Plymouth by Town & City: Older Population, Ambulances, COVID-19 figures, EMS Region and Rural Designation
Concrete things your neighborhood, town and city can do right now
to push back on COVID-19's local spread and fatality rate.
6/17/20: Get latest update: WorldForceStrategies.com

FOR QUICK ACTION: PASS IT ON. Because there is minimum testing, continual containment of local COVID-19's spread and readying for imminent surges are imperatives to save lives. Plymouth County shares same medical and non-medical resources. The below community needs assessment guide imbedded with local information and population counts can assist places in (a.) ==incorporating wider-spread testing== *and* (b.) in **working together to project AND get** potentially needed resources like: (i.) stronger communication and outreach networks, (ii.) medical and emergency like beds, masks, ambulances, etc., (iii.) food delivery and security, (iv.) disinfectants including for medical transporters, (v.) people power and (vi.) whatever else to fight COVID-19 now *and* its future surges. This guide is for anyone, anywhere.

Fighting a pandemic is a geospatial challenge. Understanding virus's data and factors with a place's population dynamics are critical for effective local response. Location metrics including community virus patterns can assist in quicker fact-based decisions. Below shows how to understand and use local measurements when assessing community needs.

People 60 years and older are a significant portion of hospitalized COVID-19 cases.

Backed by strong data science, research, the discipline of geography and community needs assessment, below presents usable data and information to expedite targeted local action. It lays out seven fundamental action steps with local descriptive data to assess, strengthen and build the kind of local infrastructure needed in each municipality and county to protect the most vulnerable against the virus. It is for making a plan that is backed by data and knowledge.

The most effective way to get the most out of this tool is to share it with many others in the community, like those in faith and non-faith organizations, businesses and elected positions. Its intent is not to re-create but to draw upon local skills and expertise to fortify and expand existing systems and, if necessary, build new ones. It has something for everyone.

Take the lead.   ==Talk about.==   Share expertise.   Centralize.   Make a Plan.   ==Pass it on==.

A location's attributes such as age distribution and physical geography show that besides knowing what each town has in place that *sharing* of resource information *and* actual resources among neighborhoods, cities and towns can strengthen the position of the entire county against local virus patterns.

SEVEN ACTION STEPS FOR ANY COMMUNITY: Below **helps to know what the county needs** *and* **who** *and* **what it is preparing for**: **by municipality**. Putting below systems in place right now and *sharing* helps build faster response to control local virus transmission, conserve and leverage resources, protect most vulnerable, and prepare for next surges. Doing these steps now can expedite and support building other local systems like contact tracing, testing and more.

Descriptive data shows each municipality's total population including older and ambulance counts, EMS region and municipality's designated rural level, if applicable. Rural designation is included because COVID-19 brings different transmission, tracking, containment and demographic challenges compared to an urban area. Use World Force Strategies' *other companion reports* with this guide. ACTION #7 makes COVID-19 data more meaningful and useable.

Sharing this can help (a.) focus response, (b.) direct and conserve resources and (c.) coordinate efforts between towns and neighborhoods. Look for updates. Other companion reports now show household populations that don't have cell *or* computer connection. Next look for local virus density reports and more. Keep checking back for updates and other useable metrics. These are guides. They provide a framework for understanding and using local metrics in assessment and planning. They can make a world of difference. Thank you.

This information is for public use - pass it on.

http://worldforcestrategies.com/Reports/MA/Plymouth/PlymouthAgeAmb.pdf
bringing real numbers to real people

Because COVID-19's patterns in your community change, your action plan needs to be <u>flexible</u> enough to respond to these changes. This is especially true because your population dynamics don't change. Over time, different virus impacts emerge that govern how to respond.

<u>Fast reaction time</u> **against COVID-19's local spread is very critical**. This means if there are things already underway in your community to control transmission like contact tracing by experts, wider testing, door-to-door food delivery and more, then it is time to muster up support to help fortify these efforts.

Plymouth County crosses into two of the state's five EMS Regions (Emergency Medical Services). They are Region 4 which is Metropolitan Boston and Region 5, Southeastern MA/Cape Cod. A town's region is helpful to know when gathering more information and working among towns. This is because state information indicates what region a town is in *and* may help when learning more about local ambulance needs and capacity for town and a cluster of towns.

Plymouth County is 1,093 square miles. Its total population is 512,135 and 24.2%, or 123,698, is 60 years or old. There are 27 municipalities including the city of Brockton. Six towns are designated Rural Level One by the state. As of April 14th, Plymouth had at least 2,200 of the state's cumulative 28,163 confirmed COVID-19 cases. Cumulative is since state's first day of testing. May 27th it was 7,656 of 94,220. The state reports as "less than five" if a small town has 1 to 4 cases. Total test performed state-wide on May 27th was 552,144. The state's population is 6,902,149. Most testing was in different types of elder living residences. Age 60 years and over accounted for about 72% of state's virus-related hospitalizations. (See ACTION #7 for a deeper look at Plymouth's COVID-19 numbers and changes by town and town clusters.) <u>As of April 14th and May 27th town COVID-19 data are baseline measurements including for future comparisons</u>.

There are 83 licensed ambulances in the county as of December 2019 and all licensed by 25 towns and primarily their fire department.

Brockton and Plymouth each contract with Brewster Ambulance Service a private licensee from Weymouth.
1. State data shows Brewster, headquartered in Weymouth licenses 182. This Internet research should be confirmed. It appears in 2019:
    a. Brewster had nine ambulances that were dedicated to servicing Brockton, and
    b. had 4 dedicated operating out of five fire stations in Plymouth.

Other helpful information:
1. All licensees, on application inform the state of their coverage area. See below ACTION #1 about other information that can be learned about an ambulance service which is not included in this report but can assist in needs assessment.
2. Local fire departments and rescue squads rely heavily on volunteers.
    a. The volunteer particulars by town, although not included in this report, are critical for planning, gauging resources and executing a plan.
3. Through contract, a private ambulance company can fully service a town or supply back-up support to a municipality's own services.

This information is for public use - pass it on.

