Project Tycho

Preliminary data for the state of Michigan

June 2011

University of Pittsburgh Graduate School of Public Health

University of Pittsburgh   VMI
                                  Vaccine Modeling Initiative

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Disease specific data for Michigan, continued

Acknowledgements

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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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Tycho data report for the state of Michigan

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 Michigan. This includes all data that has ever been published at state or city level for Michigan 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

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[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

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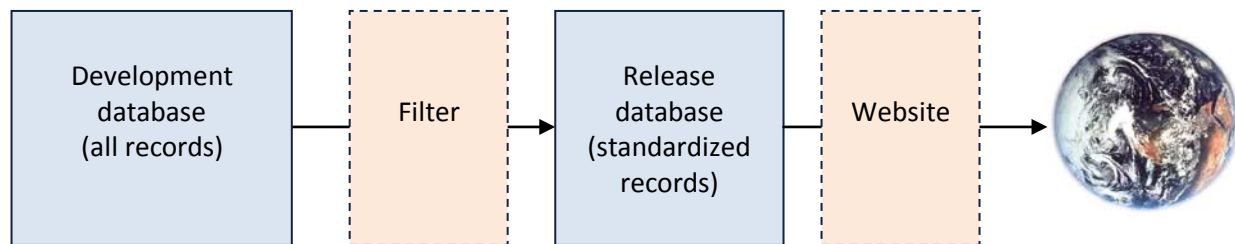
Figure 1, Schematic of the Tycho data architecture. Access to a consistent, standardized subset of the digitized US weekly surveillance reports will be provided for beta testing through a website that will allow querying and downloading of data. Data from the development database will be pushed through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

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Overview of data available for the state of Michigan

In this section, an overview of data available for the state of Michigan 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 Michigan. 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 Michigan per each disease and subcategory.

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

Disease	City	State
Aids	-	946
Anthrax	-	143
Brucellosis [undulant fever]	5	513
Chickenpox [varicella]	451	825
Chlamydia	-	664
Coccidioidomycosis	-	307
Cryptosporidiosis	-	511
Dengue	9	-
Diphtheria	2168	1752
Dysentery		
Amebic	-	283
Bacillary	-	264
Unspecified	-	197
Encephalitis		
Lethargic	426	-
Post infectious	-	337
Primary [infectious] including unspecified	388	1884
Escherichia coli		
EHEC 0157	-	179
EHEC non-0157	-	73
EHEC non serogrouped	-	84
O157:H7 NETSS	-	267
O157:H7 PHLIS	-	243
STEC	-	192

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

Disease	City	State
Giardiasis	-	389
Gonorrhea		
Civilian	-	758
Unspecified	-	1045
Haemophilus influenzae		
Age <5 non-serotype B	-	73
Age <5 serotype B	-	109
Age <5 unknown serotype	-	71
All ages all serotypes	-	614
Hepatitis		
Acute type A	-	379
Acute type B	-	376
Acute type C	-	135
Acute type NA NB [including C]	-	44
All types, <20 years	-	208
All types, >=20 years	-	104
All types, all ages	50	710
Type A [infectious]	1	1737
Type B [serum]	1	1666
Type NA NB [including C]	-	857
Type unspecified	1	907
Influenza	980	864
Legionellosis	-	1204
Leprosy	1	342
Listeriosis	-	242
Lyme disease	-	548
Malaria		
Military	-	6
Unspecified	1	1859
Measles		
Imported	-	493
Indigenous	-	561
Unspecified	2205	3010
Meningitis		
Aseptic	1	1617
Meningococcus	954	1263
Unspecified	456	5

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

Disease	City	State
Meningococcal disease		
All serogroups	-	47
Invasive all serogroups	-	186
Invasive serogroup unknown	-	43
Other serogroup	-	2
Serogroup A C Y and W-135	-	46
Serogroup B	-	2
Serogroup unspecified	64	2525
Mumps	451	1717
Pellagra	424	1
Pneumonia		
Lobar	40	-
Unspecified	576	169
Poliomyelitis		
Non paralytic	-	242
Paralytic	-	479
Total	1363	1802
Psittacosis	-	15
Rabies in animals	23	2306
Rocky mountain spotted fever	-	993
Rubella	-	1369
Salmonellosis		
NETSS	-	127
PHLIS	-	127
Unspecified	-	386
Scarlet fever		
Including streptococcal sore throat	98	561
Unspecified	2153	1283
Shigellosis		
NETSS	-	127
PHLIS	-	124
Unspecified	-	381
Streptococcal disease, invasive group a	-	389
Streptococcal sore throat	-	100
Streptococcus pneumoniae invasive disease		
Drug resistant <5 years	-	101
Drug resistant A	-	5
Drug resistant all ages	-	210
Drug resistant B	-	5
Non drug resistant <5 years	-	163

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

Disease	City	State
Syphilis		
Civilian primary and secondary	-	736
Congenital	-	153
Primary and secondary	-	1082
Tetanus	-	517
Toxic shock syndrome	-	410
Trichiniasis	2	6
Tuberculosis [phthisis pulmonalis]		
New active	-	150
Unspecified	871	1412
Tularemia	3	748
Typhoid fever [enteric fever]		
Including paratyphoid fever	339	647
Unspecified	1765	2472
Typhus fever		
Endemic	-	24
Unspecified	39	178
West nile disease		
Neuroinvasive	-	107
Non-neuroinvasive	-	41
Whooping cough [pertussis]	1546	2452

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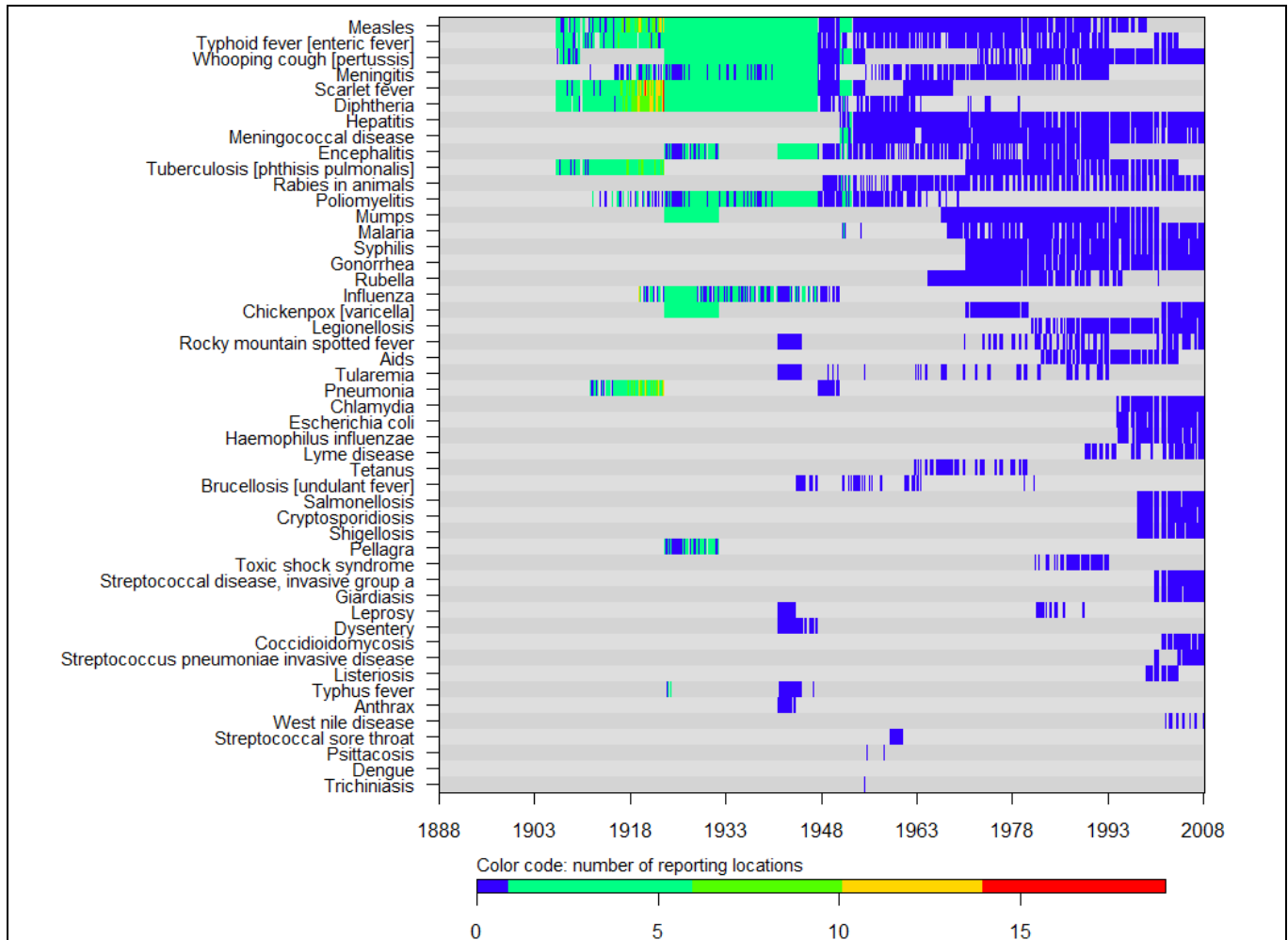
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Figure 1, The number of locations (in color code) reporting on each disease per week between 1888 and 2009

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)

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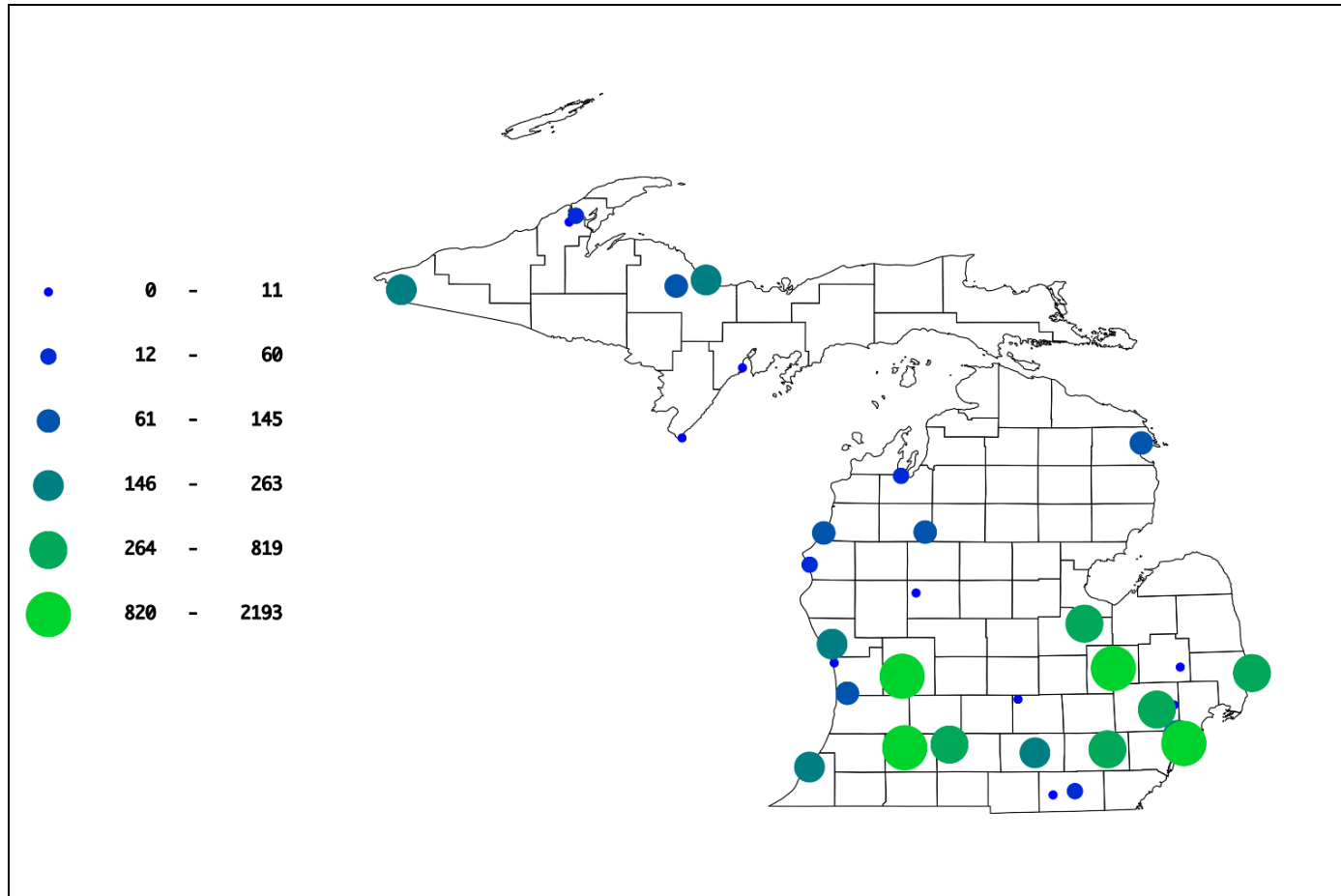
Figure 2, This map displays the number of weekly reports available for any disease per city (note that city reports were only available until 1953)

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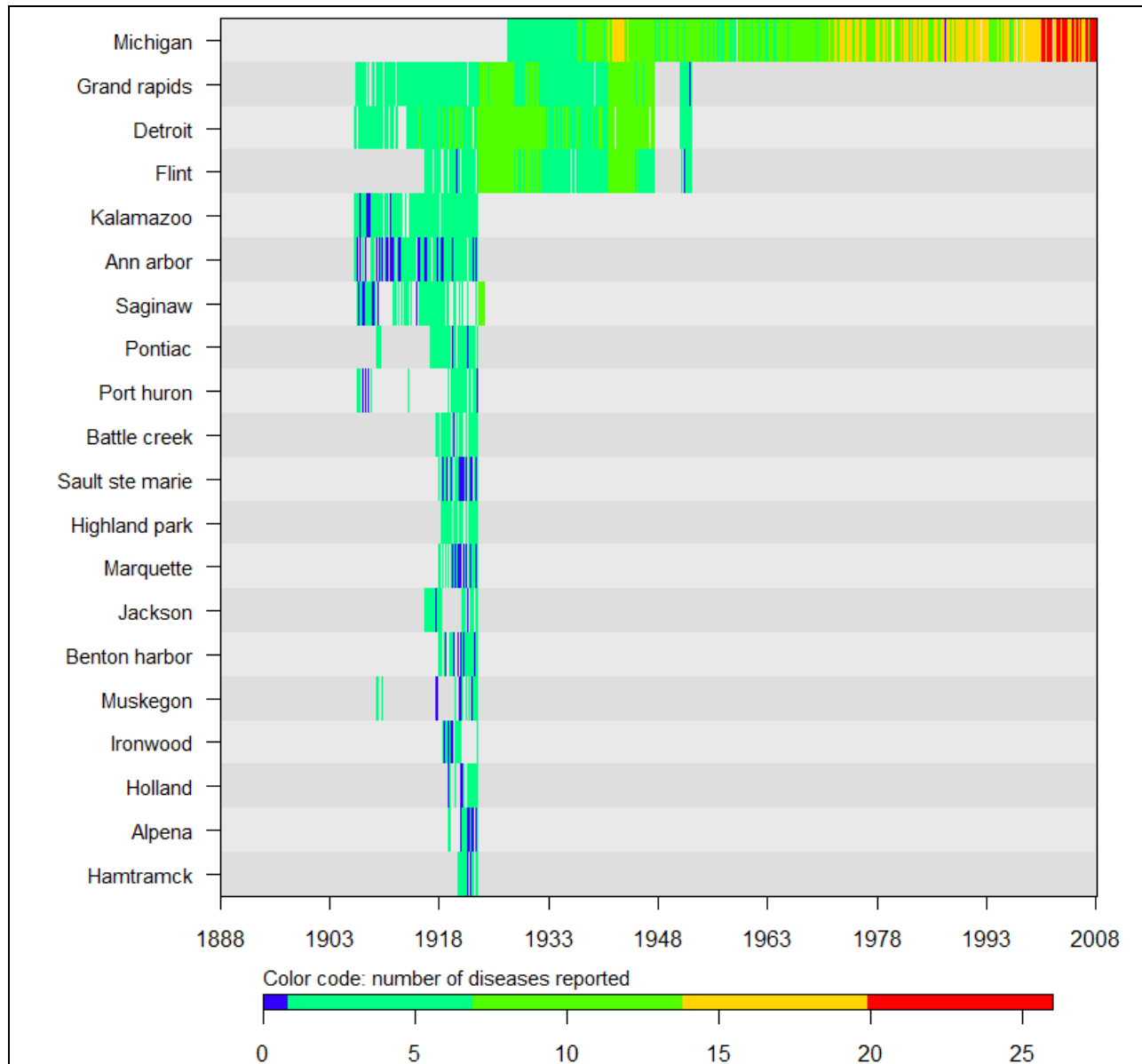
Figure 3, The number of diseases (in color code) that were reported for the state and city level (state on top row) for each week between 1888 and 2009

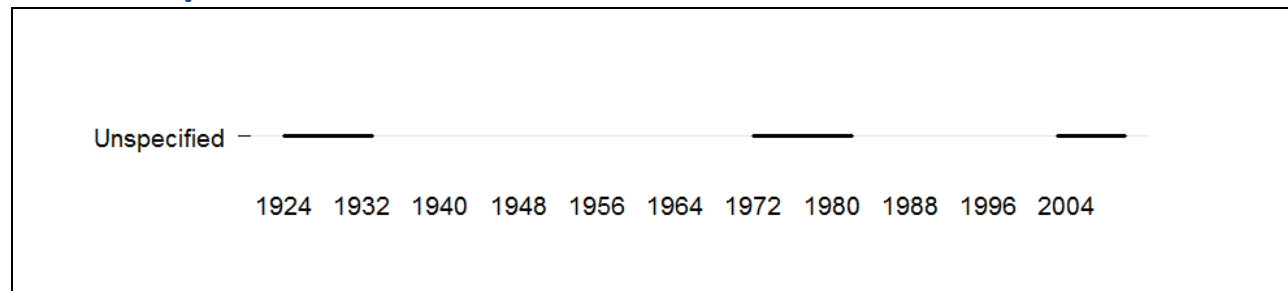## Disease specific data for Michigan

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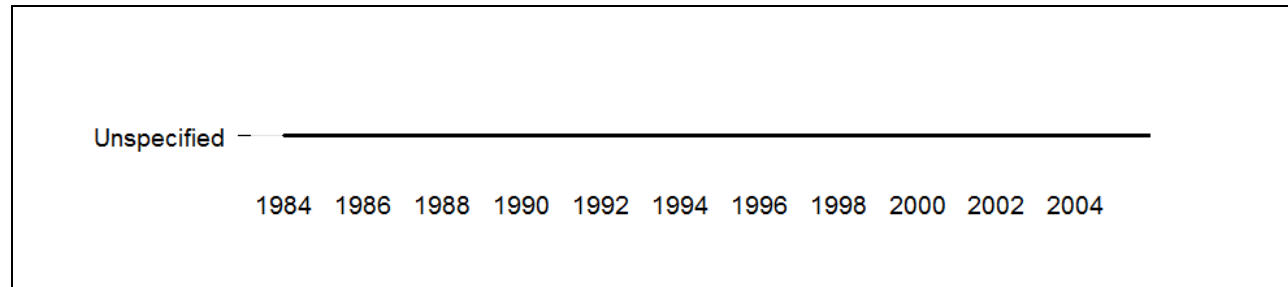
Figure D1, Weeks between 1888 and 2009 for which data on the disease and subcategories (if applicable) are available in the Tycho database. If no subcategory was reported, a subcategory of "Unspecified" was assigned.

Table D1, Summary information for AIDS

| Indicator	Michigan
Report period	1984-2005
Total weeks	946
Total cases	12,255
Max. cases per year	1,685
Year (max)	1993
Max. cases per week	615
Week (max)	1993, wk 15
Average cases per year	557
95%CI	(396-718)
Average cases per week	13
95%CI	(11-15)
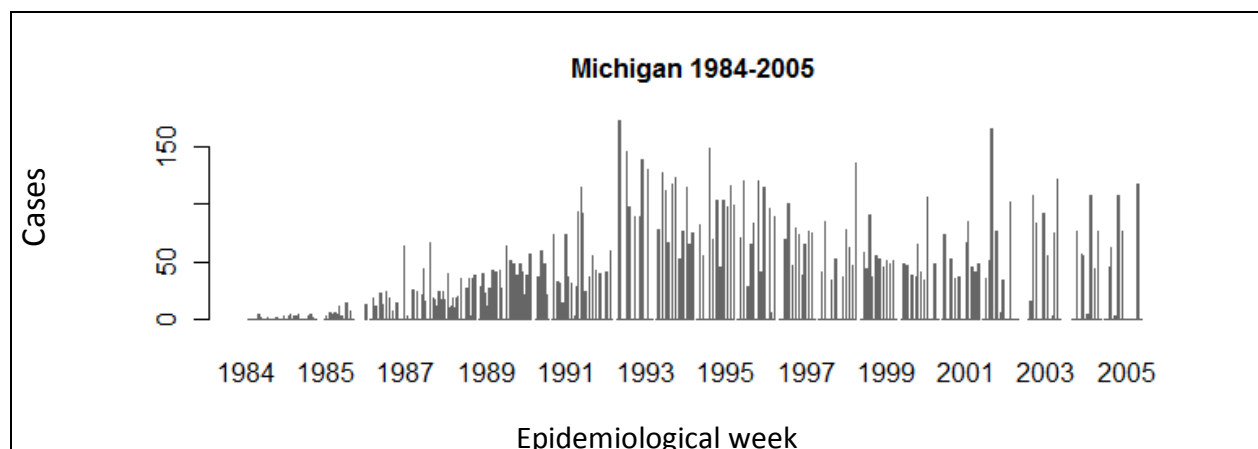
Figure D2, Number of cases reported for AIDS per epidemiological week
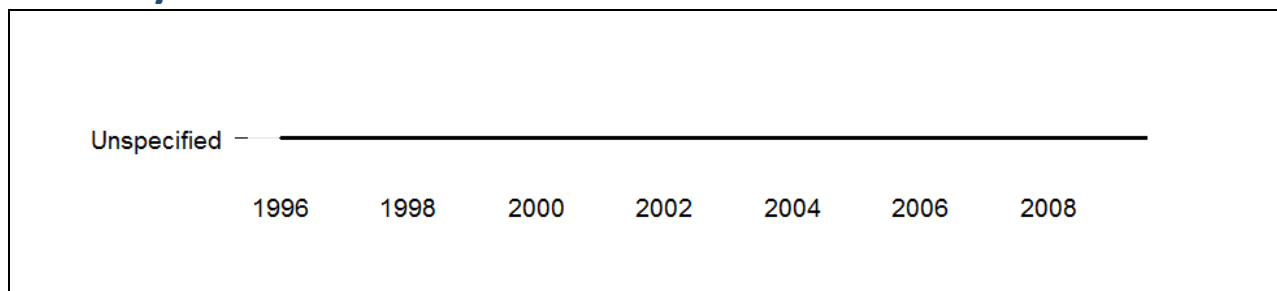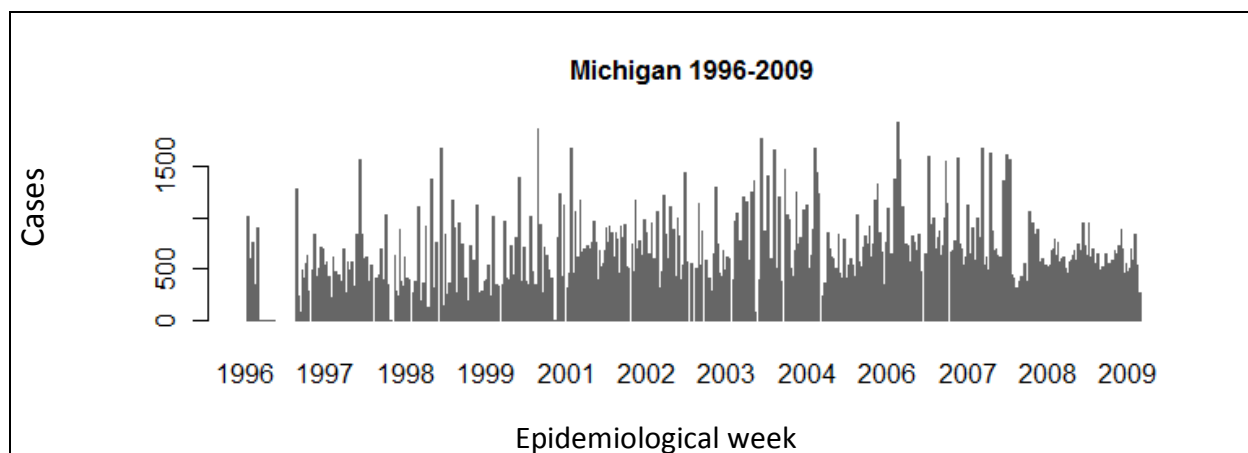
Chickenpox

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 Chickenpox

Indicator	Grand Rapids	Detroit	Flint
Report period	1924-1932	1924-1932	1924-1932
Total weeks	439	449	447
Total cases	2,011	25,654	5,082
Max. cases per year	292	3,412	783
Year (max)	1926	1931	1931
Max. cases per week	25	237	60
Week (max)	1926, wk 09	1928, wk 49	1929, wk 47
Average cases per year			
before 1995	223	2,850	565
95%CI	(190-256)	(2,476-3,224)	(418-712)
Average cases per week			
before 1995	5	57	11
95%CI	(5-5)	(53-61)	(10-12)

