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Large Commons Biomedical Data for Massachusetts CoViD-19
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Abstract

CoViD-19 has killed millions of people around the world over the past eighteen months, making research mandatory. This includes its diverse effects upon various groups. Statistical analysis included the use of a BRN formula and a percentage breakdown of population versus cases. In doing so, communities with epidemic spread of CoViD-19 could be identified, as well as the hardest-hit groups. Well-off communities had significantly higher BRNs. However, cases occurred in disproportionate amounts in the communities with the lowest infection rates.

Acknowledgment

This project would not have been possible without the help and support of innumerable people. Special credit must be given to the following:

My family: my mother, father, sister, and grandmother all listened to my complaints, and to my celebrations. They provided a sounding board for my work and they are the people I look forward most to sharing this paper with.

My friends, especially Ari, Dakota, Ginger, and Gwendalyn. Their support as I worked on this paper, their time when I needed to talk to someone, and their understanding when this work took priority over plans all deserve more thanks than I can give.

My professors, who provided me with the expertise needed to produce this paper. Special credit must be given to Professor Arnold and Professor Lui. Professor Arnold deserves credit for stoking my love of mathematics, and Professor Lui for igniting an interest in the study of CoViD-19. Many of the concepts explored in this paper are the direct result of the time that Professor Lui took to explain epidemiology, and due recognition must be given to his efforts.

My peers, especially Alex and Javier. Without their collaboration on Modeling CoViD-19 in Massachusetts, Texas and Iowa, my understanding of the next-generation method to determine the Basic Reproduction Number and of parameter tuning would be sorely lacking.

Finally, Professors Fofana and Krueger. Their work to guarantee that this project was a success cannot be understated, and I am infinitely grateful for the faith put in me and my abilities.

I hope to have made everyone – my family, friends, professors, peers, and advisors – proud.

1 Threats from Infections and Emerging Infectious Diseases

CoViD-19 is a deadly disease that has already killed 600,000 people in the United States alone, with hundreds of other deaths around the world. It has infected 38.5 million people in the United States, and continues to spread. Without meaningful examination of the spread of CoViD-19, with close examination of the communities most at risk, the virus will continue to infect, to spread, and to kill. With such knowledge, more resources and investment can be given to the groups and areas most at risk.

To this directive, studies can be conducted which compile, process, clean, and analyze the data made available by the state of Massachusetts. Such is the purpose of this study. By documenting the groups of society most in need of aid during the current pandemic, and by providing additional medical focus, such as increased programs about the effectiveness of masks, increased regulation of CoViD-19 restrictions, and increased efforts to provide vaccines to the communities, their risk might approach the norm. Of course, repeating this study to determine if the rate of infection has decreased will be invaluable to

determining the efficacy of such efforts. Any future studies can also identify the communities that are most at risk once the spread has been appropriately curbed in the first identified communities. If such efforts prove worthwhile, this method can be generalized to other states and nations. In doing so, the spread of CoViD-19 may leave its current epidemic state, and may become endemic.

If this research proves to be this impactful, then it may also be used to map future pandemics, and identify the communities most affected by a different virus. In this situation, the focus can first be on the communities identified as at-risk in this study, and then as more data is analyzed, a more specific response can be formulated and executed. This data can also be used to coordinate general medical practice. When communities are identified as at-risk during a pandemic, they likely are at risk in general. Thus, this data holds value outside of the current CoViD-19 crisis, both as a roadmap for future epidemics, and as a reference for medical needs. In fact, this study's power for predicting medical need would be augmented by repeated research across other viruses - with more data across different periods and circumstances, a more detailed map of needs can be made.

In order to complete a study such as this, there are some requisite steps that must be followed. First, data must be found, which provides the infections at a time interval approximately equal to the length of a period of infection - in this case, the data used was biweekly.

From here, the population can be split into the documented groups, such as Lifestyle Social Contract (LS2C), Infected, and Uninfected. If the data allows, additional categories such as Deceased, Hospitalized, and Exposed can be added to the list of classes. From here, a mathematical model must be devised, which provides a system of equations that maps the movement of peoples through the various classes. After proving the validity of such a system, it can be used to calculate the Basic Reproduction Number (BRN) for the data. Bar graphs can also be made, which compare a group's percentage of the population to their total percentage of cases.

At this point, tables must be constructed, dividing the population into its subordinate groups being analyzed, and then documenting the state of each population in relation to the mathematical model. From this information, the Basic Reproduction Number formula may be executed, so as to remove population weighting and create comparable data.

If desired, the data for all groups may be evaluated on a singular date, or the data for all dates may be evaluated for a singular group. From these tables, comparisons can be made as to the spread of a given virus over a period of time between communities for each viral reproduction period. This data can be consolidated to any multiple period, by adding weeks of appropriate data together and recalculating. Monthly and seasonal periods were chosen for this study. After this, at-risk communities can be identified and additional aid can be provided.

This paper is organized as follows:

2 Landscape of Coronavirus and Efforts to Stop the

Virus Spread

CoViD-19 is a novel coronavirus disease, which was first discovered on December 31st of 2019¹. This is the basis for its name – Co(rona)Vi(rus)D(isease)–(discovered 20)19¹.

Coronaviruses are a form of viral disease, which are so named due to their spiky appearance, like a crown – in latin, *corona*¹. Coronaviruses come in four main types:

2

Common coronaviruses include:

2

These are all common colds².

Other well-known coronaviruses are MERS-CoV – also known as Middle East Respiratory Syndrome Coronavirus, and SARS-CoV – or Severe Acute Respiratory Syndrome Coronavirus³.

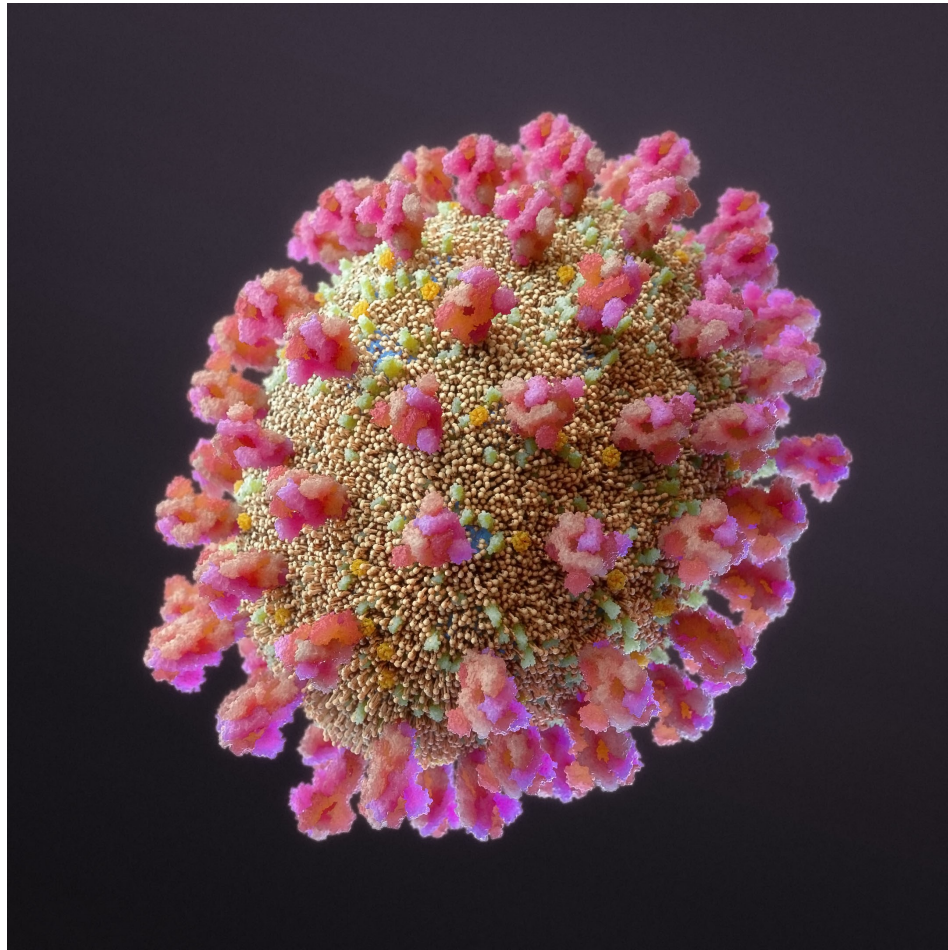
CoViD-19 has been such a concerning virus because of its myriad symptoms. These range from the “mild case” symptoms of:

4

Hospitalized cases may include the following:

4

CoViD-19 was originally discovered in the Wuhan province of China⁵. This acted as an epicenter for the virus, and many of the original studies were focused on this region⁵. As the virus spread, the focus of studies expanded to include the other infected locations.



A CoViD-19 Molecule

By the end of January, this included the United States, as the first case was reported in Washington state⁵. By the end of the month, then-President Trump had declared a Public Health Emergency, restricting travel from China⁶. Besides this, little action was taken until March, at which point, many states mandated masks, limited gatherings, closed schools, and eliminated non-essential travel⁷. By April, all states had reported cases of the virus⁸. Due to economic pressures, some restrictions were periodically lifted, but these frequently resulted in an increase in cases and the subsequent reinstatement of those restrictions.

One of the most notable early studies is that of Tang et al., who used Markov Chain Monte Carlo simulations to determine the parameters of a nine-class expanded SIR model, using data from Wuhan⁹. Such studies provide important data on the spread of CoViD-19. However, there are still questions that remain on the topic. Further analysis of data, especially localized data from an extended period, has value in improving understanding of the transmission of the virus.

These data localization points can be as large as a continent, or as small as a town. They can be devoid of location entirely, and instead focus on age, gender, or race. All of these provides valuable insight into the communities most at risk for the virus.

Fortunately for those studying CoViD-19, there is a plethora of information. 220 countries and

territories have reported data on CoViD-19¹⁰. Some nations, such as the United States, have provided regional information, or data on the ethnicity, sex, and age of CoViD-19 cases.

It has already been noted by many scholars that the virus has been disproportionately affecting minority communities¹¹. Black, Hispanic, and Native American communities each have a greater percentage of cases and deaths than they do percentage of the population¹¹. Similar data is difficult to find for gender and age; however, it is commonly noted that the changes in lifestyle associated with aging typically result in an increased risk of death for CoViD-19 patients, and that nursing homes are responsible for the spread of CoViD-19, although this information is more anecdotal and less data-driven^{12,13}.

This data frequently includes the number of deaths attributed to CoViD-19. With the latest data suggesting over 3.85 million cases, 616,358 of which occurred in the United States, it is evident that the virus requires close examination in order to help determine who is the most at-risk, which can reduce mortality¹⁰.

This urgency is especially relevant with the advent of CoViD-19 vaccines. These inoculations from Moderna, Pfizer, and Johnson & Johnson help reduce the spread of the virus, and have been heavily encouraged for everyone age 12 and up¹⁴. It is important to identify the groups and communities most in need of the vaccine, because more resources can then be invested in such areas.

CoViD-19 is a phenomenon with substantial information, and misinformation, available. This project cannot substantially alter the depth of misinformation around the virus; however, it can provide more accurate and more advanced data on subsets of interest – namely, the communities and peoples most at risk for the Novel Coronavirus.

3 Epidemiology

A way to study the spread of CoViD-19 is through the use of epidemiology. By studying specified groups and their distribution of CoViD-19 infection and recovery, researchers develop insight into the causes and risk factors for the virus's spread¹⁵. Such research can be based on distinguishing characteristics such as age, gender, race, county, educational status, and hundreds of other divisions¹⁵. These allow researchers to determine if commonalities can be found in groups that are infected at greater rates, and in groups that are infected at lower rates, than the norm¹⁵.

Epidemiology has several elements: it is a part of determining all of the variations in severity of a disease, of determining transmission rates and risks, determining the risk factors for death or life-changing illness, and developing responses to a disease¹⁶. This study focuses on the transmission rates and risks, but it is important to note the work done in the other categories.

Firstly, credit must be given to Dr. Fauci and the Center for Disease Control (CDC), who have held press briefings and shared information throughout the pandemic¹⁷. These have provided invaluable recommendations, which helped reduce the spread of the virus. Advice such as mask mandates, social distancing of at least six feet, lockdown, eliminating pleasure travel, and regular CoViD-19 tests all helped to bring the rate of infection down to less than half of the Basic Reproduction Number (BRN) of the virus¹⁷.



Dr. Fauci Gives a Speech on CoViD-19

This necessitates the recognition of teams of researchers, such as Tang et al., who helped document the BRN while accounting for quarantining⁹. By examining the many different severities of CoViD-19, and creating a mathematical model accounting for each class of the population in a quarantine state, an understanding of the severity of the virus was reached before the number of cases snowballed⁹.

The researchers of CoViD-19 worked closely with the World Health Organization (WHO), whose authority helped extend the impact of research and provided invaluable global data on CoViD-19. In doing so, comparisons between response methods could be more easily made, increasing the rate of research.

Of course, CDC recommendations and research would not have halted the virus alone - Governor Charlie Baker deserves accolades for his hard-line stance against CoViD-19, informed by Dr. Fauci, research teams, and WHO. His efforts to eliminate all unnecessary travel, to mandate quarantine, and to place a capacity limit on events all reduced the spread of the virus¹⁸.



Governor Baker Announces CoViD-19 Restrictions

All of this work makes it possible for CoViD-19 to have less of an impact in the future. CDC teams can execute Field Epidemiology Training Programs (FETP) with the information on CoViD-19, to help prevent future outbreaks¹⁹. These programs help by deploying teams to viral areas, where they track the spread and provide education on controlling a disease¹⁹. According to their mission statement, with this work, they can begin to develop national, regional, and local capabilities to eliminate disease outbreaks before they begin²⁰.

A Field Epidemiology Training Program Ambulance (Side)

A Field Epidemiology Training Program Ambulance (Inside)

A Field Epidemiology Training Program Ambulance (Front)

It also allows more specialized care in hospitals and when emergency medical services are required²¹. With more data on at-risk communities, and an understanding of the various severities of a virus, medical aid can be provided quicker and more accurately²². With more knowledge on a disease, a response to cases can be tailored to the characteristics of the case and of the individual, increasing the likelihood of survival and decreasing the risk of infecting others²².

Of course, this relies on an understanding of CoViD-19 and of the communities most at risk. This is most easily done through mathematical modeling, such as that done in this study.

4 Mathematical Modeling

To analyze the data, it is easiest to view as a simple *SIR* model. Although the data can be viewed without a model, this does not take into account the weights of the information. As such, a system of equations, weighted for the population, contributes more meaningful information.

The *SIR* model utilized is as follows:

	$\dot{S} = -\frac{\beta IS}{N}$	(1)
	$\dot{I} = \frac{\beta IS}{N} - \gamma I$	(2)
	$\dot{R} = \gamma I$	(3)

S represents the number of Susceptible people in a population, which are those who have never been infected or recovered. This group will be considered those with a Lifestyle-Social Contract, or *LS2C*. I represents the people who are currently Infected, and R is the removed people – those who have died, or recovered and have immunity. This study will ignore the vaccination as a method to create immunity, as there is not sufficient data on the subject.

Instead of using starting parameters, which would unfairly bias data, the values can be calculated on a biweekly basis. It cannot occur more frequently than this, as the average length of infection is approximately 10-14 days. To calculate weekly would be to re-count too high of a percentage of cases.

Basic lemmas must be proven in order to have confidence in the model used. Although the proofs for a basic *SIR* model are well-known, verification is a necessary step of the process. As such, the population's constancy; the steady states; and, the basic reproduction number, must all be shown.

Lemma 1

Let

$N := S + I + R.$	(4)
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Then

$\dot{N} = 0.$	(5)
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This implies that

$N(t) = N_0 := N(0)$	(6)
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for

$t > 0.$	(7)
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This means the population size remains unchanged for all time.

Proof

Because (4),

$N := S + I + R.$	(8)
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By (1), (2), and (3),

$\dot{N} := -\frac{\beta IS}{N} + \frac{\beta IS}{N} - \gamma I + \gamma I.$	(9)
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This clearly means that

$\dot{N} := 0.$	(10)
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The proof of the lemma is complete.

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Lemma 2

The only steady-state of the model is

$(S, 0, R)$	(11)
-------------	------

where

$S + R = N_0 .$	(12)
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Thus, in the long run, part of the susceptible population remains uninfected (susceptible), while the rest of the population become infected and at the end either recovered or died.

Proof

I can be factored out of (1), (2), and (3), resulting in

	$\dot{S} = I \left(-\frac{\beta S}{N} \right)$	(13)
	$\dot{I} = I \left(\frac{\beta S}{N} - \gamma \right)$	(14)
	$\dot{R} = I(\gamma)$	(15)

Thus, if,

	$I = 0,$	(16)
	$\dot{S} = \dot{I} = \dot{R} = 0.$	(17)

The proof of the lemma is complete.

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Lemma 3

The basic reproduction number, R_0 , of this model is given by

$R_0 = \frac{\beta S}{N\gamma} .$	(18)
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Proof

The Next-Generation Method can be used to determine R_0 . Doing so requires a matrix of methods in which a Susceptible individual may become Infected (matrix $\mathcal{F}$), and a matrix of methods in which an Infected individual may become Removed (matrix $\mathcal{V}$). For an *SIR* model, this is easy:

	$\mathcal{F} = \frac{\beta IS}{N},$	(19)
--	-------------------------------------	---------------------------------------

and

$\mathcal{V} = \gamma I$	(20)
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R_0 is $\mathcal{K}$, where

	$\mathcal{K} = \mathcal{F}\mathcal{V}^{-1} .$	(21)
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Thus,

$\mathcal{K} = \frac{\beta IS}{N\gamma I} = \frac{\beta S}{N\gamma} .$	(22)
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The proof of the lemma is complete.

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5 Cleaning and Processing

The data chosen for analysis fits in to five categories:

Massachusetts has provided information on all five of these groups²³.

The Massachusetts total data is also available on the table with county data. To determine the average incidence rate in Massachusetts, it will be used independently of any table, using 2019 population estimates from the 2010 census²⁴. This will show if any group is above or below the mean.

5.1 Age

Age has been divided into the groups:

This table provides a weekly update on the number of cases, and population estimate for each of the age groups. Although the weekly information is available, a biweekly chart is made. Using this information, the Uninfected can be found by adding the previous period's Infected to the last period's Uninfected. Then, the Lifestyle-Social Contract can be determined by subtracting the current Infected and Uninfected from the population.

While this method works, it has its flaws. Since the data begins on August 12, 2020 (spanning back to July 26th), the 107,897 cases prior to July 26th are not counted. Thus, a method to distribute them fairly among each age group is needed. This can be done either by using a weighted average of the population estimates, or a weighted average of the cases at the end of data gathering on April 21st. The first ignores trends and creates its own, but the second reinforces the trends found at the end on the beginning cases. In order to maintain the same trends, the preexisting cases are divided using a weighted average of the cases at the end of April, with the acknowledgment of the biases created.

5.2 Gender

The second table, on gender, has four categories:

The same process is used to construct this table as was used for the first.

A notable difference, however, is in the calculation of the transgender cases. Since this data is not available before December 30th, a method to account for this must be used. Additionally, the population estimate for transgender people is not available; however, studies suggest that approximately 0.57% of the population of Massachusetts is transgender²⁵. This statistic can be used to calculate the total number of transgender peoples, and more accurately represent the population for females and males, by multiplying both groups by 0.0057 for the transgender population, and each by 0.9943 for their actual population. This ignores disparities between likelihood for males to be transgender vs females to be transgender, but it is better than the alternative of doing nothing.

This process can also be used to calculate transgender CoViD-19 cases before December 30th. These

numbers are substantially higher than those after December 30th, so both using this method and ignoring previous transgender cases will be used.

An additional note on this data is that some weeks have less than five cases for transgender people. This will be addressed by using the average.

5.3 Race

The Massachusetts data for race is presented differently than that of age or gender. Here, a cumulative total of cases can be found. This means that the information is for the total Uninfected in the next biweekly period. Thus, the current biweekly Lifestyle-Social Contract is the estimated population minus the cumulative cases, and the current Infected is the cumulative from the current week, with the last biweekly period's cumulative subtracted

This method, while more roundabout, does have its benefits: namely, it means that all cases are included in the cumulative data, and no biases will be presented by artificially adding them. This means that the data is more reliable.

There is, however, still an issue with the data: two categories:

Only begin reporting on December 30th. They cannot be properly estimated before then. The other six races:

All can be accurately tracked back to June 3rd.

June 3rd is not the first date of data, but it is the best starting date. From June 1st through November 1st, racial data was provided daily, but starting on November 4th, data is weekly. Therefore, the dates for biweekly data must line up with November 4th, which is why June 1st is used.

5.4 County

The fourth table is by county. Here, the case count is both cumulative and new. This means that the starting state is accessible, and after this, the methods used for Tables 1 and 2 can be used. The population for each county is not provided, but can be estimated using the 2010 Census data's estimate for 2019 population²⁶.

The counties are as follows:

It is worth noting that Dukes and Nantucket are separate counties; however, their data is only presented for both together. Thus, they will be analyzed as one entity.

5.5 Higher Education

One of the primary areas of concern for the pandemic has been school settings. The data on CoViD-19's spread is available for higher education, which will be analyzed to determine how much risk a college setting brings. There are no subcategories of this data, and it is of the same form as county data and will be treated in the same fashion. The table does not provide any information on the number of higher education students in Massachusetts, but this data can be easily found elsewhere²⁷.

5.6 Table Presentation

The data in these categories can be presented in various methods. A book can contain dated sheets, where the categories are all on one sheet. Alternatively, the sheets could each be a category, with all dates on one sheet. The first allows easy comparison between groups, while the second allows the SIR

model to be most easily used, providing the BRN for each period. Thus, both will be made.

The Excel formula for R_0 in a given row x is as follows:

For the first row:

$\frac{(C(x+1) - C(x))B(x)}{(E(x+1) - E(x))C(x)}$	(23)
---	------

For the second row to the second-to-last ($n - 1$) row:

$\frac{(C(x+1) - C(x-1))B(x)}{(E(x+1) - E(x-1))C(x)}$	(24)
---	------

For the last (n) row:

$\frac{(C(x) - C(x-1))B(x)}{(E(x) - E(x-1))C(x)}$	(25)
---	------

In addition to these separations, the length between dates can be changed to months or seasons. A month would be a period of two biweekly data sets, and a season would be a period of three monthly data sets. All three versions of dated sets allow for different analysis, and should all be made.

From this set of R_0 values, the mean can be calculated using the average function of Excel. Additionally, the Rank and Percentile Data Analysis tool of the Analysis ToolPak Add-in allows an easy determination of the time periods with a Basic Reproduction Number below the 25th percentile and above the 75th percentile.

External statistical analysis was used to determine the groups in each table below the 25th percentile and above the 75th percentile for the average BRN.

6 Tips for State of Readiness and Operational Effectiveness

The data gleaned from this study suggests the communities with the highest rate of infection, and ignores the severity of any given instance of CoViD-19. It is additionally of note that the order of impact changes with the period analyzed. This is likely due to the fact that if there was an uneven amount of biweekly periods, the final biweekly period was eliminated. Similarly, if the number of monthly periods was not a multiple of three, the final one or two was removed to create a factor of three number of periods.

The following table for Massachusetts will be used for comparison:

Massachusetts
Reference Average
 R_0

Period	R_0
Biweekly	1.150
Monthly	1.368
Seasonal	4.598

It is important to note that the R_0 value increases as the period gets larger. This is the result of the formula for the first week, which becomes a much larger value than the other equations and artificially inflates the average. It does not decrease the validity of the data, but changes the comparison.

It is also of note that the actual Basic Reproduction Number is higher than those found. This represents the spread of CoViD-19 in a mask-mandated, socially distanced, and event-capacity-limited state, which all play a roll in reducing infection. If the virus spread freely, the BRN would likely be closer to 6, as suggested by Tang et al.

$\frac{B(x)}{SUM(B2:B(n))}$	(26)
-----------------------------	------

The formula for the percentage breakdown of the population is above, and that for a percentage breakdown of the total cases is below. Note that any unknown or other groups are not accounted for in the percentage breakdown of cases, so the sum of percentages will be less than 100 for each set of data.

$\frac{D(x)+E(x)}{SUM(D2:E(n))}$	(27)
----------------------------------	------

Where x represents the current row and n represents the last row in both equations.

Although graphs are provided for the biweekly, monthly, and seasonal periods, they are consistent to the point that only one must be analyzed. This suggests that the percentage ever infected does not change substantially throughout the time analyzed – the removal of the final weeks and months to make monthly and seasonal graphs does not have an impact on the model, so they must match the model.

6.1 Age

The data on age is represented in the following tables:

Biweekly Age
Average R_0

Rank	Age	R_0
1	0-19	1.207
2	20-29	1.190
3	30-39	1.189
4	40-49	1.186
5	50-59	1.183
6	60-69	1.173
7	70-79	1.134
8	80+	1.118

Monthly Age Average
 R_0

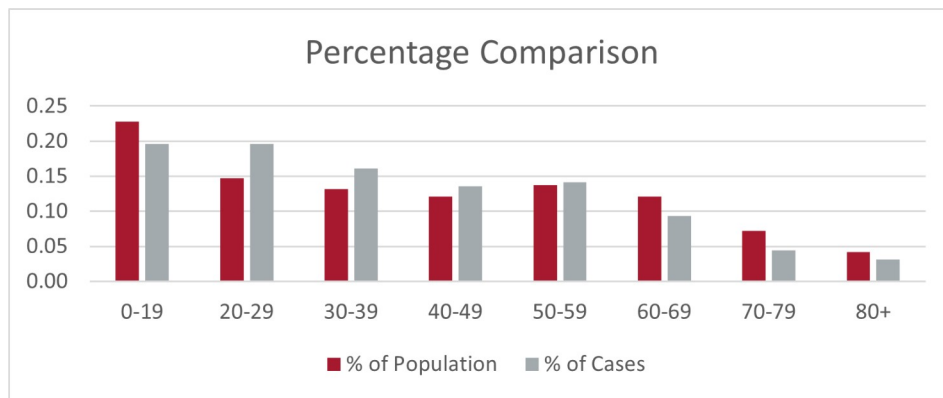
Rank	Age	R_0
1	0-19	1.459
1	20-29	1.459
3	60-69	1.453
4	50-59	1.448
5	40-49	1.432
6	30-39	1.426
7	70-79	1.372
8	80+	1.367

Seasonal Age Average

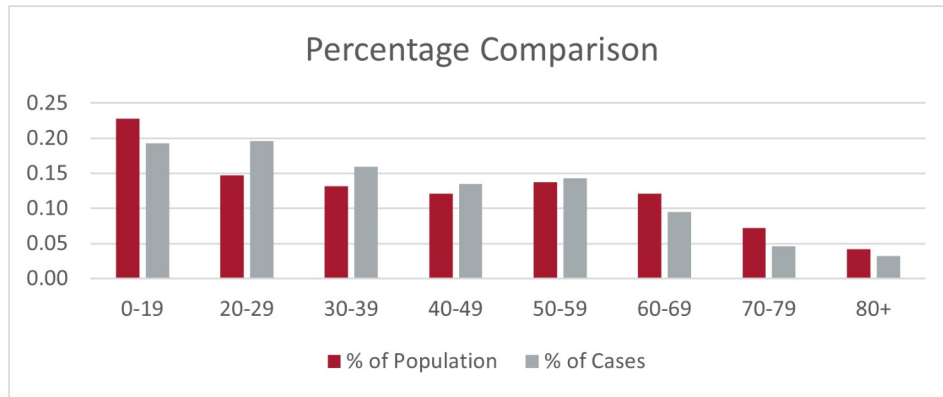
$$R_0$$

Rank	Age	R_0
1	60-69	4.233
2	70-79	4.010
3	50-59	3.902
4	80+	3.878
5	40-49	3.520
6	0-19	3.482
7	30-39	3.376
8	20-29	3.280

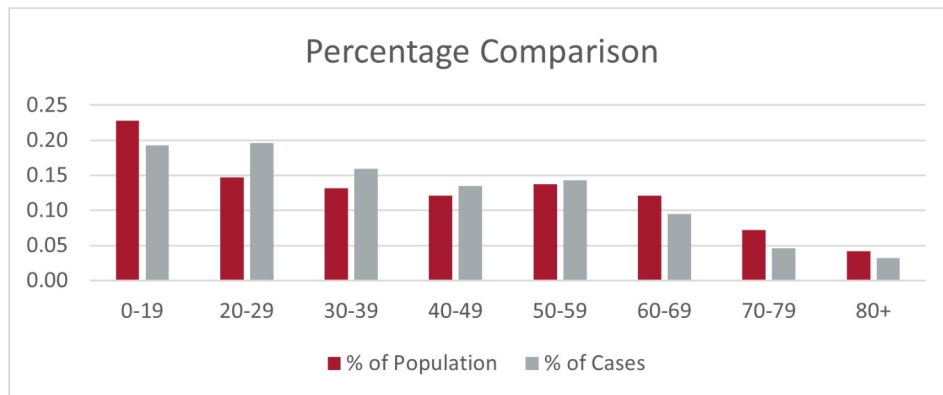
and the following charts:



Biweekly Age Percentage Comparison



Monthly Age Percentage Comparison



Seasonal Age Percentage Comparison

This data suggests that those aged 0-29 are the most likely to catch CoViD-19. Younger people put themselves in situations where they are more likely to be infected, while older individual have been reducing their risk of contamination.