Example A: These types of things can be learned from the county's table, including by looking at clusters.

About Two Cities: One third of the county live in these two urban municipalities.
1. Brockton's population of 95,426 is the highest in the county.
2. Plymouth's is second with 59,331 people.
3. Twenty-nine percent of Plymouth's population, or 17,116 people, is 60 years and older.
4. Nineteen percent, meaning 18,114 of Brockton's, is in this same age group.

About the Towns:
1. The remaining 65% of the county's total population live the other 25 municipalities.

2. There are eleven municipalities where the 60 and older group make up more than 27% or more of their total population. Figures like these, help to know what kind of resources you need and where to focus them and more.

3. Whitman has the smallest portion which is 18% of people in this age group, meaning 2,706, of its total population of 14,961.
   a. Comparatively, by age, Whitman is a younger community because proportionately it has 4% less than the state has of this group.

4. Mattapoisett has the highest portion of 60 or older, meaning 37% percent, or 2,337, of its total. It licenses 2 ambulances.
   a. It has 15% more than Massachusetts' portion of 22%. (When assessing any town need, the Commonwealth's portion and other municipalities' figures are helpful gauges, along with the town's other location attributes.)

5. **Other clustering can show location attribute patterns, for example, by geographic proximity when:**

Comparing Four Neighboring Towns				
Licensee by Municipality or Private Entity	Total Population	Number 60 Years and Older	Percent 60 Years and Older	Total Ambulances (Vehicles) Licensed
Marion	5,100.00	1,817	35.6	2
Mattapoisett	6,294.00	2,337	37.1	2
Rochester	5,527.00	1,342	24.4	2

For public use through Creative Commons, for example, this map is a quick reference for showing abutting towns.

Clustering is a key concept in many areas like geography, disease control, economics and more. It is part of analysis and field work. This guide is for both.

Everyone has a bit of a geographer inside themselves. For examples, delivering food or assessing ambulance capacity are field work. In summary: this is a "how-to-local guide" backed by supporting information that can accelerate and fortify a town's position against local virus spread.

This information is for public use - pass it on.

http://worldforcestrategies.com/Reports/MA/Plymouth/PlymouthAgeAmb.pdf
bringing real numbers to real people

Above examples can assist when reviewing table, gathering more local information and assessing community needs.

Other Information: These population numbers do not include others who are also at risk of COVID-19 including hospitalization and fatality. Send any updates about local ambulance services to WorldForceStrategies.com.
Data Sources: US Census Bureau 2018, Commonwealth of Massachusetts: Office of Emergency Medical Services, Office of Rural Health, Ambulance Services, Dept. of Public Health and ambulance licensees' websites.

<p align="center">**SEVEN ACTION STEPS FOR ANY TOWN, NEIGHBORHOOD AND ORGANIZATION**</p>

Use the portion of older people in the community as a guide. The numbers foster ideas on what is needed and more readily can focus local decisions to get ahead of local COVID-19 spread.

Below action steps will expedite the building of other local out-reach systems like contact tracing, testing and more.

A systemic community needs assessment relies on a variety of different skills and expertise that already exist locally. An assessment starting point are questions like: **What is already available? What is needed? How to get? How soon?**

<p align="center">**TODAY, concrete answers to these kinds of questions are needed _per town_ based on its specific local population dynamics. What are other ideas? For starters:**</p>

ACTION #1: Look at Town's Older Population and Ambulances Counts: Learning more about local ambulance counts, service areas and actual availability will help each municipality put the below things in place based on population numbers.

1. Compare number of ambulance rides to and from the hospital in previous years against how many more rides could be needed. The ride projections would be determined on a municipality's **specific factors** such as: (a.) wide-spread transmission, (b.) population figures, (c.) if city, neighborhood or town and (d.) drive-time to medical beds. What else?

2. Assess if the specifics of contracted ambulance services, for example, _number dedicated,_ coverage time and **operation, garage location and service area** are in alignment with population dynamics.

3. How to get more ambulances? Where would they come from? Can local providers handle the surge given a town's below counts? Can the licensee? (See Action #6 about pact between neighboring 2 cities and 4 towns in Essex County.)

4. _Based on your population figure_s are there enough breathing machines, ICU beds, ambulance supplies, etc.?

Other Information: Ambulance licensing information is provided by private and public licensees to the state. A private licensee, for examples, can be a university, hospital, amusement park or whatever. If the number of ambulances appear be high in a community this can mean a company has service contracts with others in the area.

ACTION #2: Grow Hands-On People Power
1. What outreach methods can be used to increase volunteers? Especially because of your local age dynamics?
2. What local people power and skills are needed? Are people on board who like numbers? (See ACTION #7)
   a. What would happen when people get quarantined or sick? Will substitutes be needed?
3. For examples, do road maintenance crews have be increased because of springtime problems like mud or in anticipation of hurricane season or other things that can impede ambulance access? What else can impede?
   a. What other teams have to be bolstered? Fire department volunteers?
4. How can college students help? With technology support, food delivery or what else?

<p align="center">**This information is for public use - pass it on.**</p>

<p align="center">http://worldforcestrategies.com/Reports/MA/Plymouth/PlymouthAgeAmb.pdf
bringing real numbers to real people</p>

5. Have second home owners, who are now living more permanently in town, been reached out to as a new source of support?
6. Are more public health nurses needed?
7. What organizations already need more assistance in bolstering local hands-on support
8. What else?

