NYC Health

2018

LEGIONNAIRES' DISEASE ANNUAL SURVEILLANCE REPORT

Summary and Frequently Asked Questions

What is Legionnaires' disease?

- Legionnaires' disease is a form of pneumonia caused by *Legionella* bacteria.
- People can contract Legionnaires' disease by *inhaling* droplets of water (mist) contaminated with *Legionella* bacteria into their lungs.
- People cannot contract Legionnaires' disease by *drinking* water contaminated with *Legionella* bacteria.
- People generally develop symptoms of Legionnaires' disease between 2 and 10 days after they inhale *Legionella* bacteria. The time between inhaling *Legionella* bacteria and the development of symptoms is called the disease incubation period.
- *Legionella* bacteria are very common in the natural environment. Most people who are exposed to the bacteria do not develop Legionnaires' disease.

How common is Legionnaires' disease in NYC?

- Legionnaires' disease is not a common disease. Among the 8.5 million people living in New York City (NYC), between 200 and 700 cases of Legionnaires' disease are reported each year. Legionnaires' disease patients who are hospitalized therefore account for a small proportion of the approximately 35,000 hospitalizations for pneumonia that occur in New York City each year.[1] In 2018, there were 656 reported cases of Legionnaires' disease. By comparison, about 52,000 cases of laboratory confirmed influenza[2] were reported that same year.

Is the rate of Legionnaires' disease increasing in New York City and across the United States?

- While it remains a relatively rare infection, the rate of Legionnaires' disease is increasing significantly in NYC. This increase in the disease rate might be driven by: (1) more people who have *Legionella* pneumonia getting diagnosed and reported to the Health Department due to increased use of diagnostic testing by health care providers; (2) more people contracting *Legionella* pneumonia; or (3) some combination of these factors. Factors that might increase the number of people contracting *Legionella* pneumonia include an aging population, aging plumbing infrastructure or changing weather patterns.
    - From 2007-2018, there was an 11.9% average increase in the rate of Legionnaires' disease cases citywide each year.
    - The rate of Legionnaires' disease increased significantly in all boroughs and demographic groups over this period.
- Data from the Centers for Disease Control and Prevention (CDC) show that rates of Legionnaires' disease increased across the country from 2010-2018. During that period, 15 jurisdictions had an average annual percent increase in cases that was larger than the increase in NYC. See Appendix A.

Who gets Legionnaires' disease?

- Most healthy people do not develop Legionnaires' disease even if they are exposed to *Legionella* bacteria. People at higher risk for Legionnaires' disease include those who are aged 50 years or older, people with chronic lung disease or other chronic conditions, or people taking immunosuppressive medications.
- The majority (71%) of people diagnosed with Legionnaires' disease in 2018 were adults aged 55 years or older. Almost all those diagnosed (99%) reported at least one chronic health condition, most commonly diabetes (34%) or lung disease (21%).
- Over half (59%) of people diagnosed with Legionnaires' disease in 2018 reported a history of smoking.
- Men were nearly twice as likely as women to be diagnosed with Legionnaires' disease (9.5 and 5.9 per 100,000 people, respectively). Among all racial groups, non-Hispanic Black New Yorkers had the highest rate of disease (14.5 per 100,000 people).
- In 2018, most Legionnaires' disease cases (29%) occurred in Manhattan; however, the Bronx had the highest rate (12.3 cases per 100,000 people).

When does the Health Department investigate Legionnaires' disease cases?

The Health Department follows up on every Legionnaires' disease case diagnosed in residents of New York City to confirm their clinical history and understand more about how they may have been exposed to *Legionella* bacteria. The Health Department also continuously monitors for clusters of cases that might be related to a common environmental source of *Legionella* bacteria exposure.

- Community cluster investigations: The Health Department investigates cases of Legionnaires' disease that cluster closely in time and geography among people who live in different buildings. This pattern of disease indicates a possible community source of exposure, such as a cooling tower. The Health Department performs evaluations of nearby cooling towers when surveillance finds a cluster of Legionnaires' disease cases.
    - The Health Department investigated two community clusters in 2018, both occurring in the Washington Heights neighborhood of Manhattan. A total of 59 cases and two death were linked to these clusters.
    - The Health Department collected a total of 58 samples from 26 cooling tower systems as a part of these investigations. One cooling tower was identified as the source of both outbreaks.
        - All cooling towers in NYC are required to be registered in an online system, sampled by owners at least every 90 days of operation and are inspected by the Health Department for compliance with NYC cooling tower regulations[1].
- Building water system evaluations: The Health Department evaluates the water system in a building when two or more residents of the building are diagnosed with Legionnaires' disease within 12 months of each other. The Health Department also evaluates a building water system when a single case occurs in a person who spent the entirety of the disease incubation period in a higher-risk setting (e.g., shelter or assisted living facility).
    - The Health Department conducted evaluations of ten NYC building water systems in 2018. Legionella was found in 9 of these buildings; the Health Department worked with the building owners to remediate the building water system.

[1] Local Law 77 of 2015 and Chapter 8 of Title 24 of the New York City Rules and Regulations

Contents

I. Legionnaires' Disease in NYC Over Time 4

II. Geographic Distribution of Legionnaires' Disease 5

III. Demographic and Clinical Characteristics 6

IV. Cluster Detection Methods and Investigation Summary 8

V. Appendices 9

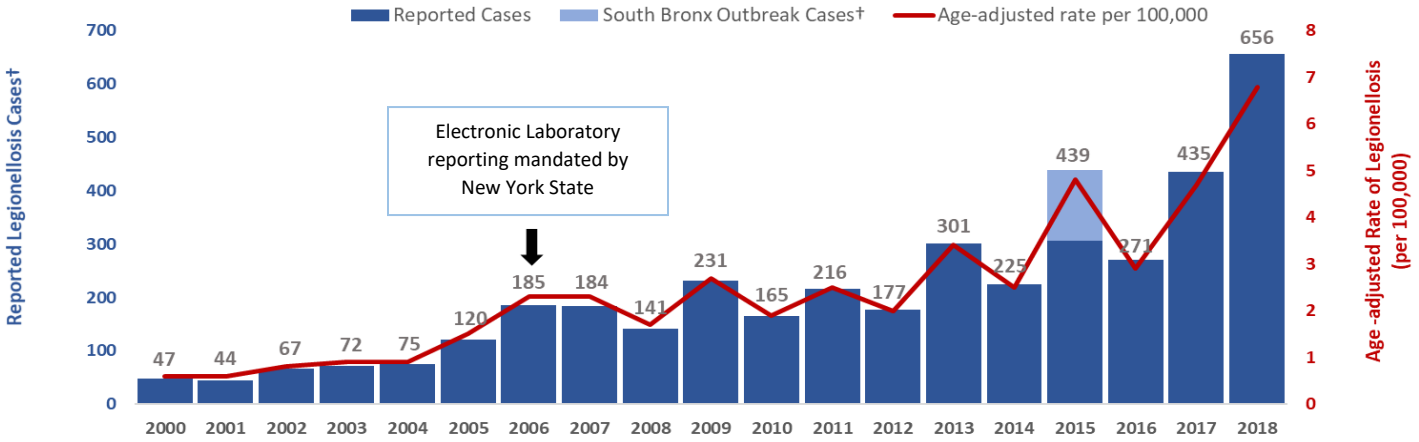
VI. Appendix A: Trends in Reported Legionnaires' Disease Rates Nationwide, 2010-2018 9