The data on age suggests that the groups where recovery efforts should be focused are 20-49. These groups all have higher rates of infection than they should by population. This means that the age group of 20-29 deserves the most attention, as the most infected population with the second most rapid spread.

Thus, future campaigns for CoViD-19 safety should target younger crowds; however, this classification should be closely watched, as it seemseasily susceptible to change.

6.2 Gender

The data on gender is represented in the following tables:

Biweekly Gender Average

R_0 (Method 1)

Rank	Gender	R_0
1	Male	1.192
2	Female	1.176
3	Transgender	0.6982

Biweekly Gender Average R_0

(Method 2)

Rank	Gender	R_0
1	Male	1.192
2	Female	1.176
3	Transgender	1.107

Monthly Gender Average R_0

(Method 1)

Rank	Gender	R_0
1	Male	1.454
2	Female	1.424
3	Transgender	0.5110

Monthly Gender Average R_0

(Method 2)

Rank	Gender	R_0
1	Male	1.453
2	Female	1.423
3	Transgender	1.207

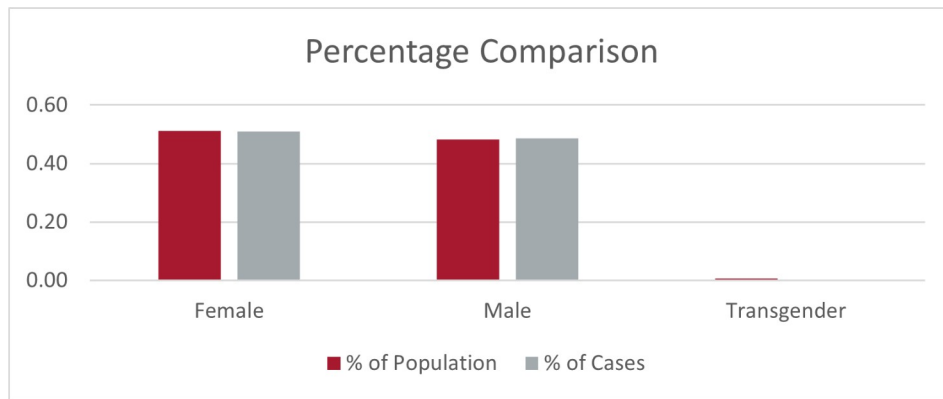
Seasonal Gender Average R_0
(Method 1)

Rank	Gender	R_0
1	Male	3.638
2	Female	3.565
3	Transgender	1.850

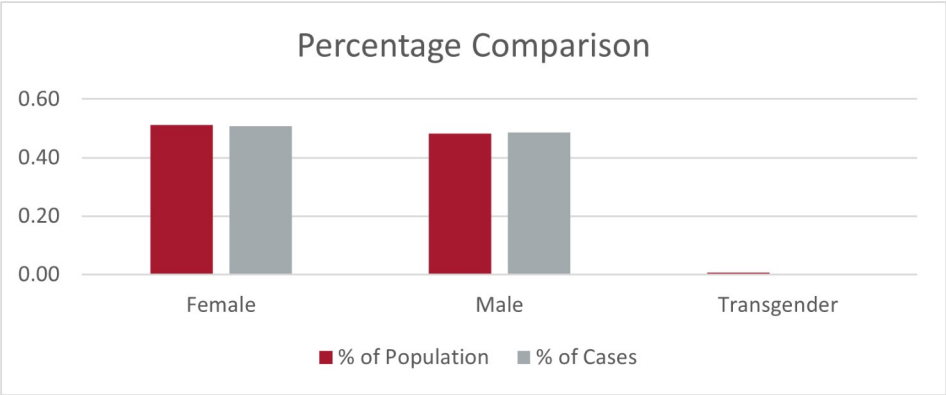
Seasonal Gender Average R_0
(Method 2)

Rank	Gender	R_0
1	Male	3.637
2	Female	3.566
3	Transgender	1.743

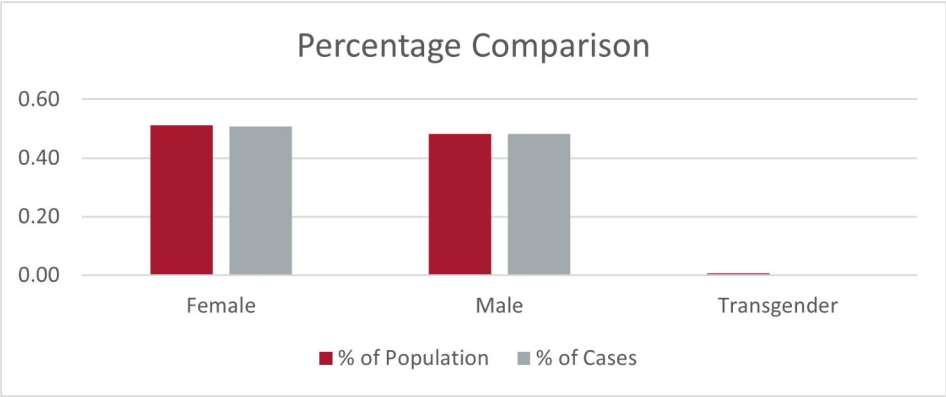
and the following charts:



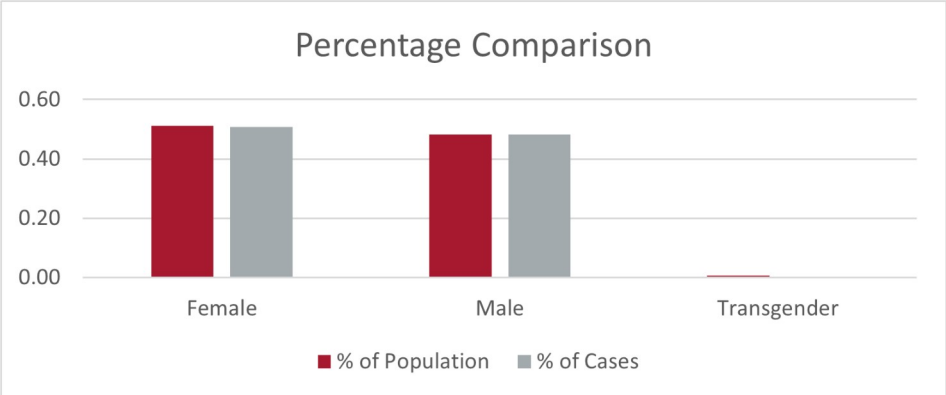
Biweekly Gender Percentage Comparison (Method 1)



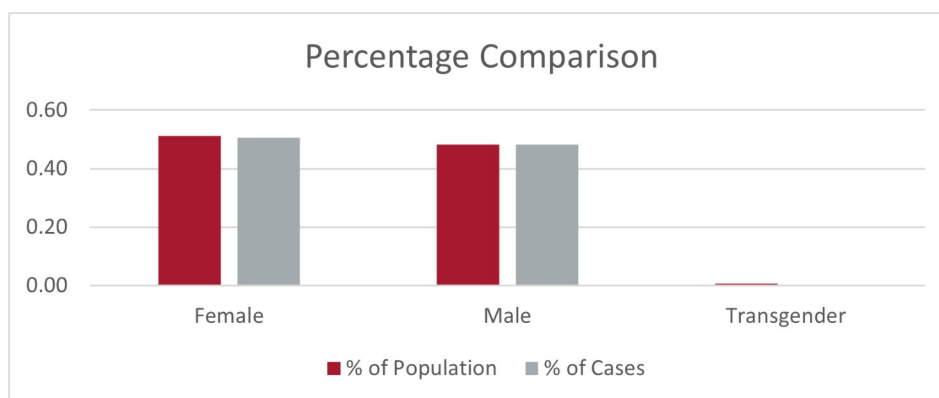
Biweekly Gender Percentage Comparison (Method 2)



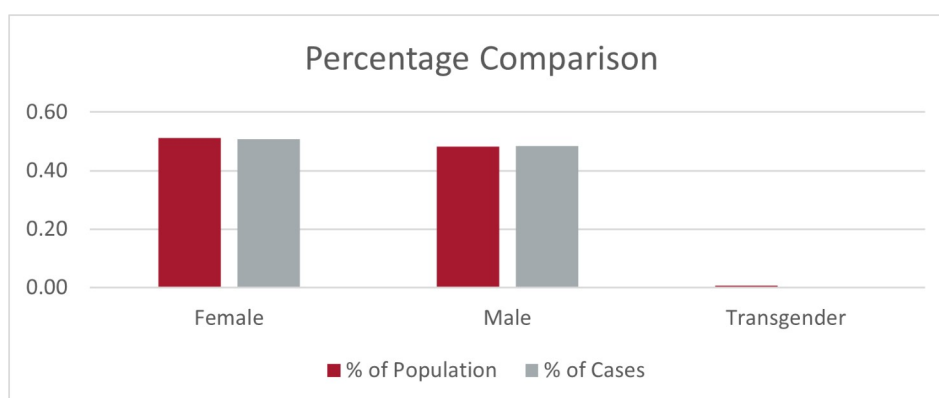
Monthly Gender Percentage Comparison (Method 2)



Biweekly Gender Percentage Comparison (Method 2)



Seasonal Gender Percentage Comparison (Method 1)



Seasonal Gender Percentage Comparison (Method 2)

This data is consistent in rank across all tables. This means that both males and females are almost equally at risk for CoViD-19 contagion. Analysis of the graphs verifies that any differences by gender are minimal, suggesting that both groups should be given equal attention. This data also suggests that Method 2, accounting for transgender cases before December 30th, 2020, more closely matches the actual cases, as it is not as volatile as Method 1, ignoring the possibility of transgender cases before reporting. This is likely a result of transgender people who are not out to their physician.

6.3 Race

The data on race is represented in the following tables:

Biweekly Race Average R_0

Rank	Race	R_0
1	White, non-Hispanic	1.274
2	Hispanic	1.106
3	Asian, non-Hispanic	1.087
4	Black or African American, non-Hispanic	1.041
5	American Indian/Alaskan Native, non-Hispanic	0.7741
6	Native Hawaiian/Pacific Islander, non-Hispanic	0.7601

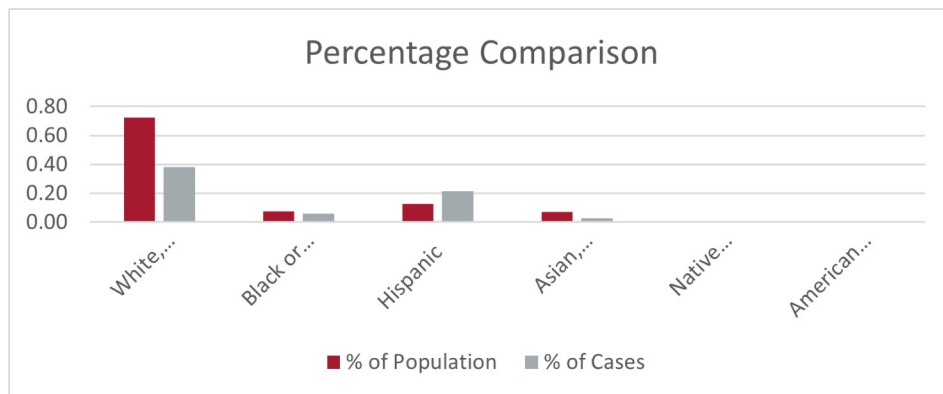
Monthly Race Average R_0

Rank	Race	R_0
1	White, non-Hispanic	1.221
2	Asian, non-Hispanic	1.196
3	Hispanic	1.188
4	Black or African American, non-Hispanic	1.112
5	American Indian/Alaskan Native, non-Hispanic	0.7534
6	Native Hawaiian/Pacific Islander, non-Hispanic	0.6571

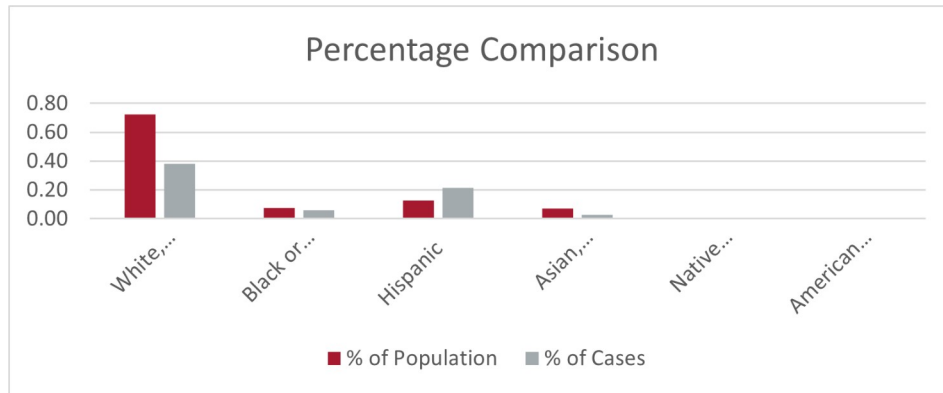
Seasonal Race Average R_0

Rank	Race	R_0
1	Asian, non-Hispanic	1.367
2	White, non-Hispanic	1.311
3	Hispanic	1.223
4	Black or African American, non-Hispanic	0.9245
5	Native Hawaiian/Pacific Islander, non-Hispanic	0.8594
6	American Indian/Alaskan Native, non-Hispanic	0.8513

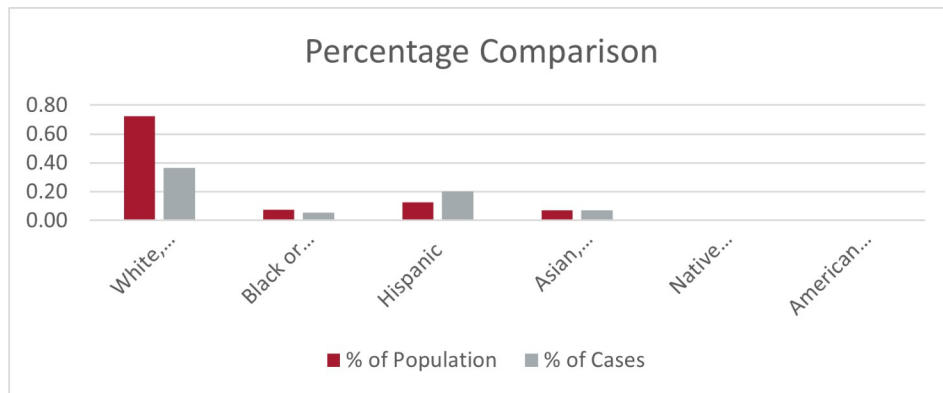
and the following charts:



Biweekly Race Percentage Comparison



Monthly Race Percentage Comparison



Seasonal Race Percentage Comparison

The data on race is significant. It is clear that the White, non-Hispanic community has the greatest CoViD-19 spread. However, the Hispanic community has the highest rate of infection, which is especially significant given the number of unknown race cases – more than thirty percent. Any campaigns to reduce the spread of CoViD-19 should focus on White non-Hispanics heavily, as they have a substantially greater rate of transfer. Alternatively, work to aid hard-hit communities should focus on Hispanic communities..

6.4 County

The data on counties is represented in the following tables:

Biweekly County Average

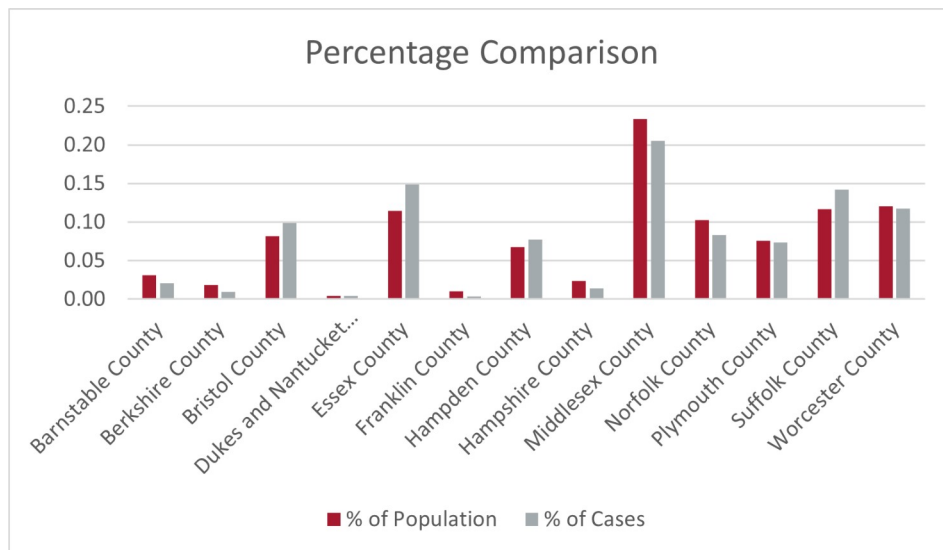
R_0

Rank	County	R_0
1	Dukes and Nantucket	1.220
2	Berkshire	1.198
3	Barnstable	1.070
4	Hampden	1.058
5	Suffolk	1.038
6	Bristol	1.036
7	Plymouth	1.024
8	Hampshire	1.010
9	Essex	1.002
10	Middlesex	0.9971
11	Norfolk	0.9868
12	Worcester	0.9835
13	Franklin	0.9442

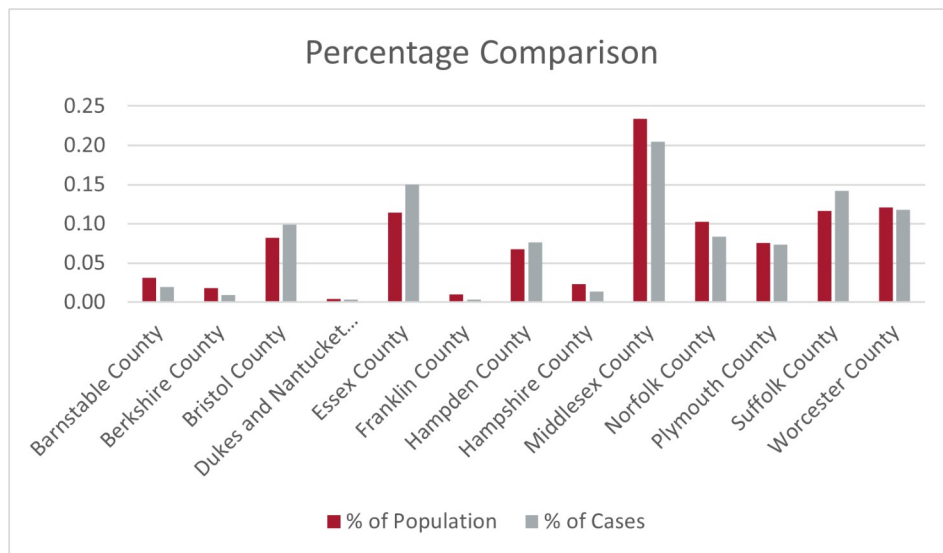
Monthly County Average R_0

Rank	County	R_0
1	Barnstable	1.344
2	Berkshire	1.338
3	Hampshire	1.139
4	Plymouth	1.093
5	Hampden	1.089
6	Dukes and Nantucket	1.088
7	Norfolk	1.072
8	Suffolk	1.069
9	Middlesex	1.039
10	Bristol	1.027
11	Worcester	0.9846
12	Essex	0.9628
13	Franklin	0.9370

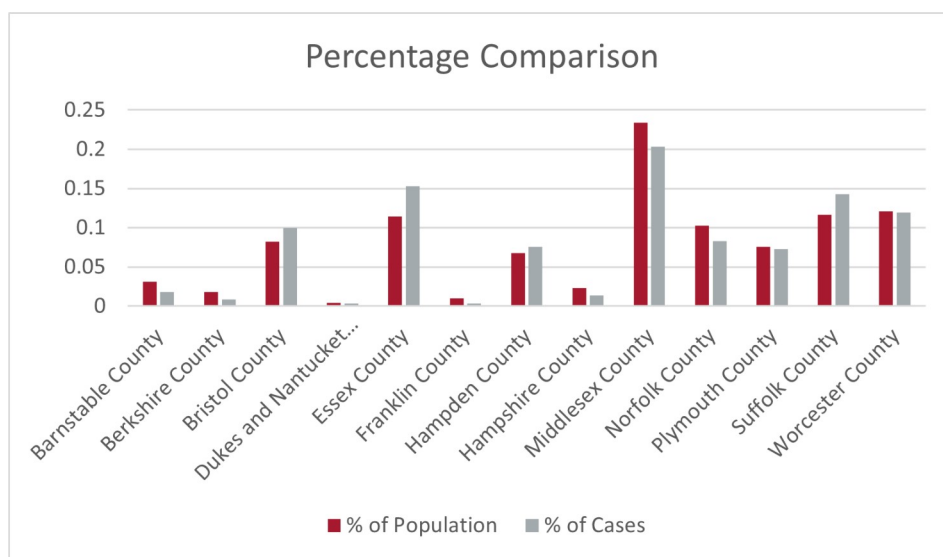
and the following charts:



Biweekly County Percentage Comparison



Monthly County Percentage Comparison



Seasonal County Percentage Comparison

The county data does not have a seasonal table as there is only one set of data, and a Basic Reproduction Number cannot be constructed without a slope. The existing data suggests a growing number of cases in Dukes County and Nantucket County, which likely follows from their existence as travel destinations. As the weather improves, cases will likely pick up in summer communities. Outside of Dukes and Nantucket, it is important to note that Barnstable County and Berkshire County are both consistently above the 75th percentile of R_0 values. Any work done would benefit from focusing in these four regions.

Work should also focus on Bristol, Essex, and Suffolk Counties. All have significantly higher rates of infection per capita than other regions, and thus require a disproportionate amount of resource dispatchment. Essex County especially requires attention due to the large ratio between cases and

population.

6.5 Higher Education

The data on higher education is represented in the following table:

Higher
Education Average
 R_0

Period	R_0
Biweekly	1.238
Monthly	1.363
Seasonal	2.892

The data for those pursuing a higher education suggests that they are roughly equal to the general population. This makes sense, as colleges are regularly tested. In doing so, they most accurately match the breakdown of the state - they compose a large percentage of tests. That being said, the fact that the biweekly average is above the state average is of concern and may require further examination..

7 Conclusion and Future Recommended Research Work

From the results, it is clear that many of the preconceived notions of who is most at risk for CoViD-19 are wrong. In many cases, it is the exact opposite of colloquial information holds when only considering infection. This data would likely change if death was accounted for, as a weighting of the severity of the virus would greatly impact the response to CoViD-19.

In many ways, this result should be expected. In communities where recovery is more certain, less precautions for safety have to be taken. If one feels that they are likely to survive because they are young, white, and live in an affluent community with ample health care, they can be more cavalier and take greater risks. These risks may still result in infection, but infection may not be a concern one feels it is likely that they will recover without a problem, and that if there is a problem, they will receive the health support that they require.

This maps across nearly every aspect of the tables. When age, race, gender, or county is examined, the greatest infection rates occur in the communities with the most robust medical knowledge, and with the most access to medicine. Well-off people with summer houses have access to better health care, and can take more risks compared to those in urban centers where many live at or below the poverty line. Most medical data is on men, with little to no information on transgender people. White, non-Hispanic

individuals similarly have the most focus in scientific literature. The elderly are more likely to die from any disease, and so have to be constantly vigilant against risks of contamination.

Additionally, people tend to interact within their communities. As a group suffers from a greater incidence of infection, it is more likely to continue to experience similar Basic Reproduction Number values. A prime example is nursing homes. In a situation where an incidence rate is high in a closed community, it will likely spread rapidly until there is no one left to infect. Similarly, without travel, cases would tend to stay localized to a county, city, and locality. Since many communities are homogeneous, this maintains racial separations, which are reflected in the data. This also suggests why the higher education population closely matched the general population in terms of the Basic Reproduction Number - college students are a heterogeneous mix of the various subgroups of the population, and as such, reflect the masses instead of any specific population.

This all works to suggest an inverse proportionality between case severity and case incidence in the population. This can be further supported or disproven by comparing incidence rate to death rate - if this hypothesis holds true, then the lower the incidence rate for a population, the greater the deaths in cases per capita ($DiCpC$). A weighting would have to be made for size of a population, and one such method would be to use the following formula:

$$DiCpC = \frac{D * R_0}{I},$$

(28)

where I = infection and D = deaths .

If this theory proves correct, then campaigns can be made to reduce CoViD-19 spread in communities with high R_0 values, and greater ambulatory care and health care services can be provided to the communities with high $DiCpC$ values.

However, the analysis of cases per capita through the graphs of percentage of population and percentage of cases suggests different results. It seems that cases started at a higher level in other communities, such as Hispanics, and Bristol, Essex, and Suffolk Counties. Although they do not have the highest rates of infection, they are the most disproportionately infected. Although efforts to contain the virus should focus on the high BRNs, but efforts to treat communities should focus on those with high cases per capita. To best analyze both the BRN and the cases per capita, the BRN might be multiplied by the percent of cases over the percent of the population.

Other studies could look at other communities. With more time and resources, the data can be used to calculate cities most at risk. With government cooperation, subcategories can be combined - instead of analyzing age, gender, race, and county separately, groups such as 0-19 year-old white, non-Hispanic women from Barnstable County can be compared to 80+ Hispanic men from Worcester County. This will provide greater specificity in which communities are truly at risk.

This study has provided an effective starting place for epidemiological research. Now, it can be utilized, and it can be expanded upon.

8 Appendices

8.1 Appendix A: Reference Tables

The following is the provided Data Documentation for the Massachusetts Data used.

For Cases (Report Date):

Date – Date to which this data applies – by the date the case was reported to the state

Positive Total – Running total of individuals that meet the confirmed COVID-19 case definition by the date the case was reported to the state

[Note that this will not equal the “Positive Total” column on the CasesByDate.xlsx file. This file is based on the date the case was reported and CasesByDate.xlsx is based on date the patient was tested.]

Positive New – New cases today that meet the confirmed COVID-19 case definition by the date the case was reported to the state (today’s positive total cases minus yesterday’s positive cases)

[Note that this will not equal the “Positive New” column on the CasesByDate.CSV file. This file is based on the date the case was reported and CasesByDate.CSV is based on date the patient was tested.]

For Age:

Date – Date to which this data applies

Age – Age categories covered by the data.

Cases_Last2Weeks – Total probable and confirmed COVID-19 case count for age group in the last two weeks

Start_Date – First day of the "last two weeks" period to which this data applies

End_Date – Last day of the "last two weeks" period to which this data applies

For Gender:

Date – Date to which this data applies

Sex – Sex category to which the data applies

Cases_Last2Weeks – Total probable and confirmed COVID-19 case count in the last two weeks

Start_Date – First day of the "last two weeks" period to which this data applies

End_Date – Last day of the "last two weeks" period to which this data applies

For Race:

Date – Date to which this data applies

Race/Ethnicity – The Race/Ethnicity category to which the counts apply

All Cases – Total number of probable and confirmed COVID-19 cases by race/ethnicity

For County and State:

County – Name of the county in MA to which this data applies; Address information for these cases listed in "Unknown" are currently being obtained.