ACTION #3: Increase Out-Reach: Strengthen and expand of communication that: (1.) inform what is happening with local COVID-19, (2.) learn the health status of residents, (3.) reduce impacts of prolonged isolation and (4.) inform about testing and fully integrate into daily life in every community. (See report by town who doesn't have cell or computer for Internet connection, including seniors: WorldForceStrategies.com)

What is being done right now to bring in your community to bring wide-spread testing which means: (i.) non-restrictive, (ii.) easy and (iii.) ensuring that everyone is getting tested even with the mildest of symptoms?
   a. By profession, organization and workplace?
      i. See Harvard Global Health Institute. "We want to be at a point where everybody who has mild symptoms is tested. (5/17/20, Washington Post)
2. What regular communications methods are in place to learn the health status of residents.
   a. For example: is there a daily land line telephone outreach system with people, not robots, that do outreach? And, for getting longer-term gauge on what is happening in your elderly community?
   b. Is it possible to assure all residents who need medial alerts have them? How can new users be educated on how to use them?
3. Is research already in place to identify, locate and monitor isolated and restricted due to heath and age?
4. Are there enough ways that towns and neighborhoods can engage that help address longer-term social isolation and physical restrictions due to age and health? Do more networks have to be built?
   a. For examples, can a relationship be established for local newspaper to deliver directly to the doorstep and at reduced rates? Is it time to start local news letter?
   b. Is it time to (a.) learn more about the status of existing communication networks and, (b.) if they need to be expanded or strengthen to (c.) reach more people and/or (d.) address prolonged isolation?
      i. For example, social and spiritual networks like senior citizen organizations, clubs such as Lions, Rotary or playing bridge, faith-based organizations, social clubs like playing bridge or pitch, neighborhood associations and others social networks? Who are they are and what are they doing? Or, can do? For example:
      ii. What newsletters are already circulating in your community and who and how many do they reach?
5. Is your town, organizations and volunteer network already on board about introducing and sustaining new, different and creative ways to communicate that will sustain over a longer time, like 18 months or more?
6. Is your town updating different network methods specifically to protect elderly in preparation for that attempt to (a.) lessen the impacts of isolation *and* be ready (b.) for next virus surges?

Other information: Rural and older people still rely US Postal Service, landlines, neighborhood associations and local newspapers. See companion report where 27% of age 65 and over in Carver's households have no cell or Internet.

*Data Note: To make its data more easily accessible and usable, the US Census Bureau compiles it in pre-determined age groups such as 65 years and older. Most reports on COVID-19 now use the 65 years and older group to aligned with the agency's demographic compilations. This particular community assessment guides with analytics began in early March 2020 before the CDC's report that supported China's findings that 'hospitalization due to COVID-19 increases at age 60 years and older. This is now confirmed by Massachusetts data. This guide will continue to report on both age groups depending on data availability and accessibility. For example World Force Strategies' companion report of those in households without cell, computer or Internet is reported by age 65 and above

ACTION #4: Building Strong Food Security and Delivery: Is it time to deliver now, because some have been isolating longer than others. Leaving home to shop can quickly offset positive local steps already taken to reduce transmission. From running out of money to differing periods of prolonged isolation requires constant reassessment of food needs with or without delivery. See other report of those, including seniors, who are not reachable by cell phone or Internet.

1. Having parts of Actions #2 and #3 already in place can help make local decisions about food including delivery.
2. Drawing on existing expertise and resources, like Meal-on-Wheels and others, can help expand reach and more.
3. See Action #6 for what other places are doing.

ACTION #5: Pro-Active Preparedness

1. Is regularly testing being fully integrated into the community? Are professional taking advantage of it? Grocery, hardware, convenient, home improve, and delivery workers? In-home builders and contractors? Who else?
2. Practice: under the direction of the emergency preparedness leaders are basic hands-on disaster response techniques and life-saving skills being taught in the community?
   a. For example, with safe distancing are tutorials happening in driveways or cul-de-sacs?
3. Is it time to set up virtual first aid training on zoom, skype, etc.?
4. What else?

ACTION #6: Learn from Others, for examples:

1. Share best practices, information, expertise and other resource across neighborhoods, towns and cities:
   a. **KIRKLAND, WA best practices:** Hospital Protocol and City, Fire and EMS depts.' considerations.
   b. Six area fire departments create a pact. Newburyport, Salisbury, Amesbury, West Newbury, Merrimac and Newbury make sure each had enough equipment and resources to fully confront the COVID-19 pandemic. See 4/23 release details.
   c. City of Framingham MA's instituted an emergency phone number for people with extreme food need who can't access food through existing network of local providers.
   d. Town of New Salem's Board of Health called every resident age 72 and older to let them know they are not alone and that groceries and other staples are just a phone call away. This Hampden County town reached out after compiling a list of residents willing to shop for others.
   e. Barnstable County Incident Command COVID-19 response through its Critical Delivery Service is providing a free grocery delivery to older and at risk in all 15 towns with help from 40 volunteers.
2. Another helpful tool for assessing, planning and executing is free radius coverage mapping on Internet.
3. What are other municipalities and local workplaces doing to incorporate regular non-stop wide spread testing?
4. <mark>Forward this report to accelerate shared learning</mark>.

ACTION #7: Use municipality's COVID-19 data and information and neighboring towns' when assessing, planning, acting and informing. The purpose is to study the numbers to *determine COVID's local changes in a place, town and neighboring towns*. Data patterns and their changes and applying localized findings with above action steps can help prevent, contain and inform.

Share this document and below with others who like numbers and can help.

1. **Track, analyze, use and talk about the state's numbers** so as to make concerns and testing part of the daily fabric of your community. Use others' best practices to make it happen fast. Like, for example, a good model is how Lyme Disease chat is now part of daily lives.
2. **Testing:** know all information about how local testing is being conducted
   a. Follow, talk about, broadcast and publicize: (i.) what is happening with locally with testing *and* contact tracing including, (ii.) results and (iii.) changes. Make the information an integral part of the community's daily vernacular. For example,
      i. In own examples explain what "exponential growth". (Easy explanations are on Internet.)
   b. why and, if so, testing is not being accessed by people even when available. (See May 17th, Wash. Post)

  c. <u>**Weekly,**</u> **at least, look at state's new data,** updates, methods including increased testing and other information.

    i. Different virus geodata are released on different days. Wednesday's close is good marker because it includes town updates that can then be compared to county and state's numbers.

3. **Follow national and state trends. Learn from think tanks** including about <u>**rural vs urban**</u> virus transmission and control. Apply in local assessment and plan based on municipalities' designation. (See table on last page.)