Appendix B. Legionnaires' Disease Rates by Neighborhood Tabulation Area, NYC, 2018 11

VII. References 14

I. Legionnaires' Disease in NYC Over Time

Figure 1.1 Number and Rate of Reported Legionnaires' Disease Cases*, NYC, 2000-2018‡



*Numbers represent all confirmed cases of legionellosis, which includes Legionnaires' disease and a flu-like illness called Pontiac fever. Pontiac fever makes up fewer than 2% of reported legionellosis cases each year.

†2015 South Bronx Legionnaires' Disease Outbreak: An outbreak linked to a cooling tower in the South Bronx involved 133 NYC residents with illness onset July 2 to August 3, 2015.[3] In response, the Health Department added rules to the New York City Administrative Code that placed new requirements on building owners concerning the registration, inspection and maintenance of cooling towers.

‡For national trends, see Appendix A.

The rate of Legionnaires' disease has increased significantly in NYC. Between 2007 and 2018, disease rates increased in all NYC boroughs and demographic groups. This increase may reflect a more vulnerable population (older adults or persons living in poverty), aging plumbing infrastructure or changing weather patterns. Increased use of diagnostic testing may also influence the rate of disease. Similar increasing rates of Legionnaires' disease have been seen across the United States. Data from the CDC show that rates of Legionnaires' disease have increased in 96% of reporting jurisdictions during 2010-2018. During that period, 15 jurisdictions had an average annual percent increase in cases that was larger than the increase in NYC (Appendix A).

Table 1.1: Trends in Legionnaires' Disease Rates per 100,000 People by Demographic Groups, NYC†‡, 2007-2018

Group	2007	2018	AAPC
Total	2.3	7.6	11.9***
Sex			
Female	1.4	5.9	13.3***
Male	3.2	9.5	10.9***
Race and Ethnicity			
Black/African American (NH)	2.5	14.5	16.1***
Latino/Hispanic	1.6	5.4	11.6***
White (NH)	2.2	5.7	9.5***
Asian (NH)	0.4	2.0	18.5***
Age Group (Years)			
<35 years	0.2	2.2	12.2***
35 to 54 years	1.5	4.0	8.4**
55 to 64 years	4.0	15.5	13.7***
65 to 74 years	3.2	13.1	14.5***
75 to 84 years	6.1	12.7	8.1***
≥85 years	5.2	14.8	12.4***

Group	2007	2018	AAPC
Borough of Residence			
Bronx	4.1	12.3	10.8***
Brooklyn	1.8	4.1	6.7***
Manhattan	2.7	11.3	14.6***
Queens	1.5	6.8	15.3***
Staten Island	1.5	4.0	14.1***
Neighborhood Poverty Level			
Low (<10% below FPL)	2.0	7.3	12.1***
Medium (10 to <20% below FPL)	1.6	6.0	11.9***
High (20 to <30% below FPL)	2.3	7.9	10.9***
Very High (≥ 30% below FPL)	3.2	9.7	12.1***

Abbreviations: AAPC, average annual percent change; FPL, federal poverty level; NH, non-Hispanic.

Data sources: Population and poverty data from NYC DOHMH population estimates, modified from US Census Bureau intercensal population estimates, 2000-2017. Updated September 2018.

† Excludes 2015 South Bronx Outbreak

‡ For national trends, see Appendix A.

* p<0.05, **p<0.01, ***p<0.001

II. Geographic Distribution of Legionnaires' Disease

Figure 2.1 Legionnaires' Disease Rate by Neighborhood Tabulation Area (NTA), 2018*

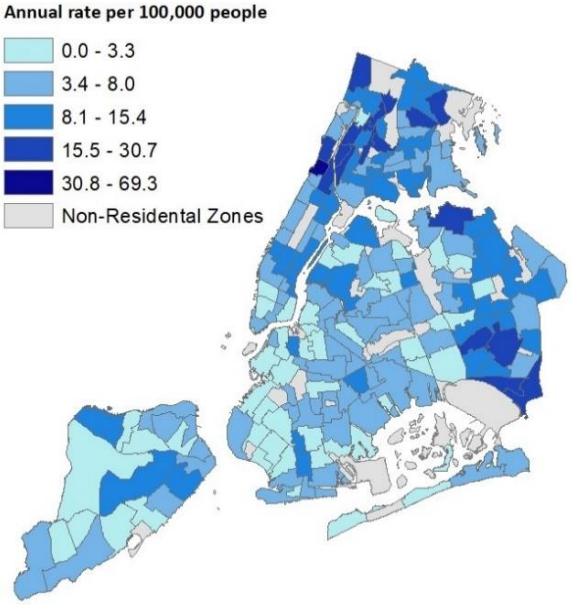
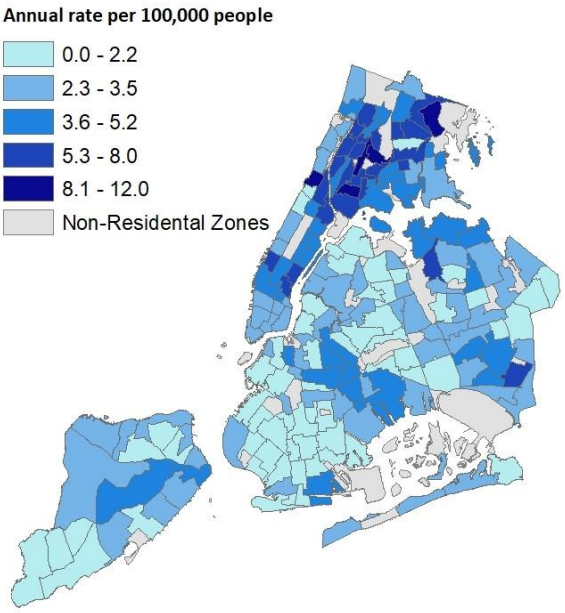


