A Dynamic Surveillance Report of Notifiable Infectious Diseases Data in Mainland, China

2023 June

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Monthly Report -- 2023 June

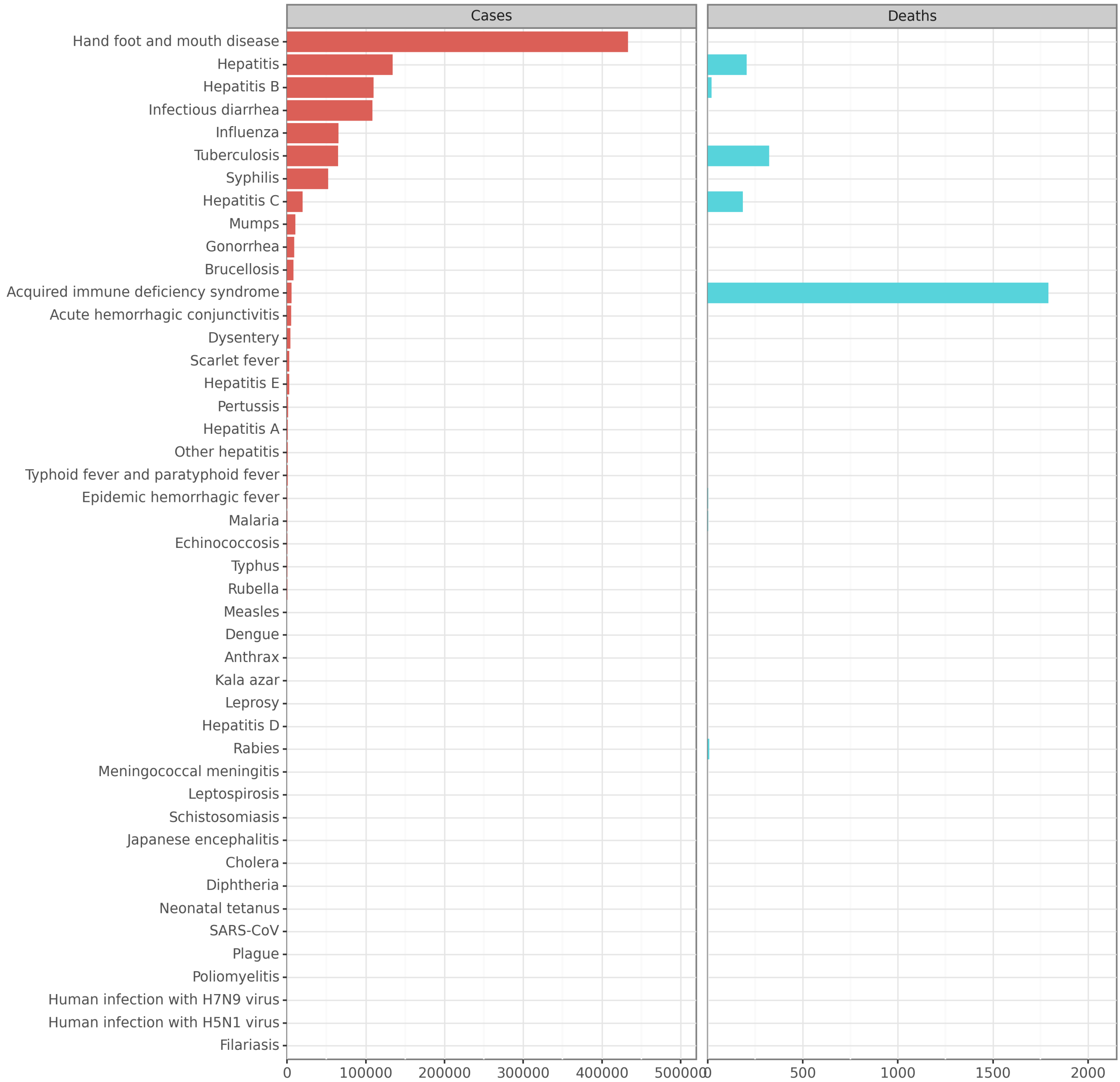

Figure 1: Monthly Notifiable Infectious Diseases Reports in 2023 June

In June 2023, mainland China reported a total of 906,707 disease cases, resulting in 2,337 deaths. This data will be examined to identify significant patterns and trends in disease cases and deaths.
1. Disease Cases: - Overall, disease cases showed a significant increase compared to May 2023, with a 24.61% rise equating to 179,062 more cases. However, when compared to June 2022, there was a 29.49% decrease, with 379,151 fewer cases. - Specific diseases experienced substantial increases in cases compared to May 2023, including acute hemorrhagic conjunctivitis (115.71%), dengue (161.90%), and hand foot and mouth disease (374.57%). - Conversely, diseases like brucellosis (-8.17%), echinococcosis (-19.75%), and infectious diarrhea (-6.43%) saw a decrease in cases compared to May

2023. - When compared to June 2022, there was a significant increase in cases for diseases such as dengue (5400.00%), hepatitis (1.54%), and malaria (325.81%).
2. Deaths: - In June 2023, there were 2,337 reported deaths, which represented a slight decrease of 5.19% compared to May 2023. However, there was an increase of 13.12% (271 more deaths) compared to June 2022. - Noteworthy diseases that saw an increase in deaths compared to May 2023 include hepatitis (21.18%) and rabies (28.57%). - Diseases like influenza (-50.00%), infectious diarrhea (-100.00%), and meningococcal meningitis (-100.00%) reported no deaths in June 2023. - When compared to June 2022, significant increases in deaths were observed for diseases such as hepatitis (303.92%), hepatitis C (1140.00%), and syphilis (13.12%).
3. Patterns and Trends: - The substantial increase in disease cases compared to May 2023 suggests a potential outbreak or heightened transmission of particular diseases in mainland China. - Diseases like acute hemorrhagic conjunctivitis, dengue, and hand foot and mouth disease exhibited the highest increases in cases, underscoring the importance of monitoring and implementing control measures for these infectious diseases. - The decline in cases for diseases such as brucellosis, echinococcosis, and infectious diarrhea compared to May 2023 may indicate successful control and prevention efforts. - The rise in deaths compared to June 2022 emphasizes the need for improved healthcare interventions and surveillance to reduce mortality rates. - Diseases such as hepatitis, hepatitis C, and syphilis demonstrated both an increase in cases and deaths, highlighting the necessity for targeted interventions and public health campaigns to address these diseases.
In conclusion, the epidemiological data for June 2023 in mainland China reveals significant patterns and trends in disease cases and deaths. The increase in disease cases compared to the previous month, along with variations in specific diseases, calls for enhanced surveillance, prevention, and control efforts. The rise in deaths compared to the previous year underscores the importance of prioritizing public health strategies to reduce mortality rates associated with certain diseases.

Table 1: Monthly Notifiable Infectious Diseases Cases in 2023 June

Diseases	Cases	Comparison with 2023 May	Comparison with 2022 June
Plague	0	0 (/)	0 (/)
Cholera	3	0 (0.00%)	-3 (-50.00%)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	5,759	304 (5.57%)	133 (2.36%)
Hepatitis	133,888	-7,604 (-5.37%)	2,031 (1.54%)
Hepatitis A	944	-132 (-12.27%)	-94 (-9.06%)
Hepatitis B	110,063	-5,871 (-5.06%)	3,217 (3.01%)
Hepatitis C	19,664	-1,299 (-6.20%)	-1,261 (-6.03%)
Hepatitis D	23	3 (15.00%)	1 (4.55%)
Hepatitis E	2,529	-293 (-10.38%)	118 (4.89%)
Other hepatitis	665	-12 (-1.77%)	50 (8.13%)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	89	-20 (-18.35%)	-21 (-19.09%)
Epidemic hemorrhagic fever	365	-34 (-8.52%)	-201 (-35.51%)
Rabies	11	1 (10.00%)	-4 (-26.67%)
Japanese encephalitis	3	3 (/)	-4 (-57.14%)
Dengue	55	34 (161.90%)	54 (5400.00%)

Anthrax	31	6 (24.00%)	2 (6.90%)
Dysentery	4,353	600 (15.99%)	-355 (-7.54%)
Tuberculosis	64,788	-4,280 (-6.20%)	-3,113 (-4.58%)
Typhoid fever and paratyphoid fever	627	80 (14.63%)	-73 (-10.43%)
Meningococcal meningitis	9	7 (350.00%)	3 (50.00%)
Pertussis	1,512	178 (13.34%)	-2,701 (-64.11%)
Diphtheria	1	1 (/)	1 (/)
Neonatal tetanus	1	1 (/)	1 (/)
Scarlet fever	2,684	786 (41.41%)	-212 (-7.32%)
Brucellosis	8,326	-741 (-8.17%)	-1,617 (-16.26%)
Gonorrhea	8,863	-214 (-2.36%)	-125 (-1.39%)
Syphilis	52,007	-1,251 (-2.35%)	3,500 (7.22%)
Leptospirosis	9	1 (12.50%)	-3 (-25.00%)
Schistosomiasis	7	4 (133.33%)	2 (40.00%)
Malaria	264	52 (24.53%)	202 (325.81%)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	65,289	-147,600 (-69.33%)	-681,749 (-91.26%)
Mumps	10,710	1,780 (19.93%)	-1,235 (-10.34%)
Rubella	110	37 (50.68%)	-57 (-34.13%)
Acute hemorrhagic conjunctivitis	4,985	2,674 (115.71%)	2,080 (71.60%)
Leprosy	24	-3 (-11.11%)	-13 (-35.14%)
Typhus	131	-40 (-23.39%)	7 (5.65%)
Kala azar	25	-7 (-21.88%)	5 (25.00%)
Echinococcosis	252	-62 (-19.75%)	2 (0.80%)
Filariasis	0	0 (/)	0 (/)
Infectious diarrhea	108,442	-7,456 (-6.43%)	13,430 (14.14%)
Hand foot and mouth disease	433,084	341,825 (374.57%)	292,423 (207.89%)
Total	906,707	179,062 (24.61%)	-379,151 (-29.49%)

Table 2: Monthly Notifiable Infectious Diseases Deaths in 2023 June

Diseases	Deaths	Comparison with 2023 May	Comparison with 2022 June
Plague	0	0 (/)	0 (/)
Cholera	0	0 (/)	0 (/)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	1,792	-141 (-7.29%)	145 (8.80%)
Hepatitis	206	36 (21.18%)	155 (303.92%)
Hepatitis A	0	0 (/)	0 (/)

Hepatitis B	20	3 (17.65%)	-15 (-42.86%)
Hepatitis C	186	35 (23.18%)	171 (1140.00%)
Hepatitis D	0	0 (/)	0 (/)
Hepatitis E	0	-2 (-100.00%)	0 (/)
Other hepatitis	0	0 (/)	-1 (-100.00%)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	0	0 (/)	0 (/)
Epidemic hemorrhagic fever	2	2 (/)	-4 (-66.67%)
Rabies	9	2 (28.57%)	3 (50.00%)
Japanese encephalitis	0	0 (/)	0 (/)
Dengue	0	0 (/)	0 (/)
Anthrax	0	0 (/)	0 (/)
Dysentery	0	0 (/)	0 (/)
Tuberculosis	324	-19 (-5.54%)	-21 (-6.09%)
Typhoid fever and paratyphoid fever	0	0 (/)	0 (/)
Meningococcal meningitis	0	0 (/)	-1 (-100.00%)
Pertussis	0	0 (/)	0 (/)
Diphtheria	0	0 (/)	0 (/)
Neonatal tetanus	0	0 (/)	0 (/)
Scarlet fever	0	0 (/)	0 (/)
Brucellosis	0	0 (/)	0 (/)
Gonorrhea	0	0 (/)	0 (/)
Syphilis	1	-9 (-90.00%)	-3 (-75.00%)
Leptospirosis	0	0 (/)	0 (/)
Schistosomiasis	0	0 (/)	0 (/)
Malaria	2	2 (/)	2 (/)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	1	-1 (-50.00%)	-3 (-75.00%)
Mumps	0	0 (/)	0 (/)
Rubella	0	0 (/)	0 (/)
Acute hemorrhagic conjunctivitis	0	0 (/)	0 (/)
Leprosy	0	0 (/)	0 (/)
Typhus	0	0 (/)	0 (/)
Kala azar	0	0 (/)	0 (/)
Echinococcosis	0	0 (/)	0 (/)
Filariasis	0	0 (/)	0 (/)
Infectious diarrhea	0	0 (/)	-1 (-100.00%)

Hand foot and mouth disease	0	0 (/)	-1 (-100.00%)
Total	2,337	-128 (-5.19%)	271 (13.12%)

History Data Analysis2023 June

Total

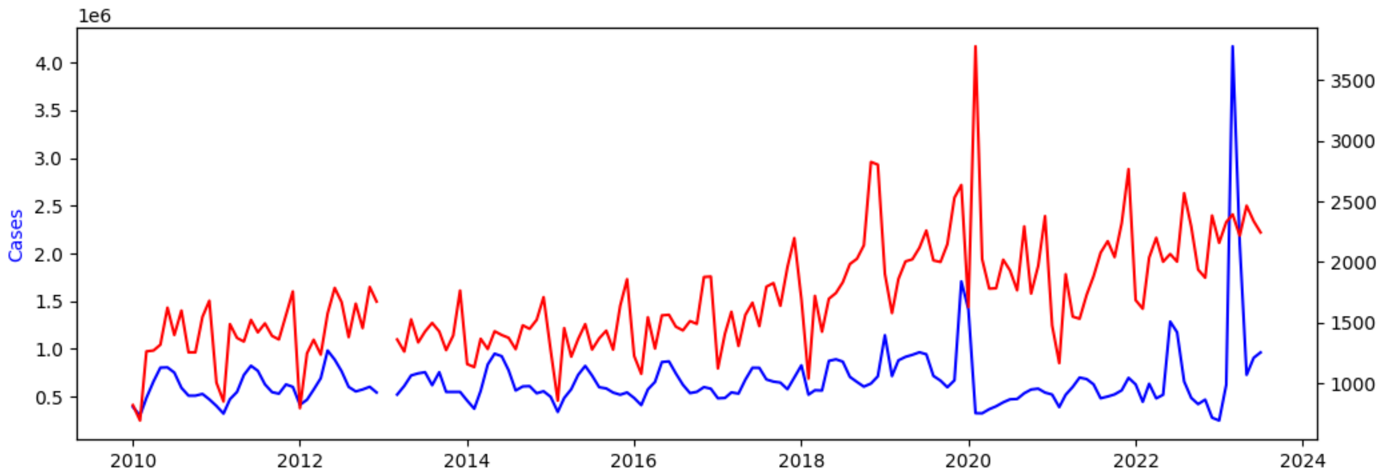

Figure 2: The Change of Total Reports before 2023 June

Seasonal Patterns: Based on the monthly data, a consistent pattern emerges indicating higher cases and deaths during the winter months (December to February), and lower cases and deaths during the summer months (June to August). This suggests a seasonal pattern in disease transmission, with a higher incidence during colder months and a lower incidence during warmer months.
Peak and Trough Periods: The peak period for cases in mainland China occurred in January 2023, with a recorded value of 4,171,295 cases. The trough period for cases was in August 2010, with a recorded value of 591,982 cases. Similarly, for deaths, the peak period occurred in December 2019, with a recorded value of 2,767 deaths, and the trough period occurred in April 2012, with a recorded value of 1,235 deaths.
Overall Trends: Upon examining the overall trend, there has been an increasing incidence of cases and deaths from 2010 to June 2023. While there have been fluctuations during certain years, the general trend has been upward. However, it is worth noting a sudden decrease in reported cases and deaths in January and February 2013. This significant decline could be attributed to issues related to data collection or reporting.
Discussion: The seasonal patterns observed in the data provide evidence of a seasonal trend in disease transmission in mainland China, with higher cases and deaths occurring during the winter months. This can potentially be attributed to various factors such as increased indoor gatherings, reduced ventilation, and closer contact during colder months. The consistent pattern of higher incidence in winter and lower incidence in summer underscores the importance of seasonal variations in public health measures and interventions.
The overall increasing trend in cases and deaths highlights the ongoing spread and impact of the disease over time. It is imperative for public health authorities to closely monitor and respond to these trends in order to prevent further transmission and mitigate the impact on public health. Additionally, the sudden decrease in reported cases and deaths in January and February 2013 raises concerns about the accuracy and completeness of the data during that period.
It is important to acknowledge that this analysis solely relies on the provided data and does not consider other potential factors that may influence the observed patterns and trends. As a result, further analysis and investigation are necessary to fully comprehend the underlying factors driving the observed patterns and trends in cases and deaths in mainland China.

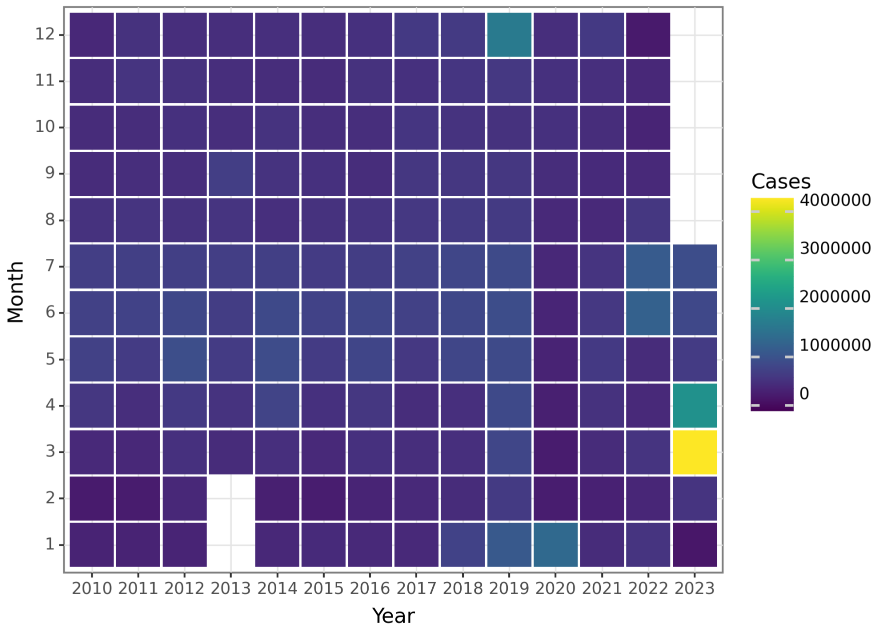

Figure 3: The Change of Total Cases before 2023 June

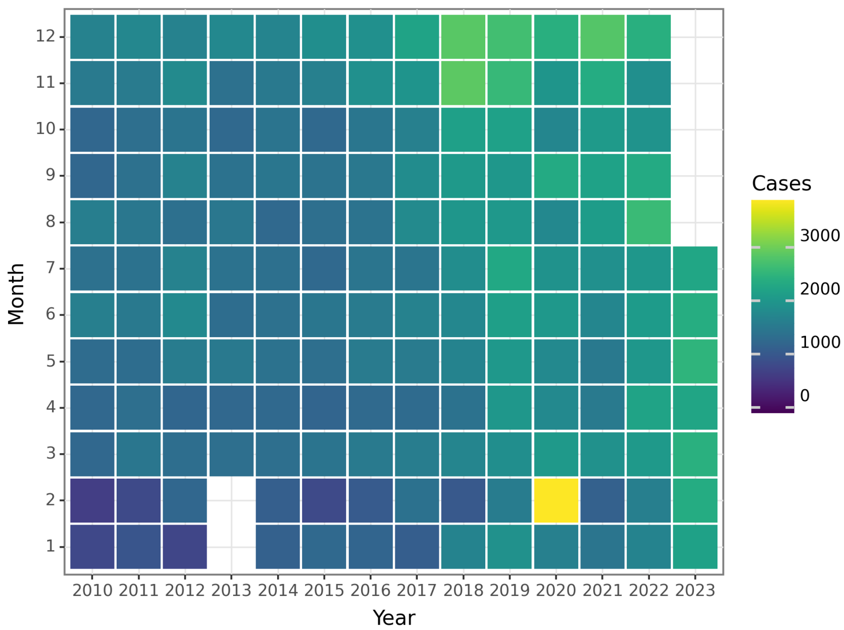

Figure 4: The Change of Total Deaths before 2023 June

Plague

Plague, also known as the Black Death, is a severe infectious disease caused by the bacterium Yersinia pestis. While the disease has plagued humanity for centuries, it is currently relatively rare but still poses a significant public health threat in certain regions. This overview will discuss the epidemiology of Plague, including its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, major risk factors, and the impact on different regions and populations.

Prevalence and Transmission Routes: Plague has a global distribution, but its prevalence varies significantly across regions. Today, the majority of Plague cases occur in Africa, particularly in the Democratic Republic of Congo, Madagascar, and Uganda. Other regions reporting cases are Peru, Bolivia, and Brazil in South America, as well as China, Mongolia, and parts of Russia. In the United States, a few sporadic cases are reported in the southwestern states annually.

The bacterium Yersinia pestis, primarily transmitted by fleas that infest rodents as their natural reservoir, is responsible for the transmission of Plague. Humans can become infected through three main routes:

1. Flea bites: The most common method of transmission occurs when fleas infect humans after feeding on infected rodents, usually rats. This form is known as bubonic Plague. 2. Contact with infected tissues or bodily fluids: Direct contact with infected animals, such as rodents, can lead to septicemic Plague. 3. Inhalation: In rare cases, people can contract pneumonic Plague by inhaling respiratory droplets from infected individuals.

Affected Populations and Key Statistics: Plague can affect individuals of all ages and genders, but certain populations are at higher risk. In endemic regions, agricultural workers, hunters, veterinarians, and others who come into close contact with rodents are more susceptible.

According to the World Health Organization (WHO), the number of reported Plague cases worldwide has steadily decreased over the past few decades. In recent years, between 1,000 and 2,000 cases have been reported annually, with a case-fatality rate between 8 and 30 percent. However, these figures likely underestimate the true burden of the disease due to unreported cases in remote or conflict-affected areas.

Historical Context and Discovery: Plague has had a profound impact on human history. The most infamous pandemic, known as the Black Death, occurred in Europe in the 14th century and resulted in an estimated 75 to 200 million deaths. This outbreak, along with subsequent waves, had devastating social, economic, and political consequences.

The discovery of Plague's causative agent, Yersinia pestis, was made by Alexandre Yersin in 1894 during an outbreak in Hong Kong. His work paved the way for understanding the infectious nature of the disease, leading to the development of diagnostic tests and targeted treatments.

Major Risk Factors: Several risk factors contribute to the transmission of Plague, including:

1. Poor sanitation: Areas with inadequate waste management, overcrowding, and limited access to clean water are more prone to Plague outbreaks. 2. Urbanization and slum conditions: Rapid urbanization and living in crowded slums with substandard housing increase the likelihood of encounters with infected rodents. 3. Climate and ecological factors: Environmental conditions, such as increased rainfall or ecological disruptions, may lead to increased rodent populations and, subsequently, higher Plague transmission rates.

Impact on Different Regions and Populations: The impact of Plague varies across different regions and populations. Endemic regions, such as parts of Africa, experience sporadic outbreaks with a higher prevalence of bubonic and septicemic Plague. These areas often face challenges in healthcare infrastructure and disease surveillance, which can contribute to underreporting.

In Madagascar, Plague outbreaks occur almost annually. The country reported an outbreak in 2017, with over 2,400 cases and 209 deaths. Additionally, pneumonic Plague cases have been reported in recent years, adding to concern due to its potential for rapid person-to-person transmission.

In the United States, the southwestern states such as Arizona, New Mexico, and Colorado report sporadic cases almost every year. However, due to better healthcare infrastructure and prompt public health responses, these cases are typically isolated and do not result in large-scale outbreaks.

In summary, Plague remains a low-prevalence but significant public health concern in certain regions globally. The disease is primarily transmitted through flea bites, contact with infected tissues, or inhalation. Key risk factors include poor sanitation, urbanization, and specific ecological conditions. By understanding the epidemiology of Plague and implementing effective prevention and control measures, public health organizations aim to minimize the impact of this ancient and deadly disease.

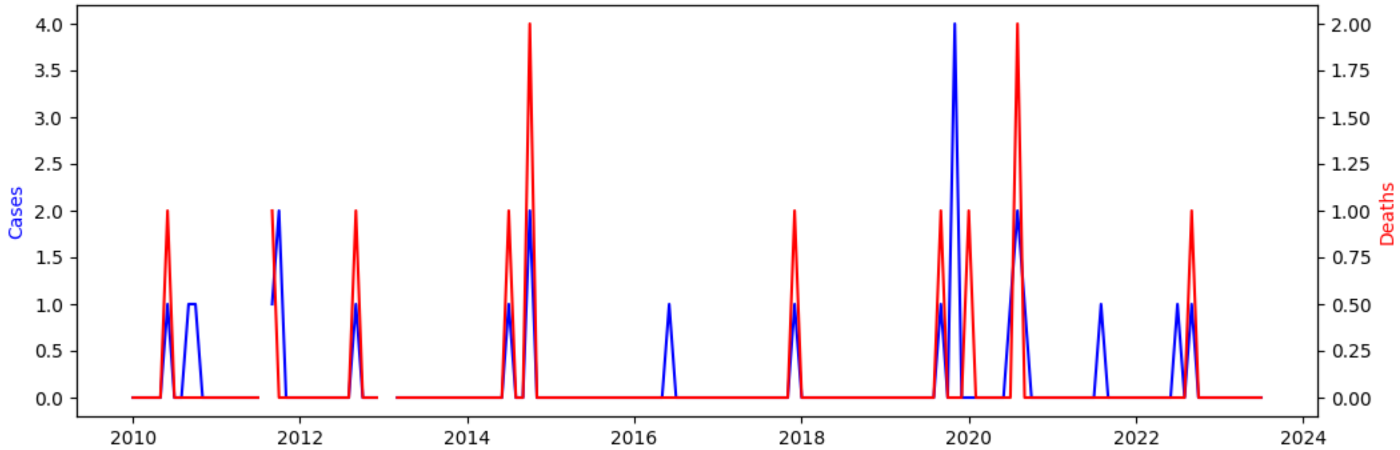

Figure 5: The Change of Plague Reports before 2023 June

Seasonal Patterns:
Based on the data provided, no clear seasonal pattern is observed for the cases and deaths of the Plague in mainland China before June 2023. The number of cases and deaths fluctuates throughout the years without consistent month-to-month patterns.
Peak and Trough Periods:
The data does not exhibit distinct peak and trough periods for the cases and deaths of the Plague. The number of cases and deaths varies from month to month, with occasional spikes and declines, but no consistent patterns of regular peaks or troughs can be identified.
Overall Trends:
Overall, the number of cases and deaths due to the Plague in mainland China before June 2023 is relatively low. There are multiple months where no cases or deaths are reported, indicating periods of low transmission or absence of the disease. However, occasional spikes in cases and deaths can be observed in certain months, but these incidents remain isolated.
Discussion:
The provided data on cases and deaths from the Plague in mainland China before June 2023 does not reveal any significant seasonal patterns, peak and trough periods, or consistent trends. This lack of pattern may suggest sporadic outbreaks rather than sustained transmission. It is important to note that the data provided is limited, and additional information and analysis would be required to establish a more comprehensive understanding of the epidemiology of the Plague in mainland China. Further investigation into additional factors such as geographical location, demographics, and environmental conditions may be necessary to identify potential underlying patterns or influencing factors.

Figure 6: The Change of Plague Cases before 2023 June

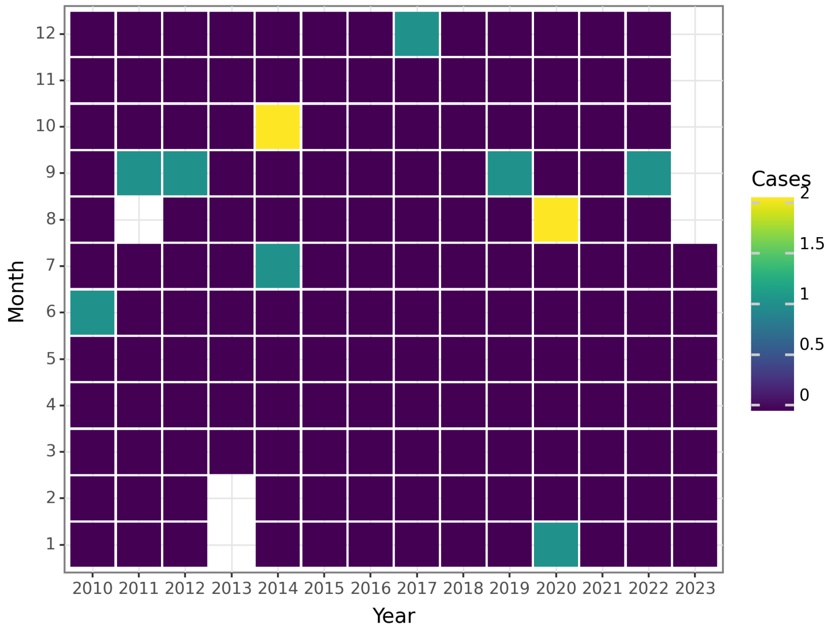

Figure 7: The Change of Plague Deaths before 2023 June

Cholera

Cholera, caused by the bacterium Vibrio cholerae, is a severe diarrheal illness. Inadequate sanitation and contaminated water and food are the primary modes of transmission, leading to rapid spread in areas with poor sanitation and hygiene practices. Cholera is a major global health issue, particularly in areas with limited access to clean water and sanitation facilities.

Historically, cholera has been documented since ancient times, dating back to the 5th century BC. However, it gained significant attention in the early 19th century due to devastating outbreaks. The most notable outbreak occurred from 1817 to 1824, originating in India and spreading globally through trade routes, impacting Europe, North America, and other regions. The discovery of the cholera bacterium by Filippo Pacini in 1854, later confirmed by Robert Koch in 1883, marked a crucial milestone in understanding the disease.

Cholera is endemic in many parts of the world, especially in regions with poor sanitation infrastructure. According to the World Health Organization (WHO), approximately 1.3 to 4 million cases occur each year, resulting in 21,000 to 143,000 deaths worldwide. However, these figures are likely underestimates due to underreporting and challenges in data collection.

The primary mode of cholera transmission is through the ingestion of contaminated water or food. The bacterium can survive and thrive in aquatic environments, particularly in coastal areas with brackish water. Factors contributing to cholera transmission include inadequate water treatment, improper waste disposal, overcrowding, and poor hygiene practices.

Cholera can affect individuals of all ages, but children are more vulnerable due to their weaker immune systems and higher susceptibility to dehydration. Populations living in areas with limited access to clean water and sanitation facilities are at a greater risk. Additionally, communities affected by natural disasters, conflicts, and population displacement are also more prone to cholera outbreaks.

Key statistics regarding cholera include a high case-fatality rate ranging from 1% to 40%, depending on the outbreak and available healthcare services. The incubation period is typically short, lasting from a few hours to five days. Primary symptoms include profuse watery diarrhea, vomiting, and dehydration. If left untreated, cholera can lead to rapid dehydration, electrolyte imbalances, and shock.

Several major risk factors are associated with cholera transmission:

1. Lack of access to clean water: Insufficient access to safe drinking water increases the likelihood of individuals consuming contaminated water and contracting cholera. 2. Poor sanitation practices: Improper waste disposal, absence of sanitary latrines, and open defecation contribute to water source contamination. 3. Overcrowding and unsanitary living conditions: Communities with crowded living conditions, such as refugee camps or slums, are highly susceptible to cholera outbreaks. 4. Limited healthcare infrastructure: In regions with limited healthcare services and resources, prompt diagnosis and treatment of cholera may be challenging, exacerbating the outbreak's impact.

The impact of cholera can vary across regions and populations. Sub-Saharan Africa, including countries like the Democratic Republic of Congo and Mozambique, experiences recurrent cholera outbreaks. The South Asian region, particularly India and Bangladesh, also faces a significant burden of cholera. In recent years, Yemen has witnessed one of the largest outbreaks globally, mainly due to the ongoing conflict and collapse of healthcare services.

Furthermore, within regions, certain populations may be disproportionately affected by cholera. This includes marginalized communities with limited access to healthcare, sanitation, and clean water, as well as populations affected by natural disasters or conflicts. Displaced populations, such as refugees or internally displaced persons, are particularly vulnerable to cholera outbreaks due to overcrowding and limited access to essential services.

In conclusion, cholera remains a significant global health concern, particularly in areas with inadequate access to clean water and sanitation facilities. The prevalence, transmission routes, and impact of the disease can vary across regions, highlighting the importance of implementing comprehensive measures to prevent cholera outbreaks and provide timely treatment in affected communities.