4. **Know what state's COVID-19 numbers are really measuring and telling.** What do they mean?

  a. The number of confirmed cases, right now, are based solely on the number of tests administered. There are three places on state's website to get COVID-19 geodata data: <u>archive excel files</u>, <u>dashboard</u> and municipalities' case and fatality numbers.

  b. On April 14th the state first provided cases and death numbers by town and on May 27th tests numbers.

More can be learned about geographic patterns of COVID-19 by grouping towns into clusters and looking at case and test numbers and local demographic patterns. By doing so local virus patterns can be noticed that can help guide outreach. This guide uses the same widely used data. Below is the number of confirmed cases as a result of testing. Massachusetts provided its first report on April 14th that shows cumulative town cases from January 1, 2020.

Each week it is updated to again show the cumulative total. Below helps build familiarity with the numbers so they can be applied in the action steps. Sharing this will save time and can focus conserving resource virus containment strategies.

The below presentation is intended to foster idea. Besides the ones presented other patterns may emerge when local COVID-19 data are looked at through the eyes of local people who know the location attributes, in combination with demographics. Because COVID-19 is new and much is unknown getting on board early to look at any accessible data and plugging in the findings can help guide, including when other data become more accessible. For these reasons and others, like limited testing, projections of coming surges *including with weather changes*, back to school and limited resources make a real good case for regularly reviewing data, attempting to determine what patterns might be suggesting and, of course, applying various actions steps by town or group of towns based on clusters and <u>*with early intervention to*</u>:

1. inform,
2. contain, and
3. prevent local virus spread.

Assessment Questions:

1. Where and how can clustering and its findings be effectively used?
2. What other clusters might emerge so action steps, resources and defenses can effectively cross-town lines?
3. Are there best practices that can be applied and shared including in multiple towns' strategies based on cluster findings?

<u>**SUMMARY OF FINDINGS**</u> **per Town and Clusters of Town for Seven Weeks: April 14th to May 27th**

The number of confirmed cases, right now, are based solely on the number of tests administered. There are three places on state's website to get COVID-19 geodata data: <u>archive excel files</u>, <u>dashboard</u> and municipalities' case and fatality numbers. See FINDING #3 below for alphabetical listing of municipalities' COVID-19 numbers and demographics.

**ABOUT Positivity: May 12, 2020 the World Health Organization (WHO) advised governments that before reopening, <u>rates of positivity test results,</u> meaning out of all tests conducted how many came back positive for COVID-19, should remain at 5% or lower for at least 14 days. According to John Hopkin University's COVID-19 resource center positivity gives insight into whether a community is conducting enough testing to find cases. High positivity suggests that a community may largely be testing the sickest patients and possibly missing milder or asymptomatic cases. A lower rate may indicate a community is testing more patients with milder or no symptoms.

http://worldforcestrategies.com/Reports/MA/Plymouth/PlymouthAgeAmb.pdf

bringing real numbers to real people

ABOUT POSITIVITY NUMBERS: **On May 27th for the first time Massachusetts provide town testing data. One indicator is positivity. The numbers and rates on its weekly report show number of persons tested by municipality. This column means number of persons tested, not total tests performed. Test "positivity" is calculated by the cumulative number of confirmed cases, meaning "Count" column, divided by number of "Total Persons Tested" which equals the percent, or rate, in "Positivity" column. (See below about rate.) May 27th is a benchmark for future comparisons.

Note: Positivity rate is a useful indicator and good to understand and follow in the state's weekly report. Here is one example of many as to why it valuable, like when there is an influx of tourists. It is important to look at these five indicators and understand how they relate to one another: Count, Rate, Total Persons Tested, Tested Rate and Percent Positivity.

For examples:

More about Positivity
- Massachusetts provided positivity rates for 301 towns. The rates:
- ranged from Oaks Bluff's in Dukes County of 2.30% to Buckland's in Franklin County of 44.40%
- median was 12.20% meaning about 1/2 of towns are above the median and ½ are below that rate.

The Percent of Positivity tells about testing patterns. It is a benchmark that can be used when trying to achieve wider testing goals. As a local gauge, it is useful when talking and informing about any town's metrics. (See Action #3 above.)

NOTE: The most effective way to use this community assessment guide relies on local citizens' interest and knowledge about their communities.

Needs Assessment Questions: Are there any emerging "best practices" in the county that others should try? Or elsewhere in the state? Or, what things have not worked to control local transmission elsewhere? What to share? And, how to share? Especially before season change or next coming major surge? Or, because more local testing is coming?

Other Information: When looking at place's numbers it very often means comparing with neighbors' figures, including in abutting counties and states. A pandemic is a problem of place and without geo-political boundaries.

ABOUT RATE: Rate is figured on two things. It is the number of cases divided by total population multiplied by 100,000. Rates make for easier comparison when multiplied by 100,000 in consideration of the differing sizes of big cities and small towns' populations. Per Capita is used when discussing rates. It is used because in Latin it means "for each head." It helps describe and compare values among populations of different sizes.

Finding #3 below shows Norwell and Hanson are very close in population size. How the measurements are calculated can be easier understood by looking at these towns' data side-by-side. **Note:** Because this guide uses population data directly from the US Census Bureau and also presents Massachusetts' COVID-19 data prepared by University of Massachusetts Donahue Institute, when calculating the rate using the total population a small difference will be seen from the rate on the table. However, the rate patterns remain the same.

SUMMARY OF PLYMOUTH COUNTY'S FINDINGS:
1.) Many towns that had lower positivity rates with fewer number of cases and case rates were completely surrounded by towns with much higher COVID-19 numbers: low positivity hopscotches by town.
   a. Several towns with the lowest positivity have the largest portion of age 60 and older.
2.) Location attributes like transportation arteries, commutation patterns, shopping hubs, essential industries and workforce distribution, tourist influx, age and other population demographics are potential variables among that could be accounting for the hopscotching and wide span of varying positivity rates.

As of May 27th:

FINDING #1: **Nine Municipalities including one rural level 1in the northwest corner or on the north border had the highest rate of confirmed COVID-19 cases as of May 27th:** Abington, Bridgewater, Brockton, East Bridgewater, Hingham, Norwell, Rockland, West Bridgewater and Whitman which is 44.5%, or 227,859, of the county's population.

