Project Tycho

Preliminary data for the state of Massachusetts

Tycho database beta test version

The data presented in this report are of preliminary nature and should not be used for publication or other types of official use

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University of Pittsburgh Graduate School of Public Health

University of Pittsburgh

VMI
Vaccine Modeling Initiative

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We also acknowledge the help of many contributors that have contributed to the digitization and processing of weekly surveillance data included in this database. Digital Divide Data: Linda Thomas, Eric Gold, Heak Hok, Villa Kem and Hetel Patel. University of Pittsburgh Graduate School of Public Health: Steve Wisniewsky, Heather Eng, Sharon Crow, David Galloway, Jia Xu and Raaka Kumbhakar. University of Pittsburgh School of Information Sciences: Vladimir Zadorozhny, Ying-Feng Hsu, David Paul Koenig , Fatimah Ridwan and Divyasheel Sharma. Johns Hopkins Bloomberg School of Public Health: Derek Cummings. Pittsburgh Supercomputing Center: David Graham and Andrew Adams.

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Contact information

The Tycho database is currently being tested and a login account will be required to use the database and website (www.tycho.pitt.edu). All State Epidemiologists, CDC partners, other federal agencies and our research collaborators will be provided with user accounts. User accounts can also be provided upon specific request. Note that the quality of the data during the testing phase cannot be guaranteed to be sufficient for publication or official use.

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Introduction

Project Tycho started in 2009 as part of the Vaccine Modeling Initiative (VMI) at the University of Pittsburgh Graduate School of Public Health, funded by the Bill & Melinda Gates foundation. This project aims to contribute to the availability of public health data for research and policy making. The vision for this project as described in the next section is a central access point for public health data of a detailed spatial and temporal scale for all countries. Currently, the Tycho database contains 10 million records that each represent a weekly report from a location for a specific disease. These records were extracted from weekly US Nationally Notifiable Disease Surveillance Reports between 1888 and 2009 (6300 reports) using double data entry (200 million keystrokes). The current database includes a total of 90 million reported cases and 4 million reported deaths due to notifiable diseases in the United States for the last 122 years.

Project **Tycho** is named after the Danish nobleman Tycho Brahe (1546 – 1601), who meticulously collected astronomical data. After Brahe's death, his assistant Kepler used these data to develop area laws of planetary motion.

Background

"No health department, State or local, can effectively prevent or control diseases without knowledge of when, where and under what conditions cases are occurring"
(Quote stated above weekly surveillance reports published in the Public Health Reports, 1888-1951)

This quote has accompanied weekly reports on the prevalence of notifiable diseases in the United States as long as these were published in the Public Health Reports, emphasizing the importance of data for disease control policy making. In the current day and age, this statement has lost none of its significance. On the contrary, as infectious diseases continue to pose challenges to the global public health system in an increasingly interconnected global society. The public health system has responded to this challenge by evermore sophisticated disease surveillance systems. The availability of internet and information technology has facilitated collection of detailed data on infectious disease incidence, the spread of pathogens, disease determinants, health behavior, etc. New technologies such as remote sensing and mobile reporting systems have advanced measurement of these factors in both high and low resource settings. The enormous wealth of public health information that is currently being accrued also poses its own challenges for data storage, management, preservation and dissemination. Public health agencies will need to allocate resources and develop capacity to specifically address these issues.

Although the importance of public health data collection has been widely recognized, the dissemination of data has been neglected for many reasons. The above quote does not only imply data collection but also its use and dissemination as knowledge on disease occurrence can only be derived from data after processing and analysis. Not only has disease surveillance become more sophisticated, analytical tools have changed as well and now include computational models to assess disease transmission and to evaluate disease control options. These methods have introduced the opportunity for data intensive studies of fine spatial-temporal patterns using dynamic models. Disease surveillance data at such scale are often not available for analysis for multiple reasons. First, surveillance data are not collected for research purposes but for disease monitoring and planning. Secondly, public health staff often lack time or capacity to prepare these data for analysis. Third, surveillance methodology often lacks transparency and standardization, reducing options for scientific analyses. Fourth, disease surveillance data are often

kept confidential and ownership or data use requirements are often unclear. Finally, archiving and preservation of surveillance data are often not a priority and disaggregated records may get lost, losing the opportunity to ever use these data for analysis.

The Tycho project aims at overcoming some of these challenges by providing open access to large public health datasets of great spatial-temporal detail. Open access to these data will provide great opportunities for scientific analysis and better informed policy making on disease control.

The Tycho database and website

As described in the methods section, a large heterogeneity in reporting practice was observed over the past 122 years of weekly disease surveillance and substantial efforts were made to clean and standardize these data. The current online database includes all cleaned and standardized data in a format that allows comparisons across time and space. It does not include parts of the data that require additional cleaning and research such as classification of disease subcategories.

Each record in the database provides a reported number of cases or deaths due to a specific disease for a specific location, for a certain week. The database can be searched online (www.tycho.pitt.edu) by selecting a dataset, an aggregation method and an output format. Data can be viewed in tables, graphics and maps and these can be downloaded for further use.

Data availability

The data provided by the Tycho database reflect the weekly US Nationally Notifiable Disease Surveillance System between 1888 and 2009. It includes all diseases that were reported as part of this system, but it does not yet include records from other surveillance systems such as the annual system or disease specific subsystem (such as the influenza surveillance system).

The available data also reflects changes in reporting practices over time. This explains why city or state level reports are only available for a certain time period (1888-1953 for cities and 1927-2009 for states) and why morbidity and mortality reports are available for different time periods. We are currently working on inclusion of additional data as described in the section on collaboration.

Testing and release of the Tycho database

The Tycho database is currently in a beta testing phase that will start during the 2011 annual meeting of the Council of State and Territorial Epidemiologists (CSTE) in Pittsburgh June 12-16. This phase will end with a release to the general public in the fall of 2011. During the testing phase, invited users will be provided with login accounts that will enable full use of all features of the website and database. Invited users will include all state epidemiologists, partners in the CDC and other federal agencies as well as research collaborators. During this phase, data cleaning and standardization will continue. The quality of the data will not be sufficient for publication or official use during this phase.

Future developments

After optimization of the database and website during the testing phase, the first version of the Tycho database will be released to the general public. After that, efforts to clean and standardize the data will continue and more data will be released in subsequent versions. In addition, ongoing and new collaborations for inclusion of new data will allow gradual expansion of the dataset over time and increased opportunities for data driven analysis and policy making.

Vision and goal

The vision for project Tycho is based on the value of open access to detailed, disaggregated public health data for scientific analysis and policy making. Starting with 122 years of weekly US surveillance data, it is our hope that this example will convince public health authorities worldwide of the value of this resource and will stimulate similar contributions from other countries.

In the past, data sharing and archiving have not been a priority in public health or among health sciences in general. Continuous and diligent public health data collection has led to a large pool of disaggregated data scattered over the world including the internet, ranging from paper archives to basements of local health departments. The need for open access to a central repository of public health data has been recognized and both benefits and challenges of open access to data in general have been well described. Open access to data could lead to increased accountability, transparency, innovation, collaboration, cost-effectiveness, replication of results, the development of new methods and insights, and a narrower data access gap between low- and higher income countries. Ultimately, this would result in the advancement of science and technology to the benefit of all.

Challenges to open access include inconsistent formats, lack of annotation or metadata, lack of information technology (IT) capacity, a lack of incentive, and cultural norms around data ownership. Open access to public health data in particular is confronted by decentralized archiving of disease reports, lack of time and capacity for data management, degraded physical format of records and archives, and governmental level legal constraints. Multiple principles and requirements for a central open access repository for public health data have been described and include (1) capacity building for data management in low- and middle income countries, (2) feedback loops to data contributors, (3) sustainability, (4) common standards, (5) interoperability, and (6) user-friendliness.

The ultimate goal of the Tycho project is to provide a central global public health data access point. Historical as well as current public health data are of great value if archived and accessible for research and analysis. Open access will enable the use of analytical capacity from around the globe which will lead to new discoveries of disease patterns and control policies. Furthermore, a central data access point will facilitate data archiving and preservation into the future which will be an increasing need in a data rich public health environment.

Collaboration

The application of the surveillance data from the Tycho database as well as the inclusion of new data will require a wide range of collaborations with public health offices in the US and abroad. The Tycho project has currently made the first step of digitizing 122 years of weekly US surveillance reports that had already been published. The next step will be the completion of the existing dataset as well as the inclusion of new data from unpublished sources.

This report provides an overview of data available from the Tycho database for the state of Massachusetts. This includes all data that has ever been published at state or city level for Massachusetts in the weekly US Nationally Notifiable Disease Surveillance System. As you will find, the data availability will vary greatly over time, between city and state level reports, between diseases and between morbidity vs. mortality reports.

The Tycho development team would look forward to work with state health departments in the US to:

1. Better understand the current Tycho data for each state (eg. by collecting historic documentation)
2. Provide better usability and applications of current Tycho data for each state by continued joint development of website and database features.
3. Collect and/or digitize official, confirmed data to validate the current (preliminary) weekly data.
4. For each state, collect and/or digitize new data that has not yet been included. For example all city level reports discontinued in 1953 and completion of city level data until 2009 would greatly increase opportunities for analysis of disease patterns and trends.
5. Provide support to state health offices to manage, preserve and provide access to public health data.

Summary of methods

Detailed documentation on the methods used for the Tycho database has been provided on the website (www.tycho.pitt.edu). This section describes these methods in short.

Data collection

Weekly reports that contain tables on the occurrence of nationally notifiable diseases have been published since 1888 by public health authorities at the Federal level in various journals. Table 1 provides the list of publications and the responsible agency since 1888. All weekly nationally notifiable disease reports between 1888 and 1951 could be retrieved from the PubMed Central repository of the National Library of Medicine [1]. For 1995 to 2009, these reports could be retrieved from the MMWR digital archive on the CDC website [2]. Most weekly reports between 1952 and 1995 could be retrieved from the HathiTrust Digitial Library [3] [4], but many could not be found and had to be copied from hard copies of MMWR issues in the University of Pittsburgh library.

Table 1, publications and responsible Federal agencies for nationally notifiable disease reports

Time period	Publication title	Responsible federal agency
1888-1889	Weekly Abstract of Sanitary Reports	US Marine Hospital Service
1890-1895	Abstract of Sanitary Reports	US Marine Hospital Service
1896-1901	Public Health Reports	US Marine Hospital Service
1902-1911	Public Health Reports	US Public Health and Marine Hospital Service
1912-1951	Public Health Reports	US Public Health Service
1952-1960	Morbidity and Mortality Weekly Report	National Office of Vital Statistics, US Public Health Service
1961-1969	Morbidity and Mortality Weekly Report	Communicable Disease Center
1970-1991	Morbidity and Mortality Weekly Report	Center for Disease Control
1992-2009	Morbidity and Mortality Weekly Report	Centers for Disease Control and Prevention

Inclusion criteria

Weekly reports of each year were reviewed systematically to assess the diseases reported. We included all tables that provided disease specific information by week for US cities, townships, counties or states. Tables that provided summary or aggregated information by month, year or at the national level were not included. Similarly, tables that did not contain disease specific information (such as all cause mortality) were not included.

Data entry

Weekly reports were downloaded or scanned as PDF files and selected tables with notifiable disease reports were entered into computer spreadsheets in a highly standardized fashion using double data entry. During the second round of data entry, operators could not see what had been entered in the first round and could not continue if the system detected a discrepancy between the second and first entry

[1] http://www.pubmedcentral.nih.gov/tocrender.fcgi?journal=333&action=archive
[2] http://www.cdc.gov/mmwr
[3] http://catalog.hathitrust.org/Record/003910026
[4] http://catalog.hathitrust.org/Record/003843660

for a specific value. Such discrepancies could only be resolved by checking the PDF file and try again or discussion with the group leader and verification of a value in the source documents.

Quality control for data entry
The accuracy of data entry was checked at various levels. First, completeness of data was verified by comparing the content of entered data with PDF sources files. Secondly, accuracy of data entry was verified by multiple rounds of comparing random samples of entered files with PDF source files. Thirdly, data formatting was verified by various checks to ensure appropriate formatting for data loading.

Data loading and standardization
All data was entered in Excel spreadsheets and various components of these spreadsheets were loaded in data files. Table titles, column headers, place names and reported numbers were loaded in separate files. These files were used to extract information on each reported number, including:

1. the disease reported
2. the disease subcategory reported
3. cases or deaths reported
4. the reporting location (name, state and type of location)
5. the time period for which a number was reported
6. the date of publication of the original weekly report associated with a reported number

Integration
All reported numbers and extracted information was integrated in one database with one record per reported number and associated information.

Post-processing quality control
After integration of all data in one database, checks were performed to detect duplicate reports and data inconsistencies. Duplicate records were removed and inconsistencies resolved by verification with original PDF source files.

Data filtering
The digitized version of all historical weekly US nationally notifiable disease surveillance records is a very heterogeneous dataset. It took a substantial number of data processing protocols to standardize time and space variables as well as disease names. All standardized records have been separated from non-standard records by a filter. All remaining heterogeneity in non-standard records is inherent to the surveillance system and can only be standardized after further analysis will have been completed (eg. remaining heterogeneity in reporting periods for reports before 1953 and standardization of disease subcategories). The largest proportion of data (>4 million records) has been standardized however and has been made available in the current testing version.

Data visualization
Figures in this reports were made with the R system, version 2.9.2 and the maps were generated by the GAIA platform developed at the University of Pittsburgh Graduate School of Public Health in collaboration with the Pittsburgh Supercomputing Center (PSC). See http://midas-pitt.psc.edu/gaia for more information.

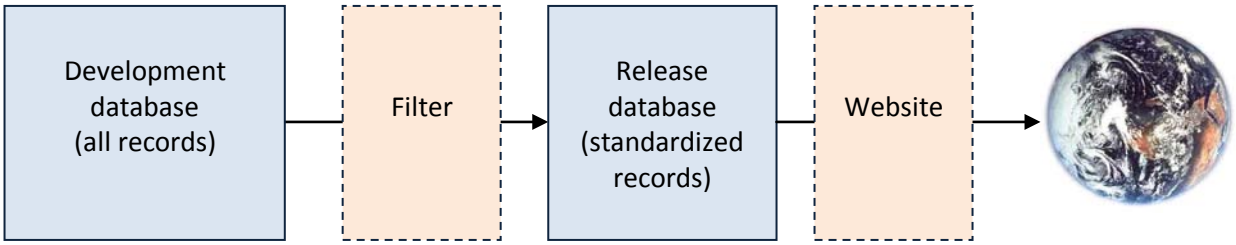

Figure 1, Schematic of the Tycho data architecture. Access to a consistent, standardized subset of the digitized US weekly surveillance reports will be provided for beta testing through a website that will allow querying and downloading of data. Data from the development database will be pushed through a filter to feed the Tycho database.

The current Tycho database will provide the reported number of cases or deaths reported by city or state health authorities to the federal health agency for all weeks between 1888 and 2009. Currently, only standardized, consistent data are being released for testing, according to the following criteria:

1. Only weekly reports are provided (reports for other periods such as 10 days, 2 weeks, 1 month, 1 year) are currently not included due to lack of comparability with the weekly reports.
2. Only reports that were published in the same year as the reporting period were included (this excludes updates or comparisons that were published more than a year after the original reporting period)
3. Only numbers were included for which information about the location, time period and disease could be extracted.
4. Only numbers or time periods for which no disease subcategories were reported were included.

Each of the steps described above have been described in detailed protocols that are posted in the documentation part of the Tycho website (www.tycho.pitt.edu).

Website

The Tycho website features simple and advanced searches of the data, visualizations and downloading of machine readable files. A dataset can be selected by specifying: 1) the disease of interest, 2) the location(s) of interest and 3) the time period. In a second step, the type of aggregation and length of increments can be specified and in a third step, the type of output (table, graphic or map) can be selected. After output has been generated, data can be downloaded.

As mentioned above, data availability varies largely by disease, time period and location. We aimed to restrict selection options by data availability to avoid "no results available.

Access to the most of the website will be password protected during the testing phase. For invited users after login, full functionality of the database and website will be available. During this phase however, the data quality will not be sufficient for publication or official use.

Overview of data available for the state of Massachusetts

In this section, an overview of data available for the state of Massachusetts will be provided. As described earlier, data availability depends entirely on historical reporting practices in the weekly US Nationally Notifiable Disease Surveillance System between 1888 and 2009. For this report, we only included morbidity reports (cases) to improve the format and limit the size of this report. As mentioned earlier, the analysis and standardization of has not been completed yet for all records in the database and preliminary data are provided here that may not yet be available in the online database.

This section will provide a general overview of data availability. The next sections will provide disease specific data from state and city level reports of Massachusetts. Data for a maximum of 3 major cities were provided depending on availability (city data was only reported until 1953). Some summary data will be provided at the end of this report, for a subset of diseases for which data was fragmented over time.

Table 1 lists the number of weekly state or city reports that are available for Massachusetts per each disease and subcategory.

Table 1, Number of weekly state or city reports per disease and subcategory

Disease	City	State
Aids	-	934
Anthrax	-	143
Brucellosis [undulant fever]	4	316
Chickenpox [varicella]	452	629
Chlamydia	-	679
Cryptosporidiosis	-	441
Dengue	9	-
Diphtheria	2185	1795
Dysentery		
Amebic	-	219
Bacillary	-	297
Unspecified	-	195
Encephalitis		
Lethargic	426	-
Post infectious	1	224
Primary [infectious] including unspecified	351	1479
Escherichia coli		
EHEC 0157	-	177
EHEC non-0157	-	127
EHEC non serogrouped	-	111
O157:H7 NETSS	-	282
O157:H7 PHLIS	-	265
STEC	-	153

Table 1, Number of weekly state or city reports per disease and subcategory, *continued*

Disease	City	State
Giardiasis	-	344
Gonorrhea		
Civilian	-	756
Unspecified	-	1044
Haemophilus influenzae		
Age <5 non-serotype B	-	110
Age <5 serotype B	-	40
Age <5 unknown serotype	-	105
All ages all serotypes	-	614
Hepatitis		
Acute type A	-	342
Acute type B	-	335
Acute type C	-	37
Acute type NA NB [including C]	-	34
All types, <20 years	-	207
All types, >=20 years	-	104
All types, all ages	90	715
Type A [infectious]	1	1697
Type B [serum]	1	1411
Type NA NB [including C]	-	737
Type unspecified	1	940
Influenza	650	286
Legionellosis	-	989
Leprosy	1	427
Listeriosis	-	210
Lyme disease	-	799
Malaria		
Military	-	14
Unspecified	2	1858
Measles		
Imported	-	579
Indigenous	-	660
Unspecified	2253	2946
Meningitis		
Aseptic	1	1182
Meningococcus	934	1224
Unspecified	722	5

Table 1, Number of weekly state or city reports per disease and subcategory, *continued*

Disease	City	State
Meningococcal disease		
All serogroups	-	46
Invasive all serogroups	-	155
Invasive serogroup unknown	-	44
Other serogroup	-	2
Serogroup A C Y and W-135	-	2
Serogroup B	-	2
Serogroup unspecified	75	2410
Mumps	451	1403
Pellagra	425	-
Pneumonia		
Lobar	41	-
Unspecified	395	22
Poliomyelitis		
Non paralytic	-	113
Paralytic	-	328
Total	1541	1658
Psittacosis	-	14
Rabies in animals	1	1410
Rocky mountain spotted fever	-	1207
Rubella	-	1383
Salmonellosis		
NETSS	-	127
PHLIS	-	122
Unspecified	-	345
Scarlet fever		
Including streptococcal sore throat	98	564
Unspecified	2158	1283
Shigellosis		
NETSS	-	124
PHLIS	-	121
Unspecified	-	345
Streptococcal disease, invasive group a	-	340
Streptococcal sore throat	-	102
Streptococcus pneumoniae invasive disease		
Drug resistant <5 years	-	47
Drug resistant all ages	-	65
Non drug resistant <5 years	-	166

Table 1, Number of weekly state or city reports per disease and subcategory, *continued*

Disease	City	State
Syphilis		
Civilian primary and secondary	-	739
Congenital	-	1
Primary and secondary	-	1090
Tetanus	-	351
Toxic shock syndrome	-	326
Trichiniasis	19	60
Tuberculosis [phthisis pulmonalis]		
New active	-	150
Unspecified	889	1481
Tularemia	-	766
Typhoid fever [enteric fever]		
Including paratyphoid fever	339	645
Unspecified	1794	2468
Typhus fever		
Endemic	1	25
Unspecified	43	176
West nile disease		
Neuroinvasive	-	38
Non-neuroinvasive	-	40
Whooping cough [pertussis]	1555	2239

The diseases included in the weekly US Nationally Notifiable Disease Surveillance System varied largely over time and reflected the historical social-political priorities of each time period. Note that the diseases in the weekly system were a subset of all diseases included in the annual Notifiable Disease Surveillance System (that was not entered as part of this project).

The number of locations reporting diseases also varied over time depending on the type of reports submitted. Figure 1 on the next page provides an overview of the number of unique locations reporting each disease per week between 1888 and 2009. For the remainder of this report, the state of Massachusetts was considered a unique reporting location in addition to the individual city reports. Figure 1 indicates that many locations (mostly cities) were included in the reporting system before 1925, after which the number of cities dropped substantially. After 1953, only state reports were included and city reports were discontinued. These patterns were observed nationwide.

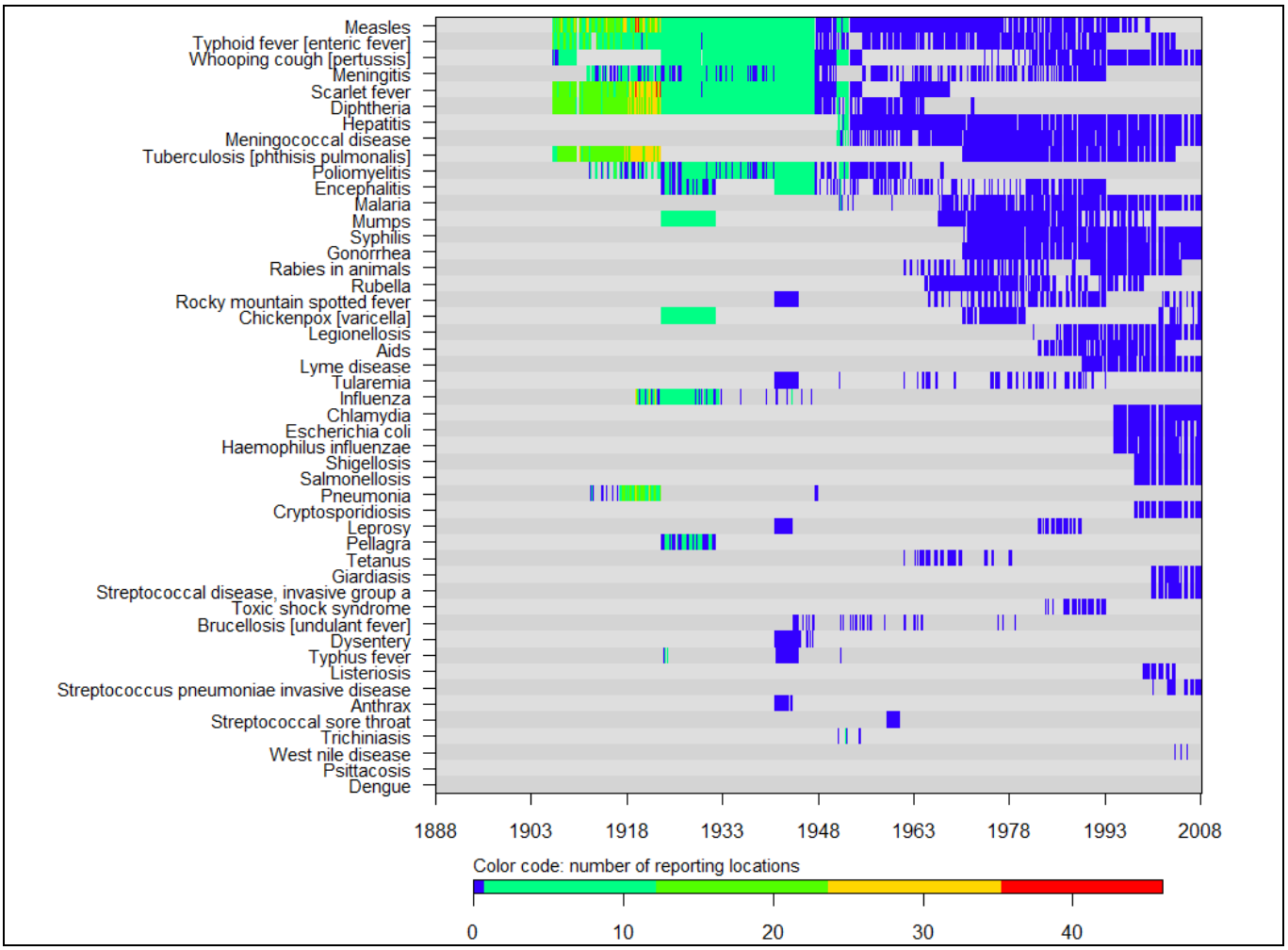

Figure 1, The number of locations (in color code) reporting on each disease per week between 1888 and 2009

For the majority of the time period between 1888 and 2009, only state level reports were available. It would be of great interest to complete the collection of city data after 1953 and we will seek collaboration with state health offices for this.