Figure 2.2 Average Legionnaires' Disease Rate by NTA, 2007-2017†



Legionnaires' disease rates vary substantially across NYC's neighborhoods. Because there are relatively few cases of Legionnaires' disease diagnosed each year (when compared to the total population), neighborhoods with highest rates of disease may vary from year to year (Figure 2.1). Longer-term rates are more stable (Figure 2.2). Geographic difference in disease rates may reflect different environmental exposures, variations in health system practices, and, variations in health conditions that increase the risk of Legionnaires' disease like smoking, chronic lung disease, diabetes and other chronic conditions that suppress the immune system. Multiple factors likely contribute to the occurrence and detection of Legionnaires' disease in neighborhoods with the highest rates of disease. Many neighborhoods with the highest rates of disease also have older populations and the highest rates of poverty (Figures 2.2,2.3, and 2.4). Environmental sources of *Legionella* bacteria may vary by neighborhood, based on the type and maintenance of infrastructure in the area, including cooling tower systems. In addition, the rate of testing for Legionnaires' disease may not be uniform across the city due to variations in health system practices.

Figure 2.3 Neighborhood Poverty by NTA, 2010-2017

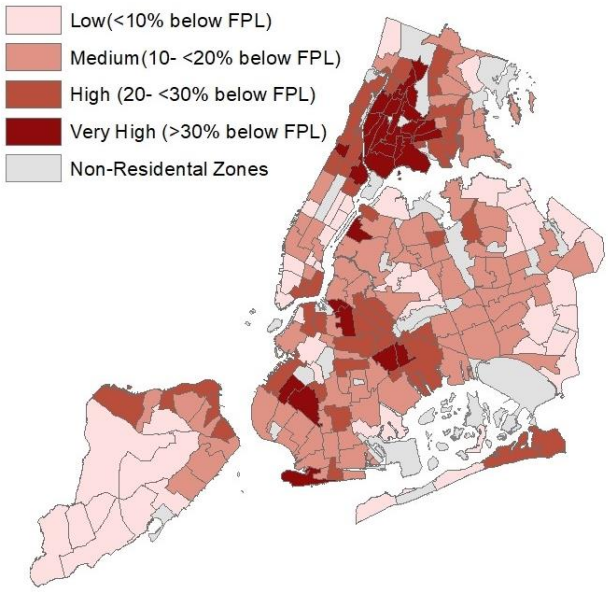
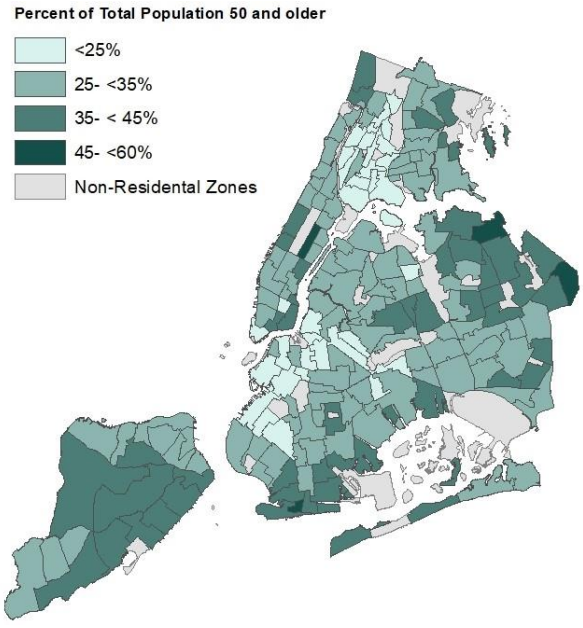


Figure 2.4 Older Adult Populations by NTA, 2007- 2017



Abbreviations: FPL, federal poverty level.

Data sources: Population and poverty data are from NYC DOHMH population estimates, modified from US Census Bureau intercensal population estimates, 2000-2017. Updated September 2018

*See Appendix B for 2018 count and rate values by NTA.

† Excludes 2015 South Bronx Outbreak

III. Demographic and Clinical Characteristics

Table 3.1: Legionnaires' Disease Case Reporting Summary, NYC, 2018

	N	%
Confirmed Cases	656	100%
Method of Diagnosis		
Urine antigen test (UAT) only	614	94%
Bacterial culture only	8	1%
Bacterial culture and UAT	26	4%
Missing/unknown	8	1%
Case Classification		
Community-associated	610	93%
Possible health care-associated*	16	2%
Definite health care-associated**	30	5%

* Person spent some (1-9) nights during their disease incubation period in an Article 28 health care facility
** Person spent ≥10 nights during their disease incubation period in an Article 28 health care facility
(See: health.ny.gov/facilities/hospital/regulations).

The majority of Legionnaires' disease cases are diagnosed by urine antigen test (UAT). The UAT provides rapid results allowing for prompt treatment of patients. Clinical bacterial cultures are necessary for cases to be linked to potential environmental sources. However, bacterial cultures are infrequently available because appropriate specimens are difficult to obtain. Clinical bacterial cultures were available for only 5% of cases in 2018, thus limiting the opportunity for environmental source matching to clinical cases.

People who spend time in hospitals or nursing homes are at higher risk for Legionnaires' disease. This higher disease risk exists because people in health care settings are more likely to have health conditions or receive treatments that suppress their immune systems. The Health Department refers cases that occur in people who spent one or more nights during their disease incubation period (the 10 days before feeling sick) in a hospital or nursing home to New York State for further follow-up and possible environmental testing of the health care facility.

A small percent of Legionnaires' disease cases (7%) in 2018 occurred among individuals who spent one or more nights in a health care facility during their 10-day disease incubation period.

In 2018, Legionnaires' disease did not occur at the same rate across all demographic groups. Rates of Legionnaires' disease were higher among men than women, higher among older people, and higher among people living in poverty.