1. Accounted for 73.8%, or 5,653, of the total cumulative confirmed cases of 7,656 in the county
    a. Accounted for 75.7%, or 1,667, of 2,200 as of April 14th
    b. Eight had highest jump in case rate in 7 weeks as of April 14th to May 27th: East Bridgewater did not.
2. Eight had the highest test positivity rate.
    a. Bridgewater did not. It had the 16th highest positivity of 10.5% and third highest number of cases.
3. Six accounted for highest number of confirmed cases in the county on May 27th: Brockton, Bridgewater, Rockland, Hingham, Abington and Whitman
4. Five out of the 9 towns accounted for a larger portion of county's number of people tested.
    a. Brockton ranked first municipality with the highest number of people tested of 13,555.
    b. West Bridgewater ranked 21st with 599 persons tested.
        i. Its test rate, based on its population size was the 4th highest in the county. The town, rural level one:
            1. accounts for 1.4% of the county's population.
            2. Twenty-seven percent, or 1,936, of its 7,165 are 60 years and older.
            3. 25.7% in households age 65 and older do not have cell phone, computer, or Internet.

FINDING #1: Table: Nine Municipalities with Highest Confirmed Case Rate on May 27th

|												
FINDING #1: Nine municipalities in Plymouth County, including one rural, account for 44.5% of total population and had the highest rate of cumulative confirmed COVID-19 cases as May 27th. They accounted 73.8%, or 5,653, of total cases of 7,656 in the county on May 27th. (See Action #3.) (Table sorted by May 27th rate of confirmed cases.												
Municipality	**Rural Level**	**Total Population**	**Percent of County's Population**	**Number of Population 60 Years and Older**	**Percent of Population 60 Years and Older**	**Count April 14th**	**Rate April 14th**	**Count May 27th**	**Rate May 27th**	**Total Persons Tested May 27**	**Tested Rate May 27th**	**Percent Positivity****
Brockton		95,426	18.6%	18,114	19.00%	1202	1223.43	3961	4,032	13,555	13,797	29.20%
West Bridgewater	R1	7,165	1.4%	1,936	27.10%	26	358.74	140	1,932	599	8,265	23.40%
Rockland		17,909	3.5%	3,966	22.20%	64	354.84	273	1,514	1,428	7,917	19.10%
Abington		16,330	3.2%	3,511	21.50%	54	300.65	226	1,258	1,346	7,494	16.80%
East Bridgewater		14,386	2.8%	3,132	21.80%	87	589.58	173	1,172	1,077	7,299	16.10%
Bridgewater		27,397	5.3%	5,048	18.40%	103	362.08	330	1,160	3,136	11,024	10.50%
Whitman		14,961	2.9%	2,706	18.00%	52	337.23	178	1,154	1,028	6,667	17.30%
Norwell		10,987	2.1%	2,523	22.90%	30	280.25	118	1,102	682	6,371	17.30%
Hingham		23,298	4.5%	6,463	27.80%	49	205.99	254	1,068	1,730	7,273	14.70%
****Percent Positivity** is the rate of positive test results. May 27th's rate is a benchmark and useful local gauge when trying to achieve wider testing goals and future comparisons.												
Compiled by Theresa Clary, founder of World Force Strategies, for local response to COVID-19. See companion reports. Report Date: 6/16/20.												
Source: US Census Bureau, 2018; Massachusetts Office of Rural Health and Dept. of Public Health												
Data Note 2: R1 or R2 denotes state's rural level. Massachusetts' definition and designation of rural levels are purposefully created for use in assessment and planning. Both levels are rural. Level two is less densely population and more remote and isolated from urban core areas. If town does not have a designation it is considered urban.												
WorldForceStrategies.com: Also see by Town: Older Population and Ambulance Counts with Local Community Needs Assessment Tool.												

FINDING #1: **Map:** Nine Municipalities with Highest Confirmed Case Rate on May 27th
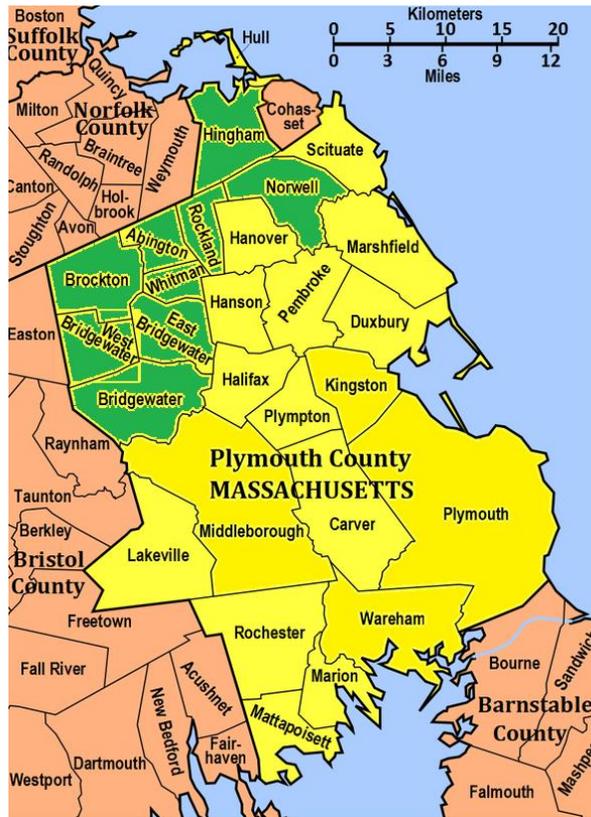
FINDING #2a-2c: COUNTY BY FIVE CLUSTERS BY MUNICIPALITY FROM LOWEST TO HIGHEST POSITIVITY

Findings #2a: Cluster #1 and #2 - See below table of twelve towns with positivity of 2.90% to 10.50%, of which:

1. Four are rural.
2. All had the lowest positivity rates as May 27th.
3. Eleven had the lowest increase in both the number of confirmed cases and rate as of April 14th to May 27th
   a. Bridgewater, not in the eleven, had higher increases in confirmed cases and rate. It had:
      i. 6th highest case rate and 3rd highest number of confirmed cases in the county
   b. Marshfield, in the eleven, had lowest positivity in this group with and
      i. 11th highest number of confirmed cases.
4. Marion, Duxbury, Plympton and Carver were surrounded by towns with significantly higher case rates and lower positivity.
   a. Plympton and Carver abut which may save towns' resources by working together when doing outreach to support and inform. (See Action #6 for what some abutting towns in the state are doing.)
   b. Marion had the 6th lowest positivity rate in the state.
   c. Plympton's positivity was on par with two municipalities in the state that have about same population.

