

MA State Office of Rural Health

Rural Definition



1 BACKGROUND

1.1 WHAT IS RURAL?

Public health programming relies on accurate data, which are often unavailable for small populations like rural communities. These small population groups have some of the worst health disparities in the United States, making it an ethical imperative to explore creative solutions to the problem of insufficient data. There is no single definition of Rural. In fact there are many rural definitions recognized within federal, state and regional organizations. No single definition can fulfill all programmatic and policy needs, so different definitions are implemented based on the requirements of a program or policy. The Rural Health Information Hub States:

Rural is an inexact term that can mean different things to different people, organizations and governments. Trying to define what "rural" is, in a nation of diverse geography, can be a daunting task. However, for those concerned with rural healthcare and human services, that which constitutes rural must be precisely defined. Federal and state policymakers, as well as service providers and researchers, need a clearly stated definition that is current in its interpretation.

Typically, methods for defining rural are based on geographic units that are sometimes combined with population or provider characteristics. For the purposes of the State Office of Rural Health (SORH), the following three federal agency rural definitions are the most commonly used.

- **the U.S. Census Bureau**
 - Urbanized Areas (UAs) are geographic areas of 50,000 or more people. Urban Clusters (UCs) are geographic areas of 2,500 to 50,000 people. Any area not categorized as a UA or UC is considered rural.
- **the Office of Management and Budget (OMB)**
 - Categorizes Metropolitan, Micropolitan, & Nonmetropolitan statistical areas. Metropolitan areas contain a core urban area population of 50,000 or more. Nonmetropolitan areas contain a population of less than 50,000. Micropolitan areas are urban clusters with populations 10,000 to 50,000.
- **the Economic Research Service of the U.S. Department of Agriculture (RUCAs)**
 - Utilizes the U.S. Census Bureau's UAs and UCs definitions with information on work commuting. Classification delineates metropolitan, micropolitan, small town and rural commuting areas with whole numbers 1-10 and further subdivides into 21 secondary codes based on commuting flows - local or to another census tract.

1.2 CREATION OF A STATE DEFINITION

The framework for a state definition was created in 2002. The Massachusetts Department of Public Health - State Office of Rural Health (SORH) worked with its advisory council, the Massachusetts Rural Council on Health to develop this definition. This framework is updated with the release of new census data every ten years. Every update is reviewed to make sure it still meets the needs of our office and advisory council. The Massachusetts SORH's rural definition is used for assessment and planning purposes.

Definition of Rural Massachusetts Towns

A municipality in Massachusetts is considered rural if it meets one of the following criteria:

- Meets at least one of three federal rural definitions at the sub-county level (Census Bureau, OMB, or RUCAs), and/or
- Has a population less than 10,000 people and a population density below 500 people per square mile, and/or
- Has an acute care hospital in the town that meets the state hospital licensure definition of a small rural hospital (SRH), or is a certified Critical Access Hospital (CAH), and/or
- Has a federally licensed Rural Health Clinic (RHC) in the town.

Two Levels of Rurality

Rural towns are classified into two categories of rurality. Towns classified as rural level one meet fewer rural criteria than towns considered rural at level two.

- Towns in level two are less densely populated and more remote and isolated from urban core areas.
- Towns in level one and level two are both rural.
- Towns not in level one or two are considered urban.

There is no geographic definition for the “suburbs” within the federal classifications we are using. We have included information on some methodologies that have been used in other states to define suburban geographies in our resource section.

To determine the level of rurality, the MA SORH's rural definition uses a composite scoring system with points assigned for meeting particular definitions of rural.

Definitions of Rural	Standard	Points if Met
Census Bureau	>50% Rural	5 points
OMB	town level	10 points
RUCAs	Codes 4 - 10	10 points
Population & Density	Pop< 10,000 & Den<500 PPSM	5 points
SRH/CAH/RHC in town	MA law & Hospital Regs	5 point

Points for each definition were then added together and categorized as follows:

Rural Level 1: Communities with combined rurality scores of 5-15

Rural Level 2: Communities with combined rurality scores of 20-35

2 RUNNING DATA ON MASSACHUSETTS RURAL TOWNS

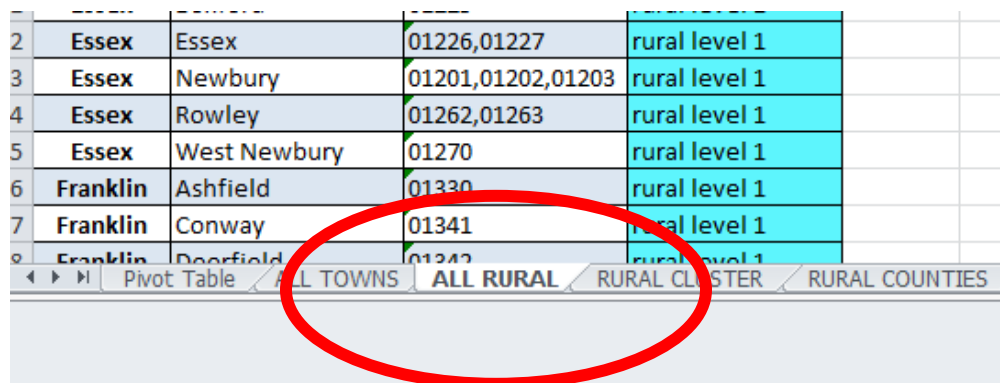
The definition of Massachusetts Rural Towns can be used for analysis in different ways. These analysis levels are available in excel format from the State Office of Rural Health. The descriptions below introduce you to the levels and examples of appropriate uses. For access to the rural definition spread sheet please contact the State Office of Rural Health.

- All Rural Towns
- All Rural Counties
- Rural Clusters

2.1.1 All Rural

We have provided a list of all towns in MA classified as rural, including their level of rurality and zip code. Classifying towns in MA as either rural or urban for analyzing data will provide a high level view of rural communities across the Commonwealth. This larger list is favorable to address cell suppression due to small sample sizes as well as to get an overall data comparison of rural and urban communities at the state level. This tab also contains the stratifications of rural level 1 and rural level 2.

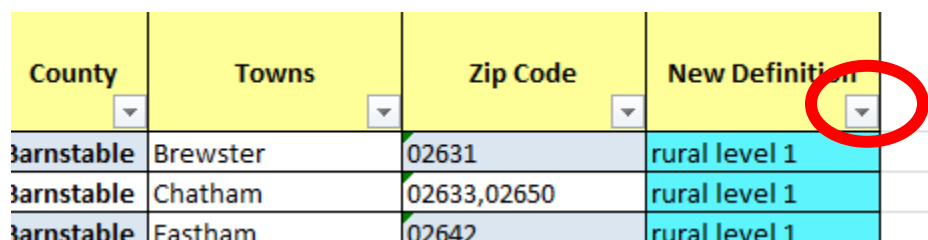
This analysis level can be found in the 'ALL RURAL' tab



2	Essex	Essex	01226,01227	rural level 1
3	Essex	Newbury	01201,01202,01203	rural level 1
4	Essex	Rowley	01262,01263	rural level 1
5	Essex	West Newbury	01270	rural level 1
6	Franklin	Ashfield	01330	rural level 1
7	Franklin	Conway	01341	rural level 1
8	Franklin	Deerfield	01342	rural level 1

Pivot Table ALL TOWNS **ALL RURAL** RURAL CLUSTER RURAL COUNTIES

Each table also contains filtering for easier navigation.

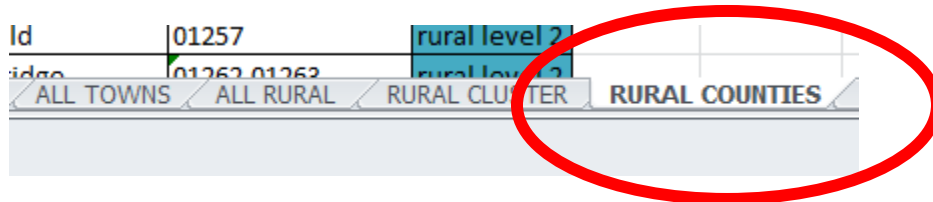


County	Towns	Zip Code	New Definition
Barnstable	Brewster	02631	rural level 1
Barnstable	Chatham	02633,02650	rural level 1
Barnstable	Eastham	02642	rural level 1

2.1.2 Rural Counties

This analysis tab provides rural information at the county level. Included in this analysis level are the three completely rural counties in MA as well as the one nearly-rural county (it includes one urban town).

This analysis level can be found in the 'RURAL COUNTIES' tab

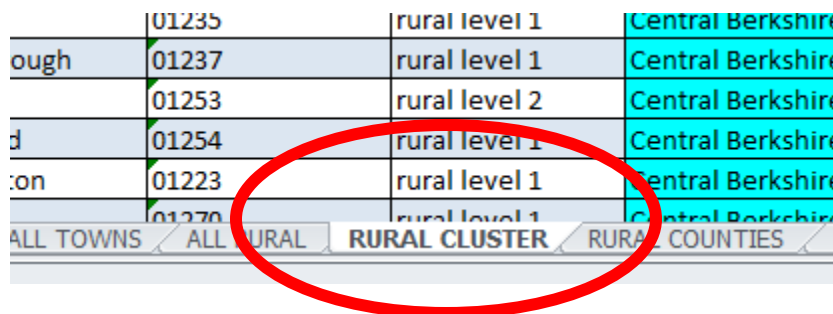


Id	01257	rural level 2	
idgo	01262 01262	rural level 2	
ALL TOWNS	ALL RURAL	RURAL CLUSTER	RURAL COUNTIES