Table 3.2: Demographic Characteristics of People Diagnosed With Legionnaires' Disease, NYC, 2018

	N	%	Rate/ 100,000
Confirmed Cases	656	100%	7.6
Sex			
Female	265	40%	5.9
Male	390	59%	9.5
Transgender*	1	1%	-
Age			
Mean (min, max)		63 (24,97)	
<35 years	30	5%	2.2
35 to 54 years	155	24%	4.0
55 to 64 years	171	26%	15.5
65 to 74 years	132	20%	13.1
75 to 84 years	88	13%	12.7
≥85 years	80	12%	14.8
Race and Ethnicity			
Latino/Hispanic	136	21%	5.4
Black/African American (NH)	275	42%	14.5
White (NH)	156	24%	5.7
Asian (NH)	26	4%	2.0
Other (NH)	24	4%	13.9
Missing/Unknown	39	6%	-
Borough of Residence			
Bronx	181	28%	12.3
Brooklyn	108	16%	4.1
Manhattan	189	29%	11.4
Queens	159	24%	6.7
Staten Island	19	3%	4.0
Neighborhood Poverty Level†			
Low (<10% below FPL)	163	25%	7.3
Medium (10% to < 20% below FPL)	158	24%	6.0
High (20% to <30% below FPL)	139	21%	7.9
Very high (≥30% below FPL)	189	29%	9.7
Residence During Disease Incubation Period‡			
Apartment/private home	545	83%	-
Long-term care/nursing home	26	4%	-
Homeless/shelter	21	3%	-
Assisted living facility	8	1%	-
Other	8	1%	-
Missing/unknown	48	7%	-

Abbreviations: FPL, federal poverty level; NH, non-Hispanic.
Data sources: Population estimates, modified from US Census Bureau intercensal population estimates, 2000-2017. Updated September 2018.
* Population denominators for transgender persons are not currently available.
† Cases involving an incorrect or missing address not included (n=7).
‡ The incubation period is the 10 days prior to the date of symptom onset.

Table 3.3: Clinical and Behavioral Characteristics of People Diagnosed With Legionnaires' Disease, NYC, 2018

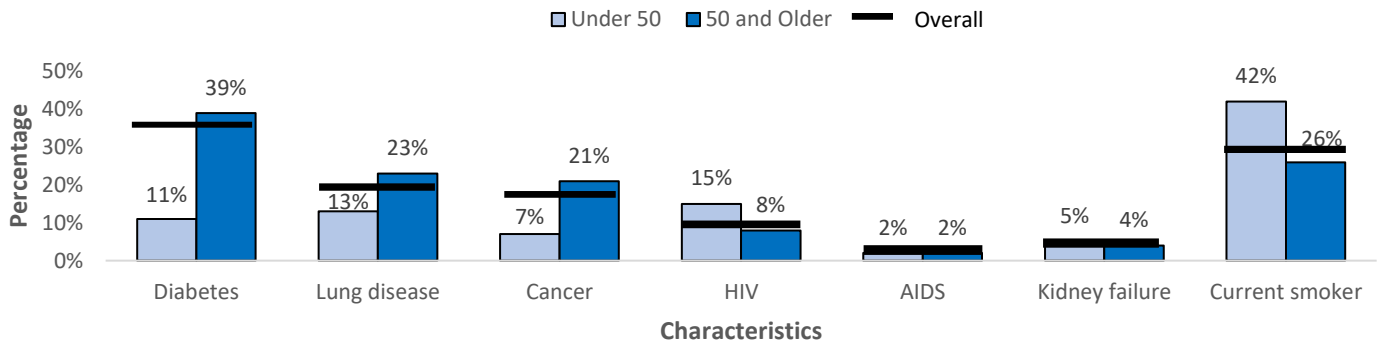
	N	%
Confirmed Cases	656	100 %
Underlying Medical Condition		
Yes	650	99%
No	1	0%
Unknown/missing	5	1%
Common conditions (not mutually exclusive)		
Diabetes	222	34%
Lung disease	138	21%
Cancer	118	18%
HIV	60	9%
AIDS	14	2%
Kidney failure	27	4%
Other chronic condition	539	82%
Smoking Status		
Any history of smoking	388	59%
Current smoker	190	29%
Former smoker	198	30%
No history of smoking	227	35%
Unknown/missing	41	6%

Table 3.4: Reported Water Exposures During Disease Incubation Period, NYC, 2018*

	N	%
Confirmed Cases	656	100%
Reported Water/Aerosol Exposure or Water Service Disruption during Disease Incubation Period*†		
Yes	378	58%
No	278	42%
Type of water exposure or service disruption reported (not mutually exclusive)		
Grocery store mister	100	15%
Water Service interruption at residence	71	11%
Respiratory equipment	43	7%
Shower outside of home	51	8%
Plumbing work at residence	53	8%
Decorative fountain	15	2%
Air humidification	14	2%
Gym shower	18	3%
Whirlpool spa, hot tub	10	2%
Steam room	2	0%
Swimming pool	1	0%

* The incubation period is the 10 days prior to the date of symptom onset.
† DOHMH collects exposure information for non-routine water-related exposures or water service disruptions that have previously been associated with the occurrence of Legionnaires' disease in the United States and worldwide.

Figure 3.1 Clinical and Behavioral Characteristics of People Diagnosed with Legionnaires' Disease, Overall and by Age, NYC, 2018



Most healthy people do not develop Legionnaires' disease even if they are exposed to *Legionella* bacteria. People who smoke or have chronic health conditions are at greater risk for Legionnaires' disease. Among people with Legionnaires' disease in 2018, 99% had at least one chronic medical condition and 59% were previous or current smokers. The most commonly reported medical condition was diabetes (34%), followed by lung disease (21%). People with who were under 50 at the time they were diagnosed with Legionnaires' disease are more likely to report being current smokers or have been diagnosed with HIV.

Legionella bacteria are found naturally in the environment, meaning that exposure can occur from a variety of sources. As part of the surveillance process, DOHMH interviews each diagnosed person about their water use to identify common sources of exposure. However, it is rare that patient interviews identify possible common sources of exposure for different people. In 2018, the majority of people with Legionnaires' disease (58%) reported exposure to aerosols outside their home, water service disruption in their homes, or exposure to aerosols in their homes beyond routine water use. For this reason, the Health Department routinely initiates an evaluation of a building's water system if two or more cases occur within 12 months in residents of the building, as this may indicate a common source of exposure (see 'Building Water System Evaluations' on page 8).