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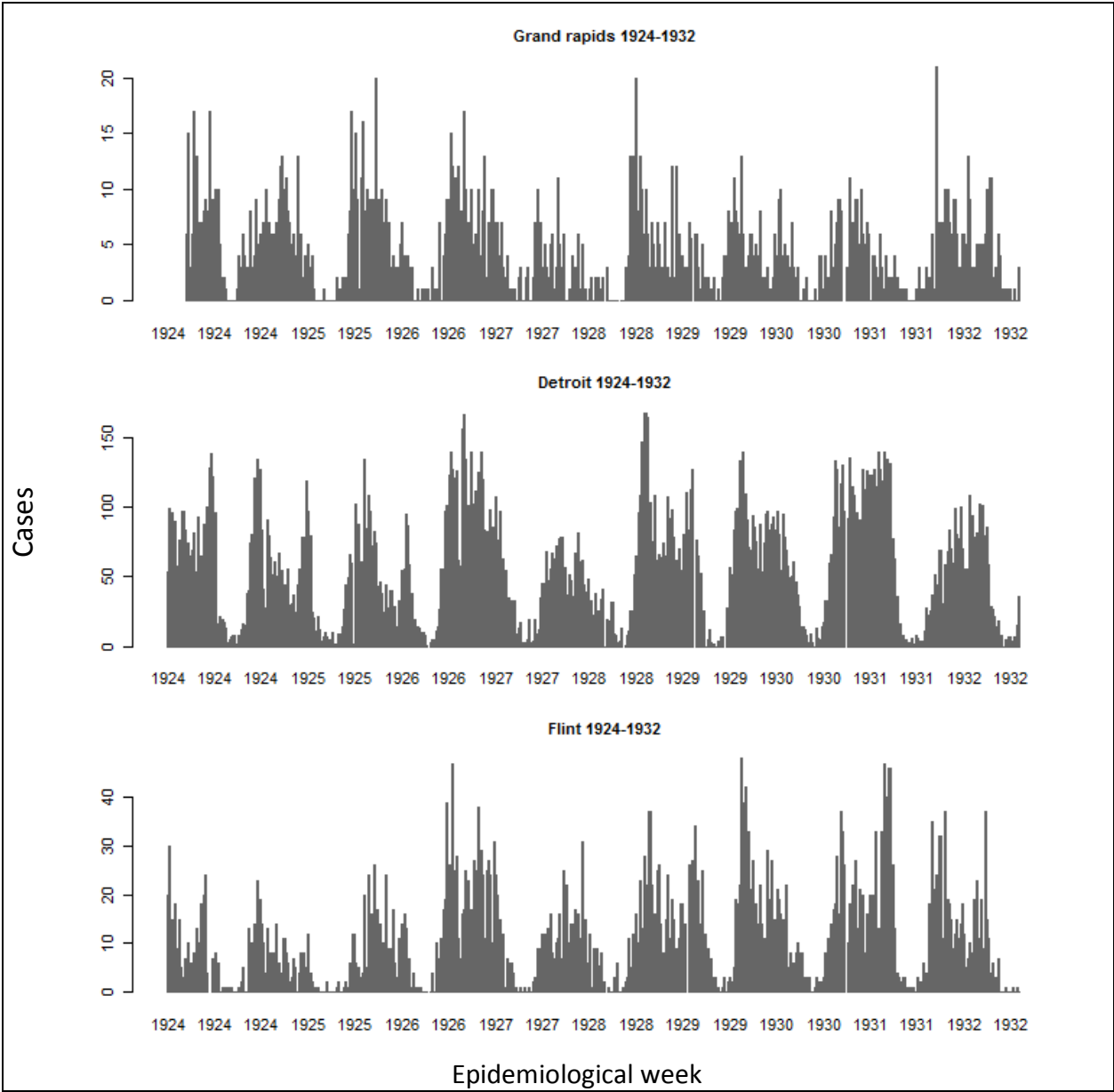
Figure D2, Number of cases reported for Chickenpox per epidemiological week
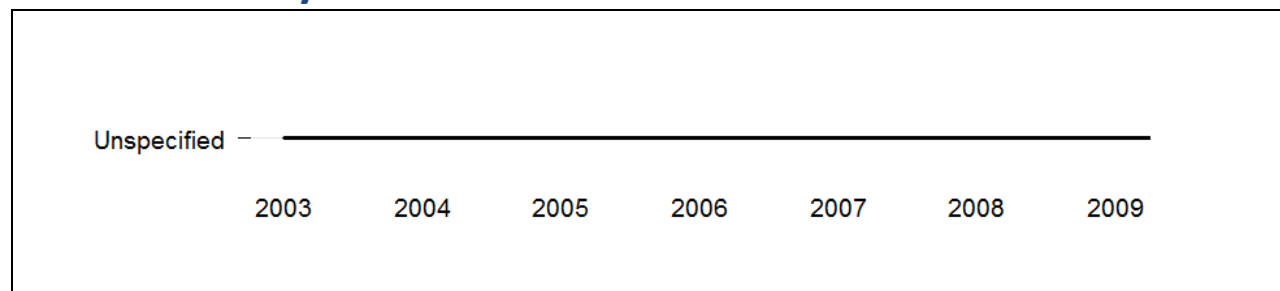
Chlamydia

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	Michigan
Report period	1996-2009
Total weeks	663
Total cases	372,708
Max. cases per year	39,855
Year (max)	2006
Max. cases per week	2,392
Week (max)	2003, wk 16
Average cases per year	26,622
95%CI	(22,079-31,165)
Average cases per week	562
95%CI	(534-590)

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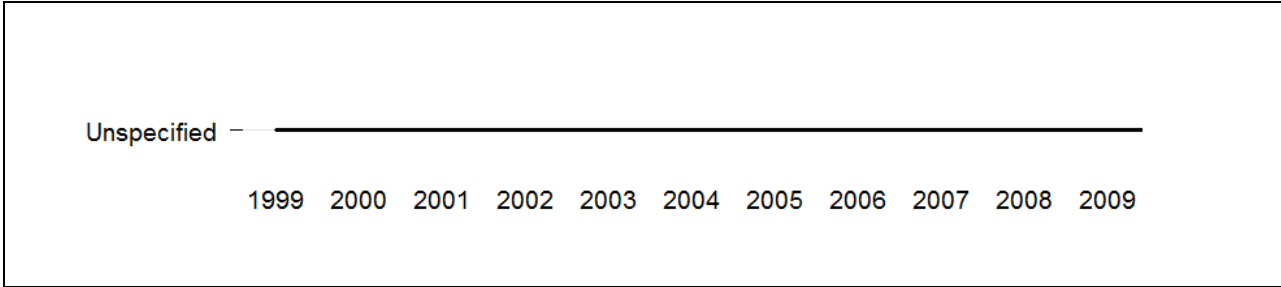
Coccidioidomycosis

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 Coccidioidomycosis

Indicator	Michigan
Report period	2003-2009
Total weeks	307
Total cases	135
Max. cases per year	39
Year (max)	2006
Max. cases per week	6
Week (max)	2008, wk 29
Average cases per year	19
95%CI	(8-30)
Average cases per week	0
95%CI	(0-0)
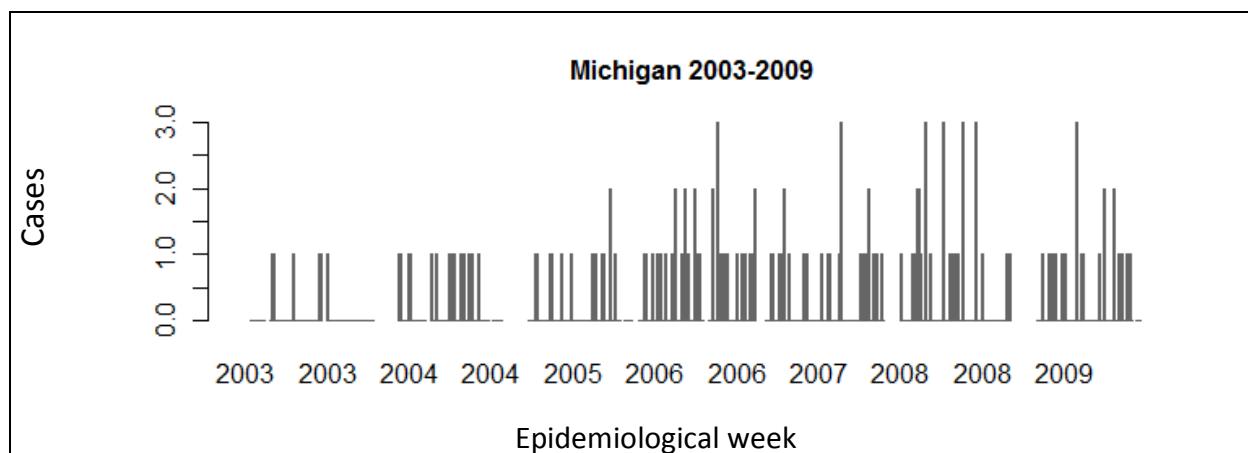
Figure D2, Number of cases reported for Coccidioidomycosis per epidemiological week
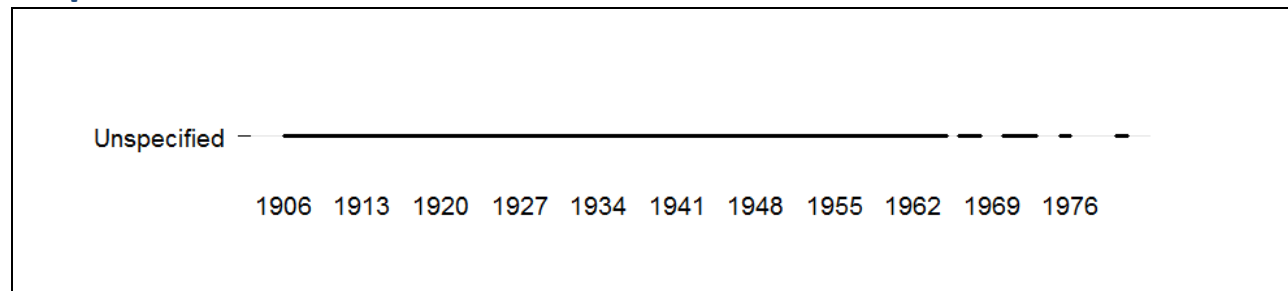
Cryptosporidiosis

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	Michigan
Report period	1999-2009
Total weeks	511
Total cases	1,410
Max. cases per year	192
Year (max)	2007
Max. cases per week	14
Week (max)	2000, wk 37
Average cases per year	128
95%CI	(98-158)
Average cases per week	3
95%CI	(3-3)
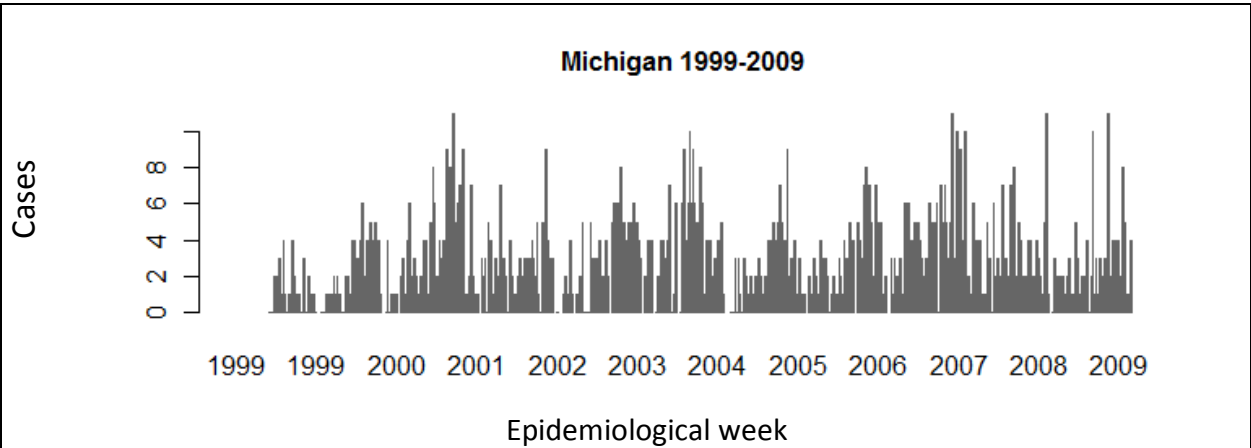
Figure D2, Number of cases reported for Cryptosporidiosis per epidemiological week

Tycho data report for the state of Michigan

Dengue

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 Dengue

Indicator	Grand Rapids
Report period	1924-1924
Total weeks	2
Total cases	0

Tycho data report for the state of Michigan

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	Michigan	Grand Rapids	Detroit	Flint
Report period	1927-1980	1906-1948	1906-1953	1916-1953
Total weeks	1,752	1,958	2,070	1,573
Total cases	24,499	4,086	58,146	3,834
Max. cases per year	4,668	486	4,570	550
Year (max)	1929	1920	1921	1921
Max. cases per week	326	35	162	44
Week (max)	1970, wk 44	1920, wk 44	1920, wk 52	1921, wk 39
Average cases per year				
before 1940	1,468	116	1,625	151
95%CI	(664-2,272)	(70-162)	(1,160-2,090)	(82-220)
after 1940	127	2	127	5
95%CI	(67-187)	(1-3)	(58-196)	(2-8)
Average cases per week				
before 1940	30	3	34	3
95%CI	(28-32)	(3-3)	(33-35)	(3-3)
after 1940	4	0	3	0
95%CI	(3-5)	(0-0)	(3-3)	(0-0)

Tycho data report for the state of Michigan
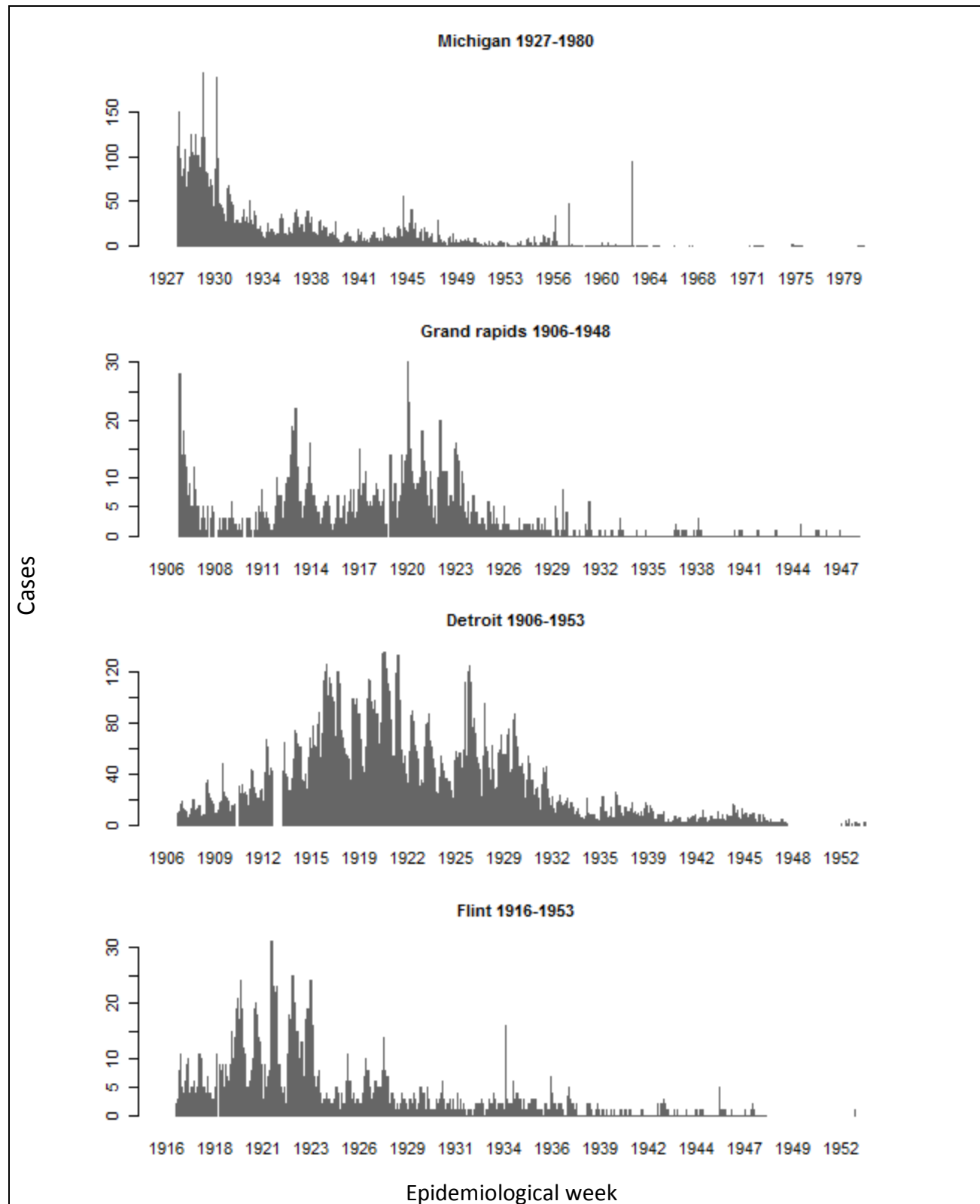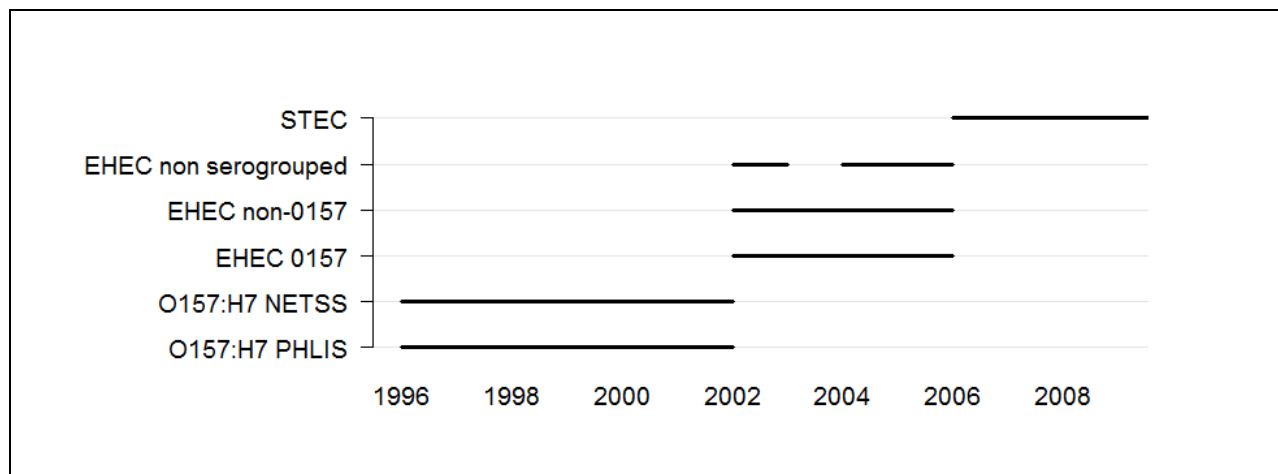
Figure D2, Number of cases reported for Diphtheria per epidemiological week

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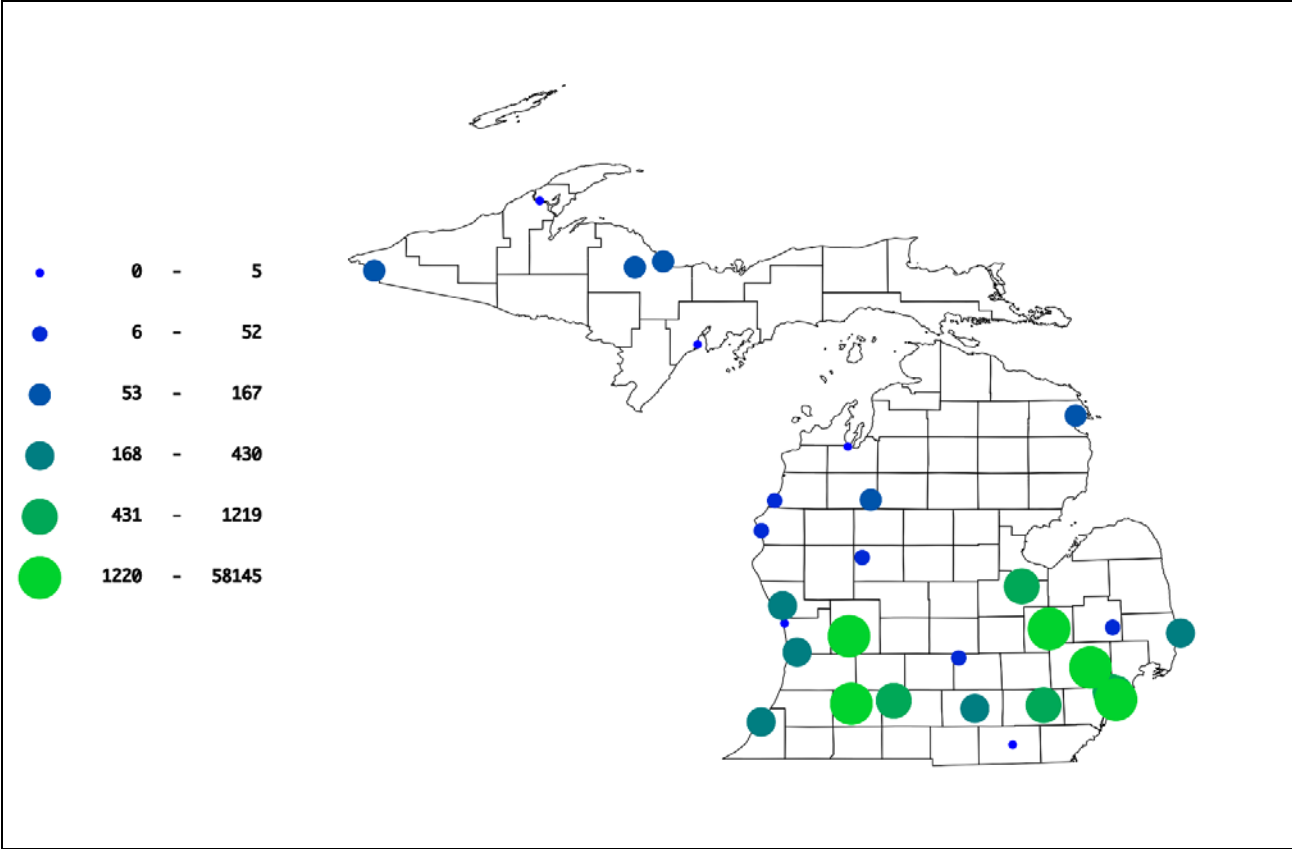
Figure D3, The total number of cases reported for Diphtheria by each city for the entire time period

Tycho data report for the state of Michigan
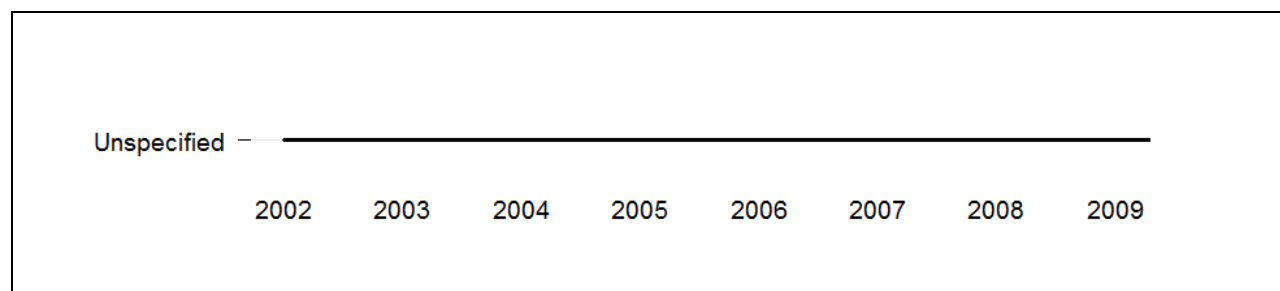
Escherichia Coli

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	Michigan
Report period	1996-2009
Total weeks	614
Total cases	1,267
Max. cases per year	151
Year (max)	2008
Max. cases per week	43
Week (max)	1997, wk 30
Average cases per year	90
95%CI	(76-104)
Average cases per week	2
95%CI	(2-2)
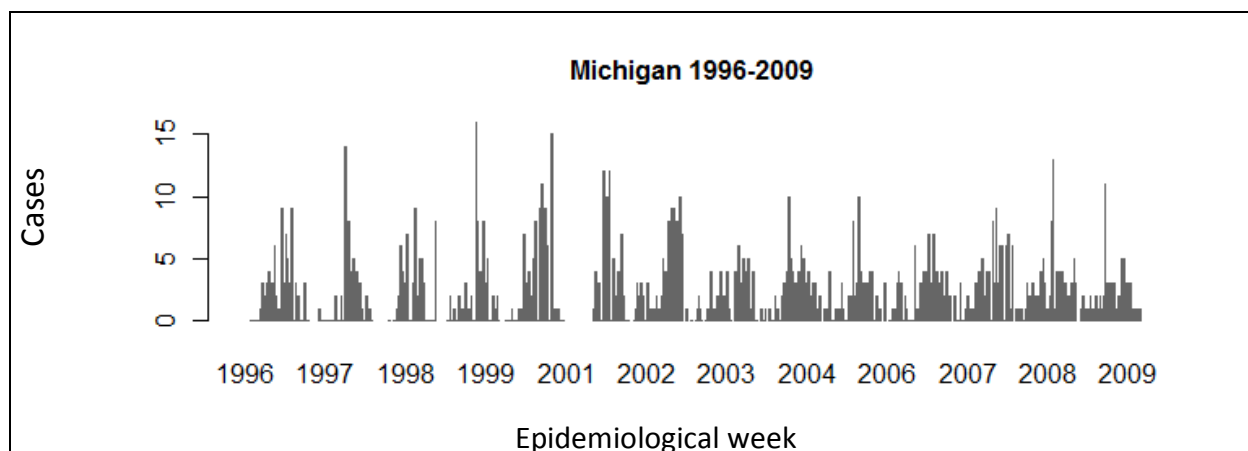
Figure D2, Number of cases reported for Escherichia Coli per epidemiological week