Total Case Count – Total number of confirmed COVID-19 cases since Jan 1, 2020

Case Count (Last 14 Days) – Total number of confirmed COVID-19 cases in the last 14 days

For Higher Education:

Date – Date to which this data applies

New Higher ED Confirmed Cases – Confirmed COVID-19 cases that are associated with higher education testing that on that date received a positive molecular test

Total Higher ED Confirmed Cases – Running total of confirmed COVID-19 cases that are associated with higher education testing



Massachusetts Reference Data - Cases (Report Date)

Date	Positive Total	Positive New
6/1/2020	97291	326
6/2/2020	97539	248
6/3/2020	97964	425
6/4/2020	98376	412
6/5/2020	98796	420
6/6/2020	99301	505
6/7/2020	99562	261
6/8/2020	99755	193
6/9/2020	99955	200
6/10/2020	100158	203
6/11/2020	100504	354
6/12/2020	100811	307
6/13/2020	101070	259
6/14/2020	101276	206
6/15/2020	101334	58
6/16/2020	101474	140
6/17/2020	101654	180
6/18/2020	101853	199
6/19/2020	102005	152
6/20/2020	102228	223
6/21/2020	102333	105
6/22/2020	102469	136
6/23/2020	102651	182
6/24/2020	102762	111
6/25/2020	102922	160
6/26/2020	103071	149
6/27/2020	103376	305

Massachusetts Reference Data - Gender

Date	Sex	Cases_Last2Weeks	Start_Date	End_Date	Population_Estimate_N
8/12/2020	Female	2148	7/26/2020	8/8/2020	3582833.33
8/12/2020	Male	1698	7/26/2020	8/8/2020	3381549.20
8/19/2020	Female	2542	8/2/2020	8/15/2020	3582833.33
8/19/2020	Male	2167	8/2/2020	8/15/2020	3381549.20
8/26/2020	Female	2470	8/9/2020	8/22/2020	3582833.33
8/26/2020	Male	2151	8/9/2020	8/22/2020	3381549.20
9/2/2020	Female	2238	8/16/2020	8/29/2020	3582833.33
9/2/2020	Male	2006	8/16/2020	8/29/2020	3381549.20
9/9/2020	Female	2432	8/23/2020	9/5/2020	3582833.33
9/9/2020	Male	2153	8/23/2020	9/5/2020	3381549.20
9/16/2020	Female	2416	8/30/2020	9/12/2020	3582833.33
9/16/2020	Male	2190	8/30/2020	9/12/2020	3381549.20
9/23/2020	Female	2554	9/6/2020	9/19/2020	3582833.33
9/23/2020	Male	2407	9/6/2020	9/19/2020	3381549.20
9/30/2020	Female	2958	9/13/2020	9/26/2020	3582833.33
9/30/2020	Male	2907	9/13/2020	9/26/2020	3381549.20
10/7/2020	Female	3830	9/20/2020	10/3/2020	3582833.33
10/7/2020	Male	3802	9/20/2020	10/3/2020	3381549.20
10/14/2020	Female	4562	9/27/2020	10/10/2020	3582833.33
10/14/2020	Male	4375	9/27/2020	10/10/2020	3381549.20
10/21/2020	Female	4894	10/4/2020	10/17/2020	3582833.33
10/21/2020	Male	4612	10/4/2020	10/17/2020	3381549.20
10/27/2020	Female	6359	10/10/2020	10/23/2020	3582833.33
10/27/2020	Male	5938	10/10/2020	10/23/2020	3381549.20
11/4/2020	Female	8213	10/18/2020	10/31/2020	3582833.33
11/4/2020	Male	7706	10/18/2020	10/31/2020	3381549.20
11/11/2020	Female	11009	10/25/2020	11/7/2020	3582833.33
11/11/2020	Male	10233	10/25/2020	11/7/2020	3381549.20

Massachusetts Reference Data - Race

Date	Race/Ethnicity	All Cases	Start_Date	End_Date	Population_Estimate_N
6/1/2020	White, non-Hispanic	26162	5/15/2020	5/28/2020	4955521.08
6/1/2020	Black or African American, non-Hispanic	8853	5/15/2020	5/28/2020	509227.93
6/1/2020	Hispanic	18331	5/15/2020	5/28/2020	859094.85
6/1/2020	Asian, non-Hispanic	1875	5/15/2020	5/28/2020	492858.34
6/1/2020	Other race, non-Hispanic	4549	5/15/2020	5/28/2020	
6/1/2020	Unknown or missing	41035	5/15/2020	5/28/2020	
6/2/2020	White, non-Hispanic	26390	5/16/2020	5/29/2020	4955521.08
6/2/2020	Black or African American, non-Hispanic	8904	5/16/2020	5/29/2020	509227.93
6/2/2020	Hispanic	18470	5/16/2020	5/29/2020	859094.85
6/2/2020	Asian, non-Hispanic	1892	5/16/2020	5/29/2020	492858.34
6/2/2020	Other race, non-Hispanic	4574	5/16/2020	5/29/2020	
6/2/2020	Unknown or missing	40933	5/16/2020	5/29/2020	
6/3/2020	White, non-Hispanic	26941	5/17/2020	5/30/2020	4955521.08
6/3/2020	Black or African American, non-Hispanic	9209	5/17/2020	5/30/2020	509227.93
6/3/2020	Hispanic	18691	5/17/2020	5/30/2020	859094.85
6/3/2020	Asian, non-Hispanic	1931	5/17/2020	5/30/2020	492858.34

Massachusetts Reference Data - Higher
Education

Date	New Higher ED Confirmed Cases	Total Higher ED Confirmed Cases
8/15/2020	3	3
8/16/2020	7	10
8/17/2020	11	21
8/18/2020	4	25
8/19/2020	11	36
8/20/2020	12	48
8/21/2020	10	58
8/22/2020	11	69
8/23/2020	5	74
8/24/2020	20	94
8/25/2020	14	108
8/26/2020	12	120
8/27/2020	13	133
8/28/2020	13	146
8/29/2020	16	162
8/30/2020	17	179
8/31/2020	36	215
9/1/2020	18	233
9/2/2020	35	268
9/3/2020	21	289
9/4/2020	18	307
9/5/2020	11	318
9/6/2020	7	325
9/7/2020	24	349
9/8/2020	58	407

8.2 Appendix B: Biweekly by Type

This data was used to construct the Biweekly Tables and Graphs found in Section 6.

8.2.1 Appendix B.1: Reference - Massachusetts

These tables were constructed using the data from Massachusetts Reference Data – County and State. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Biweekly Ranking Massachusetts

Point	Column1	Rank	Percent
11	1.845363	1	100.00%
13	1.61726	2	95.40%
10	1.562239	3	90.90%
12	1.535793	4	86.30%
4	1.432959	5	81.80%
14	1.332404	6	77.20%
9	1.33097	7	72.70%
21	1.308037	8	68.10%
8	1.228383	9	63.60%
5	1.196447	10	59.00%
15	1.189276	11	54.50%
6	1.13002	12	50.00%
3	1.129073	13	45.40%
7	1.096487	14	40.90%
16	1.059634	15	36.30%
22	1.024619	16	27.20%
23	1.024619	16	27.20%
20	1.022639	18	22.70%
17	0.783719	19	18.10%
19	0.739164	20	13.60%
2	0.671236	21	9.00%
18	0.667419	22	4.50%
1	0.531623	23	0.00%

Biweekly Massachusetts

Date	Population	LS2C	Infected	Uninfected	BRN
6/1/2020	7029917	6928633	4319	96965	0.531623279
6/15/2020	7029917	6926370	2263	101284	0.67123609
6/29/2020	7029917	6924280	2090	103547	1.129072921
7/13/2020	7029917	6921529	2751	105637	1.432959037
7/27/2020	7029917	6917450	4079	108388	1.196447171
8/10/2020	7029917	6913488	3962	112467	1.130019875
8/24/2020	7029917	6908514	4974	116429	1.09648724
9/7/2020	7029917	6903859	4655	121403	1.228382727
9/21/2020	7029917	6896898	6961	126058	1.330969523
10/5/2020	7029917	6888691	8207	133019	1.562238687
10/19/2020	7029917	6873678	15013	141226	1.845362646
11/2/2020	7029917	6846794	26884	156239	1.535793319
11/16/2020	7029917	6811009	35785	183123	1.617259741
11/30/2020	7029917	6748598	62411	218908	1.332404033
12/14/2020	7029917	6685408	63190	281319	1.189275989
12/28/2020	7029917	6606544	78864	344509	1.059634408
1/11/2021	7029917	6543948	62596	423373	0.783719422
1/25/2021	7029917	6503343	40605	485969	0.667419026
2/8/2021	7029917	6480229	23114	526574	0.73916382
2/22/2021	7029917	6459927	20302	549688	1.022638872
3/8/2021	7029917	6439430	20497	569990	1.308036876
3/22/2021	7029917	6411043	28387	590487	1.024618577
4/5/2021	7029917	6384627	26416	618874	1.024618577

8.2.2 Appendix B.2: Table 1 - Age

These tables were constructed using the data from Massachusetts Reference Data – Age and Massachusetts Reference Data – Cases (Report Date). LS2C stands for Lifestyle Social Contract. BRN

stands for Basic Reproduction Number.

Biweekly Ranking 0-19

Point	Column1	Rank	Percent
7	1.677247	1	100.00%
9	1.577171	2	94.40%
4	1.446941	3	88.80%
5	1.416669	4	83.30%
6	1.399589	5	77.70%
8	1.396683	6	72.20%
1	1.329574	7	66.60%
17	1.265741	8	61.10%
10	1.255601	9	55.50%
18	1.19942	10	50.00%
11	1.189177	11	44.40%
2	1.139566	12	38.80%
12	1.116193	13	33.30%
16	1.0875	14	27.70%
19	1.053146	15	22.20%
3	1.040231	16	16.60%
15	0.814965	17	11.10%
13	0.806553	18	5.50%
14	0.7217	19	0.00%

Biweekly 0-19

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	1588321.07	1478572.07	7444	102305	N/A
8.12.2020	1588321.07	1587698.07	623	21140.18105	1.329574479
8.26.2020	1588321.07	1586870.07	828	21763.18105	1.139566198
9.9.2020	1588321.07	1586046.07	824	22591.18105	1.040230874
9.23.2020	1588321.07	1585154.07	892	23415.18105	1.446941042
10.7.2020	1588321.07	1583568.07	1586	24307.18105	1.416668714
10.21.2020	1588321.07	1581654.07	1914	25893.18105	1.399589081
11.4.2020	1588321.07	1578690.07	2964	27807.18105	1.677246884
11.18.2020	1588321.07	1573522.07	5168	30771.18105	1.396682887
12.2.2020	1588321.07	1567438.07	6084	35939.18105	1.57717081
12.16.2020	1588321.07	1556009.07	11429	42023.18105	1.255600982
12.30.2020	1588321.07	1545896.07	10113	53452.18105	1.189177051
1.13.2021	1588321.07	1531076.07	14820	63565.18105	1.116192501
1.27.2021	1588321.07	1519069.07	12007	78385.18105	0.806553373
2.10.2021	1588321.07	1510382.07	8687	90392.18105	0.721699724
2.24.2021	1588321.07	1504867.07	5515	99079.18105	0.814964876
3.10.2021	1588321.07	1499416.07	5451	104594.181	1.087499682
3.24.2021	1588321.07	1493609.07	5807	110045.181	1.265741177
4.7.2021	1588321.07	1486016.07	7593	115852.181	1.199419741
4.21.2021	1588321.07	1478572.07	7444	123445.181	1.053146439

Biweekly Ranking 20-29

Point	Column1	Rank	Percent
7	2.032665	1	100.00%
9	1.510154	2	94.40%
8	1.47742	3	88.80%
17	1.443356	4	83.30%
6	1.363492	5	77.70%
4	1.256772	6	72.20%
10	1.202283	7	66.60%
18	1.200864	8	61.10%
5	1.176026	9	55.50%
3	1.155337	10	50.00%
2	1.149263	11	44.40%
1	1.131739	12	38.80%
11	1.129427	13	33.30%
12	1.094103	14	27.70%
16	1.075719	15	22.20%
19	0.897211	16	16.60%
15	0.827171	17	11.10%
13	0.763138	18	5.50%
14	0.72176	19	0.00%

Biweekly 20-29

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	1026828.80	916844.8	5772	104212	N/A
8.12.2020	1026828.80	1025964.8	864	21185.44745	1.131739311
8.26.2020	1026828.80	1024987.8	977	22049.44745	1.14926312
9.9.2020	1026828.80	1023852.8	1135	23026.44745	1.155337085
9.23.2020	1026828.80	1022554.8	1298	24161.44745	1.256772408
10.7.2020	1026828.80	1020807.8	1747	25459.44745	1.176025564
10.21.2020	1026828.80	1018994.8	1813	27206.44745	1.3634924
11.4.2020	1026828.80	1015990.8	3004	29019.44745	2.032664721
11.18.2020	1026828.80	1009306.8	6684	32023.44745	1.477419889
12.2.2020	1026828.80	1001921.8	7385	38707.44745	1.510153998
12.16.2020	1026828.80	988575.8	13346	46092.44745	1.202282893
12.30.2020	1026828.80	977925.8	10650	59438.44745	1.129426867
1.13.2021	1026828.80	962764.8	15161	70088.44745	1.094102939
1.27.2021	1026828.80	951447.8	11317	85249.44745	0.763138448
2.10.2021	1026828.80	944041.8	7406	96566.44745	0.721760021
2.24.2021	1026828.80	939023.8	5018	103972.4475	0.827171265
3.10.2021	1026828.80	934643.8	4380	108990.4475	1.075718654
3.24.2021	1026828.80	929821.8	4822	113370.4475	1.443355791
4.7.2021	1026828.80	922616.8	7205	118192.4475	1.200863587
4.21.2021	1026828.80	916844.8	5772	125397.4475	0.897210923

Biweekly Ranking 30-39

Point	Column1	Rank	Percent
7	1.821895	1	100.00%
9	1.542828	2	94.40%
6	1.537133	3	88.80%
8	1.427128	4	83.30%
5	1.334318	5	77.70%
17	1.309885	6	72.20%
4	1.282515	7	66.60%
10	1.232399	8	61.10%
18	1.208465	9	55.50%
1	1.189391	10	50.00%
11	1.147219	11	44.40%
16	1.096516	12	38.80%
2	1.086113	13	33.30%
19	1.081749	14	27.70%
12	1.056132	15	22.20%
3	1.01257	16	16.60%
15	0.79308	17	11.10%
13	0.73964	18	5.50%
14	0.693988	19	0.00%

Biweekly 30-39

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	914617.34	824648.34	4667	85302	N/A
8.12.2020	914617.34	913890.34	727	17330.09821	1.189391076
8.26.2020	914617.34	913026.34	864	18057.09821	1.08611308
9.9.2020	914617.34	912165.34	861	18921.09821	1.012569673
9.23.2020	914617.34	911284.34	881	19782.09821	1.282515235
10.7.2020	914617.34	909939.34	1345	20663.09821	1.334317907
10.21.2020	914617.34	908329.34	1610	22008.09821	1.537132943
11.4.2020	914617.34	905428.34	2901	23618.09821	1.821895486
11.18.2020	914617.34	900193.34	5235	26519.09821	1.427128
12.2.2020	914617.34	894000.34	6193	31754.09821	1.542828326
12.16.2020	914617.34	882959.34	11041	37947.09821	1.232398697
12.30.2020	914617.34	873496.34	9463	48988.09821	1.147218577
1.13.2021	914617.34	860494.34	13002	58451.09821	1.056131737
1.27.2021	914617.34	851174.34	9320	71453.09821	0.739639964
2.10.2021	914617.34	845129.34	6045	80773.09821	0.693988334
2.24.2021	914617.34	841321.34	3808	86818.09821	0.793080208
3.10.2021	914617.34	837941.34	3380	90626.09821	1.096516296
3.24.2021	914617.34	834100.34	3841	94006.09821	1.309885219
4.7.2021	914617.34	829315.34	4785	97847.09821	1.208464762
4.21.2021	914617.34	824648.34	4667	102632.0982	1.081748995

Biweekly Ranking 40-49

Point	Column1	Rank	Percent
7	1.77406	1	100.00%
6	1.580779	2	94.40%
9	1.567437	3	88.80%
8	1.420452	4	83.30%
5	1.399068	5	77.70%
1	1.350138	6	72.20%
4	1.280947	7	66.60%
17	1.278092	8	61.10%
10	1.272185	9	55.50%
11	1.154235	10	50.00%
16	1.116921	11	44.40%
18	1.10525	12	38.80%
2	1.067349	13	33.30%
12	1.057855	14	27.70%
3	1.004478	15	22.20%
19	0.946377	16	16.60%
15	0.757796	17	11.10%
13	0.746391	18	5.50%
14	0.656142	19	0.00%

Biweekly 40-49

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	841388.18	765447.18	3319	72622	N/A
8.12.2020	841388.18	840844.18	544	14627.98284	1.350137638
8.26.2020	841388.18	840110.18	734	15171.98284	1.067348915
9.9.2020	841388.18	839482.18	628	15905.98284	1.004478091
9.23.2020	841388.18	838745.18	737	16533.98284	1.280946835
10.7.2020	841388.18	837739.18	1006	17270.98284	1.399068165
10.21.2020	841388.18	836317.18	1422	18276.98284	1.580779329
11.4.2020	841388.18	833924.18	2393	19698.98284	1.774060195
11.18.2020	841388.18	829609.18	4315	22091.98284	1.420452083
12.2.2020	841388.18	824529.18	5080	26406.98284	1.567436728
12.16.2020	841388.18	815178.18	9351	31486.98284	1.272184614
12.30.2020	841388.18	806742.18	8436	40837.98284	1.154235311
1.13.2021	841388.18	795493.18	11249	49273.98284	1.057854962
1.27.2021	841388.18	787054.18	8439	60522.98284	0.746391209
2.10.2021	841388.18	781747.18	5307	68961.98284	0.656141886
2.24.2021	841388.18	778674.18	3073	74268.98284	0.757795993
3.10.2021	841388.18	775870.18	2804	77341.98284	1.116920673
3.24.2021	841388.18	772621.18	3249	80145.98284	1.278091881
4.7.2021	841388.18	768766.18	3855	83394.98284	1.105250085
4.21.2021	841388.18	765447.18	3319	87249.98284	0.946376722

Biweekly Ranking 50-59

Point	Column1	Rank	Percent
7	1.834989	1	100.00%
9	1.620904	2	94.40%
8	1.534043	3	88.80%
6	1.53244	4	83.30%
5	1.451436	5	77.70%
10	1.295719	6	72.20%
4	1.271223	7	66.60%
17	1.241177	8	61.10%
1	1.214961	9	55.50%
11	1.15893	10	50.00%
18	1.100242	11	44.40%
2	1.059879	12	38.80%
12	1.050649	13	33.30%
16	1.044423	14	27.70%
3	0.992222	15	22.20%
19	0.926529	16	16.60%
13	0.751477	17	11.10%
15	0.743838	18	5.50%
14	0.652165	19	0.00%

Biweekly 50-59

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	956483.28	877094.28	3294	76095	N/A
8.12.2020	956483.28	955951.28	532	15292.14693	1.214961481
8.26.2020	956483.28	955305.28	646	15824.14693	1.059879196
9.9.2020	956483.28	954704.28	601	16470.14693	0.992222377
9.23.2020	956483.28	954070.28	634	17071.14693	1.271223215
10.7.2020	956483.28	953138.28	932	17705.14693	1.451436095
10.21.2020	956483.28	951805.28	1333	18637.14693	1.532439719
11.4.2020	956483.28	949684.28	2121	19970.14693	1.834989282
11.18.2020	956483.28	945512.28	4172	22091.14693	1.534042533
12.2.2020	956483.28	940141.28	5371	26263.14693	1.62090364
12.16.2020	956483.28	930308.28	9833	31634.14693	1.295718938
12.30.2020	956483.28	920980.28	9328	41467.14693	1.158930002
1.13.2021	956483.28	908926.28	12054	50795.14693	1.050648854
1.27.2021	956483.28	899632.28	9294	62849.14693	0.751476869
2.10.2021	956483.28	893837.28	5795	72143.14693	0.652164902
2.24.2021	956483.28	890436.28	3401	77938.14693	0.743838457
3.10.2021	956483.28	887469.28	2967	81339.14693	1.044423285
3.24.2021	956483.28	884265.28	3204	84306.14693	1.241177395
4.7.2021	956483.28	880388.28	3877	87510.14693	1.100242098
4.21.2021	956483.28	877094.28	3294	91387.14693	0.926528745

Biweekly Ranking 60-69

Point	Column1	Rank	Percent
7	1.873755	1	100.00%
6	1.680952	2	94.40%
9	1.612119	3	88.80%
8	1.511568	4	83.30%
5	1.391249	5	77.70%
10	1.320585	6	72.20%
1	1.238855	7	66.60%
4	1.221712	8	61.10%
11	1.160932	9	55.50%
2	1.148852	10	50.00%
17	1.131753	11	44.40%
3	1.028379	12	38.80%
12	1.026048	13	33.30%
18	1.019599	14	27.70%
16	0.969153	15	22.20%
19	0.847715	16	16.60%
13	0.744662	17	11.10%
15	0.726899	18	5.50%
14	0.641171	19	0.00%

Biweekly 60-69

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	841570.64	789178.64	1791	50601	N/A
8.12.2020	841570.64	841268.64	302	10091.90394	1.238855163
8.26.2020	841570.64	840894.64	374	10393.90394	1.148851821
9.9.2020	841570.64	840492.64	402	10767.90394	1.028379146
9.23.2020	841570.64	840097.64	395	11169.90394	1.221711761
10.7.2020	841570.64	839520.64	577	11564.90394	1.391249056
10.21.2020	841570.64	838748.64	772	12141.90394	1.680951706
11.4.2020	841570.64	837260.64	1488	12913.90394	1.873755499
11.18.2020	841570.64	834535.64	2725	14401.90394	1.51156763
12.2.2020	841570.64	830945.64	3590	17126.90394	1.612118966
12.16.2020	841570.64	824483.64	6462	20716.90394	1.320585152
12.30.2020	841570.64	817940.64	6543	27178.90394	1.16093244
1.13.2021	841570.64	809809.64	8131	33721.90394	1.026047711
1.27.2021	841570.64	803452.64	6357	41852.90394	0.744661809
2.10.2021	841570.64	799509.64	3943	48209.90394	0.641171428
2.24.2021	841570.64	797178.64	2331	52152.90394	0.72689914
3.10.2021	841570.64	795189.64	1989	54483.90394	0.969153121
3.24.2021	841570.64	793222.64	1967	56472.90394	1.131752969
4.7.2021	841570.64	790969.64	2253	58439.90394	1.019599133
4.21.2021	841570.64	789178.64	1791	60692.90394	0.84771457

Biweekly Ranking 70-79

Point	Column1	Rank	Percent
7	1.751975	1	100.00%
9	1.616763	2	94.40%
8	1.609912	3	88.80%
6	1.590715	4	83.30%
5	1.51612	5	77.70%
10	1.308516	6	72.20%
4	1.305005	7	66.60%
1	1.207507	8	61.10%
11	1.182684	9	55.50%
2	1.043671	10	50.00%
12	1.036184	11	44.40%
17	0.936033	12	38.80%
18	0.91069	13	33.30%
3	0.908465	14	27.70%
16	0.799027	15	22.20%
19	0.78038	16	16.60%
13	0.757079	17	11.10%
15	0.657125	18	5.50%
14	0.631421	19	0.00%

Biweekly 70-79

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	501714.18	476817.18	511	24386	N/A
8.12.2020	501714.18	501545.18	169	4795.7347	1.207507335
8.26.2020	501714.18	501341.18	204	4964.7347	1.043671361
9.9.2020	501714.18	501156.18	185	5168.7347	0.908465396
9.23.2020	501714.18	500988.18	168	5353.7347	1.30500454
10.7.2020	501714.18	500696.18	292	5521.7347	1.516119752
10.21.2020	501714.18	500292.18	404	5813.7347	1.590715434
11.4.2020	501714.18	499592.18	700	6217.7347	1.751975196
11.18.2020	501714.18	498366.18	1226	6917.7347	1.609912405
12.2.2020	501714.18	496512.18	1854	8143.7347	1.616763335
12.16.2020	501714.18	493438.18	3074	9997.7347	1.308516382
12.30.2020	501714.18	490170.18	3268	13071.7347	1.182683973
1.13.2021	501714.18	486110.18	4060	16339.7347	1.036184174
1.27.2021	501714.18	482813.18	3297	20399.7347	0.757079161
2.10.2021	501714.18	480750.18	2063	23696.7347	0.631421084
2.24.2021	501714.18	479570.18	1180	25759.7347	0.657125447
3.10.2021	501714.18	478713.18	857	26939.7347	0.799026932
3.24.2021	501714.18	478017.18	696	27796.7347	0.93603306
4.7.2021	501714.18	477328.18	689	28492.7347	0.910690432
4.21.2021	501714.18	476817.18	511	29181.7347	0.780380051

Biweekly Ranking 80+

Point	Column1	Rank	Percent
7	1.842492	1	100.00%
8	1.684542	2	94.40%
9	1.619822	3	88.80%
5	1.556147	4	83.30%
6	1.527548	5	77.70%
4	1.521793	6	72.20%
10	1.355107	7	66.60%
11	1.193689	8	61.10%
3	1.126966	9	55.50%
12	1.021262	10	50.00%
18	1.018405	11	44.40%
19	0.94245	12	38.80%
17	0.820143	13	33.30%
13	0.74178	14	27.70%
2	0.726815	15	22.20%
16	0.691892	16	16.60%
1	0.669219	17	11.10%
15	0.591578	18	5.50%
14	0.585594	19	0.00%

Biweekly 80+

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	293459.04	275995.04	273	17191	N/A
8.12.2020	293459.04	293308.04	151	3363.96798	0.66921852
8.26.2020	293459.04	293207.04	101	3514.96798	0.726814609
9.9.2020	293459.04	293125.04	82	3615.96798	1.126965715
9.23.2020	293459.04	293001.04	124	3697.96798	1.521792529
10.7.2020	293459.04	292812.04	189	3821.96798	1.556146549
10.21.2020	293459.04	292515.04	297	4010.96798	1.527547565
11.4.2020	293459.04	292072.04	443	4307.96798	1.842492108
11.18.2020	293459.04	291158.04	914	4750.96798	1.68454225
12.2.2020	293459.04	289804.04	1354	5664.96798	1.61982197
12.16.2020	293459.04	287530.04	2274	7018.96798	1.355107147
12.30.2020	293459.04	284987.04	2543	9292.96798	1.193688872
1.13.2021	293459.04	281946.04	3041	11835.96798	1.021262497
1.27.2021	293459.04	279508.04	2438	14876.96798	0.741779896
2.10.2021	293459.04	278075.04	1433	17314.96798	0.585593962
2.24.2021	293459.04	277360.04	715	18747.96798	0.591578432
3.10.2021	293459.04	276874.04	486	19462.96798	0.691892001
3.24.2021	293459.04	276576.04	298	19948.96798	0.820142844
4.7.2021	293459.04	276268.04	308	20246.96798	1.018404604
4.21.2021	293459.04	275995.04	273	20554.96798	0.942449625

Biweekly Unknown

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	N/A	N/A	25	336	N/A
8.12.2020	N/A	N/A	1	69.53690109	N/A
8.26.2020	N/A	N/A	0	70.53690109	N/A
9.9.2020	N/A	N/A	2	70.53690109	N/A
9.23.2020	N/A	N/A	3	72.53690109	N/A
10.7.2020	N/A	N/A	2	75.53690109	N/A
10.21.2020	N/A	N/A	19	77.53690109	N/A
11.4.2020	N/A	N/A	18	96.53690109	N/A
11.18.2020	N/A	N/A	23	114.5369011	N/A
12.2.2020	N/A	N/A	49	137.5369011	N/A
12.16.2020	N/A	N/A	15	186.5369011	N/A
12.30.2020	N/A	N/A	38	201.5369011	N/A
1.13.2021	N/A	N/A	60	239.5369011	N/A
1.27.2021	N/A	N/A	24	299.5369011	N/A
2.10.2021	N/A	N/A	14	323.5369011	N/A
2.24.2021	N/A	N/A	7	337.5369011	N/A
3.10.2021	N/A	N/A	10	344.5369011	N/A
3.24.2021	N/A	N/A	32	354.5369011	N/A
4.7.2021	N/A	N/A	19	386.5369011	N/A
4.21.2021	N/A	N/A	25	405.5369011	N/A