The map in figure 2 (next page) illustrates the geographical distribution of the available city data. It displays the number of weekly reports for any disease available per location that was included (and for which coordinates could be derived)

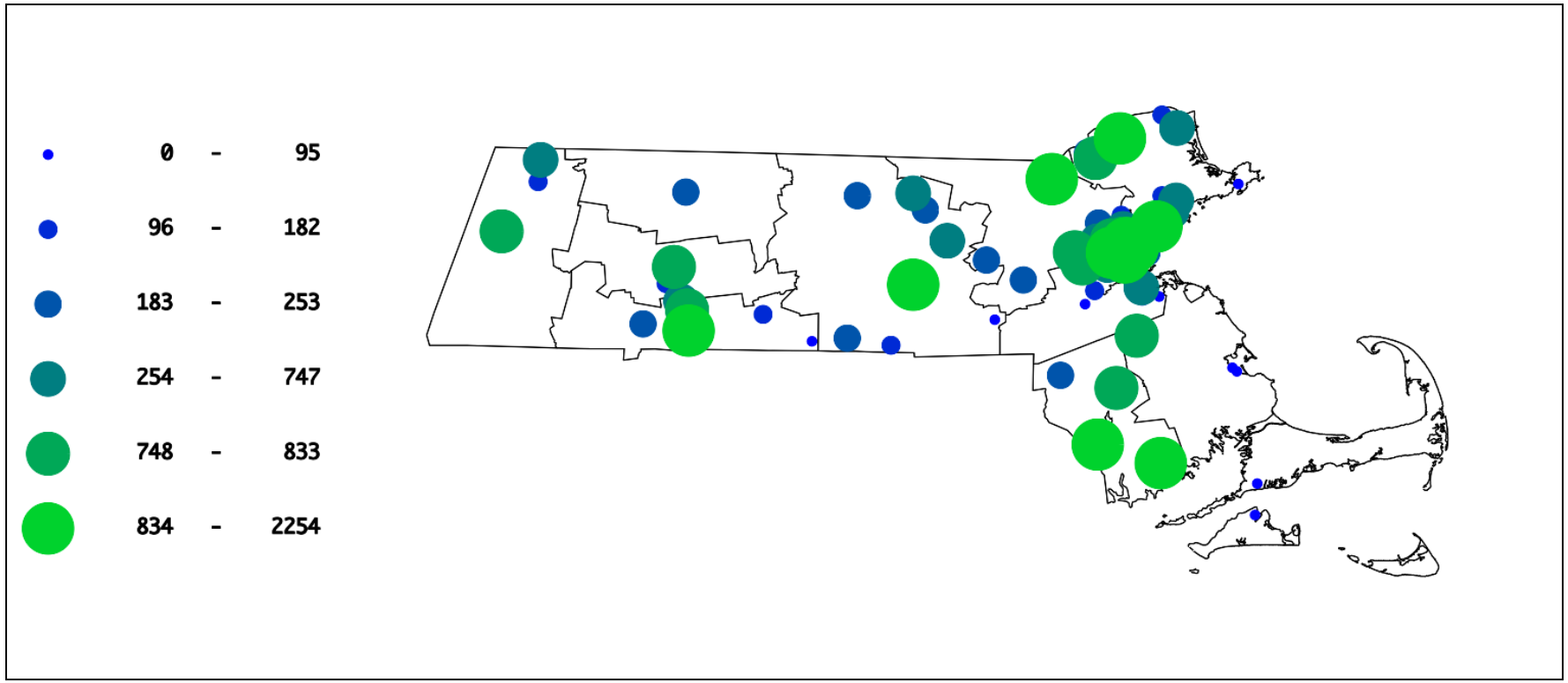

Figure 2, This map displays the number of weekly reports available for any disease per city (note that city reports were only available until 1953)

Figure 3 below provides an overview of the number of diseases for which a weekly report was included at the state state level and for individual cities. All cities for which at least 100 weekly reports are available have been listed. For most states, it shows a major drop in the number of cities after 1925 and after 1953, city reports were discontinued except for New York City, which became its own reporting jurisdiction.

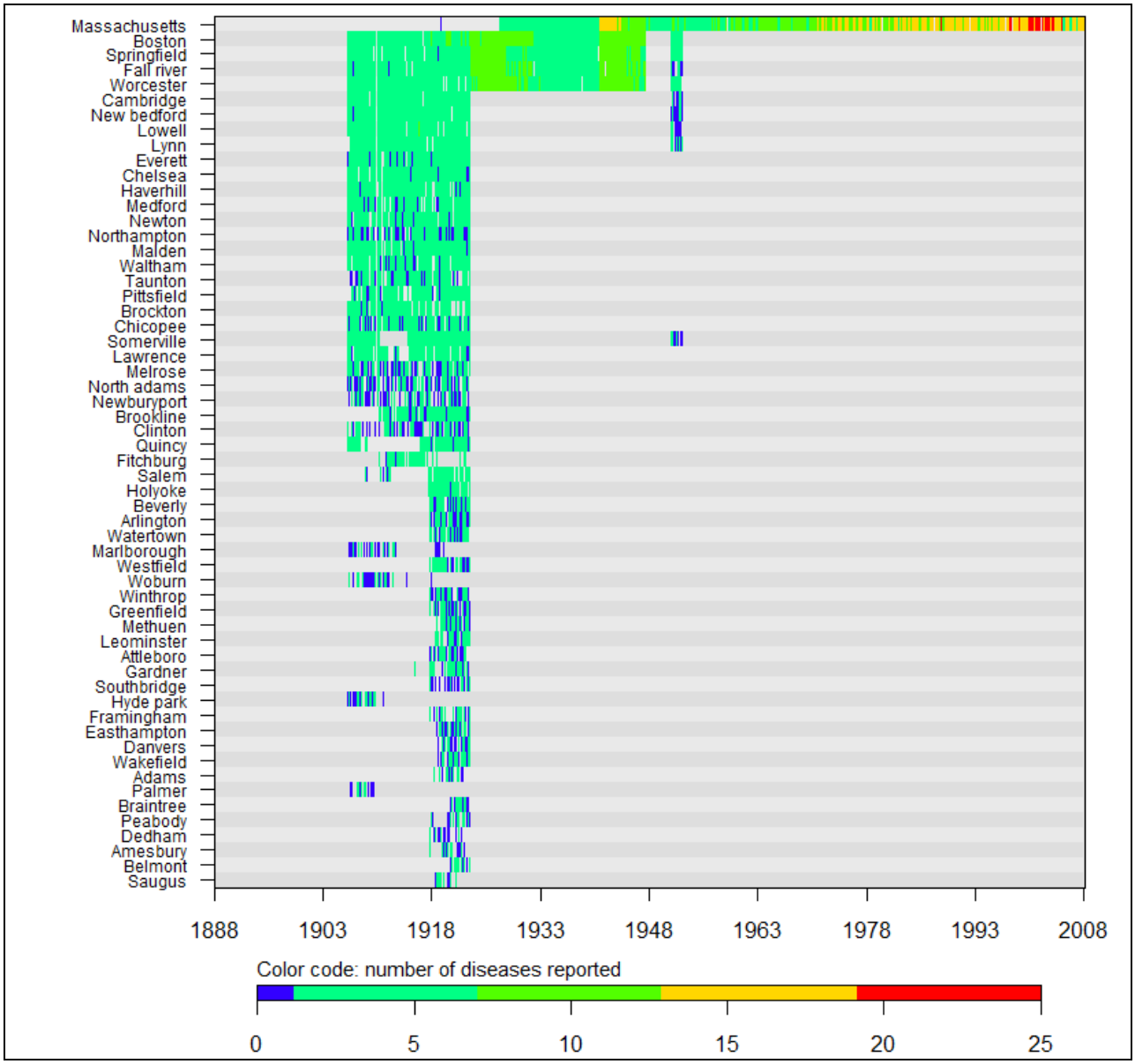

Figure 3, The number of diseases (in color code) that were reported for the state and city level (state on top row) for each week between 1888 and 2009

Disease specific data for Massachusetts

AIDS

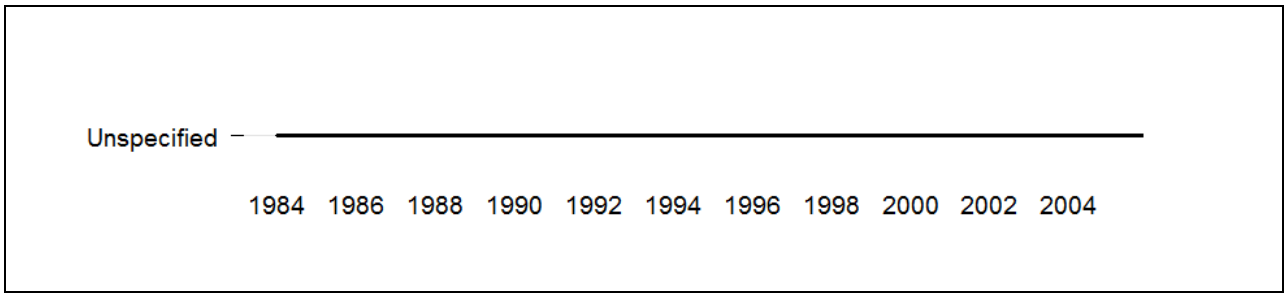

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for AIDS

Indicator	Massachusetts
Report period	1984-2005
Total weeks	934
Total cases	16,876
Max. cases per year	2,450
Year (max)	1993
Max. cases per week	416
Week (max)	1993, wk 15
Average cases per year	767
95%CI	(545-989)
Average cases per week	18
95%CI	(15-21)

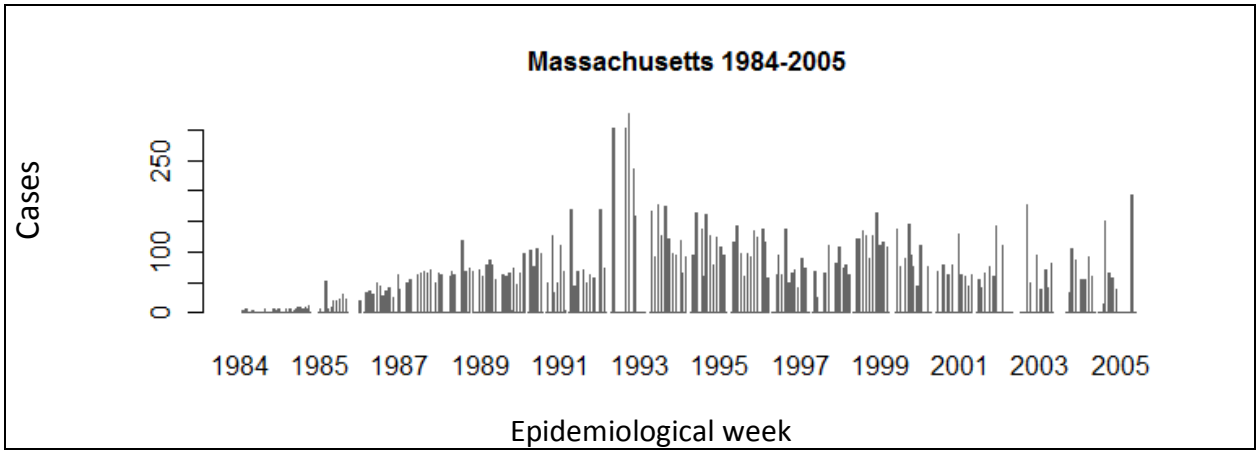

Figure D2, Number of cases reported for AIDS per epidemiological week

Chlamydia

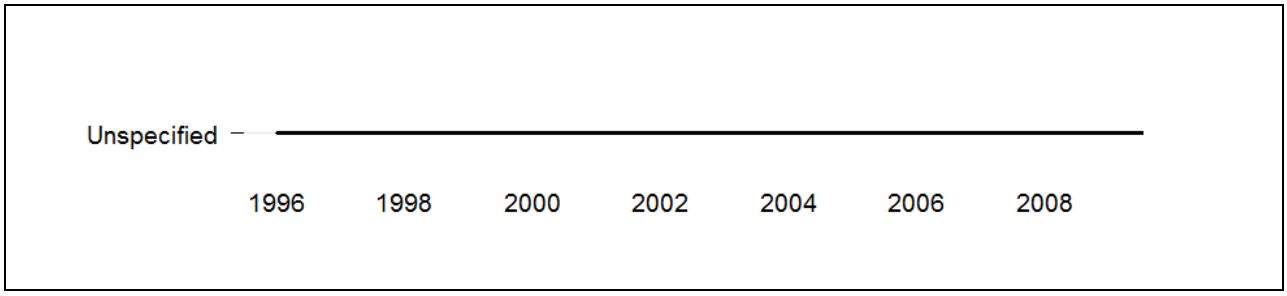

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Chlamydia

Indicator	Massachusetts
Report period	1996-2009
Total weeks	679
Total cases	173,467
Max. cases per year	20,058
Year (max)	2009
Max. cases per week	8,811
Week (max)	1999, wk 50
Average cases per year	12,390
95%CI	(9,900-14,880)
Average cases per week	255
95%CI	(225-285)

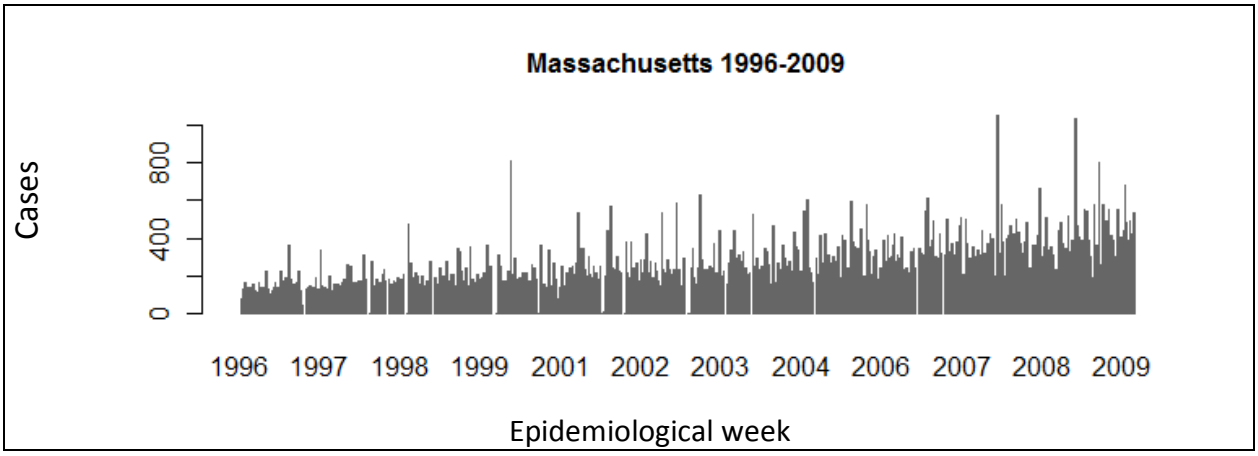

Figure D2, Number of cases reported for Chlamydia per epidemiological week

Cryptosporidiosis

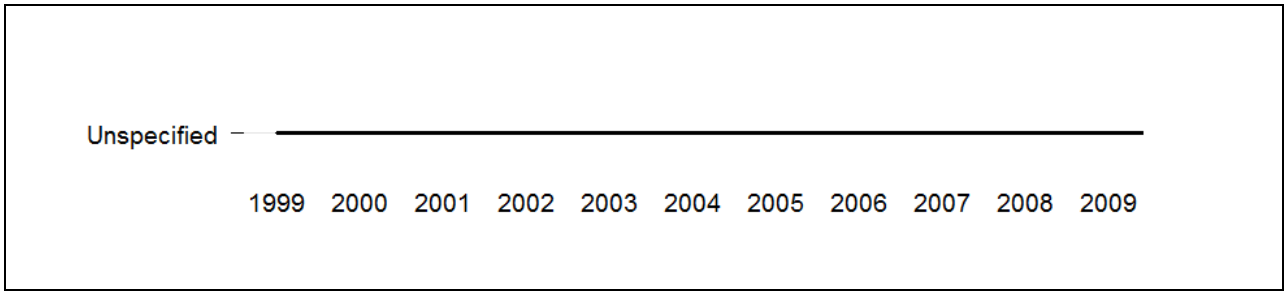

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Cryptosporidiosis

Indicator	Massachusetts
Report period	1999-2009
Total weeks	441
Total cases	697
Max. cases per year	158
Year (max)	2005
Max. cases per week	30
Week (max)	2007, wk 41
Average cases per year	63
95%CI	(36-90)
Average cases per week	2
95%CI	(2-2)

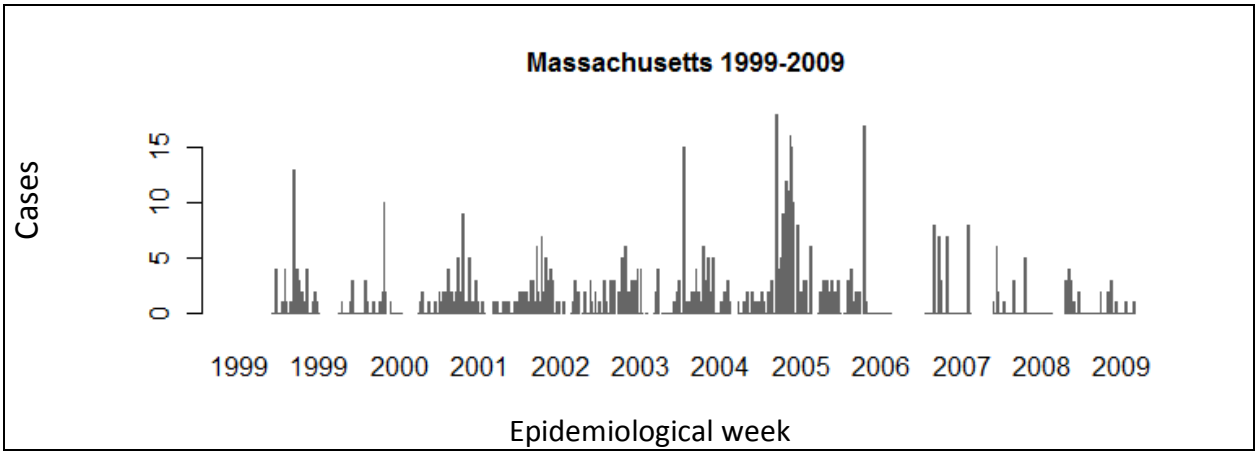

Figure D2, Number of cases reported for Cryptosporidiosis per epidemiological week

Diphtheria

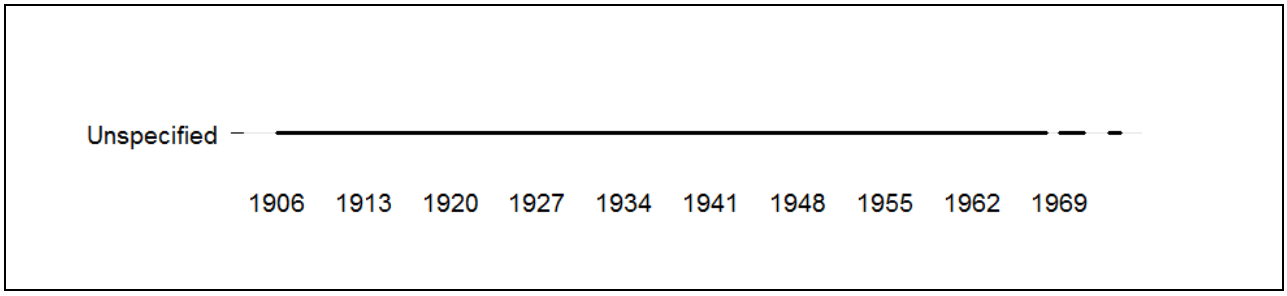

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Diphtheria

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1927-1973	1906-1953	1906-1948	1906-1953
Total weeks	1,795	2,170	2,041	2,019
Total cases	22,931	58,180	4,990	4,388
Max. cases per year	4,274	4,055	447	334
Year (max)	1929	1917	1917	1922
Max. cases per week	225	151	53	25
Week (max)	1970, wk 44	1917, wk 49	1932, wk 26	1922, wk 47
Average cases per year				
before 1940	1,404	1,636	141	122
95%CI	(545-2,263)	(1,231-2,041)	(103-179)	(93-151)
after 1940	109	93	5	14
95%CI	(58-160)	(26-160)	(2-8)	(-3-31)
Average cases per week				
before 1940	29	33	3	3
95%CI	(26-32)	(32-34)	(3-3)	(3-3)
after 1940	3	2	0	0
95%CI	(3-3)	(2-2)	(0-0)	(0-0)