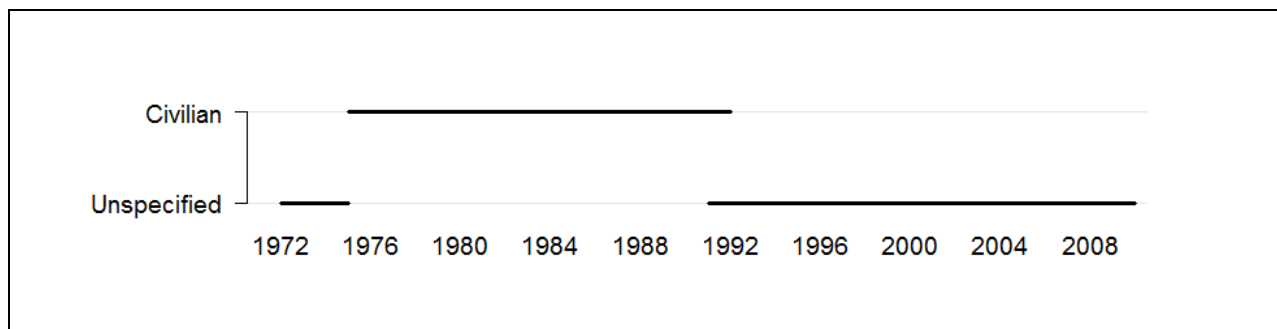*Tycho data report for the state of Michigan*

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	Michigan
Report period	2002-2009
Total weeks	388
Total cases	4,476
Max. cases per year	864
Year (max)	2002
Max. cases per week	47
Week (max)	2003, wk 49
Average cases per year	560
95%CI	(348-772)
Average cases per week	12
95%CI	(11-13)
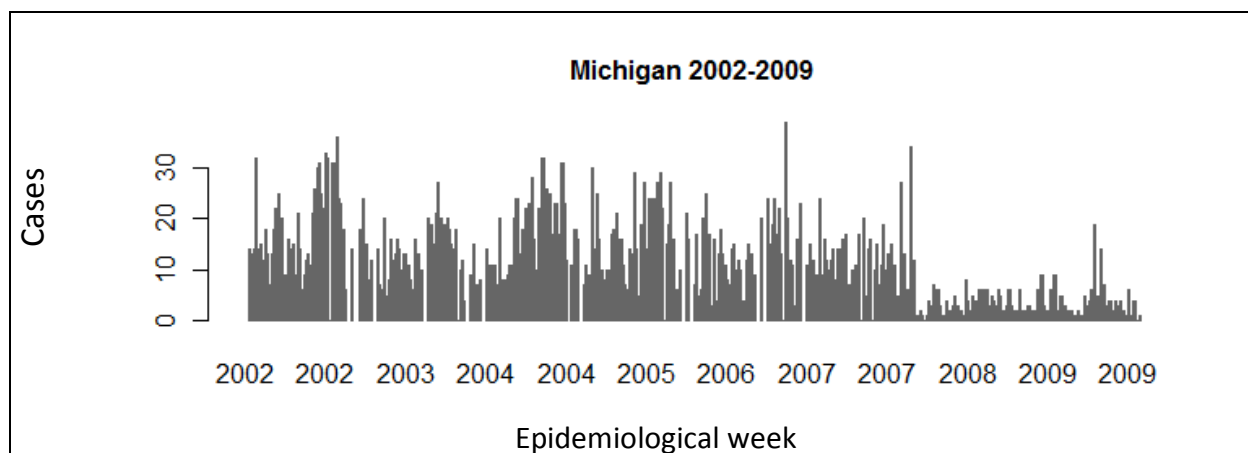
Figure D2, Number of cases reported for Giardiasis per epidemiological week

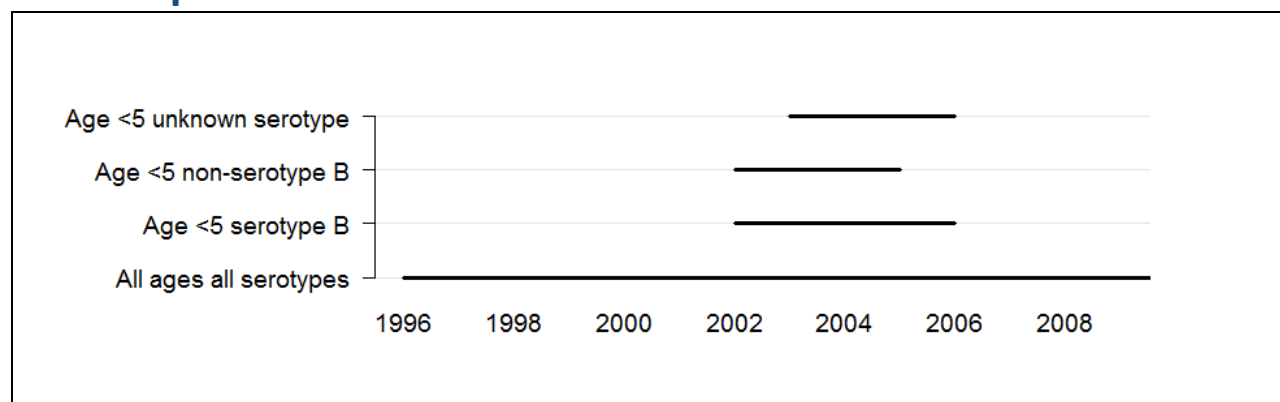*Tycho data report for the state of Michigan*

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	Michigan
Report period	1972-2009
Total weeks	1,802
Total cases	875,770
Max. cases per year	36,242
Year (max)	1987
Max. cases per week	8,988
Week (max)	2006, wk 36
Average cases per year	23,047
95%CI	(20,035-26,059)
Average cases per week	486
95%CI	(470-502)
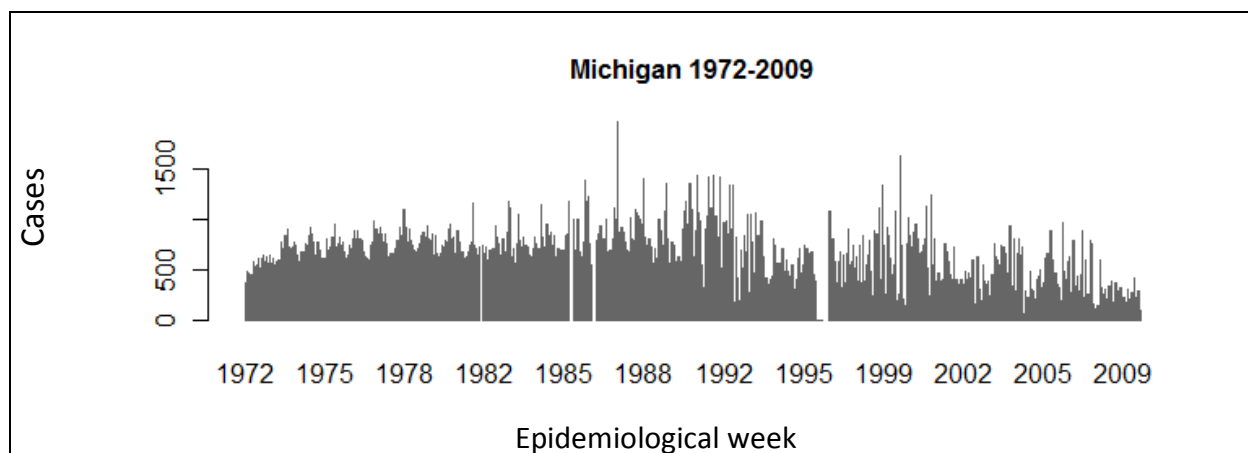
Figure D2, Number of cases reported for Gonorrhea per epidemiological week

Tycho data report for the state of Michigan
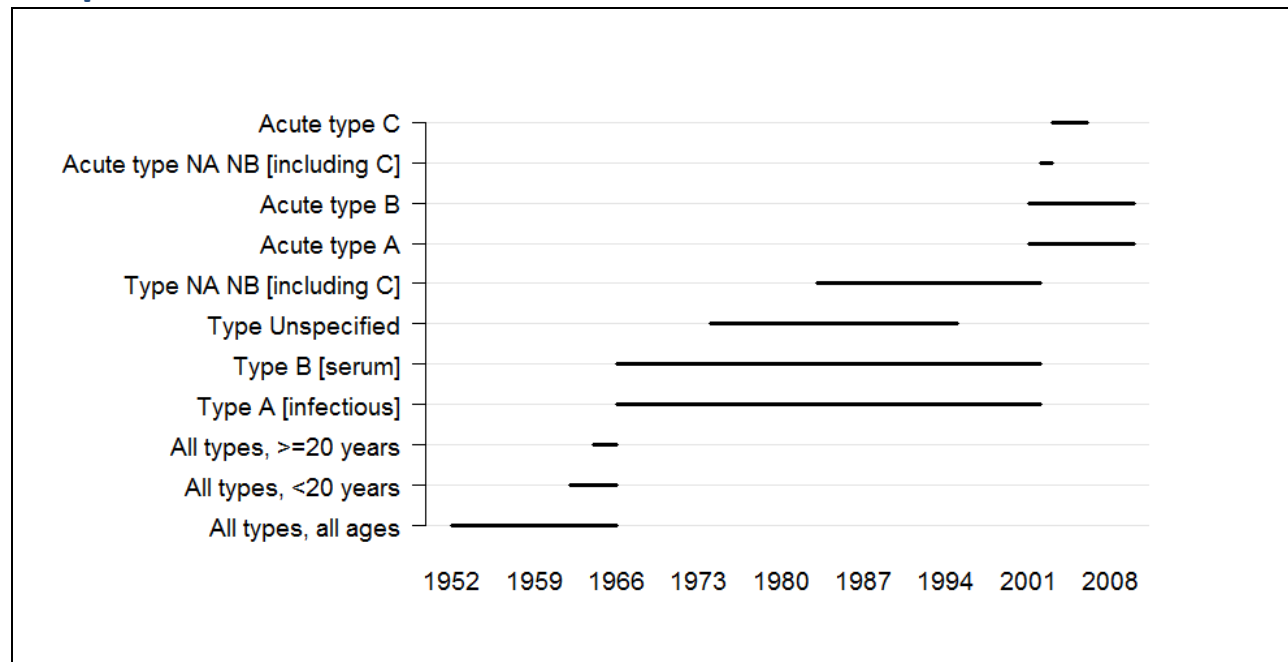
Haemophilus Influenzae

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	Michigan
Report period	1996-2009
Total weeks	614
Total cases	311
Max. cases per year	84
Year (max)	2006
Max. cases per week	60
Week (max)	2006, wk 35
Average cases per year	22
95%CI	(11-33)
Average cases per week	1
95%CI	(1-1)
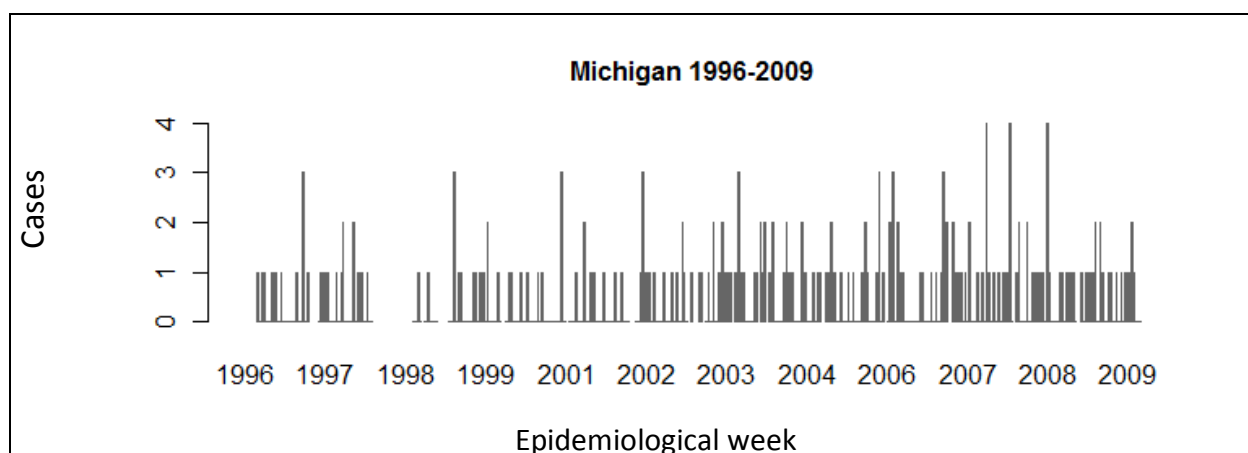
Figure D2, Number of cases reported for Haemophilus Influenzae per epidemiological week
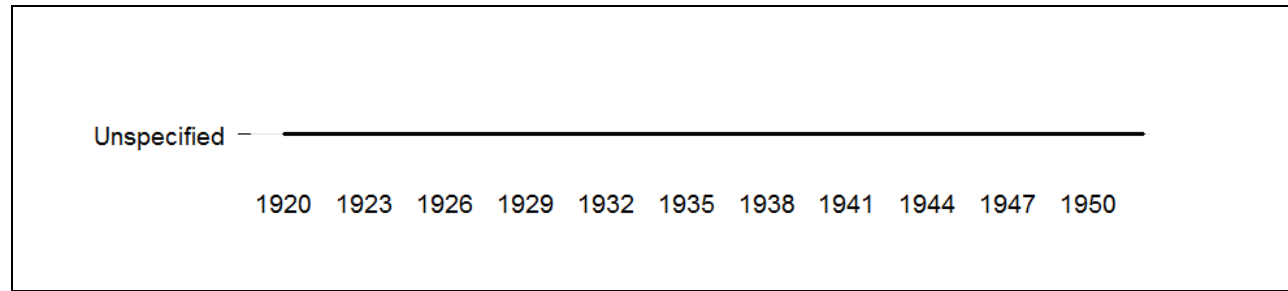
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Hepatitis

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	Michigan
Report period	1966-2009
Total weeks	2,132
Total cases	38,912
Max. cases per year	5,126
Year (max)	1970
Max. cases per week	2,866
Week (max)	1970, wk 44
Average cases per year	
before 1990	1,266
95%CI	(862-1,670)
after 1990	382
95%CI	(244-520)
Average cases per week	
before 1990	26
95%CI	(21-31)
after 1990	8
95%CI	(7-9)
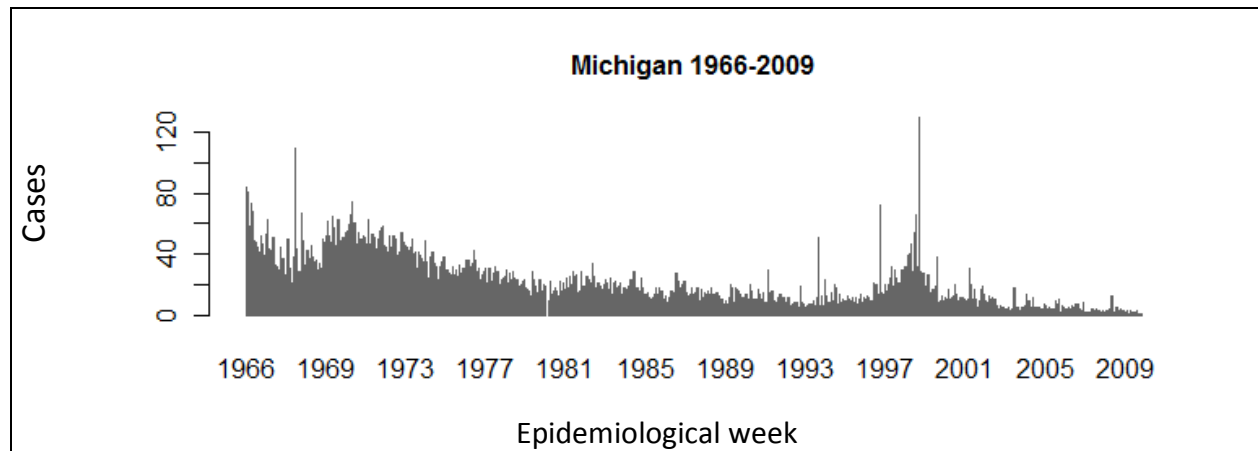
Figure D2, Number of cases reported for Hepatitis per epidemiological week

Tycho data report for the state of Michigan

Influenza

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 Influenza

Indicator	Michigan	Detroit
Report period	1927-1951	1920-1948
Total weeks	863	935
Total cases	35,992	22,210
Max. cases per year	15,479	11,390
Year (max)	1929	1920
Max. cases per week	8,948	6,922
Week (max)	1929, wk 01	1920, wk 04
Average cases per year	1,440	766
95%CI	(122-2,758)	(-47-1,579)
Average cases per week	42	24
95%CI	(16-68)	(8-40)
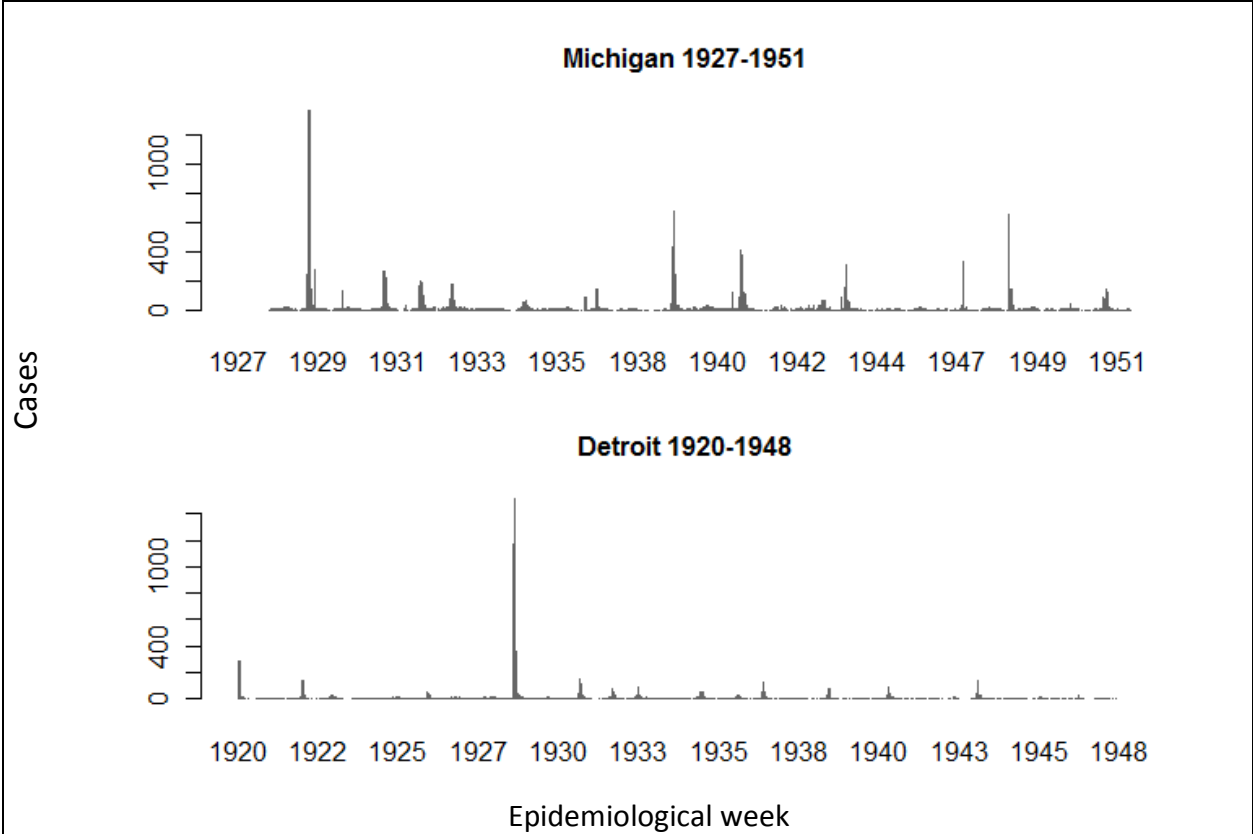
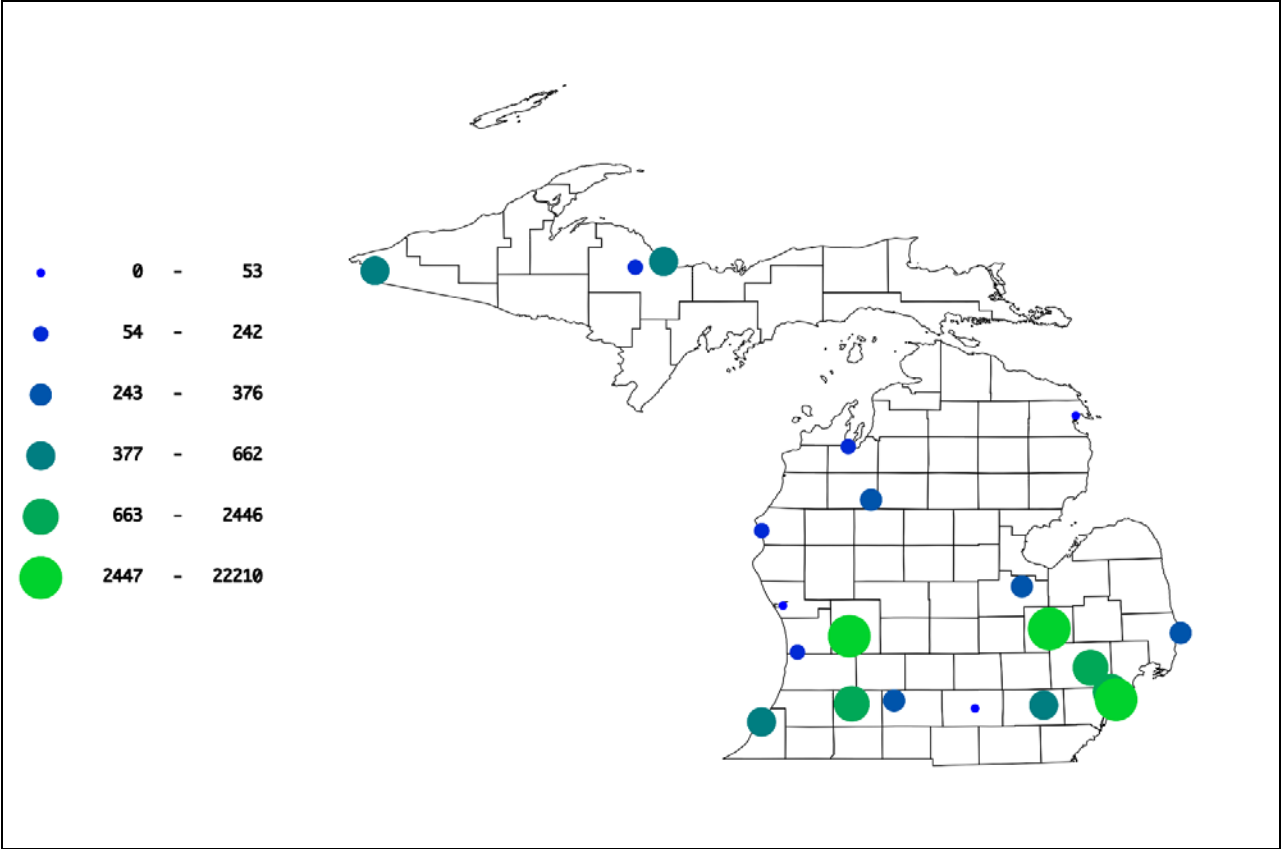**Figure D2,** Number of cases reported for Influenza per epidemiological week

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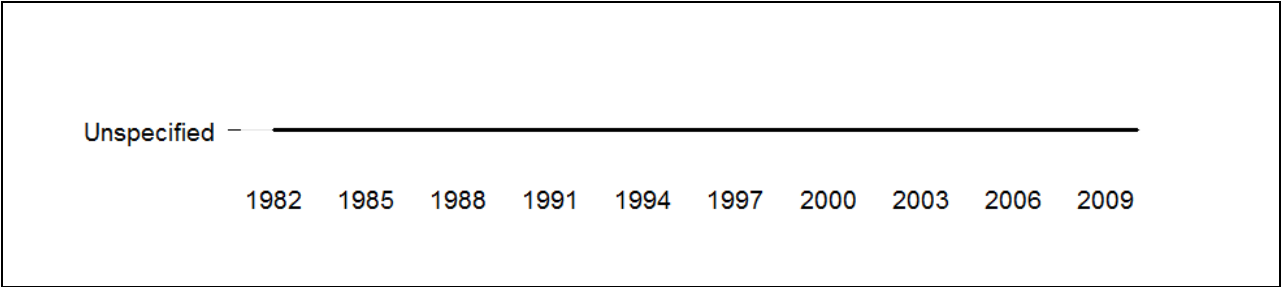
Legionellosis