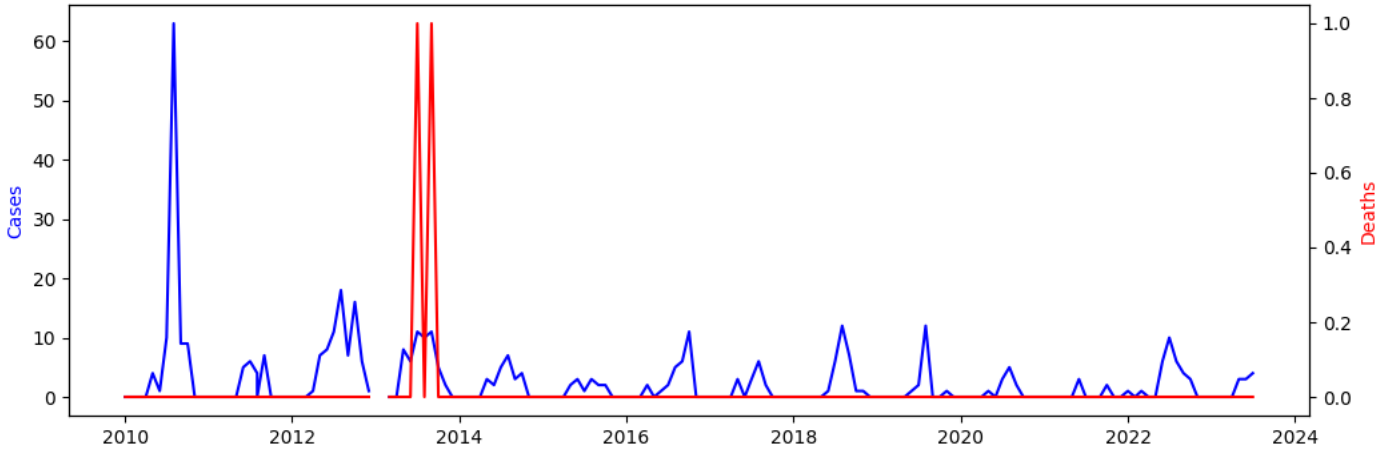

Figure 8: The Change of Cholera Reports before 2023 June

Seasonal Patterns: The data presented reveals the existence of seasonal patterns in the number of cholera cases in mainland China. The highest incidence of cases occurs primarily during July, August, and September, which corresponds to the summer season. Conversely, there is a marked decrease in cases during the winter months, specifically from December to February.
Peak and Trough Periods: In mainland China, the peak period for cholera cases is consistently observed in the summer months, particularly during July and August. These months consistently exhibit the highest number of cases. Conversely, the winter months, specifically from December to February, generally exhibit the lowest number of cases, reflecting a trough period.
Overall Trends: A comprehensive analysis of the data reveals fluctuations in the number of cholera cases in mainland China during the years 2010 to 2023. Certain years, such as 2010, 2012, 2013, 2014, 2017, and 2018, exhibit elevated case numbers and distinct seasonal peaks compared to other years. However, there are also years, such as 2011, 2015, 2016, 2019, 2020, 2021, and 2022, with lower case numbers and less pronounced seasonal patterns.
Discussion: The observed seasonal patterns in cholera cases in mainland China indicate an increased risk of transmission during the summer months, likely due to heightened outdoor activities, elevated temperatures, and population movements. The presence of peak and trough periods can be attributed to the complex interplay of various factors, including climate, sanitation practices, population density, and public health interventions. It is crucial for public health authorities to actively monitor and respond to the seasonal variations in cholera cases, particularly during the peak months, in order to implement targeted interventions and preventive measures.

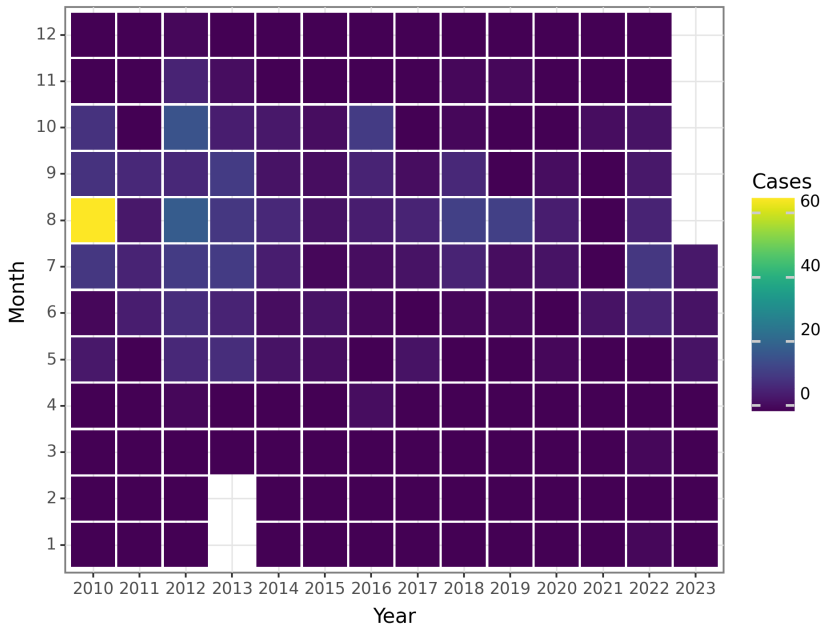

Figure 9: The Change of Cholera Cases before 2023 June

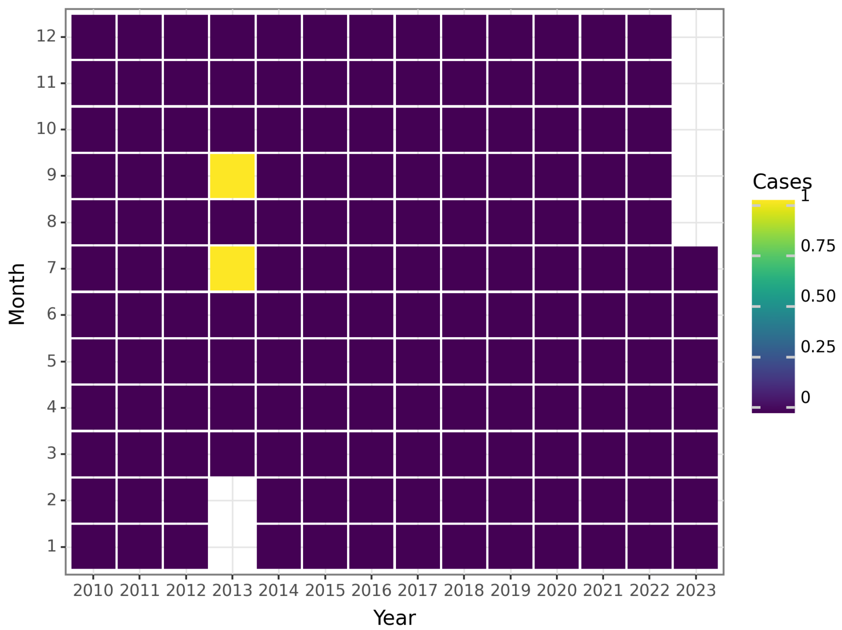

Figure 10: The Change of Cholera Deaths before 2023 June

SARS-CoV

SARS-CoV, also known as severe acute respiratory syndrome coronavirus, is a viral infection that emerged in 2002 and led to a severe epidemic in multiple countries. This virus belongs to the coronavirus family, which includes other respiratory viruses such as MERS-CoV and the common cold. Understanding the epidemiology of SARS-CoV is imperative for controlling its spread and minimizing its impact on populations.

Historical Context and Discovery: The first known outbreak of SARS-CoV occurred in Guangdong, China, in November 2002. The virus rapidly spread within the region, significantly affecting healthcare workers. It was not until February 2003 that the World Health Organization (WHO) was officially informed about the outbreak. The global spread of SARS-CoV quickly became a major concern, leading to an international effort to contain and control the virus. By July 2003, the WHO successfully declared the epidemic contained, with a total of 8,096 cases and 774 deaths reported worldwide.

Global Prevalence and Transmission Routes: During the epidemic, SARS-CoV spread to 29 countries, with the most affected regions being China, Hong Kong, Taiwan, Singapore, and Canada. The primary mode of transmission is through respiratory droplets produced when an infected person coughs or sneezes. Close contact with infected individuals or touching contaminated surfaces followed by touching the mouth, nose, or eyes can also lead to transmission. The virus is not highly contagious, and prolonged close and direct contact is usually required for infection to occur.

Affected Populations and Key Statistics: SARS-CoV primarily affects adults, with the majority of cases occurring in individuals aged 25 to 70 years. The exact reasons for this age distribution are not fully understood but may be related to differences in viral replication and immune response. Healthcare workers are at a higher risk of infection due to their close proximity to infected individuals.

Key statistics related to SARS-CoV are as follows: 1. Case Fatality Rate (CFR): The overall CFR during the 2002-2003 epidemic was approximately 9.6%, varying from 0-50% in different regions. The highest CFR was observed in individuals over 60 years of age. 2. Incubation Period: The incubation period, or the time between exposure to the virus and the onset of symptoms, ranges from 2 to 10 days, with an average of 4-6 days. 3. Reproduction number (R0): The estimated R0 for SARS-CoV ranges from 2 to 5, indicating that each infected individual, on average, spreads the virus to 2-5 others.

Major Risk Factors: Several risk factors contribute to the transmission of SARS-CoV. These include: 1. Close contact with an infected individual, especially in closed environments such as households, hospitals, or public transportation. 2. Exposure to respiratory droplets when caring for or being in proximity to an infected individual. 3. Lack of adequate infection control measures in healthcare settings. 4. Traveling to or residing in areas with ongoing SARS-CoV outbreaks. 5. Weakened immune system or underlying conditions that make individuals more susceptible to severe respiratory infections.

Impact on Different Regions and Populations: During the 2002-2003 epidemic, the impact of SARS-CoV varied between regions. China, particularly Guangdong province, experienced the highest number of cases and deaths. The virus had a significant impact on the healthcare system, with a high percentage of infections occurring in healthcare workers. Other affected regions, such as Hong Kong and Singapore, also reported substantial numbers of cases and implemented strict control measures.

Certain demographics, such as the elderly, had higher mortality rates, highlighting the increased vulnerability of older individuals to severe respiratory infections. The impact on specific populations, such as those living in crowded urban areas or individuals with underlying health conditions, was also significant.

In conclusion, SARS-CoV is a respiratory virus that caused a severe epidemic in 2002-2003. The virus primarily spreads through respiratory droplets and close contact. Healthcare workers are at a higher risk of infection, and older individuals face a higher risk of mortality. The impact and prevalence of SARS-CoV varied between different regions, with China being the most affected. Effective infection control measures and public health interventions played a crucial role in containing the epidemic.

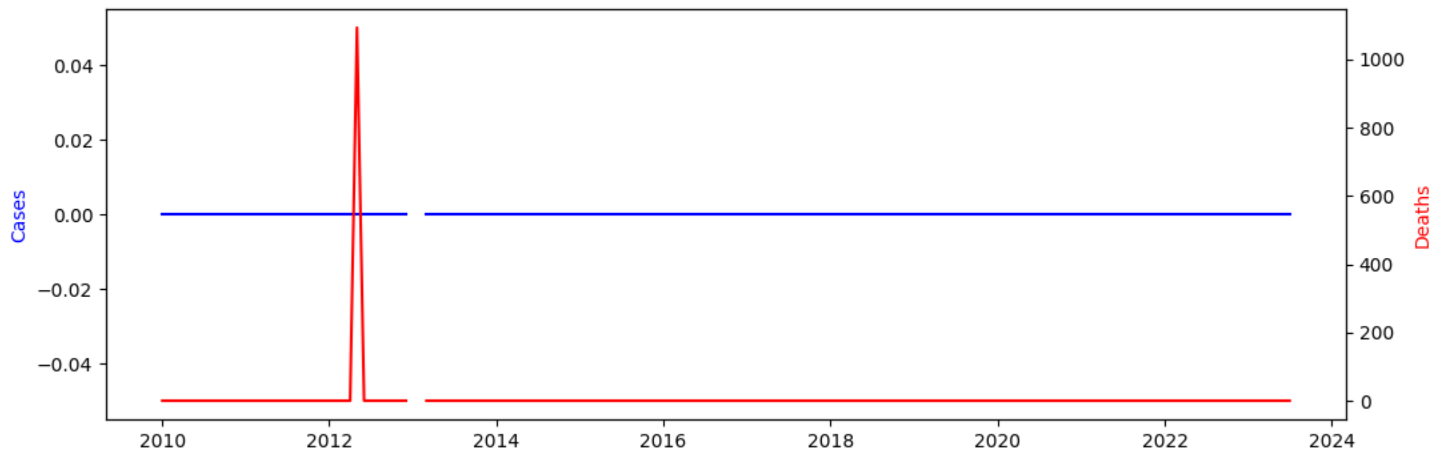

Figure 11: The Change of SARS-CoV Reports before 2023 June

Seasonal Patterns:
Based on the data provided, there is no clear evidence of seasonal patterns for cases and deaths caused by SARS-CoV in mainland China before June 2023. Throughout the years, both the number of cases and deaths remained consistently low, with values mostly reported as zero.
Peak and Trough Periods:
There are no identifiable peak or trough periods for SARS-CoV cases and deaths before June 2023 in mainland China. The data consistently shows very low or zero values for both variables, indicating a lack of significant fluctuations or variations over time.
Overall Trends:
The overall trend for cases and deaths caused by SARS-CoV before June 2023 in mainland China is characterized by minimal to no transmission or fatalities. The data consistently reports zero or negligible numbers of cases and deaths throughout the years.
Discussion:
The absence of cases and deaths caused by SARS-CoV before June 2023 in mainland China suggests that the virus had limited or no circulation during this time period. This could indicate the successful implementation of control measures by public health authorities to prevent the spread of the virus. It is important to note that the provided data does not encompass the outbreak of COVID-19, which was caused by a related coronavirus (SARS-CoV-2) and emerged in late 2019, leading to a global pandemic.
Please note that the analysis provided here is solely based on the data available and does not consider external factors or additional contextual information that may influence the patterns and trends of SARS-CoV in mainland China.

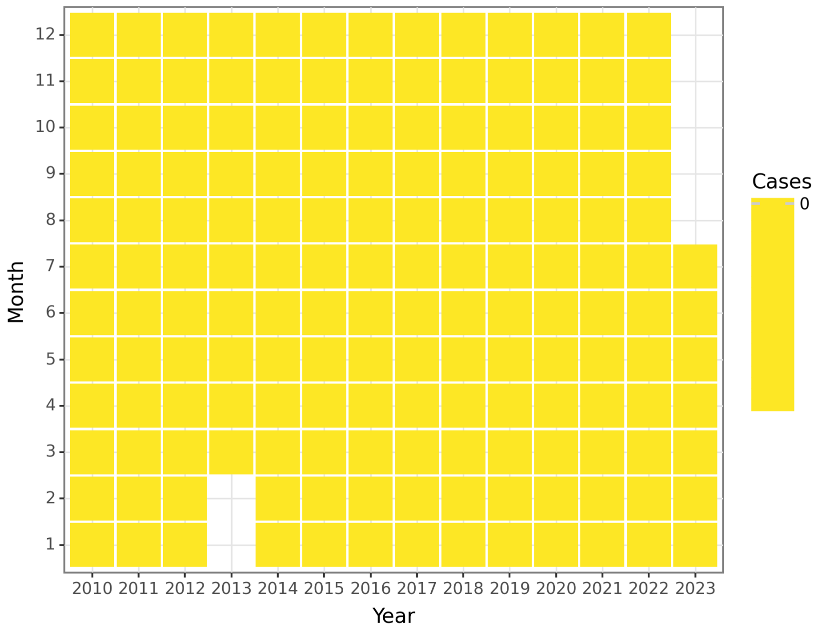

Figure 12: The Change of SARS-CoV Cases before 2023 June

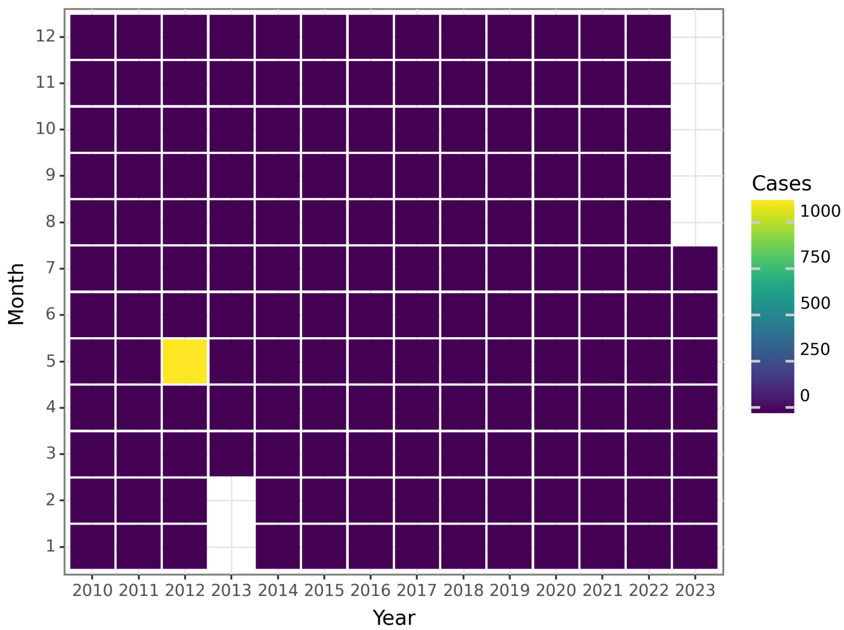

Figure 13: The Change of SARS-CoV Deaths before 2023 June

Acquired immune deficiency syndrome

Acquired immune deficiency syndrome (AIDS) is a global public health concern caused by the Human Immunodeficiency Virus (HIV). Since its identification in the early 1980s, the virus has had a profound impact on populations worldwide. This overview aims to provide comprehensive information on the epidemiology of AIDS, including its global prevalence, transmission routes, affected populations, key statistics, historical context, major risk factors, and the impact on different regions and demographics.

Global Prevalence: According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), approximately 38 million people were living with HIV/AIDS worldwide as of 2020. Sub-Saharan Africa remains the most heavily affected region, accounting for approximately two-thirds of all people living with HIV globally. Other significantly impacted regions include Asia, Eastern Europe, and Latin America.

Transmission Routes: HIV can be transmitted through various routes, including sexual contact, sharing contaminated needles or syringes, mother-to-child transmission during childbirth or breastfeeding, and through blood transfusions or organ transplants from infected individuals (although this is now rare due to screening processes). Sexual transmission, particularly through unprotected vaginal or anal intercourse, remains the primary mode of HIV transmission globally.

Affected Populations: AIDS does not discriminate and affects people from all walks of life. In the early years of the epidemic, certain populations, such as men who have sex with men (MSM), people who inject drugs, and sex workers, were disproportionately impacted. However, over time, the spread of HIV has affected various demographics, including heterosexual individuals and women.

Key Statistics: In 2020, approximately 1.5 million new HIV infections were reported globally, along with around 680,000 AIDS-related deaths. However, the number of new infections and AIDS-related deaths has been declining since the peak in the late 1990s. Access to antiretroviral therapy (ART) has played a crucial role in reducing new infections and mortality rates.

Historical Context and Discovery: The first cases of AIDS were reported in 1981 among gay men in the United States, who presented with rare infections and cancers. HIV was identified as the cause of AIDS in 1983-1984, revolutionizing the understanding of the disease and enabling efforts to develop effective prevention strategies, diagnostic tests, and treatments.

Major Risk Factors: Several risk factors contribute to HIV transmission, including unprotected sexual intercourse with an infected individual, multiple sexual partners, engaging in high-risk sexual activities, and having other sexually transmitted infections (STIs). Additionally, sharing needles or syringes for drug use and mother-to-child transmission during childbirth or breastfeeding are significant risk factors.

Impact on Different Regions and Populations: Although AIDS affects populations worldwide, the impact varies across regions and demographics. Sub-Saharan Africa faces the most severe burden, with high prevalence rates, high mortality rates, and limited access to healthcare services. In contrast, some Western countries have witnessed a decline in new infections due to comprehensive prevention strategies, improved access to testing, and treatment services. However, disparities still exist within countries, with marginalized populations such as MSM, sex workers, and people who inject drugs experiencing higher rates of infection.

In conclusion, AIDS remains a major global health issue. Understanding the epidemiology of AIDS, including its prevalence, transmission routes, affected populations, and impact on different regions and demographics, is crucial for developing targeted prevention and treatment interventions. It is essential to continue raising awareness, promoting regular testing, advocating for access to healthcare services, and combating stigma to effectively combat the spread of HIV/AIDS.

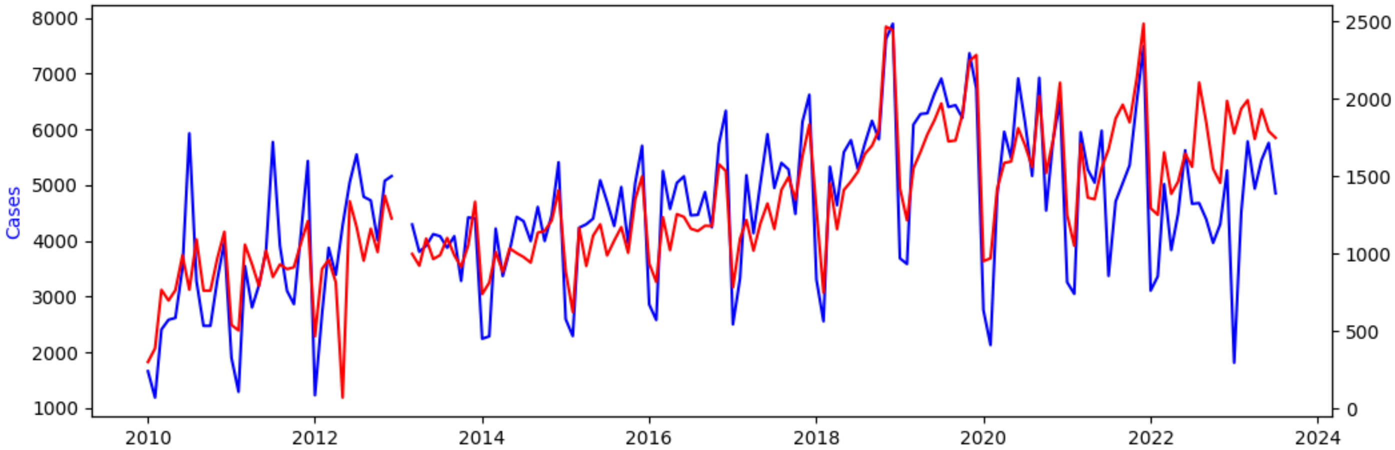

Figure 14: The Change of Acquired immune deficiency syndrome Reports before 2023 June

Seasonal Patterns: The data provided indicates the presence of seasonal patterns in the reported cases and deaths of Acquired Immune Deficiency Syndrome (AIDS) in mainland China. There are fluctuations in the number of cases and deaths throughout the years, with some periods showing higher or lower numbers.
Peak and Trough Periods: Upon examining the data, it is evident that there are periods of peak and trough for both cases and deaths of AIDS. Some months exhibit peaks, indicating a higher number of cases and deaths, while troughs represent periods of lower numbers.
Overall Trends: The overall trend demonstrates a steady increase in the number of reported cases and deaths of AIDS in mainland China since 2010. However, there are fluctuations and variations throughout the years.
Discussion: The presence of seasonal patterns in the data suggests that the occurrence of AIDS cases and deaths in mainland China may be influenced by factors that change with the seasons. These factors could include variations in population movement, transmission dynamics, or fluctuations in healthcare access and reporting.
The peak and trough periods reveal that there are months or periods with higher or lower numbers of reported cases and deaths. These fluctuations may be attributed to various factors such as changes in social behaviors, preventive measures, or public health interventions.
The overall trend indicates an increase in the reported cases and deaths of AIDS in mainland China since 2010. This trend could be the result of various factors, including improvements in surveillance and reporting systems, increased efforts in testing and diagnosis, changes in population demographics or behaviors, or a true increase in the incidence of AIDS.
It is essential to note that the provided data does not include information on interventions, policies, or specific demographic factors that could have an impact on the observed patterns and trends. Further analysis and investigation are necessary to fully comprehend the underlying factors contributing to the observed patterns and trends in AIDS cases and deaths in mainland China.

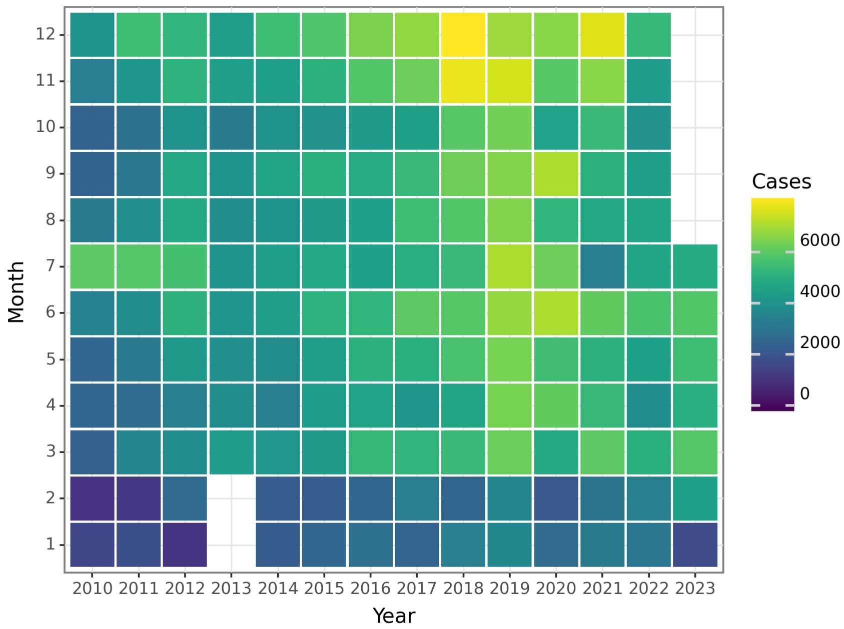

Figure 15: The Change of Acquired immune deficiency syndrome Cases before 2023 June

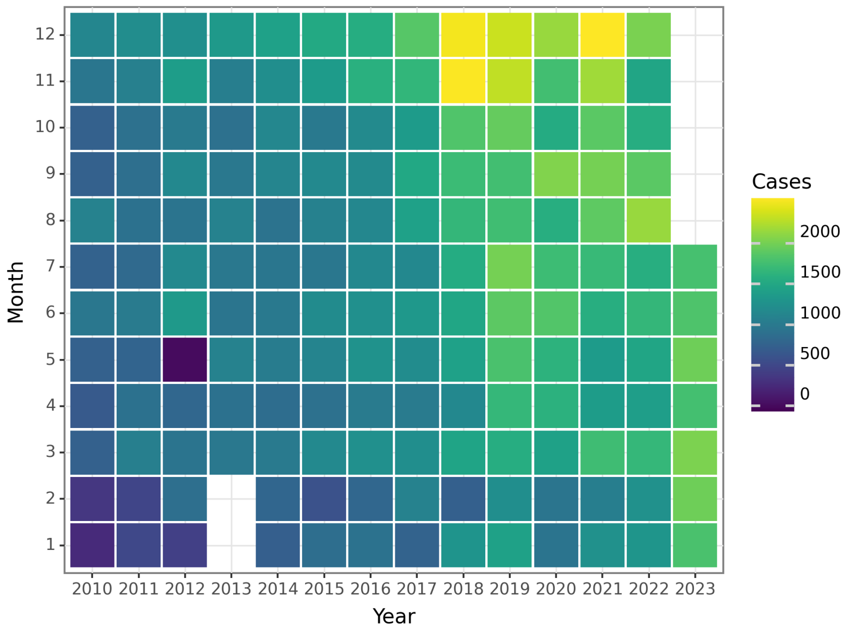

Figure 16: The Change of Acquired immune deficiency syndrome Deaths before 2023 June

Hepatitis

Hepatitis is a viral infection that causes liver inflammation and can result in severe complications such as cirrhosis, liver failure, and death. There are multiple types of hepatitis viruses, including A, B, C, D, and E, each with distinct transmission routes, affected populations, and prevalence rates.
Historical Context and Discovery: The earliest evidence of symptoms resembling hepatitis can be traced back to ancient civilizations, such as ancient Egypt. However, the identification of different hepatitis types began in the 20th century. Hepatitis A was discovered in 1973, hepatitis B in 1965, hepatitis C in 1989, hepatitis D in 1977, and hepatitis E in 1980.
Prevalence and Transmission Routes:
1. Hepatitis A: Hepatitis A is primarily transmitted through the fecal-oral route, typically through contaminated food or water. Its prevalence is higher in countries with inadequate sanitation and hygiene facilities. Global estimates suggest that approximately 114 million people had hepatitis A in 2015.
2. Hepatitis B: Hepatitis B is transmitted through contact with infected blood, semen, or other body fluids. It can occur through sexual contact, contaminated needles, blood transfusions, or from an infected mother to her baby during childbirth. Global estimates indicate that approximately 257 million people were living with chronic hepatitis B in 2015.
3. Hepatitis C: Hepatitis C is primarily spread through contact with infected blood, most commonly through sharing contaminated needles or other drug paraphernalia. It can also be transmitted through sexual contact and from an infected mother to her baby during childbirth. Globally, approximately 71 million people had chronic hepatitis C in 2015.
4. Hepatitis D: Hepatitis D only affects individuals who are already infected with hepatitis B. It is typically acquired through contact with infected blood or sexual contact with an infected person. Estimates suggest that approximately 15-20 million people worldwide have chronic hepatitis D.
5. Hepatitis E: Hepatitis E is mainly transmitted through the fecal-oral route, often through contaminated water or food. It is more prevalent in areas with inadequate sanitation facilities and is responsible for several outbreaks, particularly during natural disasters. Global estimates indicate around 20 million hepatitis E infections annually.
Major Risk Factors: - Engaging in unsafe sexual practices and having multiple sexual partners - Intravenous drug use and sharing of contaminated needles - Receiving blood transfusions or organ transplants in countries with inadequate screening protocols - Occupational exposure, particularly in healthcare settings where healthcare workers may come into contact with infected blood or body fluids - Mother-to-child transmission during childbirth or breastfeeding - Poor sanitation and hygiene practices, leading to food and water contamination
Impact on Different Regions and Populations: The prevalence of hepatitis varies across different regions and populations. In developing countries with limited access to healthcare and sanitation facilities, hepatitis A and E infections are more common. Hepatitis B and C are more prevalent in regions with high rates of injection drug use, unsafe medical practices, and vertical transmission from mother to child. Lower-income populations, marginalized communities, and individuals with limited healthcare access are often disproportionately affected by hepatitis.
In conclusion, hepatitis is a global health concern with different prevalence rates and transmission routes for each type. It can have a significant impact on affected populations, especially in regions with limited resources and healthcare infrastructure. Prevention measures, such as vaccination programs, safe injection practices, and improved sanitation, are crucial for controlling and reducing the burden of hepatitis worldwide.

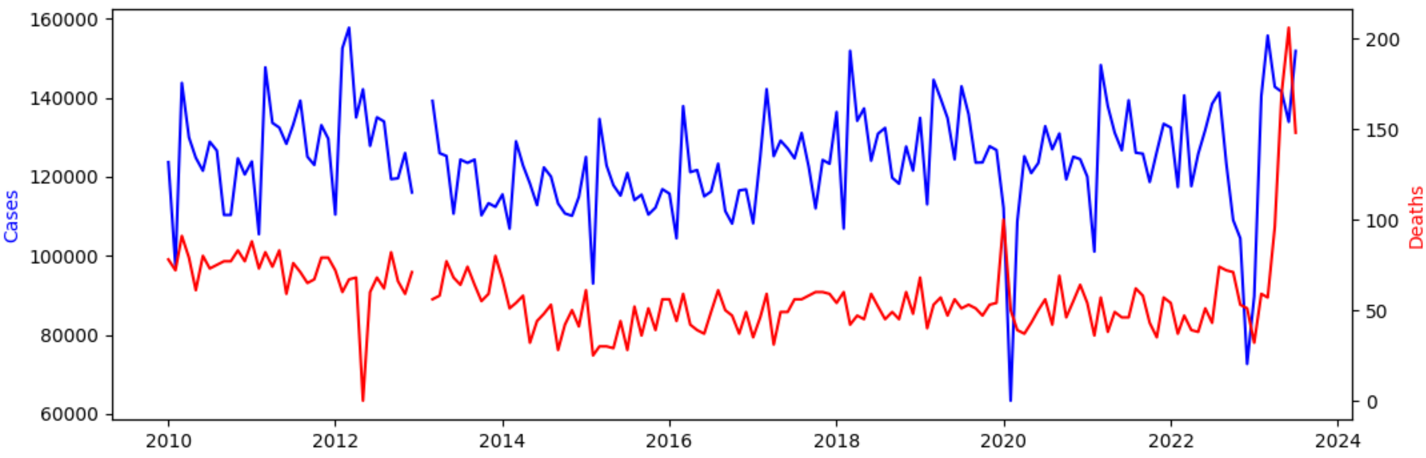

Figure 17: The Change of Hepatitis Reports before 2023 June

Seasonal Patterns:
Based on the provided monthly data, there is evidence of a seasonal pattern in the incidence of Hepatitis cases in mainland China. Generally, there is a higher number of cases in the first half of the year (January to June) and a lower number in the second half (July to December).
Peak and Trough Periods:
The peak periods for Hepatitis cases are typically observed in March, April, and May, with the highest number of cases occurring during these months. Conversely, the trough period is seen in August, September, and October, with the lowest number of cases reported during this time.
Overall Trends:
There is no apparent overall trend in the incidence of Hepatitis cases in mainland China prior to June 2023. However, it is worth noting that there is some variability in the monthly case counts, with fluctuations observed from year to year.
The observed seasonal pattern of higher Hepatitis cases in the first half of the year and lower cases in the second half aligns with the known transmission dynamics of Hepatitis. Hepatitis infections are often associated with various transmission routes, including the ingestion of contaminated food and water, inadequate sanitation practices, and close contact with infected individuals. It is possible that certain environmental and behavioral factors, such as increased travel, consumption patterns, and hygiene practices, may contribute to the observed seasonal variations in Hepatitis cases.
The fluctuating monthly case counts without a clear overall trend could be influenced by multiple factors, including changes in surveillance practices, accuracy in reporting, and variations in the circulation of Hepatitis viruses within the population. Further analysis and contextual information would be necessary to identify any significant underlying factors driving the observed patterns.
It is also important to mention that further investigation is needed to interpret the negative values observed in some months, as these may indicate data reporting errors or anomalies.
Overall, this analysis provides preliminary insights into the seasonal patterns, peak and trough periods, and overall trends of Hepatitis cases in mainland China prior to June 2023. However, it is important to note that additional data and a more comprehensive analysis would be necessary to understand the underlying factors driving these patterns and to inform public health interventions aimed at Hepatitis prevention and control.