8.2.3 Appendix B.3: Table 2 - Gender

These tables were constructed using the data from Massachusetts Reference Data – Gender and Massachusetts Reference Data – Cases (Report Date). LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Biweekly Ranking Female (Method 1)

Point	Column1	Rank	Percent
7	1.821152	1	100.00%
9	1.571832	2	94.40%
6	1.510177	3	88.80%
8	1.465667	4	83.30%
5	1.371714	5	77.70%
4	1.283846	6	72.20%
17	1.267012	7	66.60%
10	1.258603	8	61.10%
11	1.165173	9	55.50%
1	1.150601	10	50.00%
18	1.149306	11	44.40%
2	1.062876	12	38.80%
12	1.058964	13	33.30%
16	1.04152	14	27.70%
3	1.019153	15	22.20%
19	0.962318	16	16.60%
15	0.764053	17	11.10%
13	0.747525	18	5.50%
14	0.676765	19	0.00%

Biweekly Female (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3562411.18	3278502.18	13419	270490	N/A
8.12.2020	3562411.18	3560263.18	2148	54950.30975	1.150600659
8.26.2020	3562411.18	3557793.18	2470	57098.30975	1.062876305
9.9.2020	3562411.18	3555361.18	2432	59568.30975	1.019152763
9.23.2020	3562411.18	3552807.18	2554	62000.30975	1.283846234
10.7.2020	3562411.18	3548977.18	3830	64554.30975	1.371714144
10.21.2020	3562411.18	3544083.18	4894	68384.30975	1.510176755
11.4.2020	3562411.18	3535870.18	8213	73278.30975	1.821151845
11.18.2020	3562411.18	3520391.18	15479	81491.30975	1.465667305
12.2.2020	3562411.18	3501555.18	18836	96970.30975	1.571831633
12.16.2020	3562411.18	3467375.18	34180	115806.3097	1.258602701
12.30.2020	3562411.18	3436609.18	30766	149986.3097	1.165172699
1.13.2021	3562411.18	3394374.18	42235	180752.3097	1.058964348
1.27.2021	3562411.18	3362950.18	31424	222987.3097	0.747524985
2.10.2021	3562411.18	3342395.18	20555	254411.3097	0.676765273
2.24.2021	3562411.18	3329945.18	12450	274966.3097	0.764053301
3.10.2021	3562411.18	3318823.18	11122	287416.3097	1.041520063
3.24.2021	3562411.18	3307073.18	11750	298538.3097	1.267011818
4.7.2021	3562411.18	3291921.18	15152	310288.3097	1.149305513
4.21.2021	3562411.18	3278502.18	13419	325440.3097	0.962318333

Biweekly Ranking Male (Method 1)

Point	Column1	Rank	Percent
7	1.831105	1	100.00%
9	1.559954	2	94.40%
6	1.47135	3	88.80%
8	1.464718	4	83.30%
4	1.365037	5	77.70%
5	1.360069	6	72.20%
17	1.273602	7	66.60%
1	1.267425	8	61.10%
10	1.260462	9	55.50%
11	1.147365	10	50.00%
18	1.141635	11	44.40%
2	1.119494	12	38.80%
12	1.072254	13	33.30%
3	1.061374	14	27.70%
16	1.053964	15	22.20%
19	0.963803	16	16.60%
15	0.776433	17	11.10%
13	0.773315	18	5.50%
14	0.683205	19	0.00%

Biweekly Male (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3362254.48	3091207.484	13483	257564	N/A
8.12.2020	3362254.48	3360556.484	1698	52460.8822	1.267424525
8.26.2020	3362254.48	3358405.484	2151	54158.8822	1.119494083
9.9.2020	3362254.48	3356252.484	2153	56309.8822	1.061374226
9.23.2020	3362254.48	3353845.484	2407	58462.8822	1.365036765
10.7.2020	3362254.48	3350043.484	3802	60869.8822	1.360069135
10.21.2020	3362254.48	3345431.484	4612	64671.8822	1.471350475
11.4.2020	3362254.48	3337725.484	7706	69283.8822	1.831105036
11.18.2020	3362254.48	3323040.484	14685	76989.8822	1.464718231
12.2.2020	3362254.48	3305311.484	17729	91674.8822	1.559954211
12.16.2020	3362254.48	3273332.484	31979	109403.8822	1.260462028
12.30.2020	3362254.48	3244313.484	29019	141382.8822	1.147365498
1.13.2021	3362254.48	3205800.484	38513	170401.8822	1.072254415
1.27.2021	3362254.48	3175271.484	30529	208914.8822	0.77331498
2.10.2021	3362254.48	3155378.484	19893	239443.8822	0.683205454
2.24.2021	3362254.48	3142942.484	12436	259336.8822	0.776432895
3.10.2021	3362254.48	3131914.484	11028	271772.8822	1.053963828
3.24.2021	3362254.48	3119906.484	12008	282800.8822	1.273602406
4.7.2021	3362254.48	3104690.484	15216	294808.8822	1.141634538
4.21.2021	3362254.48	3091207.484	13483	310024.8822	0.963803414

Biweekly Ranking Transgender (Method 1)

Point	Column1	Rank	Percent
1	5.500277	1	100.00%
5	1.751059	2	87.50%
2	1.636817	3	75.00%
8	1.000908	4	62.50%
7	1.000782	5	50.00%
6	1.000731	6	37.50%
3	0.611419	7	25.00%
9	0.400383	8	12.50%
4	0.363838	9	0.00%

Biweekly Transgender (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	39696.87	39668.86642	0	28	N/A
8.12.2020	39696.87	39696.86642	0	5.419372661	0
8.26.2020	39696.87	39696.86642	0	5.419372661	0
9.9.2020	39696.87	39696.86642	0	5.419372661	0
9.23.2020	39696.87	39696.86642	0	5.419372661	0
10.7.2020	39696.87	39696.86642	0	5.419372661	0
10.21.2020	39696.87	39696.86642	0	5.419372661	0
11.4.2020	39696.87	39696.86642	0	5.419372661	0
11.18.2020	39696.87	39696.86642	0	5.419372661	0
12.2.2020	39696.87	39696.86642	0	5.419372661	0
12.16.2020	39696.87	39696.86642	0	5.419372661	0
12.30.2020	39696.87	39694.86642	2	5.419372661	5.500277114
1.13.2021	39696.87	39685.86642	9	7.419372661	1.636817198
1.27.2021	39696.87	39676.86642	9	16.41937266	0.611419155
2.10.2021	39696.87	39674.86642	2	25.41937266	0.363838003
2.24.2021	39696.87	39672.86642	2	27.41937266	1.751058658
3.10.2021	39696.87	39667.86642	5	29.41937266	1.00073107
3.24.2021	39696.87	39665.86642	2	34.41937266	1.000781528
4.7.2021	39696.87	39660.86642	5	36.41937266	1.000907696
4.21.2021	39696.87	39658.86642	2	41.41937266	0.400383269

Biweekly Unknown (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	N/A	N/A	191	2291	N/A
8.12.2020	N/A	N/A	0	480.3886766	N/A
8.26.2020	N/A	N/A	0	480.3886766	N/A
9.9.2020	N/A	N/A	0	480.3886766	N/A
9.23.2020	N/A	N/A	0	480.3886766	N/A
10.7.2020	N/A	N/A	0	480.3886766	N/A
10.21.2020	N/A	N/A	0	480.3886766	N/A
11.4.2020	N/A	N/A	0	480.3886766	N/A
11.18.2020	N/A	N/A	0	480.3886766	N/A
12.2.2020	N/A	N/A	0	480.3886766	N/A
12.16.2020	N/A	N/A	0	480.3886766	N/A
12.30.2020	N/A	N/A	4	480.3886766	N/A
1.13.2021	N/A	N/A	821	484.3886766	N/A
1.27.2021	N/A	N/A	531	1305.388677	N/A
2.10.2021	N/A	N/A	242	1836.388677	N/A
2.24.2021	N/A	N/A	158	2078.388677	N/A
3.10.2021	N/A	N/A	169	2236.388677	N/A
3.24.2021	N/A	N/A	155	2405.388677	N/A
4.7.2021	N/A	N/A	211	2560.388677	N/A
4.21.2021	N/A	N/A	191	2771.388677	N/A

Biweekly Ranking Female (Method 2)

Point	Column1	Rank	Percent
7	1.821074	1	100.00%
9	1.569985	2	94.40%
6	1.510132	3	88.80%
8	1.470179	4	83.30%
5	1.371685	5	77.70%
4	1.283826	6	72.20%
17	1.266496	7	66.60%
10	1.255887	8	61.10%
11	1.164966	9	55.50%
1	1.150597	10	50.00%
18	1.148805	11	44.40%
2	1.062868	12	38.80%
12	1.058699	13	33.30%
16	1.041118	14	27.70%
3	1.019141	15	22.20%
19	0.961875	16	16.60%
15	0.763774	17	11.10%
13	0.747296	18	5.50%
14	0.676533	19	0.00%

Biweekly Female (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3562411.18	3280013.096	13342.5117	269055.6	N/A
8.12.2020	3562411.18	3560275.424	2135.7564	54855.33712	1.150596702
8.26.2020	3562411.18	3557819.503	2455.921	56991.09352	1.062868441
9.9.2020	3562411.18	3555401.365	2418.1376	59447.01452	1.019141244
9.23.2020	3562411.18	3552861.923	2539.4422	61865.15212	1.283826452
10.7.2020	3562411.18	3549053.754	3808.169	64404.59432	1.371684548
10.21.2020	3562411.18	3544187.65	4866.1042	68212.76332	1.510132241
11.4.2020	3562411.18	3536021.464	8166.1859	73078.86752	1.82107393
11.18.2020	3562411.18	3520630.694	15390.7697	81245.05342	1.470179367
12.2.2020	3562411.18	3501794.694	18836	96635.82312	1.569984995
12.16.2020	3562411.18	3467809.52	33985.174	115471.8231	1.255887126
12.30.2020	3562411.18	3437218.886	30590.6338	149456.9971	1.164966017
1.13.2021	3562411.18	3395224.626	41994.2605	180047.6309	1.058699096
1.27.2021	3562411.18	3363979.743	31244.8832	222041.8914	0.747296201
2.10.2021	3562411.18	3343541.906	20437.8365	253286.7746	0.676533165
2.24.2021	3562411.18	3331162.871	12379.035	273724.6111	0.763774005
3.10.2021	3562411.18	3320104.266	11058.6046	286103.6461	1.041118185
3.24.2021	3562411.18	3308421.241	11683.025	297162.2507	1.266495557
4.7.2021	3562411.18	3293355.608	15065.6336	308845.2757	1.14880493
4.21.2021	3562411.18	3280013.096	13342.5117	323910.9093	0.961875047

Biweekly Ranking Male (Method 2)

Point	Column1	Rank	Percent
7	1.831028	1	100.00%
9	1.559801	2	94.40%
6	1.471308	3	88.80%
8	1.46462	4	83.30%
4	1.365017	5	77.70%
5	1.360041	6	72.20%
17	1.273039	7	66.60%
1	1.267421	8	61.10%
10	1.260267	9	55.50%
11	1.147128	10	50.00%
18	1.141095	11	44.40%
2	1.119487	12	38.80%
12	1.071956	13	33.30%
3	1.061363	14	27.70%
16	1.053522	15	22.20%
19	0.963322	16	16.60%
15	0.776124	17	11.10%
13	0.773055	18	5.50%
14	0.68295	19	0.00%

Biweekly Male (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3362254.48	3092752.451	13406.1469	256095.9	N/A
8.12.2020	3362254.48	3360566.162	1688.3214	52350.29919	1.267420875
8.26.2020	3362254.48	3358427.423	2138.7393	54038.62059	1.11948677
9.9.2020	3362254.48	3356286.695	2140.7279	56177.35989	1.061363407
9.23.2020	3362254.48	3353893.415	2393.2801	58318.08779	1.365017257
10.7.2020	3362254.48	3350113.086	3780.3286	60711.36789	1.360040878
10.21.2020	3362254.48	3345527.375	4585.7116	64491.69649	1.471308302
11.4.2020	3362254.48	3337865.299	7662.0758	69077.40809	1.831028335
11.18.2020	3362254.48	3323264.003	14601.2955	76739.48389	1.464619715
12.2.2020	3362254.48	3305636.059	17627.9447	91340.77939	1.559801042
12.16.2020	3362254.48	3273839.339	31796.7197	108968.7241	1.260266884
12.30.2020	3362254.48	3244985.747	28853.5917	140765.4438	1.147127798
1.13.2021	3362254.48	3206692.271	38293.4759	169619.0355	1.071956219
1.27.2021	3362254.48	3176337.287	30354.9847	207912.5114	0.773055498
2.10.2021	3362254.48	3156557.677	19779.6099	238267.4961	0.68295023
2.24.2021	3362254.48	3144192.562	12365.1148	258047.106	0.776124198
3.10.2021	3362254.48	3133227.422	10965.1404	270412.2208	1.053522178
3.24.2021	3362254.48	3121287.867	11939.5544	281377.3612	1.27303875
4.7.2021	3362254.48	3106158.598	15129.2688	293316.9156	1.141094949
4.21.2021	3362254.48	3092752.451	13406.1469	308446.1844	0.963321951

Biweekly Ranking Transgender (Method
2)

Point	Column1	Rank	Percent
7	1.825897	1	100.00%
15	1.798625	2	94.40%
12	1.681265	3	88.80%
9	1.565045	4	83.30%
6	1.491071	5	77.70%
8	1.467478	6	72.20%
5	1.365945	7	66.60%
4	1.322612	8	61.10%
1	1.202172	9	55.50%
2	1.088604	10	50.00%
3	1.038879	11	44.40%
18	1.028105	12	38.80%
17	1.027972	13	33.30%
16	1.027919	14	27.70%
10	0.66434	15	22.20%
13	0.628026	16	16.60%
19	0.411263	17	11.10%
14	0.373721	18	5.50%
11	0.029805	19	0.00%

Biweekly Transgender (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	39696.87	38619.69033	0	1077.176	N/A
8.12.2020	39696.87	39674.94422	21.9222	209.2395458	1.202171948
8.26.2020	39696.87	39648.60452	26.3397	231.1617458	1.08860351
9.9.2020	39696.87	39622.47002	26.1345	257.5014458	1.038879412
9.23.2020	39696.87	39594.19232	28.2777	283.6359458	1.322612159
10.7.2020	39696.87	39550.68992	43.5024	311.9136458	1.365944637
10.21.2020	39696.87	39496.50572	54.1842	355.4160458	1.491071173
11.4.2020	39696.87	39405.76742	90.7383	409.6002458	1.825896762
11.18.2020	39696.87	39233.83262	171.9348	500.3385458	1.467477901
12.2.2020	39696.87	39024.79663	209.0359899	672.2733458	1.565045455
12.16.2020	39696.87	38647.69033	377.1063	881.3093357	0.664340343
12.30.2020	39696.87	38645.69033	2	1258.415636	0.029804843
1.13.2021	39696.87	38636.69033	9	1260.415636	1.681264832
1.27.2021	39696.87	38627.69033	9	1269.415636	0.628026059
2.10.2021	39696.87	38625.69033	2	1278.415636	0.373720807
2.24.2021	39696.87	38623.69033	2	1280.415636	1.798624514
3.10.2021	39696.87	38618.69033	5	1282.415636	1.027918505
3.24.2021	39696.87	38616.69033	2	1287.415636	1.027971742
4.7.2021	39696.87	38611.69033	5	1289.415636	1.028104858
4.21.2021	39696.87	38609.69033	2	1294.415636	0.411263246

Biweekly Unknown (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	N/A	N/A	191	2291	N/A
8.12.2020	N/A	N/A	0	482.12414	N/A
8.26.2020	N/A	N/A	0	482.12414	N/A
9.9.2020	N/A	N/A	0	482.12414	N/A
9.23.2020	N/A	N/A	0	482.12414	N/A
10.7.2020	N/A	N/A	0	482.12414	N/A
10.21.2020	N/A	N/A	0	482.12414	N/A
11.4.2020	N/A	N/A	0	482.12414	N/A
11.18.2020	N/A	N/A	0	482.12414	N/A
12.2.2020	N/A	N/A	0	482.12414	N/A
12.16.2020	N/A	N/A	0	482.12414	N/A
12.30.2020	N/A	N/A	4	482.12414	N/A
1.13.2021	N/A	N/A	821	486.12414	N/A
1.27.2021	N/A	N/A	531	1307.12414	N/A
2.10.2021	N/A	N/A	242	1838.12414	N/A
2.24.2021	N/A	N/A	158	2080.12414	N/A
3.10.2021	N/A	N/A	169	2238.12414	N/A
3.24.2021	N/A	N/A	155	2407.12414	N/A
4.7.2021	N/A	N/A	211	2562.12414	N/A
4.21.2021	N/A	N/A	191	2773.12414	N/A

8.2.4 Appendix B.4: Table 3 - Race

These tables were constructed using the data from Massachusetts Reference Data – Race. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Biweekly Ranking White, Non-Hispanic

Point	Column1	Rank	Percent
9	7.270848	1	100.00%
12	1.722119	2	95.60%
14	1.678017	3	91.30%
8	1.55315	4	86.90%
11	1.52757	5	82.60%
13	1.477934	6	78.20%
15	1.366144	7	73.90%
10	1.361129	8	69.50%
22	1.231453	9	65.20%
16	1.165757	10	60.80%
5	1.139495	11	56.50%
4	1.080109	12	52.10%
21	1.048687	13	47.80%
17	1.031306	14	43.40%
23	0.994554	15	39.10%
6	0.938026	16	34.70%
24	0.787086	17	30.40%
18	0.776972	18	26.00%
20	0.756338	19	21.70%
19	0.683077	20	17.30%
3	0.516747	21	13.00%
2	0.193086	22	8.60%
1	0.163578	23	4.30%
7	0.11979	24	0.00%

Biweekly White, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	4955521.08	4928580.08	26941	0	0.163578141
6.17.2020	4955521.08	4924197.08	4383	26941	0.193086166
7.1.2020	4955521.08	4922570.08	1627	31324	0.516747182
7.15.202	4955521.08	4921112.08	1458	32951	1.080109213
7.29.2020	4955521.08	4919261.08	1851	34409	1.13949524
8.12.2020	4955521.08	4917369.08	1892	36260	0.938025924
8.26.2020	4955521.08	4915777.08	1592	38152	0.119789663
9.9.2020	4955521.08	4916955.08	-1178	39744	1.553150085
9.23.2020	4955521.08	4915139.08	1816	38566	7.270848093
10.7.2020	4955521.08	4912354.08	2785	40382	1.361128539
10.21.2020	4955521.08	4908931.08	3423	43167	1.527570422
11.4.2020	4955521.08	4902960.08	5971	46590	1.722119274
11.18.2020	4955521.08	4892925.08	10035	52561	1.477933898
12.2.2020	4955521.08	4879603.08	13322	62596	1.67801682
12.16.2020	4955521.08	4854332.08	25271	75918	1.366143769
12.30.20	4955521.08	4827956.08	26376	101189	1.165757367
1.13.2021	4955521.08	4795674.08	32282	127565	1.031305634
1.27.2021	4955521.08	4769413.08	26261	159847	0.776971936
2.10.2021	4955521.08	4751896.08	17517	186108	0.683077379
2.24.2021	4955521.08	4740738.08	11158	203625	0.75633845
3.10.2021	4955521.08	4731148.08	9590	214783	1.04868672
3.24.2021	4955521.08	4719965.08	11183	224373	1.231452705
4.7.2021	4955521.08	4706783.08	13182	235556	0.994554479
4.21.2021	4955521.08	4696949.08	9834	248738	0.787086335

Biweekly Ranking Black or African
American, Non-Hispanic

Point	Column1	Rank	Percent
14	1.75232	1	100.00%
9	1.665728	2	95.60%
12	1.631295	3	91.30%
13	1.419353	4	86.90%
11	1.356819	5	82.60%
15	1.319966	6	78.20%
22	1.241641	7	73.90%
10	1.235092	8	69.50%
4	1.150879	9	65.20%
5	1.14304	10	60.80%
8	1.133376	11	56.50%
23	1.103736	12	52.10%
17	1.087603	13	47.80%
16	1.0773	14	43.40%
21	1.011528	15	39.10%
6	0.911748	16	34.70%
24	0.889175	17	30.40%
18	0.878929	18	26.00%
7	0.73415	19	21.70%
20	0.732249	20	17.30%
19	0.718726	21	13.00%
3	0.606585	22	8.60%
2	0.106034	23	4.30%
1	0.080398	24	0.00%

Biweekly Black or African American, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	509227.93	500018.93	9209	0	0.080398456
6.17.2020	509227.93	499291.9278	727	9209	0.106034308
7.1.2020	509227.93	498985.9278	306	9936	0.606585417
7.15.202	509227.93	498677.9278	308	10242	1.150879332
7.29.2020	509227.93	498293.9278	384	10550	1.143040149
8.12.2020	509227.93	497903.9278	390	10934	0.911747942
8.26.2020	509227.93	497603.9278	300	11324	0.734149525
9.9.2020	509227.93	497408.9278	195	11624	1.133375962
9.23.2020	509227.93	497055.9278	353	11819	1.665728061
10.7.2020	509227.93	496517.9278	538	12172	1.235091968
10.21.2020	509227.93	495982.9278	535	12710	1.356819244
11.4.2020	509227.93	495099.9278	883	13245	1.631295264
11.18.2020	509227.93	493733.9278	1366	14128	1.419353066
12.2.2020	509227.93	492004.9278	1729	15494	1.752319908
12.16.2020	509227.93	488493.9278	3511	17223	1.319965817
12.30.20	509227.93	485369.9278	3124	20734	1.077300374
1.13.2021	509227.93	481680.9278	3689	23858	1.087603093
1.27.2021	509227.93	478360.9278	3320	27547	0.878929288
2.10.2021	509227.93	475893.9278	2467	30867	0.718725591
2.24.2021	509227.93	474473.9278	1420	33334	0.732249089
3.10.2021	509227.93	473241.9278	1232	34754	1.011527648
3.24.2021	509227.93	471980.9278	1261	35986	1.241640969
4.7.2021	509227.93	470372.9278	1608	37247	1.103736025
4.21.2021	509227.93	469055.9278	1317	38855	0.889175147

Biweekly Ranking Hispanic

Point	Column1	Rank	Percent
14	1.63805	1	100.00%
12	1.620547	2	95.60%
5	1.483805	3	91.30%
9	1.426966	4	86.90%
11	1.389229	5	82.60%
6	1.382339	6	78.20%
22	1.368097	7	73.90%
13	1.331979	8	69.50%
15	1.330377	9	65.20%
10	1.316814	10	60.80%
23	1.290059	11	56.50%
24	1.155088	12	52.10%
17	1.122617	13	47.80%
16	1.111586	14	43.40%
21	1.109216	15	39.10%
8	1.10709	16	34.70%
4	1.023704	17	30.40%
7	0.987883	18	26.00%
20	0.878331	19	21.70%
18	0.827185	20	17.30%
19	0.742211	21	13.00%
3	0.696914	22	8.60%
2	0.123474	23	4.30%
1	0.085538	24	0.00%

Biweekly Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	859094.85	840403.85	18691	0	0.085537646
6.17.2020	859094.85	838839.8459	1564	18691	0.123473988
7.1.2020	859094.85	837961.8459	878	20255	0.696914174
7.15.202	859094.85	837179.8459	782	21133	1.023704455
7.29.2020	859094.85	836305.8459	874	21915	1.483804978
8.12.2020	859094.85	834787.8459	1518	22789	1.382338954
8.26.2020	859094.85	833092.8459	1695	24307	0.987883197
9.9.2020	859094.85	831709.8459	1383	26002	1.107090109
9.23.2020	859094.85	829793.8459	1916	27385	1.426965728
10.7.2020	859094.85	827162.8459	2631	29301	1.316814052
10.21.2020	859094.85	824028.8459	3134	31932	1.389228518
11.4.2020	859094.85	819480.8459	4548	35066	1.620546965
11.18.2020	859094.85	812153.8459	7327	39614	1.331979446
12.2.2020	859094.85	804527.8459	7626	46941	1.638050356
12.16.2020	859094.85	789215.8459	15312	54567	1.330377336
12.30.20	859094.85	776493.8459	12722	69879	1.11158634
1.13.2021	859094.85	761049.8459	15444	82601	1.122616574
1.27.2021	859094.85	748482.8459	12567	98045	0.827184583
2.10.2021	859094.85	740862.8459	7620	110612	0.742211436
2.24.2021	859094.85	735561.8459	5301	118232	0.878330564
3.10.2021	859094.85	731145.8459	4416	123533	1.109216414
3.24.2021	859094.85	726388.8459	4757	127949	1.368096928
4.7.2021	859094.85	720534.8459	5854	132706	1.290058864
4.21.2021	859094.85	714907.8459	5627	138560	1.155088466

Biweekly Ranking Asian, Non-Hispanic

Point	Column1	Rank	Percent
9	2.284468	1	100.00%
8	1.783253	2	95.60%
12	1.678314	3	91.30%
14	1.637694	4	86.90%
13	1.464421	5	82.60%
11	1.368939	6	78.20%
15	1.26055	7	73.90%
10	1.258499	8	69.50%
5	1.172509	9	65.20%
22	1.148778	10	60.80%
17	1.128693	11	56.50%
16	1.127754	12	52.10%
4	1.099357	13	47.80%
21	1.092373	14	43.40%
24	1.04411	15	39.10%
23	1.040366	16	34.70%
6	0.935747	17	30.40%
18	0.831402	18	26.00%
20	0.747297	19	21.70%
19	0.673799	20	17.30%
7	0.527598	21	13.00%
3	0.503795	22	8.60%
2	0.156267	23	4.30%
1	0.128936	24	0.00%

Biweekly Asian, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	492858.34	490927.34	1931	0	0.128936031
6.17.2020	492858.34	490679.3353	248	1931	0.156266831
7.1.2020	492858.34	490588.3353	91	2179	0.5037953
7.15.202	492858.34	490509.3353	79	2270	1.099357267
7.29.2020	492858.34	490402.3353	107	2349	1.172509488
8.12.2020	492858.34	490292.3353	110	2456	0.935747418
8.26.2020	492858.34	490200.3353	92	2566	0.527597826
9.9.2020	492858.34	490186.3353	14	2658	1.783252696
9.23.2020	492858.34	490012.3353	174	2672	2.284468209
10.7.2020	492858.34	489759.3353	253	2846	1.258498682
10.21.2020	492858.34	489478.3353	281	3099	1.368938681
11.4.2020	492858.34	489033.3353	445	3380	1.678314404
11.18.2020	492858.34	488269.3353	764	3825	1.464420985
12.2.2020	492858.34	487279.3353	990	4589	1.637694395
12.16.2020	492858.34	485429.3353	1850	5579	1.260549939
12.30.20	492858.34	483753.3353	1676	7429	1.127754002
1.13.2021	492858.34	481526.3353	2227	9105	1.128692848
1.27.2021	492858.34	479449.3353	2077	11332	0.831402154
2.10.2021	492858.34	478045.3353	1404	13409	0.673799057
2.24.2021	492858.34	477174.3353	871	14813	0.747297378
3.10.2021	492858.34	476399.3353	775	15684	1.092372857
3.24.2021	492858.34	475436.3353	963	16459	1.148778362
4.7.2021	492858.34	474473.3353	963	17422	1.040366214
4.21.2021	492858.34	473507.3353	966	18385	1.044109949