IV. Cluster Detection Methods and Investigation Summary

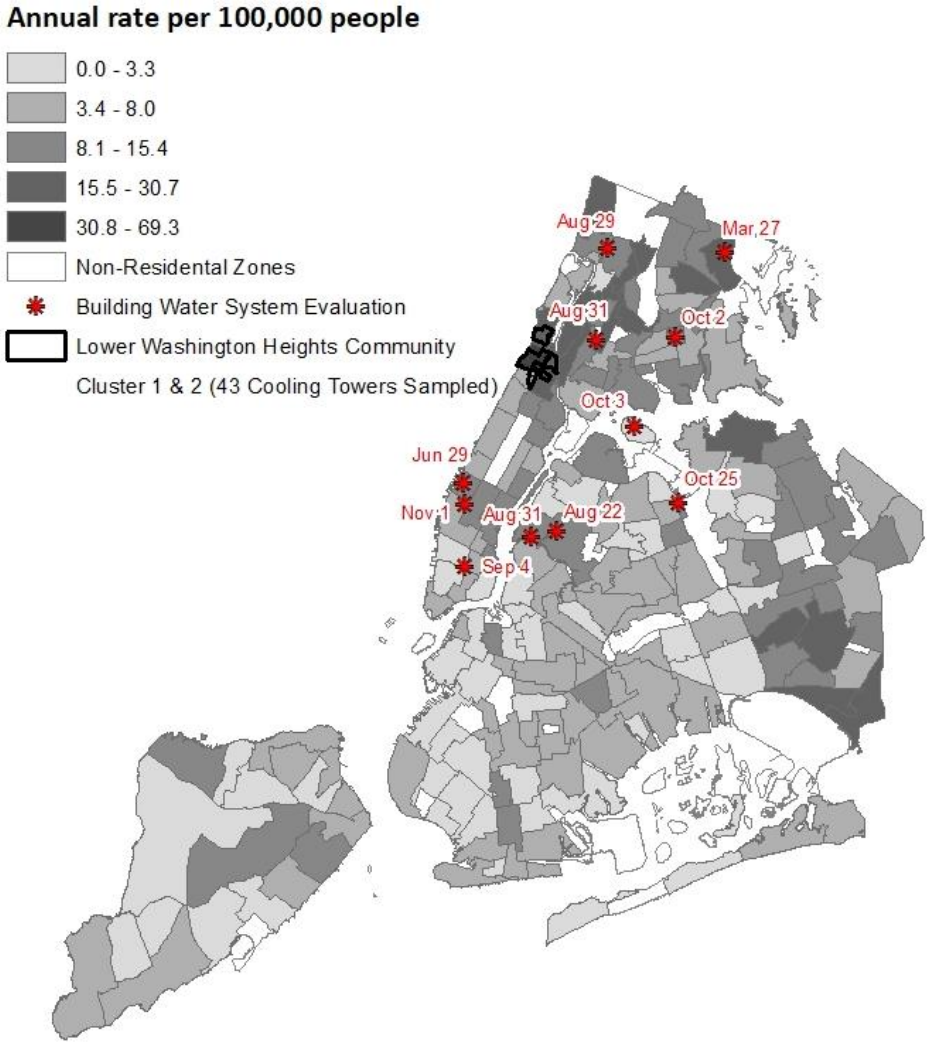
The Health Department routinely analyzes Legionnaires' disease surveillance data to identify possible clusters of cases. Depending on the location and timing of cases, as well as the presence of possible common exposures, the Health Department might initiate one of the following responses:

- *Community cluster investigation*: The Health Department investigates cases of Legionnaires' disease that cluster closely in time and geography among people who live in different buildings. This pattern of disease indicates a possible community source of exposure, such as a cooling tower. The Health Department performs evaluations of nearby cooling towers when surveillance finds a cluster of Legionnaires' disease cases
- *Building water system evaluation*: The Health Department evaluates the water system in a building when two or more residents of the building are diagnosed with Legionnaires' disease within 12 months of each other. The Health Department also evaluates a building water system when a single case occurs in a person who spent the entirety of the disease incubation period in a higher-risk setting (e.g., shelter or assisted living facility).

Table 4.1: Health Department Response Summary, 2018

10	10 Building Water System Evaluations were initiated. 9 out of 10 buildings required remediations.	**2**	2 Community Clusters were identified, both in the Lower Washington Heights Community. 58 environmental samples were collected from 26 cooling tower systems. 2 clinical and environmental *Legionella* isolates matched via whole genome sequencing

Figure 4.1 Community Cluster Investigations and Building Water System Evaluations, 2018



V. Appendices

VI. Appendix A: Trends in Reported Legionnaires' Disease Rates Nationwide, 2010-2018

Data Sources for Appendix A:

- Legionnaires' disease 2010-2018 data: Centers for Disease Control and Prevention (CDC). National Notifiable Diseases Surveillance System, Annual Tables of Infectious Disease Data.[4-11]
- Population data: Annual Estimates of the Resident Population for the United States, Regions, States and Puerto Rico: April 1, 2010, to July 1, 2018, U.S. Census Bureau, Population Division.
- Average annual percent change (AAPC) calculated using Joinpoint software for analysis of trend over time.[12]