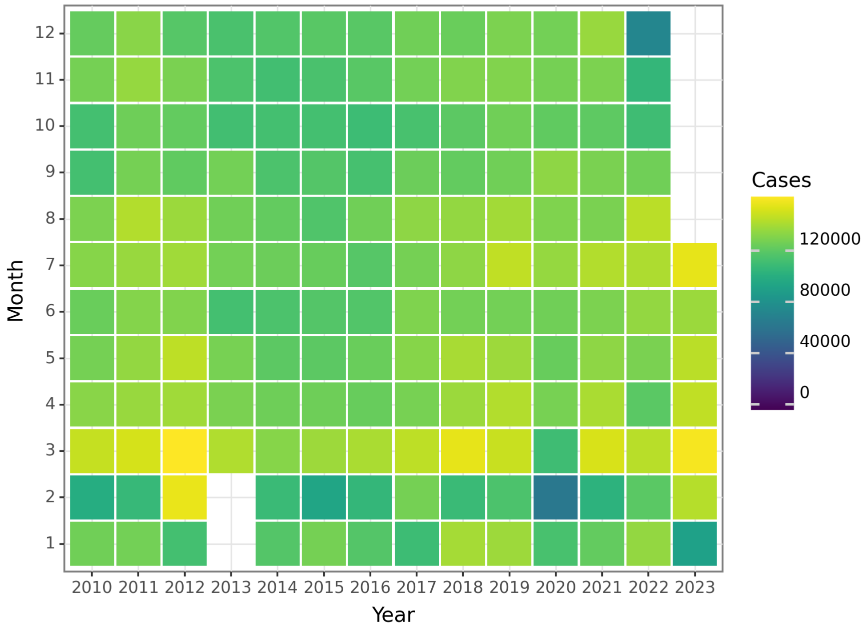

Figure 18: The Change of Hepatitis Cases before 2023 June

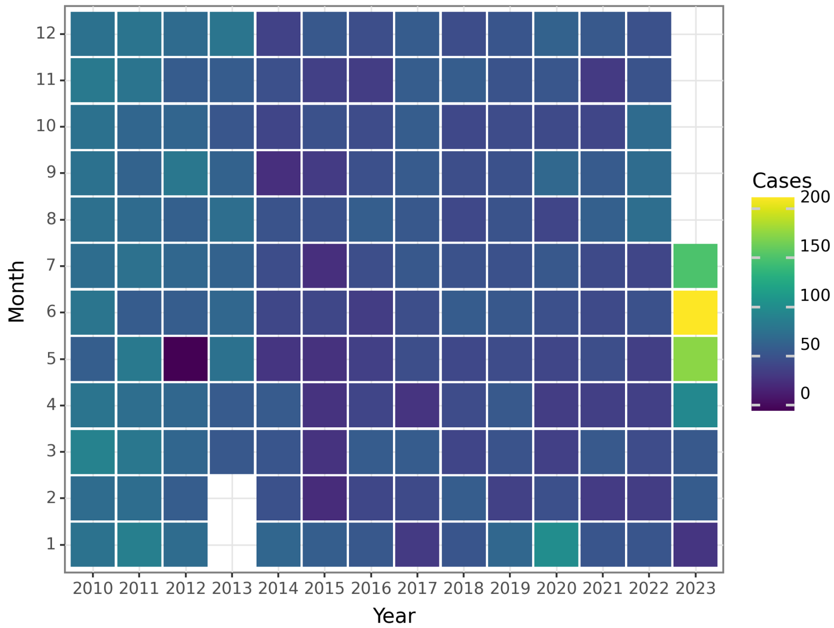

Figure 19: The Change of Hepatitis Deaths before 2023 June

Hepatitis A

Hepatitis A is a viral infection that primarily affects the liver. It is caused by the hepatitis A virus (HAV) and is commonly transmitted through the ingestion of contaminated food or water. Hepatitis A is a significant global health concern, with varying prevalence rates among different regions and populations.

Historical Context and Discovery: Hepatitis A was first described in the 19th century; however, its viral etiology was not discovered until the mid-20th century. In 1973, researchers identified the hepatitis A virus (HAV) as the causative agent of the disease. This discovery revolutionized the understanding and management of hepatitis A and led to the development of preventive measures such as vaccines.

Prevalence and Transmission Routes: Hepatitis A is found worldwide, but its prevalence varies among countries and regions. The virus is most prevalent in areas with inadequate sanitation or hygiene practices, which contribute to fecal-oral transmission routes. Common modes of transmission include:

1. Consumption of contaminated food or water: The virus can be present in water supplies or food that has been washed or irrigated with contaminated water. Handling food with unwashed hands can also contribute to transmission. 2. Close person-to-person contact: Hepatitis A can spread through direct contact with an infected person's fecal matter, such as during sexual activity, childcare settings, or through poor personal hygiene practices. 3. Travel-related transmission: Travelers to countries with higher prevalence rates may be at risk of acquiring hepatitis A due to exposure to contaminated food, water, or unsanitary conditions.

Affected Populations: While hepatitis A can affect individuals of all ages and demographics, certain populations are particularly vulnerable to infection. These populations include:

1. Individuals living in areas with inadequate sanitation: Regions with poor sanitary conditions have higher rates of hepatitis A. This includes developing countries or specific areas within developed countries with inadequate infrastructure. 2. Travelers to higher-risk regions: Individuals traveling to countries with higher hepatitis A prevalence may be at higher risk, especially if they have limited access to clean water and safe food. 3. Injecting drug users: Sharing contaminated needles or engaging in risky drug-related behaviors can increase the risk of hepatitis A transmission. 4. Men who have sex with men: This population is at an increased risk of hepatitis A due to the potential for fecal-oral transmission during sexual activity. 5. Children in low socioeconomic areas: Children living in settings with poor sanitation, crowding, or limited resources may be more susceptible to hepatitis A infection.

Key Statistics: Each year, approximately 1.4 million cases of acute hepatitis A occur worldwide. However, this number may not accurately represent the true burden of the disease as many mild or asymptomatic cases go unreported. The majority of hepatitis A cases occur in regions with inadequate sanitation and limited access to safe water.

Impact on Different Regions and Populations: Hepatitis A has varying impacts on different regions and populations. In developed countries with high standards of sanitation, the incidence of hepatitis A is relatively low. However, outbreaks can still occur in these regions, particularly when susceptible individuals come into contact with infected individuals or travel to higher-risk areas.

In contrast, developing countries with limited access to clean water and proper sanitation face a higher burden of hepatitis A. These regions often experience periodic outbreaks, especially in densely populated areas with inadequate hygiene practices.

The impact of hepatitis A also varies among populations. While adults infected with hepatitis A may experience mild symptoms or be asymptomatic, the disease can be more severe in young children and older individuals. Consequently, regions or groups with a higher proportion of vulnerable populations may experience more severe health consequences and complications associated with hepatitis A infection.

In summary, the global epidemiology of hepatitis A highlights varying prevalence rates and affected populations. Improving sanitation and hygiene practices, along with widespread vaccination, are crucial in reducing the burden of hepatitis A worldwide.

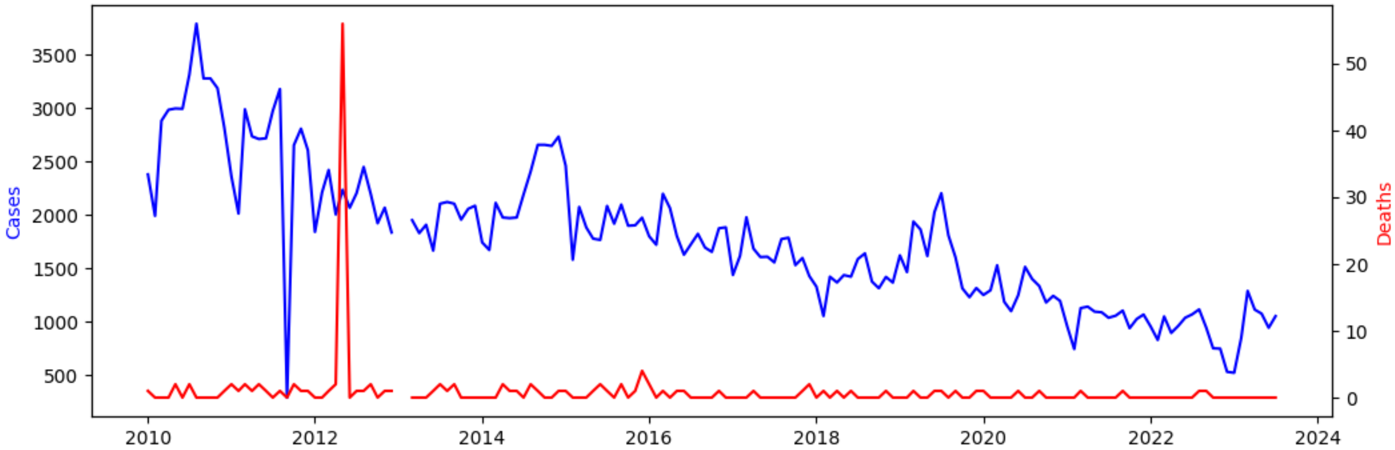

Figure 20: The Change of Hepatitis A Reports before 2023 June

Seasonal Patterns: Hepatitis A cases in mainland China exhibit a distinct seasonal pattern. Based on the available data, there is an evident increase in cases during the summer months (June to August) followed by a decline towards the end of the year. Specifically, there is a prominent peak in cases during July and August, followed by a decrease in the winter months.

Peak and Trough Periods: The peak period for Hepatitis A cases in mainland China consistently occurs during the summer and autumn months, with the most cases appearing in July and August. This peak is then followed by a trough period in the winter months, particularly in December and January. This seasonal pattern holds true across multiple years according to the available data.

Overall Trends: Generally, there is a downward trend in Hepatitis A cases in mainland China leading up to June 2023. The number of cases seems to have decreased from 2010 to 2023, albeit with some fluctuations over the years. It is worth noting that there was a significant decline in reported cases in 2013, specifically in January and February. However, this decline might be attributed to inconsistencies in data reporting.

Discussion: The observed seasonal patterns and peak and trough periods of Hepatitis A cases in mainland China indicate a potential association with specific environmental and behavioral factors. The higher incidence during the summer months could be linked to increased outdoor activities, improper food handling practices, and a potential elevation in exposure to contaminated water sources. Conversely, the decrease in cases during the winter months may be attributed to improved sanitation practices and heightened awareness of preventive measures.

The overall declining trend in cases demonstrates the effectiveness of public health interventions and vaccination programs in reducing the burden of Hepatitis A in mainland China. Nevertheless, it is crucial to remain vigilant and sustain efforts to keep case numbers low and prevent outbreaks. Further analysis and investigation are required to comprehend the precise factors contributing to the observed trends and to inform targeted interventions for the control and prevention of Hepatitis A in the future.

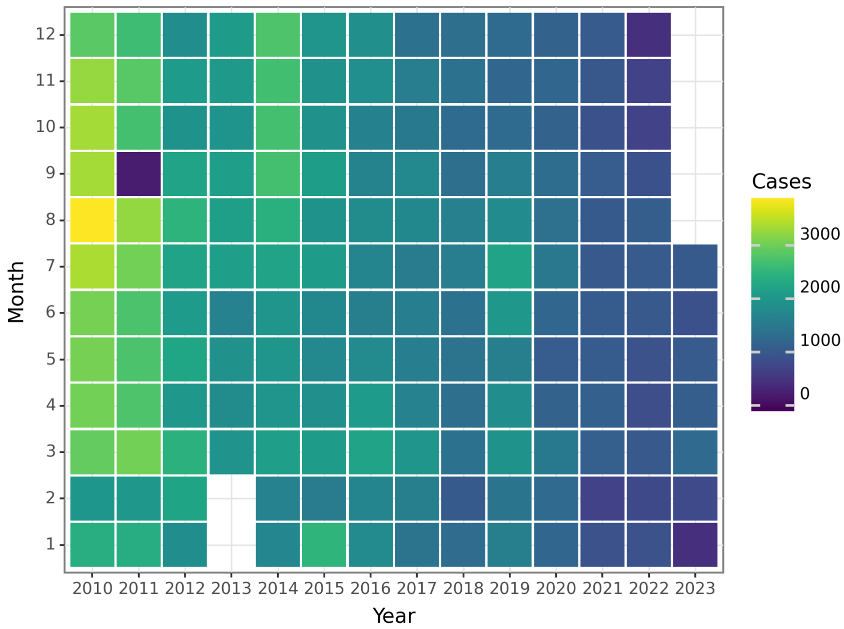

Figure 21: The Change of Hepatitis A Cases before 2023 June

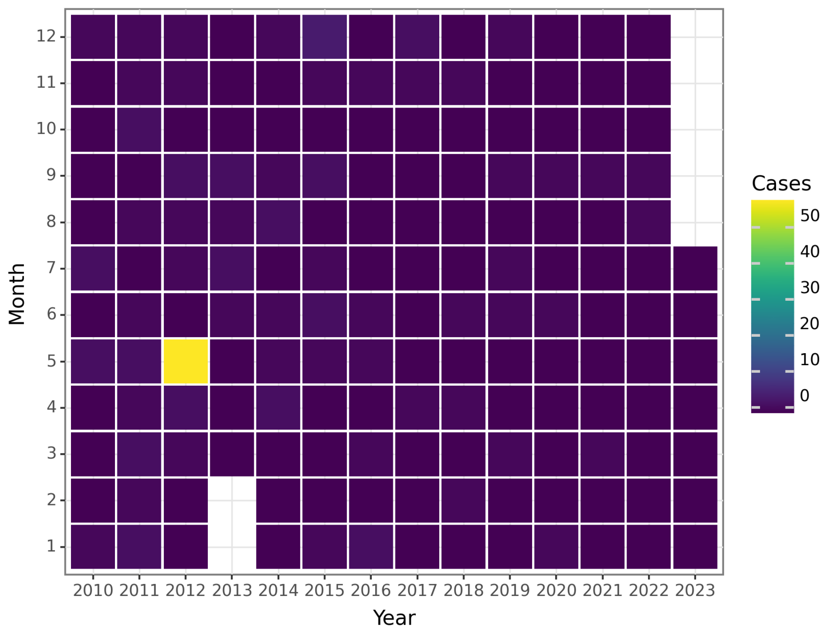

Figure 22: The Change of Hepatitis A Deaths before 2023 June

Hepatitis B

Hepatitis B is a viral infection that specifically targets the liver and is caused by the hepatitis B virus (HBV). It is a significant global public health issue, with varying prevalence rates across regions and populations. Hepatitis B is primarily transmitted through contact with infectious blood or bodily fluids of an infected individual. In this overview, we will provide a comprehensive discussion on the epidemiology of Hepatitis B, including its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, major risk factors for transmission, and the impact on different regions and populations.
Global Prevalence: Hepatitis B is one of the most commonly occurring viral infections worldwide. According to the World Health Organization (WHO), an estimated 257 million people were living with chronic hepatitis B infection in 2019. The highest rates of infection are seen in sub-Saharan Africa and the Western Pacific region, where prevalence rates exceed 5%. On the other hand, North America and Western Europe have low prevalence rates, below 1%.
Transmission Routes: Hepatitis B is primarily transmitted through exposure to infected blood or bodily fluids. The most common modes of transmission include the following:
1. Mother-to-child transmission: During childbirth, hepatitis B can be transmitted from an infected mother to her baby. 2. Unsafe medical procedures: The virus can be transmitted through the use of contaminated medical equipment, such as syringes, needles, and other injection-related equipment. 3. Unprotected sexual contact: Hepatitis B can be transmitted through sexual intercourse with an infected individual. 4. Needle-sharing and drug paraphernalia: Individuals who inject drugs and share needles or other paraphernalia have an increased risk of Hepatitis B transmission. 5. Occupational exposure: Healthcare workers, laboratory staff, and others who come into contact with infected blood or bodily fluids are at risk of contracting Hepatitis B. 6. Tattooing and body piercing: If proper infection control measures are not followed, Hepatitis B can be transmitted through tattooing and body piercing procedures.
Affected Populations: Hepatitis B can affect individuals of any age, sex, or race. However, certain populations are more vulnerable to infection. These include:
1. Infants born to HBV-infected mothers: Without timely intervention, up to 90% of infants born to mothers with chronic HBV infection become chronically infected themselves. 2. Injecting drug users: Sharing needles and drug paraphernalia significantly increases the risk of Hepatitis B transmission. 3. Individuals with multiple sexual partners: Unprotected sexual contact with an infected person increases the risk of transmission. 4. Men who have sex with men: This group is at a higher risk due to the higher likelihood of unprotected sexual contact. 5. Healthcare workers: Those who come into contact with infected blood or bodily fluids are at an increased risk if proper infection control practices are not followed.
Key Statistics: - Approximately 2 billion people have been infected with Hepatitis B at some point in their lives, resulting in around 880,000 deaths each year due to complications of the infection. - The majority of individuals (90%) infected with Hepatitis B during infancy or childhood develop chronic infection. - Chronic Hepatitis B infection can lead to severe liver diseases, including cirrhosis and liver cancer. - Hepatitis B is preventable through a safe and effective vaccine.
Historical Context and Discovery: Hepatitis B has been a recognized disease for centuries; however, it wasn't until the 1960s that the discovery of the hepatitis B surface antigen (HBsAg) contributed to an improved understanding and identification of the virus. The development of the first effective vaccine against Hepatitis B occurred in the early 1980s, which has since played a significant role in reducing the burden of the disease.
Major Risk Factors for Transmission: 1. Lack of vaccination: Individuals who have not received the Hepatitis B vaccine are at an increased risk of transmission. 2. Unprotected sexual contact: Engaging in sexual activities without using barrier methods, such as condoms, increases the risk of transmission. 3. Sharing of needles and drug paraphernalia: Injection drug users who share needles have an elevated risk of contracting Hepatitis B. 4. Occupational exposure: Healthcare workers who come into contact with infected blood or bodily fluids without proper protective measures are at risk. 5. Migration from high prevalence regions: Individuals from countries with high prevalence rates who move to regions with low prevalence may carry the virus and continue its transmission.
Impact on Different Regions and Populations: The impact of Hepatitis B varies across regions and populations due to differences in prevalence rates and affected demographics. Sub-Saharan Africa and the Western Pacific region bear a significant burden, with high prevalence rates and an increased risk of transmission through mother-to-child transmission. In contrast, North America and Western Europe have successfully implemented vaccination programs, resulting in lower prevalence rates and reduced impact. However, vulnerable populations within these regions, such as injecting drug users and immigrants from

high-risk areas, may still be affected.
To address the global burden of Hepatitis B, prevention efforts focus on vaccination programs, increasing awareness about transmission routes and risk factors, and improving access to screening and treatment. Public health strategies emphasize the importance of universal vaccination, safe injection practices, and comprehensive sexual health education to reduce transmission rates and the impact of Hepatitis B worldwide.

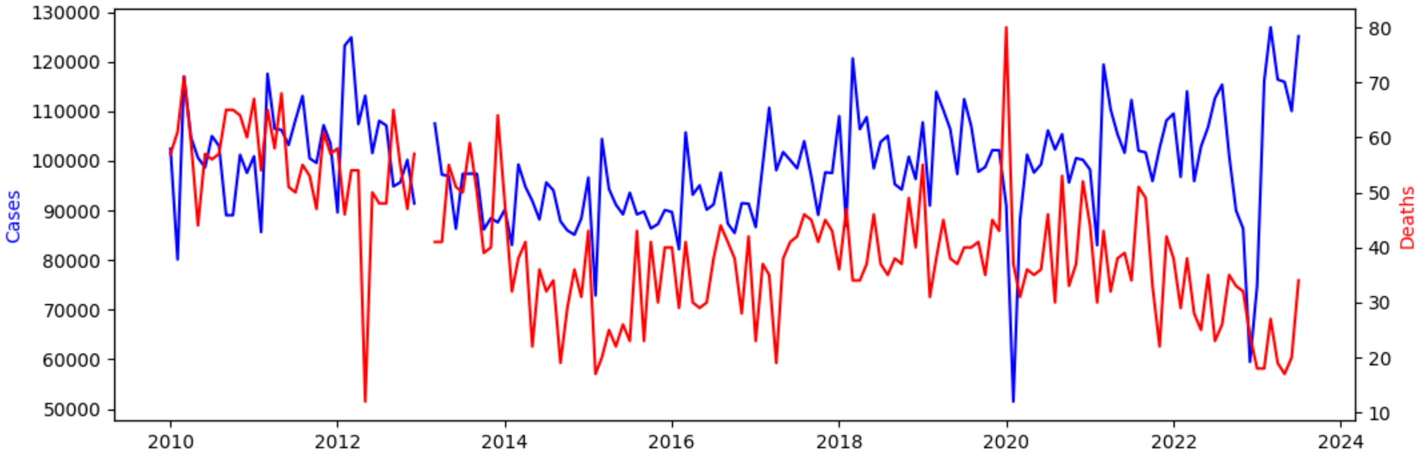

Figure 23: The Change of Hepatitis B Reports before 2023 June

Seasonal Patterns
The provided data on Hepatitis B cases and deaths in mainland China reveals distinct seasonal patterns. Fluctuations are observed throughout the year, with higher numbers occurring in certain months compared to others.
Peak and Trough Periods
The peak periods for Hepatitis B cases and deaths exhibit variation across different years. However, it is consistently observed that the months of March, April, and May consistently have higher numbers of both cases and deaths, indicating these months as peak periods for Hepatitis B in mainland China. Conversely, the trough periods occur in January and February, with significantly lower numbers compared to the rest of the year.
Overall Trends
Upon analysis of the overall trends, an increasing pattern in Hepatitis B cases and deaths is noted from 2010 to 2018. However, starting from 2019, a slight decrease in the number of cases and deaths is observed. It is important to note a significant decrease in deaths from 2012 to 2013, likely due to the inclusion of inappropriate values (-10) during these months.
Discussion
The seasonal patterns of Hepatitis B cases and deaths in mainland China potentially reflect factors such as changes in weather, human behavior, and viral transmission dynamics. Peak periods during spring (March, April, and May) may be influenced by increased outdoor activities, gatherings, and exposure to infected individuals. Conversely, trough periods in winter (January and February) may be associated with fewer social interactions and lower transmission rates due to colder weather, limiting disease transmission.
The overall increasing trend in Hepatitis B cases and deaths from 2010 to 2018 may indicate various factors influencing the disease burden, including changes in awareness, testing, reporting practices, population susceptibility, and risk behaviors. The subsequent slight decrease in cases and deaths from 2019 onwards may suggest improved prevention and control interventions, increased vaccination coverage, or changes in population behavior and awareness. However, further analysis and investigation are required to comprehensively understand the drivers behind these trends.
It is worth noting that the presence of inappropriate values (-10) for certain months introduces data inconsistencies, particularly regarding deaths. These values need to be reviewed and corrected to ensure data accuracy and reliability for further analysis and interpretation.

Overall, continuous monitoring of Hepatitis B cases and deaths, along with interventions focused on the identified peak periods, can contribute to the control and prevention of the disease in mainland China.

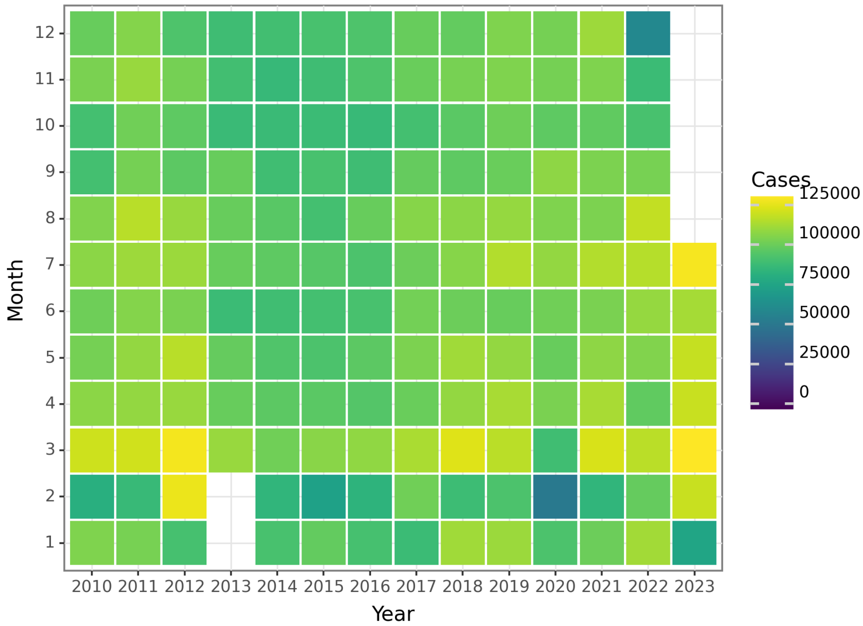

Figure 24: The Change of Hepatitis B Cases before 2023 June

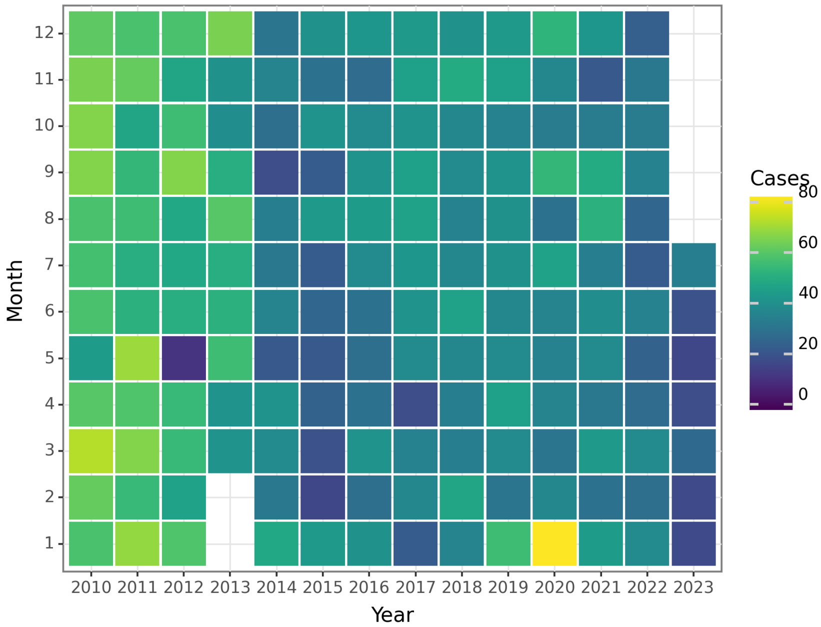

Figure 25: The Change of Hepatitis B Deaths before 2023 June

Hepatitis C

Hepatitis C is a viral infection caused by the Hepatitis C virus (HCV) and is a significant concern for public health worldwide. It is primarily transmitted through exposure to infected blood and can result in chronic liver disease, cirrhosis, and hepatocellular carcinoma if left untreated. Understanding the epidemiology of Hepatitis C is essential for developing effective prevention strategies and allocating healthcare resources efficiently.
1. Global Prevalence: Hepatitis C affects individuals in all regions of the world, with an estimated 71 million people globally living with chronic HCV infection. Annually, it causes 399,000 deaths. The highest prevalence rates are found in low- and middle-income countries, particularly in Africa, the Eastern Mediterranean, and Central and East Asia.
2. Transmission Routes: The most common routes of Hepatitis C transmission include: - Injection drug use, which involves sharing needles and other drug paraphernalia. - Blood transfusions received before the implementation of screening techniques in the 1990s. - Unsafe medical practices that involve contaminated healthcare equipment, including needles, syringes, and other invasive devices. - Rare instances of transmission through organ transplantation and surgical procedures. - Although less common, sexual transmission can occur, especially among individuals with multiple sexual partners and engaging in high-risk sexual behaviors. - Mother-to-child transmission occurs during childbirth and accounts for less than 6% of cases.
3. Affected Populations: Although Hepatitis C can affect individuals of all ages and backgrounds, certain populations are more vulnerable, including: - People who inject drugs, who have the highest prevalence of HCV due to sharing needles and other injection equipment. - Individuals in prisons or correctional facilities, where crowded conditions, shared drug equipment, and limited access to healthcare contribute to higher prevalence rates. - Patients who received blood transfusions or organ transplants before effective screening measures were implemented. - Healthcare workers exposed to infected blood and needle injuries. - Individuals with HIV or Hepatitis B, as co-infection with other viral infections increases the risk of acquiring HCV. - Babies born to HCV-positive mothers.
4. Historical Context and Discovery: The discovery of Hepatitis C occurred relatively recently. Before its identification, only two main types of viral hepatitis were recognized: Hepatitis A and Hepatitis B. In the 1960s, research indicated the existence of another form of viral hepatitis that was neither Hepatitis A nor B. Initially known as non-A, non-B hepatitis, it wasn't until 1989 that the virus responsible was isolated and named Hepatitis C. This breakthrough led to improved diagnostic testing and the development of antiviral therapies over time.
5. Major Risk Factors for Transmission: Several risk factors can increase the likelihood of acquiring Hepatitis C, including: - Injection drug use, involving sharing needles and other drug paraphernalia. - Receiving blood transfusions or organ transplants before screening measures were implemented. - Receiving medical or dental procedures in poorly regulated settings with inadequate infection control practices. - Occupational exposure to infected blood, such as healthcare workers or laboratory staff. - Having multiple sexual partners, particularly in the presence of other sexually transmitted infections. - Maternal transmission during childbirth.
6. Regional and Population Impact: The impact of Hepatitis C varies across regions and populations due to different healthcare infrastructure, prevention strategies, and access to treatment. For example: - High-income countries have successfully implemented prevention and treatment programs, resulting in decreased prevalence rates. - In low- and middle-income countries with limited resources and awareness, the burden of Hepatitis C remains higher. - Populations such as people who inject drugs and prisoners have significantly higher infection rates due to specific risk behaviors and limited access to healthcare.
In conclusion, Hepatitis C is a global health issue with varying prevalence rates across different regions, affecting people from diverse backgrounds. Recognizing the various transmission routes and populations at risk is crucial for developing effective prevention strategies and appropriately allocating healthcare resources. The discovery of Hepatitis C has led to significant advancements in diagnosis and treatment, although challenges persist in achieving global elimination of this viral infection.