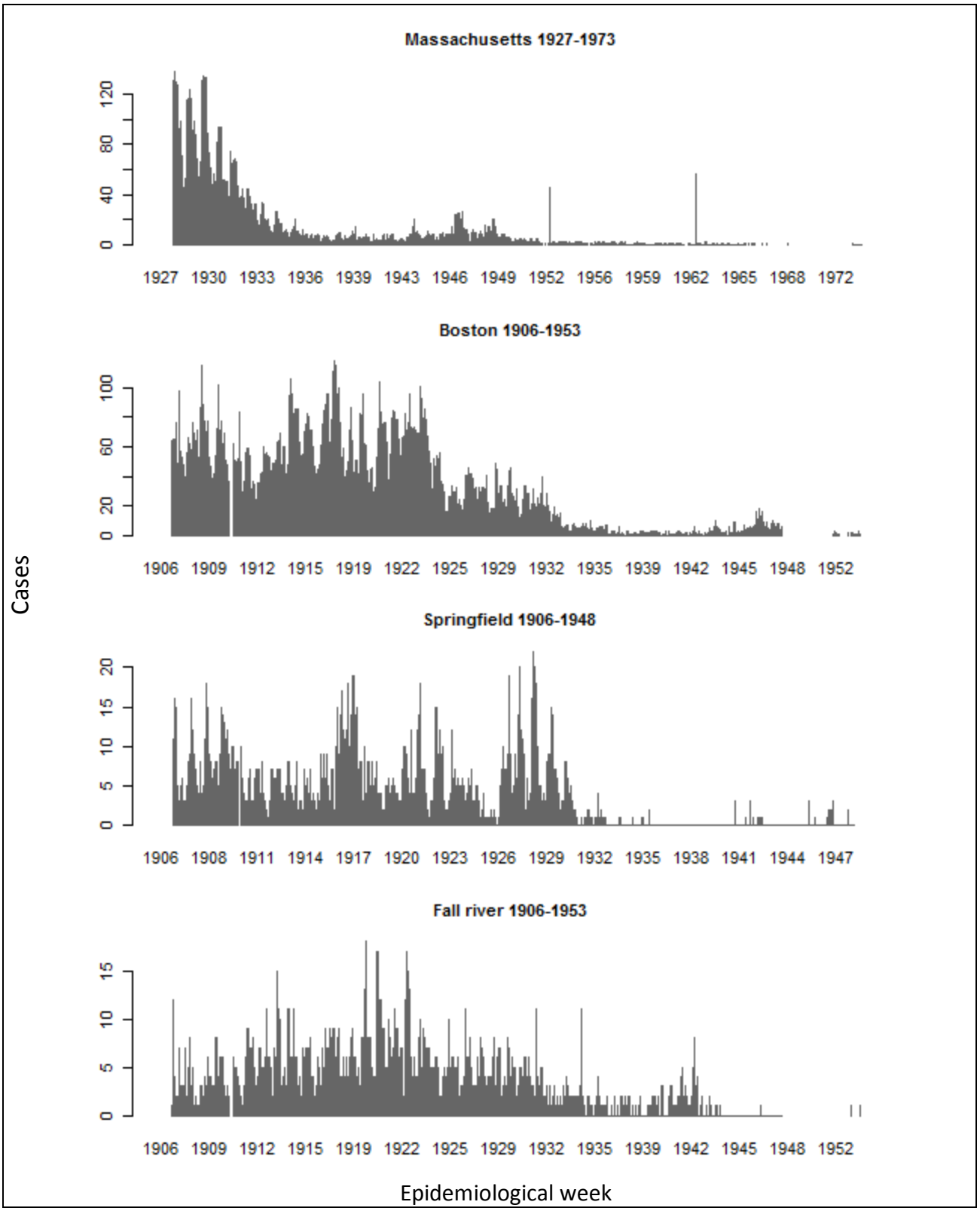

Figure D2, Number of cases reported for Diphtheria per epidemiological week

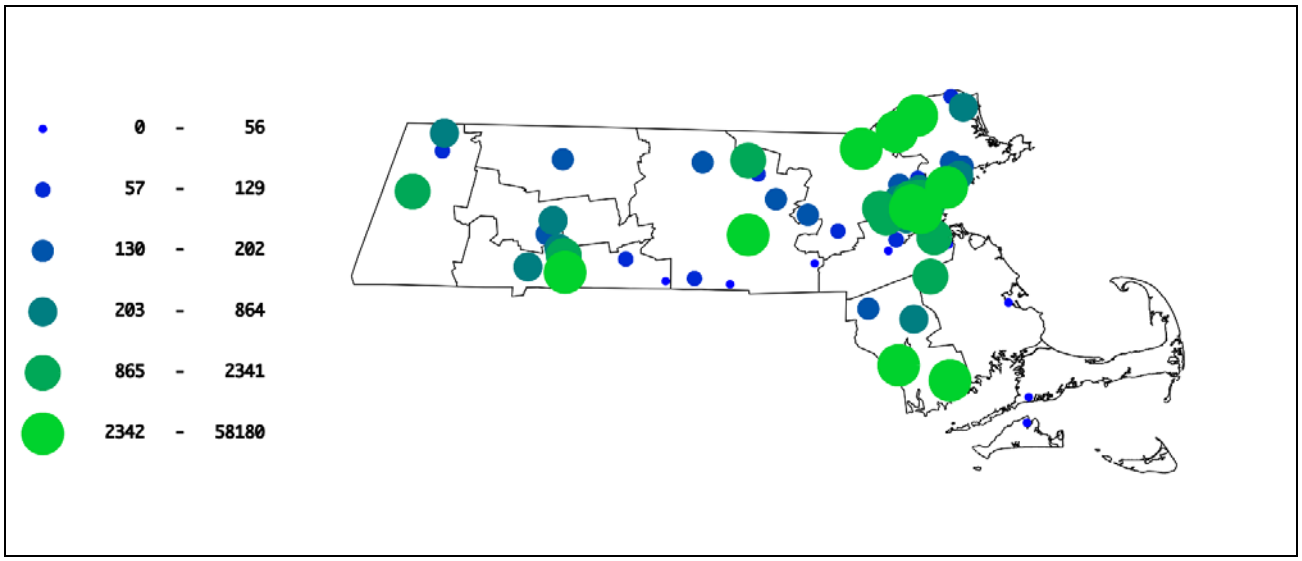

Figure D3, The total number of cases reported for Diphtheria by each city for the entire time period

Escherichia Coli

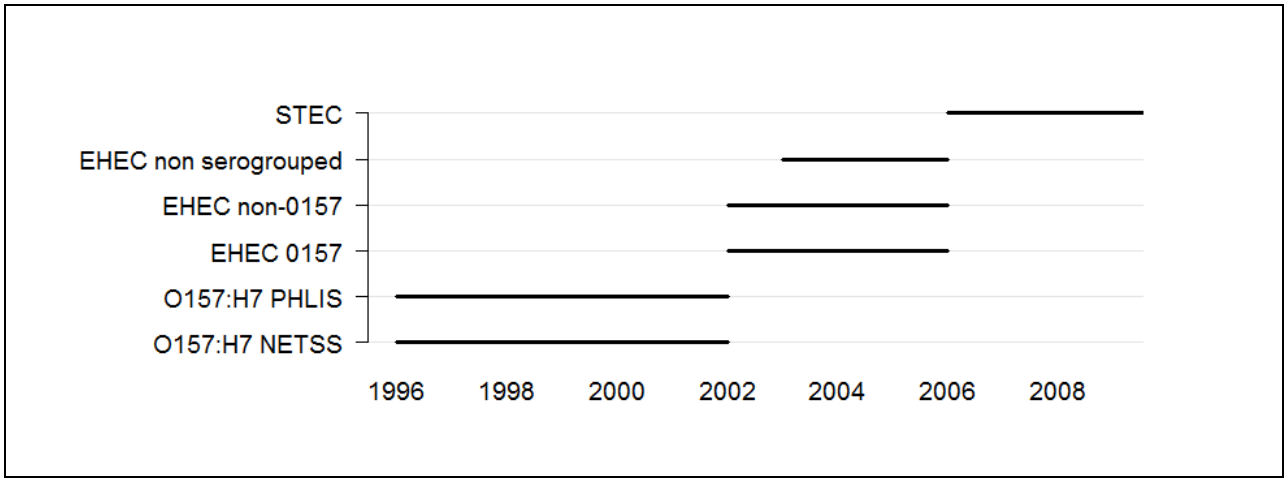

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Escherichia Coli (0157:H7 PHLIS, EHEC 0157, and STEC)

Indicator	Massachusetts
Report period	1996-2009
Total weeks	595
Total cases	1,468
Max. cases per year	183
Year (max)	1999
Max. cases per week	112
Week (max)	1996, wk 47
Average cases per year	105
95%CI	(83-127)
Average cases per week	2
95%CI	(1-3)

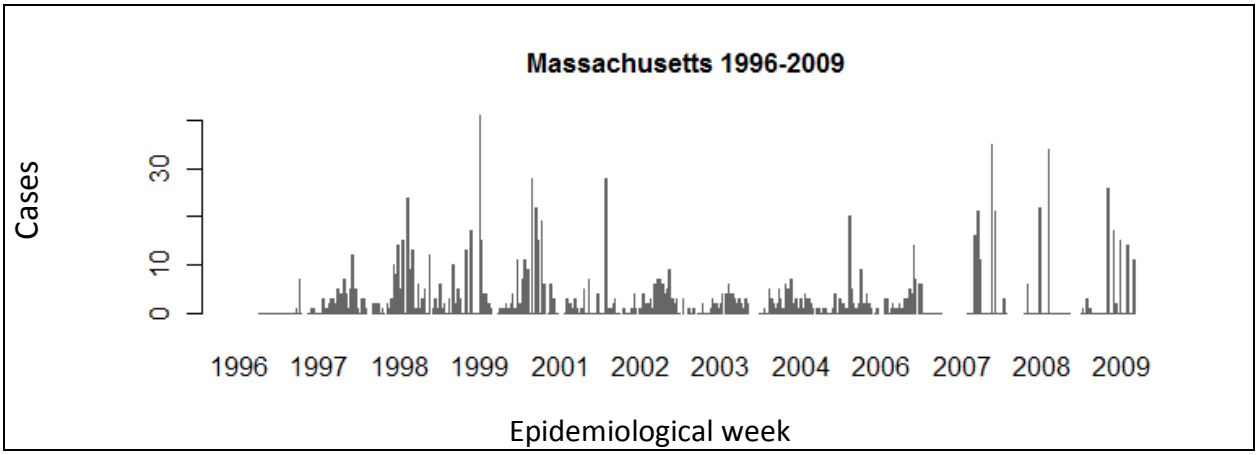

Figure D2, Number of cases reported for Escherichia Coli per epidemiological week

Giardiasis

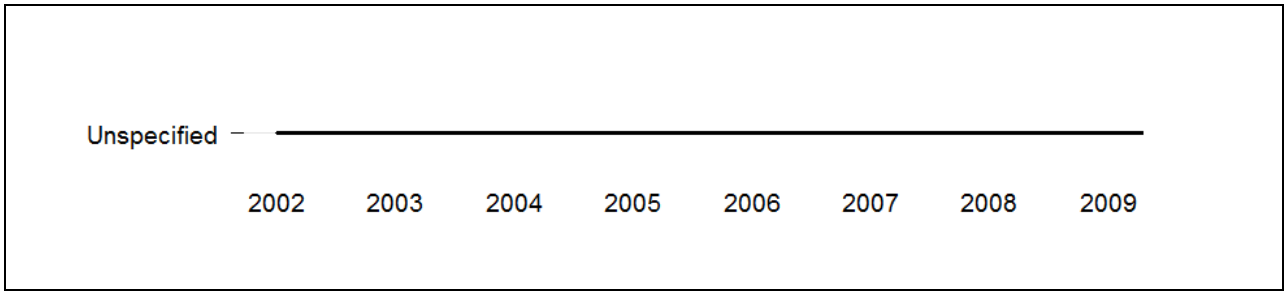

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Giardiasis

Indicator	Massachusetts
Report period	2002-2009
Total weeks	344
Total cases	13,385
Max. cases per year	9,769
Year (max)	2006
Max. cases per week	9,473
Week (max)	2006, wk 35
Average cases per year	1,673
95%CI	(-1,076-4,422)
Average cases per week	39
95%CI	(-15-93)

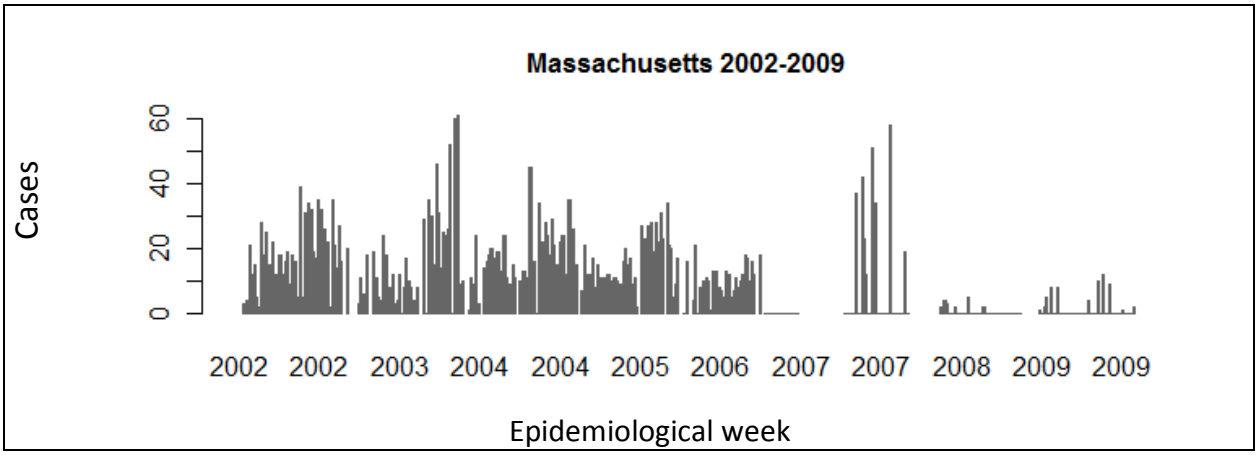

Figure D2, Number of cases reported for Giardiasis per epidemiological week

Gonorrhea

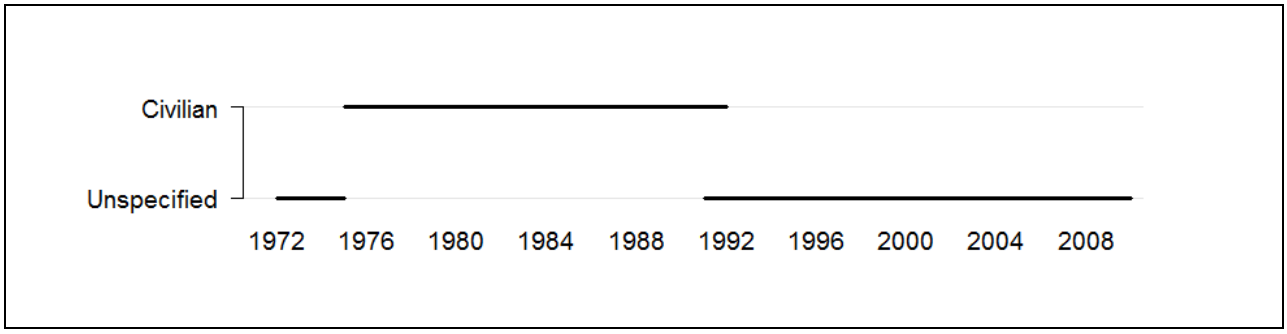

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Gonorrhea (Unspecified and Civilian)

Indicator	Massachusetts
Report period	1972-2009
Total weeks	1,800
Total cases	227,785
Max. cases per year	13,366
Year (max)	1976
Max. cases per week	2,634
Week (max)	2001, wk 44
Average cases per year	5,994
95%CI	(4,841-7,147)
Average cases per week	127
95%CI	(121-133)

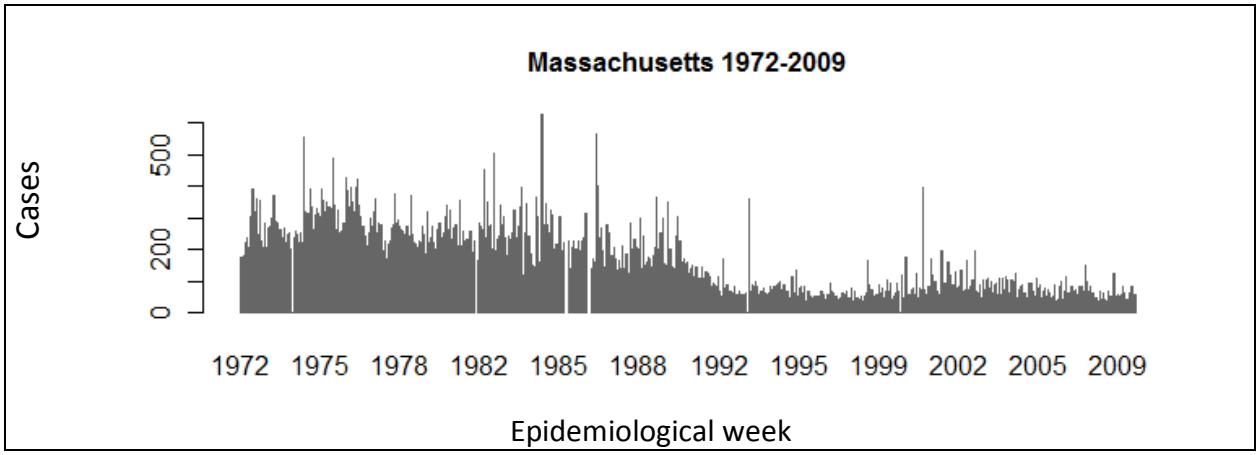

Figure D2, Number of cases reported for Gonorrhea per epidemiological week

Haemophilus Influenzae

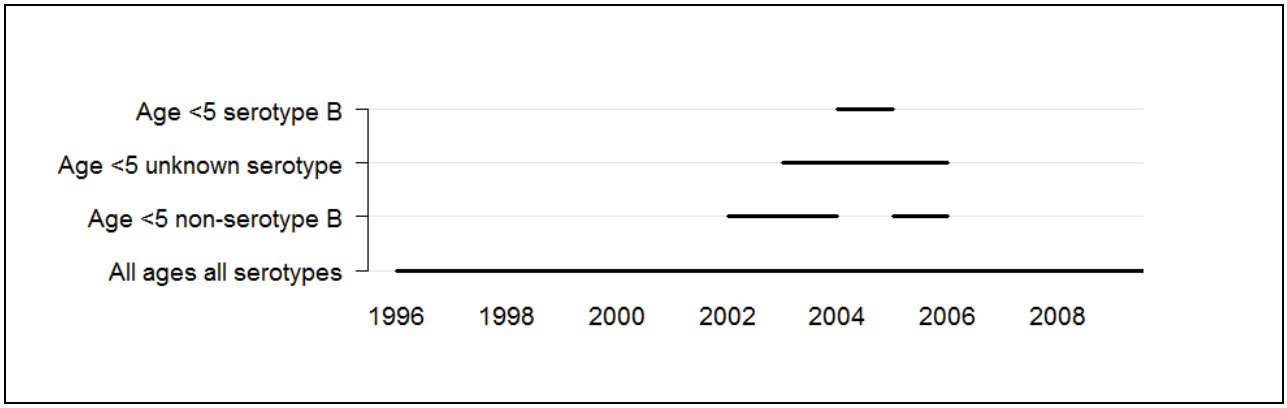

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Haemophilus Influenzae (All ages all serotypes)

Indicator	Massachusetts
Report period	1996-2009
Total weeks	614
Total cases	767
Max. cases per year	124
Year (max)	2005
Max. cases per week	35
Week (max)	1996, wk 51
Average cases per year	55
95%CI	(41-69)
Average cases per week	1
95%CI	(1-1)

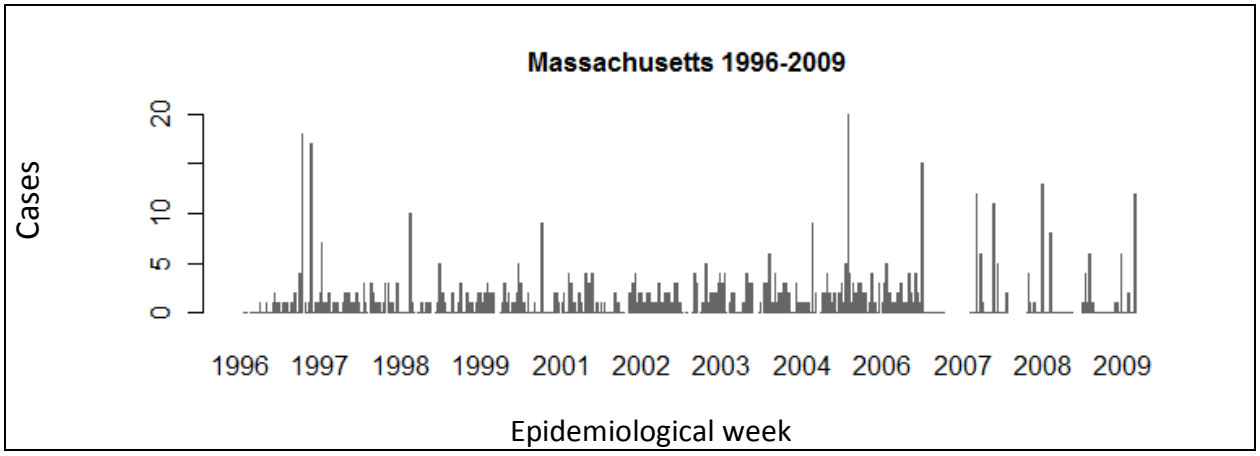

Figure D2, Number of cases reported for Haemophilus Influenzae per epidemiological week

Hepatitis

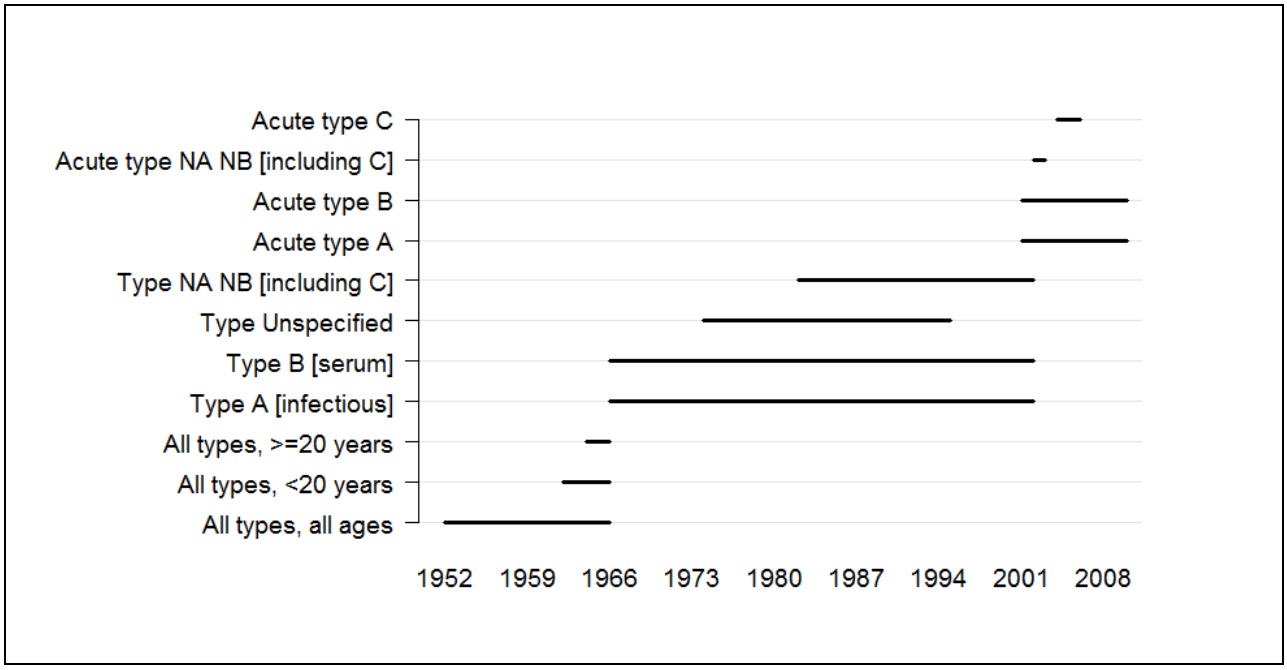

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Hepatitis (Type A [Infectious], Acute type A, Type B [Serum], and Acute type B)

Indicator	Massachusetts
Report period	1966-2009
Total weeks	2,079
Total cases	18,493
Max. cases per year	2,945
Year (max)	1970
Max. cases per week	1,520
Week (max)	1970, wk 44
Average cases per year	
before 1990	601
95%CI	(352-850)
after 1990	182
95%CI	(109-255)
Average cases per week	
before 1990	12
95%CI	(9-15)
after 1990	4
95%CI	(4-4)