2.1.3 Rural Clusters

Larger than the town level but smaller than counties are rural clusters. These groupings of rural towns allow for more specific analyses to be done. Towns have been clustered according to characteristics identified by the rural communities themselves and represent geographic areas that have been historically classified together in those regions. Clusters may represent areas of shared services, cultural commonality, or geographic cohesion. This analysis level can be helpful for hot spotting data and identifying trends specific to certain regions. This analysis level tends to be more helpful to rural communities themselves when utilizing data and analyses.

This analysis level can be found under the 'RURAL CLUSTER' tab.



	01235	rural level 1	Central Berkshire
ough	01237	rural level 1	Central Berkshire
	01253	rural level 2	Central Berkshire
d	01254	rural level 1	Central Berkshire
on	01223	rural level 1	Central Berkshire
	01270	rural level 1	Central Berkshire
ALL TOWNS	ALL RURAL	RURAL CLUSTER	RURAL COUNTIES

2.1.4 Other Tabs Included in Spreadsheet

All Towns

This analysis tab has both urban and rural towns and the individual data elements we use to determine rurality. It is the master data tab that can be used for deeper analysis and understanding of the definition elements.

92	Franklin	LEYDEN	rural level 2	30	5	
93	Franklin	MONTAGUE	rural level 2	30	4.1	
94	Franklin	NORTHFIELD	rural level 2	30	5	
95	Franklin	SHUTESBURY	rural level 2	10	2	
101	Franklin	SUNDERLAND	rural level 2	10	2	
105	Franklin	WILMINGTON	rural level 2	10	2	
ALL TOWNS ALL RURAL RURAL CLUSTER RURAL COUNTIES FEDERAL DEFINITIONS						

Federal Definitions

This tab allows for easy navigation of the three federal definitions used within the definition of Massachusetts Rural Towns. This can be used to see what towns meet certain federal definitions which may allow for access to certain funding and programs.

92	Franklin	LEYDEN	rural level 2	30	5	R	M
93	Franklin	MONTAGUE	rural level 2	30	4.1	R	M
94	Franklin	NORTHFIELD	rural level 2	30	5	R	M
95	Franklin	SHUTESBURY	rural level 2	10	2	U	M
101	Franklin	SUNDERLAND	rural level 2	10	2	U	M
105	Franklin	WILMINGTON	rural level 2	10	2	U	M
ALL TOWNS ALL RURAL RURAL CLUSTER RURAL COUNTIES FEDERAL DEFINITIONS Pivot Table							

3 TIPS ON RUNNING RURAL DATA

Rural areas face many challenges in gaining access to specific measurement data and implementing improvement efforts to address the needs of their populations. Small populations and cases are key challenges of measurement in rural areas.

Creating larger sample sizes helps to eliminate data suppression, allowing rural populations to be measured and seen. Some tips below will walk you through how to create larger sample sizes, with examples of how this is being done with current data sets within the MA Department of Public Health.

3.1 AGGREGATION

Aggregation of data values such as dates, diagnoses and geographic areas is one way to work with smaller sample sizes. In addition to considering each field on its own, aggregation should consider each field in combination with others. Some examples of how you may approach aggregation are below. As always it is important to understand the data set and objective of the query to ensure that aggregation is appropriate.

3.1.1 Aggregating Years

Aggregation of multiple years of data is a widely used practice to help increase sample sizes. Combining years of data can help address low sample size and reduce the amount of suppressed cells. Aggregation of years is used in the American Community Survey for the Census Bureau.

DPH Example: Grouping Years of Cancer Data

The Cancer Registry provides a report for the standardized incidence ratios of 23 types of cancer for the 351 cities and towns in Massachusetts.¹ The cancer registry suppresses standardized incidence ratios when there are fewer than 5 cases. If this report only looked at one year of data, it would result in many empty cells in the reports for rural towns. The report combines 5 years of cancer data and allows for less suppression of cells for rural communities and rare cancers. A partial chart from the report showing a rural community is below.