5. Mattapoisett, Marion, Hull, Carver and Duxbury had some of the highest portions of age 60 and older.
   a. Carver: 27.4% of age 65 and older in households don't have cell phone, computer or Internet. (See above Action Step #3 of this community assessment guide.)
6. Lakeville, Mattapoisett, Rochester and Bridgewater are western border towns. (NOTE: it could be useful to look at the numbers of their abutters in Bristol County.)
7. Clustering Duxbury with abutters Pembroke, Marshfield and Hanson could also save towns' resources when informing and supporting.
   a. Marshfield: 18.1% of 65 and older in households don't have computer, cell phone or Internet
8. Hull's positivity rate of 8.60% was more on par with Cohasset in Norfolk County of 6.6% than with Hingham's 14.7% and Scituate's 13.60%

Findings #2a Table: Clusters 1 and 2

Cluster #1: Three municipalities in Plymouth County, including two rural, account for 4.6%, 23,748 of total population and have the lowest positivity rates. They account for 87 of the county's 7,656 cumulative confirmed COVID-19 cases as May 27th. (See Action #3.) (Table sorted by positivity.)

Municipality	Rural Level	Total Population	Percent of County's Population	Number of Population 60 Years and Older	Percent of Population 60 Years and Older	Count April 14th	Rate April 14th	Count May 27th	Rate May 27th	Total Persons Tested May 27	Tested Rate May 27th	Percent Positivity**
Marion	R1	5,100	1.0%	1,817.0	35.60%	less5	*	13	280.14	445	9,589	2.90%
Plympton	R1	2,945	0.6%	735.0	24.90%	less5	*	9	301.1	152	5,085	5.90%
Duxbury		15,703	3.1%	4,190.0	26.60%	25	165.2	65	429.52	1,096	7,242	5.90%

Cluster #2: Nine municipalities in Plymouth County, including two rural, account for 25.6% or 131,051 of total population and the second lowest set of positivity rates ranging from 8.10% to 10.50% They account for 845 of the county's 7,656 cumulative confirmed COVID-19 cases as May 27th. (See Action #3.) (Table sorted by positivity.)

Municipality	Rural Level	Total Population	Percent of County's Population	Number of Population 60 Years and Older	Percent of Population 60 Years and Older	Count April 14th	Rate April 14th	Count May 27th	Rate May 27th	Total Persons Tested May 27	Tested Rate May 27th	Percent Positivity**
Carver		11,661	2.3%	3,204.0	27.50%	18	147.83	52	427.06	642	5,273	8.10%
Hanover		14,397	2.8%	3,062.0	21.20%	33	230.37	61	425.83	726	5,068	8.40%
Hull		10,424	2.0%	3,614.0	34.70%	14	141.75	47	475.88	544	5,508	8.60%
Pembroke		18,304	3.6%	4,028.0	22.00%	30	160.66	85	455.2	985	5,275	8.60%
Lakeville		11,293	2.2%	2,602.0	22.90%	21	185.99	55	487.13	624	5,527	8.80%
Mattapoisett	R1	6,294	1.2%	2,337.0	37.10%	8	138.37	29	501.61	283	4,895	10.20%
Rochester	R1	5,527	1.1%	1,342.0	24.40%	7	124.17	31	549.88	299	5,304	10.40%
Marshfield		25,754	5.0%	6,264.0	24.30%	67	259.09	155	599.39	1,481	5,727	10.50%
Bridgewater		27,397	5.3%	5,048.0	18.40%	103	362.08	330	1160.05	3,136	11,024	10.50%

NOTE: To better understand COVID-19 patterns, numbers and difference between towns and clusters here are some with about size populations. Also, notice location and abutters to see the hopscotch of low positivity in the county. **Compare:**

   a. Pembroke, cluster 2; Situate, 3; and Rockland, 4.
   b. Hull, cluster 2; Hanson, 3; and Norwell, 3

Findings #2b: <u>Cluster #3</u>: **Seven towns, see below table, including one rural, with positivity of 11.40% to 13.60%:**

1. Surround <u>Plympton</u> and <u>Carver</u> which had lower numbers
2. <u>Plymouth</u> and <u>Wareham</u> COVID-19 numbers were on par with <u>Bourne</u> in Barnstable County.
   a. <u>Plymouth</u> had the 6th highest number of confirmed cases.
3. <u>Middleborough</u> had the 6th highest number of cases
4. <u>Wareham</u> had 8th highest of confirmed cases
5. <u>Hingham</u> COVID-19 numbers including positivity were much lower than <u>Weymouth</u> and closer aligned with <u>Cohasset's</u>.

Finding #2b: <u>Table</u>: <u>Cluster #3</u>

Cluster #3: Seven municipalities in Plymouth County, including one rural, account for 30.6% or 156,874 of total population and the third highest group of positivity rates ranging from 11.40% to 13.60% They account for 1,401 of the county's 7,656 cumulative confirmed COVID-19 cases as May 27th. (See Action #3.) (Table sorted positivity.)