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

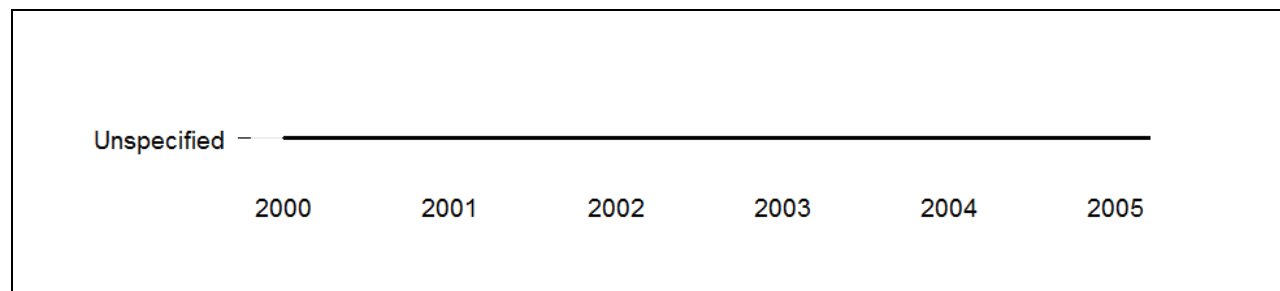| Indicator	Michigan
Report period	1982-2009
Total weeks	1,204
Total cases	2,118
Max. cases per year	149
Year (max)	2007
Max. cases per week	19
Week (max)	1996, wk 43
Average cases per year	76
95%CI	(63-89)
Average cases per week	2
95%CI	(2-2)
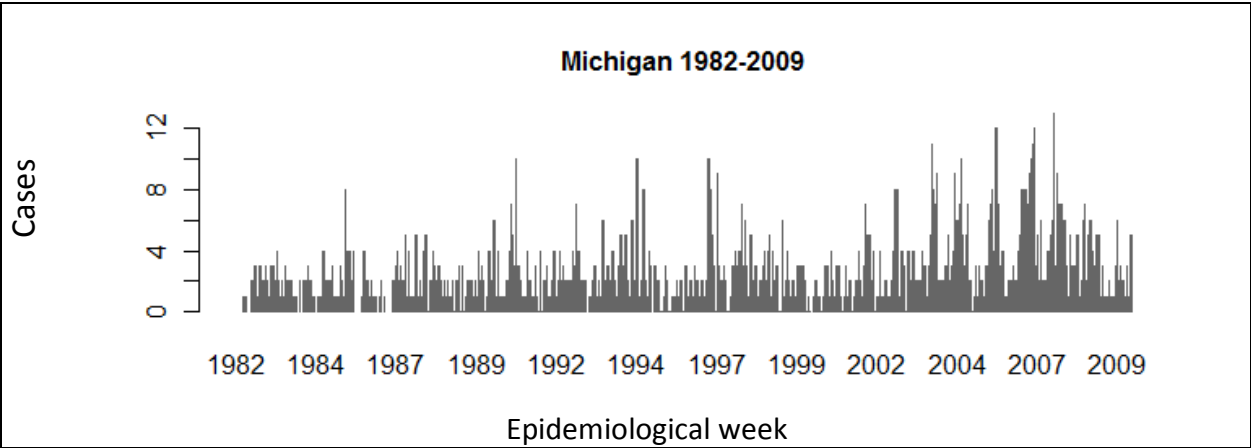
Figure D2, Number of cases reported for Legionellosis per epidemiological week

Tycho data report for the state of Michigan

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

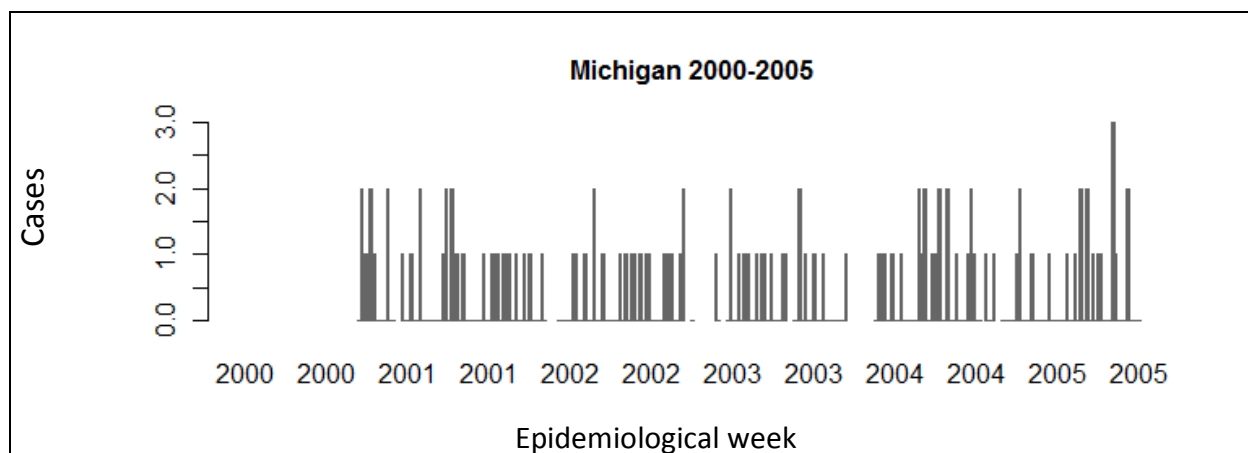| Indicator	Michigan
Report period	2000-2005
Total weeks	242
Total cases	124
Max. cases per year	28
Year (max)	2005
Max. cases per week	4
Week (max)	2005, wk 29
Average cases per year	21
95%CI	(14-28)
Average cases per week	1
95%CI	(1-1)

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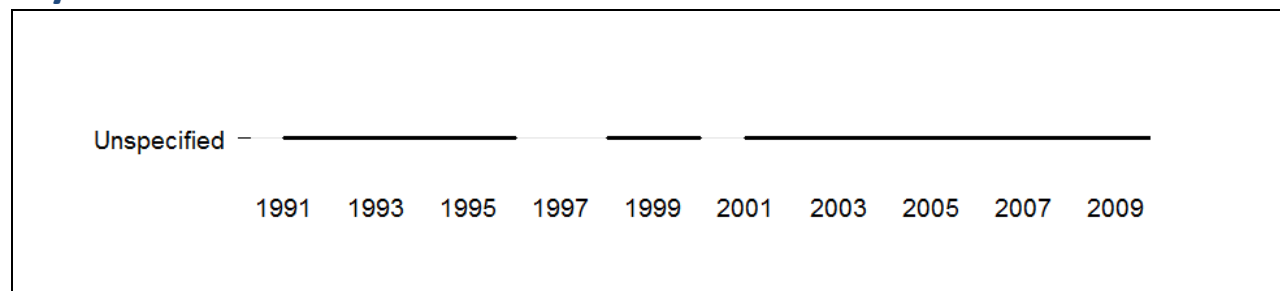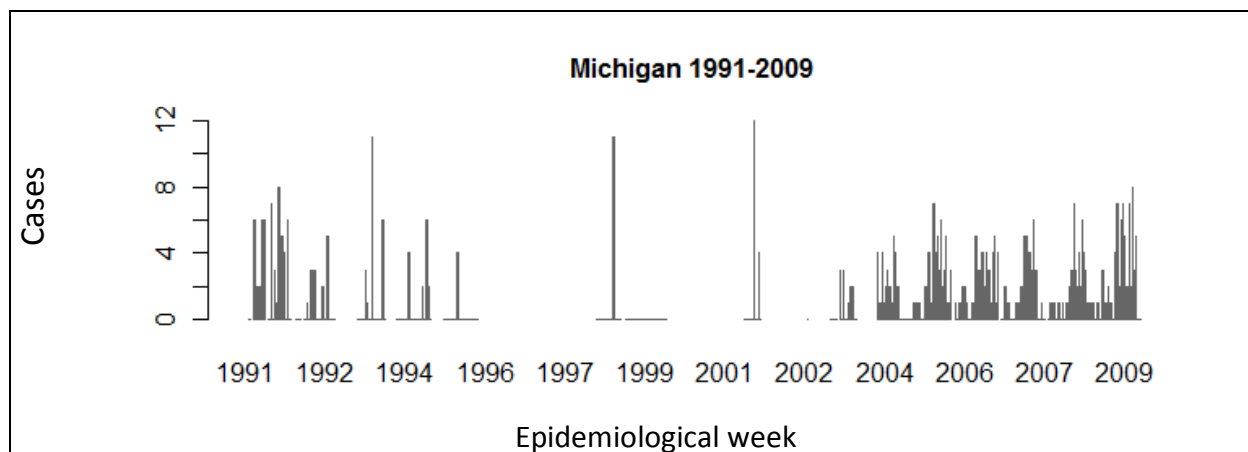
Lyme Disease

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	Michigan
Report period	1991-2009
Total weeks	548
Total cases	583
Max. cases per year	96
Year (max)	1991
Max. cases per week	32
Week (max)	1991, wk 43
Average cases per year	36
95%CI	(20-52)
Average cases per week	1
95%CI	(1-1)

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

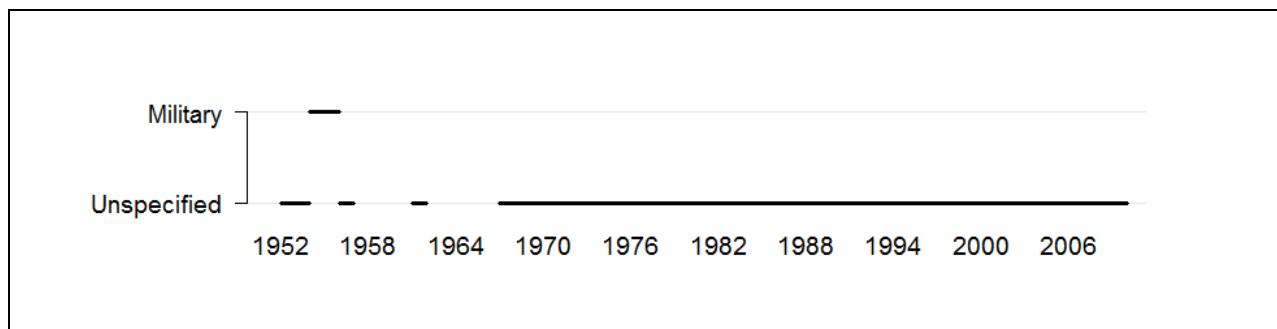*Tycho data report for the state of Michigan*

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	Michigan
Report period	1952-2009
Total weeks	1,859
Total cases	1,267
Max. cases per year	166
Year (max)	1970
Max. cases per week	79
Week (max)	1970, wk 45
Average cases per year	27
95%CI	(20-34)
Average cases per week	1
95%CI	(1-1)
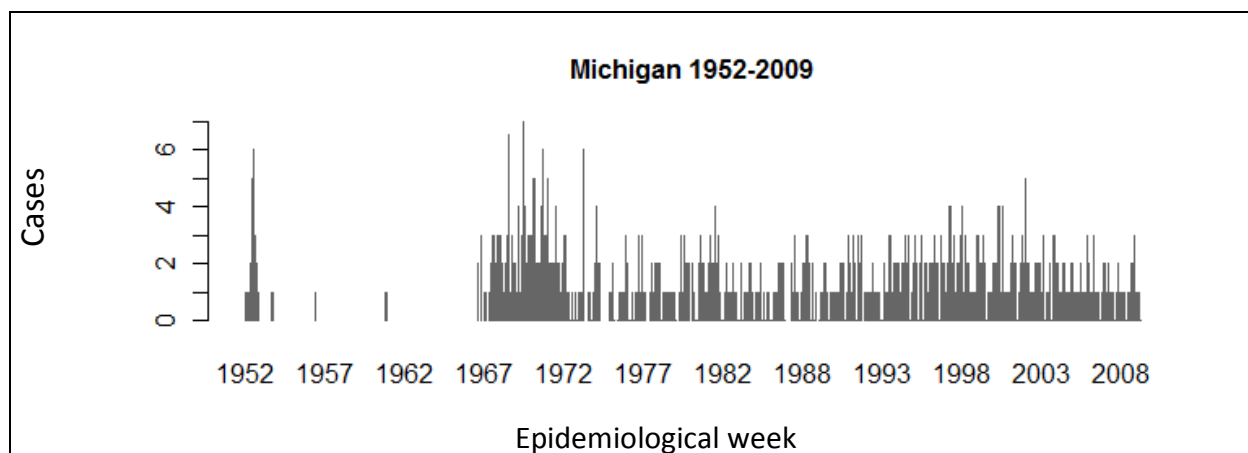
Figure D2, Number of cases reported for Malaria per epidemiological week

Tycho data report for the state of Michigan
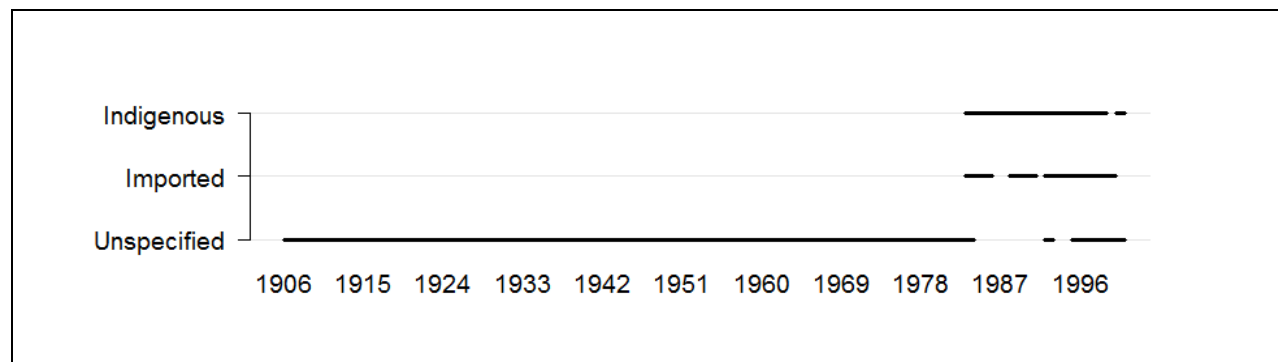
Measles

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	Michigan	Grand Rapids	Detroit	Flint
Report period	1927-2000	1906-1953	1907-1953	1916-1953
Total weeks	3,010	1,950	1,804	1,457
Total cases	1,094,325	53,244	252,910	26,902
Max. cases per year	76,996	5,341	30,647	3,529
Year (max)	1938	1941	1938	1935
Max. cases per week	6,587	574	3,195	620
Week (max)	1935, wk 18	1941, wk 14	1938, wk 11	1935, wk 11
Average cases per year				
before 1970	24,171	1,183	6,169	769
95%CI	(18,481-29,861)	(802-1,564)	(3,715-8,623)	(448-1,090)
after 1970	1,541	-	-	-
95%CI	(495-2,587)	-	-	-
Average cases per week				
before 1970	485	27	140	18
95%CI	(452-518)	(24-30)	(124-156)	(15-21)
after 1970	38	-	-	-
95%CI	(33-43)	-	-	-

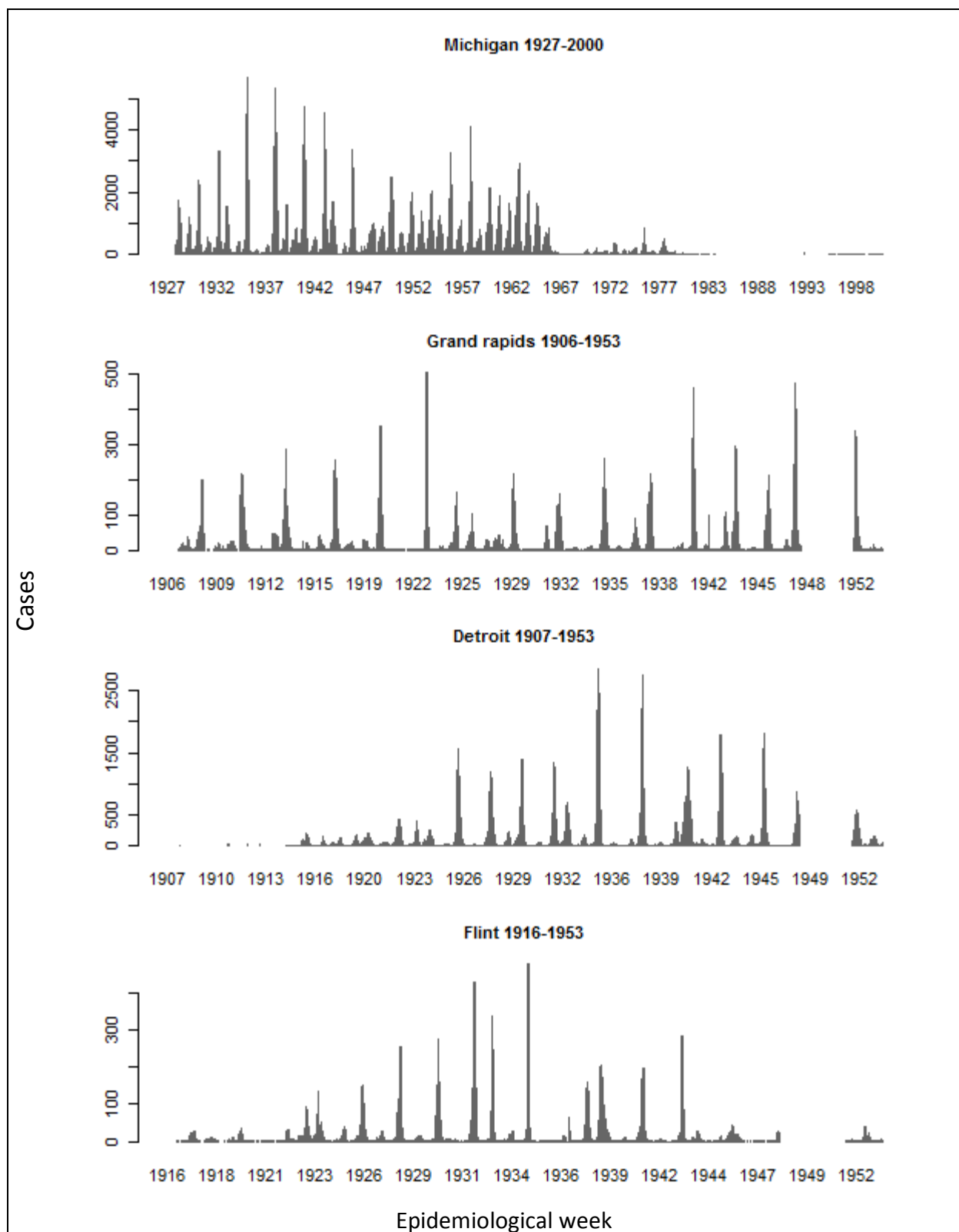*Tycho data report for the state of Michigan*

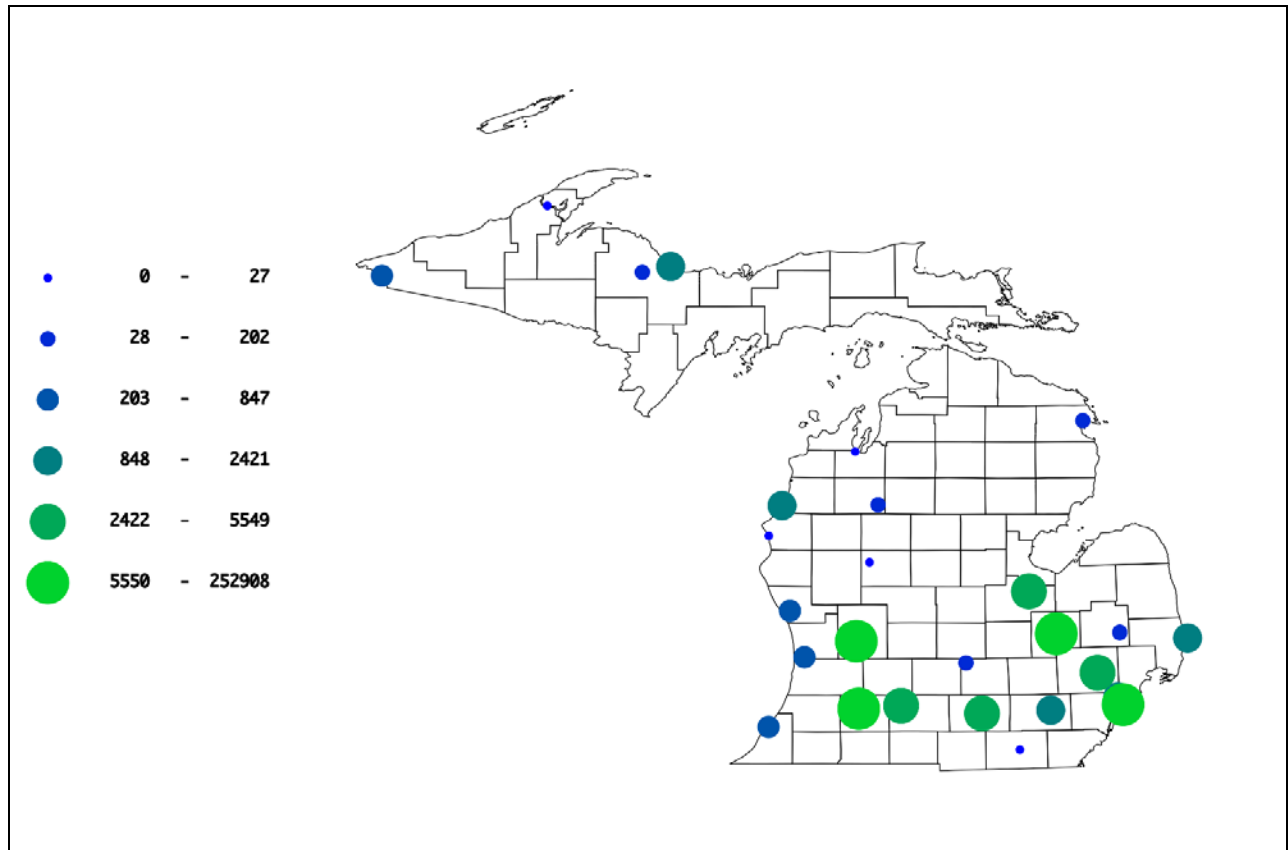**Figure D2,** Number of cases reported for Measles per epidemiological week

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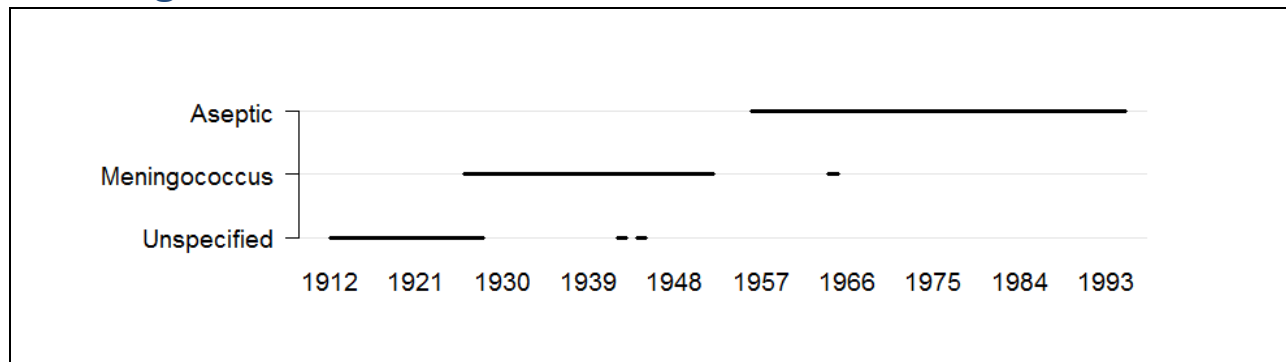
Meningitis

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)