Table A1. Legionnaires' Disease Rates by State, U.S., 2010-2018

State	Rate (per 100,000) 2010	2018	% Change	AAPC	*p*
New England					
Connecticut	1.56	5.54	254.21	15.66	0.01
Maine	0.90	2.54	181.05	7.01	0.10
Massachusetts	2.00	5.33	167.25	6.37	0.17
New Hampshire	1.75	5.68	224.99	18.23	0.01
Rhode Island	4.08	6.90	69.23	7.47	0.11
Vermont	1.44	2.71	88.76	8.16	0.08
Mid. Atlantic					
New Jersey	1.72	4.14	141.38	7.16	0.03
Pennsylvania	2.55	4.98	95.44	5.23	0.12
New York (Upstate)	2.68	6.91	158.19	17.18	0.20
New York City	2.00	7.79	288.89	16.95	0.00
S. Atlantic					
Delaware	2.00	4.76	137.7	10.75	0.01
District of Columbia	3.14	8.11	158.42	18.07	0.04
Florida	0.91	2.33	155.15	12.6	<0.01
Georgia	0.67	1.72	157.08	16.08	<0.01
Maryland	1.95	5.97	206.04	12.33	0.01
North Carolina	0.67	1.67	149.24	15.03	0.01
South Carolina	0.35	1.24	259.02	15.85	<0.01
Virginia	1.44	2.71	88.76	8.16	0.08
West Virginia	0.86	7.14	727.85	22.92	0.01
E.N. Central					
Illinois	1.16	3.99	244.28	14.18	<0.01
Indiana	0.86	3.72	331.26	20.66	<0.01
Michigan	1.81	6.33	249.44	16.4	<0.001
Ohio	2.01	7.96	295.71	14.44	<0.001
Wisconsin	1.11	5.69	414.27	19.15	0.00
E.S. Central					
Alabama	0.46	1.55	238.22	15.54	<0.01
Kentucky	0.69	3.27	373.58	18.3	<0.01
Mississippi	0.40	1.37	239.84	18.52	<0.001
Tennessee	1.13	2.53	122.95	13.13	0.01
W.N. Central					
Iowa	0.49	2.00	305.98	21.88	<0.001
Kansas	0.42	1.41	235.41	17.02	<0.01
Minnesota	0.75	2.71	259.66	20.03	<0.01
Missouri	0.62	2.45	296.77	16.76	<0.001
Nebraska	0.49	2.23	353.08	19.57	<0.001
North Dakota	0.89	1.32	47.95	8.84	0.08
South Dakota	1.10	3.74	239.21	20.42	0.01
W.S. Central					
Arkansas	0.65	1.53	134.73	16.34	<0.001
Louisiana	0.24	0.90	272.36	9.1	0.14
Oklahoma	0.40	1.60	300.46	22.21	<0.01
Texas	0.54	1.45	168.37	14.51	<0.01
Mountain					
Arizona	1.01	1.16	14.09	4.4	0.13
Colorado	0.61	1.93	214.51	14.54	<0.001
Idaho	0.51	0.86	67.89	5.36	0.22
Montana	0.50	0.94	86.52	16.57	0.03
Nevada	0.74	0.53	-28.75	-0.96	0.78
New Mexico	0.44	1.05	140.85	11.37	0.02
Utah	0.97	1.04	7.31	3.04	0.12
Wyoming	1.42	0.35	-75.57	-5.63	0.34
Pacific					
Alaska	0.28	0.41	45.21	16.27	0.08
California	0.60	1.15	90.8	12.78	0.01
Hawaii	0.15	1.20	716.18	19.7	<0.01
Oregon	0.42	0.74	77.42	8.57	0.06
Washington	0.44	0.72	61.07	7.68	0.02

Figure A1: Rank Order of Legionnaires' Disease Rate Percent Change by State, U.S., 2010–2018

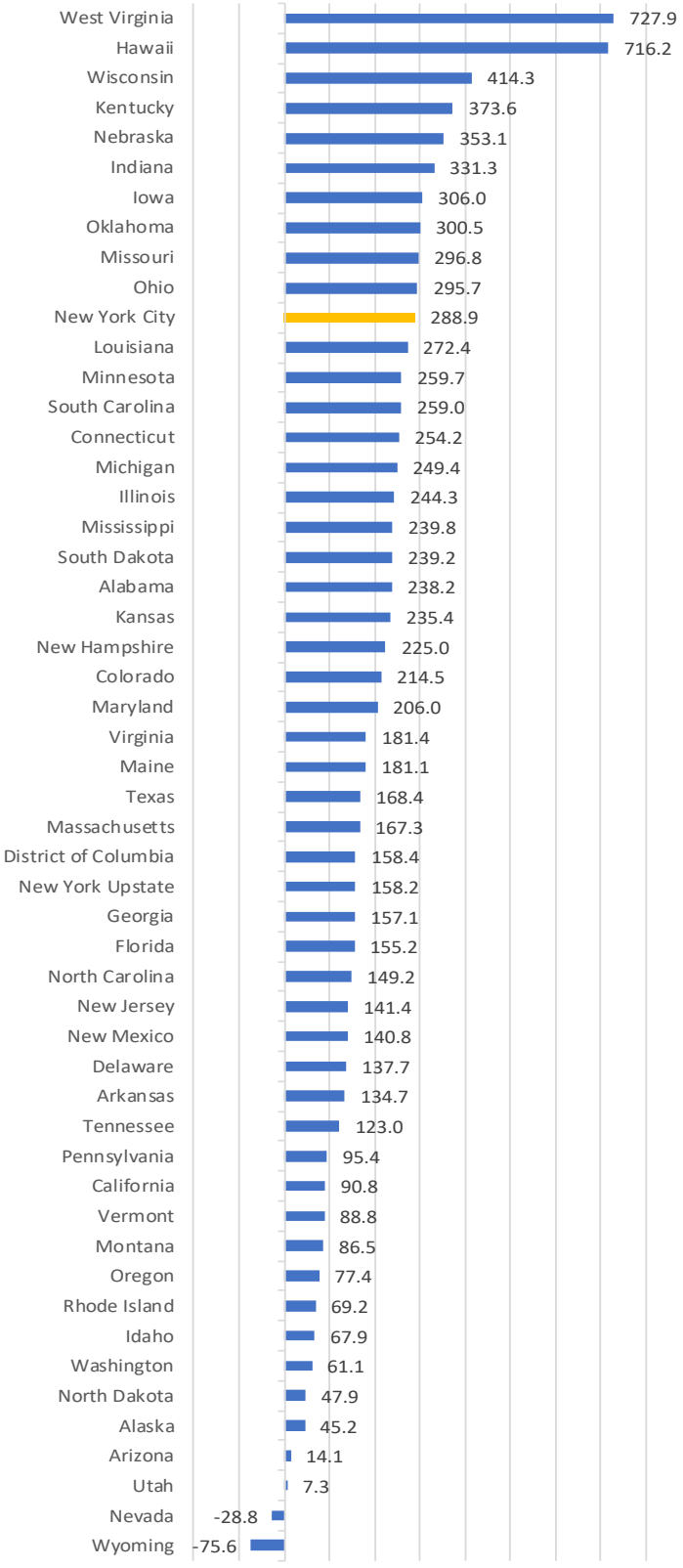
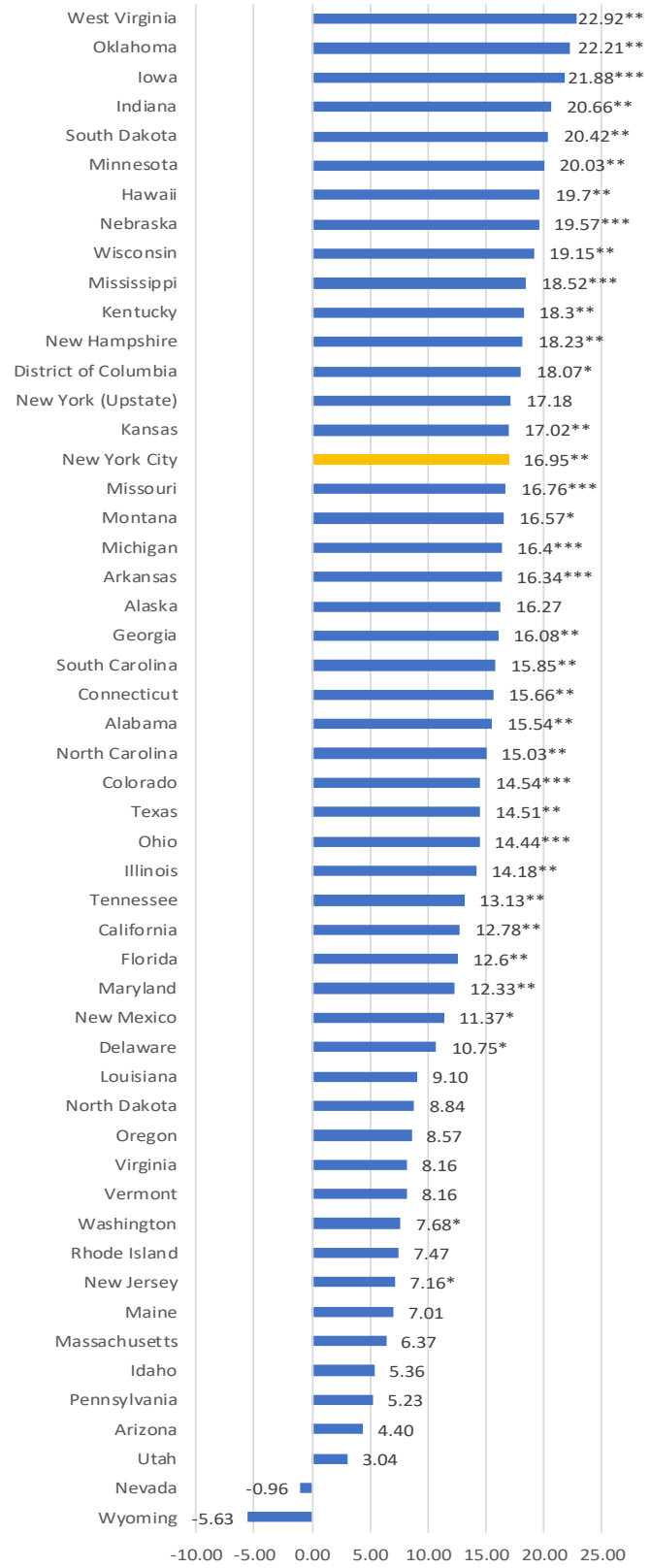