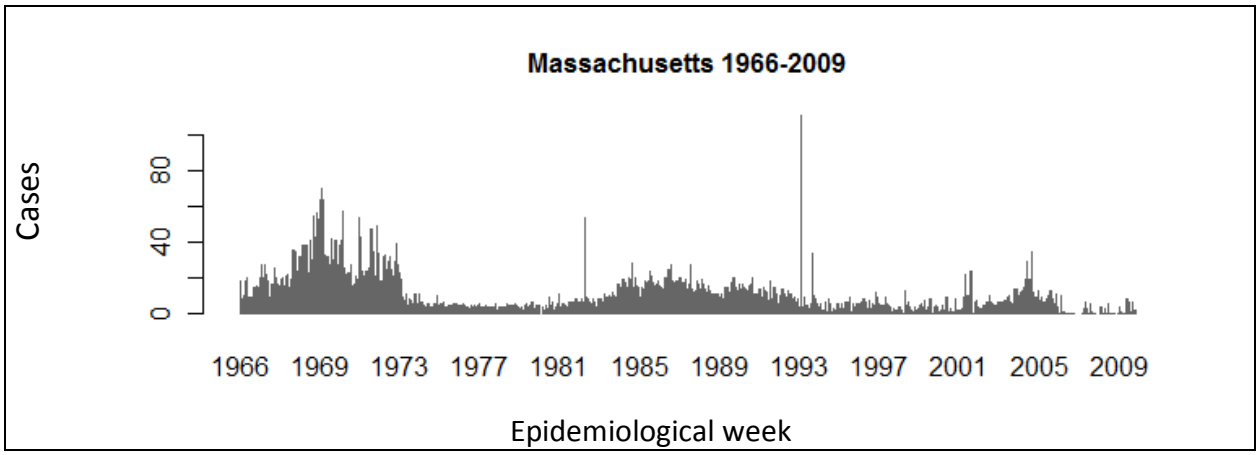

Figure D2, Number of cases reported for Hepatitis per epidemiological week

Legionellosis

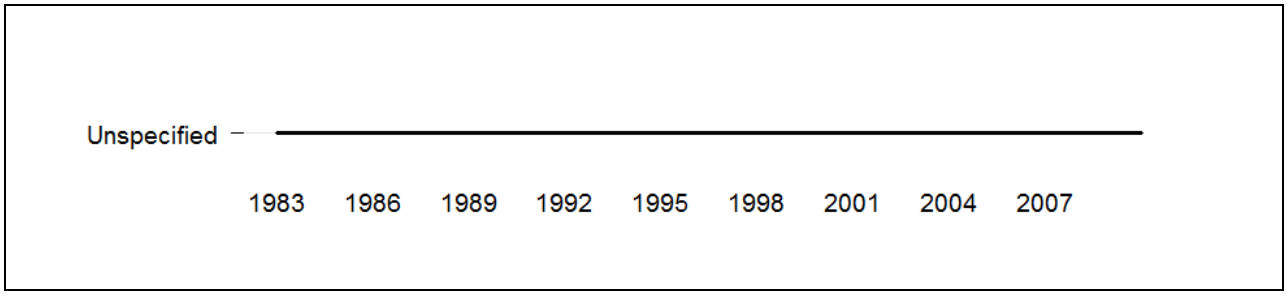

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Legionellosis

Indicator	Massachusetts
Report period	1983-2009
Total weeks	989
Total cases	904
Max. cases per year	77
Year (max)	2009
Max. cases per week	19
Week (max)	2005, wk 30
Average cases per year	33
95%CI	(26-40)
Average cases per week	1
95%CI	(1-1)

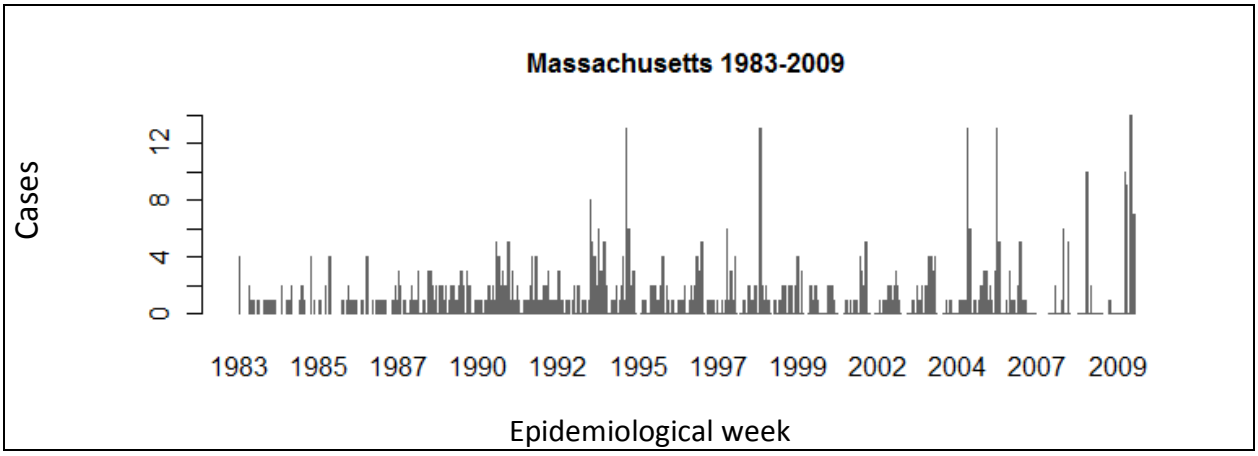

Figure D2, Number of cases reported for Legionellosis per epidemiological week

Listeriosis

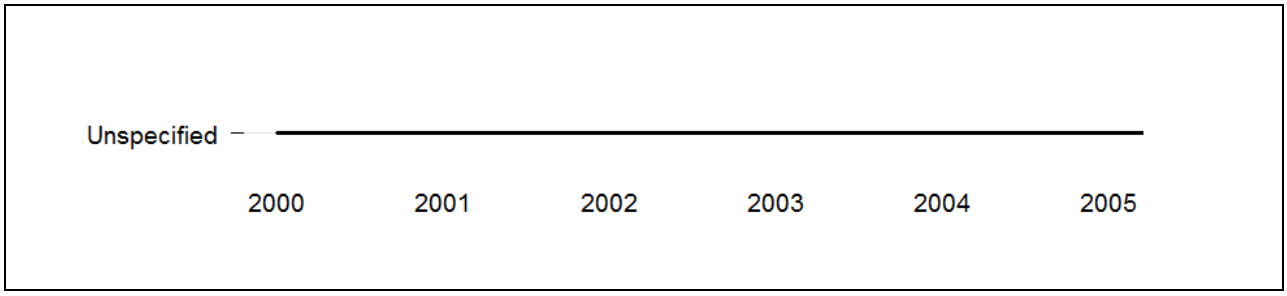

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Listeriosis

Indicator	Massachusetts
Report period	2000-2005
Total weeks	210
Total cases	102
Max. cases per year	30
Year (max)	2002
Max. cases per week	6
Week (max)	2004, wk 45
Average cases per year	17
95%CI	(8-26)
Average cases per week	0
95%CI	(0-0)

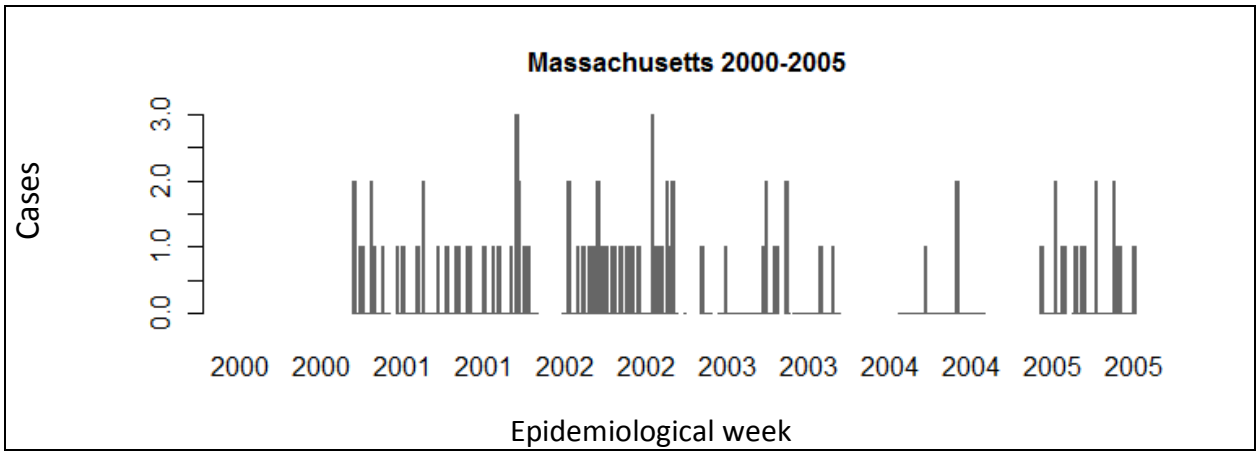

Figure D2, Number of cases reported for Listeriosis per epidemiological week

Lyme Disease

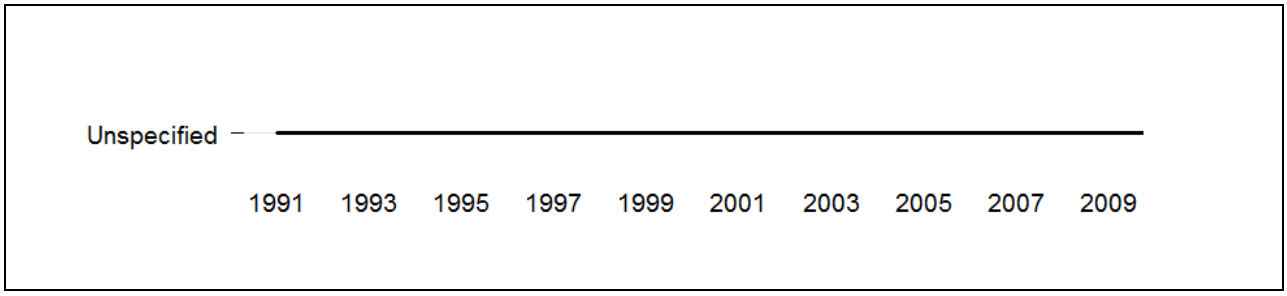

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Lyme Disease

Indicator	Massachusetts
Report period	1991-2009
Total weeks	799
Total cases	12,407
Max. cases per year	1,447
Year (max)	2002
Max. cases per week	721
Week (max)	1998, wk 44
Average cases per year	653
95%CI	(406-900)
Average cases per week	16
95%CI	(13-19)

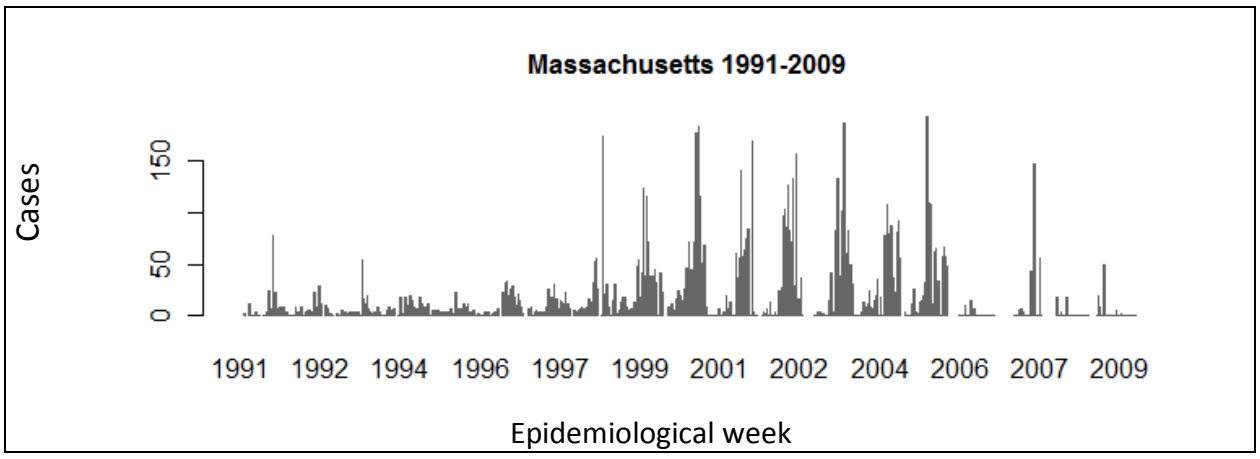

Figure D2, Number of cases reported for Lyme Disease per epidemiological week

Malaria

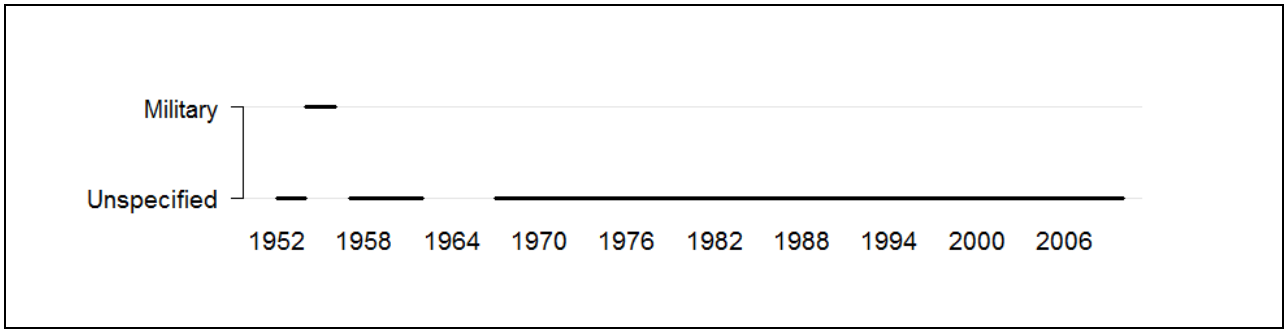

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Malaria (Unspecified and Military)

Indicator	Massachusetts
Report period	1952-2009
Total weeks	1,858
Total cases	1,331
Max. cases per year	98
Year (max)	1952
Max. cases per week	27
Week (max)	1970, wk 33
Average cases per year	27
95%CI	(21-33)
Average cases per week	1
95%CI	(1-1)

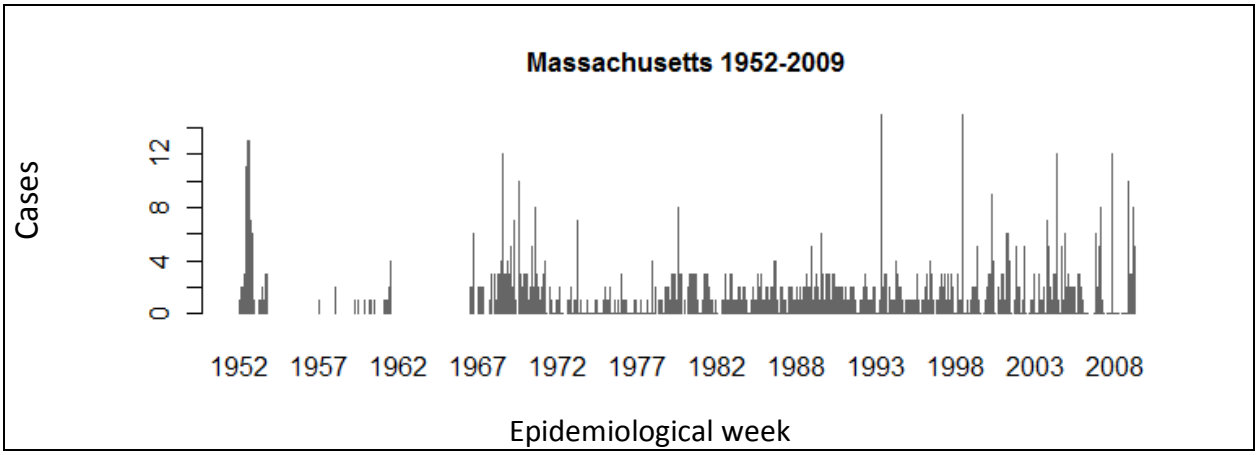

Figure D2, Number of cases reported for Malaria per epidemiological week

Measles

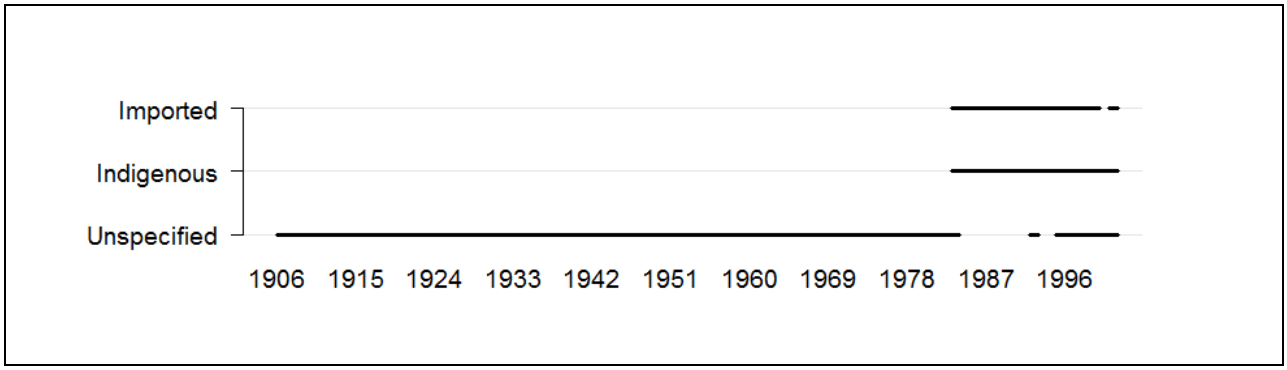

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Measles (Unspecified)

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1927-2001	1906-1953	1906-1953	1906-1953
Total weeks	2,946	2,240	1,909	1,891
Total cases	821,255	199,043	30,350	25,743
Max. cases per year	50,734	8,782	2,324	2,135
Year (max)	1952	1930	1935	1935
Max. cases per week	3,753	649	317	305
Week (max)	1952, wk 09	1928, wk 11	1926, wk 08	1935, wk 05
Average cases per year				
before 1970	18,493	4,423	674	572
95%CI	(14,428-22,558)	(3,782-5,064)	(489-859)	(406-738)
after 1970	360	-	-	-
95%CI	(-45-765)	-	-	-
Average cases per week				
before 1970	372	89	16	14
95%CI	(350-394)	(85-93)	(15-17)	(13-15)
after 1970	10	-	-	-
95%CI	(8-12)	-	-	-

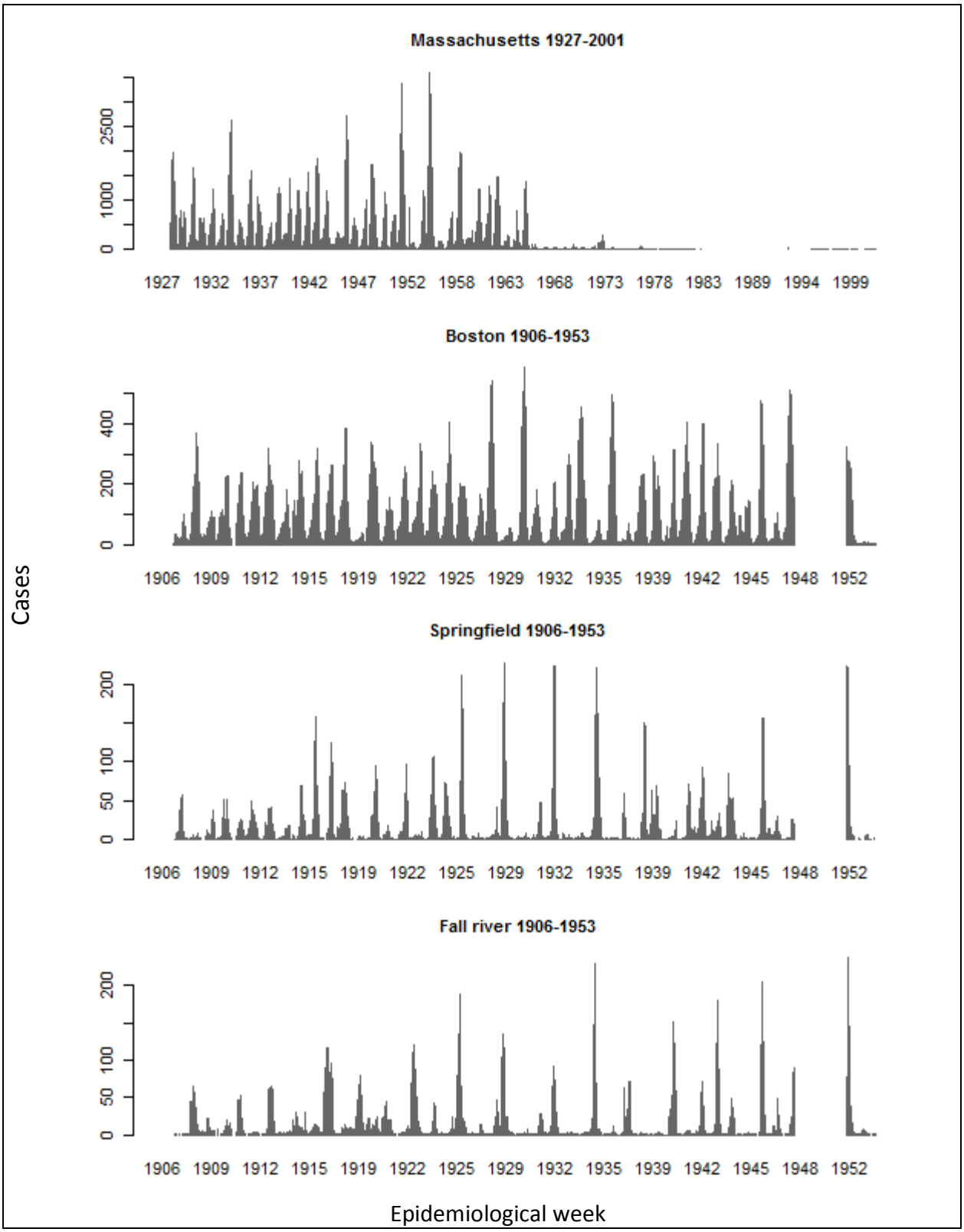

Figure D2, Number of cases reported for Measles per epidemiological week

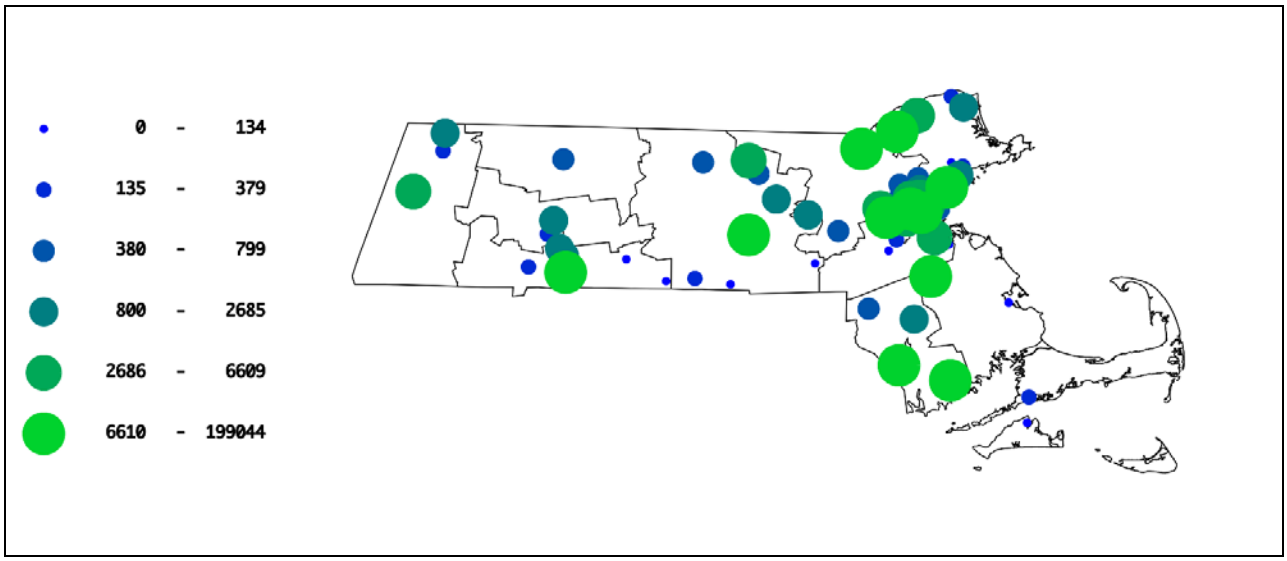

Figure D3, Total number of cases reported for Measles by each city for the entire time period