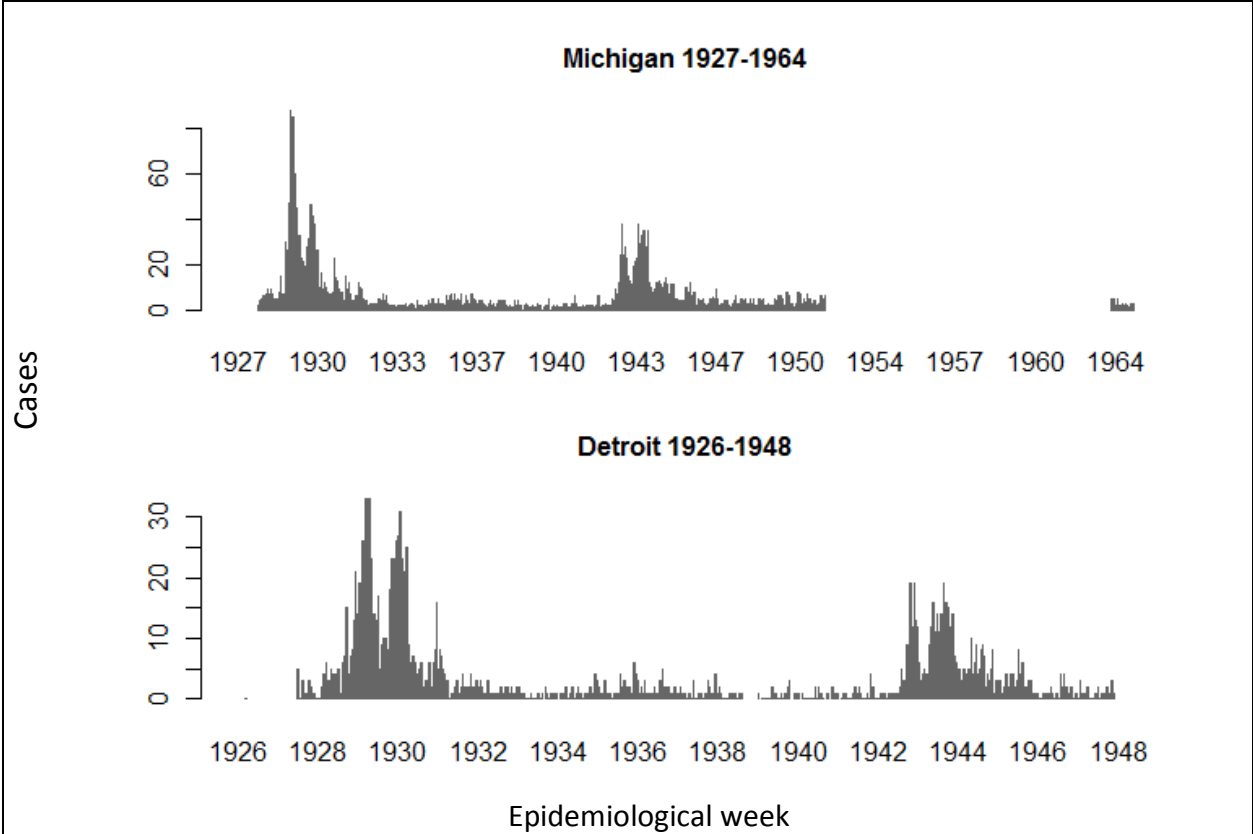| Indicator	Michigan	Detroit
Report period	1927-1964	1926-1948
Total weeks	1,263	930
Total cases	6,756	2,983
Max. cases per year	1,861	791
Year (max)	1929	1929
Max. cases per week	101	46
Week (max)	1929, wk 20	1929, wk 22
Average cases per year	260	130
95%CI	(100-420)	(42-218)
Average cases per week	5	3
95%CI	(4-6)	(3-3)

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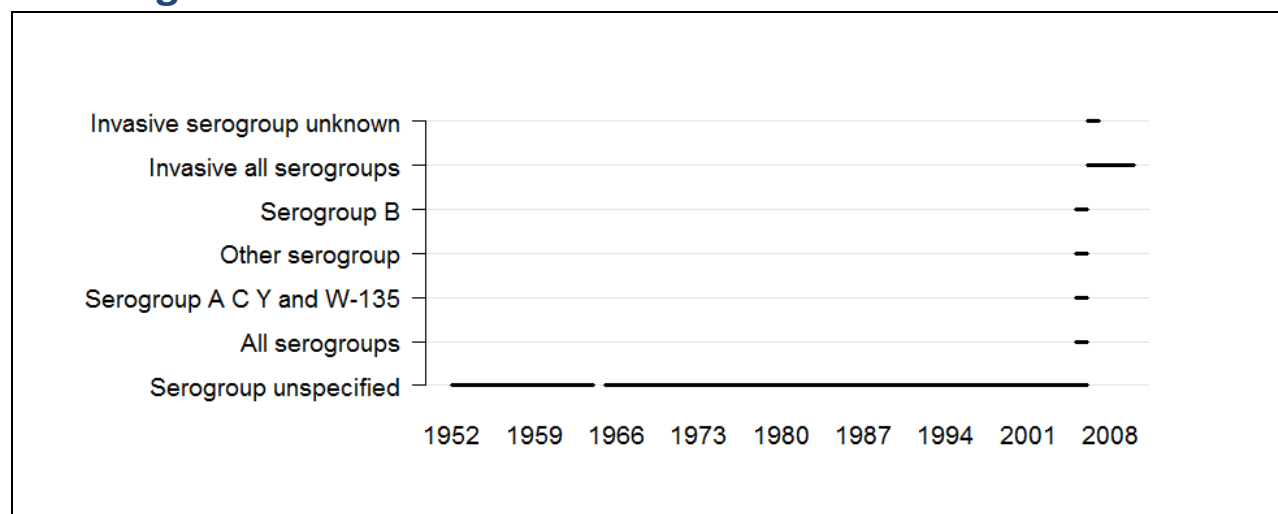
Meningococcal Disease

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	Michigan	Detroit
Report period	1952-2009	1952-1953
Total weeks	2,711	59
Total cases	6,340	96
Max. cases per year	1,312	49
Year (max)	1953	1952
Max. cases per week	899	4
Week (max)	1953, wk 02	1952, wk 09
Average cases per year		
before 1980	165	48
95%CI	(74-256)	(35-61)
after 1980	59	-
95%CI	(49-69)	-
Average cases per week		
before 1980	3	2
95%CI	(2-4)	(2-2)
after 1980	1	-
95%CI	(1-1)	-

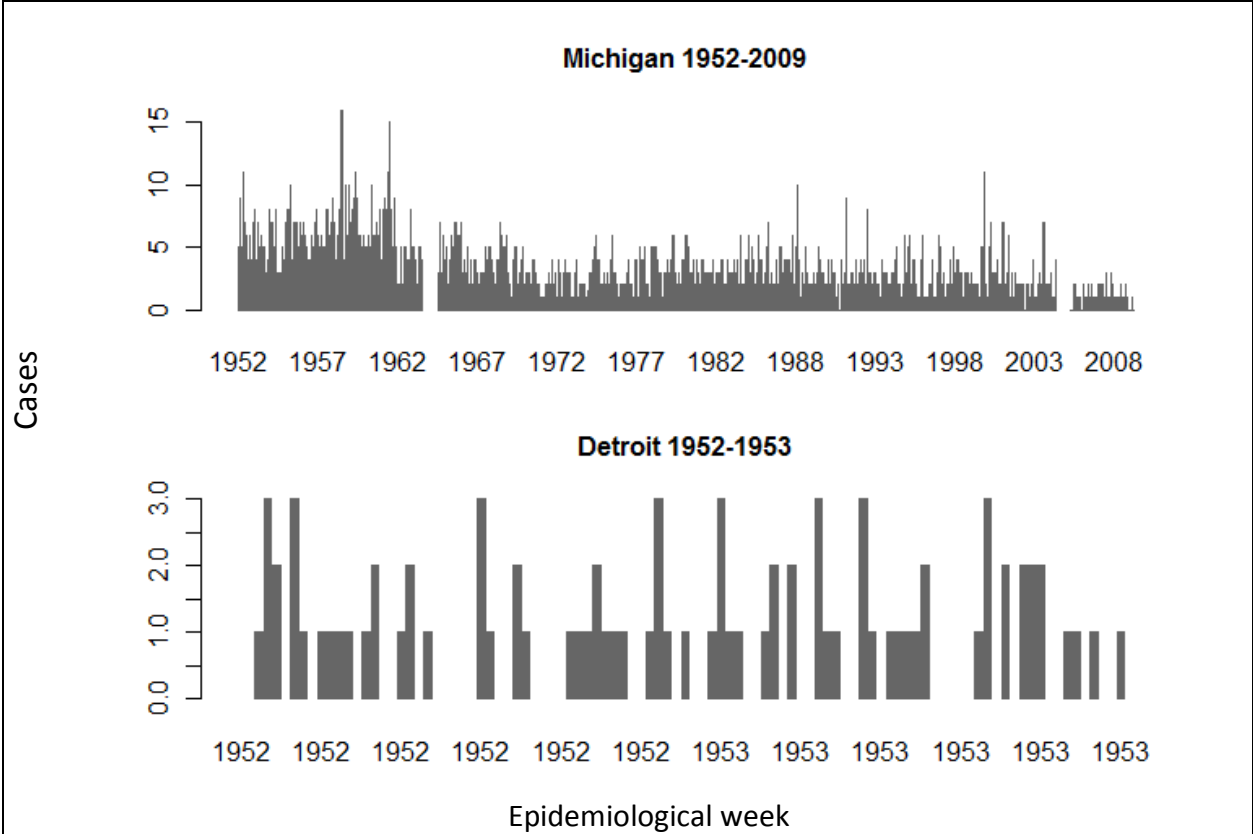*Tycho data report for the state of Michigan*

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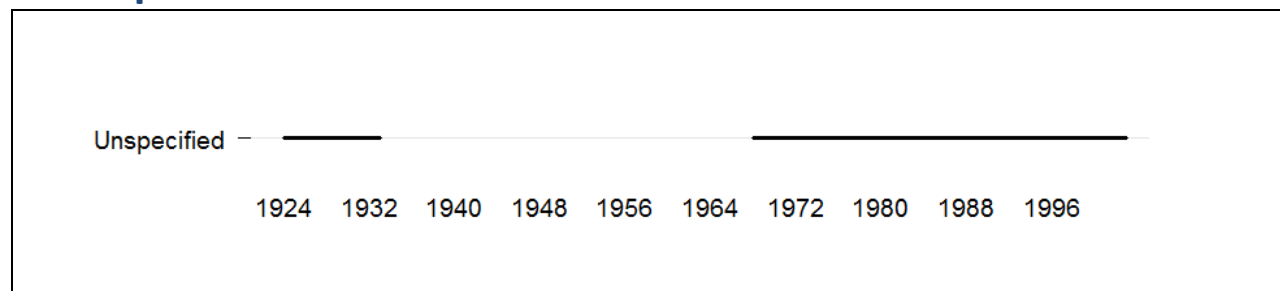
Mumps

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	Michigan	Grand Rapids	Detroit	Flint
Report period	1968-2002	1924-1932	1924-1932	1924-1932
Total weeks	1,717	440	449	447
Total cases	78,459	1,428	12,603	5,184
Max. cases per year	14,314	467	3,282	2,304
Year (max)	1968	1932	1927	1928
Max. cases per week	772	47	195	244
Week (max)	1968, wk 09	1924, wk 12	1927, wk 11	1928, wk 09
Average cases per year				
before 1980	5,693	159	1,400	576
95%CI	(3,270-8,116)	(14-304)	(720-2,080)	(-29-1,181)
after 1980	202	-	-	-
95%CI	(87-317)	-	-	-
Average cases per week				
before 1980	111	3	28	12
95%CI	(101-121)	(2-4)	(25-31)	(9-15)
after 1980	4	-	-	-
95%CI	(3-5)	-	-	-

Tycho data report for the state of Michigan
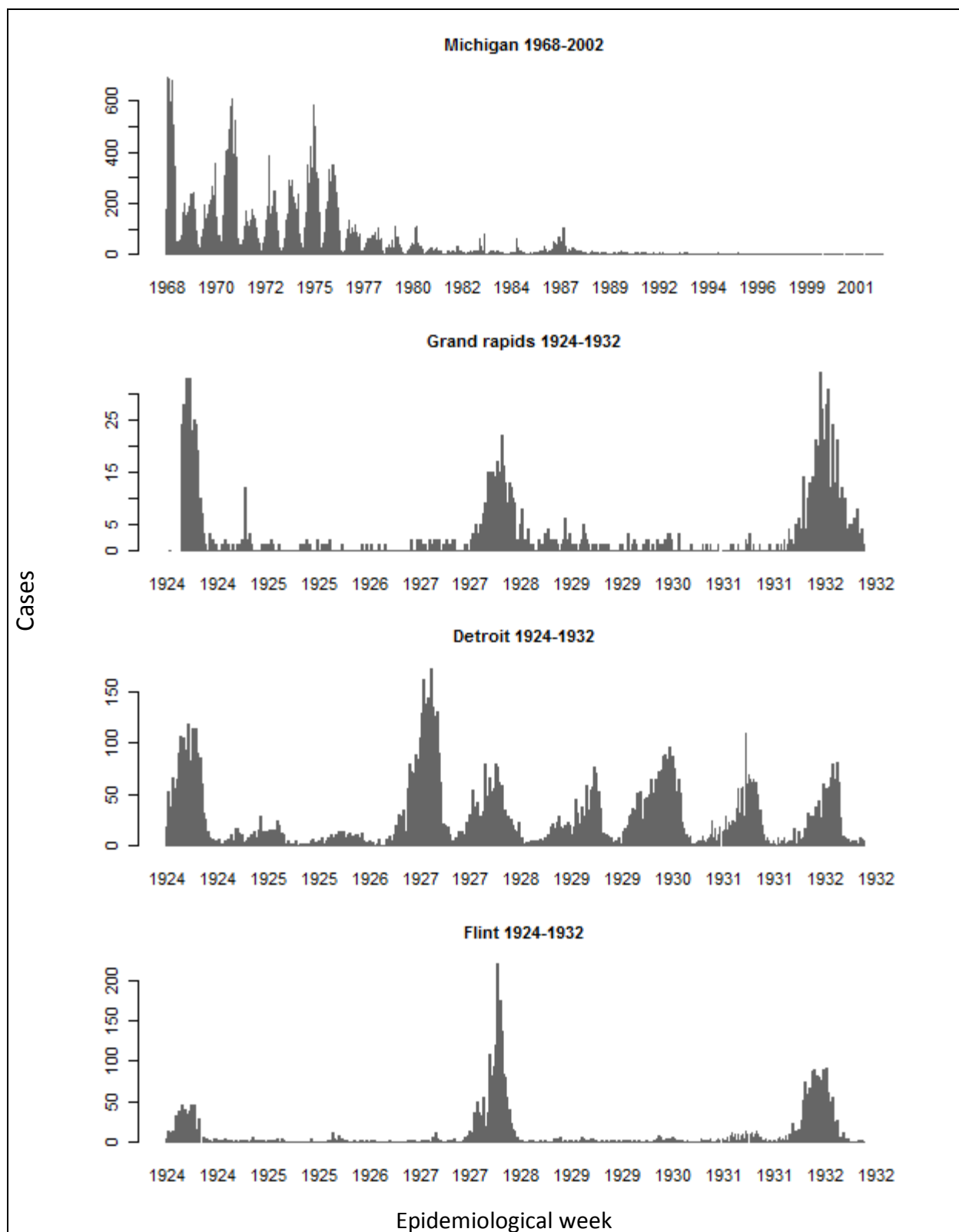
Figure D2, Number of cases reported for Mumps per epidemiological week

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
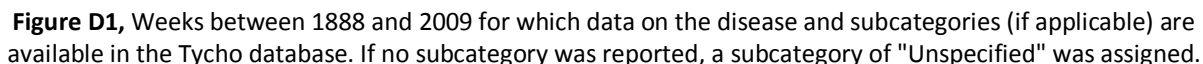
Indicator	Detroit
Report period	1924-1932
Total weeks	416
Total cases	17
Max. cases per year	5
Year (max)	1930
Max. cases per week	1
Week (max)	1924, wk 07
Average cases per year	2
95%CI	(1-3)
Average cases per week	0
95%CI	(0-0)

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

Tycho data report for the state of Michigan
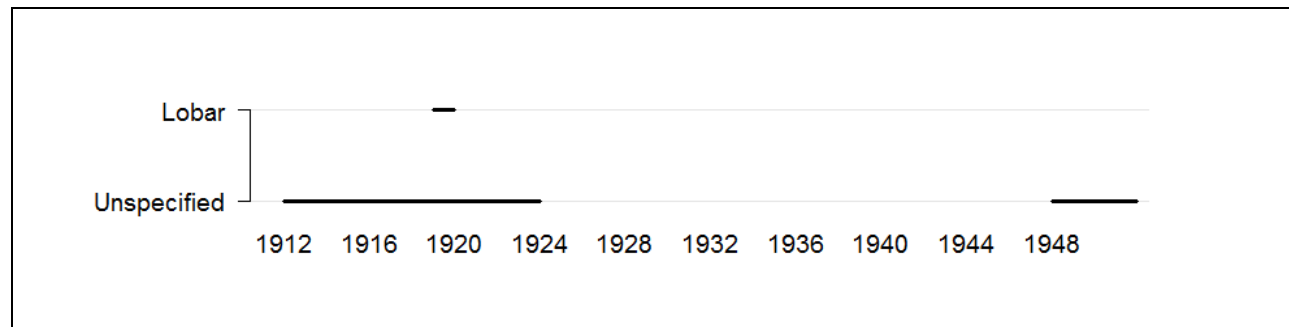
Pneumonia

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	Michigan	Grand Rapids	Detroit
Report period	1948-1951	1912-1923	1914-1923
Total weeks	169	402	415
Total cases	6,128	2,588	15,049
Max. cases per year	1,967	541	3,782
Year (max)	1949	1918	1922
Max. cases per week	150	102	640
Week (max)	1951, wk 14	1920, wk 06	1920, wk 04
Average cases per year	1,532	216	1,505
95%CI	(511-2,553)	(107-325)	(503-2,507)
Average cases per week	36	6	36
95%CI	(33-39)	(5-7)	(31-41)

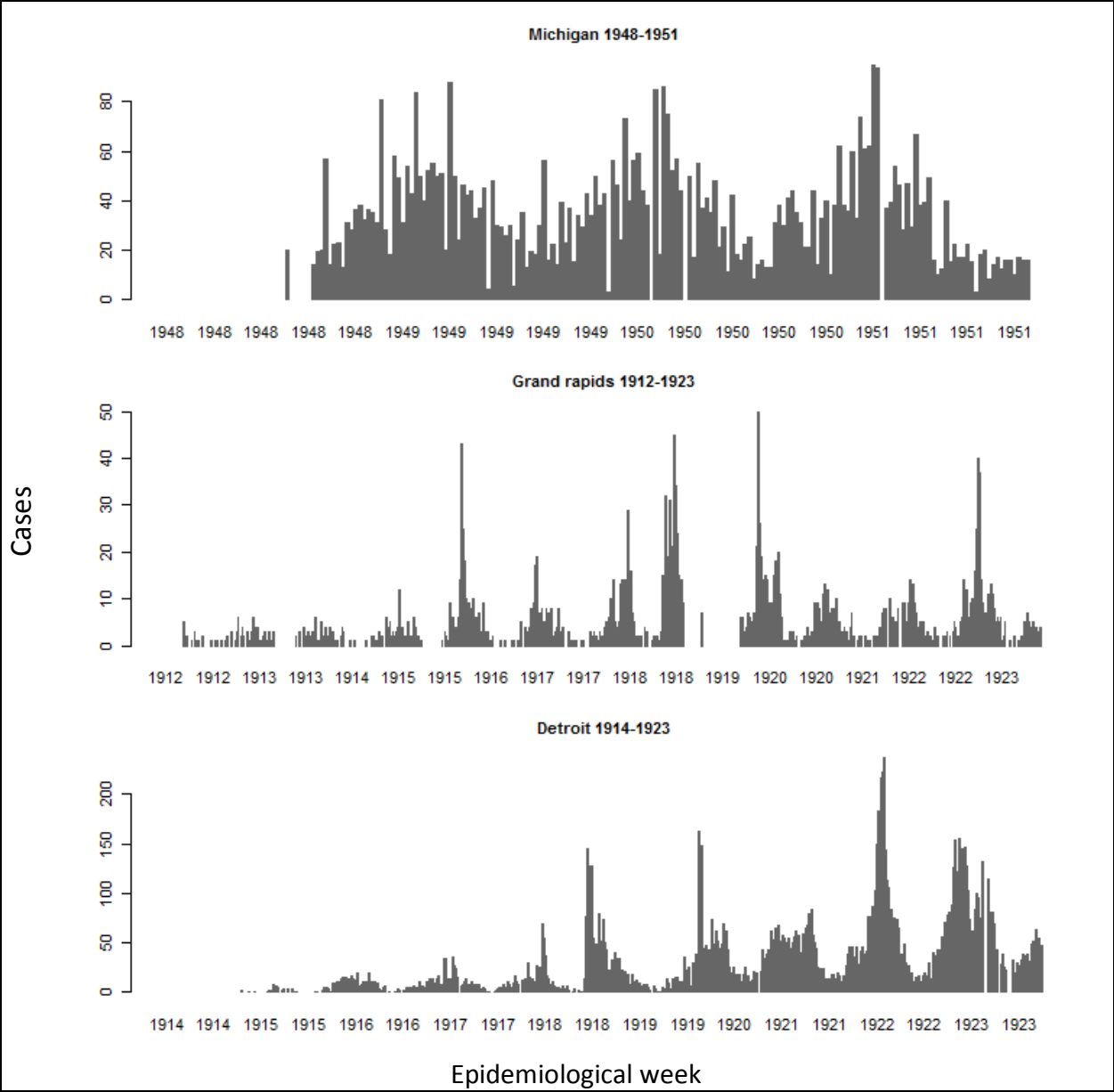*Tycho data report for the state of Michigan*

Figure D2, Number of cases reported for Pneumonia per epidemiological week
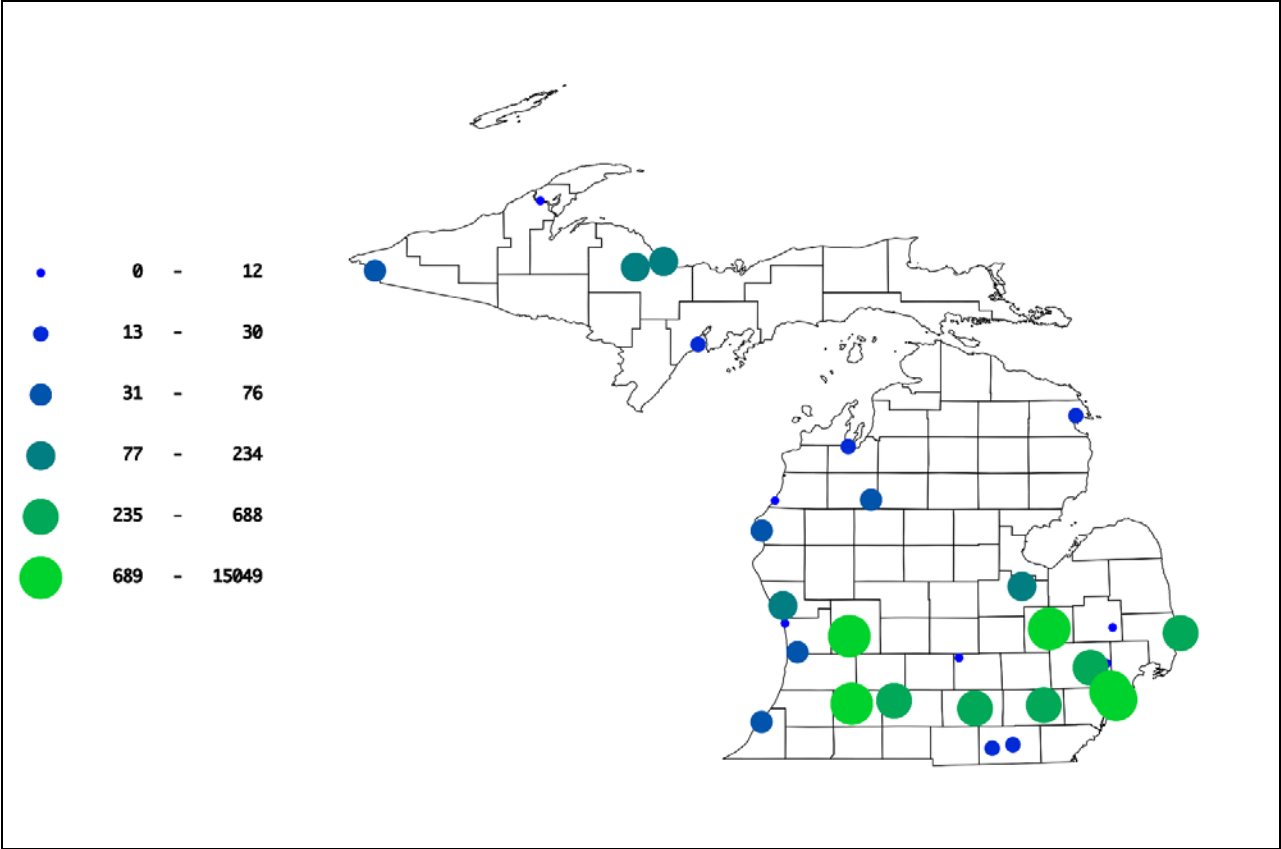
Figure D3, Total number of cases reported for Pneumonia by each city for the entire time period

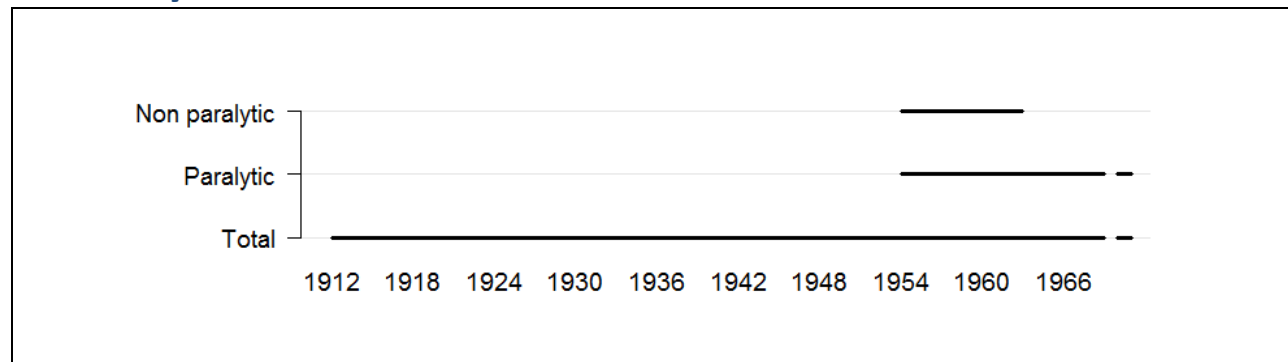*Tycho data report for the state of Michigan*