Municipality	Rural Level	Total Population	Percent of County's Population	Number of Population 60 Years and Older	Percent of Population 60 Years and Older	Count April 14th	Rate April 14th	Count May 27th	Rate May 27th	Total Persons Tested May 27	Tested Rate May 27th	Percent Positivity**
Halifax	R1	7,824	1.5%	1,724.0	22.00%	20	261.73	56	732.85	493	6,452	11.40%
Plymouth		59,331	11.6%	17,116.0	29.00%	108	174.09	526	847.89	4,354	7,018	12.10%
Kingston		13,381	2.6%	3,157.0	23.50%	24	176.95	127	936.34	1,044	7,697	12.20%
Wareham		22,574	4.4%	6,367.0	28.30%	34	141.96	200	835.05	1,598	6,672	12.50%
Middleborough		24,505	4.8%	6,487.0	26.50%	51	189.44	252	936.04	1,996	7,414	12.60%
Hanson		10,668	2.1%	2,549.0	23.90%	24	224.16	93	868.61	682	6,370	13.60%
Scituate		18,591	3.6%	5,704.0	30.70%	49	270.4	147	811.19	1,073	5,921	13.60%

Findings #2c. **Cluster #4 and #5: Eight towns, (See below table) also discussed in more detail in FINDING #1:**

1. had the highest positivity rates and are listed in Finding #1 in the county.
2. the highest jump in rate in the seven-week period as of April 14th to May 27 except <u>East Bridgewater</u>.
3. Had some of highest number of persons tested <u>Brockton</u>, <u>Hingham</u>, <u>Rockland</u>, <u>Abington</u> and <u>East Bridgewater</u>.
4. <u>Scituate's</u> 13.60% positivity is more on par with <u>Hingham's</u>, 14.79% and <u>Weymouth's</u> 15.70.

Cluster #4: Six municipalities in Plymouth County account for 19.1% or 97,871 of total population and the third from lowest set of positivity rates ranging from 11.40% to 13.60% They account for 1,222 of the county's 7,656 cumulative confirmed COVID-19 cases as May 27th. (See Action #3.) (Table sorted by positivity.)

Municipality	Rural Level	Total Population	Percent of County's Population	Number of Population 60 Years and Older	Percent of Population 60 Years and Older	Count April 14th	Rate April 14th	Count May 27th	Rate May 27th	Total Persons Tested May 27	Tested Rate May 27th	Percent Positivity**
Hingham		23,298	4.5%	6,463.0	27.80%	49	205.99	254	1067.78	1,730	7,273	14.70%
East Bridgewater		14,386	2.8%	3,132.0	21.80%	87	589.58	173	1172.37	1,077	7,299	16.10%
Abington		16,330	3.2%	3,511.0	21.50%	54	300.65	226	1258.28	1,346	7,494	16.80%
Norwell		10,987	2.1%	2,523.0	22.90%	30	280.25	118	1102.3	682	6,371	17.30%
Whitman		14,961	2.9%	2,706.0	18.00%	52	337.23	178	1154.36	1,028	6,667	17.30%
Rockland		17,909	3.5%	3,966.0	22.20%	64	354.84	273	1513.6	1,428	7,917	19.10%

Cluster #5: Two municipalities in Plymouth County account for 20% or 102,591 of total population and have the highest positivity rates. They account for 4,101 of the county's 7,656 cumulative confirmed COVID-19 cases as May 27th. (See Action #3.) (Table sorted by positivity.)

Municipality	Rural Level	Total Population	Percent of County's Population	Number of Population 60 Years and Older	Percent of Population 60 Years and Older	Count April 14th	Rate April 14th	Count May 27th	Rate May 27th	Total Persons Tested May 27	Tested Rate May 27th	Percent Positivity**
West Bridgewater	R1	7,165	1.4%	1,936.0	27.10%	26	358.74	140	1931.7	599	8,265	23.40%
Brockton		95,426	18.6%	18,114.0	19.00%	1202	1223.43	3,961	4031.62	13,555	13,797	29.20%

This information is for public use - pass it on.

FINDING #3 Table: Plymouth County's Twenty-Seven Municipalities' Population and COVID-19 Numbers.

Town	Rural Level	Total Population	Percent of County's Population	Age 60 and over	Percent of Population Over 60 and over	Count April 14th	Rate April 14th	Count May 27th	Rate May 27th	Total Persons Tested May 27	Tested Rate May 27th	Percent Positivity **
					Finding #3: Plymouth County by Municipality: Confirmed COVID-19 Cases and Testing Positivity Rate as of April 14th to May 27th (Sorted Alphabetically)							
Abington		16,330	3.2%	3,511	21.5%	54	300.65	226	1258.28	1,346	7,494	16.8%
Bridgewater		27,397	5.3%	5,048	18.4%	103	362.08	330	1160.05	3,136	11,024	10.5%
Brockton		95,426	18.6%	18,114	19.0%	1202	1223.43	3961	4031.62	13,555	13,797	29.2%
Carver		11,661	2.3%	3,204	27.5%	18	147.83	52	427.06	642	5,273	8.1%
Duxbury		15,703	3.1%	4,190	26.6%	25	165.2	65	429.52	1,096	7,242	5.9%
East Bridgewater		14,386	2.8%	3,132	21.8%	87	589.58	173	1172.37	1,077	7,299	16.1%
Halifax	R1	7,824	1.5%	1,724	22.0%	20	261.73	56	732.85	493	6,452	11.4%
Hanover		14,397	2.8%	3,062	21.2%	33	230.37	61	425.83	726	5,068	8.4%
Hanson		10,668	2.1%	2,549	23.9%	24	224.16	93	868.61	682	6,370	13.6%
Hingham		23,298	4.5%	6,463	27.8%	49	205.99	254	1067.78	1,730	7,273	14.7%
Hull		10,424	2.0%	3,614	34.7%	14	141.75	47	475.88	544	5,508	8.6%
Kingston		13,381	2.6%	3,157	23.5%	24	176.95	127	936.34	1,044	7,697	12.2%
Lakeville		11,293	2.2%	2,602	22.9%	21	185.99	55	487.13	624	5,527	8.8%
Marion	R1	5,100	1.0%	1,817	35.6%	less5	*	13	280.14	445	9,589	2.9%
Marshfield		25,754	5.0%	6,264	24.3%	67	259.09	155	599.39	1,481	5,727	10.5%
Mattapoisett	R1	6,294	1.2%	2,337	37.1%	8	138.37	29	501.61	283	4,895	10.2%
Middleborough		24,505	4.8%	6,487	26.5%	51	189.44	252	936.04	1,996	7,414	12.6%
Norwell		10,987	2.1%	2,523	22.9%	30	280.25	118	1102.3	682	6,371	17.3%
Pembroke		18,304	3.6%	4,028	22.0%	30	160.66	85	455.2	985	5,275	8.6%
Plymouth		59,331	11.6%	17,116	29.0%	108	174.09	526	847.89	4,354	7,018	12.1%
Plympton	R1	2,945	0.6%	735	24.9%	less5	*	9	301.1	152	5,085	5.9%
Rochester	R1	5,527	1.1%	1,342	24.4%	7	124.17	31	549.88	299	5,304	10.4%
Rockland		17,909	3.5%	3,966	22.2%	64	354.84	273	1513.6	1,428	7,917	19.1%
Scituate		18,591	3.6%	5,704	30.7%	49	270.4	147	811.19	1,073	5,921	13.6%
Wareham		22,574	4.4%	6,367	28.3%	34	141.96	200	835.05	1,598	6,672	12.5%
West Bridgewater	R1	7,165	1.4%	1,936	27.1%	26	358.74	140	1931.7	599	8,265	23.4%
Whitman		14,961	2.9%	2,706	18.0%	52	337.23	178	1154.36	1,028	6,667	17.3%