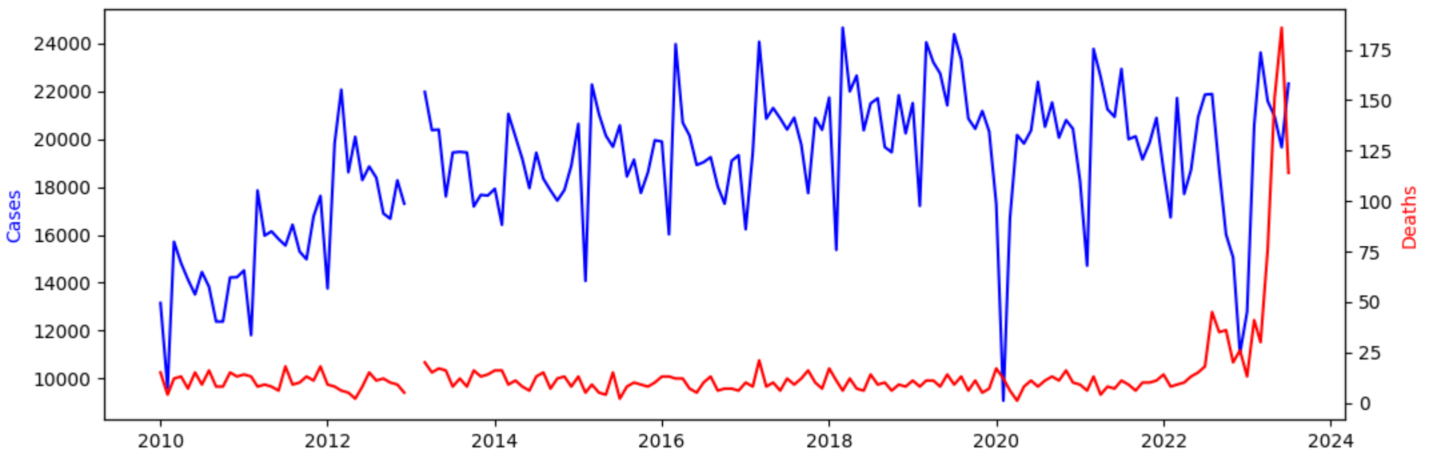

Figure 26: The Change of Hepatitis C Reports before 2023 June

Seasonal Patterns: Analysis of monthly data on Hepatitis C cases in mainland China from January 2010 to June 2023 indicates the presence of a noticeable seasonal pattern. During the winter months, the number of cases tends to be lower, while the summer months see a higher number of cases. Specifically, there is a consistent increase in cases starting in April or May, reaching a peak in July, and then declining towards the end of the year.
Peak and Trough Periods: The highest number of Hepatitis C cases in mainland China consistently occurs in July, making it the peak period. Conversely, the lowest number of cases, referred to as the trough period, typically happens during the winter months, specifically in December and January.
Overall Trends: A comprehensive analysis of the overall trend reveals an increasing pattern in Hepatitis C cases in mainland China throughout the study period. From 2010 to 2015, there is a general upward trend with some fluctuations. However, starting from 2015, there appears to be a slight decrease in the number of cases.
Discussion: The observed seasonal pattern with higher case numbers in the summer months can be attributed to various factors. One possible explanation is that increased outdoor activities and greater interpersonal contact during warm weather may facilitate the spread of the virus. Additionally, changes in behavior, travel patterns, or environmental conditions during the summer months could also contribute to the seasonal variation.
The peak in July suggests that measures to control and prevent Hepatitis C should be intensified in anticipation of and during this period. This includes targeted public health campaigns, improved screening and testing procedures, and enhanced efforts to ensure access to treatment and care.
The overall increasing trend in Hepatitis C cases until 2015 underscores the need for ongoing surveillance and intervention strategies to address the underlying risk factors and prevent further transmission. The subsequent slight decrease since 2015 may indicate that some of these efforts have been effective, emphasizing the importance of continued monitoring and strategic interventions.
It is important to acknowledge that these findings are based solely on the provided data, and additional information and analysis may be necessary for a comprehensive understanding of the dynamics of Hepatitis C in mainland China.

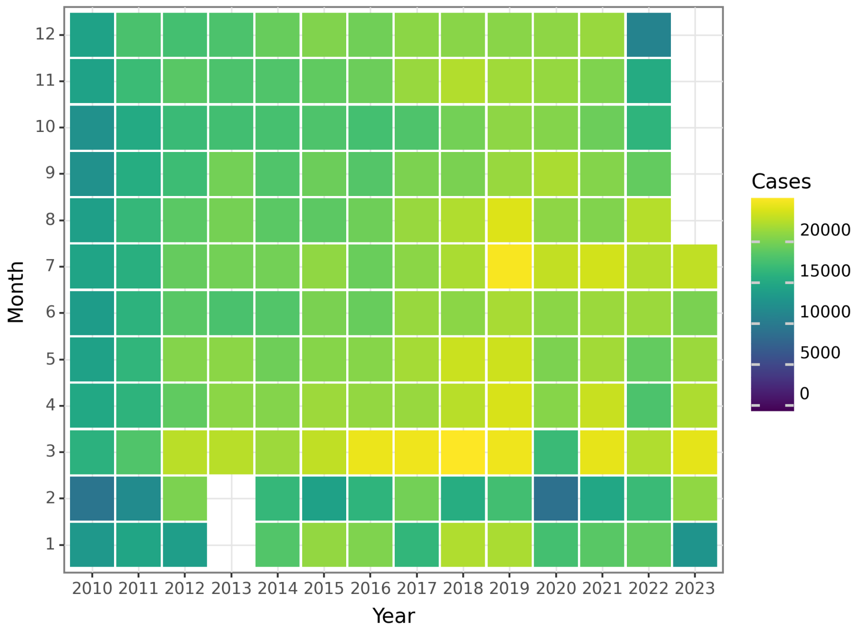

Figure 27: The Change of Hepatitis C Cases before 2023 June

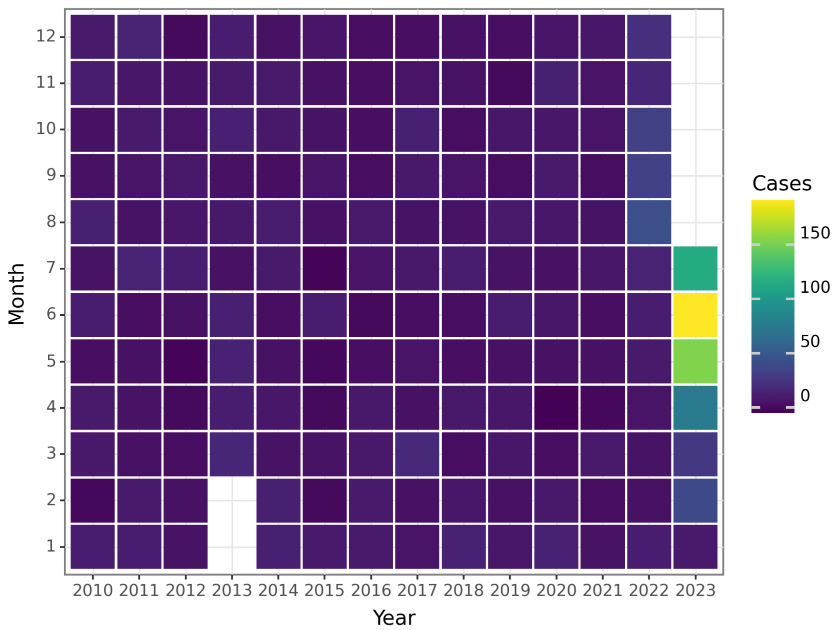

Figure 28: The Change of Hepatitis C Deaths before 2023 June

Hepatitis D

Hepatitis D, also known as delta hepatitis, is a viral infection that only occurs in individuals who are already infected with the hepatitis B virus (HBV). It is caused by the hepatitis D virus (HDV), a defective RNA virus that relies on HBV for replication. The co-infection of HBV and HDV leads to a more severe form of liver disease.
Historical Context and Discovery: Hepatitis D was initially identified in 1977 by Dr. Mario Rizzetto and his colleagues in Italy. They discovered a new antigen in the blood of patients with chronic hepatitis B, which they named the delta antigen. Later, it was determined that this antigen was linked to a new virus, HDV.
Global Prevalence: Hepatitis D is a significant public health concern in many regions around the world, although its prevalence varies greatly. The prevalence of HDV is highest in areas where HBV infection is widespread, including Sub-Saharan Africa, the Amazon Basin, Mongolia, and parts of Eastern Europe and Asia. In these regions, 70-90% of individuals with HBV also have HDV co-infection. Conversely, in Western countries and places with effective HBV vaccination programs, the prevalence of HDV is relatively low.
Transmission Routes: Hepatitis D is mostly transmitted through contact with infected blood. The primary mode of transmission is through percutaneous exposure to contaminated blood or blood products, such as sharing needles or syringes among drug users, receiving tainted blood transfusions or organ transplants, and unsafe medical procedures. While less common, transmission can also occur through sexual contact and from mother to child. Moreover, close household contact with an infected individual can result in HDV transmission.
Affected Populations: Hepatitis D primarily affects individuals already infected with HBV. Therefore, at-risk populations for HDV infection include those with chronic HBV infection, injection drug users, individuals undergoing hemodialysis, and those who have received contaminated blood or blood products. HDV infection is more common among men, likely due to higher rates of risky behaviors.
Key Statistics: - Approximately 15-20 million people worldwide are estimated to be co-infected with HBV and HDV. - The prevalence of HDV varies significantly among regions, ranging from less than 1% in certain European countries to over 70% in specific Sub-Saharan African countries. - HDV infection is associated with more severe liver disease and a higher risk of liver cirrhosis, liver failure, and hepatocellular carcinoma compared to HBV infection alone. - The annual global mortality rate due to HDV is estimated to be 20,000 to 30,000 deaths.
Major Risk Factors: The primary risk factor for HDV transmission is having chronic HBV infection. Other risk factors include injection drug use, sharing needles or syringes, receiving contaminated blood or blood products, and engaging in unsafe medical procedures. Additionally, unprotected sexual contact with an individual infected with both HBV and HDV can lead to HDV transmission.
Impact on Different Regions and Populations: The impact of HDV varies across different regions and populations. In areas with high rates of HBV and HDV co-infection, such as Sub-Saharan Africa and the Amazon Basin, HDV infection is a leading cause of chronic liver disease and hepatocellular carcinoma. In these regions, HDV significantly contributes to the burden of liver-related morbidity and mortality. Conversely, in Western countries with successful HBV vaccination programs, the prevalence of HDV is lower, and the disease has a limited impact.
In conclusion, Hepatitis D is a viral infection that exclusively occurs in individuals with HBV. Its global prevalence varies, with high rates in regions where HBV infection is endemic. HDV transmission occurs through percutaneous exposure, sexual contact, and maternal-fetal transmission. HDV infection leads to more severe liver disease than HBV infection alone and carries a higher risk of cirrhosis and hepatocellular carcinoma. Understanding the epidemiology and impact of HDV is crucial for implementing effective prevention strategies and improving global healthcare.

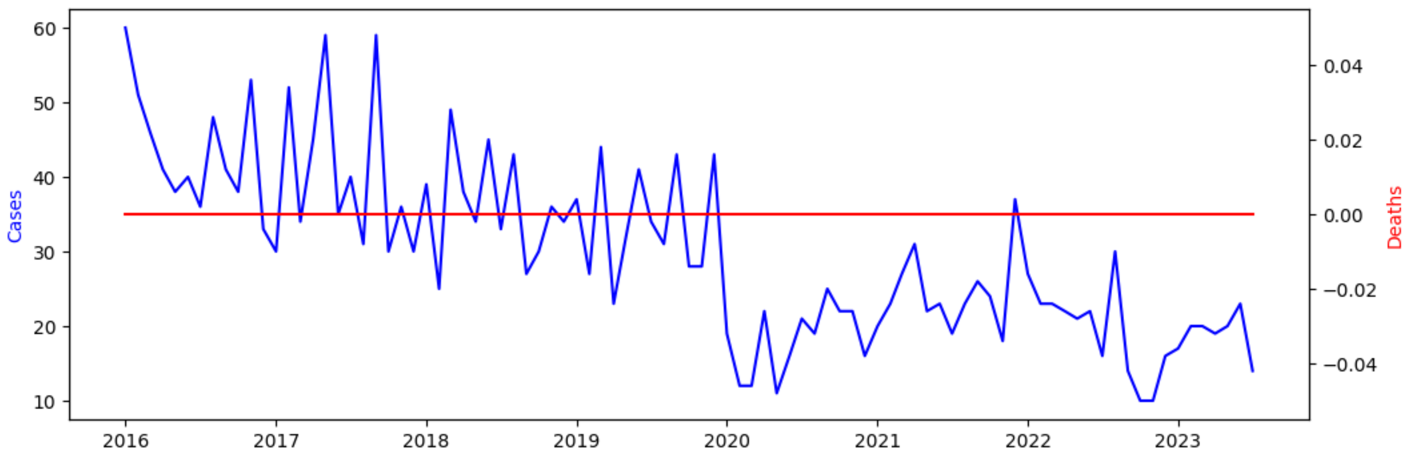

Figure 29: The Change of Hepatitis D Reports before 2023 June

Seasonal Patterns: When examining the monthly data for Hepatitis D cases in mainland China prior to June 2023, a consistent seasonal pattern becomes apparent. There is a higher incidence of cases during the winter months (December to February) and a lower incidence during the summer months (June to August).
Peak and Trough Periods: The peak periods for Hepatitis D cases primarily occur towards the end of the year, specifically in November and December, when there is a higher prevalence. Conversely, the trough periods, with the fewest number of cases, are observed during the summer months, particularly in July and August.
Overall Trends: A slight decrease in Hepatitis D cases is observed from 2016 to 2017. However, from 2017 to 2019, there is a general upward trend with intermittent fluctuations. In 2020, there is a significant decrease in cases, likely influenced by external factors such as the COVID-19 pandemic. The trend remains relatively stable from 2020 to 2023, without any substantial increases or decreases.
Discussion: The seasonal patterns of Hepatitis D cases in mainland China indicate a potential connection between the disease's incidence and the winter season. This relationship could be attributed to factors including increased indoor gatherings and closer contact among individuals during this time of year. Moreover, the consistent peaks in November and December may be linked to specific events or behaviors that contribute to the spread of the infection.
The overall trends suggest an increase in Hepatitis D cases in mainland China between 2017 and 2019, followed by a decrease in 2020. It is important to further investigate the factors that contribute to these trends and assess the effectiveness of preventative measures and interventions during these periods. However, it is important to note that this analysis is solely based on the provided data and does not consider potential factors such as changes in surveillance methods or reporting practices. Further research and analysis are necessary to comprehensively understand the epidemiology of Hepatitis D in mainland China.

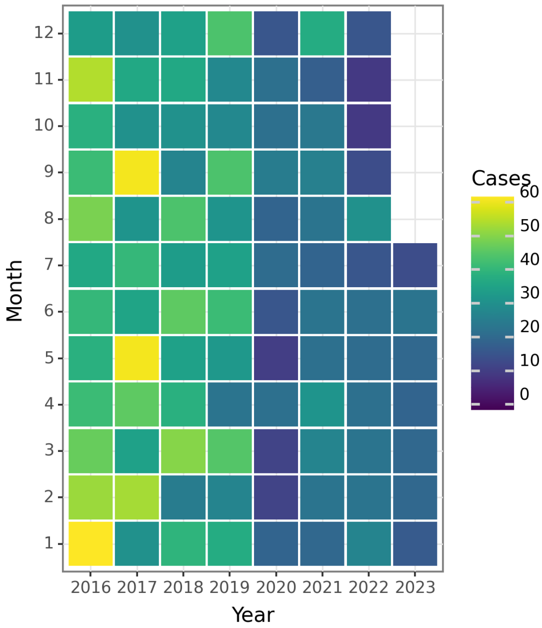

Figure 30: The Change of Hepatitis D Cases before 2023 June

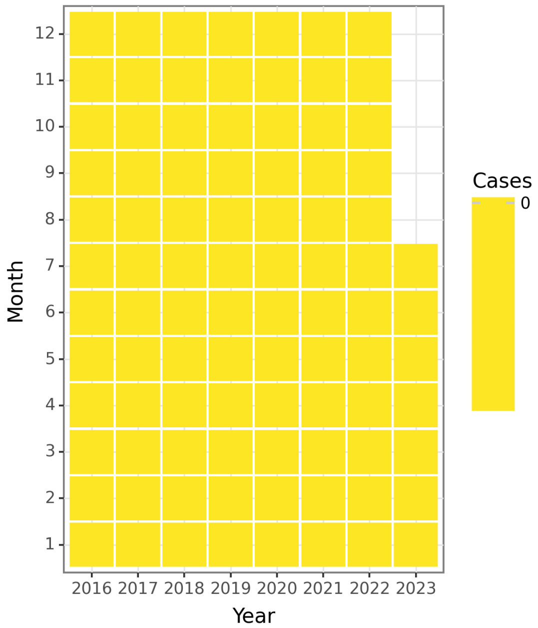

Figure 31: The Change of Hepatitis D Deaths before 2023 June

Hepatitis E

Hepatitis E is a viral infection caused by the hepatitis E virus (HEV) and primarily affects the liver. It is a disease that is widely present globally, particularly in countries with limited resources and inadequate sanitation facilities. Hepatitis E is mainly transmitted through the fecal-oral route, primarily through contaminated water and food. It can also be transmitted through person-to-person contact, blood transfusion, and vertical transmission from mother to fetus.

Historical Context and Discovery: Hepatitis E was first recognized in 1955 during a large outbreak in Delhi, India. However, the virus was not identified until 1990 when it was isolated from the feces of infected individuals. The discovery of the virus led to the development of diagnostic tests, and subsequently, cases of hepatitis E were detected worldwide.

Global Prevalence: Hepatitis E is a significant global health issue, with an estimated 20 million cases and approximately 70,000 deaths occurring each year. The highest burden of the disease is observed in regions with limited access to clean water and proper sanitation, such as Asia, Africa, and Central America. Outbreaks are more common in developing countries, particularly after natural disasters or in conflict-affected areas.

Transmission Routes: The primary route of transmission for hepatitis E is the consumption of contaminated water or food. Contaminated shellfish, pork, and game meats have been identified as sources of infection. The virus can also be transmitted through direct contact with infected individuals, including sexual contact and blood transfusion.

Affected Populations: Hepatitis E can affect individuals of all ages. However, pregnant women, especially those in their third trimester, are particularly vulnerable to severe forms of the disease, with a higher risk of mortality. Other vulnerable populations include individuals with pre-existing liver disease, such as those infected with hepatitis B or C, and individuals with compromised immune systems.

Key Statistics: 1. The global prevalence of hepatitis E is estimated to be around 2% of the population, but this varies significantly by region. 2. The case fatality rate ranges from 0.5% to 3% and can reach up to 20% in pregnant women during the third trimester. 3. Mortality rates are highest in low-income countries, where access to healthcare is limited. 4. Around 20% of acute hepatitis cases worldwide are caused by hepatitis E. 5. Outbreaks occur frequently in areas with inadequate sanitation, especially during periods of natural disasters or conflict.

Major Risk Factors: 1. Lack of access to clean water and proper sanitation facilities. 2. Consuming raw or undercooked meat, particularly pork and game meats. 3. Consuming shellfish from contaminated waters. 4. Traveling to regions with high hepatitis E prevalence. 5. Being pregnant, especially in the third trimester, as the risk of severe disease and mortality is increased.

Impact on Different Regions and Populations: The impact of hepatitis E varies across regions and populations. In countries with limited resources and poor sanitation infrastructure, hepatitis E is a significant public health concern. These regions experience frequent outbreaks, resulting in high rates of sickness and death. Pregnant women are at particular risk in these settings. In developed countries, hepatitis E is less common but can still occur through travel to regions where the disease is prevalent, consumption of contaminated foods, and cases resulting from blood transfusions.

In conclusion, hepatitis E is a globally prevalent disease primarily transmitted through contaminated water and food. The disease burden is highest in regions with inadequate sanitation, and pregnant women and those with pre-existing liver disease are at an increased risk of severe complications. Efforts to improve sanitation, increase access to clean water, and promote safe food practices are crucial in reducing the transmission and impact of hepatitis E.

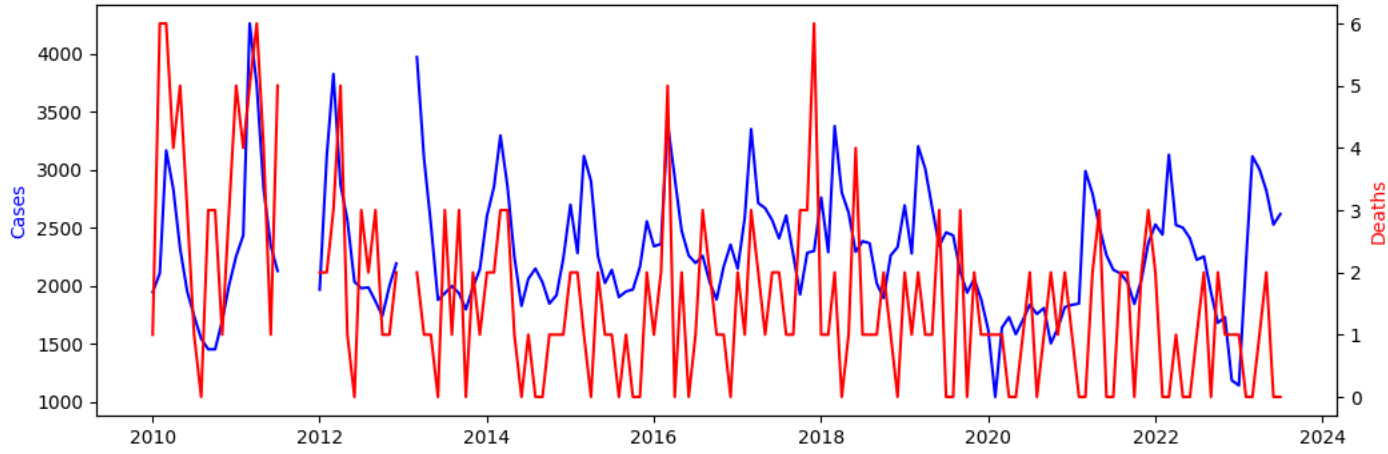

Figure 32: The Change of Hepatitis E Reports before 2023 June

Seasonal Patterns: Based on the provided data, there are noticeable seasonal patterns in the occurrence of Hepatitis E cases in mainland China. The number of cases tends to be higher during the warmer months, particularly from March to September, and lower during the cooler months, specifically from October to February. This suggests a potential association between the transmission of Hepatitis E and seasonal factors such as temperature, rainfall, or human behavior patterns.
Peak and Trough Periods: The peak period for Hepatitis E cases in mainland China is observed from March to June, with the highest number of cases occurring during these months. This corresponds to the warmer weather and potentially increased exposure to the Hepatitis E virus. On the other hand, the lowest number of cases, known as the trough period, is witnessed from October to February, during the colder months.
Overall Trends: Overall, the trend in Hepatitis E cases in mainland China from January 2010 to June 2023 appears to fluctuate annually in a cyclical pattern. There is no clear upward or downward trend in the number of cases over this time period, although there seems to be a gradual increase in cases from 2010 to 2013, followed by a decrease and subsequent fluctuations in later years.
Discussion: The observed seasonal patterns in the occurrence of Hepatitis E cases in mainland China align with previous studies and knowledge regarding the virus's transmission dynamics. Hepatitis E is known to be more prevalent in areas with higher temperatures and during the rainy season, which could explain the higher number of cases during the warmer months from March to September. The lower number of cases during the cooler months might be attributed to reduced transmission due to the decreased survival of the virus outside the host or changes in human behavior patterns.
The peak period for Hepatitis E cases during the months of March to June suggests that interventions and preventive measures targeting this time period may be most effective in reducing the burden of the disease. These measures could include improved sanitation and hygiene practices, as well as vaccination campaigns. Despite the lower number of cases during the trough period from October to February, efforts should still be made to maintain surveillance and early detection to prevent potential outbreaks.
While there is no clear overall trend in the number of Hepatitis E cases in mainland China over the study period, the observed fluctuations emphasize the need for continued monitoring and research on the factors influencing the disease's epidemiology. Further investigation into the specific seasonal and environmental drivers of Hepatitis E transmission in China, as well as potential variations across different regions, could provide valuable insights for targeted public health interventions and control measures.

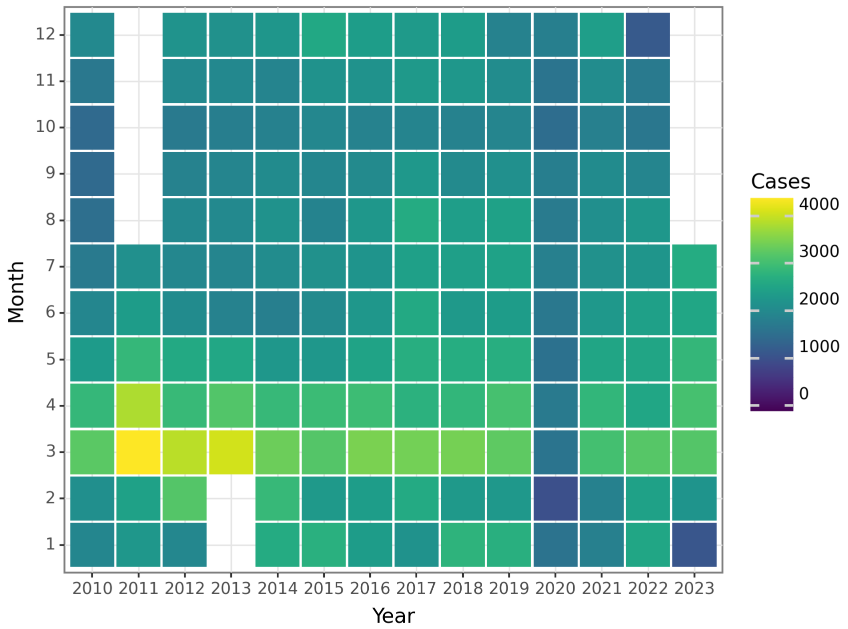

Figure 33: The Change of Hepatitis E Cases before 2023 June

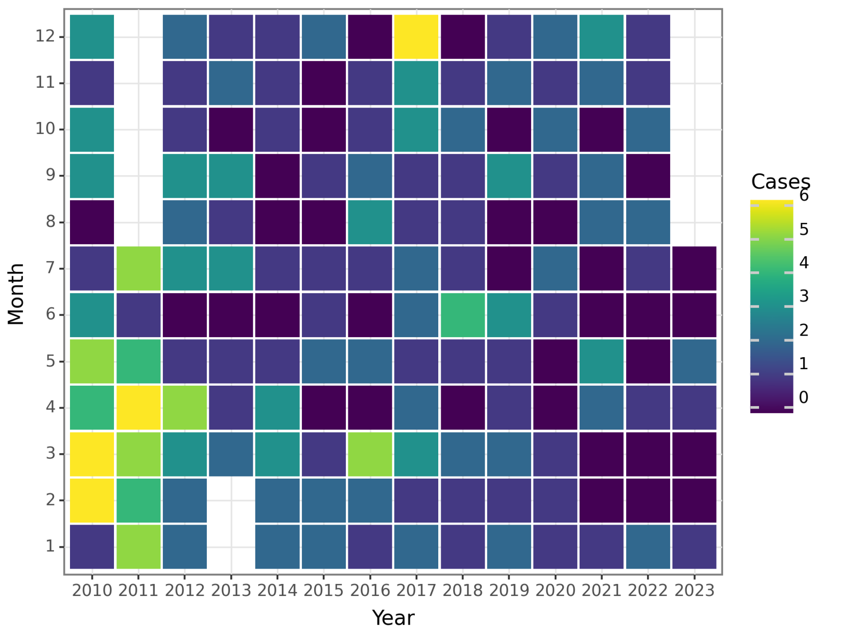

Figure 34: The Change of Hepatitis E Deaths before 2023 June

Other hepatitis

Other hepatitis refers to types of viral hepatitis that are not caused by hepatitis A, B, C, D, or E viruses. These less common and less well-known forms are typically classified as "Other hepatitis" due to their distinct characteristics and limited global prevalence. The epidemiology of Other hepatitis includes its global prevalence, transmission routes, affected populations, key statistics, historical context and discovery, major risk factors, and impact on different regions and populations.
Global Prevalence: While the global prevalence of Other hepatitis is not as well-documented as that of hepatitis A, B, C, D, or E, it is generally considered to be rare compared to these other forms of viral hepatitis. This is because Other hepatitis viruses are less transmissible and less widespread. However, the true prevalence remains uncertain since data on Other hepatitis is often limited or unavailable in many parts of the world.
Transmission Routes: The transmission routes of Other hepatitis vary depending on the specific virus involved. Some forms, such as hepatitis G and TT virus, are primarily transmitted through blood contact, similar to hepatitis B and C. Other forms, like hepatitis F and hepatitis G, may also be transmitted through sexual contact or from mother to child during childbirth. The modes of transmission for certain types of Other hepatitis are still not fully understood, and further research is needed to establish conclusive transmission routes.
Affected Populations: Other hepatitis can affect individuals of all ages and demographics. However, certain populations may be at higher risk due to specific factors. For example, healthcare workers, injection drug users, transfusion recipients, and individuals engaging in high-risk sexual behaviors may have an increased likelihood of contracting Other hepatitis due to potential exposure to contaminated blood or bodily fluids.
Key Statistics: Given the limited data and awareness surrounding Other hepatitis, specific statistics on its prevalence are often lacking. However, it is estimated that the global prevalence is relatively low compared to other forms of viral hepatitis. The true burden of Other hepatitis on public health remains largely unknown due to the scarcity of comprehensive studies.
Historical Context and Discovery: The history of Other hepatitis is closely linked to the discovery and understanding of viral hepatitis as a whole. The first few decades of the 20th century witnessed the identification of hepatitis A and B viruses. It was not until the 1970s and 1980s that additional types of hepatitis, including Other hepatitis, were discovered. Since then, several novel hepatitis viruses have been recognized, often through the study of hepatitis cases with unidentified etiology.
Major Risk Factors: The major risk factors associated with Other hepatitis transmission can vary depending on the specific virus involved. However, in general, risk factors include:
1. Blood transfusion or organ transplantation from an infected donor. 2. Injection drug use with shared needles or other drug paraphernalia. 3. Unprotected sexual intercourse with an infected individual. 4. Occupational exposure to blood or bodily fluids in healthcare settings. 5. Vertical transmission from an infected mother to her child during childbirth. 6. Tattoos or body piercings performed in unsterile environments.
Impact on Different Regions and Populations: The impact of Other hepatitis on different regions and populations is not as well-studied as the impact of hepatitis A, B, C, D, or E. This may be due to its lower prevalence and relatively recent recognition. Variations in prevalence rates and affected demographics may occur due to differences in healthcare infrastructure, population density, socioeconomic factors, and public health interventions.
In conclusion, Other hepatitis refers to various types of viral hepatitis that are not caused by hepatitis A, B, C, D, or E. Its global prevalence is relatively low compared to the more well-known forms of viral hepatitis. Transmission routes can include blood contact, sexual contact, and vertical transmission. Major risk factors include exposure to infected blood or bodily fluids through injection drug use, occupational exposure, or unprotected sex. The impact of Other hepatitis on different regions and populations is still not well-documented, and further research is needed to understand its true burden on public health.

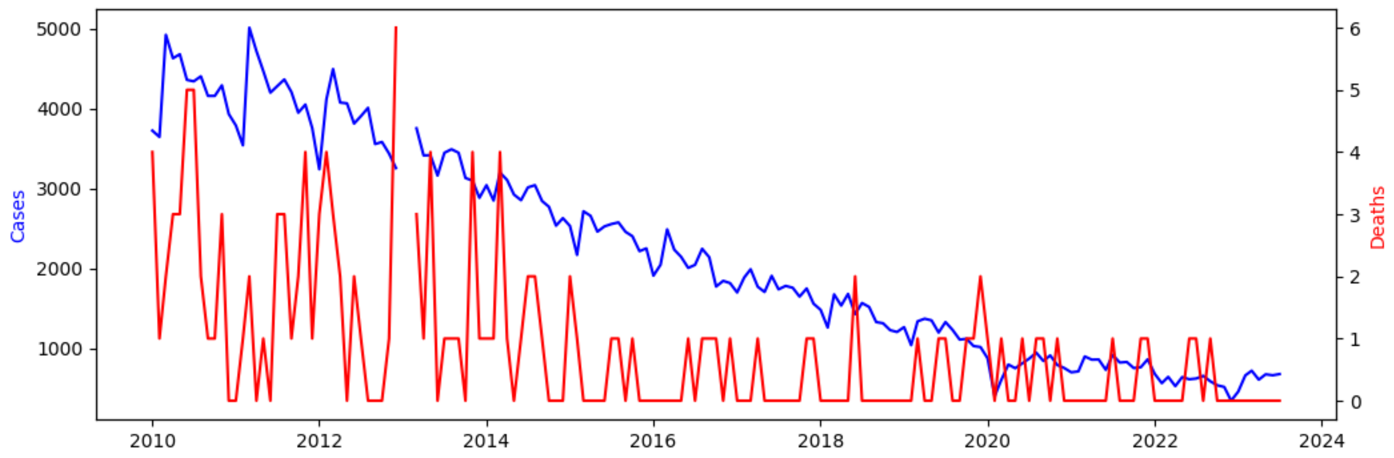

Figure 35: The Change of Other hepatitis Reports before 2023 June

Seasonal Patterns: Analysis of the data provided on cases and deaths before June 2023 for other hepatitis in mainland China reveals the presence of seasonal patterns. Typically, there is a higher incidence of cases and deaths during the first half of the year, specifically from January to June. The number of cases and deaths consistently increases from January to March, followed by a slight decline in the subsequent months. However, it is important to acknowledge that there is some variation from year to year, and not all years exhibit the same seasonal patterns.
Peak and Trough Periods: The peak periods for cases and deaths related to other hepatitis in mainland China are observed between January and March, consistently demonstrating higher numbers during this timeframe. In March, the highest number of cases is observed, while the highest number of deaths is observed in February. Following the peak period, there is a gradual decrease in both cases and deaths, reaching a trough between June and August, during which the numbers are relatively lower. This pattern suggests that other hepatitis is more prevalent and severe during the first quarter of the year.
Overall Trends: When examining the overall trends for cases of other hepatitis in mainland China, there is no clear indication of an increasing or decreasing trend over the years. The number of cases fluctuates annually, with some years experiencing higher case counts and others recording lower counts. Similarly, the number of deaths also varies, but there is a relatively stable overall trend, with no significant increasing or decreasing pattern observed.
Discussion: This analysis of the provided data emphasizes the seasonal patterns, peak and trough periods, and overall trends for cases and deaths related to other hepatitis in mainland China before June 2023. The peak periods for both cases and deaths occur from January to March, indicating a higher burden of disease during the first quarter of the year. However, it is important to acknowledge that the seasonal patterns and peak periods observed in this analysis may be influenced by various factors such as reporting biases, changes in diagnostic practices, and public health interventions. Further investigation and analysis are required to comprehend the underlying factors contributing to these patterns and trends.