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)

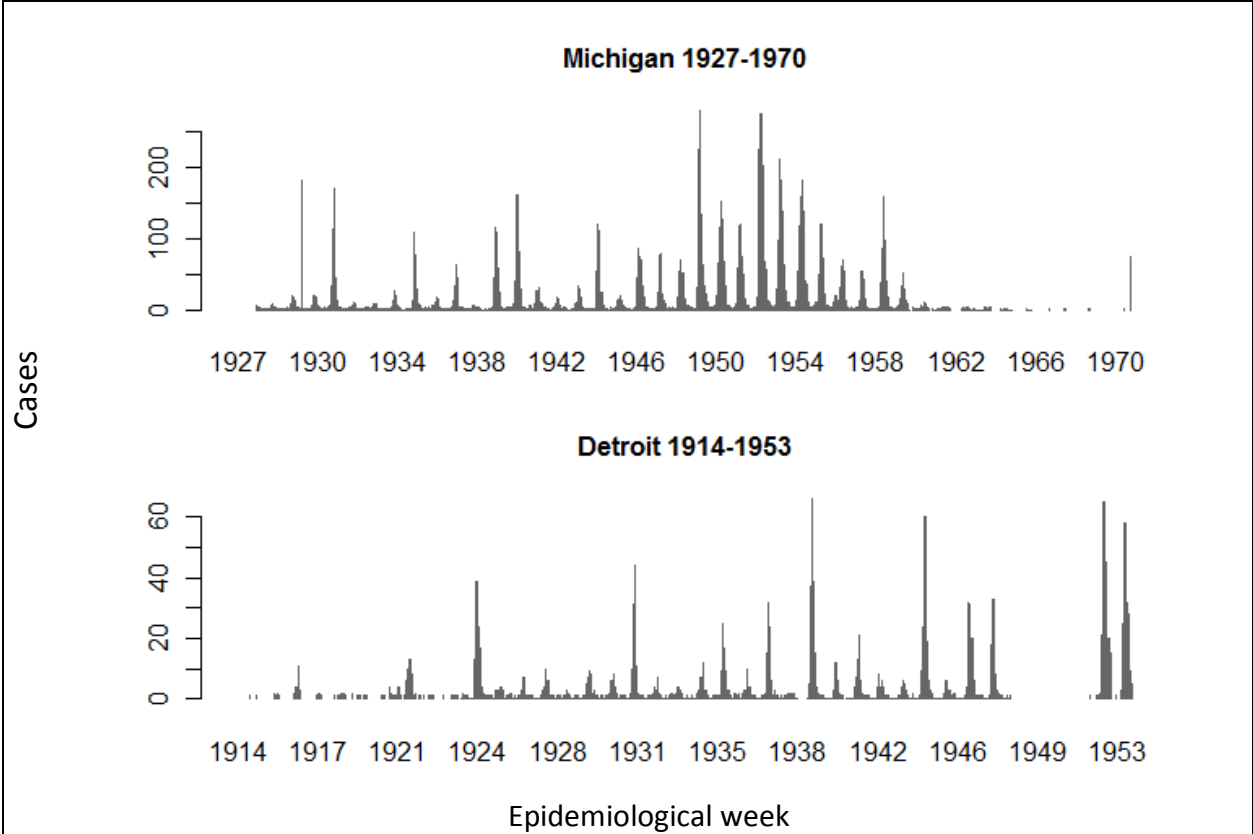| Indicator	Michigan	Detroit
Report period	1927-1970	1914-1953
Total weeks	1,802	1,232
Total cases	28,618	4,699
Max. cases per year	3,814	685
Year (max)	1952	1952
Max. cases per week	329	74
Week (max)	1949, wk 33	1952, wk 35
Average cases per year		
before 1960	837	127
95%CI	(525-1,149)	(70-184)
after 1960	19	-
95%CI	(0-38)	-
Average cases per week		
before 1960	17	4
95%CI	(15-19)	(3-5)
after 1960	1	-
95%CI	(0-2)	-

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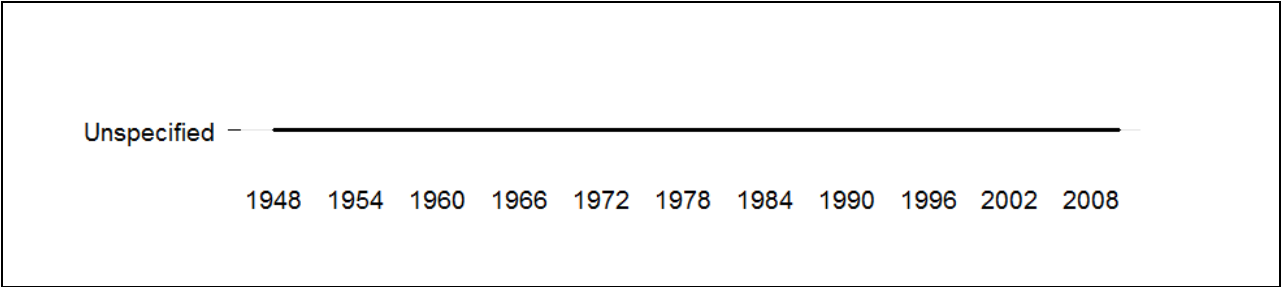
Rabies in Animals

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 Rabies in Animals

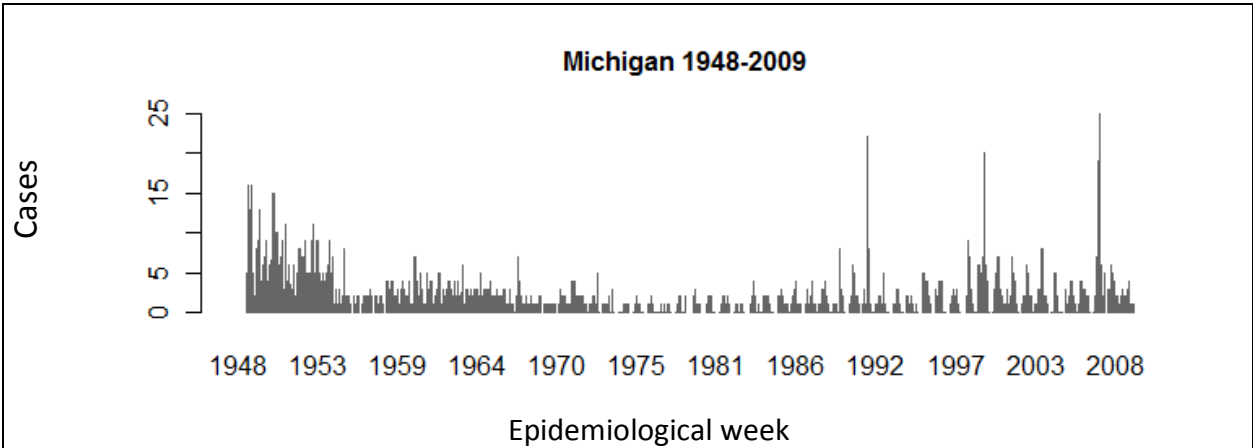| Indicator	Michigan
Report period	1948-2009
Total weeks	2,306
Total cases	2,930
Max. cases per year	211
Year (max)	1950
Max. cases per week	35
Week (max)	2007, wk 35
Average cases per year	47
95%CI	(36-58)
Average cases per week	1
95%CI	(1-1)

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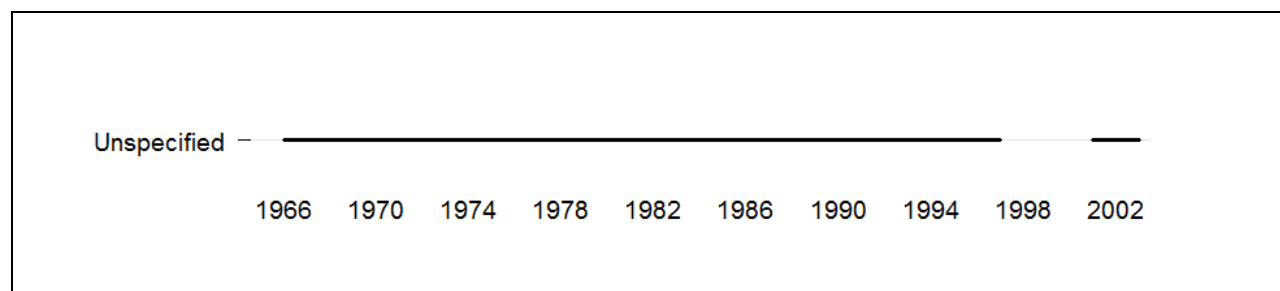
Rubella

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

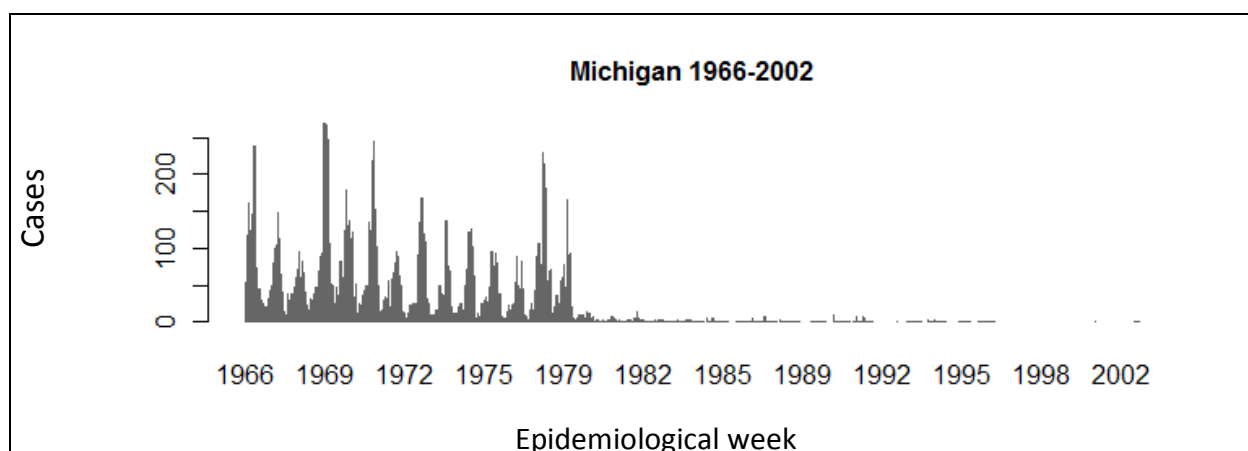| Indicator	Michigan
Report period	1966-2002
Total weeks	1,369
Total cases	30,992
Max. cases per year	4,019
Year (max)	1969
Max. cases per week	304
Week (max)	1978, wk 25
Average cases per year	
before 1970	2,781
95%CI	(1,758-3,804)
after 1970	610
95%CI	(228-992)
Average cases per week	
before 1970	55
95%CI	(49-61)
after 1970	15
95%CI	(13-17)

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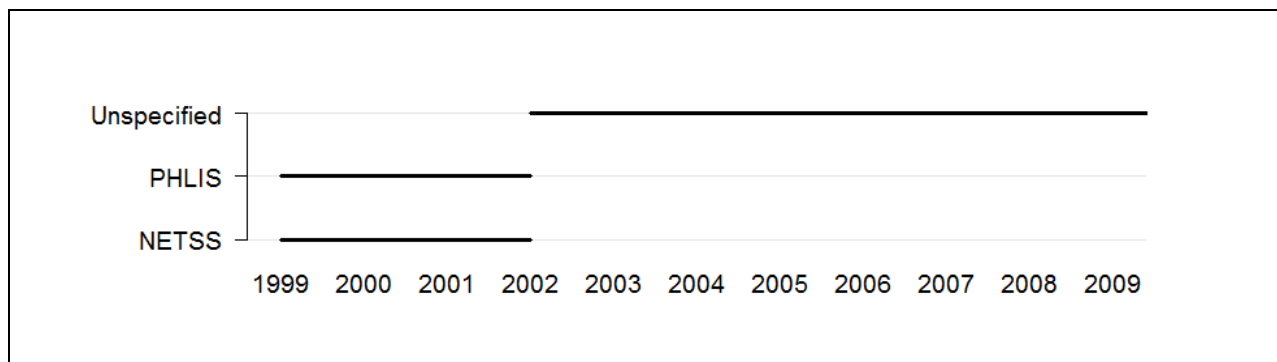
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Salmonellosis

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)

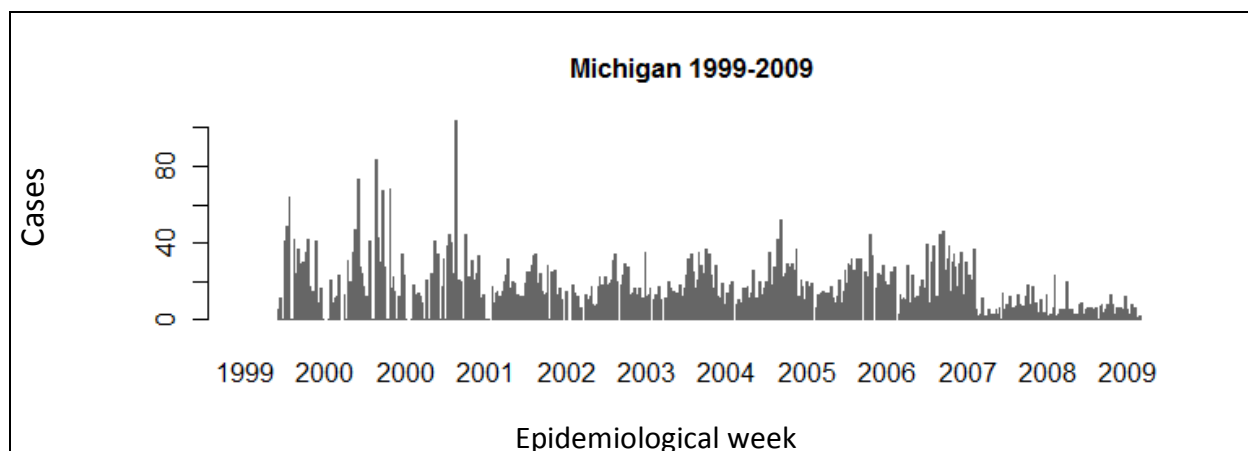| Indicator	Michigan
Report period	1999-2009
Total weeks	513
Total cases	9,105
Max. cases per year	1,737
Year (max)	2005
Max. cases per week	880
Week (max)	2005, wk 50
Average cases per year	828
95%CI	(567-1,089)
Average cases per week	18
95%CI	(14-22)

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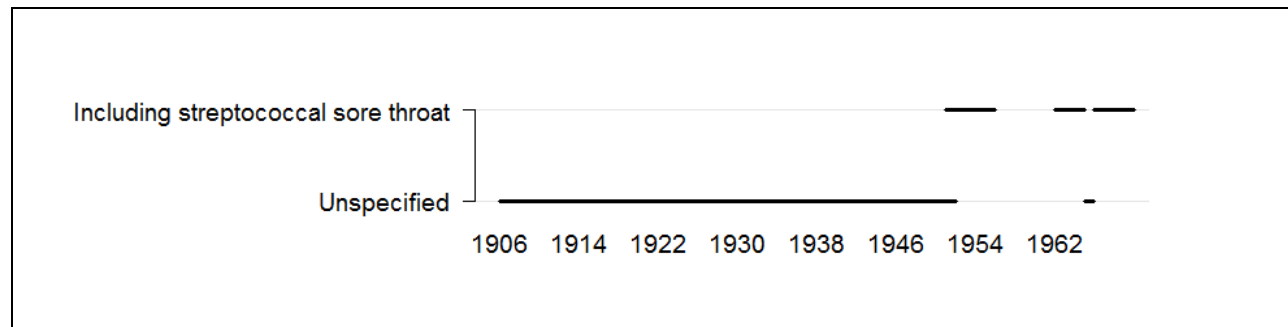
Scarlet Fever

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	Michigan	Grand Rapids	Detroit	Flint
Report period	1927-1969	1906-1953	1906-1953	1916-1953
Total weeks	1,843	2,095	2,150	1,621
Total cases	381,388	16,984	136,293	15,843
Max. cases per year	23,908	1,277	10,927	2,023
Year (max)	1937	1925	1937	1934
Max. cases per week	1,004	117	549	122
Week (max)	1937, wk 10	1914, wk 04	1937, wk 09	1934, wk 16
Average cases per year	10,308	377	3,029	453
95%CI	(8,712-11,904)	(305-449)	(2,398-3,660)	(315-591)
Average cases per week	207	8	63	10
95%CI	(200-214)	(8-8)	(60-66)	(9-11)

Tycho data report for the state of Michigan
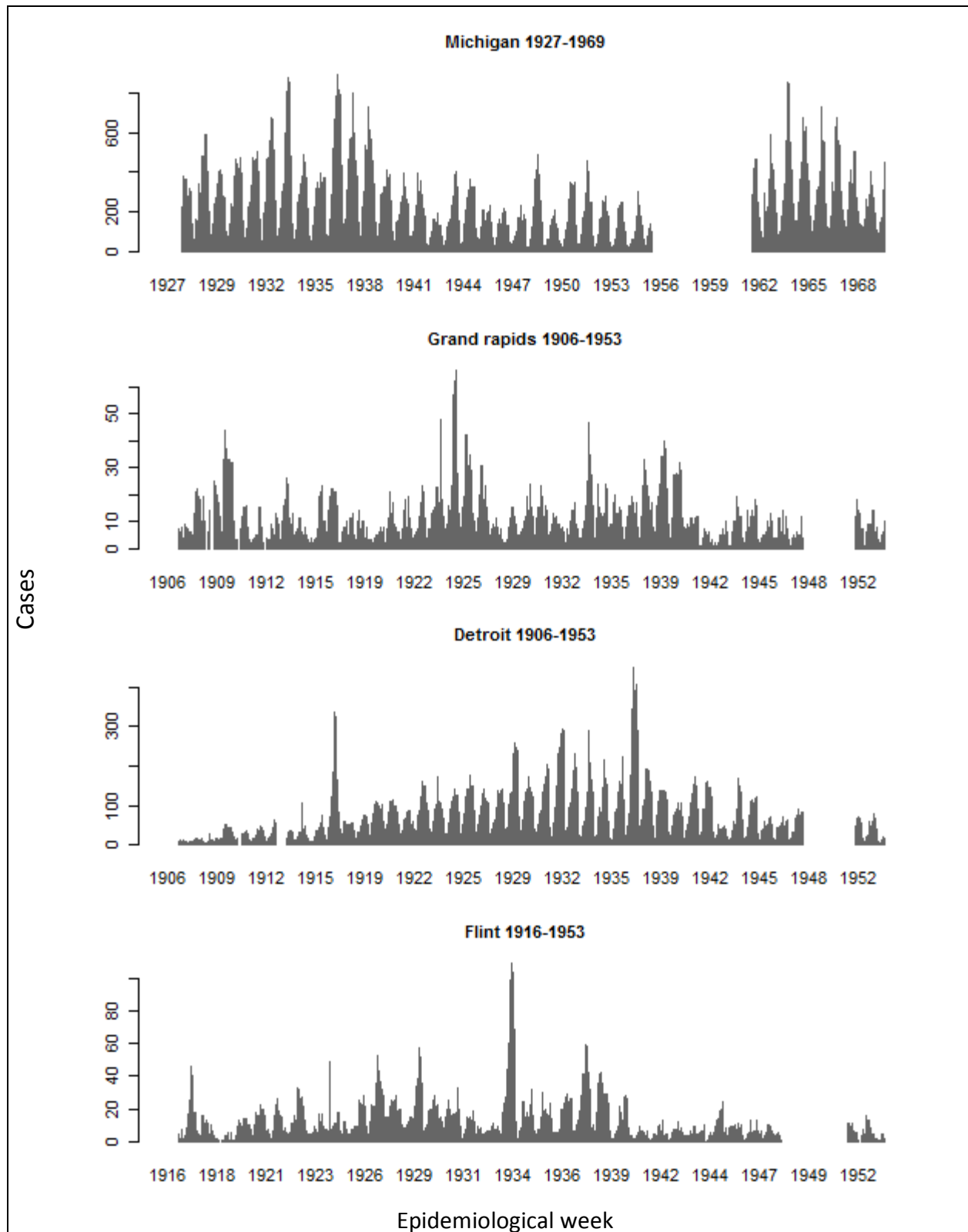
Figure D2, Number of cases reported for Scarlet Fever per epidemiological week

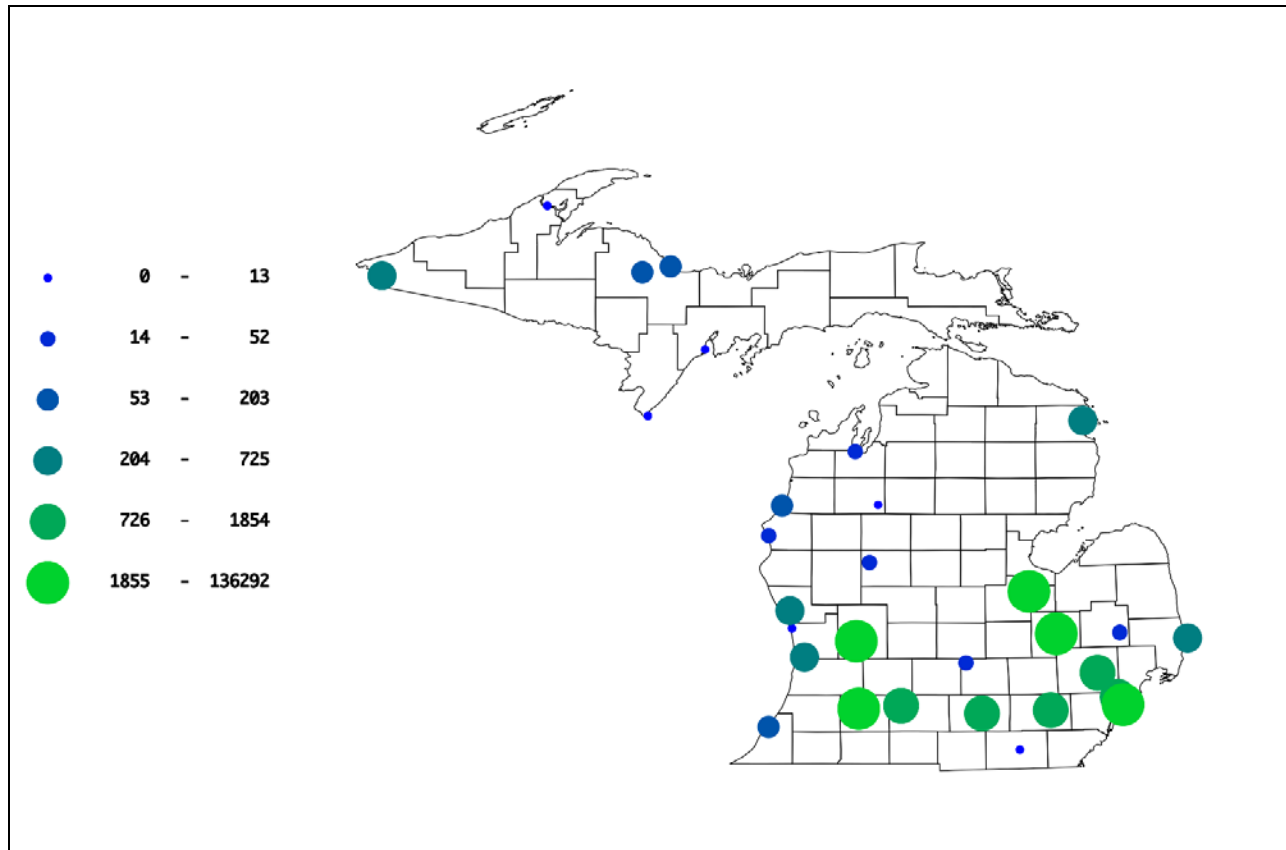*Tycho data report for the state of Michigan*

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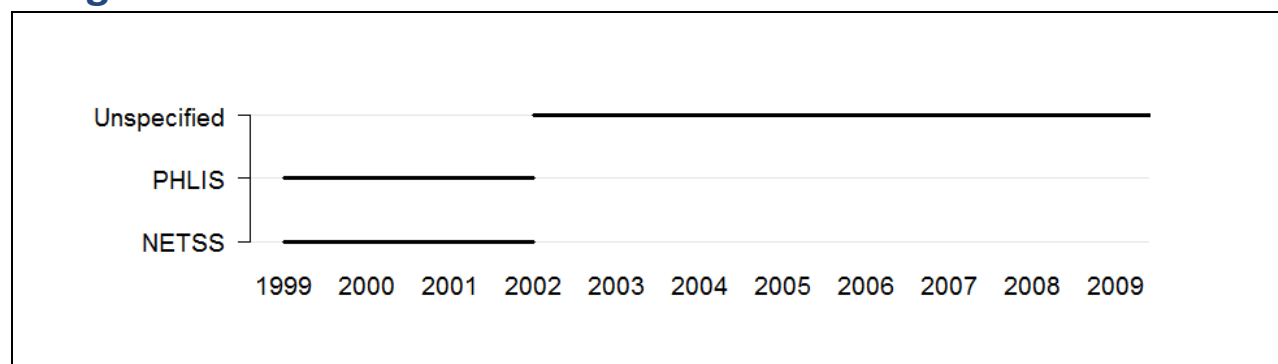
Shigellosis