Adams									
Observed and Expected Case Counts, with Standardized Incidence Ratios, 2011-2015									
	Obs	Exp	SIR	95% CI		Obs	Exp	SIR	95% CI
<u>Bladder, Urinary</u>					<u>Melanoma of Skin</u>				
Male	7	9.9	70.8	(28.4-145.9)	Male	5	6.1	81.6	(26.3-190.5)
Female	3	3.8	nc	(nc-nc)	Female	3	5.1	nc	(nc-nc)
<u>Brain and Other Nervous System</u>					<u>Multiple Myeloma</u>				
Male	1	1.8	nc	(nc-nc)	Male	2	2.0	nc	(nc-nc)
Female	3	1.6	nc	(nc-nc)	Female	1	1.8	nc	(nc-nc)
<u>Breast</u>					<u>Non-Hodgkin Lymphoma</u>				
Male	0	0.3	nc	(nc-nc)	Male	6	5.4	110.7	(40.4-240.9)
Female	35	41.8	83.8	(58.4-116.6)	Female	7	5.1	136.2	(54.6-280.7)
<u>Cervix Uteri</u>					<u>Oral Cavity & Pharynx</u>				
Female	1	1.3	nc	(nc-nc)	Male	5	4.5	112.0	(36.1-261.4)
<u>Colon / Rectum</u>					Female	0	2.3	nc	(nc-nc)
Male	13	10.0	129.8	(69.1-222.0)	<u>Ovary</u>				
Female	8	10.7	75.0	(32.3-147.7)	Female	1	3.6	nc	(nc-nc)

3.1.2 Aggregating Clinical Categories

When aggregating by clinical categories it is important to understand the end use of the data. Grouping of clinical categories can provide the needed sample size for rural areas and limit cell suppression. This aggregation method is used often by the US Department of Health and Human Services to analyze chronic disease data.

DPH Example: Grouping by Clinical Categories

In the Bureau of Infectious Disease and Laboratory Sciences, all reportable infectious diseases have different disease statuses for the purpose of tracking and categorizing infections throughout the Commonwealth. These statuses often include categories like confirmed, probable, and suspect and vary depending on clinical and/or laboratory results. They report these statuses out when able to, but at times the extra division of already small categories can create a need for suppression. For example, they often report out both confirmed and probable Hepatitis C together rather than separately because they are meaningfully similar.

This gives a picture of clinically significant Hepatitis C infections while also preventing an extra division of the number of cases seen in Massachusetts. This aggregation usually suffices for most data requests on Hepatitis C and they usually do not need the information that is lost to answer the question the data request is seeking to answer.

This situation is not infrequent when we present data by city and town in Massachusetts. Depending on the objective of the data request, combining certain categories in this way may or may not fulfill the request. For this reason, it is important to work with parties requesting data to provide the most useful information possible for a given request.

¹ <https://www.mass.gov/lists/cancer-incidence-city-town-supplement>

3.1.3 Aggregating Geographic Areas

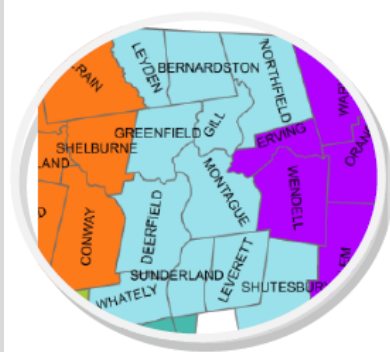
Aggregation of geographic areas is another strategy used to increase sample sizes. For rural communities it is imperative to use aggregation that is representative. Often county level data includes urban communities whose large populations are not as representative. Rural communities are often clustered by town and census tract, when appropriate.

DPH Example: Using Rural Clusters to look at Healthcare Workforce Supply

Healthcare in rural areas tends to be much more regional, since small towns are often unable to support a large number of health care practitioners. Often the supply by town is so low that numbers are suppressed, which does not give the needed information on if the health care workforce is sufficient for the population served.

The Office of Rural Health recently looked at healthcare workforce supply by the rural clusters listed in this definition. By grouping multiple towns we were able to have a large enough sample to look at the supply in the regions identified. This approach will allow for the regions to receive more granular data on their workforce supply that had previously been unavailable due to suppression. Past reports only included county level data for many of the professions.

Health Care Workforce Supply of East Franklin County



Towns Included: Bernardston, Deerfield, Gill, Greenfield, Leyden, Leverett, Montague, Northfield, Shutesbury, Sunderland, Whately.

Health Safety Net Services: One Small Rural Hospital, one Federally Qualified Health Center site.

Health Professional Shortage Areas (HPSAs):

Type	Score	FTE
Population Primary Care	9	1.37
Population Dental Health	10	1.04

Primary Care Includes Eastern Franklin Towns too.