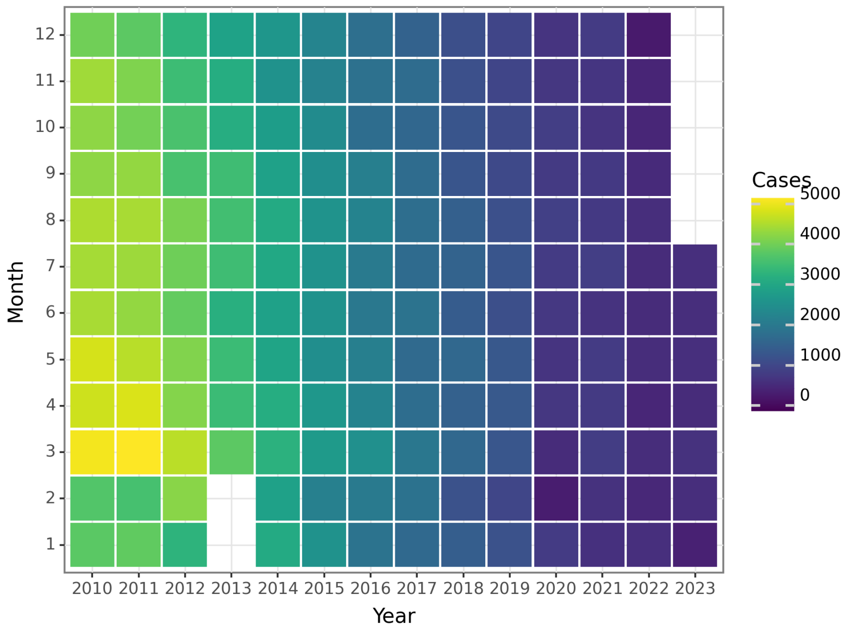

Figure 36: The Change of Other hepatitis Cases before 2023 June

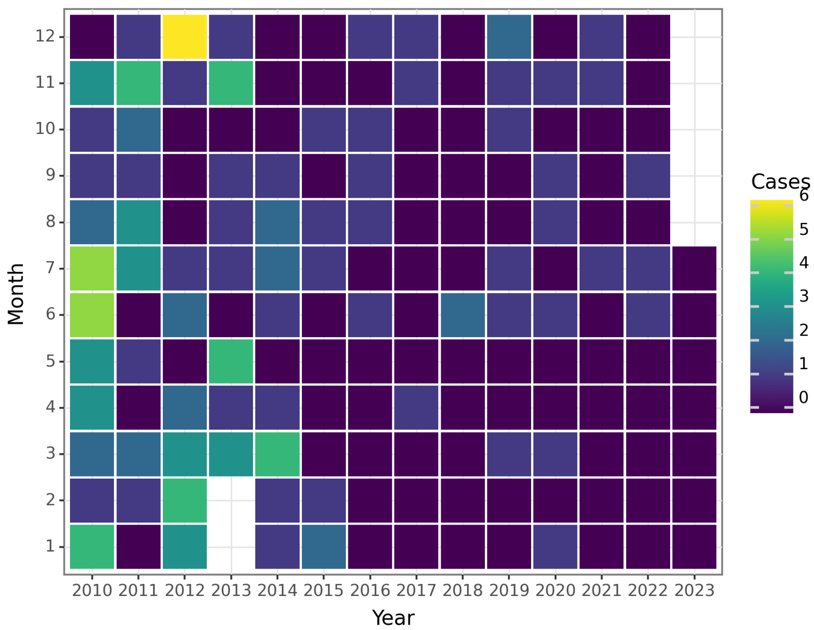

Figure 37: The Change of Other hepatitis Deaths before 2023 June

Poliomyelitis

Poliomyelitis, commonly referred to as polio, is an infectious viral disease caused by the poliovirus. Primarily affecting children under the age of five, polio can lead to lifelong paralysis or even death. This paper provides a comprehensive overview of poliomyelitis, including its epidemiology, global prevalence, transmission routes, affected populations, key statistics, historical context and discovery, major risk factors, and impact on different regions and populations.

Global Prevalence: Prior to the introduction of the polio vaccine, poliomyelitis was a significant global health concern, with large outbreaks occurring worldwide. However, with the development and widespread use of vaccines, the prevalence of polio has significantly decreased. Currently, polio remains endemic only in two countries: Afghanistan and Pakistan. Occasionally, other countries experience outbreaks due to virus importation, but these are typically contained swiftly.

Transmission Routes: The poliovirus primarily spreads through the fecal-oral route, meaning it is usually transmitted through contaminated food, water, or surfaces. Infection occurs when individuals ingest fecal matter containing the virus or when they come into contact with secretions from an infected person's mouth or nose. Respiratory droplets from coughing or sneezing by infected individuals can also contribute to the spread.

Affected Populations: While poliomyelitis can affect people of any age, children under five are particularly vulnerable. The virus mainly targets the nervous system, resulting in muscle weakness, paralysis, and potential lifelong disability. Socioeconomic factors, such as inadequate sanitation, lack of safe drinking water, and limited access to healthcare services, contribute to increased risk of polio transmission in low-income and developing countries.

Key Statistics: According to the World Health Organization (WHO), global polio cases have decreased by over 99% since the launch of the Global Polio Eradication Initiative in 1988. In 2020, only 140 cases were reported worldwide. However, it is crucial to note that these figures exclude cases in countries where polio remains endemic.

Historical Context and Discovery: Poliomyelitis has been recognized as a disease for thousands of years. However, its true nature was not understood until the late 19th century. The United States experienced its first major polio epidemic in 1916, resulting in thousands of cases and deaths. It was not until the 1950s that vaccines were developed for polio prevention. The introduction of the inactivated polio vaccine (IPV) and the oral polio vaccine (OPV) significantly reduced global polio cases.

Major Risk Factors: Risk factors associated with the transmission of poliomyelitis include residing in areas with inadequate sanitation infrastructure, lack of access to safe drinking water, and low vaccination coverage. Polio is more likely to spread in overcrowded and unsanitary conditions, such as refugee camps or areas affected by natural disasters. Furthermore, individuals with weakened immune systems, such as those with malnutrition or HIV/AIDS, face a higher risk of paralysis if infected with the poliovirus.

Impact on Different Regions and Populations: In regions where polio remains endemic, such as Afghanistan and Pakistan, the disease poses significant public health challenges. Factors such as conflict, social barriers, and religious or cultural beliefs contribute to ongoing polio transmission in these areas. The impact of polio varies among populations depending on their access to healthcare services and immunization coverage. Minority and marginalized populations, including migrants and refugees, often bear a disproportionate burden of polio due to limited healthcare access and lower vaccination rates.

In conclusion, poliomyelitis, also known as polio, is a viral disease that primarily affects children under the age of five. The global prevalence of polio has greatly decreased due to widespread vaccination efforts. Polio is mainly transmitted through contaminated food, water, and surfaces. Inadequate sanitation, limited access to safe drinking water, and deficient healthcare services contribute to the risk of transmission. While polio remains endemic in Afghanistan and Pakistan, ongoing vaccination efforts aim to eradicate the disease.

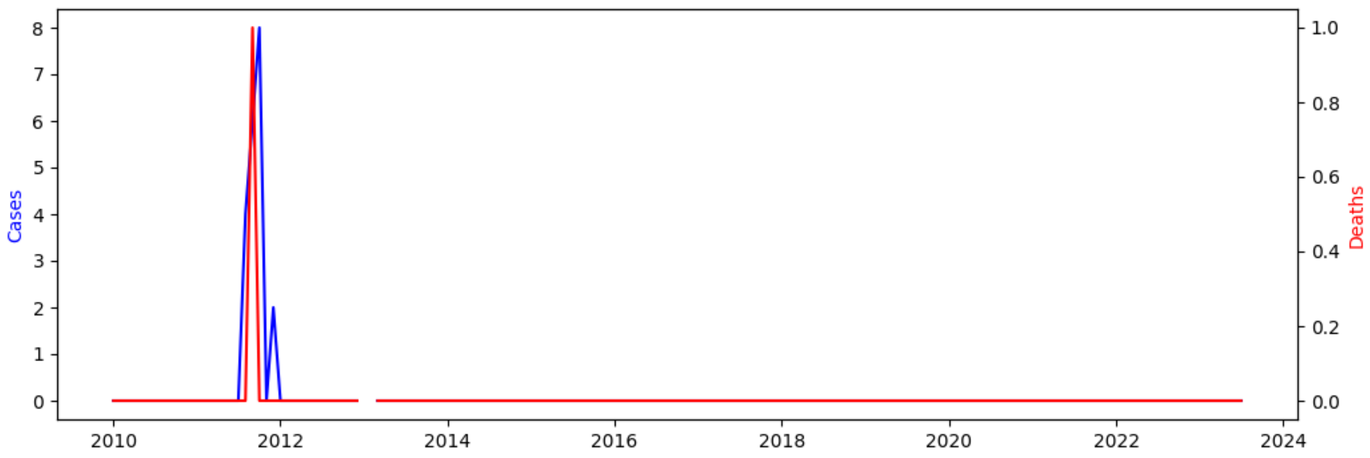

Figure 38: The Change of Poliomyelitis Reports before 2023 June

Seasonal Patterns: Based on the provided data, there is no clear seasonal pattern for cases and deaths of Poliomyelitis in mainland China prior to June 2023. The number of cases and deaths consistently remains low, with most months and years reporting zero cases and deaths.
Peak and Trough Periods: No identifiable peak or trough periods for Poliomyelitis cases and deaths in mainland China before June 2023 have been observed. The data consistently indicates very low or zero cases and deaths.
Overall Trends: The overall trend for cases and deaths of Poliomyelitis in mainland China prior to June 2023 is stable and low. There has been no significant increase or decrease in the number of cases and deaths over time. The data consistently shows very low or zero cases and deaths throughout the years.
Discussion: The absence of Poliomyelitis cases and deaths in mainland China before June 2023 is a positive indication. It suggests that effective measures, such as vaccination campaigns and improved sanitation, have successfully prevented the spread of the disease in the country. The consistently low number of cases and deaths indicates that efforts to control and eliminate Poliomyelitis have been successful.
It is important to continue monitoring and sustaining the success in preventing Poliomyelitis in mainland China. This includes ensuring high vaccination coverage and maintaining a robust surveillance system to detect any potential cases or outbreaks. By doing so, the country can continue to be free from the burden of Poliomyelitis and ensure the health and well-being of its population.

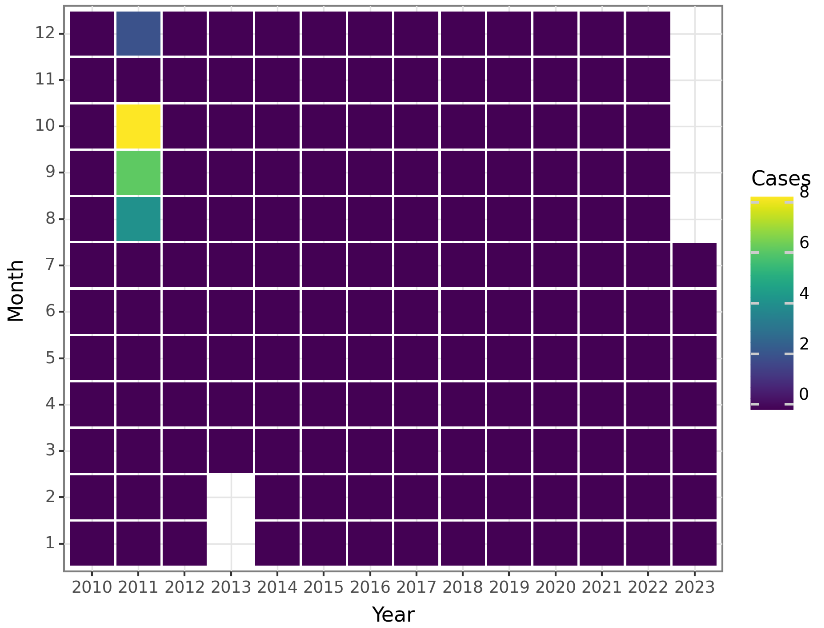

Figure 39: The Change of Poliomyelitis Cases before 2023 June

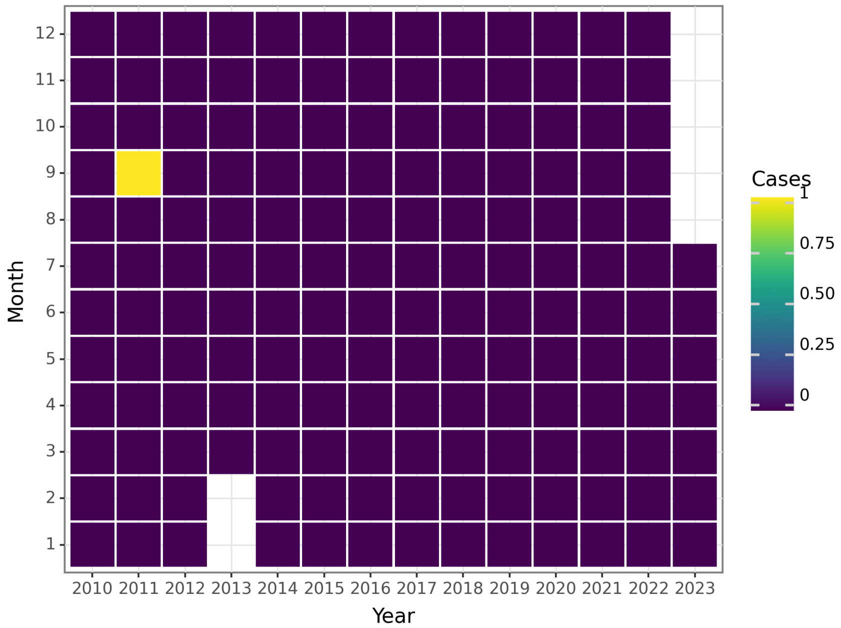

Figure 40: The Change of Poliomyelitis Deaths before 2023 June

Human infection with H5N1 virus

Human infection with the H5N1 virus, commonly known as avian influenza or bird flu, is a global concern due to its potential for causing severe illness and high mortality rates. This comprehensive overview will discuss the epidemiology of H5N1, including its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, major risk factors associated with transmission, and impact on different regions and populations.

Prevalence: Since its emergence in 1997, H5N1 has primarily affected poultry populations but has occasionally affected humans. The World Health Organization (WHO) reported the first known human cases in Hong Kong in 1997. The prevalence of H5N1 infections in humans is relatively low compared to other strains of influenza, but it is associated with a high mortality rate. As of 2021, H5N1 outbreaks have occurred in several countries across Asia, Africa, the Middle East, and Europe.

Transmission Routes: The primary way H5N1 is transmitted to humans is through direct or indirect contact with infected birds. Infection can also occur by coming into contact with contaminated surfaces or materials, such as poultry feces or feathers. Limited evidence suggests that human-to-human transmission may occur, but it is rare and inefficient. Close and prolonged contact with infected individuals has been the main route of transmission in these exceptional cases.

Affected Populations: H5N1 virus infection primarily affects individuals who have close and direct contact with infected birds or their excretions. People involved in poultry farming, live poultry markets, or the slaughtering and preparation of infected birds are at the highest risk. In some cases, individuals may acquire the infection by consuming improperly cooked poultry products. The virus does not easily infect humans and has not demonstrated efficient human-to-human transmission.

Key Statistics: As of 2021, the WHO has reported a total of 862 laboratory-confirmed cases of H5N1 infections in humans, with a case fatality rate of approximately 53%. These cases have been reported in 17 countries worldwide. The majority of cases have occurred in Southeast Asia, particularly Vietnam, followed by Indonesia, Egypt, and China. Outbreaks in poultry populations have been reported in several other countries, resulting in sporadic human infections.

Historical Context and Discovery: H5N1 was first identified in 1996 during an outbreak in domestic geese in Guangdong Province, China. The virus caused severe illness and high mortality rates in both poultry and humans. The first known human cases occurred in Hong Kong in 1997 when the transmission of the virus from poultry to humans was documented. Mass culling of poultry and other control measures were implemented to contain the outbreak. H5N1 re-emerged periodically in the following years, causing sporadic human cases and outbreaks in poultry populations.

Risk Factors Associated with Transmission: Several risk factors are associated with the transmission of H5N1 virus to humans. These include direct contact with infected poultry, handling or consumption of improperly prepared infected poultry products, and exposure to contaminated environments, such as live poultry markets. Poor infection control measures, inadequate biosecurity practices, and overcrowded living conditions increase the risk of transmission. Genetic factors, such as specific genetic polymorphisms, may also influence individual susceptibility to severe disease.

Impact on Different Regions and Populations: The impact of H5N1 virus infection varies among regions and populations. Southeast Asia has been the most affected, with Vietnam and Indonesia having the highest number of cases and deaths. The impact on the population depends on several factors, including the effectiveness of control measures, healthcare infrastructure, and awareness of prevention and early detection. Low-income countries with limited resources and inadequate healthcare infrastructure may face greater challenges in controlling outbreaks and managing cases, resulting in higher mortality rates.

In conclusion, human infection with the H5N1 virus remains a significant global concern. While the prevalence of H5N1 infections in humans is relatively low, the high mortality rate and potential for human-to-human transmission justify continued surveillance, prevention, and control measures. Efforts should focus on improving biosecurity measures, promoting awareness among high-risk populations, enhancing healthcare infrastructure, and developing effective vaccines and antiviral treatments.

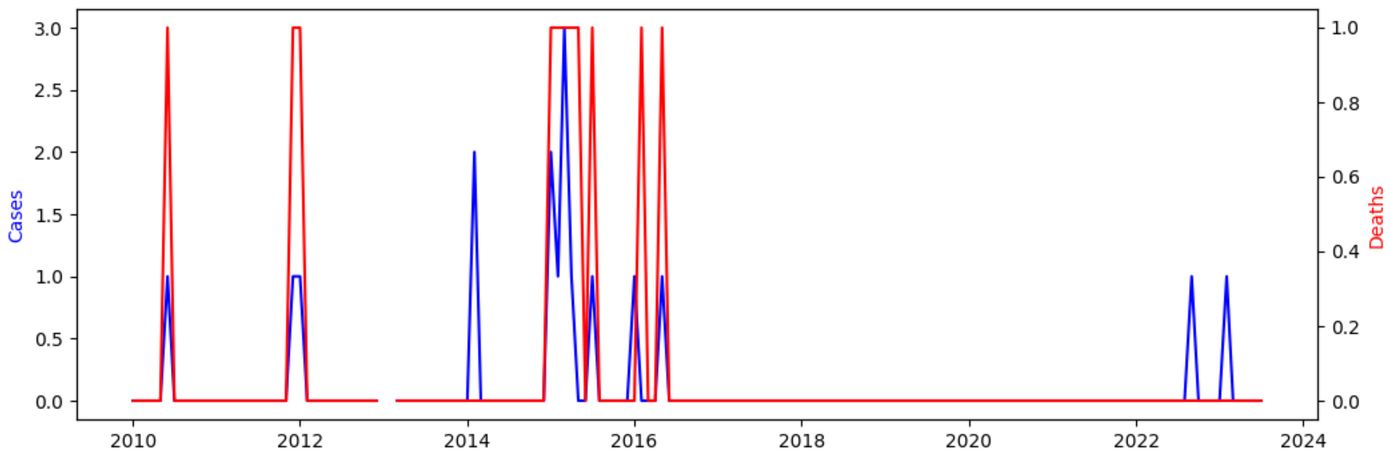

Figure 41: The Change of Human infection with H5N1 virus Reports before 2023 June

Seasonal Patterns:
Based on the data provided, no clear seasonal pattern was observed for human infection with H5N1 virus in mainland China before June 2023. The number of cases and deaths remained relatively low and sporadic throughout the years, without any discernible pattern or trend.
Peak and Trough Periods:
There were no clear peak and trough periods observed in the data. The number of cases and deaths fluctuated randomly and did not exhibit any specific periods of higher or lower activity.
Overall Trends:
The overall trend for human infection with H5N1 virus in mainland China before June 2023 was characterized by sporadic and low levels of cases and deaths. There was no significant increase or decrease in the number of cases and deaths over the years, indicating a stable and controlled situation.
Discussion:
The data provided indicates that human infection with H5N1 virus in mainland China before June 2023 was relatively low and sporadic. There was no evidence of a seasonal pattern, peak or trough periods, or any significant overall trends during this time period. It is important to note that the absence of clear patterns or trends should not be interpreted as a lack of risk or vigilance. However, further analysis and monitoring of more recent data would be necessary to assess the current situation and any potential changes in the epidemiology of H5N1 virus in mainland China.

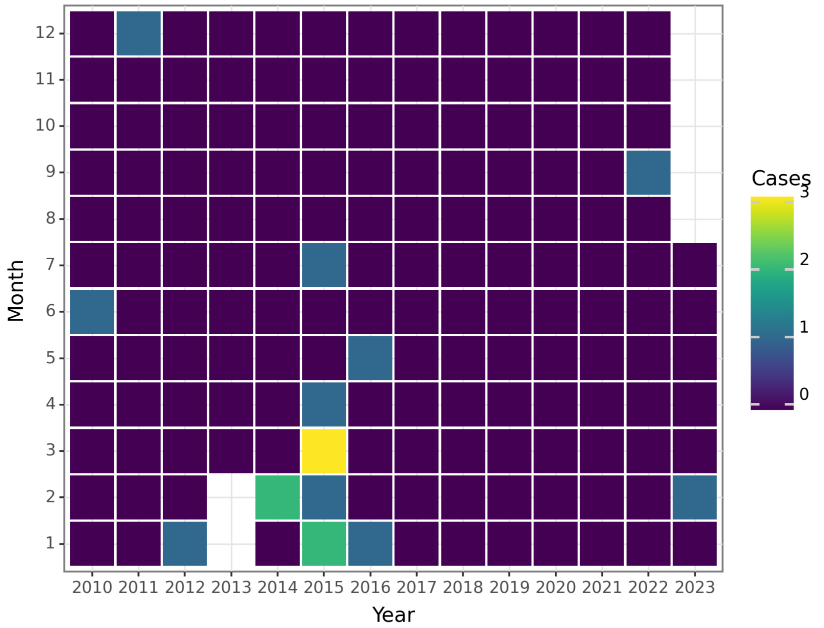

Figure 42: The Change of Human infection with H5N1 virus Cases before 2023 June

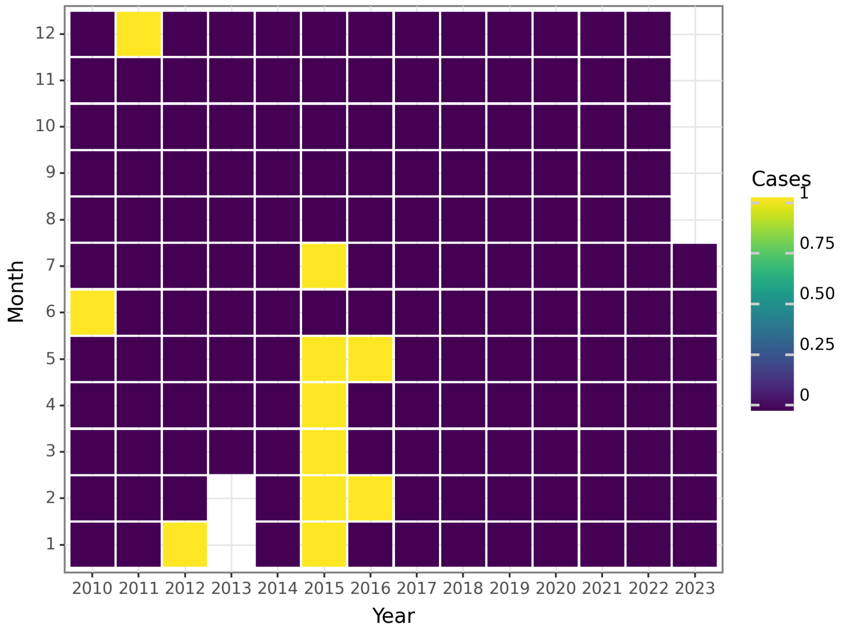

Figure 43: The Change of Human infection with H5N1 virus Deaths before 2023 June

Measles

Measles is a highly contagious viral disease that affects individuals of all age groups. It is caused by the Measles virus (MeV) and is characterized by symptoms such as fever, cough, runny nose, conjunctivitis, and a distinct red rash. Measles can lead to severe complications and even death, particularly among vulnerable populations such as young children and those with weakened immune systems.
Historical Context and Discovery: Measles has afflicted human populations for centuries. Its first description was provided by a Persian physician named Rhazes in the 10th century. However, the global impact of the disease became more evident during the 18th and 19th centuries, when outbreaks occurred across various continents and resulted in high rates of illness and death. In the 19th century, measles was identified as a distinct disease separate from other childhood rashes, and a vaccine was introduced in the 1960s.
Prevalence: Measles is present throughout the world, although its frequency varies across different regions. Prior to the implementation of widespread vaccination campaigns, measles was endemic in most countries and regularly caused outbreaks. However, significant progress has been made in reducing measles transmission and associated mortality through vaccination efforts.
Transmission Routes: Measles is primarily transmitted through respiratory droplets when an infected person coughs or sneezes. The virus can survive on surfaces and in the air for up to two hours, which contributes to its highly contagious nature. It is estimated that 90% of susceptible individuals who come into close contact with an infected person will contract the disease.
Affected Populations: Measles can affect individuals of all ages who have not been vaccinated or have not previously had the disease. However, infants and young children are particularly vulnerable to experiencing severe complications. Unvaccinated individuals, malnourished children, and those with weakened immune systems are at a higher risk of developing severe cases of measles.
Key Statistics: 1. According to the World Health Organization (WHO), there were an estimated 207,500 global deaths related to measles in 2019. 2. Measles cases have been declining worldwide due to vaccination efforts, but from 2016 to 2019, there was a resurgence, including significant outbreaks in several countries. 3. In 2020, disruptions caused by the COVID-19 pandemic led to a decrease in routine immunization coverage, potentially impacting efforts to control measles.
Major Risk Factors: 1. Lack of vaccination: The most significant risk factor for measles transmission is the absence of immunization. Unvaccinated individuals are more likely to contract the disease and contribute to its spread. 2. Crowded living conditions: Measles thrives in areas with high population density, facilitating the spread of the virus among individuals in close proximity. 3. International travel: People traveling to or from areas where measles is common can introduce the virus to susceptible populations, increasing the likelihood of outbreaks. 4. Poor healthcare infrastructure: Countries with limited access to healthcare and vaccination programs face a higher risk of experiencing measles outbreaks and related complications.
Impact on Different Regions and Populations: The incidence and prevalence of measles vary across regions due to differences in vaccination coverage, healthcare infrastructure, and disease surveillance. Sub-Saharan Africa and Southeast Asia have historically had the highest burden of measles cases, while high-income regions with high vaccination rates have seen significantly lower incidence rates. However, even developed countries can experience measles outbreaks when vaccination rates decrease.
In conclusion, despite the availability of effective vaccines, measles remains a significant global health concern. It is crucial to improve vaccination coverage, promptly detect outbreaks, and implement effective management strategies to control measles transmission, prevent outbreaks, and safeguard vulnerable populations.

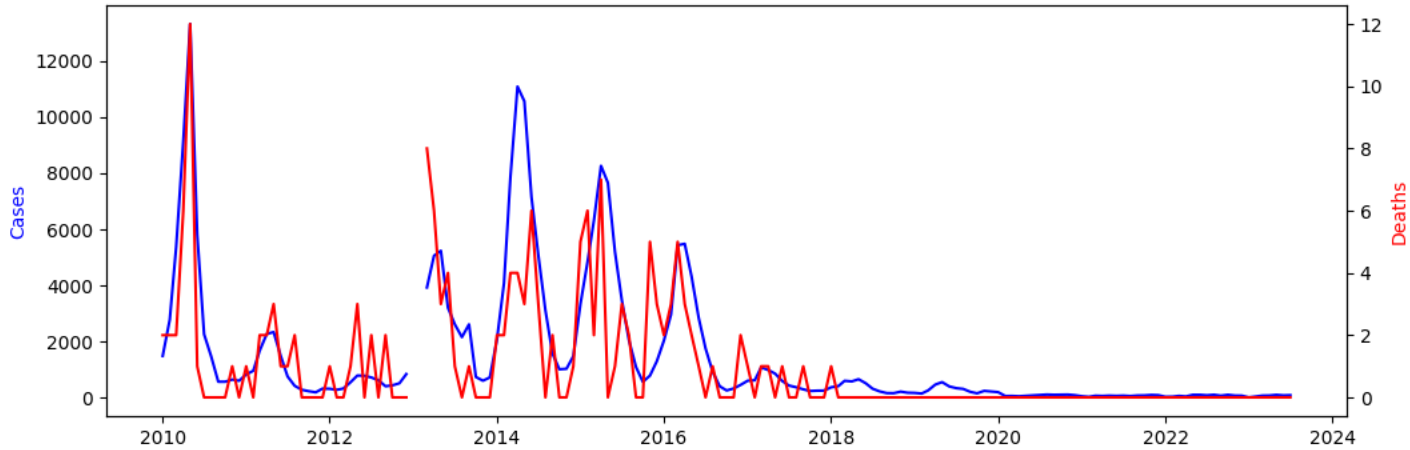

Figure 44: The Change of Measles Reports before 2023 June

Seasonal Patterns:
The data on monthly cases of measles in mainland China before June 2023 reveals a clear seasonal pattern. The number of cases is consistently lowest during the summer months (June, July, and August) and gradually increases from September onwards. The peak of the outbreak occurs during the winter months (December, January, and February), followed by a gradual decrease in the spring months (March, April, and May).
Peak and Trough Periods:
Measles cases in mainland China peak during the winter months, specifically from December to February, when the number of cases is highest. Conversely, the summer months of June, July, and August experience the lowest number of cases.
Overall Trends:
Analyzing the overall trends, there is a general upward trend in measles cases in mainland China from September to February, followed by a decline from March to August. It is important to note, however, that the number of cases has remained relatively low in recent years with occasional fluctuations.
Discussion:
The observed seasonal pattern in the data suggests that measles transmission in mainland China is influenced by factors such as climate and human behavior. The peak during the winter months can be attributed to increased indoor crowding and closer contact among individuals, facilitating the spread of the virus. On the other hand, the trough during the summer months may be influenced by improved ventilation, increased outdoor activities, and the impact of vaccination campaigns targeting schools before summer break.
It is worth noting that the number of measles cases significantly declined after 2013, indicating successful control measures and increased vaccination coverage. However, there are still fluctuations in the number of cases, emphasizing the need for continuous surveillance and efforts to maintain high vaccination coverage in order to prevent outbreaks.
Overall, the analysis of the provided data emphasizes the importance of understanding the seasonal patterns, peak and trough periods, and overall trends in measles cases in mainland China. This knowledge can inform targeted interventions and control strategies to effectively prevent and reduce the incidence of this vaccine-preventable disease.