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)

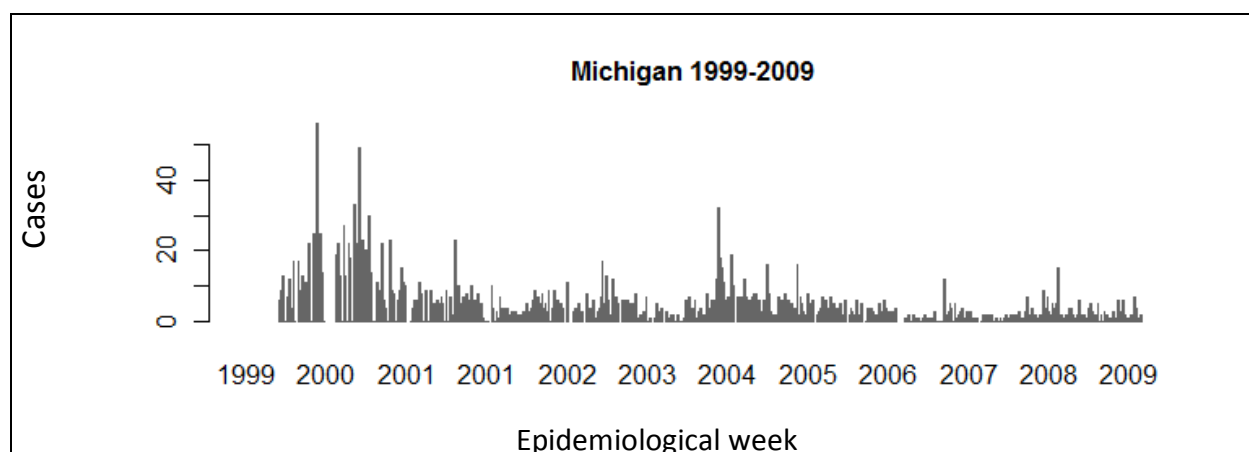| Indicator	Michigan
Report period	1999-2009
Total weeks	505
Total cases	3,007
Max. cases per year	748
Year (max)	1999
Max. cases per week	456
Week (max)	1999, wk 33
Average cases per year	273
95%CI	(128-418)
Average cases per week	6
95%CI	(4-8)

Figure D2, Number of cases reported for Shigellosis per epidemiological week
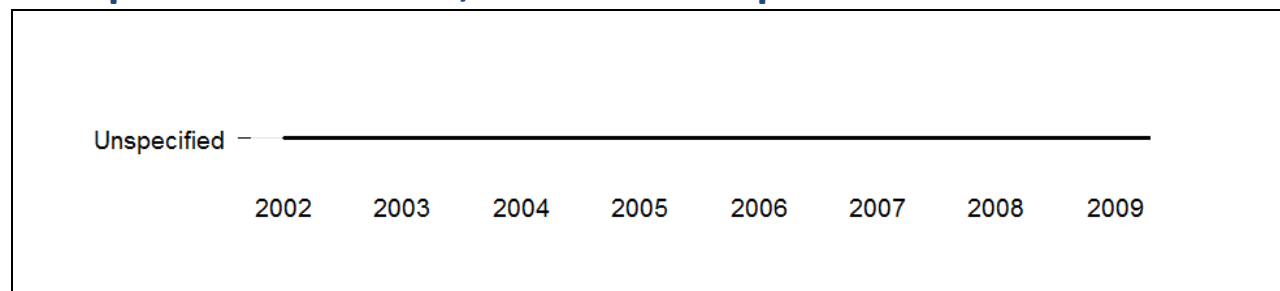
Streptococcal Disease, Invasive Group A

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

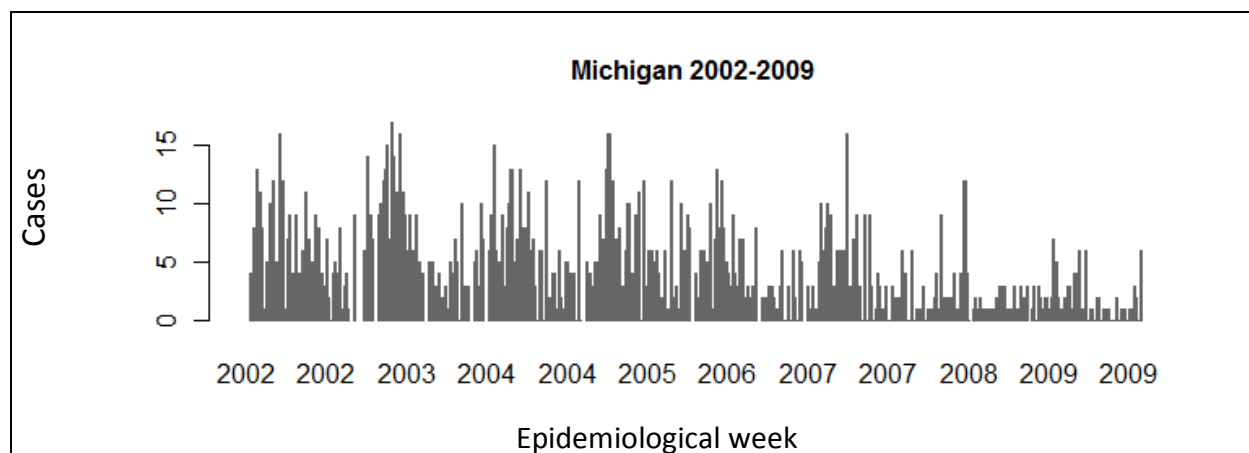| Indicator	Michigan
Report period	2002-2009
Total weeks	389
Total cases	1,727
Max. cases per year	316
Year (max)	2003
Max. cases per week	20
Week (max)	2005, wk 07
Average cases per year	216
95%CI	(140-292)
Average cases per week	4
95%CI	(4-4)

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	Michigan
Report period	1960-1961
Total weeks	100
Total cases	16,319
Max. cases per year	8,506
Year (max)	1960
Max. cases per week	499
Week (max)	1960, wk 13
Average cases per year	8,160
95%CI	(3,757-12,563)
Average cases per week	163
95%CI	(140-186)
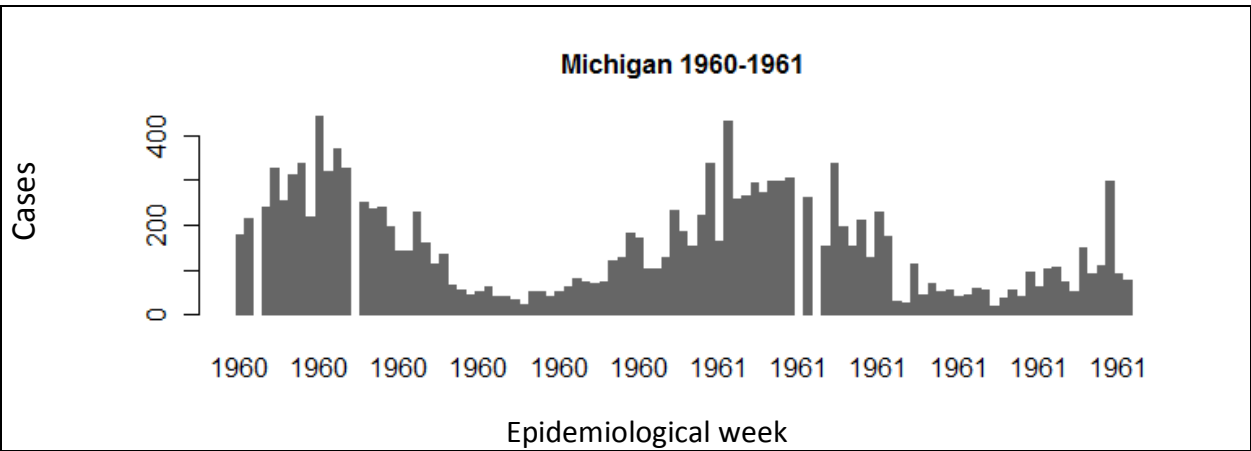
Figure D2, Number of cases reported for Streptococcal Sore Throat per epidemiological week

Tycho data report for the state of Michigan

Streptococcus Pneumonia, Invasive 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 Streptococcus Pneumonia, Invasive Disease (Drug resistant <5 years)

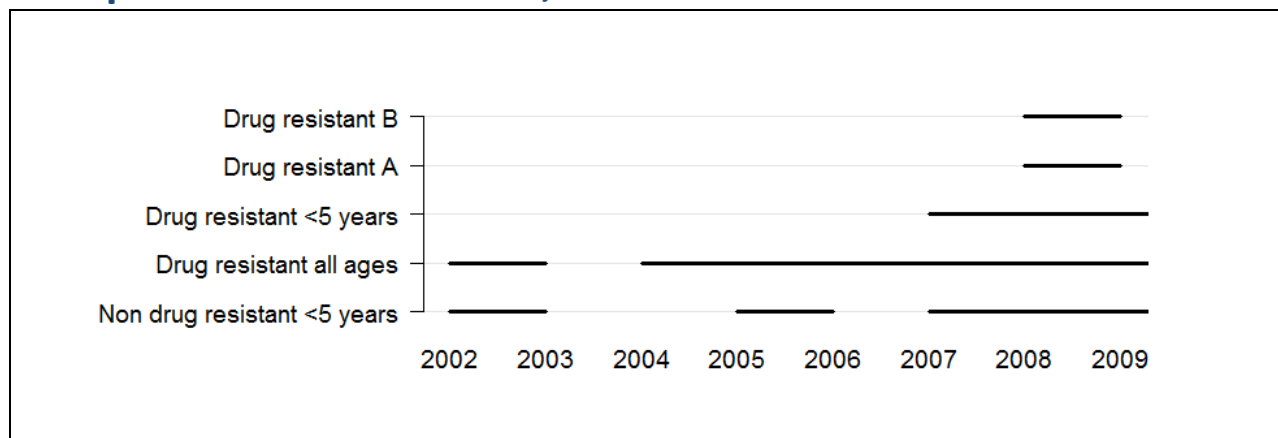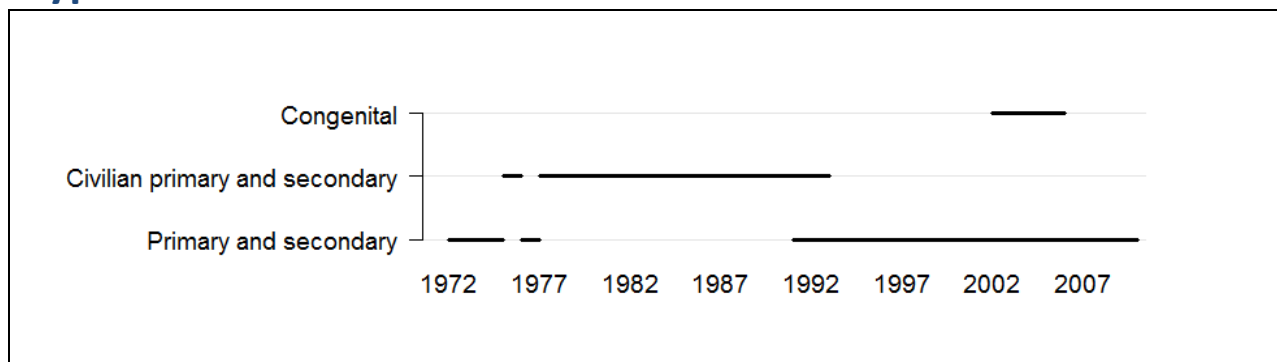| Indicator	Michigan
Report period	2007-2009
Total weeks	101
Total cases	4
Max. cases per year	3
Year (max)	2009

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	Michigan
Report period	1972-2009
Total weeks	1,818
Total cases	13,413
Max. cases per year	1,358
Year (max)	1991
Max. cases per week	403
Week (max)	1991, wk 30
Average cases per year	353
95%CI	(265-441)
Average cases per week	7
95%CI	(6-8)
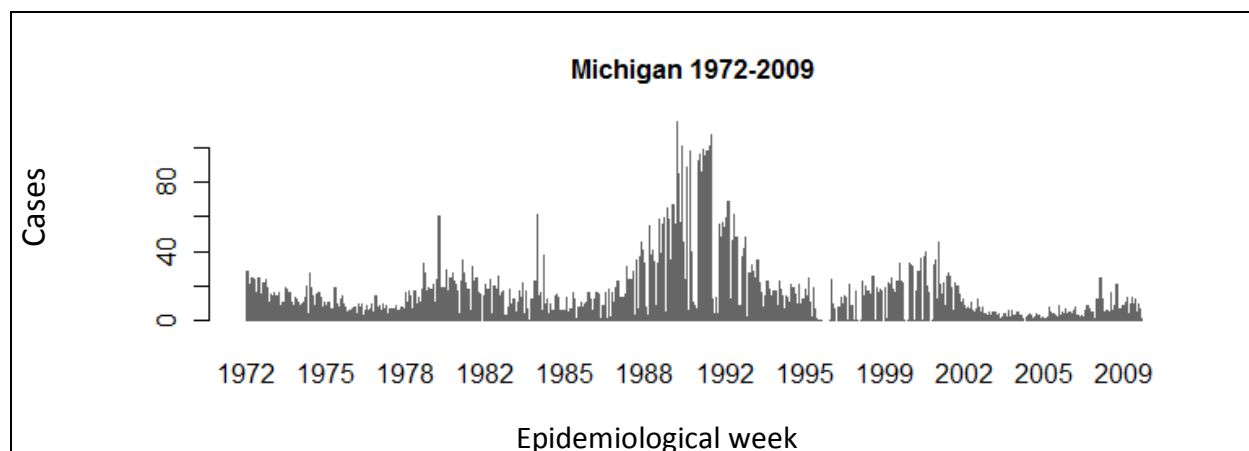
Figure D2, Number of cases reported for Syphilis per epidemiological week

Tycho data report for the state of Michigan

Tetanus

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 Tetanus

Indicator	Michigan
Report period	1963-1981
Total weeks	517
Total cases	62
Max. cases per year	8
Year (max)	1970
Max. cases per week	4
Week (max)	1971, wk 50
Average cases per year	
before 1970	6
95%CI	(5-7)
after 1970	2
95%CI	(0-4)
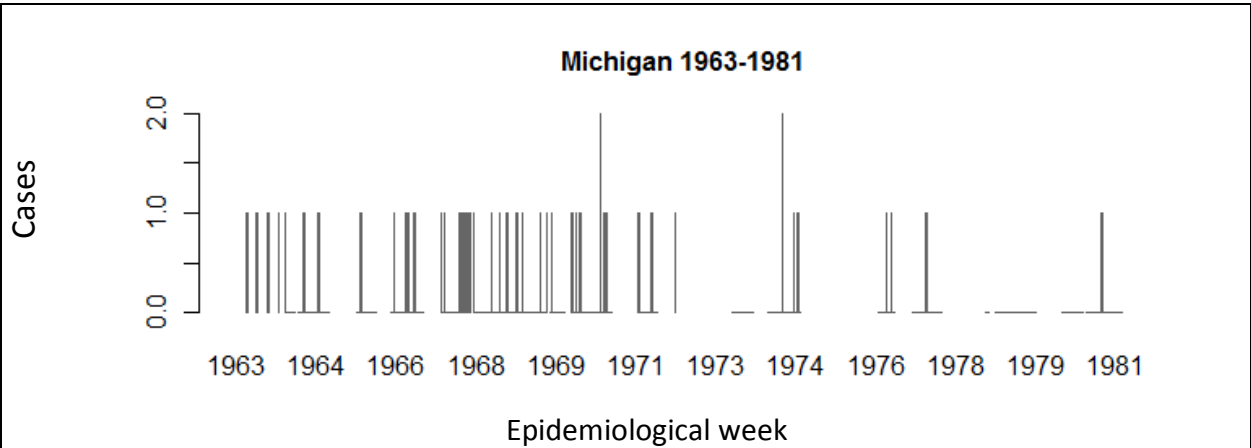
Figure D2, Number of cases reported for Tetanus per epidemiological week

Tycho data report for the state of Michigan
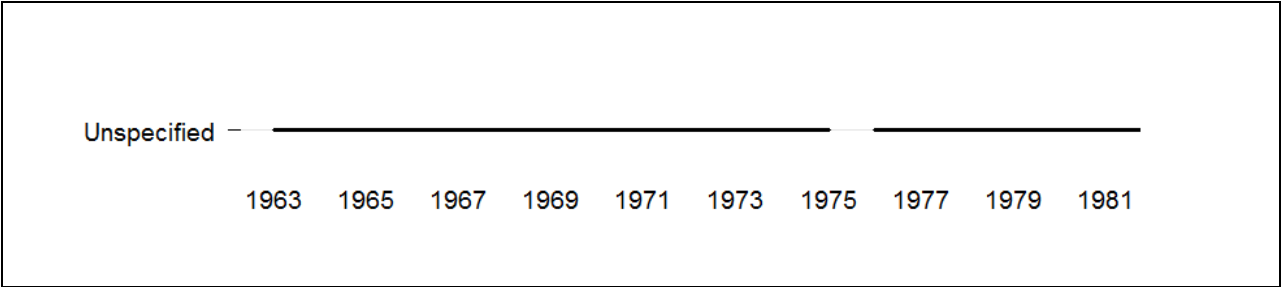
Toxic Shock Syndrome

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	Michigan
Report period	1983-1994
Total weeks	410
Total cases	254
Max. cases per year	29
Year (max)	1990
Max. cases per week	8
Week (max)	1991, wk 35
Average cases per year	21
95%CI	(18-24)
Average cases per week	1
95%CI	(1-1)
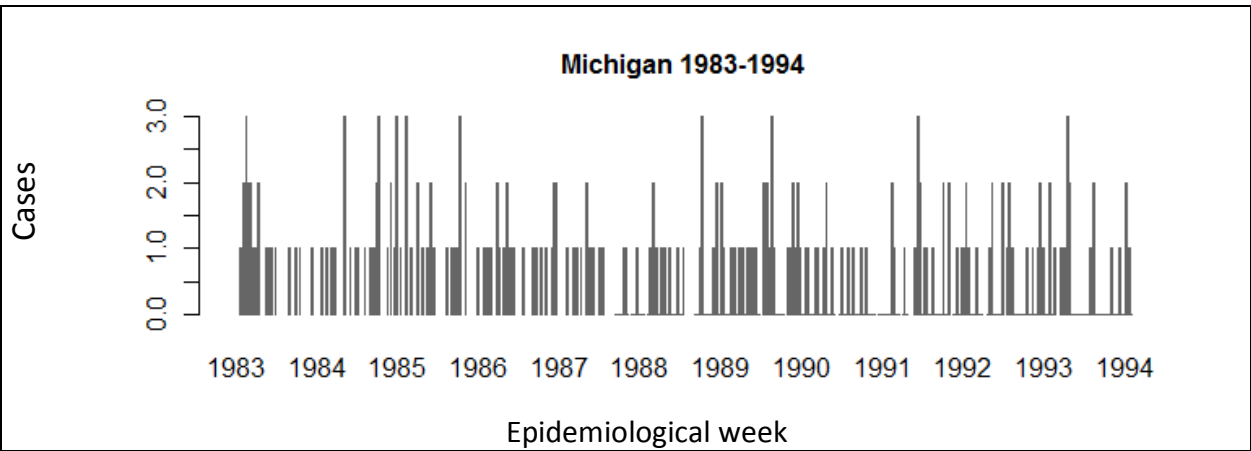
Figure D2, Number of cases reported for Toxic Shock Syndrome per epidemiological week

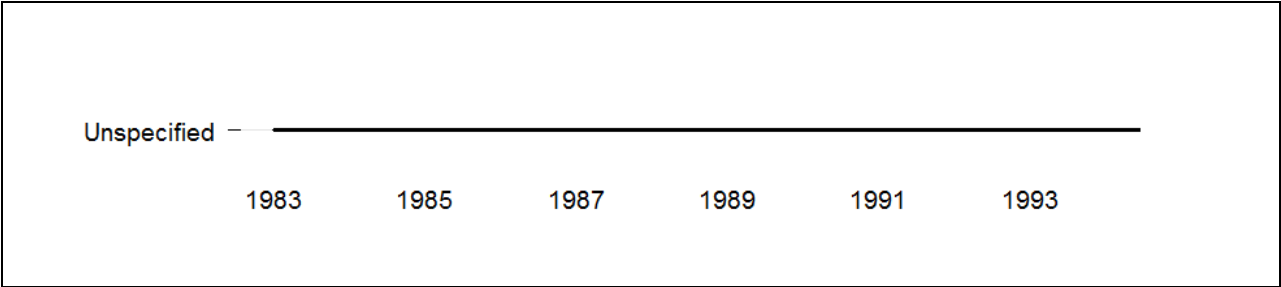*Tycho data report for the state of Michigan*
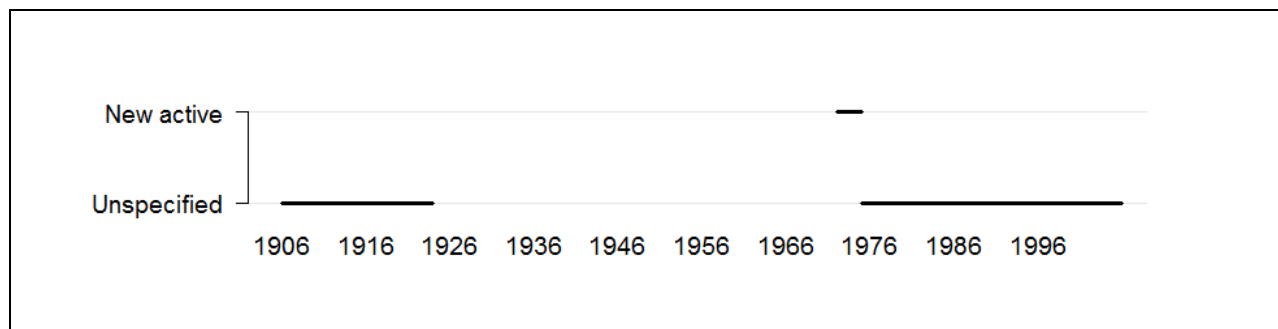
Tuberculosis

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	Michigan	Grand Rapids	Detroit
Report period	1975-2005	1906-1923	1909-1923
Total weeks	1,412	724	501
Total cases	18,444	2,987	18,374
Max. cases per year	1,413	354	2,463
Year (max)	1976	1916	1922
Max. cases per week	200	54	151
Week (max)	1991, wk 30	1916, wk 10	1921, wk 48
Average cases per year	595	166	1,531
95%CI	(451-739)	(119-213)	(994-2,068)
Average cases per week	13	4	37
95%CI	(12-14)	(4-4)	(36-38)

Tycho data report for the state of Michigan

Cases

Michigan 1975-2005

Grand rapids 1906-1923

Detroit 1909-1923

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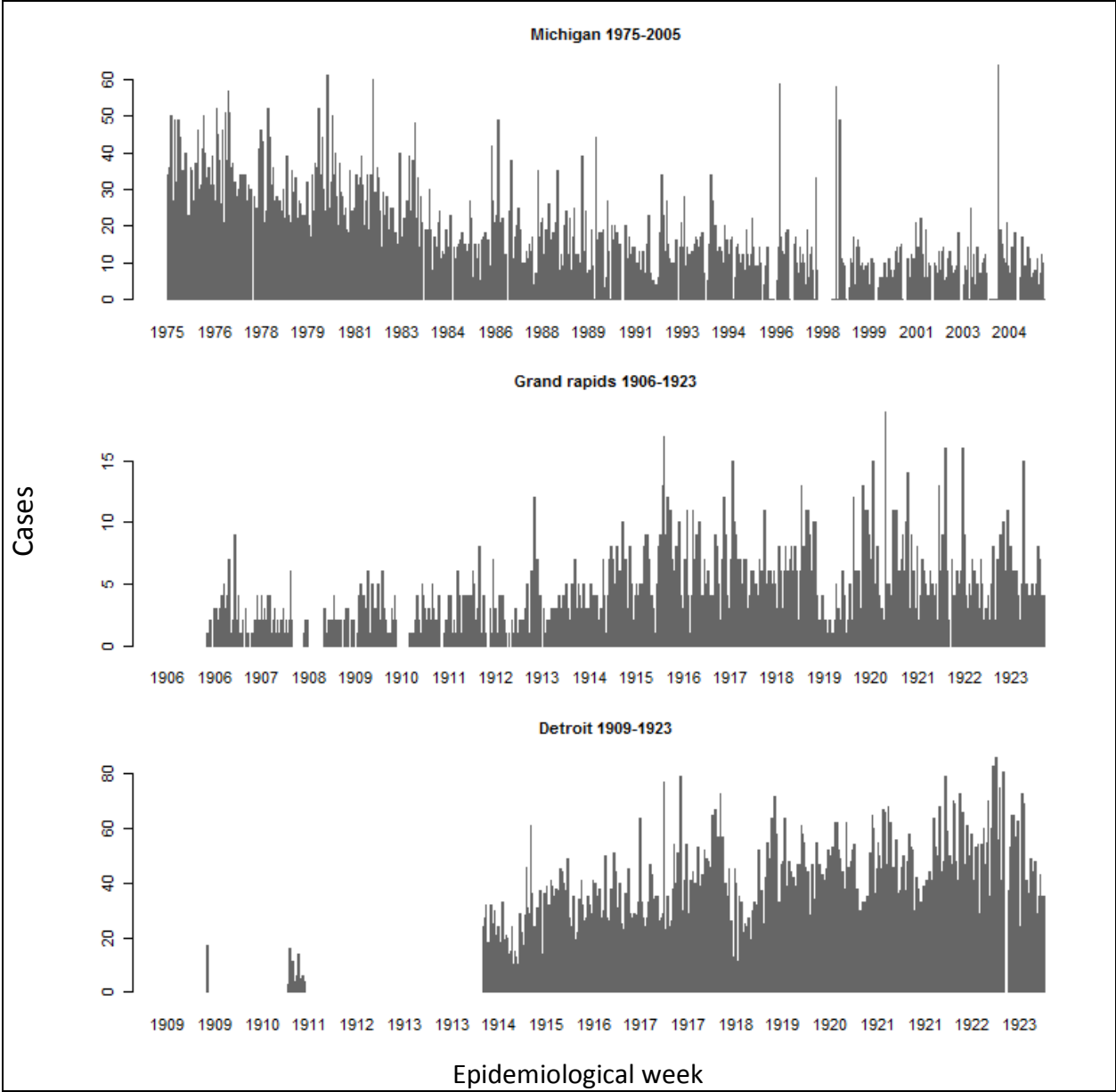
Figure D2, Number of cases reported for Tuberculosis per epidemiological week