Biweekly Other Race, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	N/A	N/A	4644	0	N/A
6.17.2020	N/A	N/A	738	4644	N/A
7.1.2020	N/A	N/A	224	5382	N/A
7.15.202	N/A	N/A	307	5606	N/A
7.29.2020	N/A	N/A	384	5913	N/A
8.12.2020	N/A	N/A	470	6297	N/A
8.26.2020	N/A	N/A	455	6767	N/A
9.9.2020	N/A	N/A	327	7222	N/A
9.23.2020	N/A	N/A	617	7549	N/A
10.7.2020	N/A	N/A	817	8166	N/A
10.21.2020	N/A	N/A	949	8983	N/A
11.4.2020	N/A	N/A	1330	9932	N/A
11.18.2020	N/A	N/A	2313	11262	N/A
12.2.2020	N/A	N/A	3108	13575	N/A
12.16.2020	N/A	N/A	5771	16683	N/A
12.30.20	N/A	N/A	4733	22454	N/A
1.13.2021	N/A	N/A	6373	27187	N/A
1.27.2021	N/A	N/A	5663	33560	N/A
2.10.2021	N/A	N/A	4233	39223	N/A
2.24.2021	N/A	N/A	2956	43456	N/A
3.10.2021	N/A	N/A	2460	46412	N/A
3.24.2021	N/A	N/A	2973	48872	N/A
4.7.2021	N/A	N/A	3693	51845	N/A
4.21.2021	N/A	N/A	3416	55538	N/A

Biweekly Unknown, Missing, or Refused

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	N/A	N/A	40176	0	N/A
6.17.2020	N/A	N/A	-3101	40176	N/A
7.1.2020	N/A	N/A	-134	37075	N/A
7.15.202	N/A	N/A	270	36941	N/A
7.29.2020	N/A	N/A	737	37211	N/A
8.12.2020	N/A	N/A	936	37948	N/A
8.26.2020	N/A	N/A	622	38884	N/A
9.9.2020	N/A	N/A	-4354	39506	N/A
9.23.2020	N/A	N/A	493	35152	N/A
10.7.2020	N/A	N/A	956	35645	N/A
10.21.2020	N/A	N/A	1352	36601	N/A
11.4.2020	N/A	N/A	3956	37953	N/A
11.18.2020	N/A	N/A	10764	41909	N/A
12.2.2020	N/A	N/A	11589	52673	N/A
12.16.2020	N/A	N/A	18165	64262	N/A
12.30.20	N/A	N/A	14757	82427	N/A
1.13.2021	N/A	N/A	20448	97184	N/A
1.27.2021	N/A	N/A	11091	117632	N/A
2.10.2021	N/A	N/A	6161	128723	N/A
2.24.2021	N/A	N/A	3196	134884	N/A
3.10.2021	N/A	N/A	2867	138080	N/A
3.24.2021	N/A	N/A	3383	140947	N/A
4.7.2021	N/A	N/A	5437	144330	N/A
4.21.2021	N/A	N/A	5016	149767	N/A

Biweekly Ranking Native
Hawaiian/Pacific Islander, Non-Hispanic

Point	Column1	Rank	Percent
3	1.279093	1	100.00%
6	1.205342	2	87.50%
1	1.1484	3	75.00%
4	0.792959	4	62.50%
5	0.756683	5	50.00%
7	0.564609	6	37.50%
9	0.533876	7	25.00%
8	0.355776	8	12.50%
2	0.203841	9	0.00%

Biweekly Native Hawaiian/Pacific Islander, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	2694.94	2694.94	0	0	0
6.17.2020	2694.94	2694.942209	0	0	0
7.1.2020	2694.94	2694.942209	0	0	0
7.15.202	2694.94	2694.942209	0	0	0
7.29.2020	2694.94	2694.942209	0	0	0
8.12.2020	2694.94	2694.942209	0	0	0
8.26.2020	2694.94	2694.942209	0	0	0
9.9.2020	2694.94	2694.942209	0	0	0
9.23.2020	2694.94	2694.942209	0	0	0
10.7.2020	2694.94	2694.942209	0	0	0
10.21.2020	2694.94	2694.942209	0	0	0
11.4.2020	2694.94	2694.942209	0	0	0
11.18.2020	2694.94	2694.942209	0	0	0
12.2.2020	2694.94	2694.942209	0	0	0
12.16.2020	2694.94	2694.942209	0	0	0
12.30.20	2694.94	2587.942209	107	0	1.148399811
1.13.2021	2694.94	2576.942209	11	107	0.203840561
1.27.2021	2694.94	2564.942209	12	118	1.279092839
2.10.2021	2694.94	2548.942209	16	130	0.792958997
2.24.2021	2694.94	2543.942209	5	146	0.756683353
3.10.2021	2694.94	2533.942209	10	151	1.205342342
3.24.2021	2694.94	2526.942209	7	161	0.56460892
4.7.2021	2694.94	2524.942209	2	168	0.355776091
4.21.2021	2694.94	2523.942209	1	170	0.533875578

Biweekly Ranking American
Indian/Alaskan Native, Non-Hispanic

Point	Column1	Rank	Percent
1	1.209144	1	100.00%
5	1.116989	2	87.50%
6	0.926378	3	75.00%
7	0.835172	4	62.50%
3	0.778829	5	50.00%
4	0.659147	6	37.50%
8	0.635201	7	25.00%
9	0.467237	8	12.50%
2	0.338509	9	0.00%

Biweekly American Indian/Alaskan Native, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	11643.81	11643.81	0	0	0
6.17.2020	11643.81	11643.81078	0	0	0
7.1.2020	11643.81	11643.81078	0	0	0
7.15.202	11643.81	11643.81078	0	0	0
7.29.2020	11643.81	11643.81078	0	0	0
8.12.2020	11643.81	11643.81078	0	0	0
8.26.2020	11643.81	11643.81078	0	0	0
9.9.2020	11643.81	11643.81078	0	0	0
9.23.2020	11643.81	11643.81078	0	0	0
10.7.2020	11643.81	11643.81078	0	0	0
10.21.2020	11643.81	11643.81078	0	0	0
11.4.2020	11643.81	11643.81078	0	0	0
11.18.2020	11643.81	11643.81078	0	0	0
12.2.2020	11643.81	11643.81078	0	0	0
12.16.2020	11643.81	11643.81078	0	0	0
12.30.20	11643.81	11332.81078	311	0	1.209144481
1.13.2021	11643.81	11277.81078	55	311	0.338509215
1.27.2021	11643.81	11212.81078	65	366	0.778828632
2.10.2021	11643.81	11187.81078	25	431	0.659147141
2.24.2021	11643.81	11155.81078	32	456	1.116989213
3.10.2021	11643.81	11126.81078	29	488	0.926378275
3.24.2021	11643.81	11101.81078	25	517	0.83517217
4.7.2021	11643.81	11083.81078	18	542	0.635200642
4.21.2021	11643.81	11075.81078	8	560	0.467236857

8.2.5 Appendix B.5: Table 4 - County

These tables were constructed using the data from Massachusetts Reference Data – County and State. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Biweekly Ranking Barnstable County

Point	Column1	Rank	Percent
7	1.692473	1	100.00%
2	1.307001	2	87.50%
8	1.206527	3	75.00%
1	1.167163	4	62.50%
3	1.061244	5	50.00%
6	0.976984	6	37.50%
9	0.814557	7	25.00%
4	0.73438	8	12.50%
5	0.672249	9	0.00%

Biweekly Barnstable County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	212990	208293	997	3700	1.167163351
1.7.2021	212990	207155	1138	4697	1.307000511
1.21.2021	212990	205579	1576	5835	1.061244413
2.4.2021	212990	204375	1204	7411	0.734380411
2.18.2021	212990	203620	755	8615	0.67224886
3.4.2021	212990	203116	504	9370	0.976983795
3.18.2021	212990	202447	669	9874	1.692473027
4.1.2021	212990	201229	1218	10543	1.206527305
4.15.2021	212990	200296	933	11761	0.814556648

Biweekly Ranking Berkshire County

Point	Column1	Rank	Percent
7	2.155066	1	100.00%
8	1.644085	2	87.50%
2	1.542859	3	75.00%
1	1.508794	4	62.50%
9	1.104631	5	50.00%
3	0.955907	6	37.50%
6	0.849138	7	25.00%
5	0.516044	8	12.50%
4	0.506106	9	0.00%

Biweekly Berkshire County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	124944	122398	410	2136	1.508793664
1.7.2021	124944	121792	606	2546	1.542859182
1.21.2021	124944	120870	922	3152	0.955907108
2.4.2021	124944	120379	491	4074	0.506106289
2.18.2021	124944	120181	198	4565	0.516043695
3.4.2021	124944	120037	144	4763	0.849138182
3.18.2021	124944	119902	135	4907	2.155066064
4.1.2021	124944	119460	442	5042	1.644085386
4.15.2021	124944	118995	465	5484	1.104631378

Biweekly Ranking Bristol County

Point	Column1	Rank	Percent
8	1.405159	1	100.00%
7	1.300679	2	87.50%
2	1.232471	3	75.00%
9	1.200017	4	62.50%
1	1.106083	5	50.00%
3	0.997683	6	37.50%
6	0.737096	7	25.00%
4	0.694046	8	12.50%
5	0.649481	9	0.00%

Biweekly Bristol County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	565217	534650	6160	24407	1.106083348
1.7.2021	565217	528205	6445	30567	1.232470831
1.21.2021	565217	520132	8073	37012	0.997682646
2.4.2021	565217	514876	5256	45085	0.694045581
2.18.2021	565217	511705	3171	50341	0.649480655
3.4.2021	565217	509921	1784	53512	0.73709604
3.18.2021	565217	508410	1511	55296	1.3006789
4.1.2021	565217	506066	2344	56807	1.405158813
4.15.2021	565217	503560	2506	59151	1.200017142

Biweekly Ranking Dukes and Nantucket
County

Point	Column1	Rank	Percent
9	2.232546	1	100.00%
8	2.128509	2	87.50%
7	1.83022	3	75.00%
2	1.060279	4	62.50%
3	1.009189	5	50.00%
6	0.856774	6	37.50%
1	0.696783	7	25.00%
4	0.605027	8	12.50%
5	0.558388	9	0.00%

Biweekly Dukes and Nantucket County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	28731	27613	333	785	0.696783373
1.7.2021	28731	27390	223	1118	1.060279181
1.21.2021	28731	27051	339	1341	1.009188654
2.4.2021	28731	26856	195	1680	0.605027479
2.18.2021	28731	26749	107	1875	0.558387774
3.4.2021	28731	26699	50	1982	0.856773662
3.18.2021	28731	26624	75	2032	1.830219952
4.1.2021	28731	26487	137	2107	2.128508752
4.15.2021	28731	26208	279	2244	2.232546423

Biweekly Ranking Essex County

Point	Column1	Rank	Percent
8	1.376607	1	100.00%
9	1.289052	2	87.50%
7	1.188019	3	75.00%
2	1.093703	4	62.50%
3	0.925938	5	50.00%
1	0.919115	6	37.50%
6	0.858748	7	25.00%
5	0.731756	8	12.50%
4	0.637634	9	0.00%

Biweekly Essex County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	789034	736333	10543	42158	0.919114838
1.7.2021	789034	727290	9043	52701	1.093703217
1.21.2021	789034	716588	10702	61744	0.925937713
2.4.2021	789034	710686	5902	72446	0.637634013
2.18.2021	789034	707052	3634	78348	0.731756433
3.4.2021	789034	704433	2619	81982	0.858747777
3.18.2021	789034	702258	2175	84601	1.18801872
4.1.2021	789034	699364	2894	86776	1.376606631
4.15.2021	789034	696073	3291	89670	1.289051549

Biweekly Ranking Franklin County

Point	Column1	Rank	Percent
7	1.414947	1	100.00%
8	1.292693	2	87.50%
9	1.152899	3	75.00%
3	0.990494	4	62.50%
2	0.913216	5	50.00%
6	0.816692	6	37.50%
4	0.678793	7	25.00%
5	0.654206	8	12.50%
1	0.584064	9	0.00%

Biweekly Franklin County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	70180	69027	329	824	0.584063775
1.7.2021	70180	68838	189	1153	0.91321564
1.21.2021	70180	68563	275	1342	0.990494144
2.4.2021	70180	68389	174	1617	0.678792787
2.18.2021	70180	68266	123	1791	0.654205607
3.4.2021	70180	68200	66	1914	0.816692268
3.18.2021	70180	68116	84	1980	1.414947051
4.1.2021	70180	67994	122	2064	1.292692588
4.15.2021	70180	67858	136	2186	1.152899328

Biweekly Ranking Hampden County

Point	Column1	Rank	Percent
8	1.364424	1	100.00%
9	1.356481	2	87.50%
2	1.224104	3	75.00%
7	1.117397	4	62.50%
3	1.057898	5	50.00%
1	1.033206	6	37.50%
6	0.911625	7	25.00%
5	0.737808	8	12.50%
4	0.721201	9	0.00%

Biweekly Hampden County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	466372	442665	4349	19358	1.03320598
1.7.2021	466372	438400	4265	23707	1.22410409
1.21.2021	466372	432753	5647	27972	1.057898321
2.4.2021	466372	428670	4083	33619	0.721200886
2.18.2021	466372	426303	2367	37702	0.737808445
3.4.2021	466372	424320	1983	40069	0.911625024
3.18.2021	466372	422695	1625	42052	1.117396668
4.1.2021	466372	420666	2029	43677	1.36442416
4.15.2021	466372	418198	2468	45706	1.356480719

Biweekly Ranking Hampshire County

Point	Column1	Rank	Percent
1	1.330833	1	100.00%
2	1.300291	2	87.50%
4	1.092717	3	75.00%
5	1.026778	4	62.50%
3	0.95438	5	50.00%
8	0.944588	6	37.50%
9	0.907014	7	25.00%
7	0.862808	8	12.50%
6	0.674868	9	0.00%

Biweekly Hampshire County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	160830	157464	604	2762	1.330833046
1.7.2021	160830	156677	787	3366	1.300291096
1.21.2021	160830	155702	975	4153	0.954380083
2.4.2021	160830	155049	653	5128	1.092717293
2.18.2021	160830	153987	1062	5781	1.026777752
3.4.2021	160830	153363	624	6843	0.674867687
3.18.2021	160830	152902	461	7467	0.862808002
4.1.2021	160830	152473	429	7928	0.944588016
4.15.2021	160830	152105	368	8357	0.907014224

Biweekly Ranking Middlesex County

Point	Column1	Rank	Percent
8	1.269467	1	100.00%
7	1.258577	2	87.50%
9	1.163472	3	75.00%
2	1.092999	4	62.50%
1	0.949866	5	50.00%
3	0.931907	6	37.50%
6	0.923842	7	25.00%
5	0.717838	8	12.50%
4	0.665645	9	0.00%

8.2.6 Appendix B.6: Table 5 - Higher Education

These tables were constructed using the data from Massachusetts Reference Data – Higher Education. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Biweekly Ranking Higher Education

Point	Column1	Rank	Percent
1	2.432209	1	100.00%
6	1.810682	2	93.70%
5	1.659437	3	87.50%
11	1.606026	4	81.20%
15	1.471156	5	75.00%
2	1.35064	6	68.70%
12	1.268756	7	62.50%
4	1.149126	8	56.20%
7	1.133001	9	50.00%
16	1.088708	10	43.70%
10	1.018902	11	37.50%
3	1.001629	12	31.20%
13	0.944944	13	25.00%
8	0.897309	14	18.70%
14	0.832086	15	12.50%
9	0.750888	16	6.20%
17	0.624269	17	0.00%

Biweekly Higher Education

Date	Population	LS2C	Infected	Uninfected	BRN
8.29.2020	505408	505262	146	0	2.432209455
9.12.2020	505408	504907	355	146	1.350640258
9.26.2020	505408	504586	321	501	1.001629058
10.10.2020	505408	504231	355	822	1.149125802
10.24.2020	505408	503811	420	1177	1.659437076
11.7.2020	505408	502949	862	1597	1.810681722
11.21.2020	505408	501501	1448	2459	1.133000961
12.5.2020	505408	500352	1149	3907	0.897309192
12.19.2020	505408	499194	1158	5056	0.750888011
1.2.2021	505408	498641	553	6214	1.018902351
1.16.2021	505408	497474	1167	6767	1.606025679
1.30.2021	505408	495922	1552	7934	1.268756273
2.13.2021	505408	494089	1833	9486	0.944944138
2.27.2021	505408	492795	1294	11319	0.832086365
3.13.2021	505408	491552	1243	12613	1.471156254
3.27.2021	505408	489165	2387	13856	1.088708343
4.10.2021	505408	487727	1438	16243	0.624269017

8.3 Appendix C: Monthly by Type

This data was used to construct the Monthly Tables and Graphs found in Section 6.

8.3.1 Appendix C.1: Reference - Massachusetts

These tables were constructed using the data from Massachusetts Reference Data – County and State. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Ranking Massachusetts

Point	Column1	Rank	Percent
6	2.563923	1	100.00%
5	2.348465	2	90.00%
7	1.780665	3	80.00%
4	1.428963	4	70.00%
3	1.394782	5	60.00%
11	1.235261	6	50.00%
2	1.145384	7	40.00%
8	1.075971	8	30.00%
1	0.746486	9	20.00%
10	0.685423	10	10.00%
9	0.64432	11	0.00%

Monthly Massachusetts

Date	Population	LS2C	Infected	Uninfected	BRN
6/1/2020	7029917	6926370	6582	96965	0.746486082
6/29/2020	7029917	6921529	4841	103547	1.145384423
7/27/2020	7029917	6913488	8041	108388	1.394781694
8/24/2020	7029917	6903859	9629	116429	1.428962648
9/21/2020	7029917	6888691	15168	126058	2.348465435
10/19/2020	7029917	6846794	41897	141226	2.563922722
11/16/2020	7029917	6746192	100602	183123	1.780664974
12/14/2020	7029917	6603292	142900	283725	1.075970937
1/11/2021	7029917	6500091	103201	426625	0.644320147
2/8/2021	7029917	6456675	43416	529826	0.685422952
3/8/2021	7029917	6407791	48884	573242	1.23526116

8.3.2 Appendix C.2: Table 1 - Age

These tables were constructed using the data from Massachusetts Reference Data – Age and

Massachusetts Reference Data – Cases (Report Date). LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Ranking 0-19

Point	Column1	Rank	Percent
3	2.269799	1	100.00%
4	2.255735	2	87.50%
5	1.712778	3	75.00%
2	1.672581	4	62.50%
9	1.324933	5	50.00%
1	1.199696	6	37.50%
6	1.130746	7	25.00%
8	0.826906	8	12.50%
7	0.740052	9	0.00%

Monthly 0-19

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	1588321.07	1478572.07	7444	102305	N/A
8.12.2020	1588321.07	1565729.889	1451	21140.18105	1.199696318
9.9.2020	1588321.07	1564013.889	1716	22591.18105	1.6725812
10.7.2020	1588321.07	1560513.889	3500	24307.18105	2.269799362
11.4.2020	1588321.07	1552381.889	8132	27807.18105	2.2557348
12.2.2020	1588321.07	1534868.889	17513	35939.18105	1.712778017
12.30.20	1588321.07	1509935.889	24933	53452.18105	1.130745672
1.27.2021	1588321.07	1489241.889	20694	78385.18105	0.740051681
2.24.2021	1588321.07	1478275.889	10966	99079.18105	0.826905981
3.24.2021	1588321.07	1464875.889	13400	110045.181	1.324933323

Monthly Ranking 20-29

Point	Column1	Rank	Percent
4	2.386066	1	100.00%
3	2.27487	2	87.50%
5	1.624039	3	75.00%
9	1.457764	4	62.50%
2	1.43785	5	50.00%
1	1.35188	6	37.50%
6	1.043489	7	25.00%
8	0.856445	8	12.50%
7	0.702592	9	0.00%

Monthly 20-29

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	1026828.80	916844.80	5772	104212	N/A
8.12.2020	1026828.80	1003802.35	1841	21185.44745	1.351880029
9.9.2020	1026828.80	1001369.35	2433	23026.44745	1.437849747
10.7.2020	1026828.80	997809.35	3560	25459.44745	2.274869628
11.4.2020	1026828.80	988121.35	9688	29019.44745	2.386065549
12.2.2020	1026828.80	967390.35	20731	38707.44745	1.62403879
12.30.20	1026828.80	941579.35	25811	59438.44745	1.043488765
1.27.2021	1026828.80	922856.35	18723	85249.44745	0.702591661
2.24.2021	1026828.80	913458.35	9398	103972.4475	0.856444767
3.24.2021	1026828.80	901431.35	12027	113370.4475	1.457764105

Monthly Ranking 30-39

Point	Column1	Rank	Percent
3	2.423886	1	100.00%
4	2.369713	2	87.50%
5	1.653357	3	75.00%
2	1.441814	4	62.50%
9	1.351738	5	50.00%
1	1.118038	6	37.50%
6	1.033675	7	25.00%
8	0.781519	8	12.50%
7	0.658692	9	0.00%

Monthly 30-39

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	914617.34	824648.34	4667	85302	N/A
8.12.2020	914617.34	895696.24	1591	17330.09821	1.118038219
9.9.2020	914617.34	893954.24	1742	18921.09821	1.441814497
10.7.2020	914617.34	890999.24	2955	20663.09821	2.423886286
11.4.2020	914617.34	882863.24	8136	23618.09821	2.369713035
12.2.2020	914617.34	865629.24	17234	31754.09821	1.653356899
12.30.20	914617.34	843164.24	22465	48988.09821	1.033675029
1.27.2021	914617.34	827799.24	15365	71453.09821	0.658691994
2.24.2021	914617.34	820611.24	7188	86818.09821	0.781518716
3.24.2021	914617.34	811985.24	8626	94006.09821	1.35173849

Monthly Ranking 40-49

Point	Column1	Rank	Percent
3	2.466392	1	100.00%
4	2.388786	2	87.50%
5	1.696217	3	75.00%
2	1.465187	4	62.50%
9	1.34863	5	50.00%
1	1.088656	6	37.50%
6	1.055873	7	25.00%
8	0.731167	8	12.50%
7	0.643798	9	0.00%

Monthly 40-49

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	841388.18	765447.18	3319	72622	N/A
8.12.2020	841388.18	825482.20	1278	14627.98284	1.088655555
9.9.2020	841388.18	824117.20	1365	15905.98284	1.465187178
10.7.2020	841388.18	821689.20	2428	17270.98284	2.466391855
11.4.2020	841388.18	814981.20	6708	19698.98284	2.388785562
12.2.2020	841388.18	800550.20	14431	26406.98284	1.696217364
12.30.20	841388.18	780865.20	19685	40837.98284	1.055872798
1.27.2021	841388.18	767119.20	13746	60522.98284	0.643797954
2.24.2021	841388.18	761242.20	5877	74268.98284	0.731166523
3.24.2021	841388.18	754138.20	7104	80145.98284	1.348629733

Monthly Ranking 50-59

Point	Column1	Rank	Percent
4	2.582838	1	100.00%
3	2.497283	2	87.50%
5	1.77904	3	75.00%
2	1.477832	4	62.50%
9	1.229432	5	50.00%
6	1.066965	6	37.50%
1	1.066756	7	25.00%
8	0.687375	8	12.50%
7	0.640523	9	0.00%

Monthly 50-59

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	956483.28	877094.28	3294	76095	N/A
8.12.2020	956483.28	940013.13	1178	15292.14693	1.066756084
9.9.2020	956483.28	938778.13	1235	16470.14693	1.477832251
10.7.2020	956483.28	936513.13	2265	17705.14693	2.497282929
11.4.2020	956483.28	930220.13	6293	19970.14693	2.582838326
12.2.2020	956483.28	915016.13	15204	26263.14693	1.779039967
12.30.20	956483.28	893634.13	21382	41467.14693	1.066965496
1.27.2021	956483.28	878545.13	15089	62849.14693	0.640522862
2.24.2021	956483.28	872177.13	6368	77938.14693	0.687374915
3.24.2021	956483.28	865096.13	7081	84306.14693	1.22943211

Monthly Ranking 60-69

Point	Column1	Rank	Percent
3	2.63219	1	100.00%
4	2.618004	2	87.50%
5	1.79118	3	75.00%
2	1.47719	4	62.50%
1	1.194275	5	50.00%
6	1.062889	6	37.50%
9	1.052777	7	25.00%
8	0.626149	8	12.50%
7	0.624084	9	0.00%

Monthly 60-69

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	841570.64	789178.64	1791	50601	N/A
8.12.2020	841570.64	830802.74	676	10091.90394	1.19427484
9.9.2020	841570.64	830005.74	797	10767.90394	1.477190319
10.7.2020	841570.64	828656.74	1349	11564.90394	2.632189653
11.4.2020	841570.64	824443.74	4213	12913.90394	2.618004234
12.2.2020	841570.64	814391.74	10052	17126.90394	1.791180311
12.30.20	841570.64	799717.74	14674	27178.90394	1.062889435
1.27.2021	841570.64	789417.74	10300	41852.90394	0.624083875
2.24.2021	841570.64	785097.74	4320	52152.90394	0.626148506
3.24.2021	841570.64	780877.74	4220	56472.90394	1.052776639

Monthly Ranking 70-79

Point	Column1	Rank	Percent
4	2.657166	1	100.00%
3	2.530889	2	87.50%
5	1.835988	3	75.00%
2	1.460983	4	62.50%
6	1.079125	5	50.00%
1	0.956232	6	37.50%
9	0.721911	7	25.00%
7	0.614545	8	12.50%
8	0.489754	9	0.00%

Monthly 70-79

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	501714.18	476817.18	511	24386	N/A
8.12.2020	501714.18	496545.45	373	4795.7347	0.956231942
9.9.2020	501714.18	496192.45	353	5168.7347	1.460982775
10.7.2020	501714.18	495496.45	696	5521.7347	2.530888612
11.4.2020	501714.18	493570.45	1926	6217.7347	2.657165726
12.2.2020	501714.18	488642.45	4928	8143.7347	1.835988004
12.30.20	501714.18	481314.45	7328	13071.7347	1.079125357
1.27.2021	501714.18	475954.45	5360	20399.7347	0.614544643
2.24.2021	501714.18	473917.45	2037	25759.7347	0.489754084
3.24.2021	501714.18	472532.45	1385	27796.7347	0.721910713

Monthly Ranking 80+

Point	Column1	Rank	Percent
4	2.758071	1	100.00%
3	2.702974	2	87.50%
5	1.908376	3	75.00%
2	1.530855	4	62.50%
6	1.08119	5	50.00%
1	0.827659	6	37.50%
7	0.573045	7	25.00%
9	0.542584	8	12.50%
8	0.382255	9	0.00%

Monthly 80+

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	293459.04	275995.04	273	17191	N/A
8.12.2020	293459.04	289843.07	252	3363.96798	0.82765863
9.9.2020	293459.04	289637.07	206	3615.96798	1.53085466
10.7.2020	293459.04	289151.07	486	3821.96798	2.702974363
11.4.2020	293459.04	287794.07	1357	4307.96798	2.758071216
12.2.2020	293459.04	284166.07	3628	5664.96798	1.90837639
12.30.20	293459.04	278582.07	5584	9292.96798	1.081189781
1.27.2021	293459.04	274711.07	3871	14876.96798	0.573045413
2.24.2021	293459.04	273510.07	1201	18747.96798	0.382254913
3.24.2021	293459.04	272904.07	606	19948.96798	0.542584138

Monthly Unknown

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	N/A	N/A	25	336	N/A
8.12.2020	N/A	N/A	1	69.53690109	N/A
9.9.2020	N/A	N/A	5	70.53690109	N/A
10.7.2020	N/A	N/A	21	75.53690109	N/A
11.4.2020	N/A	N/A	41	96.53690109	N/A
12.2.2020	N/A	N/A	64	137.5369011	N/A
12.30.20	N/A	N/A	98	201.5369011	N/A
1.27.2021	N/A	N/A	38	299.5369011	N/A
2.24.2021	N/A	N/A	17	337.5369011	N/A
3.24.2021	N/A	N/A	51	354.5369011	N/A

8.3.3 Appendix C.3: Table 2 - Gender

These tables were constructed using the data from Massachusetts Reference Data – Gender and Massachusetts Reference Data – Cases (Report Date). LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Ranking Female (Method 1)

Point	Column1	Rank	Percent
4	2.432578	1	100.00%
3	2.414062	2	87.50%
5	1.715021	3	75.00%
2	1.453876	4	62.50%
9	1.256011	5	50.00%
1	1.098049	6	37.50%
6	1.057996	7	25.00%
8	0.729186	8	12.50%
7	0.655066	9	0.00%