Meningitis

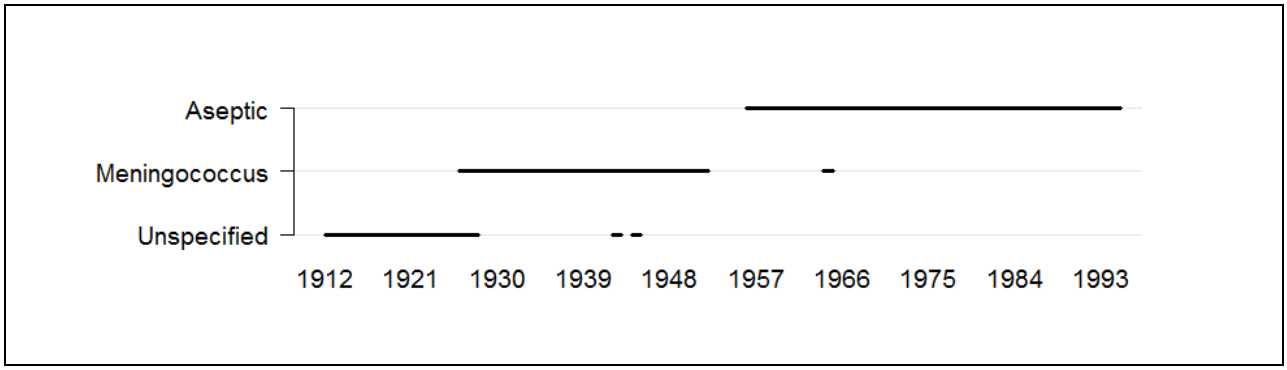

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Meningitis (Meningococcus)

Indicator	Massachusetts	Boston
Report period	1927-1964	1926-1948
Total weeks	1,224	848
Total cases	3,691	1,461
Max. cases per year	846	369
Year (max)	1943	1943
Max. cases per week	40	20
Week (max)	1943, wk 15	1943, wk 25
Average cases per year	142	64
95%CI	(73-211)	(26-102)
Average cases per week	3	2
95%CI	(3-3)	(2-2)

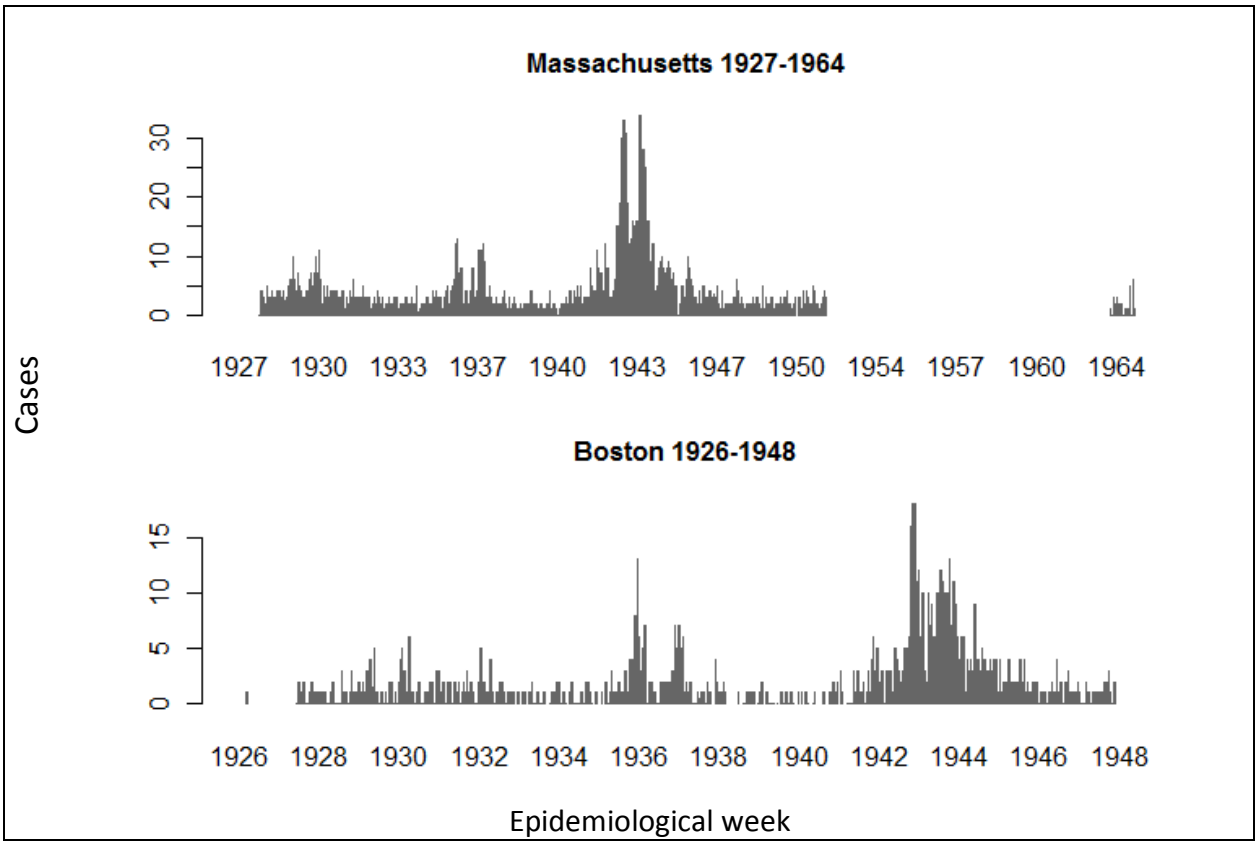

Figure D2, Number of cases reported for Meningitis per epidemiological week

Meningococcal Disease

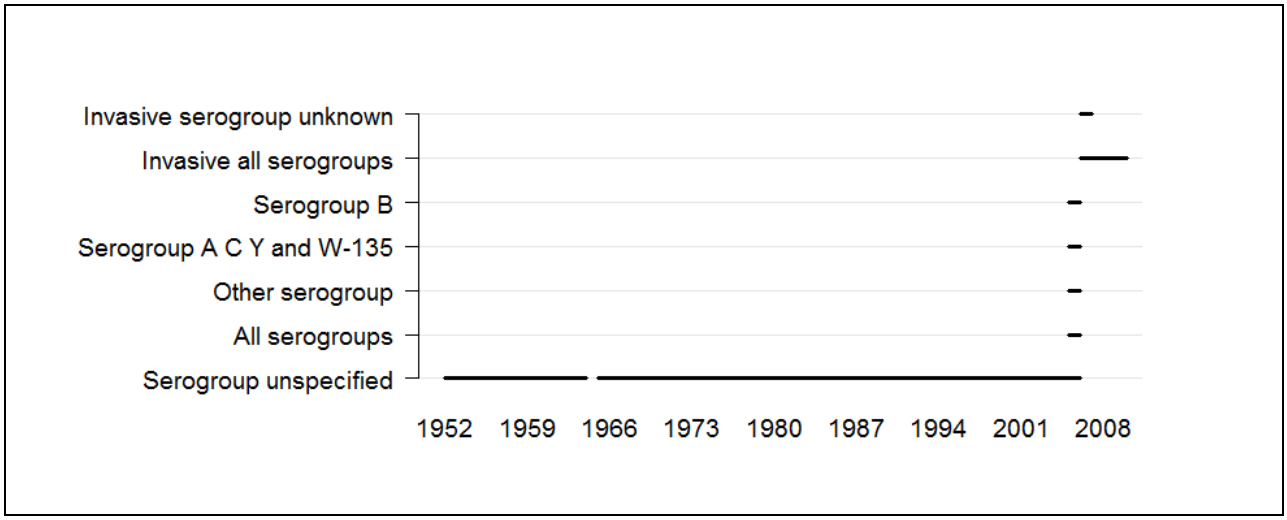

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Meningococcal Disease (Serogroup unspecified and Invasive all serogroups)

Indicator	Massachusetts
Report period	1952-2009
Total weeks	2,565
Total cases	4,005
Max. cases per year	951
Year (max)	1952
Max. cases per week	870
Week (max)	1952, wk 53
Average cases per year	
before 1980	85
95%CI	(18-152)
after 1980	56
95%CI	(46-66)
Average cases per week	
before 1980	2
95%CI	(1-3)
after 1980	1
95%CI	(1-1)

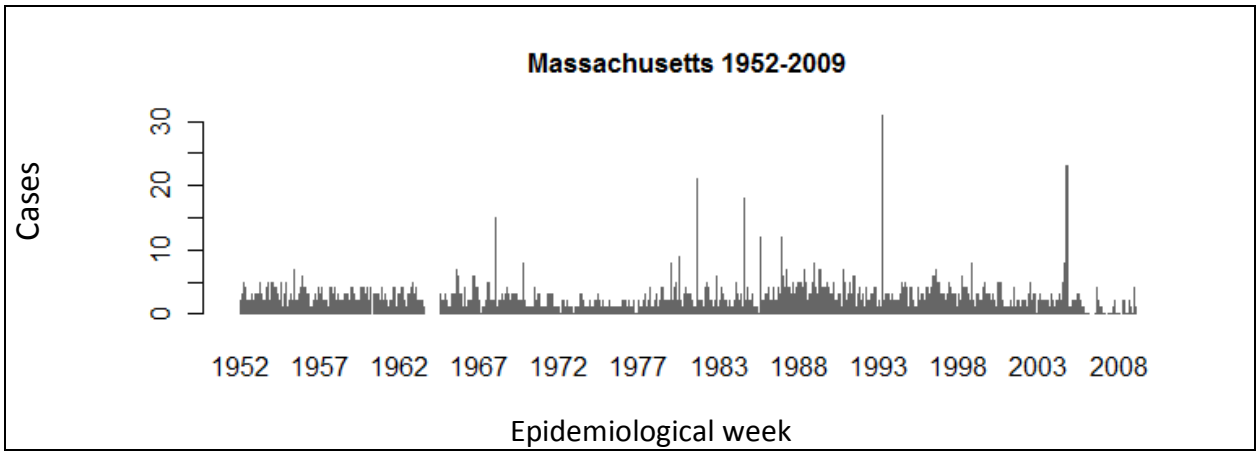

Figure D2, Number of cases reported for Meningococcal Disease per epidemiological week

Mumps

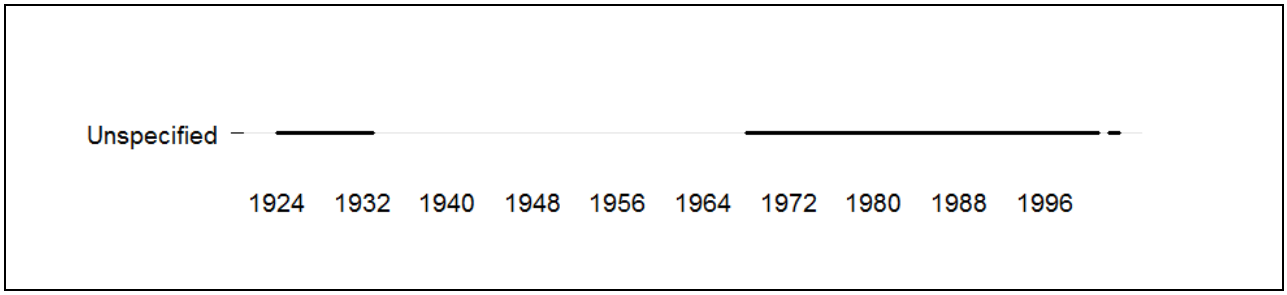

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Mumps

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1968-2002	1924-1932	1924-1932	1924-1932
Total weeks	1,403	439	451	449
Total cases	22,625	10,426	2,701	659
Max. cases per year	8,371	2,398	884	200
Year (max)	1968	1927	1928	1931
Max. cases per week	490	169	85	15
Week (max)	1968, wk 05	1927, wk 10	1928, wk 11	1931, wk 06
Average cases per year				
before 1980	1,704	1,158	300	73
95%CI	(249-3,159)	(569-1,747)	(91-509)	(27-119)
after 1980	23	-	-	-
95%CI	(8-38)	-	-	-
Average cases per week				
before 1980	34	24	6	1
95%CI	(29-39)	(21-27)	(5-7)	(1-1)
after 1980	1	-	-	-
95%CI	(1-1)	-	-	-

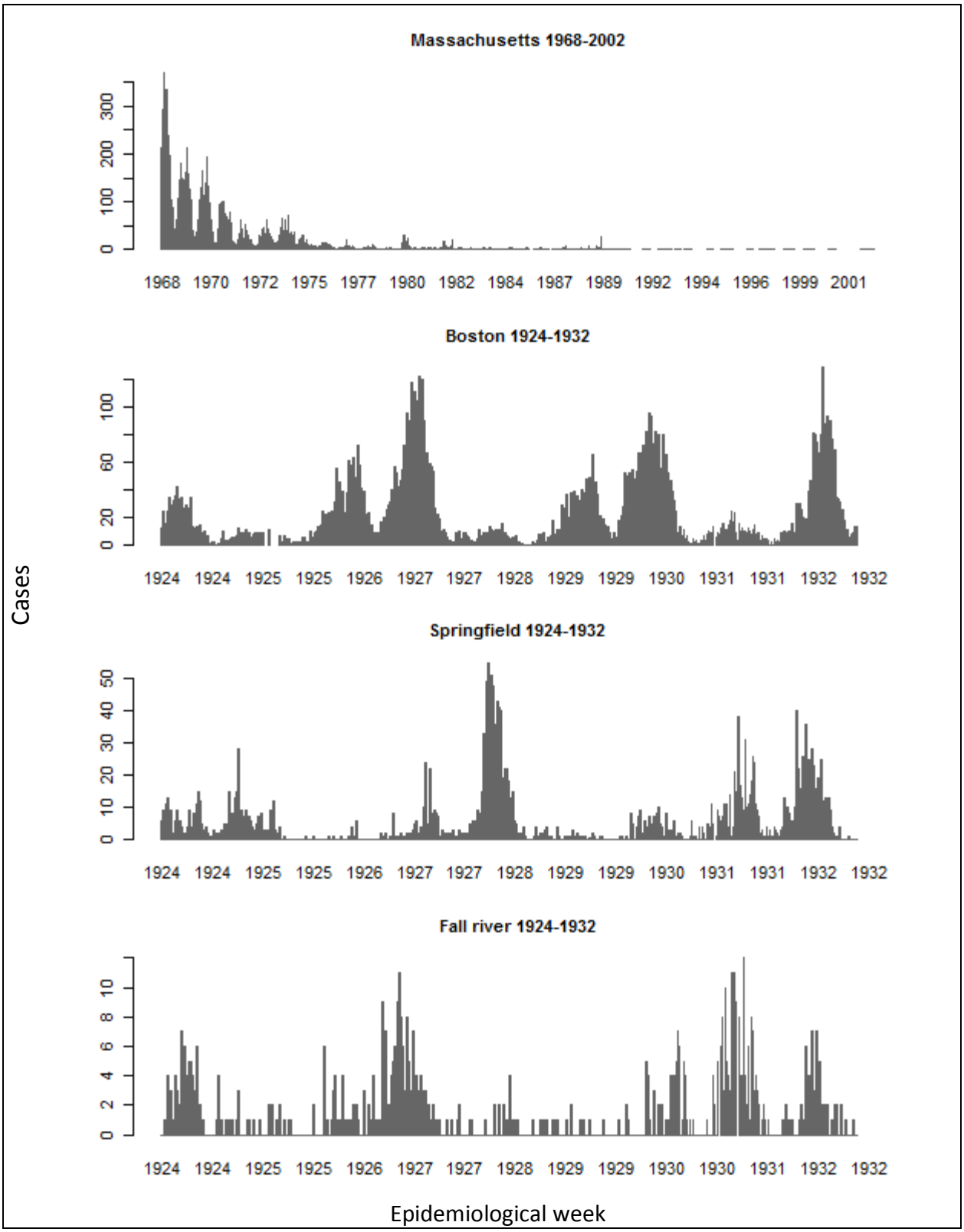

Figure D2, Number of cases reported for Mumps per epidemiological week

Pellagra

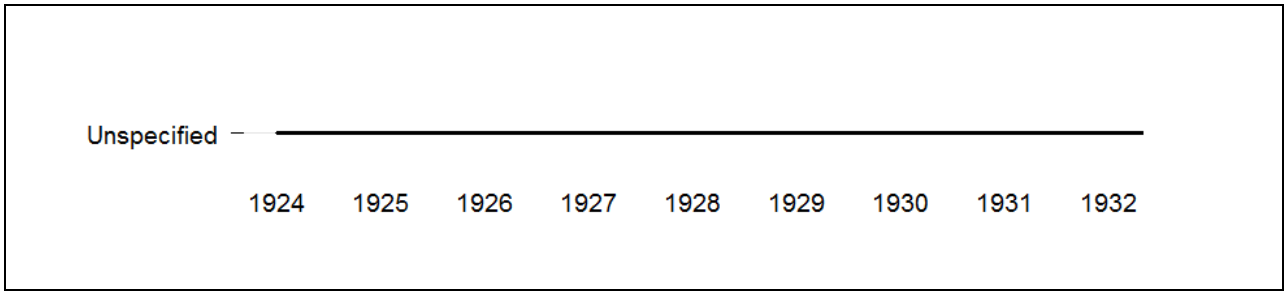

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Pellagra

Indicator	Boston
Report period	1924-1932
Total weeks	404
Total cases	74
Max. cases per year	14
Year (max)	1924
Max. cases per week	3
Week (max)	1924, wk 29
Average cases per year	8
95%CI	(6-10)
Average cases per week	0
95%CI	(0-0)

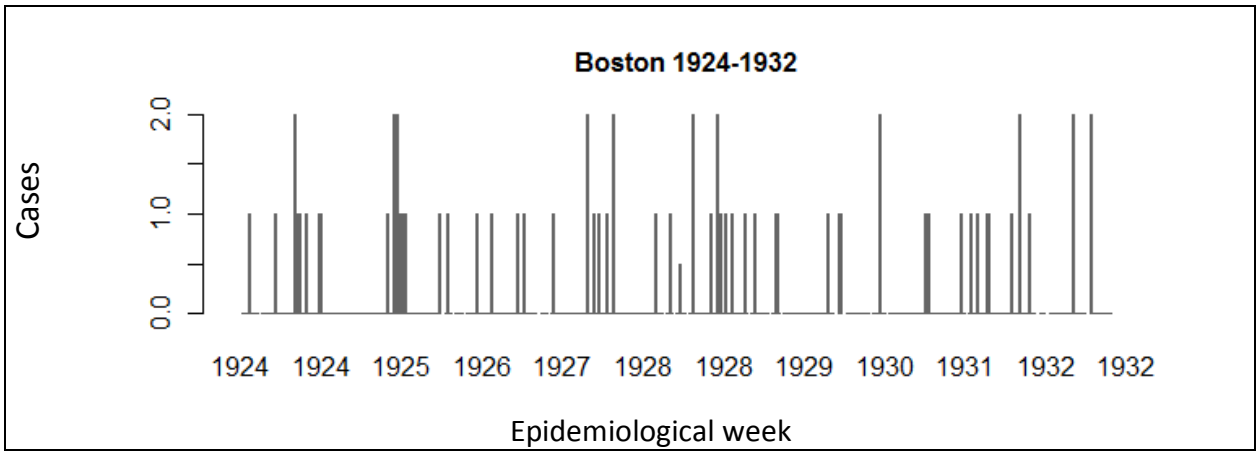

Figure D2, Number of cases reported for Pellagra per epidemiological week

Pneumonia

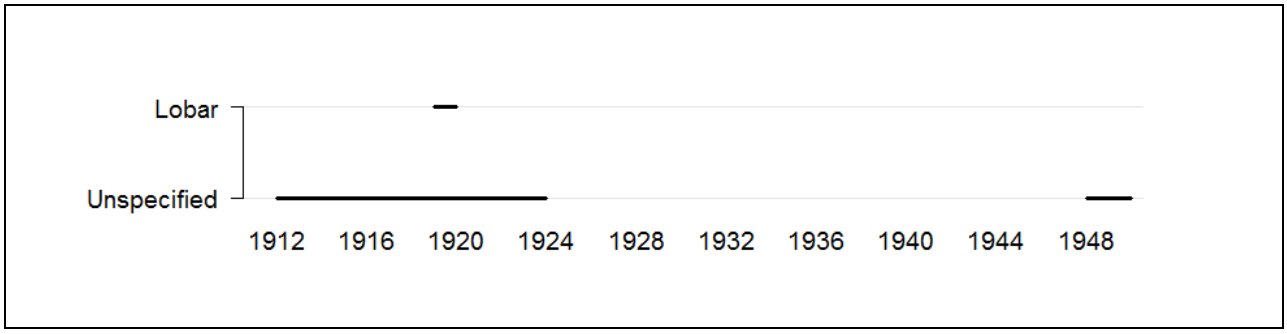

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Pneumonia (Unspecified)

Indicator	Massachusetts	Boston	Springfield
Report period	1948-1949	1916-1923	1915-1923
Total weeks	22	226	230
Total cases	597	6,999	1,657
Max. cases per year	552	2,160	818
Year (max)	1948	1918	1918
Max. cases per week	230	278	84
Week (max)	1948, wk 36	1918, wk 39	1918, wk 42
Average cases per year	298	875	184
95%CI	(-2,923-3,519)	(314-1,436)	(-7-375)
Average cases per week	27	31	7
95%CI	(7-47)	(27-35)	(6-8)