Figure A2: Rank Order of Legionnaires' Disease Rate AAPC by State, U.S., 2010–2018*



*p<0.05, **p<0.01, ***p<0.001

Appendix B. Legionnaires' Disease Rates by Neighborhood Tabulation Area, NYC, 2018

NTA Code	NTA Name	N	Rate /100,000
BX01	Claremont-Bathgate	8	22.7
BX03	Eastchester-Edenwald-Baychester	3	8.4
BX05	Bedford Park-Fordham North	12	20.9
BX06	Belmont	3	10.2
BX07	Bronxdale	3	7.4
BX09	West Farms-Bronx River	2	5.4
BX09	Soundview-Castle Hill-Clason Point-Harding Park	5	8.6
BX10	Pelham Bay-Country Club-City Island	1	3.8
BX13	Co-op City	15	29.6
BX14	East Concourse-Concourse Village	7	10.6
BX17	East Tremont	8	17.6
BX22	North Riverdale-Fieldston-Riverdale	5	18.2
BX26	Highbridge	9	22.6
BX27	Hunts Point	4	14.7
BX28	Van Cortlandt Village	7	13.3
BX29	Spuyten Duyvil-Kingsbridge	3	9.3
BX30	Kingsbridge Heights	1	3.1
BX31	Allerton-Pelham Gardens	6	18.0
BX33	Longwood	4	13.4
BX34	Melrose South-Mott Haven North	5	11.3
BX35	Morrisania-Melrose	2	4.9
BX36	University Heights-Morris Heights	9	15.9
BX37	Van Nest-Morris Park-Westchester Square	4	13.3
BX39	Mott Haven-Port Morris	4	7.1
BX40	Fordham South	5	17.3
BX41	Mount Hope	6	11.1
BX43	Norwood	7	15.9
BX44	Williamsbridge-Olinville	6	9.1
BX46	Parkchester	3	9.3
BX49	Pelham Parkway	2	6.5
BX52	Schuylerville-Throgs Neck-Edgewater Park	3	6.3
BX55	Soundview-Bruckner	3	7.7
BX59	Westchester-Unionport	1	3.4
BX62	Woodlawn-Wakefield	4	8.9
BX63	West Concourse	7	18.3
BX75	Crotona Park East	3	12.8
BX98	Rikers Island	0	0.0
BX99	Park-cemetery-etc-Bronx	0	0.0
BK09	Brooklyn Heights-Cobble Hill	1	4.0
BK17	Sheepshead Bay-Gerritsen Beach-Manhattan Beach	4	5.9
BK19	Brighton Beach	2	5.7
BK21	Seagate-Coney Island	2	6.7
BK23	West Brighton	0	0.0
BK25	Homecrest	4	8.8
BK26	Gravesend	2	6.4
BK27	Bath Beach	0	0.0
BK28	Bensonhurst West	2	2.1
BK29	Bensonhurst East	2	3.0
BK30	Dyker Heights	1	2.1
BK31	Bay Ridge	3	3.7
BK32	Sunset Park West	0	0.0
BK33	Carroll Gardens-Columbia Street-Red Hook	1	2.3
BK34	Sunset Park East	0	0.0
BK35	Stuyvesant Heights	4	6.0
BK37	Park Slope-Gowanus	2	2.6