Monthly Female (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3562411.18	3278502.18	13419	270490	N/A
8.12.2020	3562411.18	3502842.87	4618	54950.30975	1.098049034
9.9.2020	3562411.18	3497856.87	4986	59568.30975	1.453875821
10.7.2020	3562411.18	3489132.87	8724	64554.30975	2.414062478
11.4.2020	3562411.18	3465440.87	23692	73278.30975	2.432578074
12.2.2020	3562411.18	3412424.87	53016	96970.30975	1.715020926
12.30.20	3562411.18	3339423.87	73001	149986.3097	1.057995649
1.27.2021	3562411.18	3287444.87	51979	222987.3097	0.655066309
2.24.2021	3562411.18	3263872.87	23572	274966.3097	0.729185992
3.24.2021	3562411.18	3236970.87	26902	298538.3097	1.256010846

Monthly Ranking Male (Method 1)

Point	Column1	Rank	Percent
3	2.424321	1	100.00%
4	2.406101	2	87.50%
5	1.697476	3	75.00%
2	1.571318	4	62.50%
9	1.278095	5	50.00%
1	1.204903	6	37.50%
6	1.072745	7	25.00%
8	0.749031	8	12.50%
7	0.67875	9	0.00%

Monthly Male (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3362254.48	3091207.48	13483	257564	N/A
8.12.2020	3362254.48	3305944.60	3849	52460.8822	1.204902599
9.9.2020	3362254.48	3301384.60	4560	56309.8822	1.571317695
10.7.2020	3362254.48	3292970.60	8414	60869.8822	2.424320576
11.4.2020	3362254.48	3270579.60	22391	69283.8822	2.406101178
12.2.2020	3362254.48	3220871.60	49708	91674.8822	1.697476372
12.30.20	3362254.48	3153339.60	67532	141382.8822	1.072745496
1.27.2021	3362254.48	3102917.60	50422	208914.8822	0.678749966
2.24.2021	3362254.48	3079453.60	23464	259336.8822	0.749031214
3.24.2021	3362254.48	3052229.60	27224	282800.8822	1.278095388

Monthly Ranking Transgender (Method 1)

Point	Column1	Rank	Percent
1	2.000828	1	100.00%
4	1.001044	2	66.60%
2	0.818747	3	33.30%
3	0.778453	4	0.00%

Monthly Transgender (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	39696.87	39668.87	0	28	N/A
8.12.2020	39696.87	39691.45	0	5.419372661	0
9.9.2020	39696.87	39691.45	0	5.419372661	0
10.7.2020	39696.87	39691.45	0	5.419372661	0
11.4.2020	39696.87	39691.45	0	5.419372661	0
12.2.2020	39696.87	39691.45	0	5.419372661	0
12.30.20	39696.87	39680.45	11	5.419372661	2.00082758
1.27.2021	39696.87	39669.45	11	16.41937266	0.818747342
2.24.2021	39696.87	39662.45	7	27.41937266	0.778452739
3.24.2021	39696.87	39655.45	7	34.41937266	1.001044481

Monthly Unknown (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	N/A	N/A	191	2291	N/A
8.12.2020	N/A	N/A	0	480.3886766	N/A
9.9.2020	N/A	N/A	0	480.3886766	N/A
10.7.2020	N/A	N/A	0	480.3886766	N/A
11.4.2020	N/A	N/A	0	480.3886766	N/A
12.2.2020	N/A	N/A	0	480.3886766	N/A
12.30.20	N/A	N/A	825	480.3886766	N/A
1.27.2021	N/A	N/A	773	1305.388677	N/A
2.24.2021	N/A	N/A	327	2078.388677	N/A
3.24.2021	N/A	N/A	366	2405.388677	N/A

Monthly Ranking Female (Method 2)

Point	Column1	Rank	Percent
4	2.435767	1	100.00%
3	2.413924	2	87.50%
5	1.713812	3	75.00%
2	1.453814	4	62.50%
9	1.255418	5	50.00%
1	1.098011	6	37.50%
6	1.056791	7	25.00%
8	0.728879	8	12.50%
7	0.654819	9	0.00%

Monthly Female (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3562411.18	3280013.07	13342.5117	269055.6	N/A
8.12.2020	3562411.18	3502964.17	4591.6774	54855.33712	1.098011013
9.9.2020	3562411.18	3498006.59	4957.5798	59447.01452	1.453813595
10.7.2020	3562411.18	3489332.31	8674.2732	64404.59432	2.413924495
11.4.2020	3562411.18	3465775.36	23556.9556	73078.86752	2.435767276
12.2.2020	3562411.18	3412954.18	52821.174	96635.82312	1.713811767
12.30.20	3562411.18	3340369.29	72584.8943	149456.9971	1.05679067
1.27.2021	3562411.18	3288686.57	51682.7197	222041.8914	0.654818977
2.24.2021	3562411.18	3265248.93	23437.6396	273724.6111	0.728878694
3.24.2021	3562411.18	3238500.27	26748.6586	297162.2507	1.255417688

Monthly Ranking Male (Method 2)

Point	Column1	Rank	Percent
3	2.424169	1	100.00%
4	2.405855	2	87.50%
5	1.697151	3	75.00%
2	1.571242	4	62.50%
9	1.277435	5	50.00%
1	1.204854	6	37.50%
6	1.072405	7	25.00%
8	0.748685	8	12.50%
7	0.678468	9	0.00%

Monthly Male (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3362254.48	3092752.44	13406.1469	256095.9	N/A
8.12.2020	3362254.48	3306077.12	3827.0607	52350.29919	1.204854301
9.9.2020	3362254.48	3301543.12	4534.008	56177.35989	1.571242253
10.7.2020	3362254.48	3293177.08	8366.0402	60711.36789	2.424168577
11.4.2020	3362254.48	3270913.70	22263.3713	69077.40809	2.40585541
12.2.2020	3362254.48	3221489.04	49424.6644	91340.77939	1.697151029
12.30.20	3362254.48	3154341.97	67147.0676	140765.4438	1.072404604
1.27.2021	3362254.48	3104207.38	50134.5946	207912.5114	0.67846795
2.24.2021	3362254.48	3080877.12	23330.2552	258047.106	0.748685124
3.24.2021	3362254.48	3053808.30	27068.8232	281377.3612	1.277434663

Monthly Ranking Transgender (Method 2)

Point	Column1	Rank	Percent
4	2.396044	1	100.00%
3	2.393949	2	87.50%
2	1.493106	3	75.00%
1	1.134797	4	62.50%
9	1.033707	5	50.00%
7	0.845452	6	37.50%
8	0.803847	7	25.00%
5	0.726532	8	12.50%
6	0.038059	9	0.00%

Monthly Transgender (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	39696.87	38619.69	0	1077.176	N/A
8.12.2020	39696.87	39439.36	48.2619	209.2395458	1.134797009
9.9.2020	39696.87	39384.95	54.4122	257.5014458	1.493106478
10.7.2020	39696.87	39287.27	97.6866	311.9136458	2.393948733
11.4.2020	39696.87	39024.59	262.6731	409.6002458	2.396044454
12.2.2020	39696.87	38438.45	586.1422899	672.2733458	0.726532313
12.30.20	39696.87	38427.45	11	1258.415636	0.038059187
1.27.2021	39696.87	38416.45	11	1269.415636	0.845451719
2.24.2021	39696.87	38409.45	7	1280.415636	0.803847489
3.24.2021	39696.87	38402.45	7	1287.415636	1.033706589

Monthly Unknown (Method 2)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	N/A	N/A	191	2291	N/A
8.12.2020	N/A	N/A	0	482.12414	N/A
9.9.2020	N/A	N/A	0	482.12414	N/A
10.7.2020	N/A	N/A	0	482.12414	N/A
11.4.2020	N/A	N/A	0	482.12414	N/A
12.2.2020	N/A	N/A	0	482.12414	N/A
12.30.20	N/A	N/A	825	482.12414	N/A
1.27.2021	N/A	N/A	773	1307.12414	N/A
2.24.2021	N/A	N/A	327	2080.12414	N/A
3.24.2021	N/A	N/A	366	2407.12414	N/A

8.3.4 Appendix C.4: Table 3 - Race

These tables were constructed using the data from Massachusetts Reference Data – Race. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Ranking White, Non-Hispanic

Point	Column1	Rank	Percent
5	2.815151	1	100.00%
6	2.36528	2	90.90%
7	2.325759	3	81.80%
8	1.507939	4	72.70%
4	1.215861	5	63.60%
12	1.168972	6	54.50%
11	0.929751	7	45.40%
9	0.82241	8	36.30%
3	0.61354	9	27.20%
10	0.592633	10	18.10%
2	0.199824	11	9.00%
1	0.099113	12	0.00%

Monthly White, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	4955521.08	4924197.08	31324	0	0.099113281
7.1.2020	4955521.08	4921112.08	3085	31324	0.199823947
7.29.2020	4955521.08	4917369.08	3743	34409	0.613540215
8.26.2020	4955521.08	4916955.08	414	38152	1.215861201
9.23.2020	4955521.08	4912354.08	4601	38566	2.815150583
10.21.2020	4955521.08	4902960.08	9394	43167	2.365280399
11.18.2020	4955521.08	4879603.08	23357	52561	2.325758898
12.16.2020	4955521.08	4827956.08	51647	75918	1.507939006
1.13.2021	4955521.08	4769413.08	58543	127565	0.822409901
2.10.2021	4955521.08	4740738.08	28675	186108	0.592633194
3.10.2021	4955521.08	4719965.08	20773	214783	0.929751396
4.7.2021	4955521.08	4696949.08	23016	235556	1.168971986

Monthly Ranking Black or African
American, Non-Hispanic

Point	Column1	Rank	Percent
7	2.231466	1	100.00%
6	2.010299	2	90.90%
5	1.70859	3	81.80%
8	1.471188	4	72.70%
12	1.27377	5	63.60%
4	1.11815	6	54.50%
3	0.935059	7	45.40%
11	0.916233	8	36.30%
9	0.850123	9	27.20%
10	0.628425	10	18.10%
2	0.134347	11	9.00%
1	0.063025	12	0.00%

Monthly Black or African American, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	509227.93	499291.93	9936	0	0.063025233
7.1.2020	509227.93	498677.93	614	9936	0.134347341
7.29.2020	509227.93	497903.93	774	10550	0.935058575
8.26.2020	509227.93	497408.93	495	11324	1.118150458
9.23.2020	509227.93	496517.93	891	11819	1.70859048
10.21.2020	509227.93	495099.93	1418	12710	2.010299439
11.18.2020	509227.93	492004.93	3095	14128	2.231465969
12.16.2020	509227.93	485369.93	6635	17223	1.471188154
1.13.2021	509227.93	478360.93	7009	23858	0.850123258
2.10.2021	509227.93	474473.93	3887	30867	0.628424987
3.10.2021	509227.93	471980.93	2493	34754	0.91623333
4.7.2021	509227.93	469055.93	2925	37247	1.273770472

Monthly Ranking Hispanic

Point	Column1	Rank	Percent
7	2.027947	1	100.00%
6	1.940403	2	90.90%
5	1.665717	3	81.80%
12	1.50404	4	72.70%
8	1.442457	5	63.60%
4	1.439865	6	54.50%
3	1.389258	7	45.40%
11	1.10561	8	36.30%
9	0.838273	9	27.20%
10	0.630425	10	18.10%
2	0.189736	11	9.00%
1	0.083934	12	0.00%

Monthly Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	859094.85	838839.85	20255	0	0.083933996
7.1.2020	859094.85	837179.85	1660	20255	0.189736249
7.29.2020	859094.85	834787.85	2392	21915	1.389257934
8.26.2020	859094.85	831709.85	3078	24307	1.439865058
9.23.2020	859094.85	827162.85	4547	27385	1.665716899
10.21.2020	859094.85	819480.85	7682	31932	1.940402655
11.18.2020	859094.85	804527.85	14953	39614	2.027947332
12.16.2020	859094.85	776493.85	28034	54567	1.442456854
1.13.2021	859094.85	748482.85	28011	82601	0.83827276
2.10.2021	859094.85	735561.85	12921	110612	0.630424821
3.10.2021	859094.85	726388.85	9173	123533	1.10560952
4.7.2021	859094.85	714907.85	11481	132706	1.504039955

Monthly Ranking Asian, Non-Hispanic

Point	Column1	Rank	Percent
5	2.176915	1	100.00%
6	2.167734	2	90.90%
7	2.153408	3	81.80%
4	1.65915	4	72.70%
8	1.510866	5	63.60%
12	1.155255	6	54.50%
11	0.947265	7	45.40%
9	0.863729	8	36.30%
3	0.838993	9	27.20%
10	0.63002	10	18.10%
2	0.16554	11	9.00%
1	0.078364	12	0.00%

Monthly Asian, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	492858.34	490679.34	2179	0	0.078363898
7.1.2020	492858.34	490509.34	170	2179	0.165539934
7.29.2020	492858.34	490292.34	217	2349	0.838993428
8.26.2020	492858.34	490186.34	106	2566	1.659149773
9.23.2020	492858.34	489759.34	427	2672	2.176915047
10.21.2020	492858.34	489033.34	726	3099	2.167734129
11.18.2020	492858.34	487279.34	1754	3825	2.153408155
12.16.2020	492858.34	483753.34	3526	5579	1.510866087
1.13.2021	492858.34	479449.34	4304	9105	0.863729016
2.10.2021	492858.34	477174.34	2275	13409	0.63001995
3.10.2021	492858.34	475436.34	1738	15684	0.94726499
4.7.2021	492858.34	473507.34	1929	17422	1.155254982

Monthly Other Race, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	N/A	N/A	5382	0	N/A
7.1.2020	N/A	N/A	531	5382	N/A
7.29.2020	N/A	N/A	854	5913	N/A
8.26.2020	N/A	N/A	782	6767	N/A
9.23.2020	N/A	N/A	1434	7549	N/A
10.21.2020	N/A	N/A	2279	8983	N/A
11.18.2020	N/A	N/A	5421	11262	N/A
12.16.2020	N/A	N/A	10504	16683	N/A
1.13.2021	N/A	N/A	12036	27187	N/A
2.10.2021	N/A	N/A	7189	39223	N/A
3.10.2021	N/A	N/A	5433	46412	N/A
4.7.2021	N/A	N/A	7109	51845	N/A

Monthly Unknown, Missing, or Refused

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	N/A	N/A	37075	0	N/A
7.1.2020	N/A	N/A	136	37075	N/A
7.29.2020	N/A	N/A	1673	37211	N/A
8.26.2020	N/A	N/A	-3732	38884	N/A
9.23.2020	N/A	N/A	1449	35152	N/A
10.21.2020	N/A	N/A	5308	36601	N/A
11.18.2020	N/A	N/A	22353	41909	N/A
12.16.2020	N/A	N/A	32922	64262	N/A
1.13.2021	N/A	N/A	31539	97184	N/A
2.10.2021	N/A	N/A	9357	128723	N/A
3.10.2021	N/A	N/A	6250	138080	N/A
4.7.2021	N/A	N/A	10453	144330	N/A

Monthly Ranking Native
Hawaiian/Pacific Islander, Non-Hispanic

Point	Column1	Rank	Percent
1	1.265186	1	100.00%
3	0.914899	2	75.00%
4	0.561307	3	50.00%
2	0.355616	4	25.00%
5	0.188427	5	0.00%

Monthly Native Hawaiian/Pacific Islander, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	2694.94	2694.94	0	0	0
7.1.2020	2694.94	2694.94	0	0	0
7.29.2020	2694.94	2694.94	0	0	0
8.26.2020	2694.94	2694.94	0	0	0
9.23.2020	2694.94	2694.94	0	0	0
10.21.2020	2694.94	2694.94	0	0	0
11.18.2020	2694.94	2694.94	0	0	0
12.16.2020	2694.94	2587.94	107	0	1.265186232
1.13.2021	2694.94	2564.94	23	107	0.355615921
2.10.2021	2694.94	2543.94	21	130	0.914898963
3.10.2021	2694.94	2526.94	17	151	0.561307113
4.7.2021	2694.94	2523.94	3	168	0.188426674

Monthly Ranking American
Indian/Alaskan Native, Non-Hispanic

Point	Column1	Rank	Percent
1	1.423883	1	100.00%
4	0.755907	2	75.00%
3	0.654551	3	50.00%
5	0.506173	4	25.00%
2	0.426458	5	0.00%

Monthly American Indian/Alaskan Native, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	11643.81	11643.81	0	0	0
7.1.2020	11643.81	11643.81	0	0	0
7.29.2020	11643.81	11643.81	0	0	0
8.26.2020	11643.81	11643.81	0	0	0
9.23.2020	11643.81	11643.81	0	0	0
10.21.2020	11643.81	11643.81	0	0	0
11.18.2020	11643.81	11643.81	0	0	0
12.16.2020	11643.81	11332.81	311	0	1.423883255
1.13.2021	11643.81	11212.81	120	311	0.426458369
2.10.2021	11643.81	11155.81	57	431	0.654551334
3.10.2021	11643.81	11101.81	54	488	0.755906929
4.7.2021	11643.81	11075.81	26	542	0.506173261

8.3.5 Appendix C.5: Table 4 - County

These tables were constructed using the data from Massachusetts Reference Data – County and State. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Ranking Barnstable County

Point	Column1	Rank	Percent
1	1.876511	1	100.00%
4	1.586408	2	66.60%
2	1.097706	3	33.30%
3	0.81677	4	0.00%

Monthly Barnstable County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	212990	208293	2135	3700	1.876510897
1.21.2021	212990	204375	2780	5835	1.097706122
2.18.2021	212990	203116	1259	8615	0.816770312
3.18.2021	212990	201229	1887	9874	1.58640772

Monthly Ranking Berkshire County

Point	Column1	Rank	Percent
1	2.028541	1	100.00%
4	1.764585	2	66.60%
2	1.008865	3	33.30%
3	0.545053	4	0.00%

Monthly Berkshire County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	124944	122398	1016	2136	2.028540557
1.21.2021	124944	120379	1413	3152	1.008865211
2.18.2021	124944	120037	342	4565	0.545052911
3.18.2021	124944	119460	577	4907	1.764585077

Monthly Ranking Bristol County

Point	Column1	Rank	Percent
1	1.658431	1	100.00%
2	1.046766	2	66.60%
4	0.868938	3	33.30%
3	0.534093	4	0.00%

Monthly Bristol County

Population	Date	LS2C	Infected	Uninfected	BRN
565217	12.24.2020	534650	12605	24407	1.658430684
565217	1.21.2021	514876	13329	37012	1.046766018
565217	2.18.2021	509921	4955	50341	0.534093157
565217	3.18.2021	506066	3855	55296	0.868937978

Monthly Ranking Dukes and Nantucket County

Point	Column1	Rank	Percent
4	1.464719	1	100.00%
1	1.416636	2	66.60%
2	0.897076	3	33.30%
3	0.574651	4	0.00%

Monthly Dukes and Nantucket County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	28731	27613	556	785	1.41663588
1.21.2021	28731	26856	534	1341	0.897075739
2.18.2021	28731	26699	157	1875	0.574650866
3.18.2021	28731	26487	212	2032	1.464718541

Monthly Ranking Essex County

Point	Column1	Rank	Percent
1	1.403176	1	100.00%
2	0.978633	2	66.60%
4	0.91459	3	33.30%
3	0.55483	4	0.00%

Monthly Essex County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	789034	736333	19586	42158	1.40317641
1.21.2021	789034	710686	16604	61744	0.978633453
2.18.2021	789034	704433	6253	78348	0.554830015
3.18.2021	789034	699364	5069	84601	0.914589702

Monthly Ranking Franklin County

Point	Column1	Rank	Percent
1	1.252233	1	100.00%
4	1.124989	2	66.60%
2	0.877619	3	33.30%
3	0.637097	4	0.00%

Monthly Franklin County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	70180	69027	518	824	1.252233402
1.21.2021	70180	68389	449	1342	0.877619261
2.18.2021	70180	68200	189	1791	0.637096774
3.18.2021	70180	67994	206	1980	1.124988775

Monthly Ranking Hampden County

Point	Column1	Rank	Percent
1	1.711691	1	100.00%
2	1.08801	2	66.60%
4	0.931267	3	33.30%
3	0.624803	4	0.00%

Monthly Hampden County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	466372	442665	8614	19358	1.711690809
1.21.2021	466372	428670	9730	27972	1.088010413
2.18.2021	466372	424320	4350	37702	0.62480341
3.18.2021	466372	420666	3654	42052	0.931267276

Monthly Ranking Hampshire County

Point	Column1	Rank	Percent
1	1.773274	1	100.00%
2	1.409045	2	66.60%
3	0.815154	3	33.30%
4	0.556809	4	0.00%

Monthly Hampshire County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	160830	157464	1391	2762	1.773274
1.21.2021	160830	155049	1628	4153	1.409045
2.18.2021	160830	153363	1686	5781	0.815154
3.18.2021	160830	152473	890	7467	0.556809

Monthly Ranking Middlesex County

Point	Column1	Rank	Percent
1	1.448943	1	100.00%
4	1.085433	2	66.60%
2	0.988103	3	33.30%
3	0.633932	4	0.00%

8.3.6 Appendix C.6: Table 5 - Higher Education

These tables were constructed using the data from Massachusetts Reference Data – Higher Education. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Ranking Higher Education

Point	Column1	Rank	Percent
3	1.990789	1	100.00%
2	1.667435	2	85.70%
1	1.35064	3	71.40%
6	1.344881	4	57.10%
8	1.199404	5	42.80%
7	1.185416	6	28.50%
4	1.121818	7	14.20%
5	1.042275	8	0.00%

Monthly Higher Education

Date	Population	LS2C	Infected	Uninfected	BRN
8.29.2020	505408	504907	501	0	1.350640258
9.26.2020	505408	504231	676	501	1.667434543
10.24.2020	505408	502949	1282	1177	1.990789104
11.21.2020	505408	500352	2597	2459	1.121817956
12.19.2020	505408	498641	1711	5056	1.042274611
1.16.2021	505408	495922	2719	6767	1.344880888
2.13.2021	505408	492795	3127	9486	1.185416389
3.13.2021	505408	489165	3630	12613	1.199403965

8.4 Appendix D: Seasonal by Type

This data was used to construct the Seasonal Tables and Graphs found in Section 6.

8.4.1 Appendix D.1: Reference - Massachusetts

These tables were constructed using the data from Massachusetts Reference Data – County and State. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Ranking Massachusetts

Point	Column1	Rank	Percent
3	5.482218	1	100.00%
2	4.828713	2	50.00%
1	3.484237	3	0.00%

Seasonal Massachusetts

Date	Population	LS2C	Infected	Uninfected	BRN
6/1/2020	7029917	6913488	19464	96965	3.48423672
8/24/2020	7029917	6846794	66694	116429	4.828713125
11/16/2020	7029917	6508293	338501	183123	5.482217882

8.4.2 Appendix D.2: Table 1 - Age

These tables were constructed using the data from Massachusetts Reference Data – Age and Massachusetts Reference Data – Cases (Report Date). LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Ranking 0-19

Point	Column1	Rank	Percent
1	7.721503	1	100.00%
2	1.757408	2	50.00%
3	0.965977	3	0.00%

Seasonal 0-19

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	1588321.07	1478572.07	7444	102305	N/A
8.12.2020	1588321.07	1560513.889	6667	21140.18105	7.721503199
11.4.2020	1588321.07	1509935.889	50578	27807.18105	1.75740847
1.27.2021	1588321.07	1464875.889	45060	78385.18105	0.96597748

Seasonal Ranking 20-29

Point	Column1	Rank	Percent
1	7.386437	1	100.00%
2	1.640609	2	50.00%
3	0.81332	3	0.00%

Seasonal 20-29

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	1026828.80	916844.80	5772	104212	N/A
8.12.2020	1026828.80	997809.35	7834	21185.44745	7.386436813
11.4.2020	1026828.80	941579.35	56230	29019.44745	1.640608559
1.27.2021	1026828.80	901431.35	40148	85249.44745	0.813319554

Seasonal Ranking 30-39

Point	Column1	Rank	Percent
1	7.808999	1	100.00%
2	1.583614	2	50.00%
3	0.734189	3	0.00%

Seasonal 30-39

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	914617.34	824648.34	4667	85302	N/A
8.12.2020	914617.34	890999.24	6288	17330.09821	7.808998539
11.4.2020	914617.34	843164.24	47835	23618.09821	1.583614383
1.27.2021	914617.34	811985.24	31179	71453.09821	0.734188705

8.4.3 Appendix D.3: Table 2 - Gender

These tables were constructed using the data from Massachusetts Reference Data – Gender and Massachusetts Reference Data – Cases (Report Date). LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Ranking Female (Method 1)

Point	Column1	Rank	Percent
1	8.339872	1	100.00%
2	1.600837	2	50.00%
3	0.753151	3	0.00%

Seasonal Female (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3562411.18	3278502.18	13419	270490	N/A
8.12.2020	3562411.18	3489132.87	18328	54950.30975	8.339871712
11.4.2020	3562411.18	3339423.87	149709	73278.30975	1.600837388
1.27.2021	3562411.18	3236970.87	102453	222987.3097	0.753150943

Seasonal Ranking Male (Method 1)

Point	Column1	Rank	Percent
1	8.474638	1	100.00%
2	1.640678	2	50.00%
3	0.797674	3	0.00%

Seasonal Male (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	3362254.48	3091207.48	13483	257564	N/A
8.12.2020	3362254.48	3292970.60	16823	52460.8822	8.474637517
11.4.2020	3362254.48	3153339.60	139631	69283.8822	1.640677512
1.27.2021	3362254.48	3052229.60	101110	208914.8822	0.79767438

Seasonal Ranking Transgender (Method 1)

Point	Column1	Rank	Percent
1	3.274081	1	100.00%
2	2.275101	2	0.00%

Seasonal Transgender (Method 1)

Date	Population	LS2C	Infected	Uninfected	BRN
Reference	39696.87	39668.87	0	28	N/A
8.12.2020	39696.87	39691.45	0	5.419372661	0
11.4.2020	39696.87	39680.45	11	5.419372661	3.274081495
1.27.2021	39696.87	39655.45	25	16.41937266	2.275101094

8.4.4 Appendix D.4: Table 3 - Race

These tables were constructed using the data from Massachusetts Reference Data – Race. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Ranking White,
Non-Hispanic

Point	Column1	Rank	Percent
2	2.845116	1	100.00%
3	1.446712	2	66.60%
4	0.572482	3	33.30%
1	0.380604	4	0.00%

Seasonal White, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	4955521.08	4917369.08	38152	0	0.380603742
8.26.2020	4955521.08	4902960.08	14409	38152	2.845115705
11.18.2020	4955521.08	4769413.08	133547	52561	1.446712447
2.10.2021	4955521.08	4696949.08	72464	186108	0.572481745

Seasonal Ranking Black or African
American, Non-Hispanic

Point	Column1	Rank	Percent
2	1.422754	1	100.00%
3	1.418643	2	66.60%
4	0.603496	3	33.30%
1	0.253247	4	0.00%

Seasonal Black or African American, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	509227.93	497903.93	11324	0	0.253247292
8.26.2020	509227.93	495099.93	2804	11324	1.422754266
11.18.2020	509227.93	478360.93	16739	14128	1.418642508
2.10.2021	509227.93	469055.93	9305	30867	0.603496079

Seasonal Ranking Hispanic

Point	Column1	Rank	Percent
2	2.283966	1	100.00%
3	1.39073	2	66.60%
1	0.648073	3	33.30%
4	0.568278	4	0.00%

Seasonal Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	859094.85	834787.85	24307	0	0.648072685
8.26.2020	859094.85	819480.85	15307	24307	2.28396564
11.18.2020	859094.85	748482.85	70998	39614	1.390730158
2.10.2021	859094.85	714907.85	33575	110612	0.568278148

Seasonal Ranking Asian, Non-Hispanic

Point	Column1	Rank	Percent
2	2.856944	1	100.00%
3	1.471938	2	66.60%
4	0.645329	3	33.30%
1	0.493215	4	0.00%

Seasonal Asian, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	492858.34	490292.34	2566	0	0.493214777
8.26.2020	492858.34	489033.34	1259	2566	2.856943554
11.18.2020	492858.34	479449.34	9584	3825	1.471937972
2.10.2021	492858.34	473507.34	5942	13409	0.645329082

Seasonal Other Race, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	N/A	N/A	6767	0	N/A
8.26.2020	N/A	N/A	4495	6767	N/A
11.18.2020	N/A	N/A	27961	11262	N/A
2.10.2021	N/A	N/A	19731	39223	N/A