Workforce Supply - Per 1,000 of Population

Provider Type	East Franklin	Rural MA	Urban MA
Licensed Practical Nurse (LPN)	2.7	1.5	2.1
Registered Nurse (RN)	8.8	4.2	10.9
Advanced Practice Nurse (APRN)	.96	.37	1.2
Physicians Assistant	.27	.12	.37
Physicians (including PCP)	2.4	1.2	4.6
Primary Care Physicians (PCP)	.62	.42	.88
Psychiatrists	.21	.14	.40
Dentists	.59	.32	.72

3.1.4 General Aggregation Information

Aggregate data are data collected from individual-level data that have been combined for statistical or analytical purposes. When working with rural data there is a higher risk of small sample sizes due to small population sizes. Please remember:

- At minimum, MA Department of Public Health (MDPH) requires the suppression of cells containing values less than 5 (including when the small value is the numerator of a calculated value). When utilizing data from other agencies, you are responsible for complying with the standard for aggregate data release for that agency and to ensure that it is followed if it is more restrictive than the MDPH standard.
 - Any Office or Bureau within MDPH may have more restrictive standards than <5 for disclosure. Follow the suppression rule appropriate for the dataset being used.
- When multiple data sets are combined, the standard for the dataset with the most restrictive rules must be the one applied for the result.
- If you are producing a table make sure to follow complementary suppression – i.e. if other cells would allow for the calculation of suppressed cells, you must suppress them as well.

3.2 GENERAL REPRESENTATION

How data is analyzed and depicted is important and there are some general best practices for representing rural data. The tips below for representation are dependent on the individual data set and end use of the data.

3.2.1 When Comparing Rural and Urban Data

When comparing rural and urban data it is often best to utilize comparative rates instead of counts. This allows for a better representation of the data. Below is an example of using a count verses a rate with opioid overdose data.

Here is an example of comparing data from the MDPH's Number of Opioid-Related Overdose Deaths, All Intentions by City/Town Report.² In table 1 we show the comparison of one rural town and one urban town by count. When looking at this data it would appear that the urban community has a much higher instance of overdose deaths.

Town	Number of Deaths
Athol (Rural Community)	6
Boston (Urban Community)	181

When we take the same data and compare the rate of overdoses based on population by 100,000 the data shows a much different conclusion around opioid deaths between the two communities. Adjusting for population allows us to compare the communities to each other.

Town	Number of Deaths per 100,000
Athol (Rural Community)	51
Boston (Urban Community)	26

² <https://www.mass.gov/doc/opioid-related-overdose-deaths-by-citytown-november-2019/download>

3.2.2 How Granular Can Data Be

When possible, the more granular the data can be that is presented for rural communities, the more impact it will have for the end users. Due to the geography of Massachusetts, our rural communities are a patchwork of towns across the Commonwealth situated within geographic proximity to urban communities. Rivers, mountains, and other geographic barriers add to community isolation, which is not apparent when looking at larger geographic areas.

counties, census tracts, and other common location- based groupings of communities that may not always provide meaningful analysis of rural communities. The recommended clusters in section 2.1.3 have been identified by experts within rural communities across the state and allow for meaningful analysis of those rural areas. Section 2.1.2 identifies the counties in MA that are majority rural to use when comparing county-level data.

3.2.3 Communication is Key

Data is most effective when both data stewards and end users are in communication. The key point to remember is that data must be useful, and its use must be appropriate. Ensuring appropriate use depends on leveraging the vital knowledge of community members, data stewards, and end users of the data. This diverse input and knowledge can inform subsequent reporting and advocacy.

3.3 VISUAL REPRESENTATION

Please refer to the companion style guide for complete guidance and additional resources.

Data visualization elements, such as maps, can be powerful tools for displaying rural data. It is important that all visual elements are effective for the venue in which they are being presented and accessible. A few tools to help with this are listed below.

- [Color Hexa](#): helps with palette matching, finding complementary color patterns, and converts colors to their appropriate hex codes for embedding in GIS applications/HTML.
- [Color Oracle](#): browser plugin that allows you to simulate how colors would look on a webpage/presentation and simulates the visual if you had different forms of color blindness (deuteranopia, protanopia, or tritanopia).
- [Color Brewer 2.0](#): online tool that allows users to create color schemes for maps and other graphics in order to show data that is readily readable. It is possible to create maps using up to 12 different data classes which can be sequential, divergent or qualitative.

MDPH utilizes a number of visualization tools such as, Excel, Powerpoint, ArcGIS, Power BI, and Tableau. Other free visualization tools available online include Visme, and Piktochart.

For the Rural Massachusetts Town definition we selected accessible color schemes for both the definition and cluster colors. Maps of those as well as a table indicating the color palettes are available in the appendix. When representing this data, these colors should be utilized for continuity.