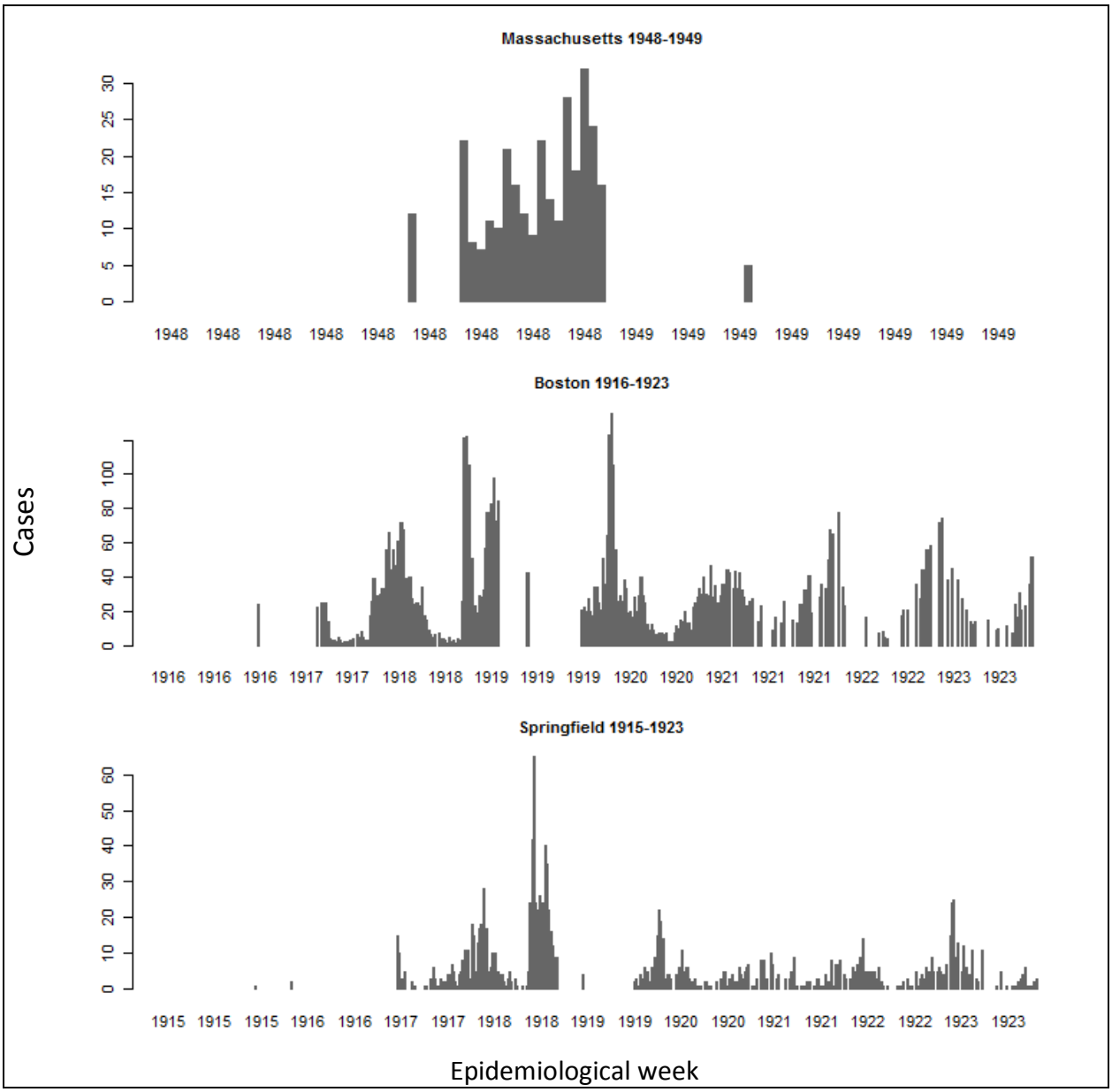

Figure D2, Number of cases reported for Pneumonia per epidemiological week

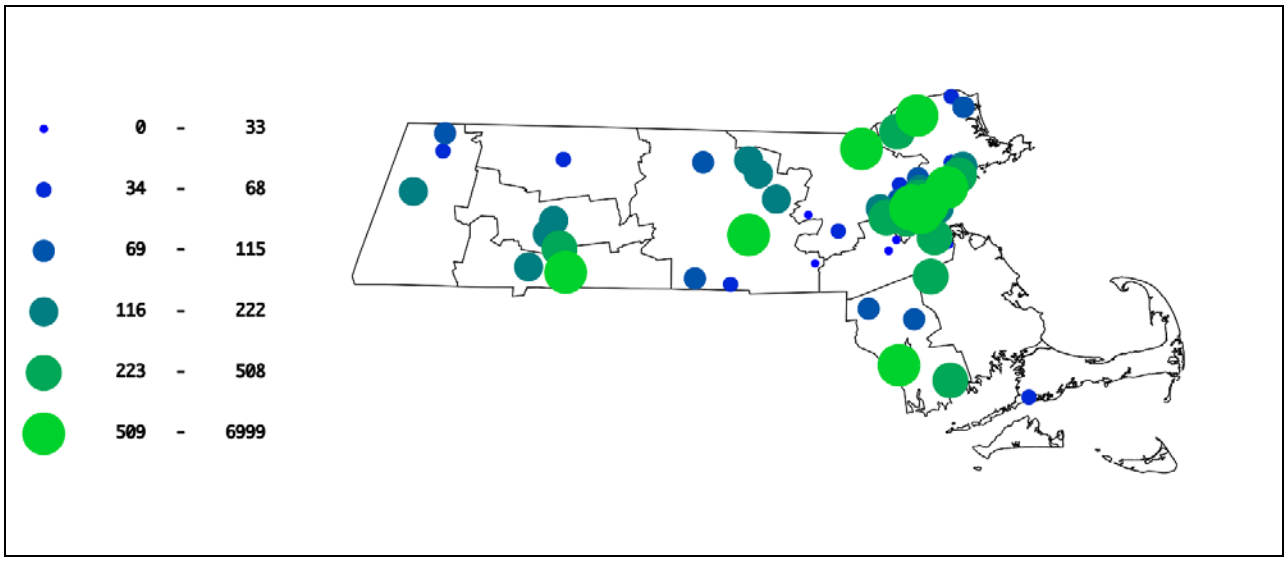

Figure D3, Total number of cases reported for Pneumonia by each city for the entire time period

Poliomyelitis

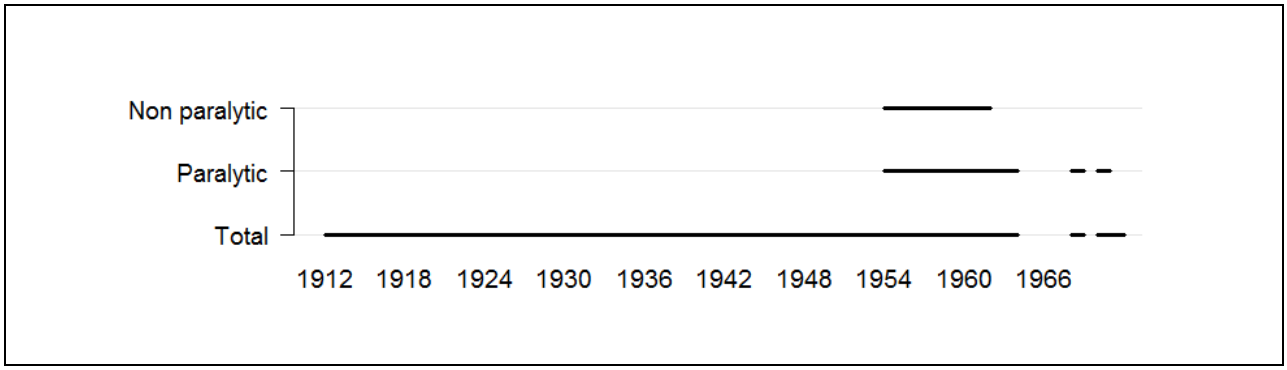

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Poliomyelitis (Total)

Indicator	Massachusetts	Boston
Report period	1923-1971	1912-1953
Total weeks	1,658	1,268
Total cases	16,274	4,852
Max. cases per year	3,593	653
Year (max)	1955	1935
Max. cases per week	448	88
Week (max)	1955, wk 33	1935, wk 37
Average cases per year		
before 1960	463	124
95%CI	(224-702)	(73-175)
after 1960	11	-
95%CI	(-3-25)	-
Average cases per week		
before 1960	10	4
95%CI	(8-12)	(4-4)
after 1960	1	-
95%CI	(0-2)	-

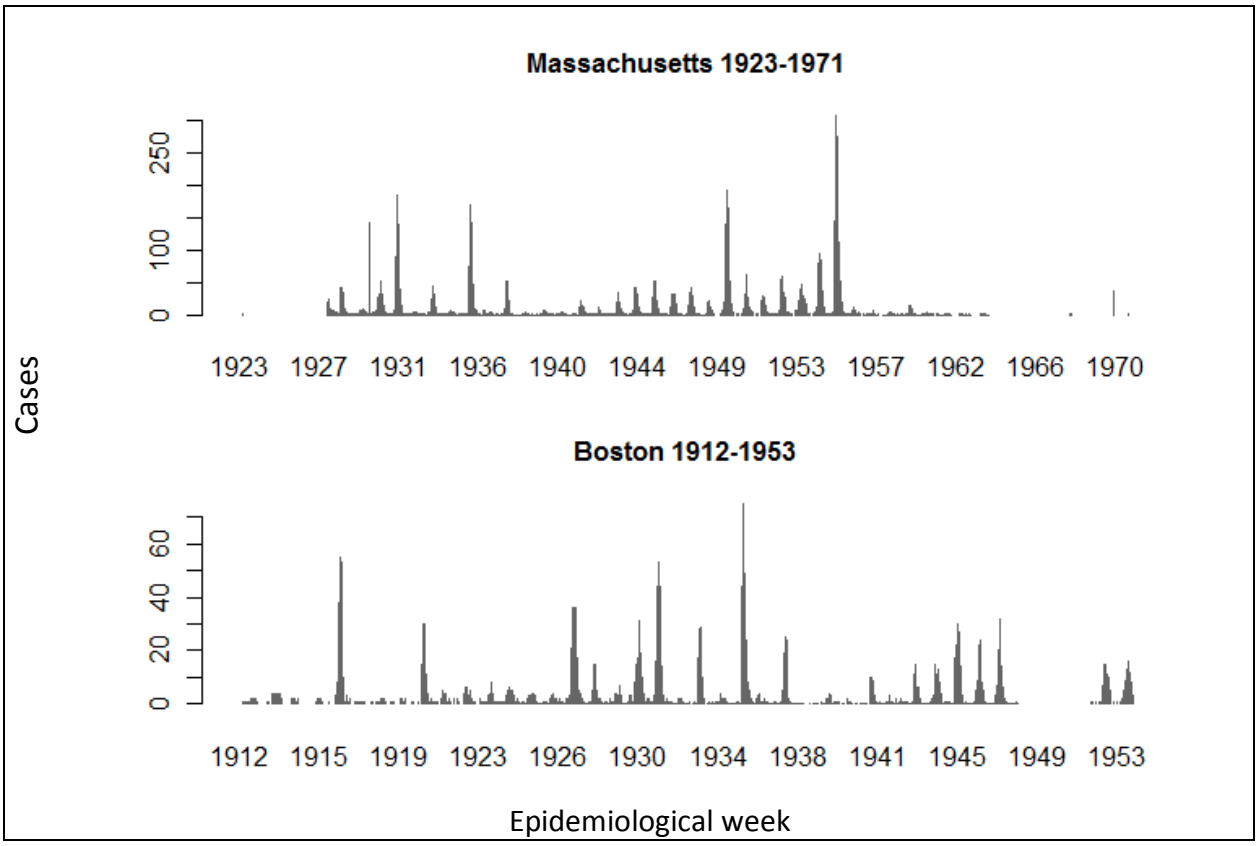

Figure D2, Number of cases reported for Poliomyelitis per epidemiological week

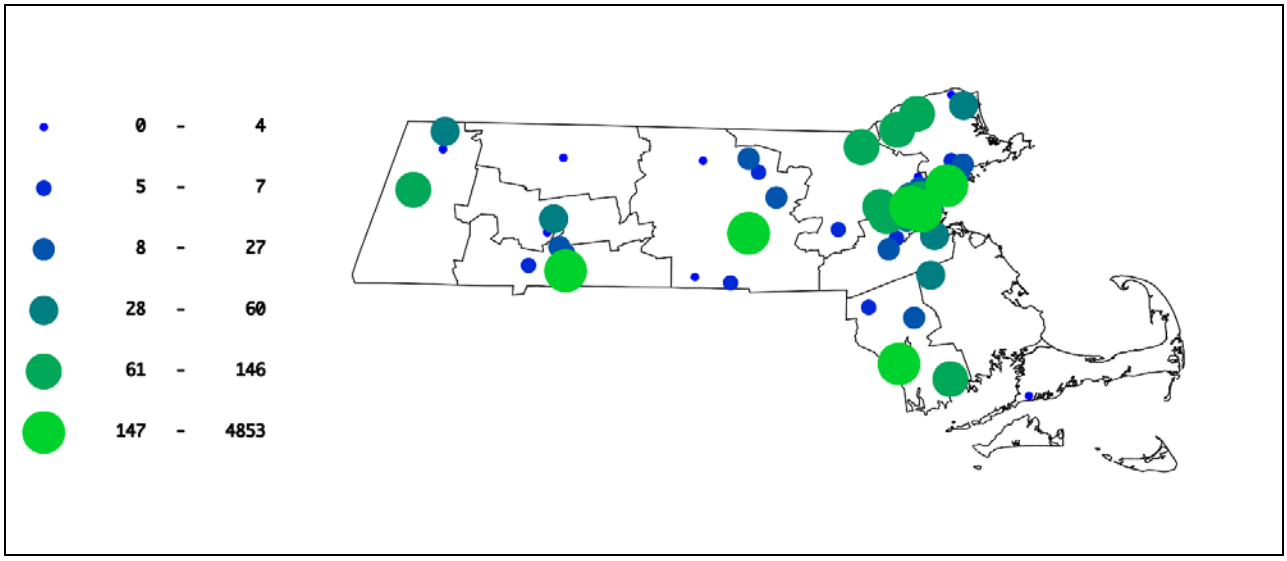

Figure D3, Total number of cases reported for Poliomyelitis by each city for the entire time period

Rubella

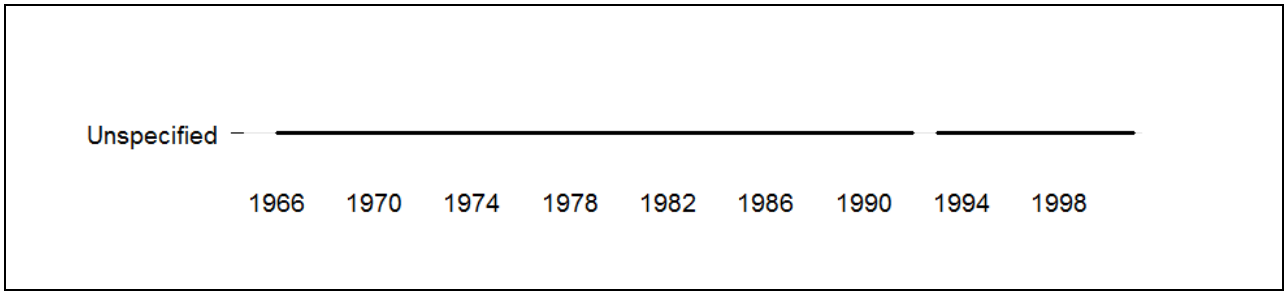

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Rubella

Indicator	Massachusetts
Report period	1966-2000
Total weeks	1,383
Total cases	16,571
Max. cases per year	3,606
Year (max)	1968
Max. cases per week	302
Week (max)	1968, wk 20
Average cases per year	
before 1970	1,946
95%CI	(734-3,158)
after 1970	236
95%CI	(61-411)
Average cases per week	
before 1970	38
95%CI	(32-44)
after 1970	6
95%CI	(5-7)

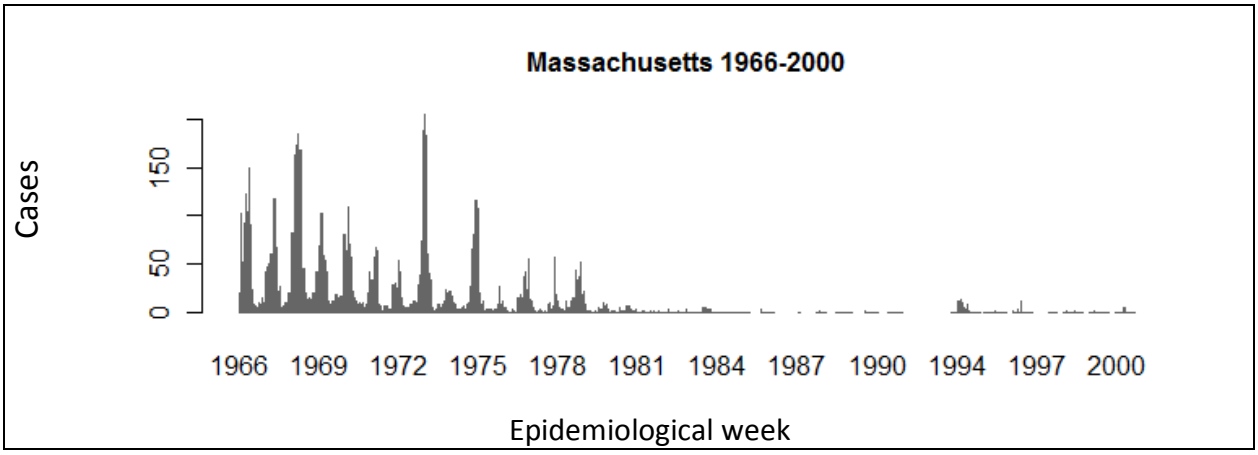

Figure D2, Number of cases reported for Rubella per epidemiological week

Salmonellosis

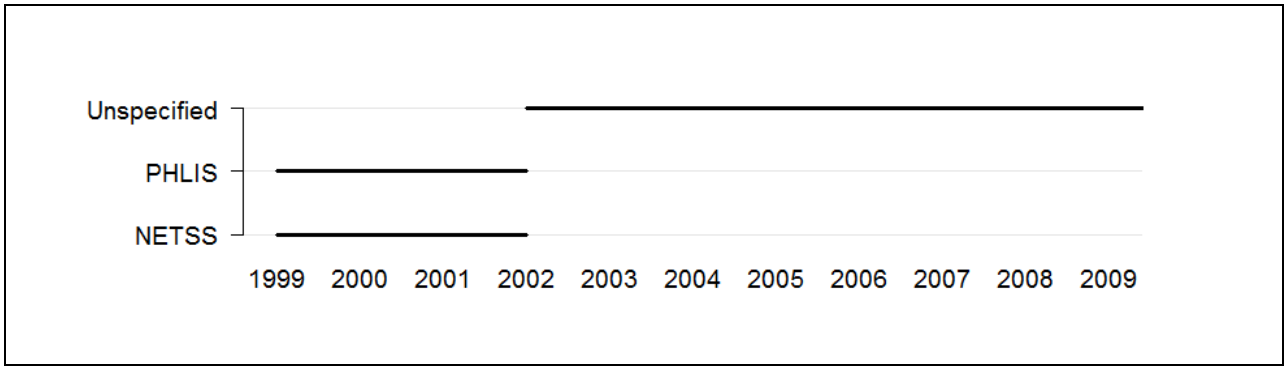

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Salmonellosis (PHLIS and Unspecified)

Indicator	Massachusetts
Report period	1999-2009
Total weeks	467
Total cases	11,074
Max. cases per year	2,607
Year (max)	2005
Max. cases per week	1,087
Week (max)	2005, wk 50
Average cases per year	1,007
95%CI	(572-1,442)
Average cases per week	24
95%CI	(18-30)

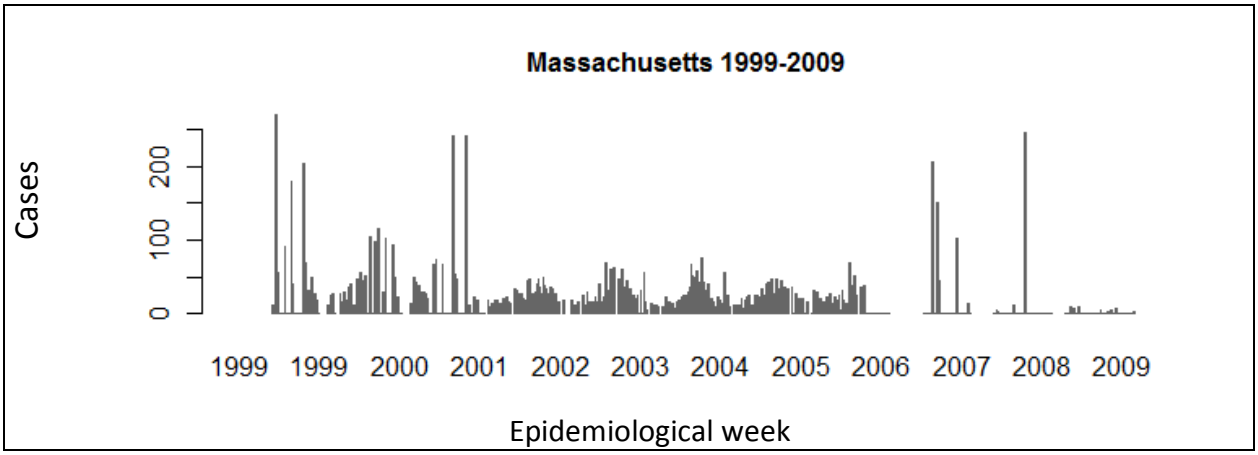

Figure D2, Number of cases reported for Salmonellosis per epidemiological week

Scarlet Fever

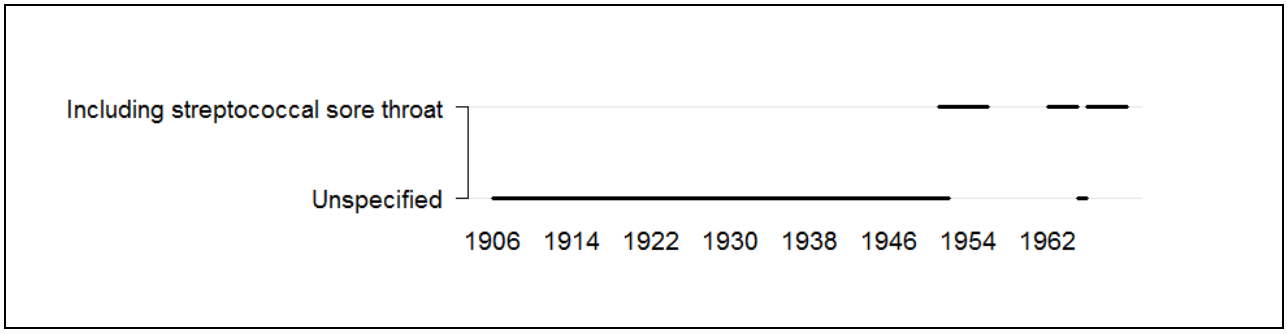

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Scarlet Fever (Including streptococcal sore throat and Unspecified)

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1927-1969	1906-1953	1906-1953	1906-1953
Total weeks	1,846	2,240	2,060	1,974
Total cases	288,180	104,503	13,960	7,975
Max. cases per year	16,036	4,880	1,800	920
Year (max)	1932	1932	1943	1942
Max. cases per week	660	271	105	74
Week (max)	1943, wk 15	1910, wk 17	1943, wk 06	1931, wk 18
Average cases per year	7,789	2,322	310	181
95%CI	(6,651-8,927)	(2,012-2,632)	(217-403)	(132-230)
Average cases per week	156	47	7	4
95%CI	(151-161)	(46-48)	(7-7)	(4-4)