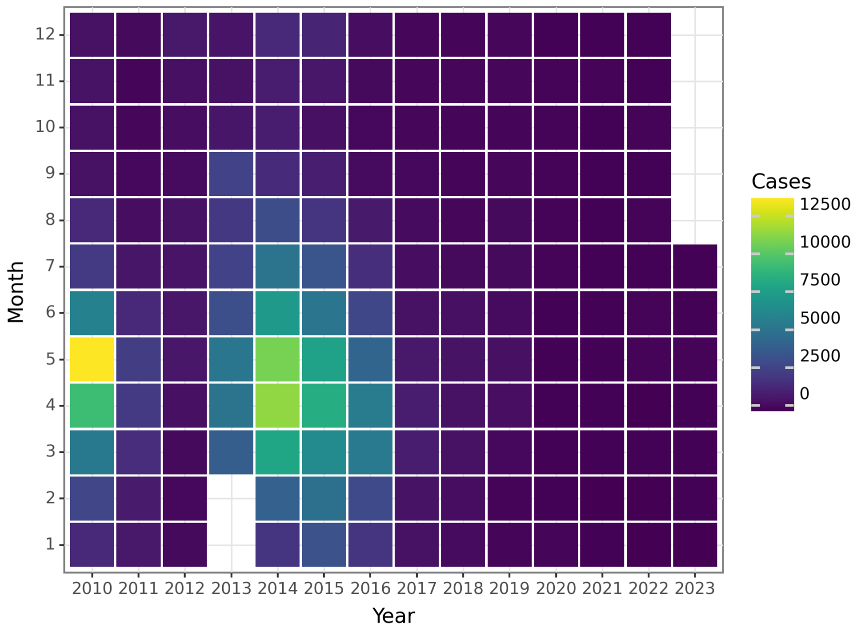

Figure 45: The Change of Measles Cases before 2023 June

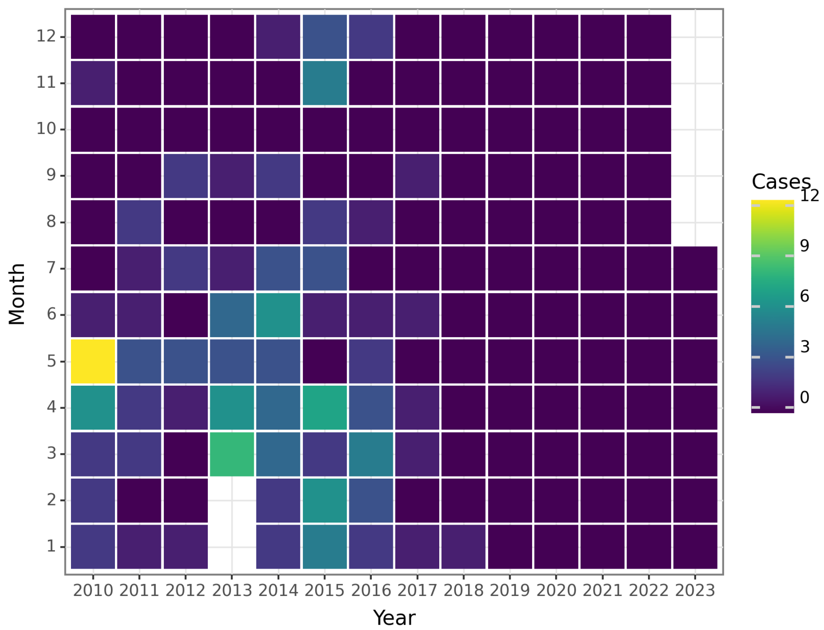

Figure 46: The Change of Measles Deaths before 2023 June

Epidemic hemorrhagic fever

Epidemic hemorrhagic fever (EHF) refers to a collection of severe febrile illnesses caused by various viral pathogens, including the Ebola virus, Marburg virus, Lassa fever virus, and Crimean-Congo hemorrhagic fever virus. These illnesses are characterized by a sudden onset of high fever, respiratory and digestive symptoms, and often progress to severe hemorrhagic manifestations.
Historical Context and Discovery: The first recognized outbreak of EHF occurred in 1967 in Marburg, Germany, when laboratory workers contracted the disease from African green monkeys imported from Uganda. This outbreak led to the identification of the Marburg virus, which is closely related to the Ebola virus. Subsequently, in 1976, simultaneous outbreaks of Ebola virus disease (EVD) occurred in Nzara, South Sudan, and Yambuku, Democratic Republic of Congo (DRC). These outbreaks marked the discovery of the Ebola virus and the naming of the disease.
Global Prevalence: EHF mainly occurs in tropical regions of Africa, but outbreaks have also been reported in other parts of the world. Ebola outbreaks have been limited to African countries, primarily in Central and West Africa. Marburg virus outbreaks have occurred in Africa, Europe (such as Serbia in 1996), and Uganda. Lassa fever is endemic in West Africa, particularly in Nigeria, while Crimean-Congo hemorrhagic fever is found in countries across Europe, Asia, and Africa.
Transmission Routes: EHF viruses are primarily transmitted to humans from animals through contact with infected blood or bodily fluids. The reservoirs for these viruses vary, including bats (as in the case of Ebola and Marburg viruses), rodents (Lassa fever virus), and ticks (Crimean-Congo hemorrhagic fever virus). Human-to-human transmission occurs through direct contact with the blood or bodily fluids of infected individuals, including during healthcare procedures without proper protective measures.
Affected Populations: EHFs can affect individuals of all age groups and occupational backgrounds. However, vulnerable populations may vary depending on the specific virus and geographical location of the outbreak. Due to their close and frequent contact with infected individuals, healthcare workers are at a higher risk of contracting EHF. Moreover, communities living in regions with limited healthcare infrastructure and poor infection control measures are more susceptible to outbreaks.
Key Statistics: The prevalence and impact of EHF vary depending on the specific virus. According to the World Health Organization (WHO), as of the end of 2020, there have been approximately 36,625 reported cases of Ebola virus disease, resulting in over 15,000 deaths. Marburg virus outbreaks have been less common, with sporadic cases reported. Lassa fever causes an estimated 100,000 to 300,000 infections annually in West Africa, resulting in 5,000 deaths. Crimean-Congo hemorrhagic fever has been reported in over 30 countries, with an estimated mortality rate of up to 40%.
Major Risk Factors Associated with Transmission: Multiple risk factors contribute to the transmission of EHF, including:
1. Direct contact with the blood or bodily fluids of infected humans or animals. 2. Poor infection control practices in healthcare settings. 3. Handling or consumption of infected animal meat or carcasses. 4. Living in crowded conditions or densely populated areas conducive to person-to-person transmission. 5. Lack of adequate surveillance and response systems in regions with a high disease burden. 6. Insufficient resources and healthcare infrastructure, leading to limited access to proper prevention and treatment measures.
Impact on Different Regions and Populations: EHF outbreaks have a significant impact on affected regions, disrupting healthcare systems, straining limited resources, and causing substantial morbidity and mortality. Outbreaks also have social and economic consequences, including community breakdown, loss of livelihoods, and decreased investment in affected areas.
In terms of affected demographics, EHF outbreaks can impact various populations differently. Factors such as age, gender, occupation, and access to healthcare can influence vulnerability and the severity of infection. For example, pregnant women are particularly vulnerable to the Ebola virus, and healthcare workers are at a heightened risk due to their occupational exposure.
In conclusion, EHF represents a group of severe and potentially deadly viral diseases with significant morbidity and mortality rates. The global prevalence of EHF varies depending on the specific virus, with the primary pathogens being Ebola, Marburg, Lassa fever, and Crimean-Congo hemorrhagic fever. Transmission occurs through contact with infected animals or humans, with significant risk factors including poor infection control practices, inadequate healthcare infrastructure, and limited resources. EHF outbreaks have profound impacts on affected regions, leading to social, economic, and healthcare challenges.

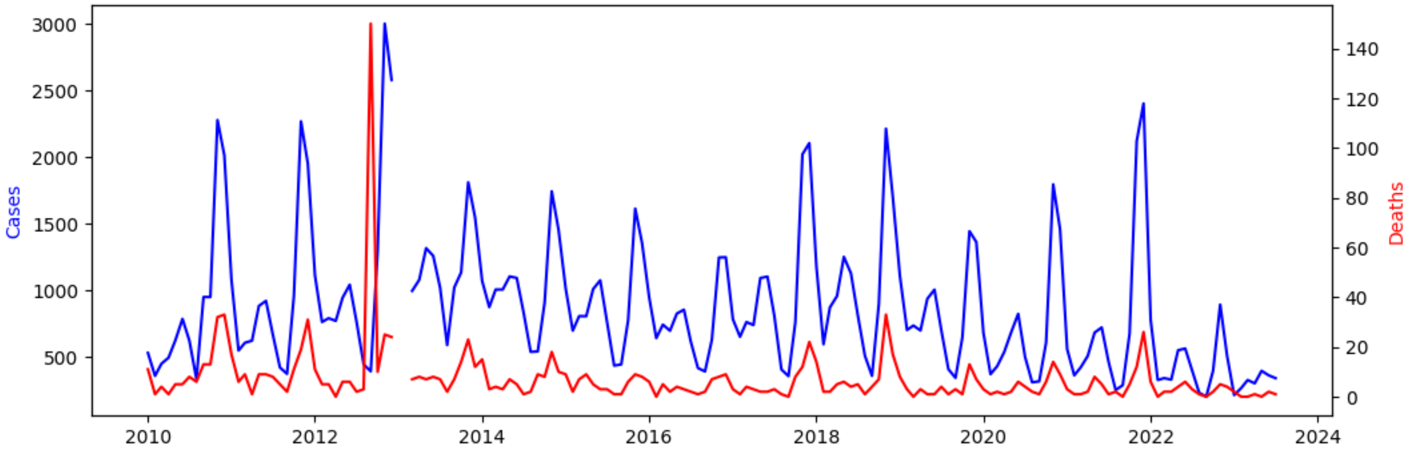

Figure 47: The Change of Epidemic hemorrhagic fever Reports before 2023 June

Seasonal Patterns: The data on epidemic hemorrhagic fever cases in mainland China demonstrates a consistent seasonal pattern over the years. In general, there is an increase in cases during the winter months and a comparatively low number of cases during the summer months. This consistent pattern is observed year after year.

Peak and Trough Periods: The peak period for epidemic hemorrhagic fever cases in mainland China is typically during the winter months, specifically in November, December, and January. These months consistently exhibit the highest number of cases throughout the years. Conversely, the trough period, with the lowest number of cases, occurs in the summer months, particularly in July and August.

Overall Trends: When examining the overall trends of epidemic hemorrhagic fever cases in mainland China, there appears to be an upward trend in the number of cases over time. The data displays a fluctuating pattern with occasional spikes in cases, but, overall, there is a long-term increase.

Discussion: The observed seasonal patterns in the data indicate that epidemic hemorrhagic fever in mainland China follows a predictable pattern, with higher transmission during the winter months and lower transmission during the summer months. Various factors, such as colder temperatures that enhance the survival and transmission of the virus, may contribute to this phenomenon.

The higher likelihood of transmission during the winter months, indicated by the peak period, may be a result of increased indoor gatherings and close contacts as people seek shelter from the cold weather. This trend may be influenced by factors like heightened crowding during holidays and seasonal travel patterns.

The overall increasing trend in the number of cases over the years raises concerns and suggests a worsening epidemic situation. This may be attributed to multiple factors, including changes in the virus itself, increased population density, and shifting environmental conditions. Further analysis and investigation are required to comprehensively understand the underlying factors driving this upward trend.

It is important to note that the data for January and February 2013, as well as some other months, include negative values for cases and deaths. These negative values may be the result of data reporting errors or anomalies and should be further investigated to ensure data accuracy.

Ultimately, the analysis of monthly data on epidemic hemorrhagic fever cases in mainland China underscores the presence of seasonal patterns, peak and trough periods, and an overall increasing trend in the number of cases. This information can inform public health practitioners and policymakers when devising and implementing effective control and prevention strategies.

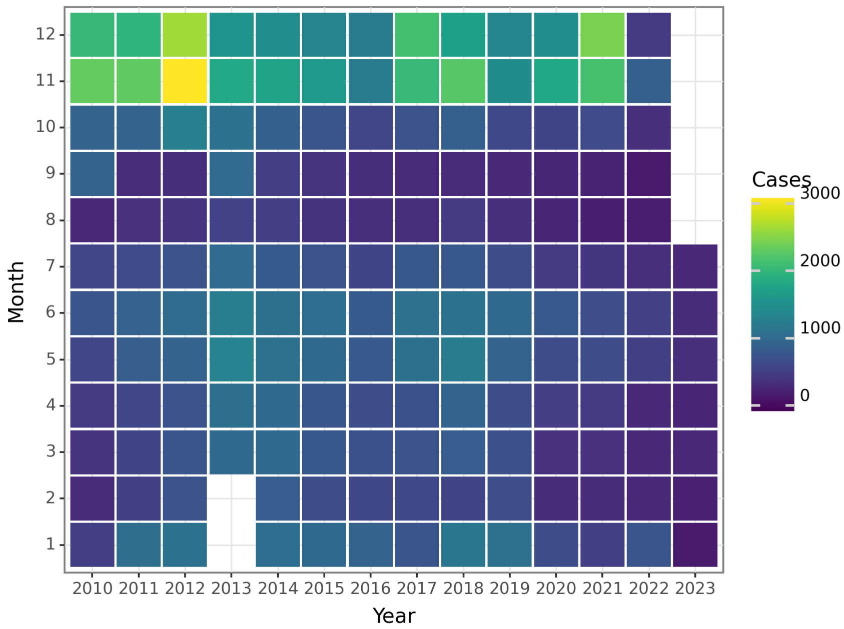

Figure 48: The Change of Epidemic hemorrhagic fever Cases before 2023 June

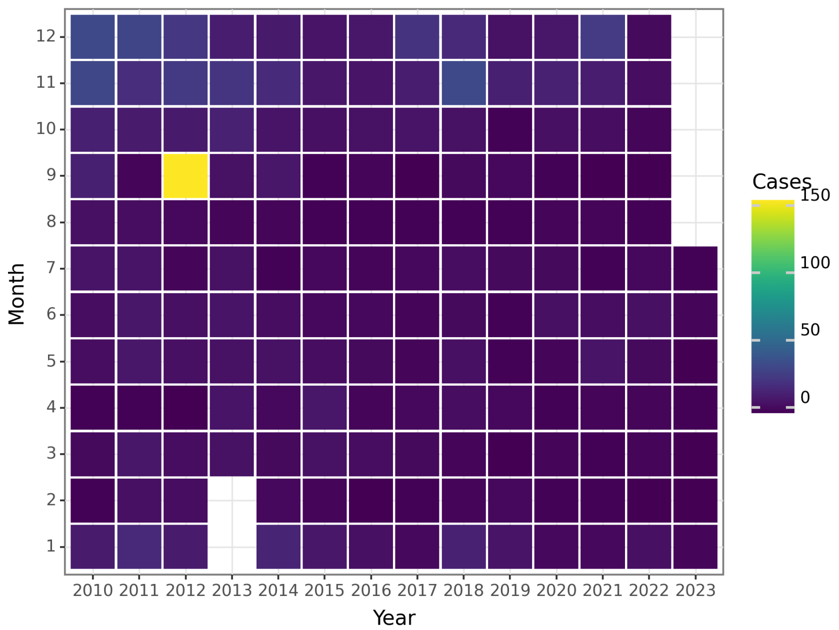

Figure 49: The Change of Epidemic hemorrhagic fever Deaths before 2023 June

Rabies

Rabies is a viral disease that is both deadly and fatal. It affects the central nervous system in humans and other mammals. The primary mode of transmission is through bites from infected animals, especially dogs. Rabies is present globally, but its prevalence is higher in developing countries, particularly in Africa and Asia.
Historical Context and Discovery:
Rabies has been recognized for thousands of years. The first recorded evidence of rabies dates back to ancient Mesopotamia around 2300 BC. During ancient times, rabies was often associated with supernatural causes and referred to as "madness."
The discovery of the rabies virus is credited to Louis Pasteur, a French microbiologist, in the 19th century. Pasteur developed the first successful rabies vaccine and conducted experiments on dogs to demonstrate the presence of the virus in the nervous system.
Global Prevalence:
Rabies is present in over 150 countries, resulting in an estimated 59,000 human deaths annually. Over 95% of these deaths occur in Africa and Asia. These regions have the highest number of cases due to a lack of effective control measures, limited access to healthcare, and a high population of stray dogs.
Transmission Routes:
The primary mode of transmission for rabies is through the bite or scratch of an infected animal. The virus can be found in the saliva and nervous tissue of infected animals. The main sources of transmission to humans include dogs, bats, and other wildlife such as raccoons, skunks, and foxes.
Risk Factors:
Several major risk factors are associated with the transmission of rabies:
1. Lack of Vaccination: The primary risk factor for rabies transmission is the absence of vaccination in both animals and humans. Vaccinating domestic animals, particularly dogs, can prevent the spread of the virus.
2. Exposure to Infected Animals: Individuals who work closely with animals, such as veterinarians, animal handlers, and wildlife researchers, are at a higher risk of exposure to the rabies virus.
3. Dog Population Control: Uncontrolled dog populations, especially stray dogs, significantly contribute to the transmission of rabies. Areas with inadequate dog vaccination campaigns and ineffective dog population control programs are at risk.
Impact on Regions and Populations:
Regions with limited access to healthcare and control measures bear the greatest burden of rabies. Africa and Asia account for approximately 90% of human cases, with India alone accounting for around 30% of global deaths caused by rabies.
High-risk populations include children under 15 years old, as they are more susceptible to dog bites and have limited access to post-exposure healthcare. Rural populations are also heavily impacted due to their proximity to wildlife and limited access to healthcare facilities.
Prevalence Rates and Affected Demographics:
Rabies prevalence rates vary significantly across regions and populations. Developed countries, such as the United States and Western Europe, have implemented extensive control measures leading to very low prevalence rates. Isolated cases typically occur from exposure during travel to regions with endemic rabies.
In contrast, countries with limited resources and weak healthcare infrastructure, particularly in Sub-Saharan Africa and parts of Asia, have high prevalence rates. Challenges in implementing vaccination programs, limited access to post-exposure prophylaxis, and inadequate reporting and surveillance systems contribute to this situation.
In conclusion, rabies is a global public health concern, with Africa and Asia bearing the heaviest burden. The disease primarily spreads through bites from infected animals, particularly dogs. Lack of vaccination, exposure to infected animals, and uncontrolled dog populations are significant risk factors. It is crucial to implement effective control measures, including vaccination campaigns and access to post-exposure treatment, to reduce the impact of rabies on different regions and populations.

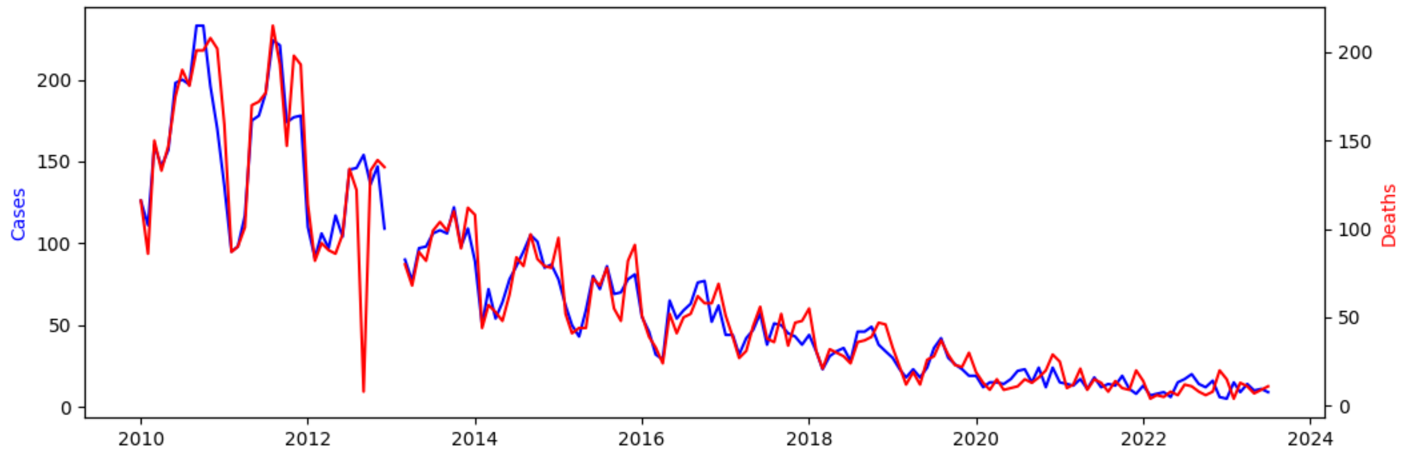

Figure 50: The Change of Rabies Reports before 2023 June

Seasonal Patterns: The data provided indicates a clear seasonal pattern in the number of rabies cases and deaths in mainland China. It can be observed that the number of cases and deaths reaches its peak during the summer months (June to August) and decreases during the winter months (December to February). This pattern can be attributed to various factors, including increased outdoor activities during the summer, which may lead to a higher risk of exposure to rabid animals.
Peak and Trough Periods: Typically, the highest number of rabies cases and deaths in mainland China occurs during the summer months (June to August), indicating a peak period. Conversely, the lowest number of cases and deaths is observed during the winter months (December to February), which can be referred to as the trough period. These patterns suggest that the risk of rabies transmission is higher during warmer months and lower during colder months.
Overall Trends: There has been a general decline in the number of rabies cases and deaths in mainland China from 2010 to 2023. However, it should be noted that the provided data only covers until June 2023, so the overall trend beyond that point is unknown. Nevertheless, the decreasing trend observed during the available data period indicates the effectiveness of efforts to control and prevent rabies transmission in mainland China.
Discussion: The observed seasonal patterns in the data align with previous studies on rabies transmission, which indicate a higher prevalence of the disease during warmer months. This is likely a result of increased outdoor activities and a higher population of susceptible animals during the summer. The peak and trough periods correspond to these seasonal patterns, with the highest number of cases and deaths occurring in the summer and the lowest in the winter.
The overall decreasing trend in rabies cases and deaths in mainland China suggests that control measures, such as vaccination campaigns and enhanced surveillance, have successfully reduced the burden of rabies. However, it is important to continue monitoring and implementing preventive measures, as even a few cases can potentially lead to outbreaks if left untreated.
It is worth noting that while the data provides valuable insights into the trends and patterns of rabies in mainland China, limitations such as missing data before 2010 and incomplete data after June 2023 should be taken into consideration. Additionally, other influential factors, such as changes in population density, animal control measures, and public awareness, could also contribute to the observed patterns and trends.

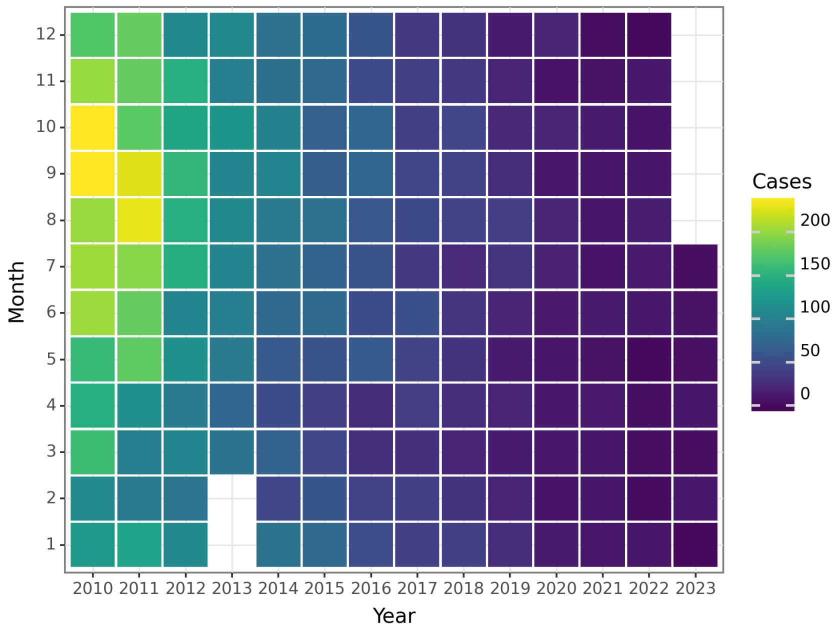

Figure 51: The Change of Rabies Cases before 2023 June

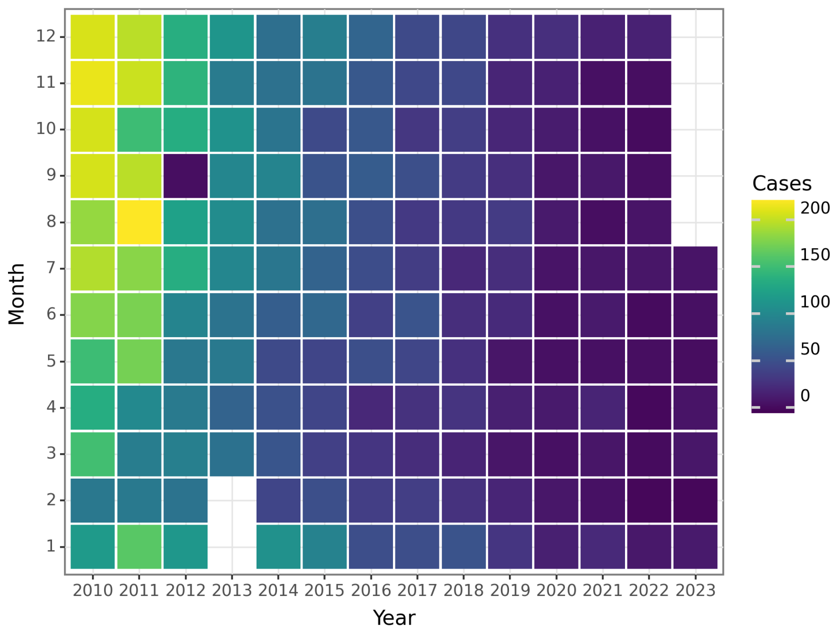

Figure 52: The Change of Rabies Deaths before 2023 June

Japanese encephalitis

Japanese encephalitis (JE) is a viral disease caused by the Japanese encephalitis virus (JEV) and transmitted by mosquitoes. It is the primary cause of viral encephalitis in Asia and the Western Pacific. This article provides a comprehensive review of JE's epidemiology, including prevalence, transmission, affected populations, statistics, historical context, risk factors, and impact.

Prevalence: JE is endemic in several countries in Asia and the Western Pacific, particularly in rural and agricultural areas. India, China, and Southeast Asian nations bear the highest burden. Annually, an estimated 30,000 to 50,000 clinical cases result in about 10,000 to 15,000 deaths. However, these figures may underestimate the actual incidence due to under-reporting and misdiagnosis.

Transmission: JEV is primarily transmitted through infected Culex mosquitoes, specifically Culex tritaeniorhynchus. Mosquitoes become infected after feeding on birds and pigs, which act as amplifying hosts. Humans, as dead-end hosts, do not produce sufficient virus to infect mosquitoes and facilitate further transmission. The virus cannot be transmitted directly from person to person.

Affected Populations: Japanese encephalitis can affect individuals of all ages, with children being disproportionately vulnerable. The disease predominates in rural and agricultural regions due to the close proximity between humans, pigs, and mosquito breeding sites. Farmers and individuals spending significant time outdoors, particularly during the transmission season, face a higher risk.

Key Statistics: - Approximately 50% of survivors experience permanent neurological sequelae, including intellectual disabilities, behavioral changes, paralysis, and movement disorders. - The case-fatality rate is estimated to be 20-30% among those developing clinical encephalitis. - Most infections are asymptomatic or result in mild symptoms, with less than 1% progressing to severe encephalitis. - Disease incidence strongly correlates with the rainy season, as mosquito breeding and population density increase.

Historical Context and Discovery: Japanese encephalitis was first identified in 1871 during a significant outbreak in Japan. In 1933, Dr. Albert Sabin isolated the virus responsible, JEV, from pigs, which played a crucial role in disease transmission. This discovery laid the foundation for subsequent vaccine development.

Major Risk Factors: 1. Geographic Location: Residing or traveling in endemic areas elevates the risk of JEV exposure. 2. Seasonal Factors: Infection risk peaks during the transmission season, typically in summer and early fall. 3. Occupation and Lifestyle: Farmers, agricultural workers, and rural residents with high mosquito exposure face an increased risk. 4. Vaccination Gap: Lack of or inadequate vaccination against Japanese encephalitis heightens susceptibility to infection.

Impact on Different Regions and Populations: The impact of Japanese encephalitis varies across regions and populations due to disparities in vaccination coverage, healthcare infrastructure, vector control measures, and cultural practices. In highly endemic areas, JE causes significant morbidity, mortality, long-term disability, and economic burden on affected individuals and communities. Developing countries, particularly in rural areas with limited resources, face major challenges in disease control and vaccine accessibility. Outbreaks can have devastating effects on vulnerable populations, such as children and marginalized communities.

In conclusion, Japanese encephalitis is a significant public health concern in many parts of Asia and the Western Pacific. The disease primarily affects children and is transmitted by infected mosquitoes. Risk factors include geographical location, lifestyle, occupation, and vaccination status. Preventive measures, including vaccination, vector control, and public health education, are crucial for reducing the burden of Japanese encephalitis and its impact on affected populations.

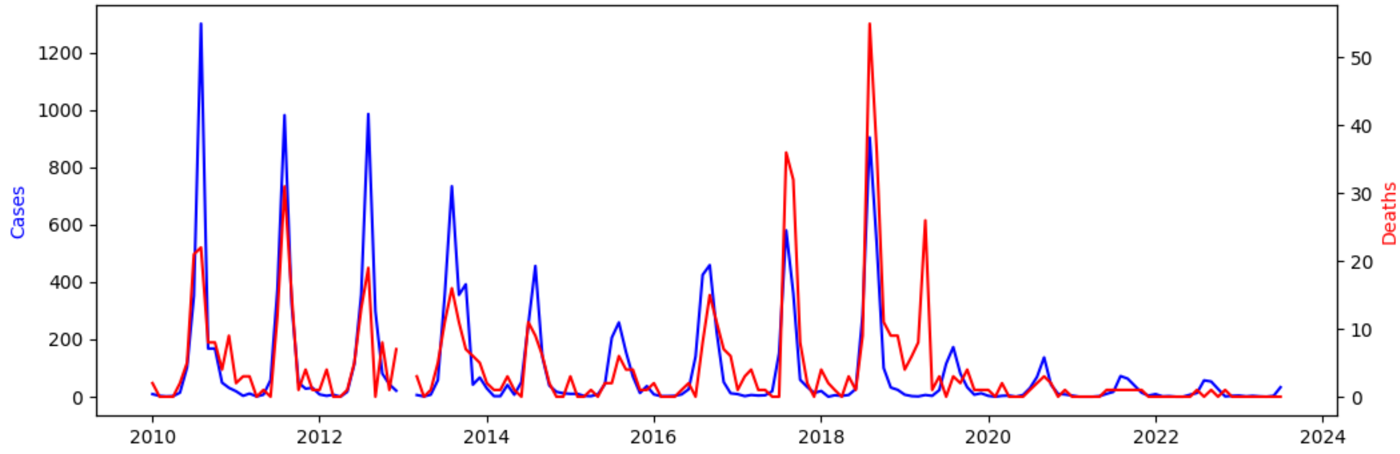

Figure 53: The Change of Japanese encephalitis Reports before 2023 June

Seasonal Patterns: The data on Japanese encephalitis cases in mainland China prior to June 2023 reveals a distinct seasonal pattern. The number of cases commences its increase in April, reaches its peak in August or September, and then gradually diminishes towards the end of the year. This consistent seasonal pattern is observed across the years analyzed.
Peak and Trough Periods: The peak period for Japanese encephalitis cases is observed in August, with a significant surge in the number of cases during this month. Conversely, the trough period, characterized by the lowest number of cases, typically occurs in December or January.
Overall Trends: In general, there is an upward trend in the number of Japanese encephalitis cases from year to year prior to June 2023. However, within each year, fluctuations occur, resulting in some years experiencing higher case numbers than others.
Discussion: The seasonal pattern identified in Japanese encephalitis cases in mainland China is likely influenced by factors such as mosquito population dynamics and climatic conditions. Mosquitoes, being the primary carriers of the virus, exhibit greater abundance during the warmer months, leading to higher transmission rates. The peak in August corresponds to ideal conditions for mosquito breeding and transmission. The decrease in cases during winter months may be attributed to reduced mosquito activity. The increasing trend in the number of cases over the years may be attributed to various factors, including changes in population density, urbanization, agricultural practices, and vaccination coverage. Continued monitoring and implementation of effective control measures are crucial in reducing the burden of Japanese encephalitis in mainland China.
It is important to note that the above analysis is solely based on the available data, and any further conclusions or recommendations would require additional information and a more comprehensive analysis.