4 ADDITIONAL RESOURCES

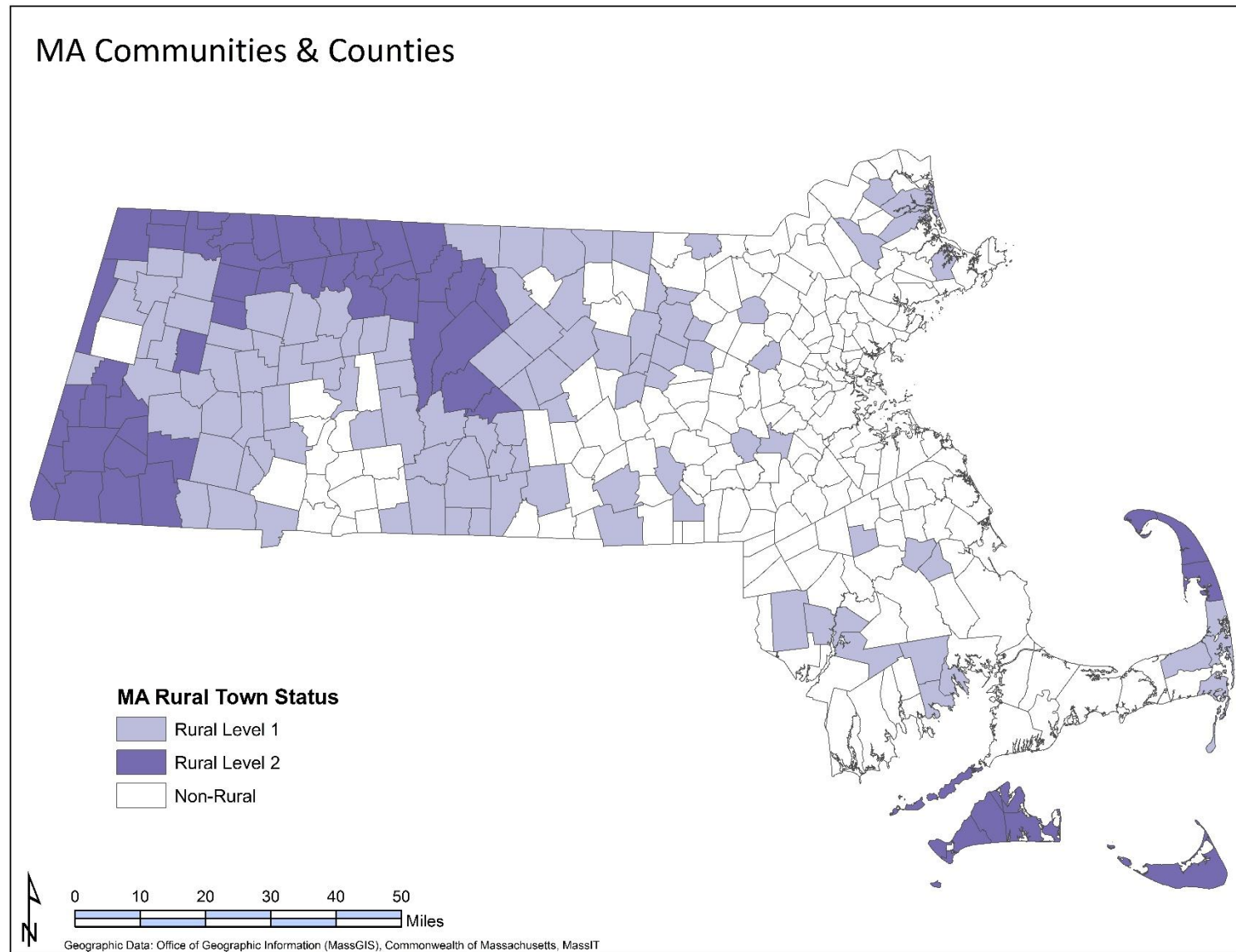
The MDPH State Office of Rural Health can provide technical assistance on this definition and its uses. Please contact Kirby Lecy in the State Office of Rural Health – kirby.lecy@state.ma.us 617-695-7420

Below is a list of additional resources to work with rural data and small population sizes.