Seasonal Unknown, Missing, or Refused

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	N/A	N/A	38884	0	N/A
8.26.2020	N/A	N/A	3025	38884	N/A
11.18.2020	N/A	N/A	86814	41909	N/A
2.10.2021	N/A	N/A	26060	128723	N/A

Seasonal Ranking Native Hawaiian/Pacific Islander, Non-Hispanic

Point	Column1	Rank	Percent
1	1.382053	1	100.00%
2	0.336752	2	0.00%

Seasonal Native Hawaiian/Pacific Islander, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	2694.94	2694.94	0	0	0
8.26.2020	2694.94	2694.94	0	0	0
11.18.2020	2694.94	2564.94	130	0	1.382052784
2.10.2021	2694.94	2523.94	41	130	0.336752287

Seasonal Ranking American Indian/Alaskan Native, Non-Hispanic

Point	Column1	Rank	Percent
1	1.368522	1	100.00%
2	0.334166	2	0.00%

Seasonal American Indian/Alaskan Native, Non-Hispanic

Date	Population	LS2C	Infected	Uninfected	BRN
6.3.2020	11643.81	11643.81	0	0	0
8.26.2020	11643.81	11643.81	0	0	0
11.18.2020	11643.81	11212.81	431	0	1.368521773
2.10.2021	11643.81	11075.81	137	431	0.334166499

8.4.5 Appendix D.5: Table 4 - County

These tables were constructed using the data from Massachusetts Reference Data – County and State. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Barnstable County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	212990	208293	6174	3700	N/A

Seasonal Berkshire County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	124944	122398	2771	2136	N/A

Seasonal Bristol County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	565217	534650	30889	24407	N/A

Seasonal Dukes and Nantucket County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	28731	27613	1247	785	N/A

Seasonal Essex County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	789034	736333	42443	42158	N/A

Seasonal Franklin County

Date	Population	L2C	Infected	Uninfected	BRN
12.24.2020	70180	69027	1156	824	N/A

Seasonal Hampden County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	466372	442665	22694	19358	N/A

Seasonal Hampshire County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	160830	157464	4705	2762	N/A

Seasonal Middlesex County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	1611699	1543545	57619	54987	N/A

Seasonal Norfolk County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	706775	682575	26408	19377	N/A

Seasonal Plymouth County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	521202	499634	22931	17429	N/A

Seasonal Suffolk County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	803907	753875	36773	42187	N/A

Seasonal Unknown County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	N/A	N/A	868	732	N/A

Seasonal Worcester County

Date	Population	LS2C	Infected	Uninfected	BRN
12.24.2020	830622	792707	35785	30207	N/A

8.4.6 Appendix D.6: Table 5 - Higher Education

These tables were constructed using the data from Massachusetts Reference Data – Higher Education. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Ranking Higher Education

Point	Column1	Rank	Percent
2	2.912327	1	100.00%
1	2.871637	2	0.00%

Seasonal Higher Education

Date	Population	LS2C	Infected	Uninfected	BRN
8.29.2020	505408	502949	2459	0	2.871637313
11.21.2020	505408	495922	7027	2459	2.912327171

8.5 Appendix E: Biweekly by Date

These tables were constructed using the data from Massachusetts Reference Data – Cases (Report Date), Massachusetts Reference Data – Age, Massachusetts Reference Data – Gender, Massachusetts Reference Data – Race, Massachusetts Reference Data – County and State, and Massachusetts Reference Data – Higher Education. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Biweekly Reference - Massachusetts 6/1/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6928633	4319	96965	0.531623279

Biweekly Table 3 - Race 6/3/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4928580.08	26941	0	0.163578141
Black or African American, non-Hispanic	509227.93	500018.93	9209	0	0.080398456
Hispanic	859094.85	840403.85	18691	0	0.085537646
Asian, non-Hispanic	492858.34	490927.34	1931	0	0.128936031
Other race, non-Hispanic	N/A	N/A	4644	0	N/A
Unknown, missing, or refused	N/A	N/A	40176	0	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Reference - Massachusetts 6/15/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6926370	2263	101284	0.67123609

Biweekly Table 3 - Race 6/17/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4924197.08	4383	26941	0.193086166
Black or African American, non-Hispanic	509227.93	499291.93	727	9209	0.106034308
Hispanic	859094.85	838839.85	1564	18691	0.123473988
Asian, non-Hispanic	492858.34	490679.34	248	1931	0.156266831
Other race, non-Hispanic	N/A	N/A	738	4644	N/A
Unknown, missing, or refused	N/A	N/A	-3101	40176	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Reference - Massachusetts 6/29/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6924280	2090	103547	1.129072921

Biweekly Table 3 - Race 7/1/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4922570.08	1627	31324	0.516747182
Black or African American, non-Hispanic	509227.93	498985.93	306	9936	0.606585417
Hispanic	859094.85	837961.85	878	20255	0.696914174
Asian, non-Hispanic	492858.34	490588.34	91	2179	0.5037953
Other race, non-Hispanic	N/A	N/A	224	5382	N/A
Unknown, missing, or refused	N/A	N/A	-134	37075	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Reference - Massachusetts 7/13/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6921529	2751	105637	1.432959037

Biweekly Table 3 - Race 7/15/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4921112.08	1458	32951	0.902393675
Black or African American, non-Hispanic	509227.93	498677.93	308	10242	1.027830161
Hispanic	859094.85	837179.85	782	21133	0.913975567
Asian, non-Hispanic	492858.34	490509.34	79	2270	0.872289265
Other race, non-Hispanic	N/A	N/A	307	5606	N/A
Unknown, missing, or refused	N/A	N/A	270	36941	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Reference - Massachusetts 7/27/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6917450	4079	108388	1.196447171

Biweekly Table 3 - Race 7/29/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4921112.08	1458	32951	2.585165638
Black or African American, non-Hispanic	509227.93	498677.93	308	10242	2.566151614
Hispanic	859094.85	837179.85	782	21133	3.138894876
Asian, non-Hispanic	492858.34	490509.34	79	2270	2.759989762
Other race, non-Hispanic	N/A	N/A	307	5606	N/A
Unknown, missing, or refused	N/A	N/A	270	36941	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Reference - Massachusetts 8/10/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6913488	3962	112467	1.130019875

Biweekly Table 1 - Age 8/12/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1566544.26	623	21140.18	1.347528374
20-29	1026828.80	1004765.69	864	21185.45	1.155617382
30-39	914617.34	896549.07	727	17330.10	1.212396573
40-49	841388.18	826206.76	544	14627.98	1.374057228
50-59	956483.28	940649.27	532	15292.15	1.234725863
60-69	841570.64	831170.23	302	10091.90	1.253906797
70-79	501714.18	496746.35	169	4795.73	1.219172482
80+	293459.04	289941.90	151	3363.97	0.676987944
Unknown	N/A	N/A	1	69.54	N/A

Biweekly Table 2 - Gender 8/12/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3505067.12	2148	55196.06	1.168719748
Male	3362254.48	3307860.99	1698	52695.50	1.287615085
Transgender	39696.87	39691.42	0	5.44	N/A
Unknown Sex	N/A	N/A	0	0.00	N/A

Biweekly Table 2 - Gender 8/12/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3505184.68	2135.7564	55090.74	1.16868055
Male	3362254.48	3307969.20	1688.3214	52596.96	1.287572961
Transgender	39696.87	39465.65	21.9222	209.30	1.208547455
Unknown Sex	N/A	N/A	0	0.00	N/A

Biweekly Table 3 - Race 8/12/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4917369.08	3743	34409	1.033722792
Black or African American, non-Hispanic	509227.93	497903.93	774	10550	1.01518147
Hispanic	859094.85	834787.85	2392	21915	1.325142892
Asian, non-Hispanic	492858.34	490292.34	217	2349	1.049382386
Other race, non-Hispanic	N/A	N/A	854	5913	N/A
Unknown, missing, or refused	N/A	N/A	1673	37211	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Reference - Massachusetts 8/24/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6908514	4974	116429	1.09648724

Biweekly Table 1 - Age 8/26/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1565716.26	828	21763.18	1.154962456
20-29	1026828.80	1003788.69	977	22049.45	1.173534518
30-39	914617.34	895685.07	864	18057.10	1.107141213
40-49	841388.18	825472.76	734	15171.98	1.086275319
50-59	956483.28	940003.27	646	15824.15	1.077132626
60-69	841570.64	830796.23	374	10393.90	1.162816231
70-79	501714.18	496542.35	204	4964.73	1.05375791
80+	293459.04	289840.90	101	3514.97	0.735255646
Unknown	N/A	N/A	0	70.54	N/A

Biweekly Table 2 - Gender 8/26/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3502597.12	2470	57344.06	1.079625757
Male	3362254.48	3305709.99	2151	54393.49781	1.137339659
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 8/26/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3502728.76	2455.921	57226.50	1.079585183
Male	3362254.48	3305830.47	2138.7393	54285.27912	1.137298209
Transgender	39696.87	39439.31	26.3397	231.2213132	1.094380583
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 8/26/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4915777.08	1592	38152	0.078228151
Black or African American, non-Hispanic	509227.93	497603.93	300	11324	0.471660309
Hispanic	859094.85	833092.85	1695	24307	0.776625572
Asian, non-Hispanic	492858.34	490200.34	92	2566	0.344902139
Other race, non-Hispanic	N/A	N/A	455	6767	N/A
Unknown, missing, or refused	N/A	N/A	622	38884	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 8/29/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	505262	146	0	2.432209455

Biweekly Reference - Massachusetts 9/7/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6903859	4655	121403	1.228382727

Biweekly Table 1 - Age 9/9/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1564892.26	824	22591.18105	1.05429245
20-29	1026828.80	1002653.69	1135	23026.44745	1.17976438
30-39	914617.34	894824.07	861	18921.09821	1.032192802
40-49	841388.18	824844.76	628	15905.98284	1.02230322
50-59	956483.28	939402.27	601	16470.14693	1.008384777
60-69	841570.64	830394.23	402	10767.90394	1.04088525
70-79	501714.18	496357.35	185	5168.7347	0.917248521
80+	293459.04	289758.90	82	3615.96798	1.140057707
Unknown	N/A	N/A	2	70.53690109	N/A

Biweekly Table 2 - Gender 9/9/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3500165.12	2432	59814.05858	1.035224352
Male	3362254.48	3303556.99	2153	56544.49781	1.078304354
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	0.00	0	0	N/A

Biweekly Table 2 - Gender 9/9/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3500310.62	2418.1376	59682.42057	1.03518132
Male	3362254.48	3303689.74	2140.7279	56424.01842	1.078261024
Transgender	39696.87	39413.17	26.1345	257.5610132	1.044396262
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 9/9/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4916955.08	-1178	39744	1.553150085
Black or African American, non-Hispanic	509227.93	497408.93	195	11624	1.133375962
Hispanic	859094.85	831709.85	1383	26002	1.107090109
Asian, non-Hispanic	492858.34	490186.34	14	2658	1.783252696
Other race, non-Hispanic	N/A	N/A	327	7222	N/A
Unknown, missing, or refused	N/A	N/A	-4354	39506	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 9/12/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	504907	355	146	1.350640258

Biweekly Reference - Massachusetts 9/21/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	504907	355	146	1.350640258

Biweekly Table 1 - Age 9/23/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1564000.26	892	23415.18105	1.466511577
20-29	1026828.80	1001355.69	1298	24161.44745	1.283378794
30-39	914617.34	893943.07	881	19782.09821	1.307394279
40-49	841388.18	824107.76	737	16533.98284	1.303698413
50-59	956483.28	938768.27	634	17071.14693	1.29194427
60-69	841570.64	829999.23	395	11169.90394	1.23657605
70-79	501714.18	496189.35	168	5353.7347	1.317625713
80+	293459.04	289634.90	124	3697.96798	1.539478805
Unknown	N/A	N/A	3	72.53690109	N/A

Biweekly Table 2 - Gender 9/23/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3497611.12	2554	62246.05858	1.304106706
Male	3362254.48	3301149.99	2407	58697.49781	1.386826532
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 9/23/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3497771.18	2539.4422	62100.55817	1.30404703
Male	3362254.48	3301296.46	2393.2801	58564.74632	1.386765002
Transgender	39696.87	39384.89	28.2777	283.6955132	1.329640782
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 9/23/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4915139.08	1816	38566	7.270848093
Black or African American, non-Hispanic	509227.93	497055.93	353	11819	1.665728061
Hispanic	859094.85	829793.85	1916	27385	1.426965728
Asian, non-Hispanic	492858.34	490012.34	174	2672	2.284468209
Other race, non-Hispanic	N/A	N/A	617	7549	N/A
Unknown, missing, or refused	N/A	N/A	493	35152	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 9/26/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	504586	321	501	1.001629058

Biweekly Reference - Massachusetts 10/5/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6888691	8207	133019	1.562238687

Biweekly Table 1 - Age 10/7/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1562414.26	1586	24307.18105	1.435849253
20-29	1026828.80	999608.69	1747	25459.44745	1.200966018
30-39	914617.34	892598.07	1345	20663.09821	1.360240854
40-49	841388.18	823101.76	1006	17270.98284	1.42394813
50-59	956483.28	937836.27	932	17705.14693	1.475118148
60-69	841570.64	829422.23	577	11564.90394	1.408187843
70-79	501714.18	495897.35	292	5521.7347	1.53079133
80+	293459.04	289445.90	189	3821.96798	1.574243896
Unknown	N/A	N/A	2	75.53690109	N/A

Biweekly Table 2 - Gender 10/7/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3493781.12	3830	64800.05858	1.393384996
Male	3362254.48	3297347.99	3802	61104.49781	1.381804639
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 10/7/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3493963.01	3808.169	64640.00037	1.393312459
Male	3362254.48	3297516.13	3780.3286	60958.02642	1.38173418
Transgender	39696.87	39341.39	43.5024	311.9732132	1.373211564
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly 3 - Race 10/7/202

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4912354.08	2785	40382	1.361128539
Black or African American, non-Hispanic	509227.93	496517.93	538	12172	1.235091968
Hispanic	859094.85	827162.85	2631	29301	1.316814052
Asian, non-Hispanic	492858.34	489759.34	253	2846	1.258498682
Other race, non-Hispanic	N/A	N/A	817	8166	N/A
Unknown, missing, or refused	N/A	N/A	956	35645	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 10/10/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	504231	355	822	1.149125802

Biweekly Reference - Massachusetts 10/19/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6873678	15013	141226	1.845362646

Biweekly Table 1 - Age 10/21/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1560500.26	1914	25893.18105	1.418561617
20-29	1026828.80	997795.69	1813	27206.44745	1.392461081
30-39	914617.34	890988.07	1610	22008.09821	1.567050115
40-49	841388.18	821679.76	1422	18276.98284	1.608939357
50-59	956483.28	936503.27	1333	18637.14693	1.55747904
60-69	841570.64	828650.23	772	12141.90394	1.701436758
70-79	501714.18	495493.35	404	5813.7347	1.606121431
80+	293459.04	289148.90	297	4010.96798	1.545330565
Unknown	N/A	N/A	19	77.53690109	N/A

Biweekly Table 2 - Gender 10/21/2020 (Method 1)

Gende	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3488887.12	4894	68630.05858	1.534068559
Male	3362254.48	3292735.99	4612	64906.49781	1.49489732
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 10/21/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3489096.91	4866.1042	68448.16937	1.533976321
Male	3362254.48	3292930.42	4585.7116	64738.35502	1.494809054
Transgender	39696.87	39287.21	54.1842	355.4756132	1.499014722
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 10/21/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4908931.08	3423	43167	1.527570422
Black or African American, non-Hispanic	509227.93	495982.93	535	12710	1.356819244
Hispanic	859094.85	824028.85	3134	31932	1.389228518
Asian, non-Hispanic	492858.34	489478.34	281	3099	1.368938681
Other race, non-Hispanic	N/A	N/A	949	8983	N/A
Unknown, missing, or refused	N/A	N/A	1352	36601	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 10/24/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	503811	420	1177	1.659437076

Biweekly Reference - Massachusetts 11/2/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6846794	26884	156239	1.535793319

Biweekly Table 1 - Age 11/4/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1557536.26	2964	27807.18105	1.700026559
20-29	1026828.80	994791.69	3004	29019.44745	2.075981008
30-39	914617.34	888087.07	2901	23618.09821	1.857470815
40-49	841388.18	819286.76	2393	19698.98284	1.805755639
50-59	956483.28	934382.27	2121	19970.14693	1.865040175
60-69	841570.64	827162.23	1488	12913.90394	1.896631248
70-79	501714.18	494793.35	700	6217.7347	1.76896699
80+	293459.04	288705.90	443	4307.96798	1.863974459
Unknown	N/A	N/A	18	96.53690109	N/A

Biweekly Table 2 - Gender 11/4/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3480674.12	8213	73524.05858	1.850031424
Male	3362254.48	3285029.99	7706	69518.49781	1.860477977
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 11/4/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3480930.72	8166.1859	73314.27357	1.849895048
Male	3362254.48	3285268.34	7662.0758	69324.06662	1.860342994
Transgender	39696.87	39196.47	90.7383	409.6598132	1.835646584
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 11/4/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4902960.08	5971	46590	1.722119274
Black or African American, non-Hispanic	509227.93	495099.93	883	13245	1.631295264
Hispanic	859094.85	819480.85	4548	35066	1.620546965
Asian, non-Hispanic	492858.34	489033.34	445	3380	1.678314404
Other race, non-Hispanic	N/A	N/A	1330	9932	N/A
Unknown, missing, or refused	N/A	N/A	3956	37953	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 11/7/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	502949	862	1597	1.810681722

Biweekly Reference - Massachusetts 11/16/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6811009	35785	183123	1.617259741

Biweekly Table 1 - Age 11/18/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1552368.26	5168	30771.18105	1.415715208
20-29	1026828.80	988107.69	6684	32023.44745	1.509116826
30-39	914617.34	882852.07	5235	26519.09821	1.455160124
40-49	841388.18	814971.76	4315	22091.98284	1.445964315
50-59	956483.28	930210.27	4172	22091.14693	1.559277615
60-69	841570.64	824437.23	2725	14401.90394	1.530082603
70-79	501714.18	493567.35	1226	6917.7347	1.625565166
80+	293459.04	287791.90	914	4750.96798	1.704245377
Unknown	N/A	N/A	23	114.5369011	N/A

Biweekly Table 2 - Gender 11/18/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3465195.12	15479	81737.05858	1.489013482
Male	3362254.48	3270344.99	14685	77224.49781	1.488319428
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 11/18/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3465539.95	15390.7697	81480.45947	1.488865322
Male	3362254.48	3270667.05	14601.2955	76986.14242	1.488172874
Transgender	39696.87	39024.53	171.9348	500.3981132	1.472964833
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 11/18/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4892925.08	10035	52561	1.477933898
Black or African American, non-Hispanic	509227.93	493733.93	1366	14128	1.419353066
Hispanic	859094.85	812153.85	7327	39614	1.331979446
Asian, non-Hispanic	492858.34	488269.34	764	3825	1.464420985
Other race, non-Hispanic	N/A	N/A	2313	11262	N/A
Unknown, missing, or refused	N/A	N/A	10764	41909	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 11/21/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	501501	1448	2459	1.133000961

Biweekly Reference - Massachusetts 11/30/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6748598	62411	218908	1.332404033

Biweekly Table 1 - Age 12/2/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1546284.26	6084	35939.18105	1.598747165
20-29	1026828.80	980722.69	7385	38707.44745	1.542797192
30-39	914617.34	876659.07	6193	31754.09821	1.573347156
40-49	841388.18	809891.76	5080	26406.98284	1.595765482
50-59	956483.28	924839.27	5371	26263.14693	1.647722442
60-69	841570.64	820847.23	3590	17126.90394	1.63195194
70-79	501714.18	491713.35	1854	8143.7347	1.632541976
80+	293459.04	286437.90	1354	5664.96798	1.638857661
Unknown	N/A	N/A	49	137.5369011	N/A

Biweekly Table 2 - Gender 12/2/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3446359.12	18836	97216.05858	1.597005711
Male	3362254.48	3252615.99	17729	91909.49781	1.585226965
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 12/2/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3446811.32	18728.6348	96871.22917	1.596796196
Male	3362254.48	3253039.10	17627.9447	91587.43792	1.585020778
Transgender	39696.87	38816.11	208.4205	672.3329132	1.574350723
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 12/2/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4879603.08	13322	62596	1.67801682
Black or African American, non-Hispanic	509227.93	492004.93	1729	15494	1.752319908
Hispanic	859094.85	804527.85	7626	46941	1.638050356
Asian, non-Hispanic	492858.34	487279.34	990	4589	1.637694395
Other race, non-Hispanic	N/A	N/A	3108	13575	N/A
Unknown, missing, or refused	N/A	N/A	11589	52673	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 5 - Higher Education 12/5/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	500352	1149	3907	0.897309192

Biweekly Reference - Massachusetts 12/14/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6685408	63190	281319	1.189275989

Biweekly Table 1 - Age 12/16/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1534855.26	11429	42023.18105	1.272906034
20-29	1026828.80	967376.69	13346	46092.44745	1.228629742
30-39	914617.34	865618.07	11041	37947.09821	1.257087835
40-49	841388.18	800540.76	9351	31486.98284	1.29544576
50-59	956483.28	915006.27	9833	31634.14693	1.317387754
60-69	841570.64	814385.23	6462	20716.90394	1.336960465
70-79	501714.18	488639.35	3074	9997.7347	1.321367054
80+	293459.04	284163.90	2274	7018.96798	1.37115942
Unknown	N/A	N/A	15	186.5369011	N/A

Biweekly Table 2 - Gender 12/16/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3412179.12	34180	116052.0586	1.278962098
Male	3362254.48	3220636.99	31979	109638.4978	1.281085487
Transgender	39696.87	39691.42	0	5.443609185	N/A
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 2 - Gender 12/16/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3412826.14	33985.174	115599.864	1.282192199
Male	3362254.48	3221242.38	31796.7197	109215.3826	1.2843379
Transgender	39696.87	38439.01	377.1063	880.7534132	0.665121642
Unknown Sex	N/A	N/A	0	0	N/A

Biweekly Table 3 - Race 12/16/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4854332.08	25271	75918	1.366143769
Black or African American, non-Hispanic	509227.93	488493.93	3511	17223	1.319965817
Hispanic	859094.85	789215.85	15312	54567	1.330377336
Asian, non-Hispanic	492858.34	485429.34	1850	5579	1.260549939
Other race, non-Hispanic	N/A	N/A	5771	16683	N/A
Unknown, missing, or refused	N/A	N/A	18165	64262	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Biweekly Table 4 - County 12/24/2020

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	208293	997	3700	1.167163351
Berkshire County	124944	122398	410	2136	1.508793664
Bristol County	565217	534650	6160	24407	1.106083348
Dukes and Nantucket Counties	28731	27613	333	785	0.696783373
Essex County	789034	736333	10543	42158	0.919114838
Franklin County	70180	69027	329	824	0.584063775
Hampden County	466372	442665	4349	19358	1.03320598
Hampshire County	160830	157464	604	2762	1.330833046
Middlesex County	1611699	1543545	13167	54987	0.949865501
Norfolk County	706775	682575	4823	19377	1.091273601
Plymouth County	521202	499634	4139	17429	1.161623451
Suffolk County	803907	753875	7845	42187	0.992013038
Unknown County	N/A	N/A	196	732	N/A
Worcester County	830622	792707	7708	30207	1.039401464

Biweekly Table 5 - Higher Education 12/19/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	499194	1158	5056	0.750888011

Biweekly Reference - Massachusetts 12/28/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6606544	78864	344509	1.059634408

Biweekly Table 1 - Age 12/30/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1524742.26	10113	53452.18105	1.205675335
20-29	1026828.80	956726.69	10650	59438.44745	1.15445266
30-39	914617.34	856155.07	9463	48988.09821	1.170455293
40-49	841388.18	792104.76	8436	40837.98284	1.175564589
50-59	956483.28	905678.27	9328	41467.14693	1.178510859
60-69	841570.64	807842.23	6543	27178.90394	1.175444648
70-79	501714.18	485371.35	3268	13071.7347	1.194377074
80+	293459.04	281620.90	2543	9292.96798	1.207956707
Unknown	N/A	N/A	38	201.5369011	N/A

Biweekly Table 2 - Gender 12/30/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3381413.12	30766	150232.0586	1.184192245
Male	3362254.48	3191617.99	29019	141617.4978	1.16630918
Transgender	39696.87	39691.42	2	5.443609185	4.500617167
Unknown Sex	N/A	N/A	4	0	N/A

Biweekly Table 2 - Gender 12/30/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3382060.14	30766	149585.038	1.187528062
Male	3362254.48	3192223.38	29019	141012.1023	1.169583057
Transgender	39696.87	38439.01	2	1257.859713	0.024516901
Unknown Sex	N/A	N/A	4	0	N/A

Biweekly Table 3 - Race 12/30/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4827956.08	26376	101189	1.165757367
Black or African American, non-Hispanic	509227.93	485369.93	3124	20734	1.077300374
Hispanic	859094.85	776493.85	12722	69879	1.11158634
Asian, non-Hispanic	492858.34	483753.34	1676	7429	1.127754002
Other race, non-Hispanic	N/A	N/A	4733	22454	N/A
Unknown, missing, or refused	N/A	N/A	14757	82427	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2587.94	107	0	1.148399811
American Indian/Alaskan Native, non-Hispanic	11643.81	11332.81	311	0	1.209144481

Biweekly Table 4 - County 1/7/2021

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	207155	1138	4697	1.307000511
Berkshire County	124944	121792	606	2546	1.542859182
Bristol County	565217	528205	6445	30567	1.232470831
Dukes and Nantucket Counties	28731	27390	223	1118	1.060279181
Essex County	789034	727290	9043	52701	1.093703217
Franklin County	70180	68838	189	1153	0.91321564
Hampden County	466372	438400	4265	23707	1.22410409
Hampshire County	160830	156677	787	3366	1.300291096
Middlesex County	1611699	1531567	11978	68154	1.092998549
Norfolk County	706775	677492	5083	24200	1.228677434
Plymouth County	521202	495025	4609	21568	1.297444913
Suffolk County	803907	746577	7298	50032	1.165675639
Unknown County	N/A	N/A	258	928	N/A
Worcester County	830622	785061	7646	37915	1.138865711

Biweekly Table 5 - Higher Education 1/2/2021

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	498641	553	6214	1.018902351

Biweekly Reference - Massachusetts 1/11/2021

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6543948	62596	423373	0.783719422

8.6 Appendix F: Monthly by Date

These tables were constructed using the data from Massachusetts Reference Data – Cases (Report Date), Massachusetts Reference Data – Age, Massachusetts Reference Data – Gender, Massachusetts Reference Data – Race, Massachusetts Reference Data – County and State, and Massachusetts Reference Data – Higher Education. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Monthly Reference - Massachusetts 6/1/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6926370	6582	96965	0.746486082

Monthly Table 3 - Race 6/3/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4924197.08	31324	0	0.099113281
Black or African American, non-Hispanic	509227.93	499291.93	9936	0	0.063025233
Hispanic	859094.85	838839.85	20255	0	0.083933996
Asian, non-Hispanic	492858.34	490679.34	2179	0	0.078363898
Other race, non-Hispanic	N/A	N/A	5382	0	N/A
Unknown, missing, or refused	N/A	N/A	37075	0	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Reference - Massachusetts 6/29/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6921529	4841	103547	1.145384423

Monthly Table 3 - Race 7/1/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4921112.08	3085	31324	0.199823947
Black or African American, non-Hispanic	509227.93	498677.93	614	9936	0.134347341
Hispanic	859094.85	837179.85	1660	20255	0.189736249
Asian, non-Hispanic	492858.34	490509.34	170	2179	0.165539934
Other race, non-Hispanic	N/A	N/A	531	5382	N/A
Unknown, missing, or refused	N/A	N/A	136	37075	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Reference - Massachusetts 7/27/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6913488	8041	108388	1.394781694

Monthly Table 1 - Age 8/12/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1566082.67	1451	20774.26	1.199426074
20-29	1026828.80	1003812.91	1841	21161.50	1.351865808
30-39	914617.34	895856.34	1591	17159.15	0.604479788
40-49	841388.18	825536.95	1278	14564.01	1.088583349
50-59	956483.28	939843.50	1178	15452.00	1.066948625
60-69	841570.64	830613.00	676	10275.14	1.194547651
70-79	501714.18	496386.18	373	4951.87	0.956538755
80+	293459.04	289713.99	252	3490.84	0.828027387
Unknown	N/A	N/A	1	68.23	N/A