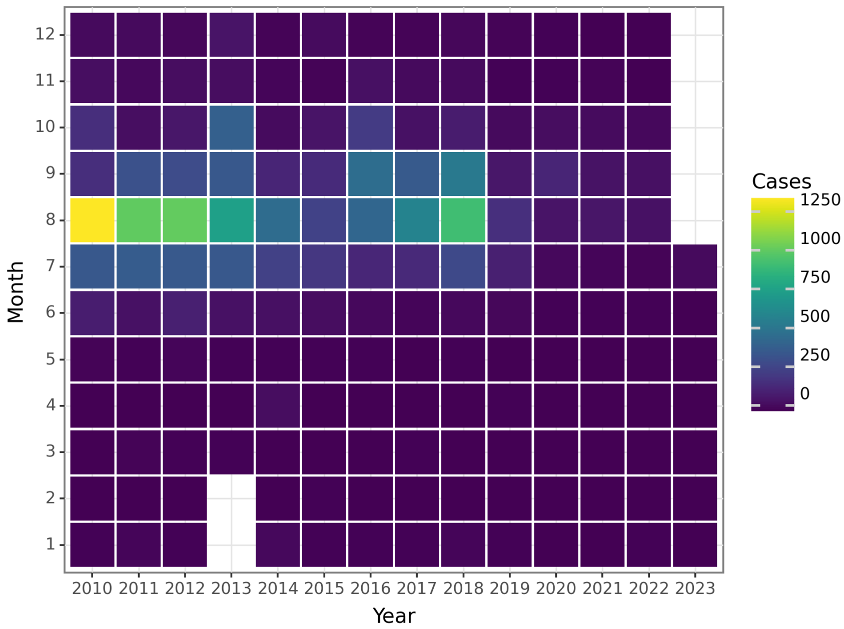

Figure 54: The Change of Japanese encephalitis Cases before 2023 June

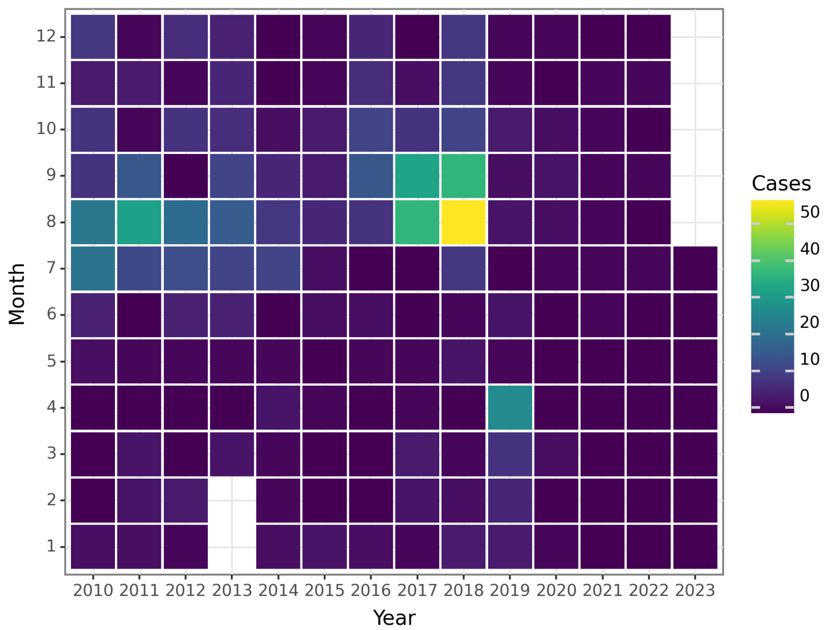

Figure 55: The Change of Japanese encephalitis Deaths before 2023 June

Dengue

Dengue fever is a viral disease transmitted by mosquitoes that is widespread in tropical and subtropical areas globally. It is caused by four closely related dengue virus serotypes (DEN-1, DEN-2, DEN-3, and DEN-4) and primarily transmitted to humans through the bite of infected female Aedes mosquitoes, specifically Aedes aegypti. This disease has become a significant concern for global health, with an increasing number of cases and geographic expansion in recent decades.

Historically, the first documented outbreaks of illnesses resembling dengue can be traced back to the 18th century in Asia, Africa, and the Americas. However, the first detailed description of dengue fever was provided by Benjamin Rush in 1789 during an outbreak in Philadelphia, USA. The name "dengue" originates from the Spanish phrase "dengue" or "denga," which means "fastidious" or "careful," describing the characteristic way in which patients would walk bent over due to severe joint pain.

Dengue is prevalent in more than 100 countries, primarily in tropical and subtropical regions of Asia, Africa, the Americas, and the Pacific. According to the World Health Organization (WHO), approximately 3.9 billion people worldwide are at risk of dengue infection, and an estimated 390 million cases occur annually. However, the precise number of cases is difficult to determine due to underreporting and misdiagnosis.

The main mode of dengue transmission is through the bite of the Aedes mosquito. Aedes aegypti is the primary vector for dengue and is commonly found in urban and semi-urban areas, breeding in water-filled containers near human settlements. Another mosquito species, Aedes albopictus, can also transmit the virus and is more prevalent in rural and suburban regions, contributing to the spread of dengue.

Key risk factors for dengue transmission include:

1. Inadequate mosquito control: Insufficient methods for controlling mosquitoes and poor sanitation practices can lead to an increase in mosquito breeding sites and higher rates of dengue transmission.
2. Urbanization and population growth: Rapid urbanization often results in larger populations living in close proximity to Aedes mosquito breeding sites, facilitating the spread of the disease.
3. Climate change: Environmental factors, such as temperature and rainfall patterns, can affect the distribution and abundance of mosquitoes, consequently influencing the incidence of dengue.
4. Travel and globalization: International travel can transport infected individuals to regions where dengue is not endemic, resulting in localized outbreaks.
5. Socioeconomic factors: Factors such as poverty, overcrowding, and limited access to healthcare can increase the risk of dengue transmission and the severity of the disease.

The impact of dengue varies across regions and populations. The highest burden of dengue is observed in Southeast Asia and the Western Pacific, where nearly 75% of global cases occur. Nevertheless, the disease has rapidly spread to other regions, including the Americas, Africa, and the Eastern Mediterranean. In recent years, dengue outbreaks have also been reported in regions with previously low prevalence, such as Europe and the United States.

Certain populations, including infants, young children, and pregnant women, are more susceptible to severe dengue infection. Individuals with pre-existing medical conditions, such as diabetes or asthma, may also have a higher risk of experiencing severe symptoms. Additionally, factors like age, immunity, and genetic predisposition can influence the severity and outcome of dengue infection.

In conclusion, dengue represents a significant global health issue with a high prevalence in tropical and subtropical regions. The primary mode of transmission is through the bite of infected Aedes mosquitoes, and risk factors include inadequate mosquito control, urbanization, climate change, travel, and socioeconomic conditions. The impact of dengue varies across regions and populations, with Southeast Asia and the Western Pacific being the most affected. Efforts to control dengue involve measures to control mosquito populations, engagement of communities, and the development of a dengue vaccine.

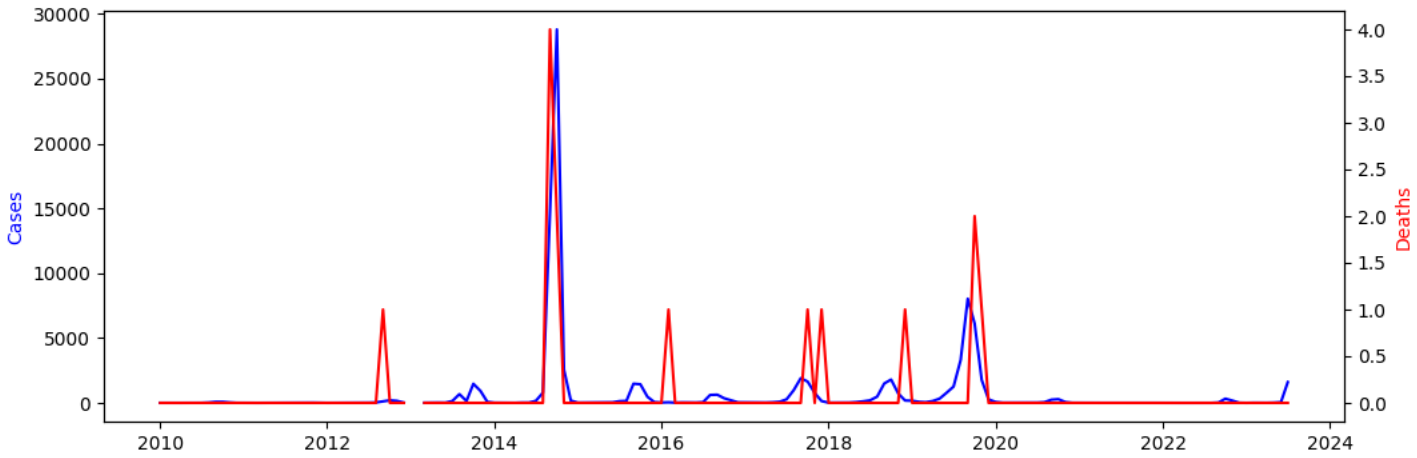

Figure 56: The Change of Dengue Reports before 2023 June

Seasonal Patterns:
Analysis of the data provided reveals distinct seasonal patterns in the incidences of Dengue in mainland China. Specifically, the number of cases shows a consistent increase from June to September, aligning with the summer season. This correlation can be attributed to the mosquito-borne nature of dengue, as mosquitoes tend to be more active in warmer temperatures. Conversely, during the winter months (December to February), a significant decrease in the number of cases is observed.
Peak and Trough Periods:
In mainland China, the peak period for Dengue cases is typically observed in September, when the number of cases reaches its highest point due to heightened mosquito activity amidst the warm and humid summer climate. Conversely, the trough period, characterized by the lowest number of cases, occurs during the winter months from December to February.
Overall Trends:
Upon examining the overall trend of Dengue cases in mainland China, it becomes apparent that fluctuations occur over the years, with some years experiencing higher case numbers than others. From 2010 to 2014, there was a progressive increase in the number of cases, reaching a peak in 2014. However, a gradual decrease has been observed since 2015, although occasional fluctuations persist. It is crucial to exercise caution while interpreting the data, as negative values are occasionally encountered for certain months, implying potential errors in data recording or reporting.
Discussion:
The provided data strongly suggests the presence of seasonal patterns in Dengue cases within mainland China, with higher numbers occurring during summer months and lower numbers during the winter. The peak period for cases is consistently observed in September, with the trough period aligning with the winter months. Furthermore, an overall downward trend in cases is evident from 2015 onwards, although sporadic fluctuations continue to arise. However, it should be noted that the accuracy of the data might be impacted by inconsistencies in reporting, as evidenced by instances of negative case values. Therefore, further analysis and investigation are necessary to comprehensively comprehend and interpret the observed patterns and trends.

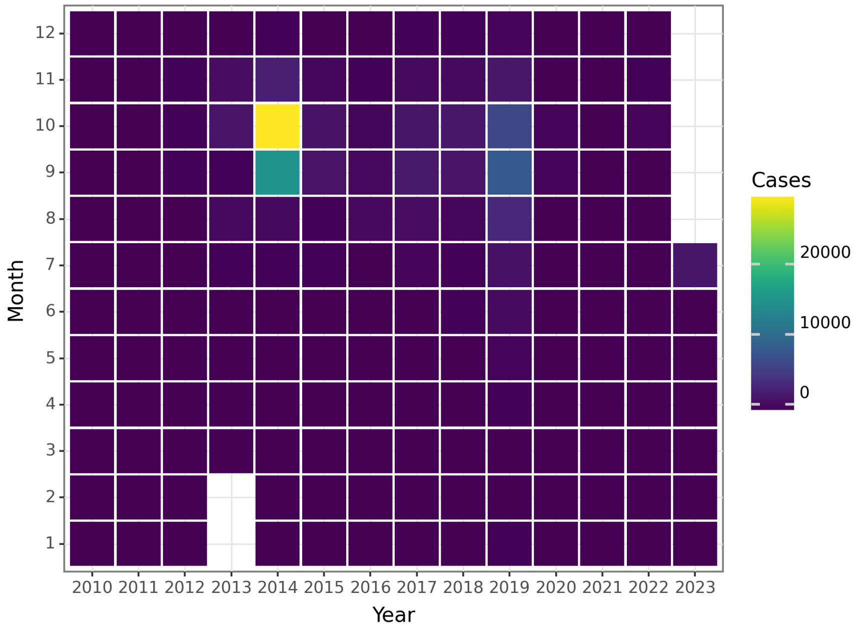

Figure 57: The Change of Dengue Cases before 2023 June

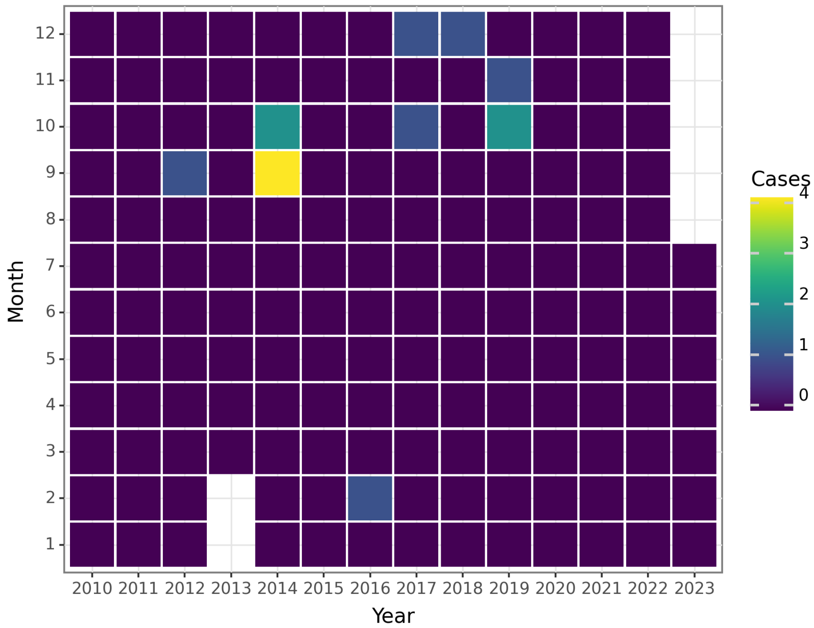

Figure 58: The Change of Dengue Deaths before 2023 June

Anthrax

Anthrax is a zoonotic infectious disease caused by the bacteria Bacillus anthracis, affecting both animals and humans globally, albeit with varying prevalence. The main modes of transmission include direct contact with infected animals or their products, consumption of contaminated meat, inhalation of spores, or exposure through wounds.

Historical Context and Discovery: Anthrax has a significant historical background, recognized for centuries. The first known description of Anthrax dates back to the ancient Egyptian civilization around 1600 BCE. Additionally, in the 5th century BCE, the Greek physician Hippocrates accurately described and documented cases. The term "anthrax" is derived from the Greek word "anthrakis," meaning "coal" or "charcoal," referring to the characteristic black eschar observed in cutaneous anthrax. In the 19th century, Italian microbiologist Agostino Bassi identified the disease as caused by a specific microorganism. Further contributions to understanding the bacteriology and transmission of Anthrax were made by scientists such as Robert Koch, Louis Pasteur, and Paul-Louis Simond in the 19th and early 20th centuries.

Global Prevalence: Anthrax is most commonly found in developing countries where there are close associations between humans and animal agriculture. It occurs on all continents except Antarctica, with certain regions experiencing higher prevalence rates. Regions with particularly high incidence rates include sub-Saharan Africa, parts of Asia (such as India, China, and Southeast Asia), and parts of South and Central America. However, cases are reported worldwide, and sporadic outbreaks can occur in any country.

Transmission Routes: Anthrax primarily infects animals, such as livestock (cattle, sheep, goats, and horses), but humans can acquire the disease through various routes. The modes of transmission include: 1. Cutaneous: Direct contact with spores through broken skin from infected animals or contaminated animal products. 2. Gastrointestinal: Consumption of undercooked or contaminated meat from infected animals. 3. Inhalational: Inhaling aerosolized spores mainly through occupational exposure, such as handling animal products or working in environments where spores are present. 4. Injectional: Rare occurrence through the use of contaminated drugs or equipment, typically seen in drug users.

Affected Populations: Anthrax affects both domestic and wild animals and can be transmitted to humans. Occupations associated with higher risk include farmers, livestock handlers, veterinarians, and laboratory workers handling the bacteria. However, community outbreaks have also occurred in areas where the disease is more prevalent.

Key Statistics: Determining exact global prevalence rates for Anthrax is challenging due to underreporting and variations in surveillance systems. The World Health Organization (WHO) estimates that there are 20,000 to 100,000 human cases reported annually worldwide, with a case-fatality rate of 20% to 60% if left untreated.

Risk Factors: Several risk factors contribute to the transmission of Anthrax, including:

1. Occupational Exposure: People working closely with animals, such as farmers, herdsmen, and veterinarians, face higher risks. 2. Poor Animal Husbandry Practices: Insufficient vaccination and control measures for livestock can lead to increased transmission and prevalence. 3. Lack of Public Health Infrastructure: Limited access to healthcare facilities, diagnostic capabilities, and lack of awareness about Anthrax in certain areas contribute to higher risks. 4. Outbreaks in Disasters or Conflicts: Natural disasters or war situations can disrupt animal health systems, resulting in increased susceptibility to Anthrax outbreaks.

Impact on Different Regions and Populations: The impact of Anthrax varies across different regions and populations. In resource-limited regions with inadequate healthcare infrastructure, the disease can have devastating consequences, causing outbreaks with high morbidity and mortality rates. Regions heavily dependent on agriculture or livestock may experience economic losses due to large-scale animal deaths. Moreover, marginalized populations living in close proximity to animals and relying on traditional animal products for their livelihoods face an increased risk of exposure and infection.

In conclusion, Anthrax is a globally prevalent infectious disease caused by Bacillus anthracis. Its transmission primarily occurs through contact with infected animals or their products, with varying prevalence rates across different regions. Understanding the epidemiology and risk factors associated with Anthrax is crucial for implementing effective prevention and control strategies.

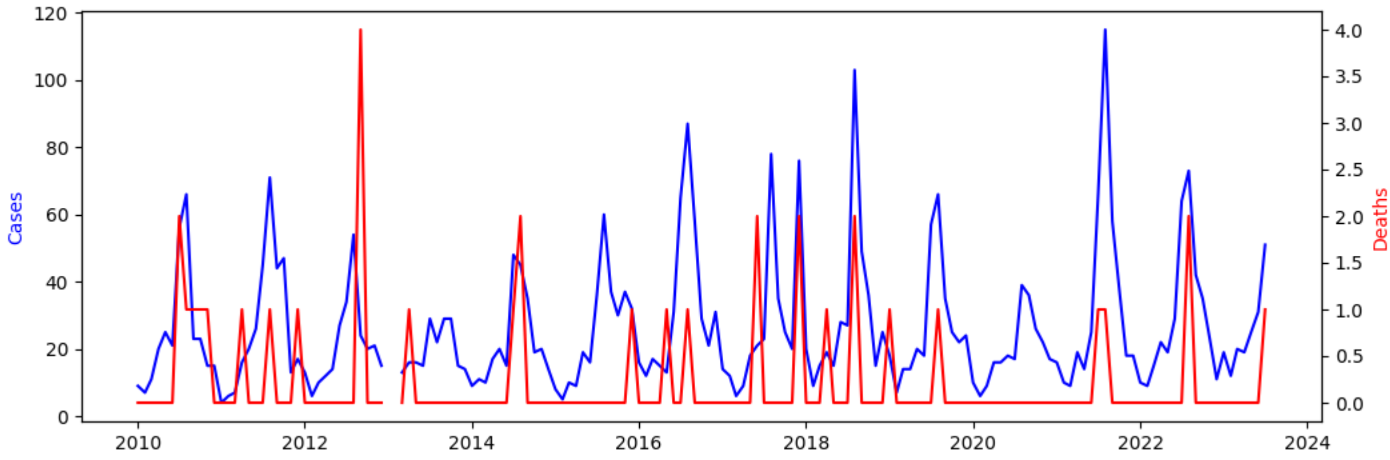

Figure 59: The Change of Anthrax Reports before 2023 June

Seasonal Patterns:
Distinct seasonal patterns are observed in mainland China based on the monthly data for Anthrax cases prior to June 2023. The number of cases tends to be higher during the summer and autumn months, specifically from June to November, which indicates a peak in Anthrax cases during this period. Conversely, the number of cases is relatively lower during the winter and spring months, from December to May, suggesting a trough period for Anthrax.
Peak and Trough Periods:
The peak period for Anthrax cases in mainland China occurs between June and November during the summer and autumn months. During this time, the number of cases significantly increases, reaching its highest levels. On the other hand, the trough period for Anthrax cases happens between December and May during the winter and spring months. The number of cases during this period is relatively lower.
Overall Trends:
Analyzing the overall trends of Anthrax cases in mainland China prior to June 2023, a fluctuating pattern is observed over the years. From 2010 to 2012, the number of cases remained relatively stable with some fluctuations, but no significant trend was observed. However, from 2013 to 2014, there was a notable decrease in the number of cases, reaching the lowest levels during this period. This decrease was followed by a gradual increase in cases from 2015 to 2016. Since then, there have been a mix of fluctuations and moderate increases in overall case numbers, with peaks occurring in certain years (e.g., 2017, 2018, 2020, 2021, and 2022). It is important to note that the number of reported cases can be influenced by various factors, including surveillance and reporting practices, public health interventions, and awareness.
Discussion:
The seasonal patterns of Anthrax cases in mainland China suggest an association with climate and environmental factors. The higher number of cases during the summer and autumn months can be attributed to increased contact with livestock or contaminated environments, as these seasons coincide with higher agricultural activities and grazing periods for animals. Additionally, temperature and humidity levels during these months may create favorable conditions for the survival and growth of the Bacillus anthracis bacteria.
The presence of peak and trough periods suggests that there are seasonal variations in the occurrence of Anthrax cases. This information can be useful for preparedness and response efforts as it allows public health authorities to allocate resources and implement targeted interventions during peak periods to reduce the impact of the disease.
The overall trend of Anthrax cases in mainland China prior to June 2023 shows fluctuations and moderate increases over the years. Factors such as changes in surveillance practices, public health interventions, and awareness levels may contribute to these variations. It is important to continue monitoring the trend and analyzing the underlying factors to effectively address and control Anthrax in mainland China.
It is worth mentioning that the analysis is based on the provided data and may not capture the complete picture of Anthrax cases in mainland China. Additional information, including demographics, geographical

distribution, and specific risk factors, would further enhance the understanding of disease dynamics and support targeted prevention and control strategies.

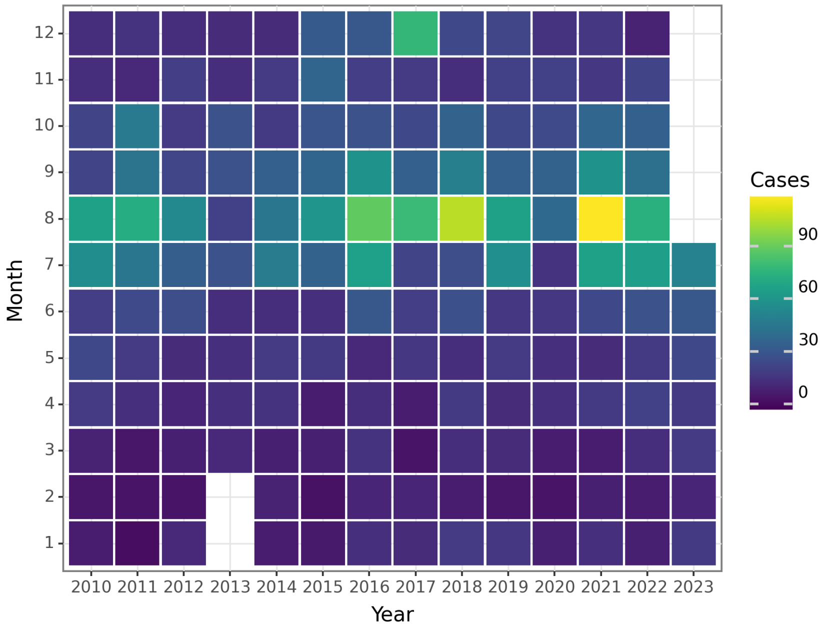

Figure 60: The Change of Anthrax Cases before 2023 June

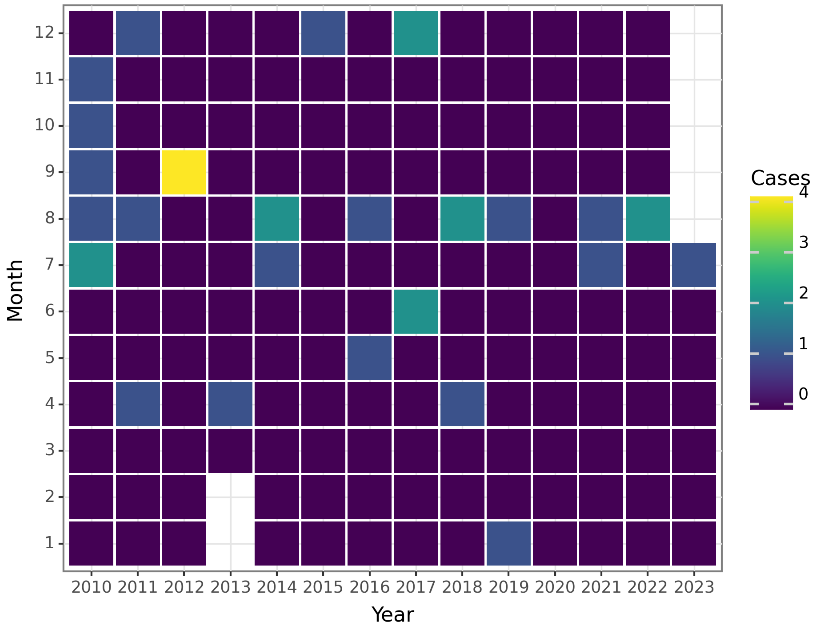

Figure 61: The Change of Anthrax Deaths before 2023 June

Dysentery

Dysentery is an infectious gastrointestinal disease that primarily affects the colon, causing inflammation and severe diarrhea. It is typically caused by bacteria such as Shigella, or less commonly, other pathogens like Campylobacter or Entamoeba histolytica. This comprehensive overview will discuss the epidemiology of dysentery, including its global prevalence, transmission routes, affected populations, key statistics, historical context, and discovery.

Prevalence: Dysentery is a global health concern, particularly in areas with inadequate sanitation and limited access to clean water. According to the World Health Organization (WHO), dysentery causes approximately 1.9 million deaths worldwide each year, mainly in low-income countries. The prevalence of dysentery varies greatly between regions and populations due to differences in socioeconomic conditions and healthcare infrastructure.

Transmission Routes: The transmission of dysentery primarily occurs through the ingestion of contaminated food or water, often due to poor hygiene practices. It can also spread through person-to-person contact, especially in crowded settings such as households, schools, or healthcare facilities. Flies and other insects can act as mechanical vectors, transferring pathogens from feces to food or surfaces.

Affected Populations: Dysentery can affect individuals of all ages, but children under five years old are particularly vulnerable. This is partly due to their immature immune systems and increased likelihood of exposure in unsanitary environments. Additionally, malnutrition can further increase the risk and severity of dysentery. Regions with conflict or natural disasters also have higher rates of dysentery due to disrupted sanitation systems.

Key Statistics: - Shigellosis, the most common form of dysentery caused by Shigella bacteria, affects an estimated 80-165 million people annually worldwide. - Dysentery-related deaths primarily occur in low- and middle-income countries, with sub-Saharan Africa and Southeast Asia being the most affected regions. - In some regions, specific Shigella strains have developed resistance to commonly used antibiotics, making treatment and control more challenging.

Historical Context and Discovery: Dysentery has been documented throughout history, with references found in texts dating back thousands of years. The term "dysentery" itself was coined in the 16th century, but the disease was recognized and described much earlier. Historically, dysentery was a significant cause of death, particularly in military conflicts and during outbreaks. Advances in understanding its various causes and transmission routes have helped to improve prevention and treatment strategies over time.

Major Risk Factors: - Poor sanitation: Lack of access to clean water, proper sanitation facilities, and hygiene education increases the risk of dysentery. - Overcrowding: Living in densely populated areas or crowded living conditions facilitates person-to-person transmission. - Contaminated food and water: Consuming food or water contaminated with fecal matter containing dysentery-causing pathogens is a significant risk factor. - Malnutrition: Undernourished individuals, especially children, are more susceptible to infections, including dysentery.

Impact on Different Regions and Populations: Dysentery prevalence varies across regions due to differences in socioeconomic factors, living conditions, and access to healthcare. Low-income countries, particularly those with inadequate sanitation infrastructure, experience a higher burden and mortality rates. Within countries, certain demographic groups such as children, pregnant women, and individuals with compromised immune systems are more susceptible to severe complications and adverse outcomes.

In conclusion, dysentery is a global health concern with significant impacts on affected regions and populations. Its prevalence is influenced by factors such as sanitation, overcrowding, contaminated food and water, and malnutrition. Understanding the epidemiological aspects of dysentery is crucial in implementing effective control measures and reducing the burden of the disease in affected communities.

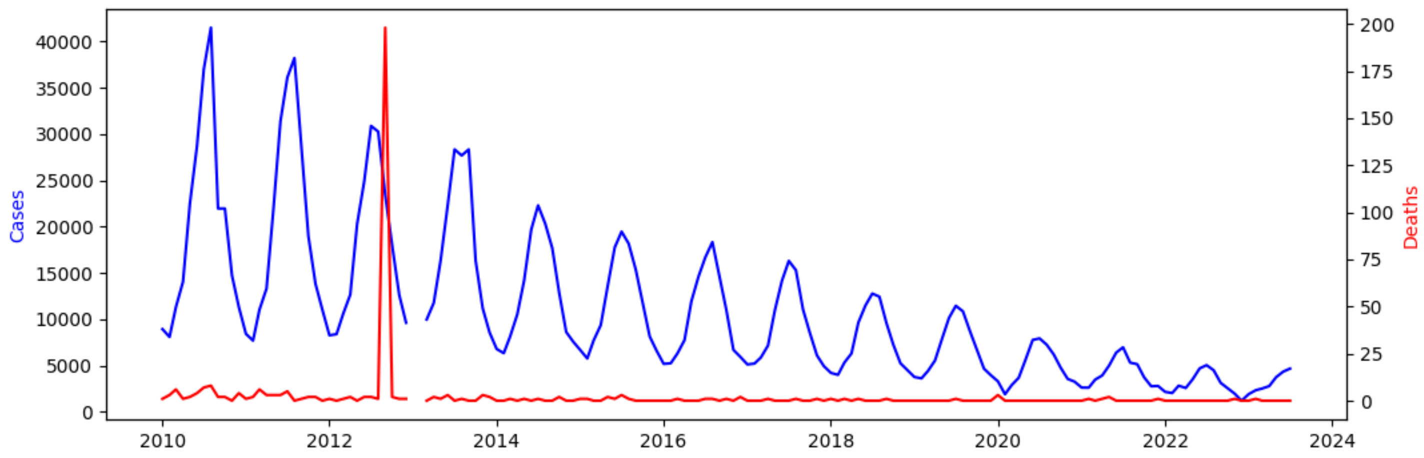

Figure 62: The Change of Dysentery Reports before 2023 June

Seasonal Patterns: The data provided indicates a distinct seasonal pattern for Dysentery cases in mainland China. Typically, the number of cases begins to increase in the early months of the year, reaching its peak during the summer months (May to August), and then gradually declining towards the end of the year. This seasonal pattern repeats annually.
Peak and Trough Periods: The peak period for Dysentery cases in mainland China occurs specifically in July and August, during which the number of cases reaches its highest point. On the other hand, trough periods can be observed in November and December, when the number of cases decreases.
Overall Trends: The overall trend for Dysentery cases in mainland China demonstrates a cyclical pattern. The number of cases increases during the first half of the year, with the peak occurring in the summer, followed by a decrease towards the end of the year. This cyclical trend has been consistently observed over the years, although there are some variations in the magnitude of the peaks and troughs.
Discussion: The observed seasonal patterns and overall trends in Dysentery cases in mainland China suggest a seasonally varying transmission of the disease. The peak in the summer months is likely influenced by factors such as higher temperatures, increased humidity, and potentially greater exposure to contaminated food and water sources.
Understanding these patterns and trends can inform public health interventions and resource allocation. Efforts should be directed towards increasing public awareness and implementing preventive measures, including promoting proper sanitation and hygiene practices, particularly during the peak months. Furthermore, surveillance and monitoring systems should be strengthened to detect and respond promptly to outbreaks.
It is important to note that the data provided is limited to monthly cases and deaths, and further analysis would require additional information such as population data and specific geographical locations. Nevertheless, the provided data highlights the seasonal patterns, peak and trough periods, and overall trends for Dysentery cases in mainland China up until June 2023.