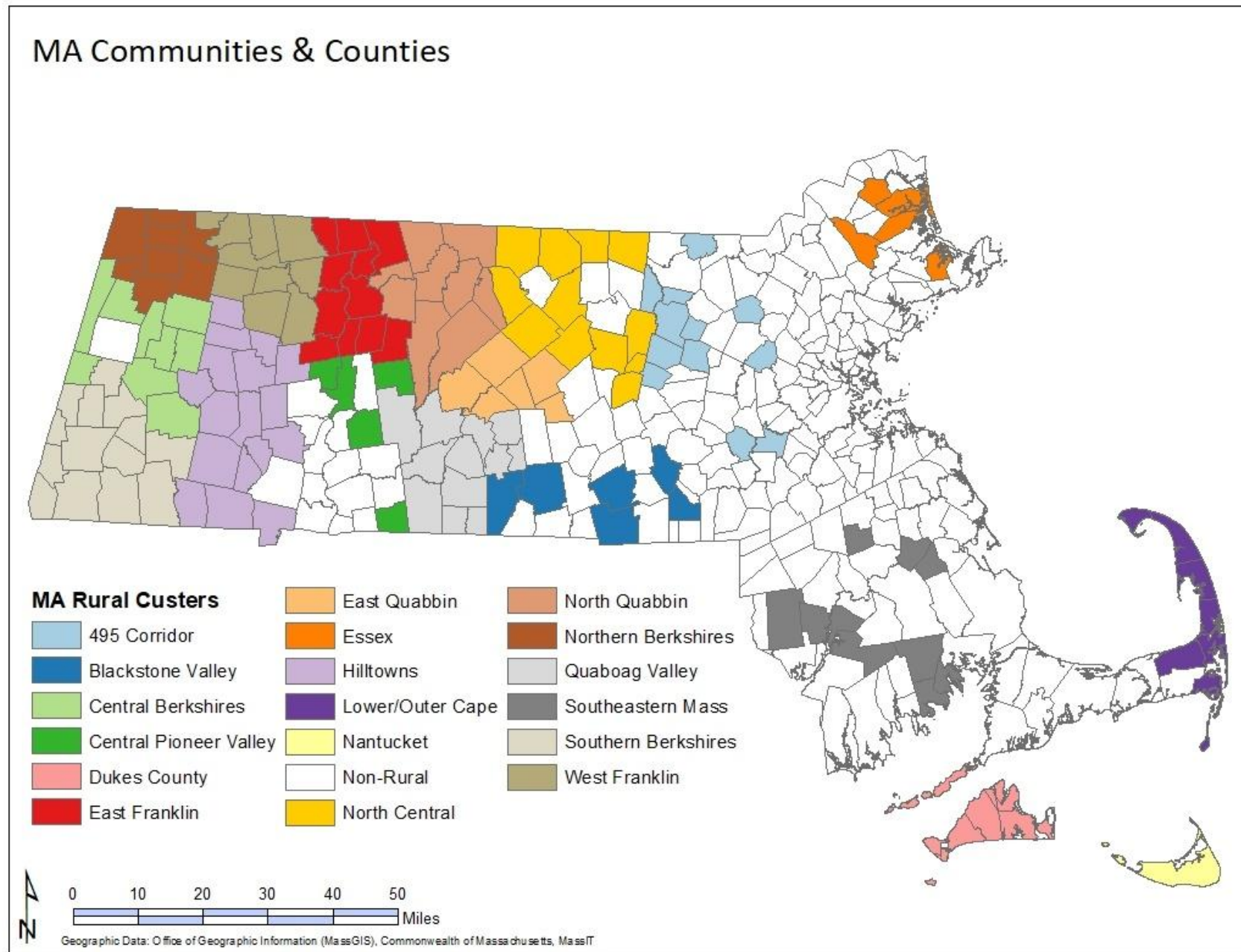
- [Rural Health Information Hub - Finding Statistics and Data Related to Rural Health](#)
- [Rural Health Information Hub - Data Sources & Tools Relevant to Rural Health](#)
- [Health Resources and Services Administration- Rural Health Data](#)
- [Centers for Disease Control - Rural Health Data](#)
- [Federal Office of Rural Health Policy \(FORHP\) Data Files](#)
- [National Organization of State Offices of Rural Health Rural Health Data Institute](#)
- [Addressing Low Case-Volume in Healthcare Performance Measurement of Rural Providers](#)
- [Improving Health Research on Small Populations](#)
- [Washington State Guidelines for Using Classifications for Public Health Assessment \(includes suburban\)](#)
- [Defining Suburbs: An Evaluation and Comparison of Four Methods](#)
- [Rural Census Guide](#)

