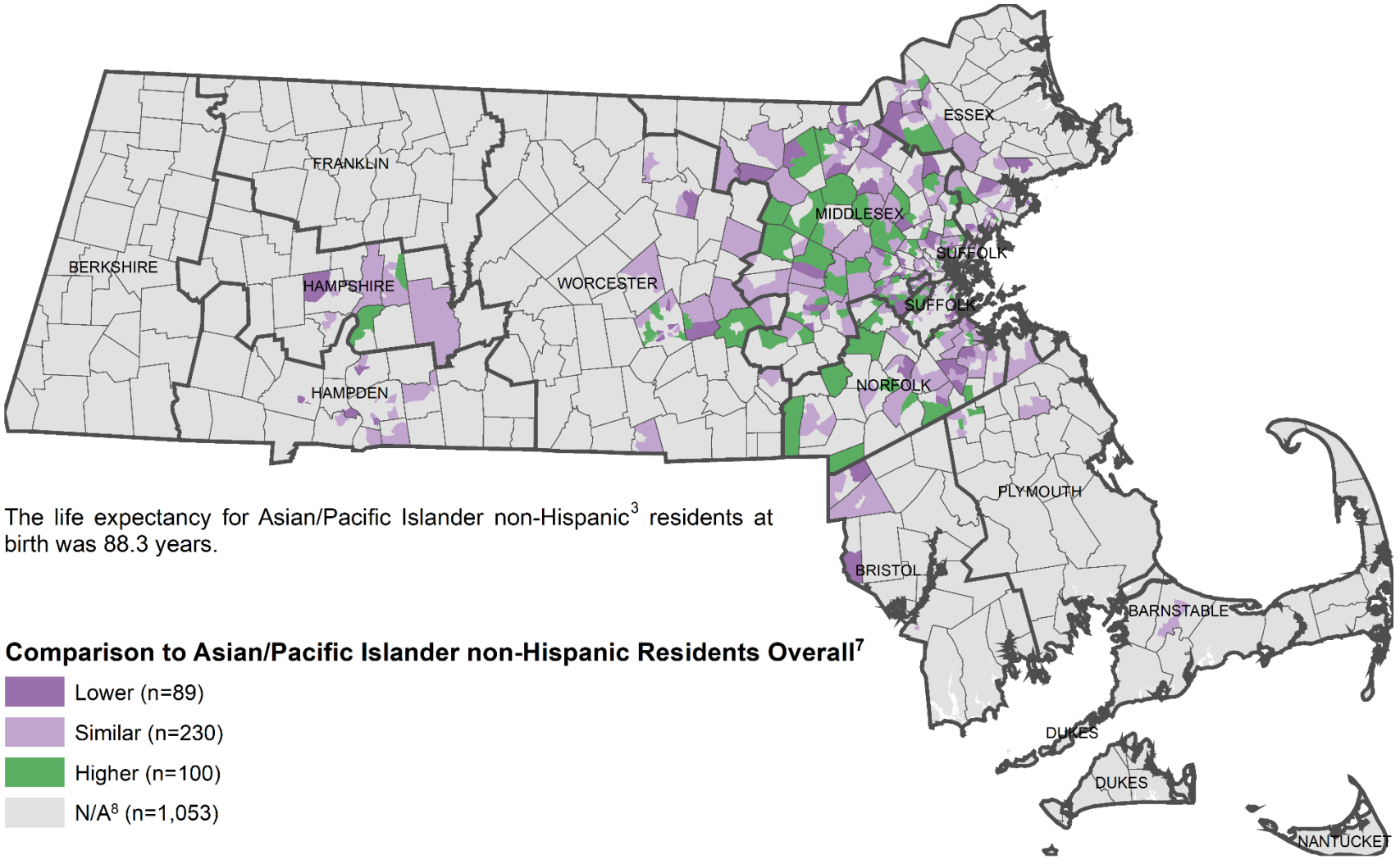
The overall life expectancy at birth was 80.5 years.

Comparison to Massachusetts Residents Overall[6]

- Lower (n=403)
- Similar (n=501)
- Higher (n=544)
- N/A[7] (n=24)

NOTES: 1. Life expectancy at birth was calculated using the Chiang II method (source: Chiang, Chin Long & World Health Organization. (1979)). 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. U.S. Census Bureau 2010 Census Tracts. 4. Data presented is of Massachusetts residents. 5. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 6. Comparisons to residents overall were based on 95% confidence intervals. 7. Life expectancy not calculated for census tracts with fewer than 5 deaths.