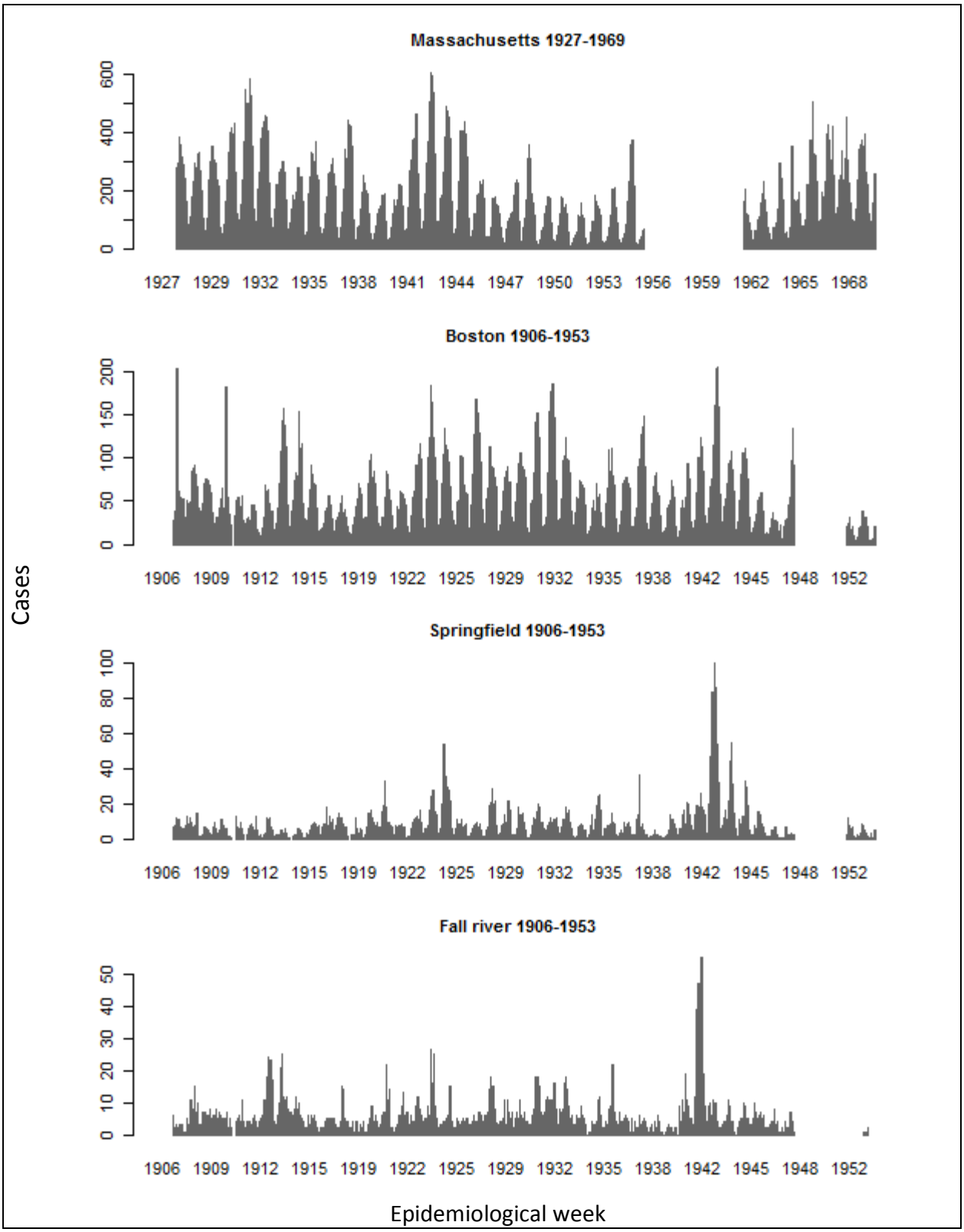

Figure D2, Number of cases reported for Scarlet Fever per epidemiological week

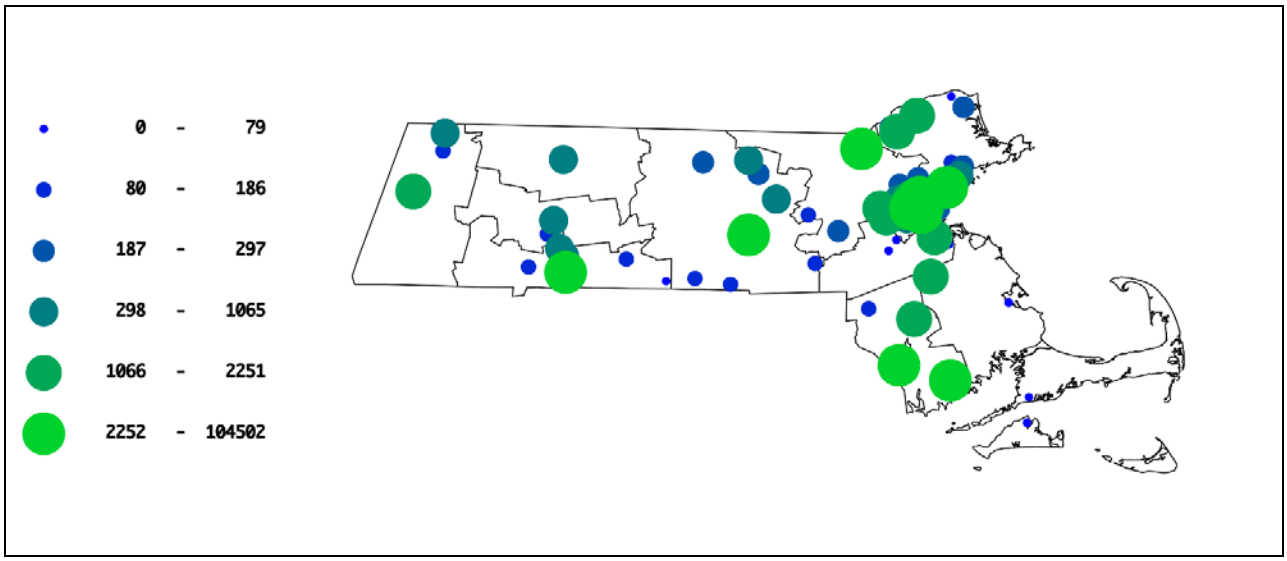

Figure D3, Total number of all cases reported for Scarlet Fever by each city for the entire time period

Shigellosis

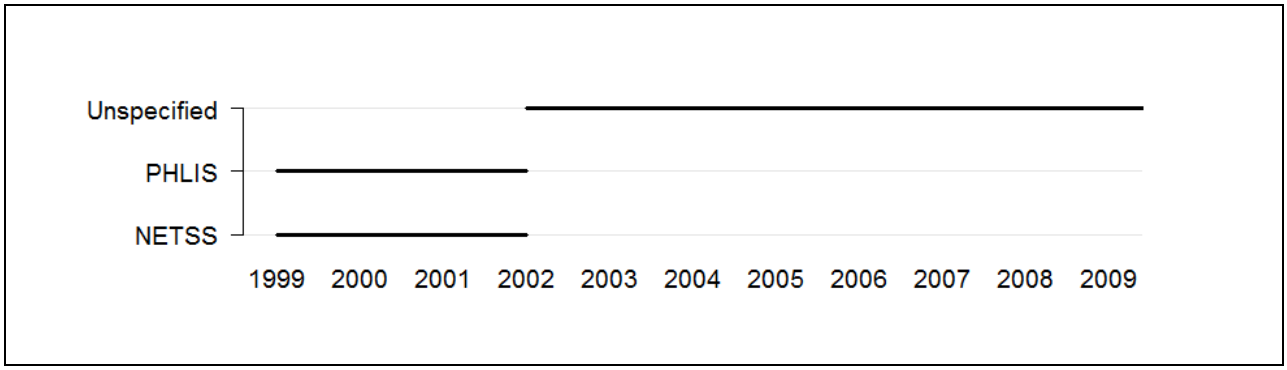

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Shigellosis (Unspecified and PHLIS)

Indicator	Massachusetts
Report period	1999-2009
Total weeks	466
Total cases	2,671
Max. cases per year	921
Year (max)	1999
Max. cases per week	405
Week (max)	1999, wk 33
Average cases per year	243
95%CI	(79-407)
Average cases per week	6
95%CI	(4-8)

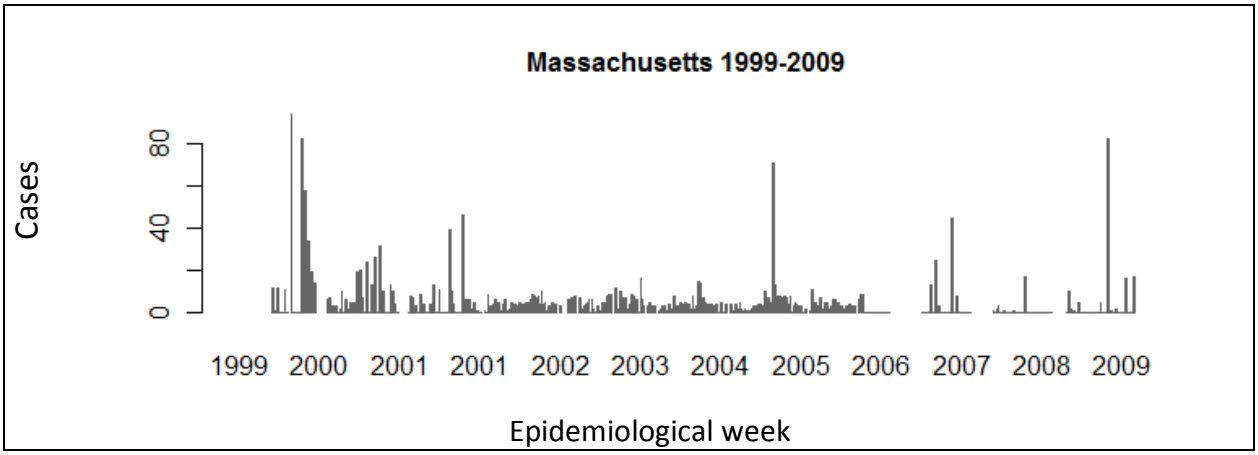

Figure D2, Number of cases reported for Shigellosis per epidemiological week

Streptococcal Disease, Invasive Group A

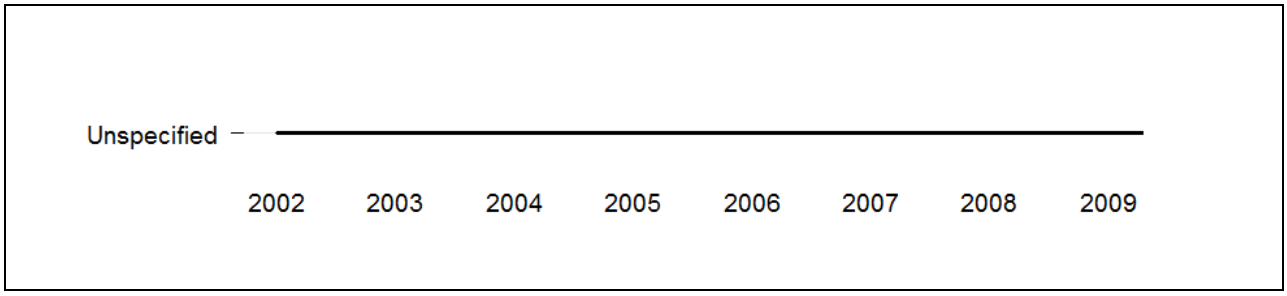

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Streptococcal Disease, Invasive Group A

Indicator	Massachusetts
Report period	2002-2009
Total weeks	340
Total cases	799
Max. cases per year	184
Year (max)	2005
Max. cases per week	68
Week (max)	2005, wk 30
Average cases per year	100
95%CI	(58-142)
Average cases per week	2
95%CI	(1-3)

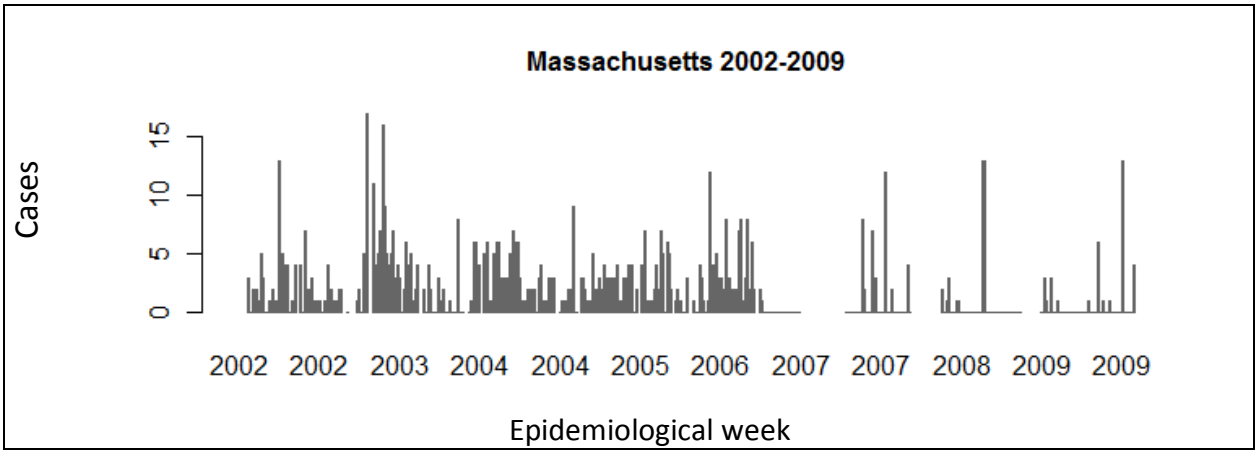

Figure D2, Number of cases reported for Group A Streptococcal disease per epidemiological week

Streptococcal Sore Throat

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Streptococcal Sore Throat

Indicator	Massachusetts
Report period	1960-1961
Total weeks	102
Total cases	11,436
Max. cases per year	5,806
Year (max)	1960
Max. cases per week	297
Week (max)	1961, wk 14
Average cases per year	5,718
95%CI	(4,600-6,836)
Average cases per week	112
95%CI	(96-128)

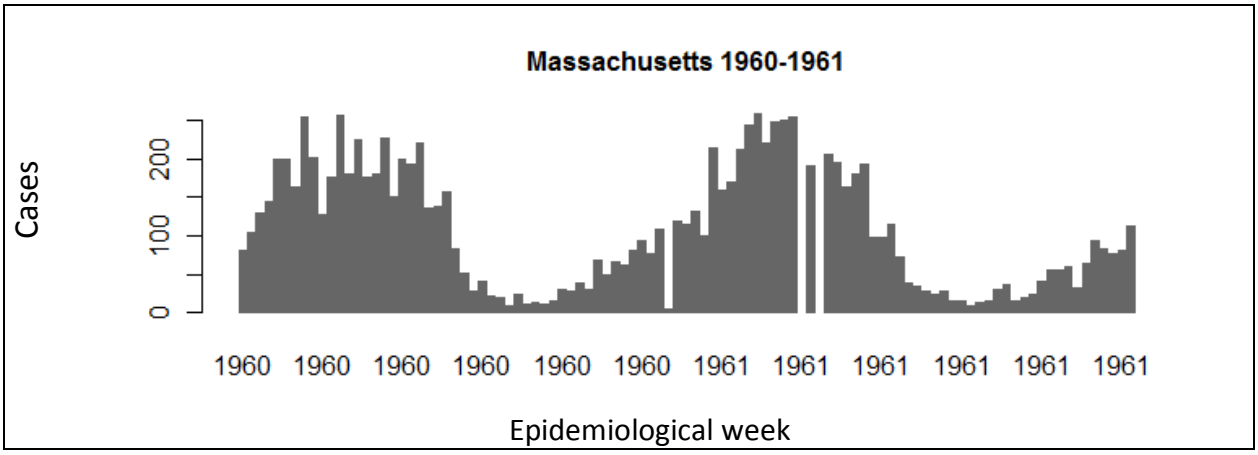

Figure D2, Number of cases reported for Streptococcal Sore Throat per epidemiological week

Syphilis

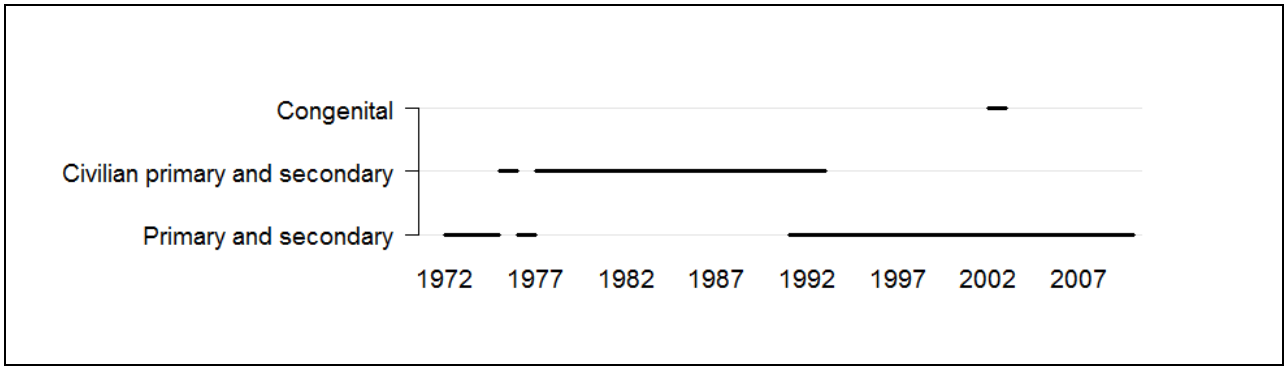

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Syphilis (Primary and secondary and Civilian primary and secondary)

Indicator	Massachusetts
Report period	1972-2009
Total weeks	1,829
Total cases	9,613
Max. cases per year	685
Year (max)	1991
Max. cases per week	269
Week (max)	1991, wk 30
Average cases per year	253
95%CI	(194-312)
Average cases per week	5
95%CI	(5-5)

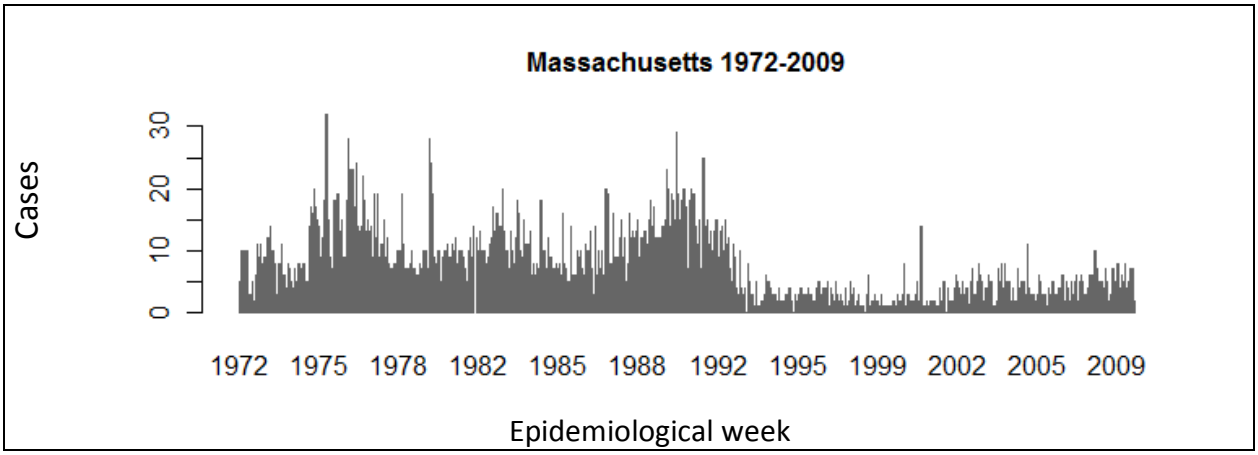

Figure D2, Number of cases reported for Syphilis per epidemiological week

Toxic Shock Syndrome

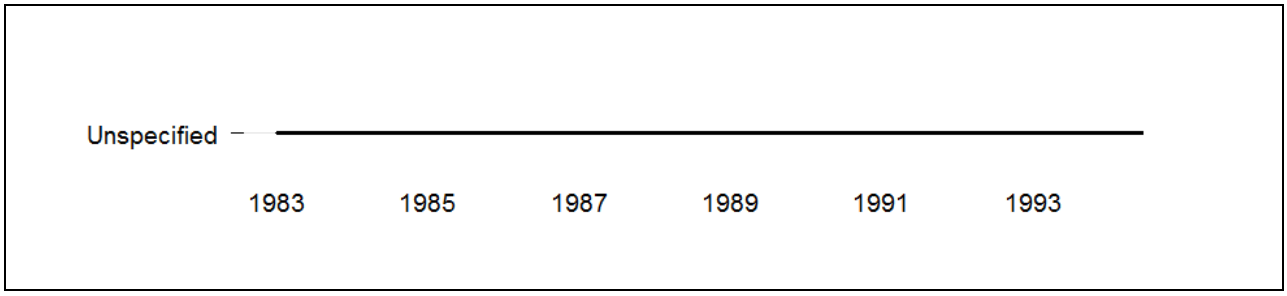

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Toxic shock syndrome

Indicator	Massachusetts
Report period	1983-1994
Total weeks	326
Total cases	81
Max. cases per year	14
Year (max)	1990
Max. cases per week	5
Week (max)	1991, wk 35
Average cases per year	7
95%CI	(5-9)
Average cases per week	0
95%CI	(0-0)

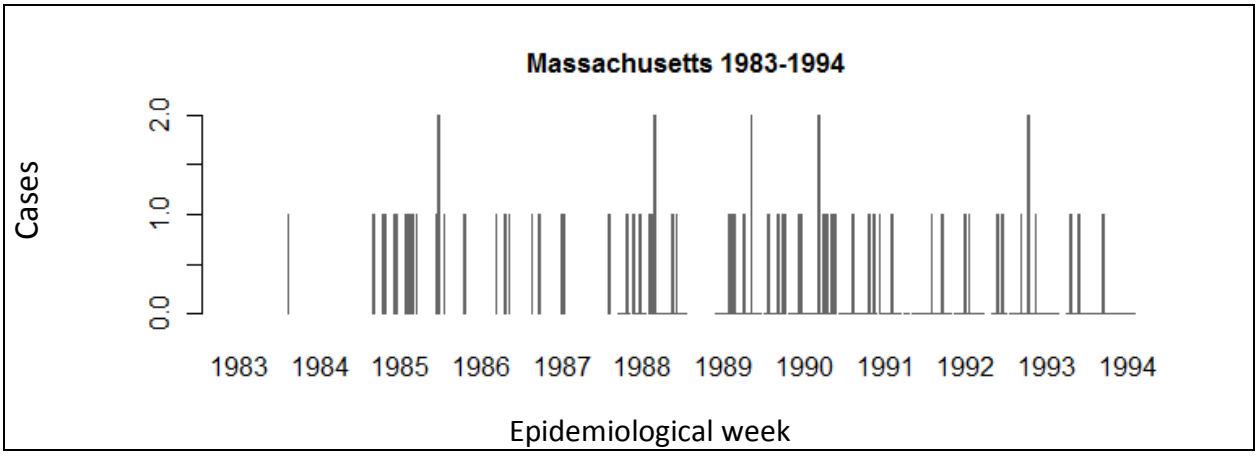

Figure D2, Number of cases reported for Toxic Shock Syndrome per epidemiological week

Tuberculosis

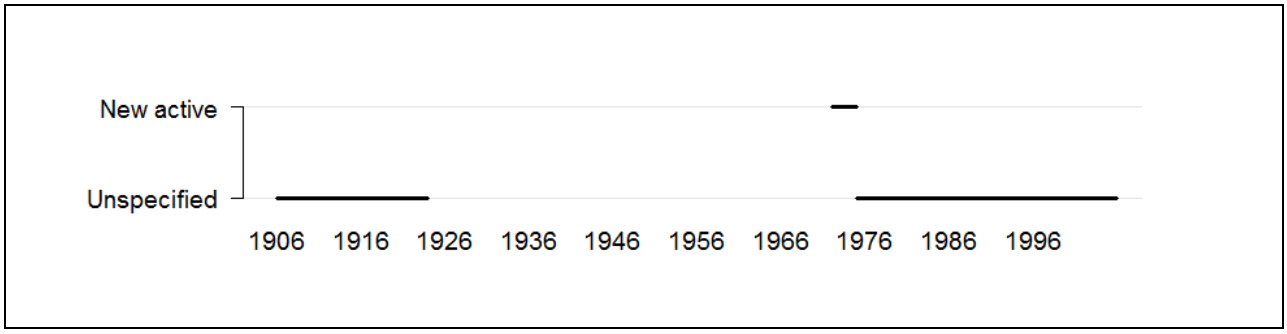

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Tuberculosis (Unspecified)

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1975-2005	1906-1923	1906-1923	1906-1923
Total weeks	1,481	881	756	841
Total cases	11,804	47,451	2,671	4,979
Max. cases per year	717	3,300	242	538
Year (max)	1975	1912	1917	1917
Max. cases per week	219	146	16	32
Week (max)	1998, wk 44	1917, wk 26	1918, wk 08	1916, wk 50
Average cases per year	381	2,636	148	277
95%CI	(333-429)	(2,324-2,948)	(116-180)	(220-334)
Average cases per week	8	54	4	6
95%CI	(8-8)	(53-55)	(4-4)	(6-6)