Compiled by Theresa Clary, founder of World Force Strategies, for local response to COVID-19. See other reports and community assessment guide. Report Date: 6/17/20.

Source: US Census Bureau, 2018; Massachusetts Office of Rural Health and Dept. of Public Health comparison.

Data Note: R1 or R2 denotes state's rural level. The state of Massachusetts' definition and designation of rural levels are purposefully created for use in assessment and planning. Both levels are rural. Level two is less densely population and more remote and isolated from urban core areas. If town does not have a designation it is considered urban.

WorldForceStrategies.com: Also see by Town: Number in households without cell phone, Internet or computer, ambulance counts and local needs assessment tool.

Other Information: Look for patterns in the geo-data. Two good tools for assessing *and* doing field work like, for example, food delivery are radius mapping and a drive-time analysis mapping. These are free Internet (Of note, a drive-time analysis map is different than written driving instructions like MapQuest's.) **Use these other reports:** Number of People in Households Who Don't Have Mobile Phone, Computer or Internet, including Age 65 Years and Over.

Thank you and good luck. Theresa Clary

Theresa Clary is a data scientist, researcher, geographer and founder of World Force Strategies. Her work is about places, people and targeted knowledge-based actions. She contributes tools and data for anyone, anywhere, in any community to fight local COVID-19 spread.

This information is for public use - pass it on.

http://worldforcestrategies.com/Reports/MA/Plymouth/PlymouthAgeAmb.pdf

bringing real numbers to real people

TClary@WorldForceStrategies.com

WORLD FORCE STRATEGIES

action based geo-data and reports

Plymouth County by Town and City: Older Population, Ambulance Counts, EMS Regions & Rural Designation

Town or City	Total Population	Number of Population 60 Years and Older	Percent of Population 60 Years and Older	Number of Ambulances	EMS Region
Abington	16,330	3,511	21.5%	3	5
Bridgewater	27,397	5,048	18.4%	5	5
Brockton	95,426	18,114	19.0%		5
Carver	11,661	3,204	27.5%	2	5
Duxbury	15,703	4,190	26.6%	3	5
East Bridgewater	14,386	3,132	21.8%	3	5
Halifax (R1)	7,824	1,724	22.0%	2	5
Hanover	14,397	3,062	21.2%	4	4
Hanson	10,668	2,549	23.9%	4	5
Hingham	23,298	6,463	27.8%	3	4
Hull	10,424	3,614	34.7%	3	4
Kingston	13,381	3,157	23.5%	4	5
Lakeville	11,293	2,602	22.9%	2	5
Marion (R1)	5,100	1,817	35.6%	2	5
Marshfield	25,754	6,264	24.3%	8	5
Mattapoisett (R1)	6,294	2,337	37.1%	2	5
Middleborough	24,505	6,487	26.5%	3	5
Norwell	10,987	2,523	22.9%	4	4
Pembroke	18,304	4,028	22.0%	3	5
Plymouth	59,331	17,116	29.0%		5
Plympton (R1)	2,945	735	24.9%	2	5
Rochester (R1)	5,527	1,342	24.4%	2	5
Rockland	17,909	3,966	22.2%	3	5
Scituate	18,591	5,704	30.7%	6	4
Wareham	22,574	6,367	28.3%	4	5
West Bridgewater (R1)	7,165	1,936	27.1%	2	5
Whitman	14,961	2,706	18.0%	4	5

Compiled by Theresa Clary, founder of World Force Strategies, for local response to COVID-19. See her other local companion tools. (Table update: 6/17/20)

Sources: US Census Bureau 2018; Commonwealth of Massachusetts: Office of Emergency Medical Services, Office of Rural Health, Ambulance Services, and Dept. of Public Health

Data Notes: EMS region per ambulance services is shown if included by data source. R1 or R2 denotes rural level. The state of Massachusetts' definition and designation of rural levels are purposefully created "for use in assessment and planning". Both levels are rural but are to different degrees. Level two is less densely population and more remote and isolated from urban core areas. If town does not have a designation it is considered urban.

See other report by town of population, including older, who is not reachable by cell phone, computer or internet.

WorldForceStrategies.com

Use these reports with above. (1.) Community Assessment Action Steps (2.) People in Households Not Technologically Connected

Theresa Clary is a data scientist, researcher, geographer and founder of World Force Strategies. Her work is about places, people and targeted knowledge-based actions. She contributes tools and data for anyone, anywhere, in any community to fight local COVID-19 spread.

This information is for public use - pass it on.

http://worldforcestrategies.com/Reports/MA/Plymouth/PlymouthAgeAmb.pdf
bringing real numbers to real people

TClary@WorldForceStrategies.com