Figure 12. Life Expectancy at Birth for Asian/Pacific Islander non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



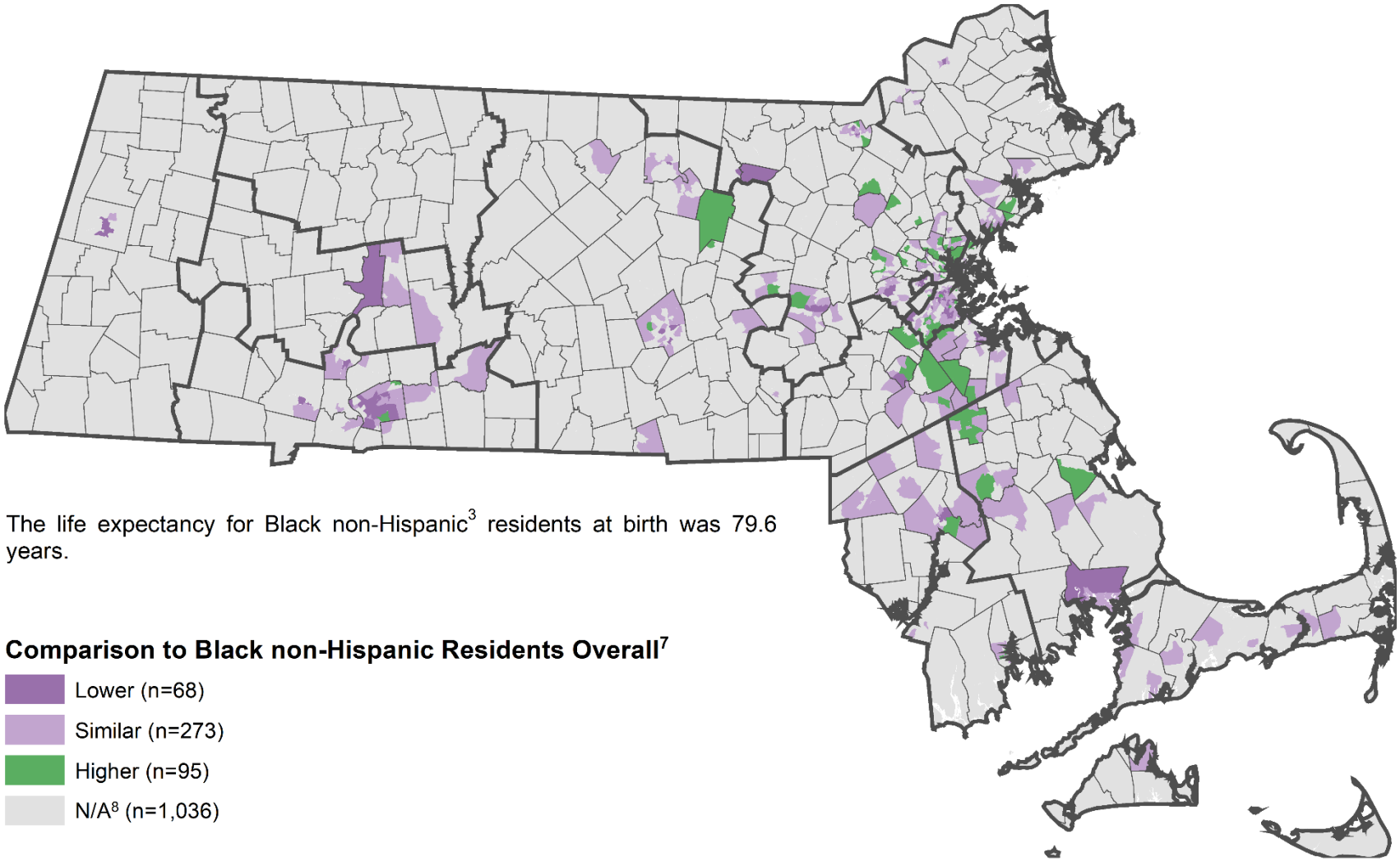
The life expectancy for Asian/Pacific Islander non-Hispanic[3] residents at birth was 88.3 years.

Comparison to Asian/Pacific Islander non-Hispanic Residents Overall[7]

- Lower (n=89)
- Similar (n=230)
- Higher (n=100)
- N/A[8] (n=1,053)

NOTES: 1. Life expectancy at birth was calculated using the Chiang II method (source: Chiang, Chin Long & World Health Organization. (1979)). 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Asian/Pacific Islander non-Hispanic residents overall were based on 95% confidence intervals. 8. Life expectancy not calculated for census tracts with fewer than 5 deaths.

Figure 13. Life Expectancy at Birth for Black non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