5 APPENDIX

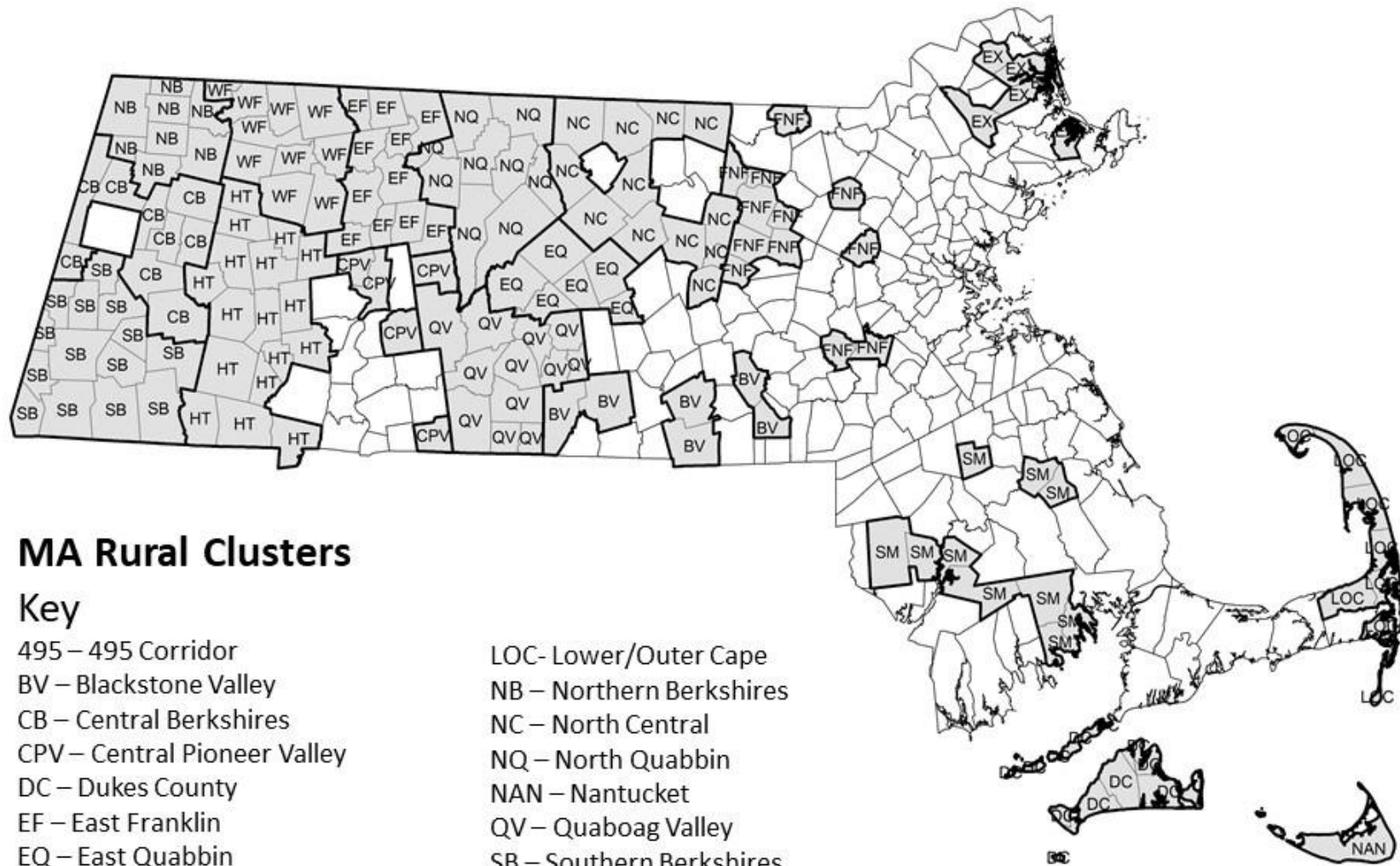
MA RURAL TOWNS BY LEVEL



MA RURAL TOWNS BY CLUSTER



MA RURAL TOWNS BY CLUSTER – BLACK & WHITE



MA Rural Clusters

Key

495 – 495 Corridor

BV – Blackstone Valley

CB – Central Berkshires

CPV – Central Pioneer Valley

DC – Dukes County

EF – East Franklin

EQ – East Quabbin

EX – Essex

HT – Hilltowns

LOC – Lower/Outer Cape

NB – Northern Berkshires

NC – North Central

NQ – North Quabbin

NAN – Nantucket

QV – Quaboag Valley

SB – Southern Berkshires

SM – Southeastern Mass

WF – West Franklin

Geographic Data: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, MassIT

KEY FOR COLORS USED IN MAPS

	Rural 2	Rural 1	495 Corridor	Blackstone Valley	Central Berkshires	Central Pioneer Valley	Dukes County	East Franklin	East Quabbin	Essex	Hilltowns	Lower/Outer Cape	Nantucket	North Central	North Quabbin	Northern Berkshires	Quaboag Valley	Southeastern Mass	Southern Berkshires	West Franklin
R	117	188	166	31	178	51	251	227	253	255	202	106	255	255	223	177	217	128	221	179
G	107	189	206	120	223	160	154	26	191	127	178	61	255	204	154	89	217	128	217	169
B	177	220	227	180	138	44	153	28	111	0	214	154	153	0	115	40	217	128	196	121
H	249	238	201	204	92	116	1	359	34	30	280	269	60	48	22	21	0	0	50	50
S	31	31	52	71	57	57	93	79	97	100	31	43	100	100	63	63	0	0	27	28
L	56	80	77	41	71	40	79	50	71	50	77	42	80	50	66	43	85	50	82	59