Monthly Table 2 - Gender 8/12/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3502411.07	4618.00	55382.11	1.09818441
Male	3362254.48	3306533.91	3849.00	51871.58	1.204687856
Transgender	39696.87	39118.66	0.00	578.20	N/A
Unknown Sex	N/A	N/A	0.00	65.11	N/A

Monthly Table 2 - Gender 8/12/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3502441.58	4591.68	55377.93	1.098174844
Male	3362254.48	3306557.28	3827.06	51870.14	1.20467934
Transgender	39696.87	39064.78	48.26	583.82	1.145678364
Unknown Sex	N/A	N/A	0.00	65.11	N/A

Monthly Table 3 - Race 7/29/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4917369.08	3743	34409	0.613540215
Black or African American, non-Hispanic	509227.93	497903.93	774	10550	0.935058575
Hispanic	859094.85	834787.85	2392	21915	1.389257934
Asian, non-Hispanic	492858.34	490292.34	217	2349	0.838993428
Other race, non-Hispanic	N/A	N/A	854	5913	N/A
Unknown, missing, or refused	N/A	N/A	1673	37211	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Reference - Massachusetts 8/24/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6903859	9629	116429	1.428962648

Monthly Table 1 - Age 9/9/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1564366.67	1716	22225.26	1.67220402
20-29	1026828.80	1001379.91	2433	23002.50	1.437834586
30-39	914617.34	894914.34	942	18750.15	1.572364324
40-49	841388.18	824171.95	1365	15842.01	1.117454496
50-59	956483.28	938608.50	1235	16630.00	1.478099339
60-69	841570.64	829816.00	797	10951.14	1.477528081
70-79	501714.18	496033.18	353	5324.87	1.461451874
80+	293459.04	289507.99	206	3742.84	1.531537206
Unknown	N/A	N/A	5	69.23	N/A

Monthly Table 2 - Gender 9/9/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3497425.07	4986	60000.11	1.454055497
Male	3362254.48	3301973.91	4560	55720.58	1.571037066
Transgender	39696.87	39118.66	0	578.20	N/A
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 2 - Gender 9/9/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3497484.00	4957.5798	59969.60	1.454030098
Male	3362254.48	3302023.27	4534.008	55697.20	1.571014456
Transgender	39696.87	39010.37	54.4122	632.09	1.507426755
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 3 - Race 8/26/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4916955.08	414	38152	1.215861201
Black or African American, non-Hispanic	509227.93	497408.93	495	11324	1.118150458
Hispanic	859094.85	831709.85	3078	24307	1.439865058
Asian, non-Hispanic	492858.34	490186.34	106	2566	1.659149773
Other race, non-Hispanic	N/A	N/A	782	6767	N/A
Unknown, missing, or refused	N/A	N/A	-3732	38884	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Table 5 - Higher Education 8/29/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	504907	501	0	1.350640258

Monthly Reference - Massachusetts 9/21/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6888691	15168	126058	2.348465435

Monthly Table 1 - Age 10/7/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1560866.67	3500	23941.25912	2.269286356
20-29	1026828.80	997819.91	3560	25435.49838	2.274845555
30-39	914617.34	891959.34	2955	19692.14613	2.918331847
40-49	841388.18	822643.95	1528	17207.01361	2.911738724
50-59	956483.28	936343.50	2265	17865.00379	2.497735353
60-69	841570.64	828467.00	1349	11748.14086	2.632792487
70-79	501714.18	495337.18	696	5677.870221	2.531702384
80+	293459.04	289021.99	486	3948.839046	2.704181536
Unknown	N/A	N/A	21	74.22883598	N/A

Monthly Table 2 - Gender 10/7/2020 (Method 1)

Age	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3488701.07	8724	64986.11	2.414361662
Male	3362254.48	3293559.90	8414	60280.58	256.833927
Transgender	39696.87	39118.66	0	578.20	N/A
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 2 - Gender 10/7/2020 (Method 2)

Age	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3488809.71	8674.2732	64927.20	2.414281728
Male	3362254.48	3293657.24	8366.0402	60231.20	2.423820663
Transgender	39696.87	38912.68	97.6866	686.50	2.416957769

Monthly Table 3 - Race 9/23/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4912354.08	4601	38566	1.614059899
Black or African American, non-Hispanic	509227.93	496517.93	891	11819	1.055197066
Hispanic	859094.85	827162.85	4547	27385	1.04623203
Asian, non-Hispanic	492858.34	489759.34	427	2672	1.336735345
Other race, non-Hispanic	N/A	N/A	1434	7549	N/A
Unknown, missing, or refused	N/A	N/A	1449	35152	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Table 5 - Higher Education 9/26/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	504231	676	501	1.667434543

Monthly Reference - Massachusetts 10/19/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6846794	41897	141226	2.563922722

Monthly Table 1 - Age 11/4/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1552734.67	8132	27441.25912	2.255222304
20-29	1026828.80	988131.91	9688	28995.49838	2.386040052
30-39	914617.34	883823.34	8136	22647.14613	2.367138823
40-49	841388.18	815935.95	6708	18735.01361	2.646722677
50-59	956483.28	930050.50	6293	20130.00379	2.583309416
60-69	841570.64	824254.00	4213	13097.14086	2.618606883
70-79	501714.18	493411.18	1926	6373.870221	2.658023436
80+	293459.04	287664.99	1357	4434.839046	2.759308806
Unknown	N/A	N/A	41	95.22883598	N/A

Monthly Table 2 - Gender 11/4/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3465009.07	23692	73710.11	2.432881216
Male	3362254.48	37889.58	22391	68694.58	207.6915618
Transgender	39696.87	39118.66	0	578.20	N/A
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 2 - Gender 11/4/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3465252.72	23556.9556	73601.50	2.432707048
Male	3362254.48	3271393.91	22263.3713	68597.20	2.405520764
Transgender	39696.87	38650.00	262.6731	784.19	2.417522645
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 3 - Race 10/21/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4908931.08	9394	43167	2.36240338
Black or African American, non-Hispanic	509227.93	495982.9278	1418	12710	2.006720496
Hispanic	859094.85	824028.8459	7682	31932	1.929693138
Asian, non-Hispanic	492858.34	489478.3353	726	3099	2.165763374
Other race, non-Hispanic	N/A	N/A	2279	8983	N/A
Unknown, missing, or refused	N/A	N/A	5308	36601	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Table 5 - Higher Education 10/24/202

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	502949	1282	1177	1.990789104

Monthly Reference - Massachusetts 11/16/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6746192	100602	183123	1.780664974

Monthly Table 1 - Age 12/2/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1535221.67	17513	35573.25912	1.712384439
20-29	1026828.80	967400.91	20731	38683.49838	1.624021063
30-39	914617.34	866589.34	17234	30783.14613	1.651525144
40-49	841388.18	801504.95	14431	25443.01361	1.694196828
50-59	956483.28	914846.50	15204	26423.00379	1.779369843
60-69	841570.64	814202.00	10052	17310.14086	1.79159772
70-79	501714.18	488483.18	4928	8299.870221	1.836586623
80+	293459.04	284036.99	3628	5791.839046	1.909243647
Unknown	N/A	N/A	64	136.228836	N/A

Monthly Table 2 - Gender 12/2/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3411993.07	53016	97402.11	1.715237968
Male	3362254.48	3221460.90	49708	91085.58	-45.10777498
Transgender	39696.87	39118.66	0	578.20	N/A
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 2 - Gender 12/2/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3412538.87	52713.8088	97158.50	1.720656782
Male	3362254.48	3221969.62	49424.6644	90860.20	1.702501555
Transgender	39696.87	38064.48	585.5268	1046.86	0.733445895
Unknown Sex	N/A	N/A	0	65.11	N/A

Monthly Table 3 - Race 11/18/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4879603.08	23357	52561	2.510910442
Black or African American, non-Hispanic	509227.93	492004.93	3095	14128	2.433972079
Hispanic	859094.85	804527.85	14953	39614	2.242503
Asian, non-Hispanic	492858.34	487279.34	1754	3825	2.334898047
Other race, non-Hispanic	N/A	N/A	5421	11262	N/A
Unknown, missing, or refused	N/A	N/A	22353	41909	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Monthly Table 5 - Higher Education 11/21/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	500352	2597	2459	1.121817956

Monthly Reference - Massachusetts 12/14/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6603292	142900	283725	1.075970937

Monthly Table 1 - Age 12/30/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1510288.67	24933	53086.25912	1.13048155
20-29	1026828.80	941589.91	25811	59414.49838	1.043477063
30-39	914617.34	844124.34	22465	48017.14613	1.032499342
40-49	841388.18	781819.95	19685	39874.01361	1.054583373
50-59	956483.28	893464.50	21382	41627.00379	1.067168072
60-69	841570.64	799528.00	14674	27362.14086	1.063141673
70-79	501714.18	481155.18	7328	13227.87022	1.079482561
80+	293459.04	278452.99	5584	9419.839046	1.081690978
Unknown	N/A	N/A	98	200.228836	N/A

Monthly Table 2 - Gender 12/30/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3338992.07	73001	150418.11	1.05813247
Male	3362254.48	3153928.90	67532	140793.58	1.072545057
Transgender	39696.87	39096.67	11	589.20	N/A
Unknown Sex	N/A	N/A	825	65.11	N/A

Monthly Table 2 - Gender 12/30/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3339537.68	73001	149872.50	1.060502709
Male	3362254.48	3154437.28	67532	140285.20	1.074970071
Transgender	39696.87	38053.48	11	1632.39	0.038478261
...					

Monthly Table 4 - County 12/24/2020

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	208293	2135	3700	1.876510897
Berkshire County	124944	122398	1016	2136	2.028540557
Bristol County	565217	534650	12605	24407	1.658430684
Dukes and Nantucket Counties	28731	27613	556	785	1.41663588
Essex County	789034	736333	19586	42158	1.40317641
Franklin County	70180	69027	518	824	1.252233402
Hampden County	466372	442665	8614	19358	1.711690809
Hampshire County	160830	157464	1391	2762	1.77327376
Middlesex County	1611699	1543545	25145	54987	1.448943035
Norfolk County	706775	682575	9906	19377	1.747602976
Plymouth County	521202	499634	8748	17429	1.762581193
Suffolk County	803907	753875	15143	42187	1.578670201
Unknown County	N/A	N/A	454	732	N/A
Worcester County	830622	792707	15354	30207	1.519196216

Monthly Table 5 - Higher Education 12/19/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	498641	1711	5056	1.042274611

Monthly Reference - Massachusetts 1/11/2021

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6500091	103201	426625	0.644320147

Monthly Table 1 - Age 1/27/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1489594.67	20694	78019.25912	0.739876417
20-29	1026828.80	922866.91	18723	85225.49838	0.702583622
30-39	914617.34	828759.34	15365	70482.14613	0.657928918
40-49	841388.18	768073.95	13746	59559.01361	0.642997681
50-59	956483.28	878375.50	15089	63009.00379	0.640646561
60-69	841570.64	789228.00	10300	42036.14086	0.624233911
70-79	501714.18	475795.18	5360	20555.87022	0.614750357
80+	293459.04	274581.99	3871	15003.83905	0.573314799
Unknown	N/A	N/A	38	298.228836	N/A

Monthly Table 2 - Gender 1/27/2020

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3287013.07	51979	223419.11	0.655152362
Male	3362254.48	3103506.90	50422	208325.58	0.678621083
Transgender	39696.87	39085.67	11	600.20	N/A
Unknown Sex	N/A	N/A	2955	890.11	N/A

Monthly Table 2 - Gender 1/27/2020

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3287558.68	51979	222873.50	0.655043631
Male	3362254.48	3104015.28	50422	207817.20	0.678509938
Transgender	39696.87	38042.48	11	1643.39	0.853762861
Unknown Sex	N/A	N/A	2955	890.11	N/A

Monthly Table 3 - Race 1/13/2021

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4769413.08	58543	127565	0.822409901
Black or African American, non-Hispanic	509227.93	478360.93	7009	23858	0.850123258
Hispanic	859094.85	748482.85	28011	82601	0.83827276
Asian, non-Hispanic	492858.34	479449.34	4304	9105	0.863729016
Other race, non-Hispanic	N/A	N/A	12036	27187	N/A
Unknown, missing, or refused	N/A	N/A	31539	97184	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2564.94	23	107	0.355615921
American Indian/Alaskan Native, non-Hispanic	11643.81	11212.81	120	311	0.426458369

Monthly Table 4 - County 1/21/2021

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	204375	2780	5835	1.192382268
Berkshire County	124944	120379	1413	3152	1.100474389
Bristol County	565217	514876	13329	37012	1.015854998
Dukes and Nantucket Counties	28731	26856	534	1341	0.966009397
Essex County	789034	710686	16604	61744	0.967051465
Franklin County	70180	68389	449	1342	0.917000554
Hampden County	466372	428670	9730	27972	1.054632782
Hampshire County	160830	155049	1628	4153	1.100337805
Middlesex County	1611699	1508652	22915	80132	1.001964936
Norfolk County	706775	665856	11636	29283	1.030825108
Plymouth County	521202	484853	10172	26177	1.046842061
Suffolk County	803907	731457	15120	57330	1.040798367
Unknown County	N/A	N/A	335	1186	N/A
Worcester County	830622	770446	14615	45561	0.983355052

Monthly Table 5 - Higher Education 1/16/2021

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	495922	2719	6767	1.344880888

Monthly Reference - Massachusetts 2/8/2021

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6456675	43416	529826	0.685422952

Monthly Table 1 - Age 2/24/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1478628.67	10966	98713.25912	0.826708694
20-29	1026828.80	913468.91	9398	103948.4984	0.856434867
30-39	914617.34	821571.34	7188	85847.14613	0.780605427
40-49	841388.18	762196.95	5877	73305.01361	0.730250639
50-59	956483.28	872007.50	6368	78098.00379	0.687508632
60-69	841570.64	784908.00	4320	52336.14086	0.626299867
70-79	501714.18	473758.18	2037	25915.87022	0.489918731
80+	293459.04	273380.99	1201	18874.83905	0.382435399
Unknown	N/A	N/A	17	336.228836	N/A

Monthly Table 2 - Gender 2/24/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3263441.07	23572	275398.11	0.729282474
Male	3362254.48	3080042.90	23464	258747.58	0.748887903
Transgender	39696.87	39078.67	7	611.20	N/A
Unknown Sex	N/A	N/A	327	3845.11	N/A

Monthly Table 2 - Gender 2/24/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3263986.68	23572	274852.50	0.729160566
Male	3362254.48	3080551.28	23464	258239.20	0.748764315
Transgender	39696.87	38035.48	7	1654.39	0.811751098
Unknown Sex	N/A	N/A	327	3845.11	N/A

Monthly Table 3 - Race 2/10/2021

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4740738.08	28675	186108	0.592633194
Black or African American, non-Hispanic	509227.93	474473.93	3887	30867	0.628424987
Hispanic	859094.85	735561.85	12921	110612	0.630424821
Asian, non-Hispanic	492858.34	477174.34	2275	13409	0.63001995
Other race, non-Hispanic	N/A	N/A	7189	39223	N/A
Unknown, missing, or refused	N/A	N/A	9357	128723	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2543.94	21	130	0.914898963
American Indian/Alaskan Native, non-Hispanic	11643.81	11155.81	57	431	0.654551334

Monthly Table 4 - County 2/18/2021

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	201229	1887	9874	1.58640772
Berkshire County	124944	119460	577	4907	1.764585077
Bristol County	565217	506066	3855	55296	0.868937978
Dukes and Nantucket Counties	28731	26487	212	2032	1.464718541
Essex County	789034	699364	5069	84601	0.914589702
Franklin County	70180	67994	206	1980	1.124988775
Hampden County	466372	420666	3654	42052	0.931267276
Hampshire County	160830	152473	890	7467	0.556809393
Middlesex County	1611699	1489504	9589	112606	1.085433246
Norfolk County	706775	656929	4061	45785	0.897891024
Plymouth County	521202	477303	3539	40360	0.96347358
Suffolk County	803907	719051	5896	78960	1.012564278
Unknown County	N/A	N/A	22	1600	N/A
Worcester County	830622	760067	4563	65992	0.85738844

Monthly Table 5 - Higher Education 2/13/2021

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	492795	3127	9486	1.185416389

Monthly Reference - Massachusetts 3/8/2021

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6407791	48884	573242	1.23526116

Monthly Table 1 - Age 3/24/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1465228.67	13400	109679.2591	1.324614325
20-29	1026828.80	901441.91	12027	113346.4984	1.457747029
30-39	914617.34	812945.34	8626	93035.14613	1.350142077
40-49	841388.18	755092.95	7104	79182.01361	1.3469245
50-59	956483.28	864926.50	7081	84466.00379	1.229673233
60-69	841570.64	780688.00	4220	56656.14086	1.053032506
70-79	501714.18	472373.18	1385	27952.87022	0.722154117
80+	293459.04	272774.99	606	20075.83905	0.542840894
Unknown	N/A	N/A	51	353.228836	N/A

Monthly Table 2 - Gender 3/24/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3236539.07	26902	298970.11	1.256178416
Male	3362254.48	3052818.90	27224	282211.58	1.27784867
Transgender	39696.87	39071.67	7	618.20	N/A
Unknown Sex	N/A	N/A	366	4172.11	N/A

Monthly Table 2 - Gender 3/24/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3263986.68	23572	274852.50	0.729160566
Male	3362254.48	3080551.28	23464	258239.20	0.748764315
Transgender	39696.87	38035.48	7	1654.39	0.811751098
Unknown Sex	N/A	N/A	327	3845.11	N/A

Monthly Table 3 - Race 3/10/2021

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4719965.08	20773	214783	0.929751396
Black or African American, non-Hispanic	509227.93	471980.93	2493	34754	0.91623333
Hispanic	859094.85	726388.85	9173	123533	1.10560952
Asian, non-Hispanic	492858.34	475436.34	1738	15684	0.94726499
Other race, non-Hispanic	N/A	N/A	5433	46412	N/A
Unknown, missing, or refused	N/A	N/A	6250	138080	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2526.94	17	151	0.561307113
American Indian/Alaskan Native, non-Hispanic	11643.81	11101.81	54	488	0.755906929

Monthly Table 4 - County 3/18/2021

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	201229	1887	9874	1.58640772
Berkshire County	124944	119460	577	4907	1.764585077
Bristol County	565217	506066	3855	55296	0.868937978
Dukes and Nantucket Counties	28731	26487	212	2032	1.464718541
Essex County	789034	699364	5069	84601	0.914589702
Franklin County	70180	67994	206	1980	1.124988775
Hampden County	466372	420666	3654	42052	0.931267276
Hampshire County	160830	152473	890	7467	0.556809393
Middlesex County	1611699	1489504	9589	112606	1.085433246
Norfolk County	706775	656929	4061	45785	0.897891024
Plymouth County	521202	477303	3539	40360	0.96347358
Suffolk County	803907	719051	5896	78960	1.012564278
Unknown County	N/A	N/A	22	1600	N/A
Worcester County	830622	760067	4563	65992	0.85738844

Monthly Table 5 - Higher Education 3/13/2021

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	489165	3630	12613	1.199403965

Monthly Table 3 - Race 4/7/2021

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4696949.08	23016	235556	1.168971986
Black or African American, non-Hispanic	509227.93	469055.93	2925	37247	1.273770472
Hispanic	859094.85	714907.85	11481	132706	1.504039955
Asian, non-Hispanic	492858.34	473507.34	1929	17422	1.155254982
Other race, non-Hispanic	N/A	N/A	7109	51845	N/A
Unknown, missing, or refused	N/A	N/A	10453	144330	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2523.94	3	168	0.188426674
American Indian/Alaskan Native, non-Hispanic	11643.81	11075.81	26	542	0.506173261

8.7 Appendix G: Seasonal by Date

These tables were constructed using the data from Massachusetts Reference Data – Cases (Report Date), Massachusetts Reference Data – Age, Massachusetts Reference Data – Gender, Massachusetts Reference Data – Race, Massachusetts Reference Data – County and State, and Massachusetts Reference Data – Higher Education. LS2C stands for Lifestyle Social Contract. BRN stands for Basic Reproduction Number.

Seasonal Reference - Massachusetts 6/1/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6913488	19464	96965	3.48423672

Seasonal Table 3 - Race 6/3/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4917369.08	38152	0	0.380603742
Black or African American, non-Hispanic	509227.93	497903.93	11324	0	0.253247292
Hispanic	859094.85	834787.85	24307	0	0.648072685
Asian, non-Hispanic	492858.34	459283.34	33575	0	0.040239365
Other race, non-Hispanic	N/A	N/A	6767	0	N/A
Unknown, missing, or refused	N/A	N/A	38884	0	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Seasonal Reference - Massachusetts 8/24/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6846794	66694	116429	4.828713125

Seasonal Table 1 - Age 8/12/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1560866.67	6667	20774.26	7.719758035
20-29	1026828.80	997819.91	7834	21161.50	7.386358649
30-39	914617.34	891959.34	5488	17159.15	8.937705711
40-49	841388.18	828074.62	4171	14564.01	9.944942956
50-59	956483.28	936343.50	4678	15452.00	9.363249889
60-69	841570.64	828467.00	2822	10275.14	10.41698103
70-79	501714.18	495337.18	1422	4951.87	10.1016737
80+	293459.04	289021.99	944	3490.84	11.36785449
Unknown	N/A	N/A	27	68.23	N/A

Seasonal Table 2 - Gender 8/12/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3489495.44	18223.53	54692.21	8.362317718
Male	3362254.48	3293446.94	16727.11	52080.44	8.496909009
Transgender	39696.87	39278.39	200.36	218.11	4.323865238
Unknown Sex	N/A	N/A	0.00	906.24	N/A

Seasonal Table 2 - Gender 8/12/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3489281.22	18328.00	54801.96	8.339517143
Male	3362254.48	3293248.36	16823.00	52183.12	8.473922748
Transgender	39696.87	39691.19	0.00	5.67	N/A
Unknown Sex	N/A	N/A	0.00	906.24	N/A

Seasonal Table 3 - Race 8/26/2021

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4902960.08	14409	38152	2.845115705
Black or African American, non-Hispanic	509227.93	495099.93	2804	11324	1.422754266
Hispanic	859094.85	819480.85	15307	24307	2.28396564
Asian, non-Hispanic	492858.34	458024.34	1259	33575	0.29605814
Other race, non-Hispanic	N/A	N/A	4495	6767	N/A
Unknown, missing, or refused	N/A	N/A	3025	38884	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2694.94	0	0	N/A
American Indian/Alaskan Native, non-Hispanic	11643.81	11643.81	0	0	N/A

Seasonal Table 5 - Higher Education 8/29/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	502949	2459	0	2.871637313

Seasonal Reference - Massachusetts 11/16/2020

Massachusetts	Population	LS2C	Infected	Uninfected	BRN
Yes	7029917	6508293	338501	183123	5.482217882

Seasonal Table 1 - Age 11/4/2020

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1510288.67	50578	27441.26	1.75699797
20-29	1026828.80	941589.91	56230	28995.50	1.640590161
30-39	914617.34	844124.34	47835	22647.15	1.605545
40-49	841388.18	787250.62	40824	18735.01	1.604541373
50-59	956483.28	893464.50	42879	20130.00	1.607634191
60-69	841570.64	799528.00	28939	13097.14	1.583433349
70-79	501714.18	481155.18	14182	6373.87	1.534556241
80+	293459.04	278452.99	10569	4434.84	1.487237335
Unknown	N/A	N/A	203	95.23	N/A

Seasonal Table 2 - Gender 11/4/2020 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3340223.64	149271.8	72915.74	1.602846009
Male	3362254.48	3154226.84	139220.1	68807.54	1.642737683
Transgender	39696.87	38421.19	857.2	418.47	0.856018871
Unknown Sex	N/A	N/A	825	906.24	N/A

Seasonal Table 2 - Gender 11/4/2020 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3339572.22	149709	73129.96	1.600766278
Male	3362254.48	3153617.36	139631	69006.12	1.640533007
Transgender	39696.87	39682.19	9	5.67	3.112261474
Unknown Sex	N/A	N/A	825	906.24	N/A

Seasonal Table 3 - Race 11/18/2020

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4769413.08	133547	52561	1.446712447
Black or African American, non-Hispanic	509227.93	478360.93	16739	14128	1.418642508
Hispanic	859094.85	748482.85	70998	39614	1.390730158
Asian, non-Hispanic	492858.34	449699.34	9584	34834	1.442059099
Other race, non-Hispanic	N/A	N/A	27961	11262	N/A
Unknown, missing, or refused	N/A	N/A	86814	41909	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2564.94	130	0	1.179998284
American Indian/Alaskan Native, non-Hispanic	11643.81	11212.81	431	0	1.368521773

Seasonal Table 4 - County 12/24/2020

County	Population	LS2C	Infected	Uninfected	BRN
Barnstable County	212990	208293	6174	3700	N/A
Berkshire County	124944	122398	2771	2136	N/A
Bristol County	565217	534650	30889	24407	N/A
Dukes and Nantucket Counties	28731	27613	1247	785	N/A
Essex County	789034	736333	42443	42158	N/A
Franklin County	70180	69027	1156	824	N/A
Hampden County	466372	442665	22694	19358	N/A
Hampshire County	160830	157464	4705	2762	N/A
Middlesex County	1611699	1543545	57619	54987	N/A
Norfolk County	706775	682575	26408	19377	N/A
Plymouth County	521202	499634	22931	17429	N/A
Suffolk County	803907	753875	36773	42187	N/A
Unknown County	N/A	N/A	868	732	N/A
Worcester County	830622	792707	35785	30207	N/A

Seasonal Table 5 - Higher Education 11/21/2020

Higher Ed	Population	LS2C	Infected	Uninfected	BRN
Yes	505408	495922	7027	2459	2.912327171

Seasonal Table 1 - Age 1/27/2021

Age	Population	LS2C	Infected	Uninfected	BRN
0-19	1588321.07	1465228.67	45060	78019.26	0.965744905
20-29	1026828.80	901441.91	40148	85225.50	0.813310027
30-39	914617.34	812945.34	31179	70482.15	0.733321622
40-49	841388.18	760523.62	26727	59559.01	0.724299785
50-59	956483.28	864926.50	28538	63009.00	0.73599873
60-69	841570.64	780688.00	18840	42036.14	0.701795294
70-79	501714.18	472373.18	8782	20555.87	0.657698875
80+	293459.04	272774.99	5678	15003.84	0.577968848
Unknown	N/A	N/A	106	298.23	N/A

Seasonal Table 2 - Gender 1/27/2021 (Method 1)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3237770.64	102453	222187.54	0.755170253
Male	3362254.48	3053116.84	101110	208027.64	0.799796181
Transgender	39696.87	38402.19	19	1275.67	0.022912456
Unknown Sex	N/A	N/A	3648	1731.24	N/A

Seasonal Table 2 - Gender 1/27/2021 (Method 2)

Gender	Population	LS2C	Infected	Uninfected	BRN
Female	3562411.18	3237119.22	102453	222838.96	0.753116429
Male	3362254.48	3052507.36	101110	208637.12	0.797601797
Transgender	39696.87	39663.19	19	14.67	2.112903382
Unknown Sex	N/A	N/A	3648	1731.24	N/A

Seasonal Table 3 - Race 2/10/2021

Race	Population	LS2C	Infected	Uninfected	BRN
White, non-Hispanic	4955521.08	4696949.08	72464	186108	0.572481745
Black or African American, non-Hispanic	509227.93	469055.93	9305	30867	0.603496079
Hispanic	859094.85	714907.85	33575	110612	0.568278148
Asian, non-Hispanic	492858.34	443757.34	5942	44418	0.688592675
Other race, non-Hispanic	N/A	N/A	19731	39223	N/A
Unknown, missing, or refused	N/A	N/A	26060	128723	N/A
Native Hawaiian/Pacific Islander, non-Hispanic	2694.94	2548.94	16	130	0.130126605
American Indian/Alaskan Native, non-Hispanic	11643.81	11075.81	137	431	0.334166499

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