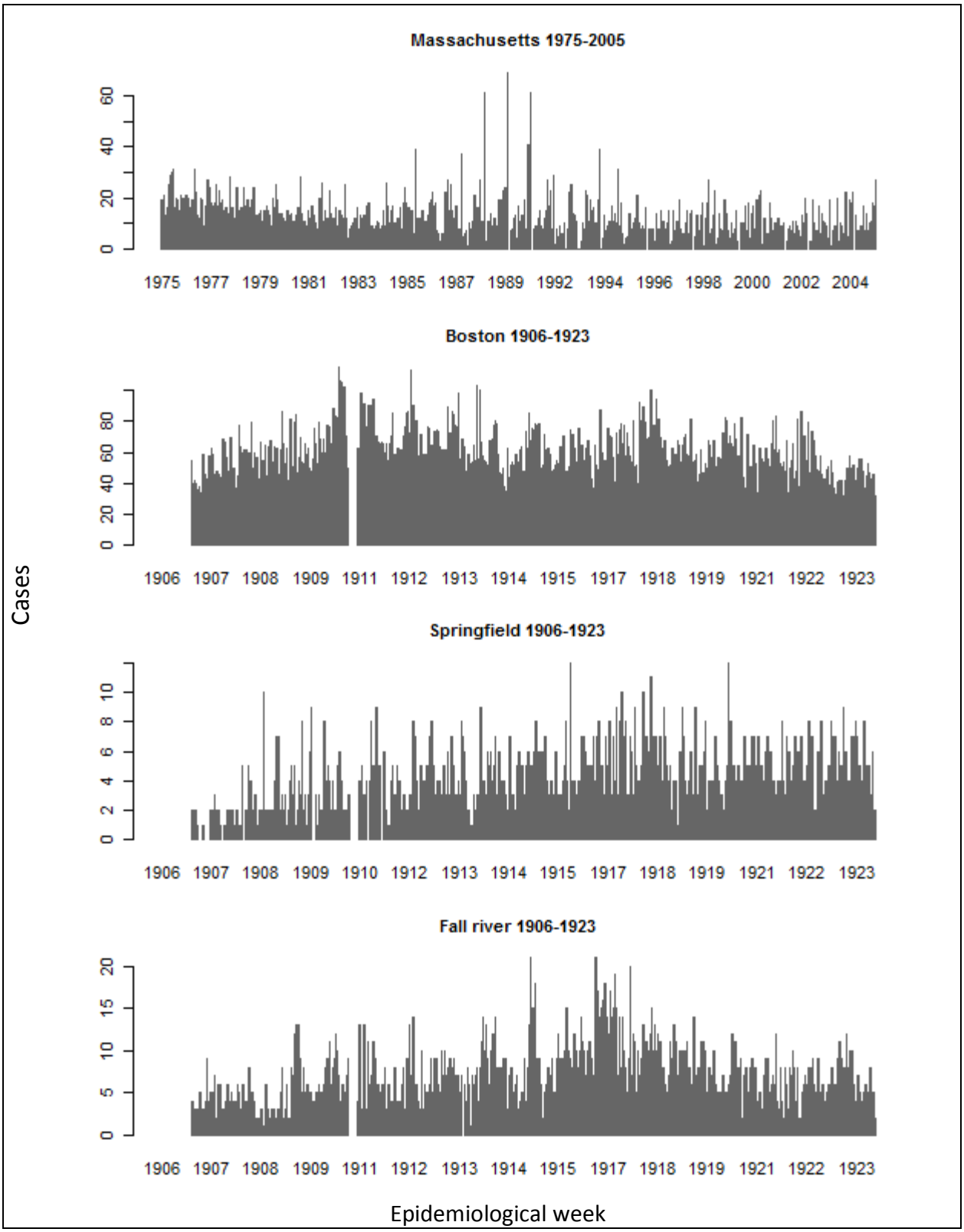

Figure D2, Number of cases reported for Tuberculosis per epidemiological week

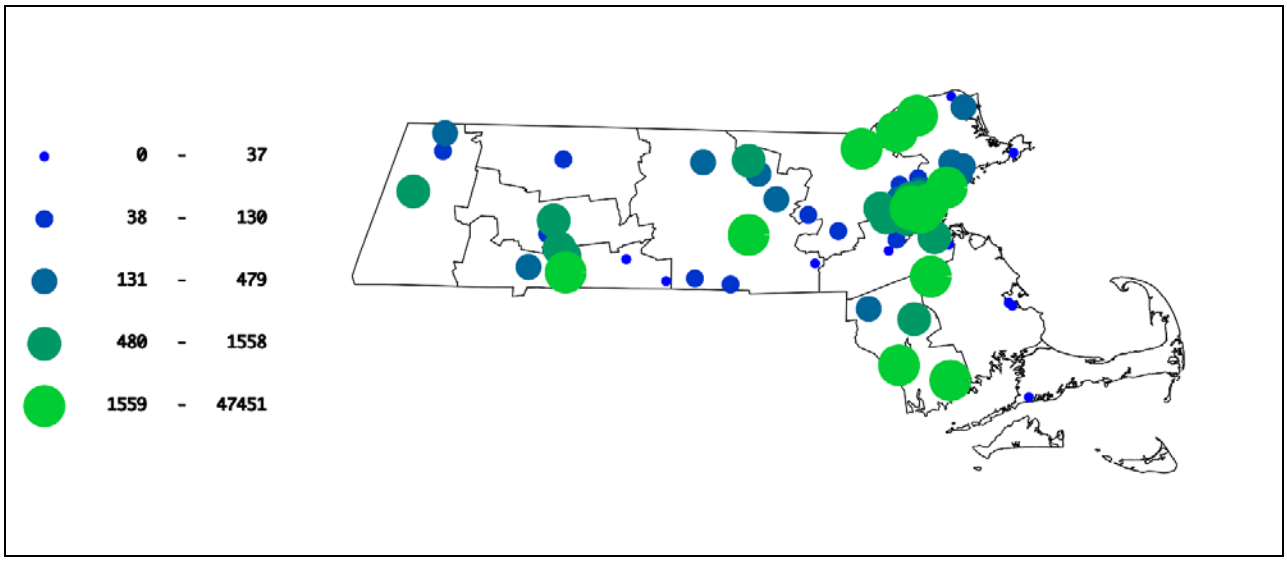

Figure D3, Total number of cases reported for Tuberculosis by each city for the entire time period

Typhoid Fever

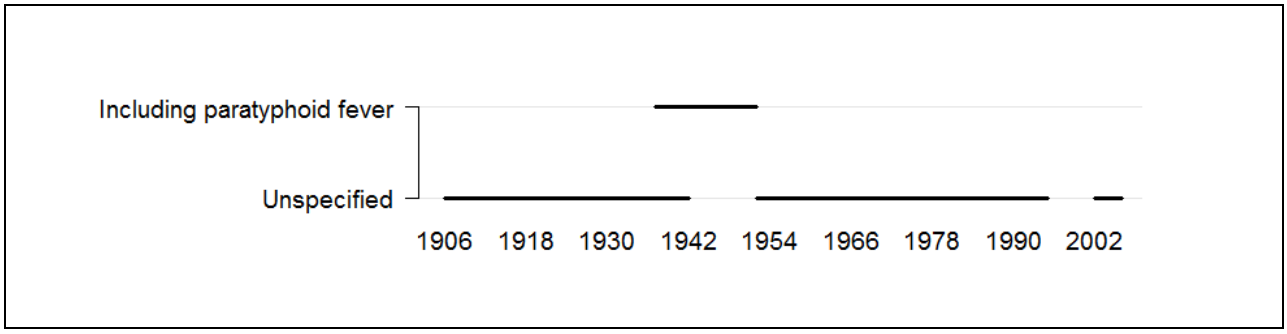

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Typhoid Fever (Unspecified and Including paratyphoid fever)

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1927-2005	1906-1953	1906-1953	1906-1953
Total weeks	3,113	2,030	1,604	1,808
Total cases	4,967	7,945	848	1,990
Max. cases per year	335	1,612	99	259
Year (max)	1928	1908	1907	1917
Max. cases per week	134	289	11	27
Week (max)	1953, wk 02	1908, wk 15	1912, wk 34	1915, wk 50
Average cases per year				
before 1950	160	185	20	46
95%CI	(124-196)	(99-271)	(13-27)	(28-64)
after 1950	24	6	2	5
95%CI	(12-36)	(-13-25)	(2-2)	-
Average cases per week				
before 1950	3	4	1	1
95%CI	(3-3)	(4-4)	(1-1)	(1-1)
after 1950	1	1	1	1
95%CI	(1-1)	(1-1)	(0-2)	(1-1)

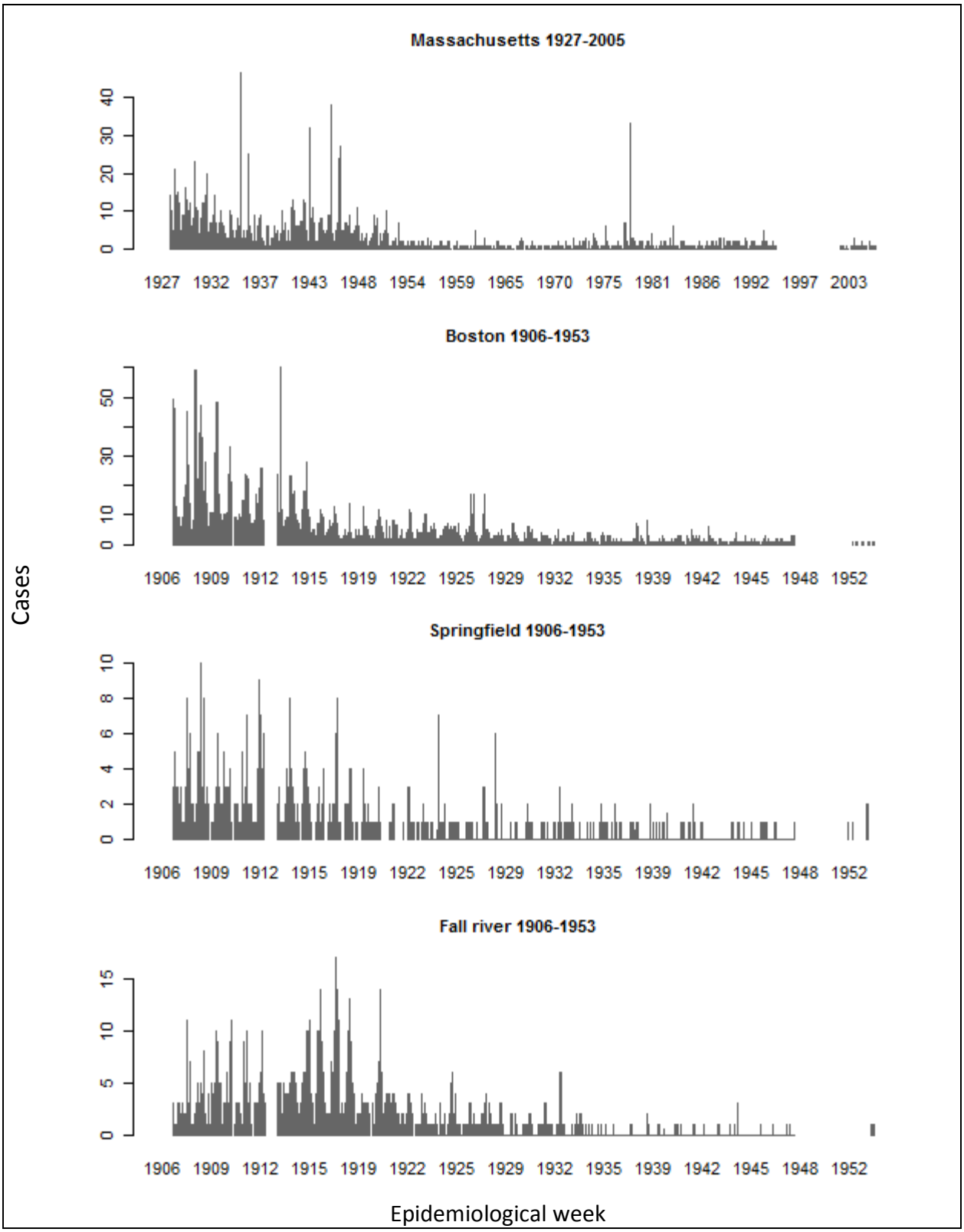

Figure D2, Number of cases reported for Typhoid Fever per epidemiological week

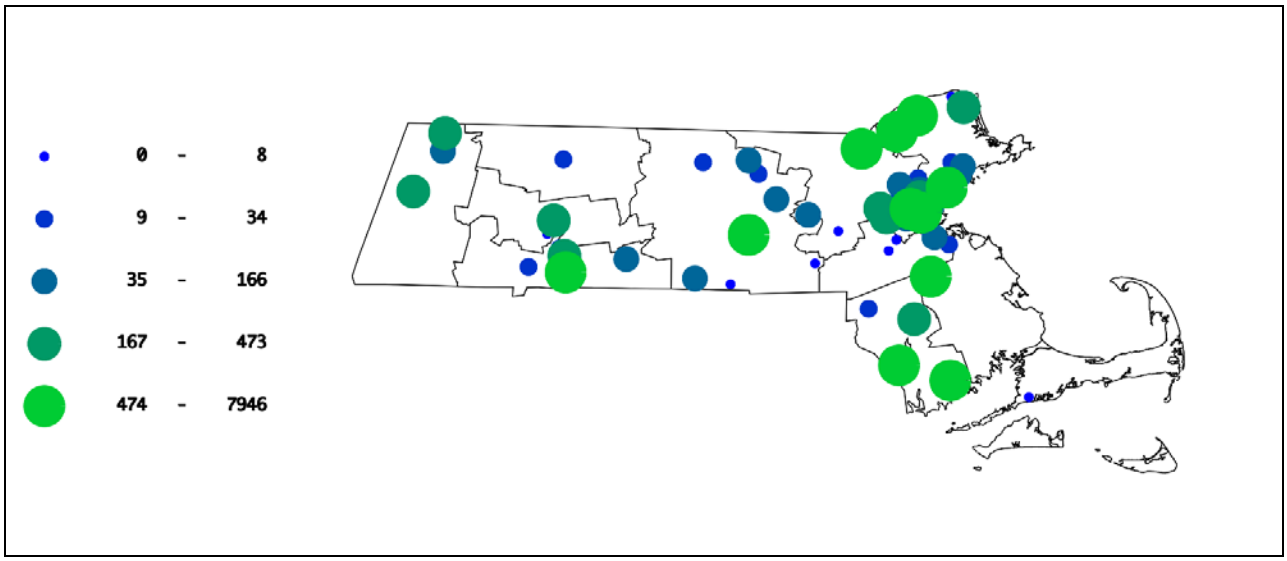

Figure D3, Total number of all cases reported for Typhoid Fever by each city for the entire time period

Whooping Cough

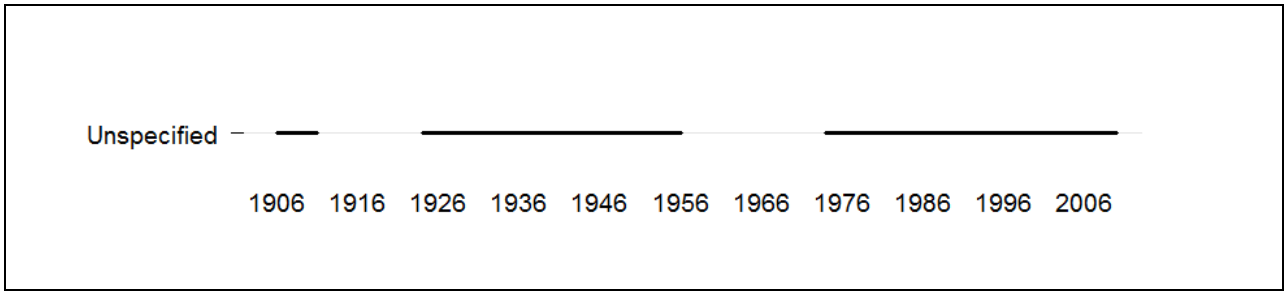

Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for Whooping Cough

Indicator	Massachusetts	Boston	Springfield	Fall River
Report period	1932-2009	1908-1953	1907-1953	1906-1953
Total weeks	2,239	1,453	1,337	1,344
Total cases	106,736	46,961	7,210	5,269
Max. cases per year	10,609	3,503	574	544
Year (max)	1942	1926	1937	1937
Max. cases per week	911	224	46	52
Week (max)	2005, wk 50	1936, wk 50	1942, wk 03	1937, wk 50
Average cases per year				
before 1960	4,754	1,565	233	165
95%CI	(3,362-6,146)	(1,209-1,921)	(178-288)	(121-209)
after 1960	324	-	-	-
95%CI	(154-494)	-	-	-
Average cases per week				
before 1960	103	32	5	4
95%CI	(99-107)	(31-33)	(5-5)	(4-4)
after 1960	9	-	-	-
95%CI	(7-11)	-	-	-

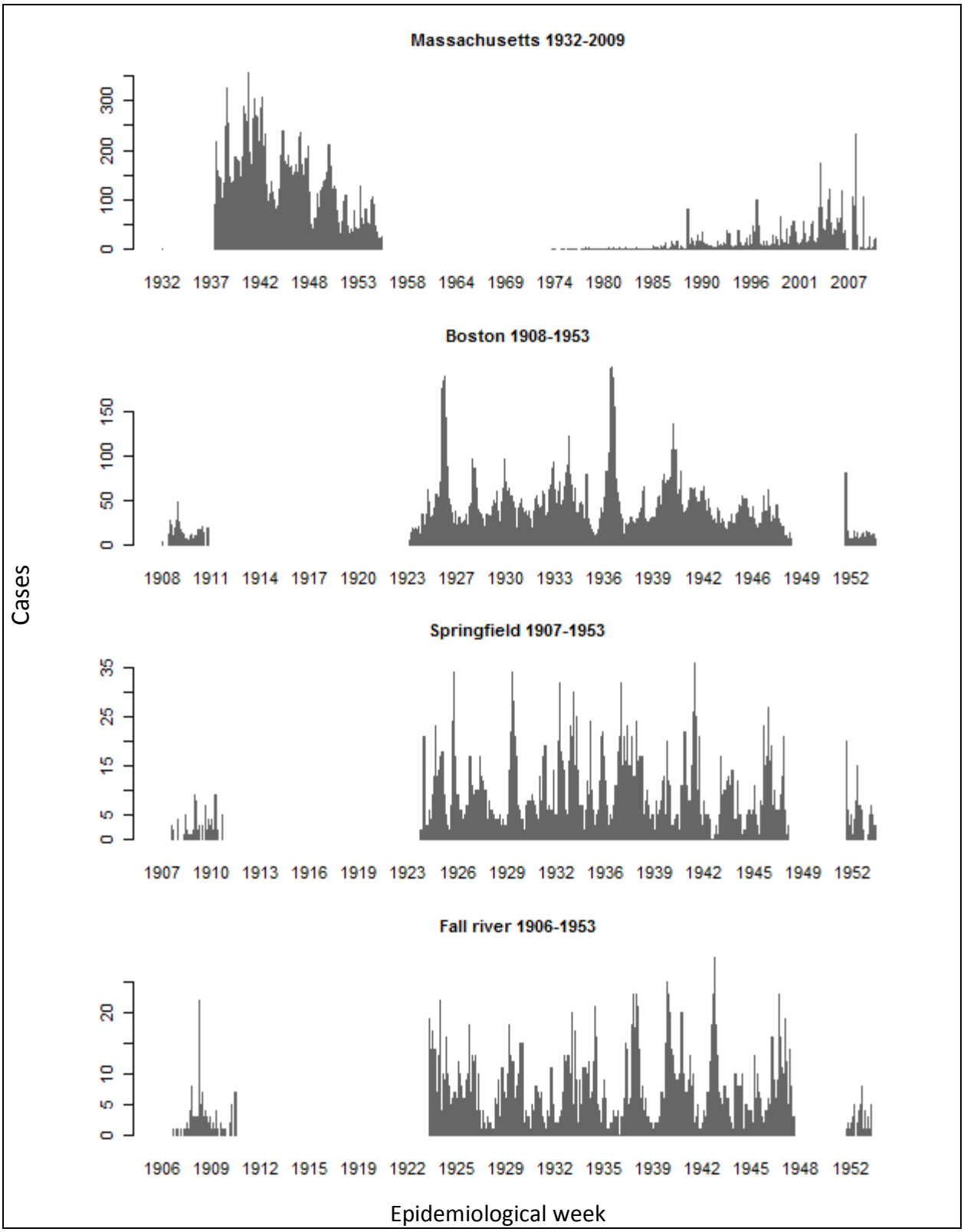

Figure D2, Number of cases reported for Whooping Cough per epidemiological week

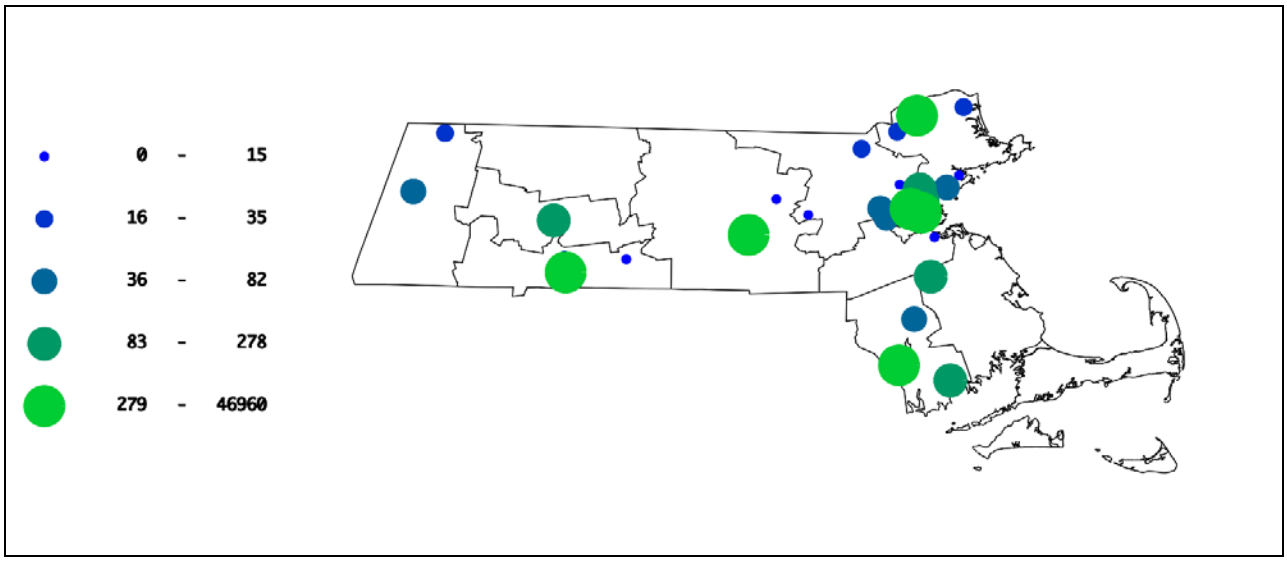

Figure D3, Total number of all cases reported for Whooping Cough by each city for the entire time period

Diseases with fragmented data over time

For a number of diseases, only fragmented data was available for Massachusetts. This was due to the inclusion of these diseases in the weekly surveillance system for short periods or widely dispersed periods of time. Due to these wide gaps or limited data, data for these diseases were not presented in separate sections but in the table below. Work will continue to include more data in the Tycho database and complete data sets for each disease where possible. Collaborations with local, state and federal public health agencies will be made to explore data availability and opportunities to include these in the Tycho database.

Table 2, Summary information on the occurrence of diseases with fragmented data in Massachusetts

Disease	Report type	Report period	Number of reports	Total cases
Anthrax	State	1942-1945	143	13
Brucellosis [undulant fever]	City	1952-1953	4	4
Brucellosis [undulant fever]	State	1943-1981	316	746
Chickenpox [varicella]	City	1924-1981	1777	29440
Chickenpox [varicella]	State	1972-2009	629	73020
Dengue	City	1924-1925	19	0
Dysentery	State	1942-1948	302	667
Encephalitis	City	1941-1981	1356	63
Encephalitis	State	1942-1994	1479	1488
Influenza	City	1920-1948	2807	40564
Influenza	State	1919-1948	286	17436
Leprosy	City	1924-1924	2	0
Leprosy	State	1942-1990	427	57
Psittacosis	State	1956-1961	14	17
Rabies in animals	City	1953-1953	4	18
Rabies in animals	State	1948-2006	1410	5436
Rocky mountain spotted fever	State	1942-2009	1207	498
Streptococcus pneumoniae invasive disease	State	2004-2009	47	7
Tetanus	State	1962-1979	351	29
Trichiniasis	City	1952-1953	21	24
Trichiniasis	State	1952-1955	60	82
Tularemia	State	1942-1994	766	314
Typhus fever	City	1924-1952	81	3
Typhus fever	State	1942-1958	201	12
West nile disease	State	2005-2007	41	4

Project Tycho

This report provides preliminary data for the state of Massachusetts available in the Tycho database. This database is currently being beta tested and these data cannot be used for publication or other official use at this time. An open access release to the general public is planned for later in 2011.

Please visit the Tycho website for more information and to query the database at: www.tycho.pitt.edu. For further information regarding the Tycho project, contact Dr. Wilbert van Panhuis at the University of Pittsburgh Graduate School of Public Health.

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