BK38	DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill	0	0.0
BK40	Windsor Terrace	1	4.4
BK41	Kensington-Ocean Parkway	2	5.2
BK42	Flatbush	7	6.4
BK43	Midwood	1	1.8
BK44	Madison	1	2.4
BK45	Georgetown-Marine Park-Bergen Beach-Mill Basin	0	0.0
BK46	Ocean Parkway South	3	14.0
BK50	Canarsie	7	8.1
BK58	Flatlands	4	5.5
BK60	Prospect Lefferts Gardens-Wingate	0	0.0
BK61	Crown Heights North	8	7.5
BK63	Crown Heights South	3	7.1
BK64	Prospect Heights	1	4.5
BK68	Fort Greene	3	9.1
BK69	Clinton Hill	0	0.0
BK72	Williamsburg	1	2.9
BK73	North Side-South Side	1	1.7
BK75	Bedford	1	1.3
BK76	Greenpoint	2	5.9
BK77	Bushwick North	2	3.3
BK78	Bushwick South	4	5.4
BK79	Ocean Hill	2	6.0
BK81	Brownsville	5	8.5
BK82	East New York	6	6.5
BK83	Cypress Hills-City Line	2	4.1
BK85	East New York (Pennsylvania Ave)	1	3.5
BK88	Borough Park	1	0.9
BK90	East Williamsburg	2	5.4
BK91	East Flatbush-Farragut	3	5.6
BK93	Starrett City	0	0.0
BK95	Erasmus	1	3.5
BK96	Rugby-Remsen Village	2	3.6
BK99	Park-cemetery-etc-Brooklyn	0	0.0
MN01	Marble Hill-Inwood	3	5.7
MN03	Central Harlem North-Polo Grounds	26	30.8
MN04	Hamilton Heights	36	69.3
MN06	Manhattanville	1	4.3
MN09	Morningside Heights	2	3.8
MN11	Central Harlem South	6	12.2
MN12	Upper West Side	10	7.3
MN13	Hudson Yards-Chelsea-Flatiron-Union Square	6	7.3
MN14	Lincoln Square	3	4.8
MN15	Clinton	6	11.4
MN17	Midtown-Midtown South	3	9.7
MN19	Turtle Bay-East Midtown	8	15.5
MN20	Murray Hill-Kips Bay	7	14.9
MN21	Gramercy	2	7.3
MN22	East Village	3	7.2
MN23	West Village	2	3.0
MN24	SoHo-TriBeCa-Civic Center-Little Italy	1	2.3
MN25	Battery Park City-Lower Manhattan	3	6.2
MN27	Chinatown	2	4.2
MN28	Lower East Side	2	2.7
MN31	Lenox Hill-Roosevelt Island	9	10.8
MN32	Yorkville	6	7.3
MN33	East Harlem South	5	8.4
MN34	East Harlem North	7	11.5

MN35	Washington Heights North	4	5.4
MN36	Washington Heights South	17	18.3
MN40	Upper East Side-Carnegie Hill	3	4.9
MN50	Stuyvesant Town-Cooper Village	2	8.5
MN99	Park-cemetery-etc-Manhattan	0	0.0
QN01	South Jamaica	9	21.5
QN02	Springfield Gardens North	4	14.1
QN03	Springfield Gardens South-Brookville	4	18.2
QN05	Rosedale	5	18.2
QN06	Jamaica Estates-Holliswood	4	14.5
QN07	Hollis	2	9.2
QN08	St. Albans	11	19.8
QN10	Breezy Point-Belle Harbor-Rockaway Park-Broad Channel	0	0.0
QN12	Hammels-Arverne-Edgemere	3	7.7
QN15	Far Rockaway-Bayswater	3	5.5
QN17	Forest Hills	7	7.9
QN18	Rego Park	2	6.9
QN19	Glendale	2	5.9
QN20	Ridgewood	3	4.1
QN21	Middle Village	2	5.3
QN22	Flushing	2	2.6
QN23	College Point	2	7.6
QN25	Corona	5	8.4
QN26	North Corona	3	5.5
QN27	East Elmhurst	0	0.0
QN28	Jackson Heights	4	3.7
QN29	Elmhurst	1	1.1
QN30	Maspeth	2	6.9
QN31	Hunters Point-Sunnyside-West Maspeth	7	9.5
QN33	Cambria Heights	2	9.9
QN34	Queens Village	4	7.2
QN35	Briarwood-Jamaica Hills	1	2.3
QN37	Kew Gardens Hills	2	5.2
QN38	Pomonok-Flushing Heights-Hillcrest	4	10.9
QN41	Fresh Meadows-Utopia	0	0.0
QN42	Oakland Gardens	3	10.3
QN43	Bellerose	3	10.9
QN44	Glen Oaks-Floral Park-New Hyde Park	1	4.2
QN45	Douglas Manor-Douglaston-Little Neck	2	7.6
QN46	Bayside-Bayside Hills	4	8.7
QN47	Ft. Totten-Bay Terrace-Clearview	3	13.4
QN48	Auburndale	2	9.4
QN49	Whitestone	7	22.2
QN50	Elmhurst-Maspeth	0	0.0
QN51	Murray Hill	3	5.4
QN52	East Flushing	0	0.0
QN53	Woodhaven	0	0.0
QN54	Richmond Hill	3	4.3
QN55	South Ozone Park	2	2.3
QN56	Ozone Park	0	0.0
QN57	Lindenwood-Howard Beach	1	3.5
QN60	Kew Gardens	0	0.0
QN61	Jamaica	6	10.5
QN62	Queensboro Hill	1	4.4
QN63	Woodside	3	6.4
QN66	Laurelton	1	3.6
QN68	Queensbridge-Ravenswood-Long Island City	0	0.0
QN70	Astoria	2	2.6

QN71	Old Astoria	2	7.1
QN72	Steinway	5	10.4
QN76	Baisley Park	4	10.2
QN98	Airport	9	21.5
QN99	Park-cemetery-etc-Queens	0	0.0
SI01	Annadale-Huguenot-Prince's Bay-Eltingville	1	3.5
SI05	New Springville-Bloomfield-Travis	1	2.4
SI07	Westerleigh	0	0.0
SI08	Grymes Hill-Clifton-Fox Hills	0	0.0
SI11	Charleston-Richmond Valley-Tottenville	1	4.1
SI12	Mariner's Harbor-Arlington-Port Ivory-Graniteville	3	9.7
SI14	Grasmere-Arrochar-Ft. Wadsworth	1	6.1
SI22	West New Brighton-New Brighton-St. George	2	5.9
SI24	Todt Hill-Emerson Hill-Heartland Village-Lighthouse Hill	3	9.0
SI25	Oakwood-Oakwood Beach	0	0.0
SI28	Port Richmond	0	0.0
SI32	Rossville-Woodrow	0	0.0
SI35	New Brighton-Silver Lake	1	5.4
SI36	Old Town-Dongan Hills-South Beach	3	11.9
SI37	Stapleton-Rosebank	1	3.7
SI45	New Dorp-Midland Beach	1	4.7
SI48	Arden Heights	0	0.0
SI54	Great Kills	1	2.3
SI99	Park-Cemetery-Etc-Staten Island	0	0.0

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