Tycho data report for the state of Michigan

Figure D3, Total number of all 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)

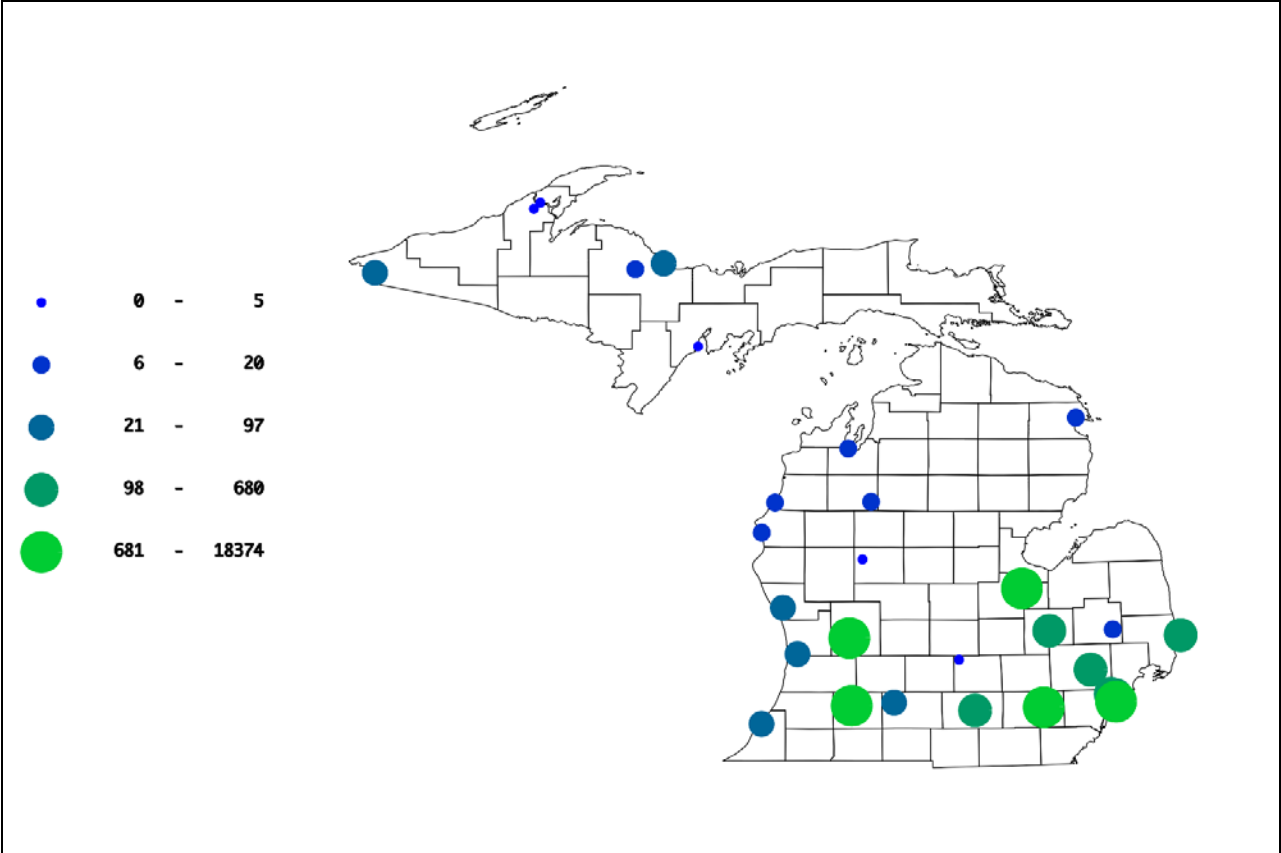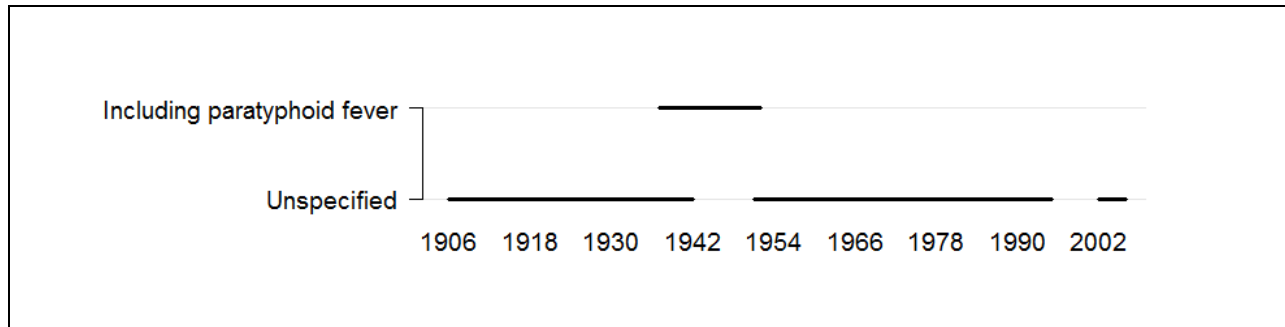| Indicator	Michigan	Grand Rapids	Detroit	Flint
Report period	1921-2005	1906-1948	1910-1953	1916-1948
Total weeks	3,119	1,775	1,733	1,415
Total cases	6,841	2,101	4,674	696
Max. cases per year	512	279	443	104
Year (max)	1932	1912	1917	1917
Max. cases per week	113	22	61	17
Week (max)	1952, wk 53	1911, wk 12	1921, wk 33	1920, wk 31
Average cases per year				
before 1950	236	49	126	21
95%CI	(168-304)	(28-70)	(83-169)	(11-31)
after 1950	20	-	8	-
95%CI	(9-31)	-	(-49-65)	-
Average cases per week				
before 1950	5	1	3	0
95%CI	(5-5)	(1-1)	(3-3)	(0-0)
after 1950	0	-	1	-
95%CI	(0-0)	-	(1-1)	-

Tycho data report for the state of Michigan
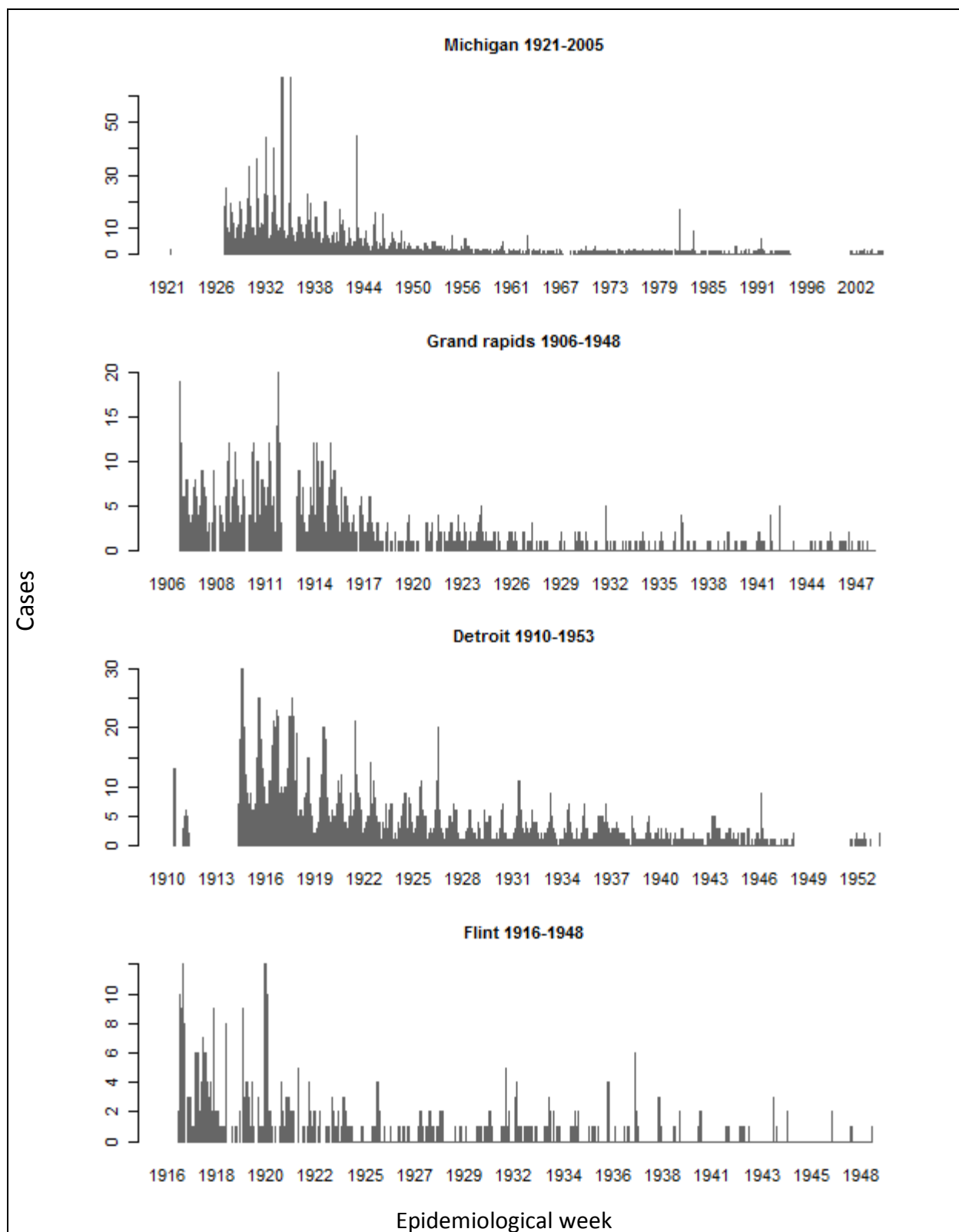
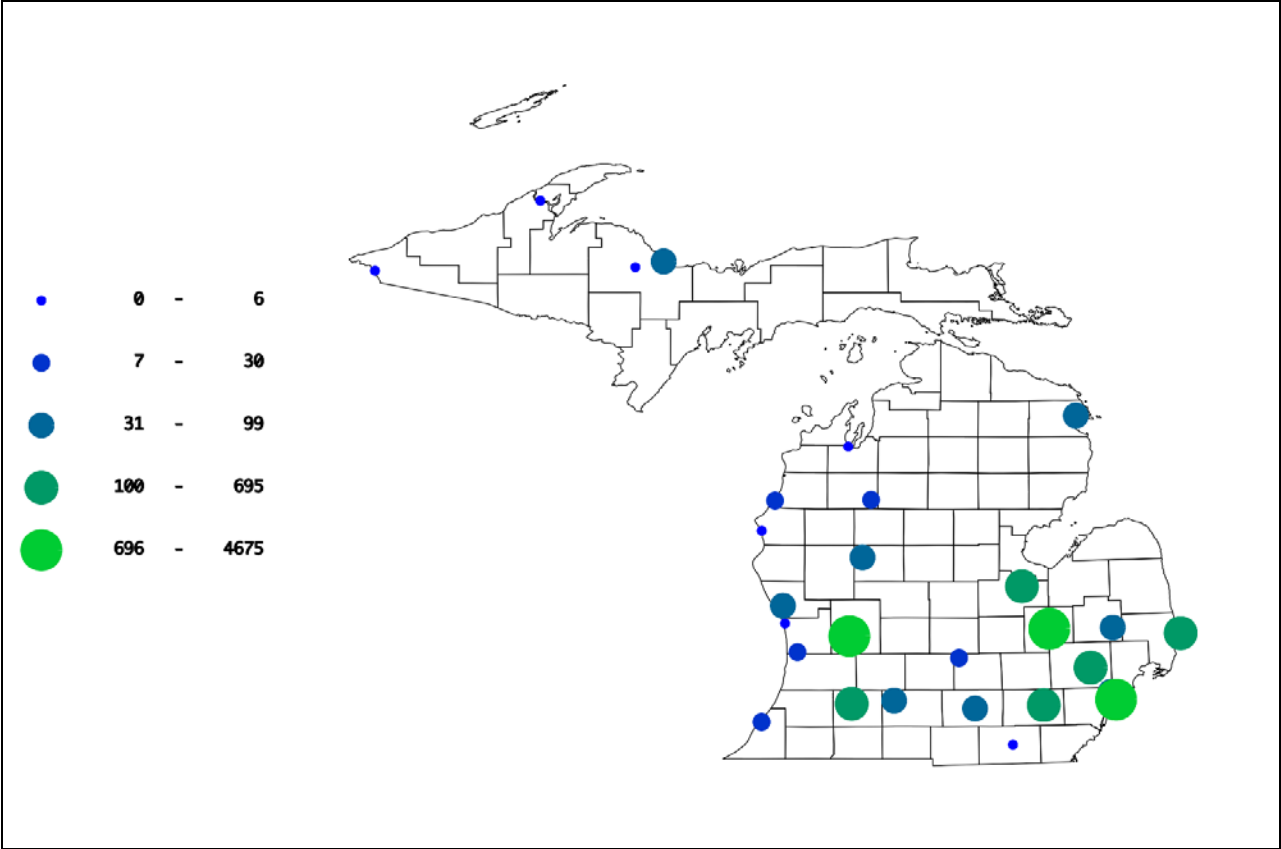**Figure D2,** Number of cases reported for Typhoid Fever per epidemiological week

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

Typhus 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 Typhus Fever (Unspecified and Endemic)

Indicator	Grand Rapids
Report period	1924-1924
Total weeks	7
Total cases	0
Max. cases per year	0
Year (max)	1924
Max. cases per week	0
Week (max)	1924, wk 36
Average cases per year	0
95%CI	-
Average cases per week	0
95%CI	(0-0)
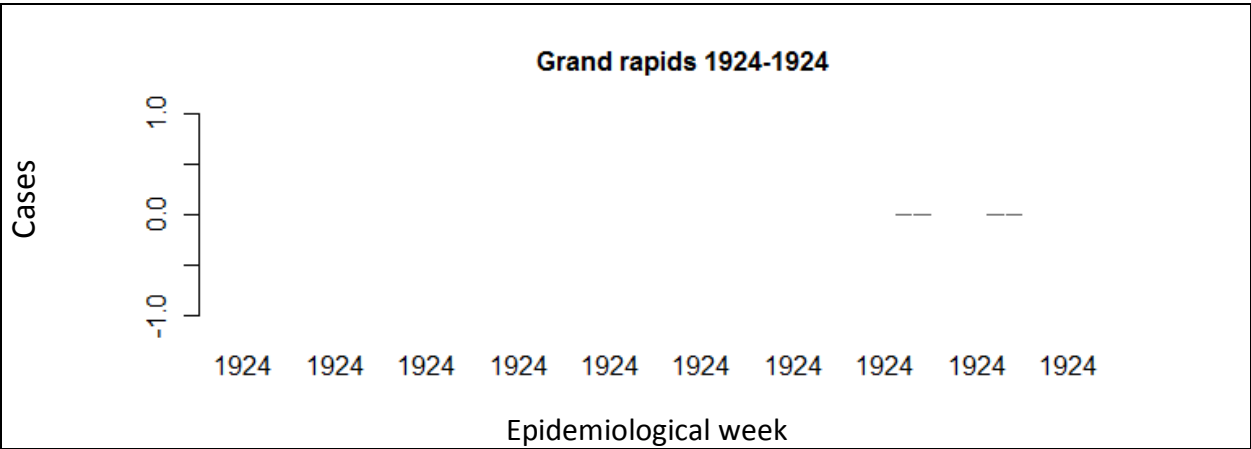
Figure D2, Number of cases reported for Typhus Fever per epidemiological week

Tycho data report for the state of Michigan
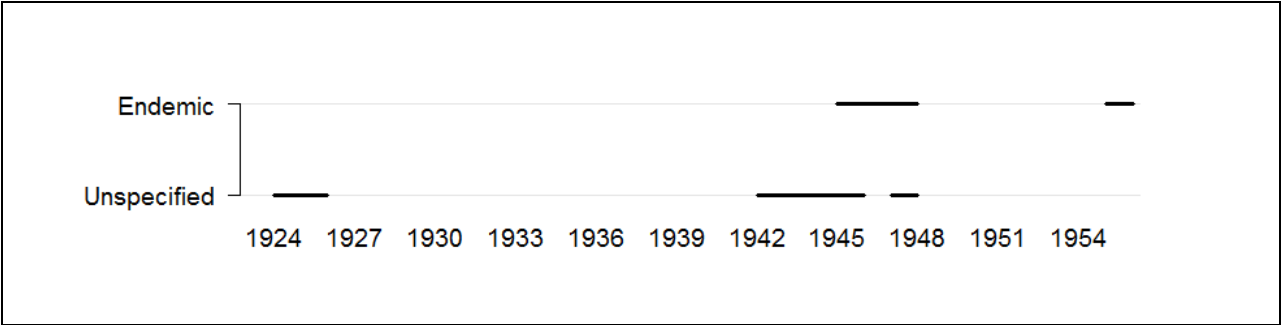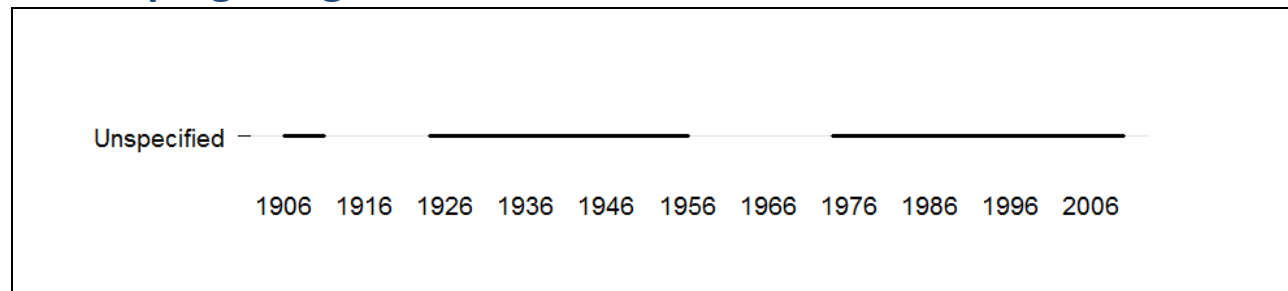
Whooping Cough

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	Michigan	Grand Rapids	Detroit	Flint
Report period	1937-2009	1907-1953	1924-1953	1924-1953
Total weeks	2,452	1,396	1,350	1,214
Total cases	134,757	11,234	101,639	7,353
Max. cases per year	15,456	1,067	7,604	588
Year (max)	1941	1940	1936	1926
Max. cases per week	489	86	303	60
Week (max)	1938, wk 29	1926, wk 06	1936, wk 23	1926, wk 02
Average cases per year				
before 1960	6,886	362	3,764	272
95%CI	(4,850-8,922)	(251-473)	(3,048-4,480)	(204-340)
after 1960	109	-	-	-
95%CI	(66-152)	-	-	-
Average cases per week				
before 1960	143	8	75	6
95%CI	(137-149)	(7-9)	(72-78)	(6-6)
after 1960	3	-	-	-
95%CI	(3-3)	-	-	-

Tycho data report for the state of Michigan
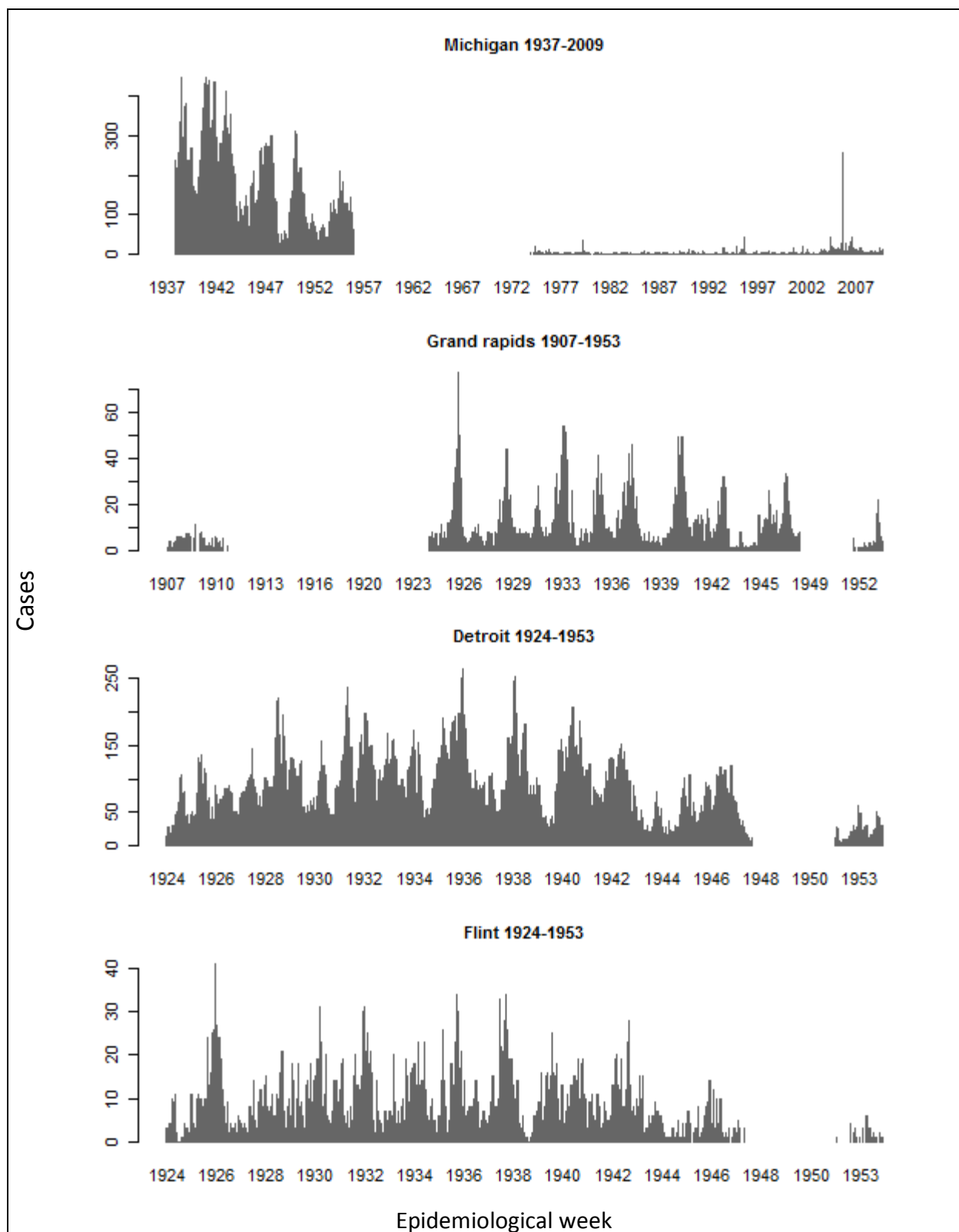
Figure D2, Number of cases reported for Whooping Cough per epidemiological week

Tycho data report for the state of Michigan

Diseases with fragmented data over time

For a number of diseases, only fragmented data was available for Michigan. 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 Michigan

Disease	Report type	Report period	Number of reports	Total cases
Anthrax	State	1942-1945	143	0
Brucellosis [undulant fever]	City	1952-1953	5	5
Brucellosis [undulant fever]	State	1943-1982	513	2991
Dysentery	State	1942-1948	309	634
Encephalitis	City	1941-1953	1055	212
Encephalitis	State	1942-1994	1884	3496
Leprosy	City	1924-1924	2	0
Leprosy	State	1942-1990	342	6
Psittacosis	State	1956-1961	15	20
Rocky mountain spotted fever	State	1942-2009	993	254
Trichiniasis	City	1952-1952	2	5
Trichiniasis	State	1952-1955	6	6
Tularemia	City	1952-1953	3	4
Tularemia	State	1942-1994	748	112
West nile disease	State	2003-2009	108	113

Tycho data report for the state of Michigan

Project Tycho

This report provides preliminary data for the state of Michigan 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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