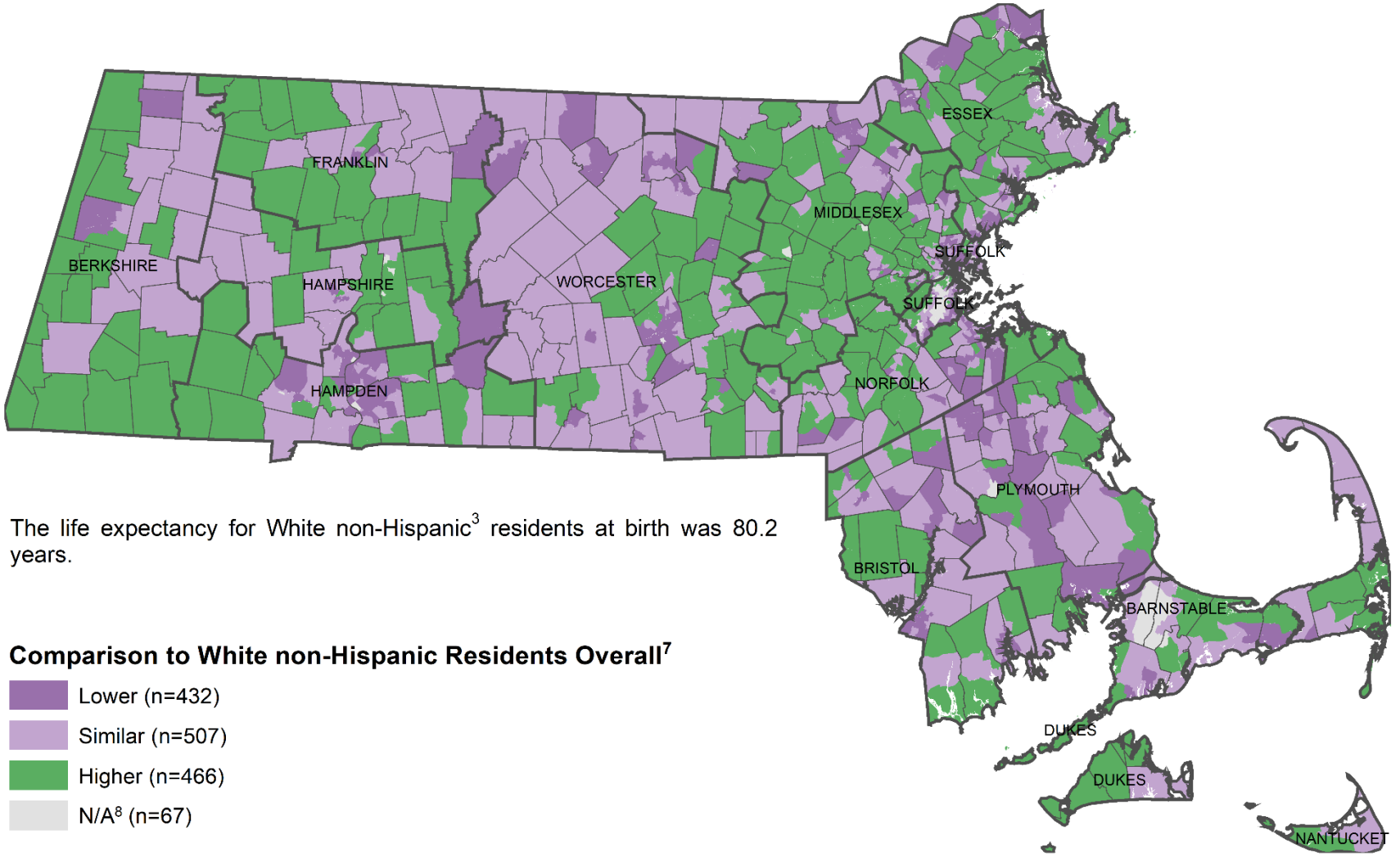
The life expectancy for Black non-Hispanic[3] residents at birth was 79.6 years.

Comparison to Black non-Hispanic Residents Overall[7]

- Lower (n=68)
- Similar (n=273)
- Higher (n=95)
- N/A[8] (n=1,036)

NOTES: 1. Life expectancy at birth was calculated using the Chiang II method (source: Chiang, Chin Long & World Health Organization. (1979)). 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to Black non-Hispanic residents overall were based on 95% confidence intervals. 8. Life expectancy not calculated for census tracts with fewer than 5 deaths.

Figure 15. Life Expectancy at Birth for White non-Hispanic Residents by Census Tract, Massachusetts: 2012-2021[1-6]



The life expectancy for White non-Hispanic[3] residents at birth was 80.2 years.

Comparison to White non-Hispanic Residents Overall[7]

- Lower (n=432)
- Similar (n=507)
- Higher (n=466)
- N/A[8] (n=67)

NOTES: 1. Life expectancy at birth was calculated using the Chiang II method (source: Chiang, Chin Long & World Health Organization. (1979)). 2. Resident population estimates were developed by the University of Massachusetts Donahue Institute in partnership with the Bureau of Environmental Health at the Massachusetts Department of Public Health. 3. Race and ethnicity data are presented as mutually exclusive categories. Persons of Hispanic ethnicity are not included in a race category. 4. U.S. Census Bureau 2010 Census Tracts. 5. Data presented is of Massachusetts residents. 6. Death data from 2012-2021 was aggregated at the census tract level; 2021 data is preliminary. 7. Comparisons to White non-Hispanic residents overall were based on 95% confidence intervals. 8. Life expectancy not calculated for census tracts with fewer than 5 deaths.