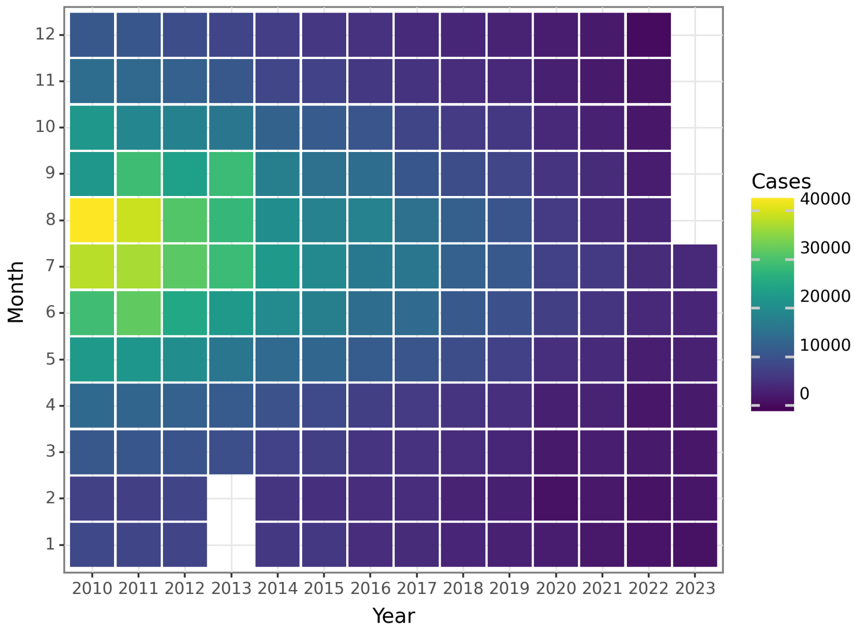

Figure 63: The Change of Dysentery Cases before 2023 June

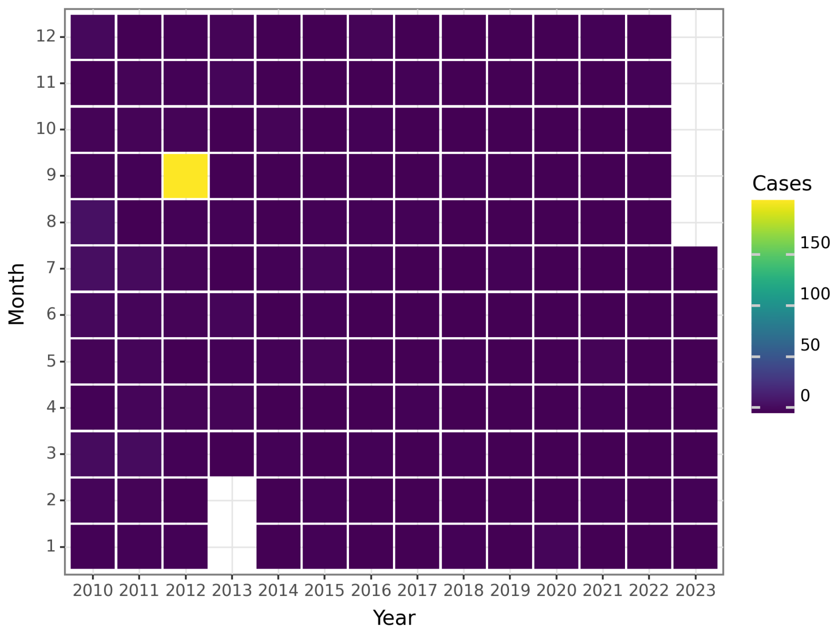

Figure 64: The Change of Dysentery Deaths before 2023 June

Tuberculosis

Tuberculosis (TB) is a contagious bacterial infection caused by Mycobacterium tuberculosis and primarily affects the lungs. However, it can also invade other parts of the body such as the kidneys, spine, and brain. TB has been a long-standing public health concern with varying impacts across different regions and populations.

Historical Context and Discovery:

TB is not a recent disease and has existed for thousands of years. Evidence of TB has been found in remains dating back to ancient Egypt, indicating its presence since at least 4,000 BCE. Throughout history, TB has been known by various names such as consumption, phthisis, and the white plague. In the 19th century, it became a major public health crisis in Europe and North America. This crisis led to the establishment of sanatoriums and the discovery of the tubercle bacillus by Robert Koch in 1882.

Global Prevalence:

TB remains a significant global health problem, especially in many developing countries. According to the World Health Organization (WHO), an estimated 10 million people developed TB in 2019, and 1.4 million died from the disease. TB is more prevalent in low and middle-income countries due to factors such as crowded living conditions, malnutrition, limited access to healthcare, and co-infection with HIV. Regions with the highest TB burden include sub-Saharan Africa, Southeast Asia, and the Western Pacific.

Transmission Routes:

TB primarily spreads through droplet transmission when an infected individual coughs, sneezes, or speaks, releasing bacteria into the air. The bacteria can survive for several hours in the environment, making close and prolonged contact with an infected person a significant risk factor. However, it is important to note that not everyone exposed to TB bacteria becomes infected. The strength of the individual's immune system and bacterial load are crucial factors in determining the likelihood of infection.

Affected Populations:

While TB can affect anyone, certain populations are more vulnerable to the disease. Key risk factors associated with Tuberculosis transmission include:

1. HIV/AIDS: People living with HIV/AIDS are highly susceptible to TB due to their weakened immune systems. 2. Malnutrition: Poor nutrition weakens the immune system and makes individuals more susceptible to TB infection and severe disease. 3. Overcrowding: Congested living conditions with poor ventilation increase the chances of TB transmission. 4. Poverty and Limited Access to Healthcare: Lack of resources and healthcare infrastructure make it difficult for individuals to access timely diagnosis and treatment, leading to increased transmission rates and poor outcomes. 5. Substance Abuse: Intravenous drug use and excessive alcohol consumption weaken the immune system and increase the risk of TB.

Impact on Regions and Populations:

TB prevalence varies significantly across different regions and populations. Sub-Saharan Africa carries the highest burden, accounting for nearly a quarter of all new TB cases worldwide. Countries within this region with a high HIV prevalence often experience more severe TB epidemics due to the synergistic relationship between the two diseases. Asian countries, such as India, Indonesia, and Bangladesh, also face a high TB burden, primarily due to their large populations and limited healthcare resources.

Certain demographics disproportionately bear the impact of TB. For example, males have a higher risk of developing TB compared to females, partly due to factors such as smoking and alcohol consumption being more prevalent among men. Additionally, healthcare workers experience an increased exposure risk due to their occupation.

In conclusion, Tuberculosis remains a significant global health problem, particularly in regions with limited resources and a high prevalence of HIV. Efforts to control TB must address key risk factors, enhance access to healthcare, and improve living conditions. Increased awareness of the disease, early detection, and appropriate treatment are crucial to reducing its impact on individuals and communities.

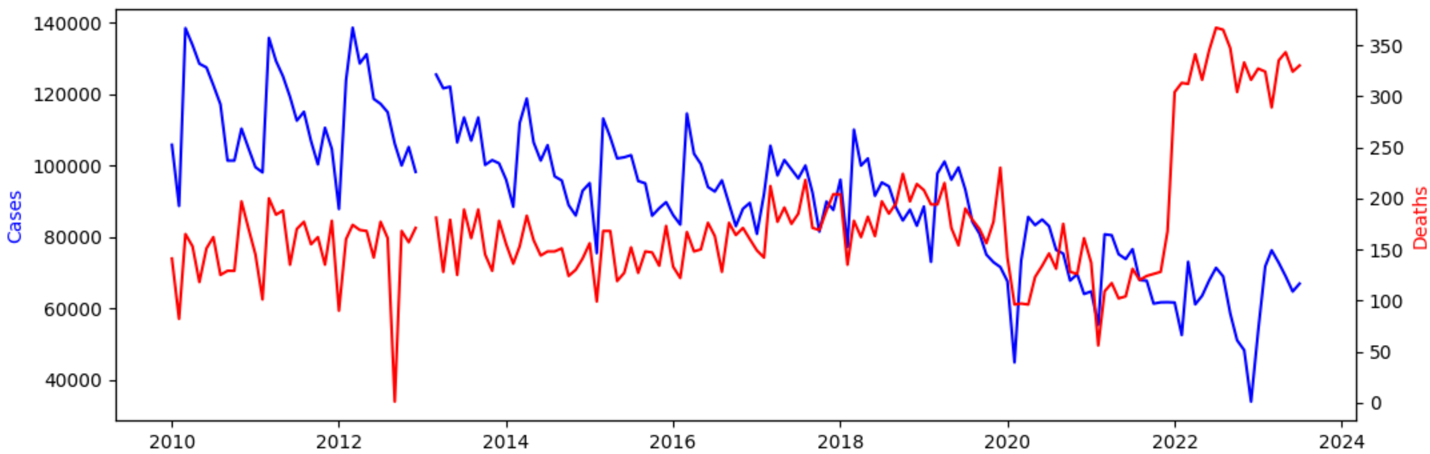

Figure 65: The Change of Tuberculosis Reports before 2023 June

Seasonal Patterns: Based on the provided data, significant seasonal patterns in the number of tuberculosis cases in mainland China are evident. Cases tend to be more prevalent during the winter months (December to February) and less common during the summer months (June to August). These findings support the existence of seasonal variation in tuberculosis transmission and incidence, with higher rates of transmission occurring during colder months.

Peak and Trough Periods: The peak periods for tuberculosis cases in mainland China are primarily observed during the winter months, specifically from December to February. This timeframe corresponds to the highest number of cases. Conversely, the trough periods, characterized by the lowest number of cases, occur during the summer months, particularly from June to August.

Overall Trends: When examining the overall trends, a fluctuating pattern in the number of tuberculosis cases is evident over the years. There are periods of increase followed by subsequent periods of decrease. The number of cases reached its peak around 2010-2012 and gradually declined until approximately 2017-2018. Subsequently, there was a slight increase from 2020 to 2022, followed by a subsequent decrease in 2023.

Discussion: The observed seasonal patterns in tuberculosis cases in mainland China align with general knowledge about infectious diseases, as respiratory illnesses often exhibit distinct seasonal patterns. The peak and trough periods represent periods of higher and lower transmission rates, respectively. The fluctuating trend of tuberculosis cases over the years may be influenced by several factors, including changes in awareness, access to healthcare, and public health interventions. To comprehend the specific factors contributing to the observed trends and assess the effectiveness of tuberculosis control measures in mainland China, further analysis and research are necessary.

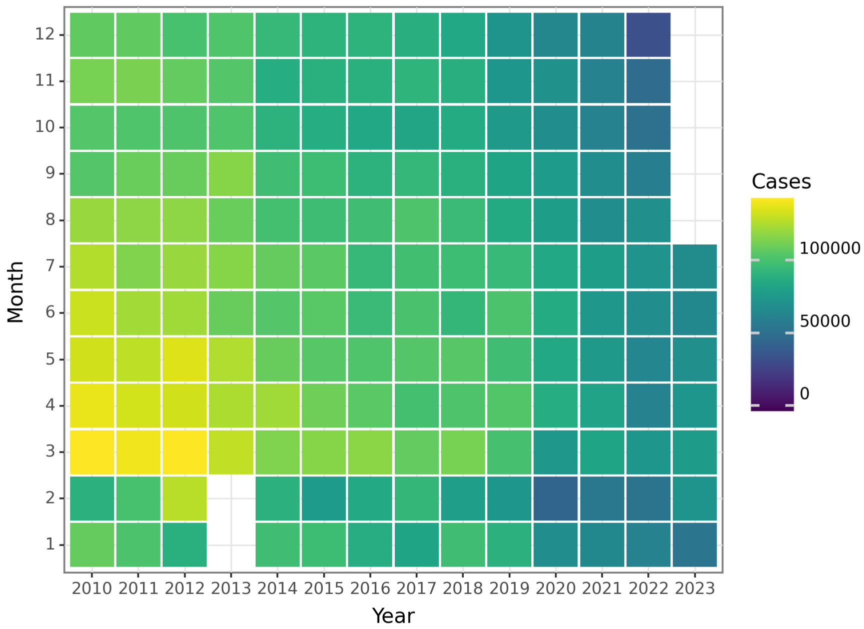

Figure 66: The Change of Tuberculosis Cases before 2023 June

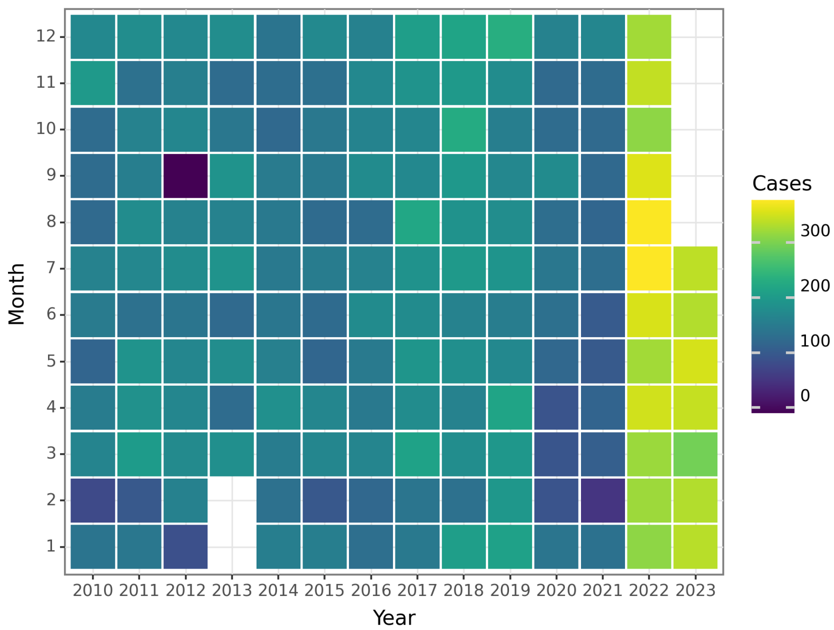

Figure 67: The Change of Tuberculosis Deaths before 2023 June

Typhoid fever and paratyphoid fever

Typhoid fever and paratyphoid fever are important global public health issues. They are caused by Salmonella enterica serovar Typhi (S. Typhi) and Salmonella enterica serovars Paratyphi A, B, and C (S. Paratyphi A, B, and C), respectively. These bacterial infections primarily affect the gastrointestinal system and can result in severe illness if left untreated.

Epidemiology and Global Prevalence: Typhoid fever and paratyphoid fever are more prevalent in developing countries, particularly in regions with inadequate sanitation and limited access to clean water. These diseases are endemic in many parts of Asia, Africa, and Latin America.

According to the World Health Organization (WHO), there were an estimated 11-20 million cases of typhoid fever worldwide in 2017, resulting in 128,000 to 161,000 deaths. Paratyphoid fever is less commonly reported, but it is believed to have a similar disease burden.

Transmission Routes: Typhoid and paratyphoid fevers are primarily transmitted through the fecal-oral route. Contaminated food and water are the primary sources of infection. People can become carriers of the bacteria without displaying symptoms and shed the bacteria in their feces, contaminating the environment. Inadequate sanitation and poor handwashing practices contribute to the spread of these diseases.

Risk Factors: Several factors increase the risk of infection. These include living in areas with limited access to clean water and proper sanitation, consuming contaminated food or water, and close contact with infected individuals. Traveling to regions with a high prevalence of these diseases and working in healthcare settings where exposure to infected patients is more likely also increases the risk.

Historical Context and Discovery: Typhoid fever has been present throughout human history, but its exact origins are uncertain. The discovery of the causative agent, S. Typhi, can be attributed to the pioneering work of bacteriologist Karl Joseph Eberth in 1880. Over time, better understanding of the disease's etiology, transmission, and prevention measures have led to significant progress in reducing its global burden.

Paratyphoid fever, on the other hand, was initially recognized in the late 19th century but often remained undifferentiated from typhoid fever until later research. The distinct serovars, S. Paratyphi A, B, and C, were identified in the 1930s.

Impact on Different Regions and Populations: The burden and impact of typhoid fever and paratyphoid fever vary among regions and populations. Developing countries, particularly those with inadequate sanitation infrastructure, bear the greatest burden. Children, especially those under five years old, are particularly susceptible to these diseases.

In some regions, such as South Asia and sub-Saharan Africa, typhoid fever is endemic, with recurrent outbreaks. These areas often experience higher prevalence rates and more severe disease outcomes compared to other parts of the world. Additionally, marginalized communities, including slum dwellers and refugees, who have limited access to clean water and sanitation facilities, are at higher risk.

Although vaccination programs and improvements in water and sanitation infrastructure have helped reduce the overall burden of typhoid fever, localized outbreaks still occur, particularly in areas with limited resources for public health interventions. The emergence of antibiotic resistance in S. Typhi strains is also a growing concern, making effective treatment more challenging.

In conclusion, typhoid fever and paratyphoid fever continue to present significant public health challenges, particularly in developing countries with limited access to clean water and sanitation. Improved infrastructure, equitable access to healthcare, and awareness of preventive measures are crucial for reducing the burden of these diseases and minimizing their impact on affected populations.

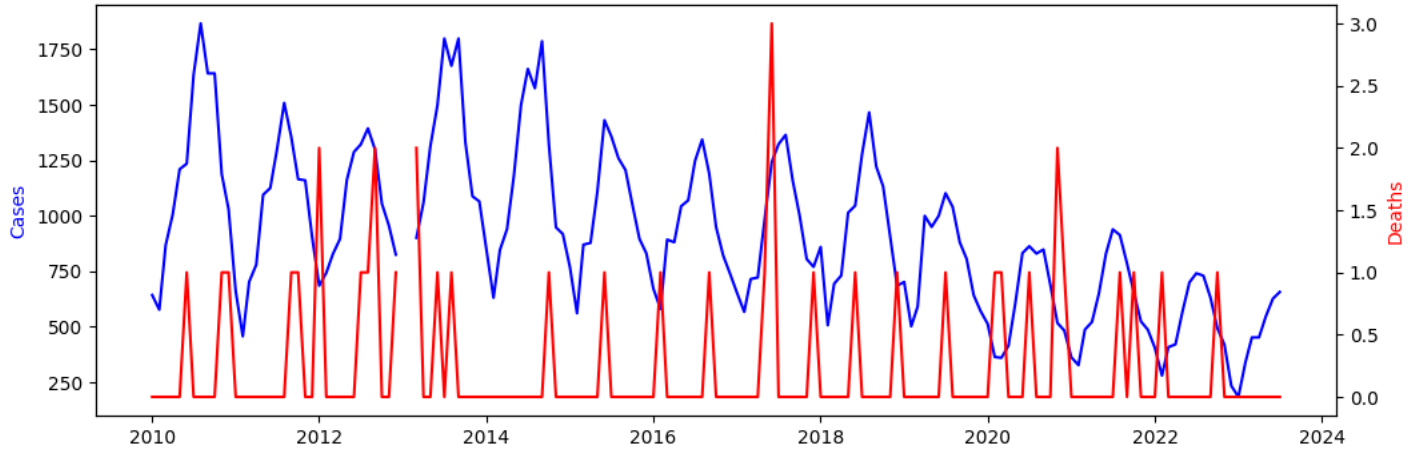

Figure 68: The Change of Typhoid fever and paratyphoid fever Reports before 2023 June

Seasonal Patterns:
According to the data provided, there are noticeable seasonal patterns for both Typhoid fever and paratyphoid fever in mainland China. The incidences of both diseases tend to increase during the summer months and reach their peak around July or August. Subsequently, the number of cases gradually decreases during the following months, with lower levels observed in the winter season.
Peak and Trough Periods:
The peak period for both Typhoid fever and paratyphoid fever occurs during the summer months, particularly in July and August, when the number of reported cases is at its highest. Conversely, the trough period for these diseases occurs in the winter season, especially in December and January, when the number of reported cases is at its lowest.
Overall Trends:
When examining the overall trends, it is evident that the number of reported cases for both Typhoid fever and paratyphoid fever has been fluctuating over the years. The data does not reveal a clear upward or downward trend. Nonetheless, there are intermittent spikes in the number of cases, particularly in certain years.
Discussion:
The observed seasonal patterns for Typhoid fever and paratyphoid fever in mainland China suggest that climatic factors influence the transmission of these diseases. The increase in cases during the summer months could be attributed to higher temperatures, which may enhance the survival and growth of the bacteria causing these diseases.
The fluctuating number of cases over the years may be influenced by various factors, including changes in surveillance and reporting systems, public health interventions, and socio-economic conditions. It is crucial for public health authorities to closely monitor these trends and implement targeted interventions to prevent and control the spread of these diseases.
It is important to note that the analysis provided is solely based on the provided data and does not account for additional factors that may affect the transmission and incidence of Typhoid fever and paratyphoid fever in mainland China.

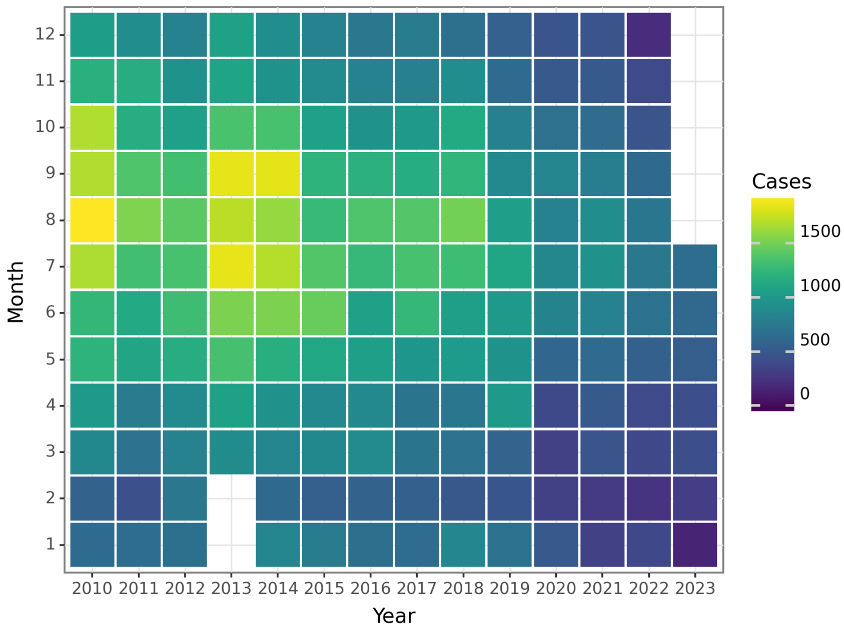

Figure 69: The Change of Typhoid fever and paratyphoid fever Cases before 2023 June

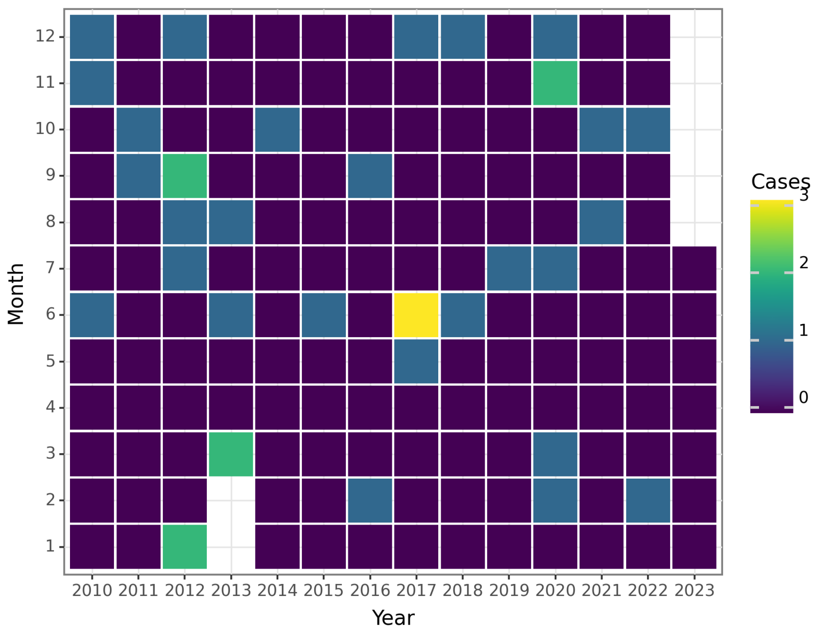

Figure 70: The Change of Typhoid fever and paratyphoid fever Deaths before 2023 June

Meningococcal meningitis

Meningococcal meningitis, caused by the bacterium Neisseria meningitidis, is a severe form of bacterial meningitis that poses a significant global health concern. If left untreated, it can lead to outbreaks and high mortality rates. This paper will provide a comprehensive overview of the epidemiology of meningococcal meningitis, including its global prevalence, transmission routes, affected populations, key statistics, historical context, and discovery. Additionally, it will discuss major risk factors associated with transmission and the impact on different regions and populations.

Epidemiology:

1. Global Prevalence: Meningococcal meningitis is a worldwide occurrence, but its highest prevalence is observed in Sub-Saharan Africa, specifically in an area known as the "meningitis belt." This belt stretches from Senegal to Ethiopia and experiences the greatest incidence rates, frequently encountering epidemics. Other regions with significant burdens of meningococcal meningitis include parts of Asia, the Middle East, and South America.
2. Transmission Routes: The transmission of Neisseria meningitidis, the bacterium responsible for meningococcal meningitis, primarily occurs through respiratory droplets from person to person. Close and prolonged contact with an infected individual is necessary for transmission to occur.
3. Affected Populations: Although meningococcal meningitis can affect individuals of all ages, certain populations face a higher risk. Infants under the age of one, adolescents, and young adults are particularly susceptible. Additionally, individuals residing in crowded conditions such as military barracks, dormitories, and refugee camps are more prone to outbreaks due to the easier transmission opportunities.
4. Key Statistics: The World Health Organization (WHO) reports approximately 450,000 cases of meningococcal meningitis each year globally. Approximately 10% of these cases result in fatalities, even with appropriate treatment. Survivors may endure long-term complications, including neurological damage, hearing loss, and learning disabilities.

Historical Context and Discovery:

Meningococcal meningitis has been recognized as a disease for centuries, with outbreaks and epidemics recorded throughout history. However, it wasn't until the late 19th and early 20th centuries that the bacterial cause was identified. In 1887, Anton Weichselbaum discovered the bacterium responsible for meningococcal meningitis, which was subsequently named Neisseria meningitidis after its discoverer, Albert Neisser.

Major Risk Factors:

1. Crowded Living Conditions: High-density living environments like barracks, dormitories, and refugee camps increase the risk of transmission due to close quarters.
2. Age: Infants, adolescents, and young adults face a higher risk of contracting meningococcal meningitis. Infants under the age of one have underdeveloped immune systems, while lifestyle factors such as communal living arrangements and sharing utensils contribute to increased transmission among adolescents and young adults.
3. Genetic Factors: Certain individuals may possess underlying genetic factors that make them more susceptible to severe meningococcal infections.
4. Travel to Endemic Regions: Travelers visiting areas with high rates of meningococcal meningitis, particularly the meningitis belt in Africa, face an elevated risk of exposure.

Impact on Different Regions and Populations:

1. Meningitis Belt: The meningitis belt in Sub-Saharan Africa experiences recurring epidemics due to the presence of serogroups A, B, C, W, and X. Factors such as limited healthcare access, overcrowding, and poor living conditions contribute to the high incidence and mortality rates in this region.
2. Developed Countries: Regions with well-established healthcare systems and widespread vaccination programs typically experience lower incidences of meningococcal meningitis. Vaccination campaigns have proven effective in reducing the disease burden, with specific recommendations for vaccination targeting adolescents and young adults.
3. Outbreaks in Other Regions: While less common, outbreaks of meningococcal meningitis can occur in other parts of the world, including Asia, the Middle East, and South America. These outbreaks are often associated with specific serogroups, and local public health responses involve vaccination campaigns and prompt treatment to control the disease's spread.

In conclusion, meningococcal meningitis, caused by Neisseria meningitidis, is a globally significant disease affecting various populations. Sub-Saharan Africa's meningitis belt experiences a higher prevalence, but transmission rates are also affected by close contact and crowded living conditions. Developed countries have reduced disease burdens through vaccination programs and healthcare infrastructure, but outbreaks can still arise. Identifying risk factors, implementing vaccination campaigns, and offering prompt treatment are essential strategies to control and mitigate the impact of meningococcal meningitis on different regions and populations.

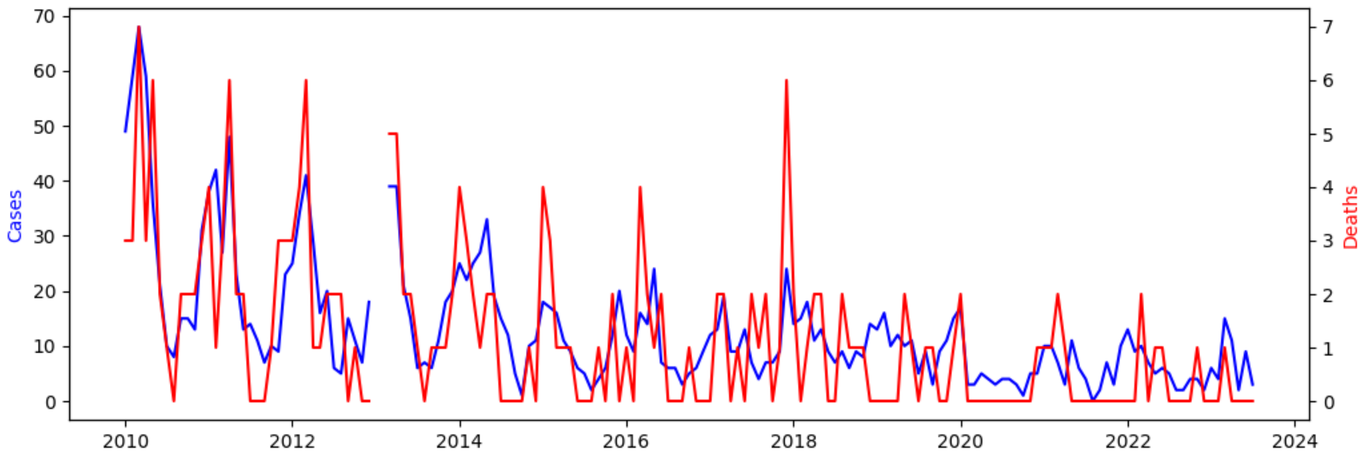

Figure 71: The Change of Meningococcal meningitis Reports before 2023 June

Seasonal Patterns:
Analyzing the monthly data for cases of Meningococcal meningitis in mainland China from January 2010 to June 2023, we can identify distinct seasonal patterns. In general, there is a higher incidence of cases reported during the winter and spring months (December to April), while the number of cases tends to be lower in the summer and fall months (May to November).
Peak and Trough Periods:
The peak periods for Meningococcal meningitis cases in mainland China correspond to the winter and spring months, especially from December to April. These months consistently demonstrate higher case counts compared to the rest of the year. Conversely, the trough period, characterized by the lowest number of cases, is primarily observed during the summer and fall months, spanning from May to November.
Overall Trends:
Throughout the years, there is no apparent increasing or decreasing trend in Meningococcal meningitis cases in mainland China. The overall trend appears to be relatively stable, with some year-to-year fluctuations. However, it is important to note that the data only covers until June 2023, so it is crucial to consider more recent data to identify any potential changing trends.
Discussion:
The seasonal patterns of Meningococcal meningitis cases in mainland China indicate a higher incidence during the winter and spring months, in line with typical observations for respiratory and contagious diseases. This trend could be attributed to factors such as colder temperatures and increased indoor activities during the winter, which facilitate the transmission of the bacteria. Additionally, the decrease in cases during the summer and fall months could be influenced by factors like higher temperatures and increased outdoor activities, which may limit person-to-person transmission.
The stable overall trend highlights the persistent health concern posed by Meningococcal meningitis in mainland China throughout the study period. It emphasizes the importance of ongoing surveillance and preventive measures to control the disease, particularly during peak periods. Public health interventions, including targeted vaccination campaigns and educational efforts, can raise awareness and promote preventive measures during the high-risk seasons.

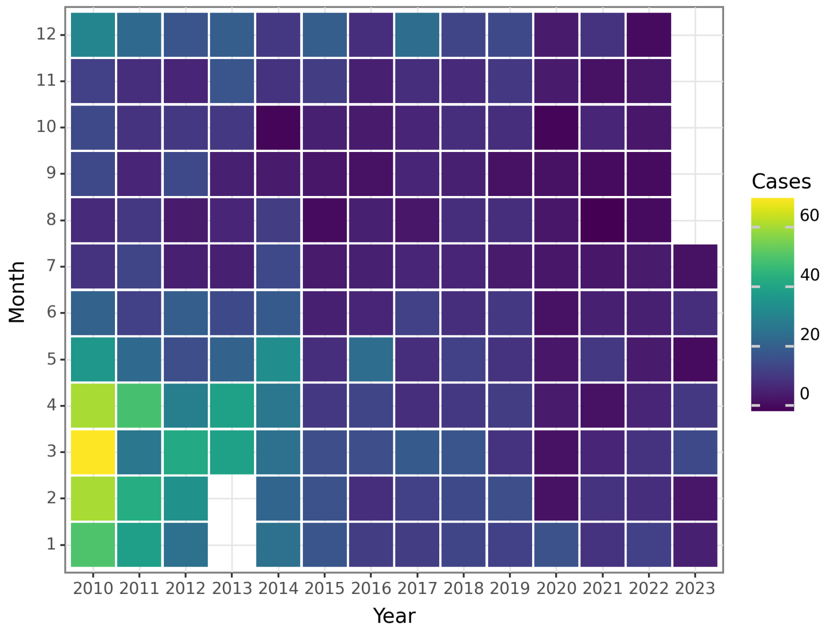

Figure 72: The Change of Meningococcal meningitis Cases before 2023 June

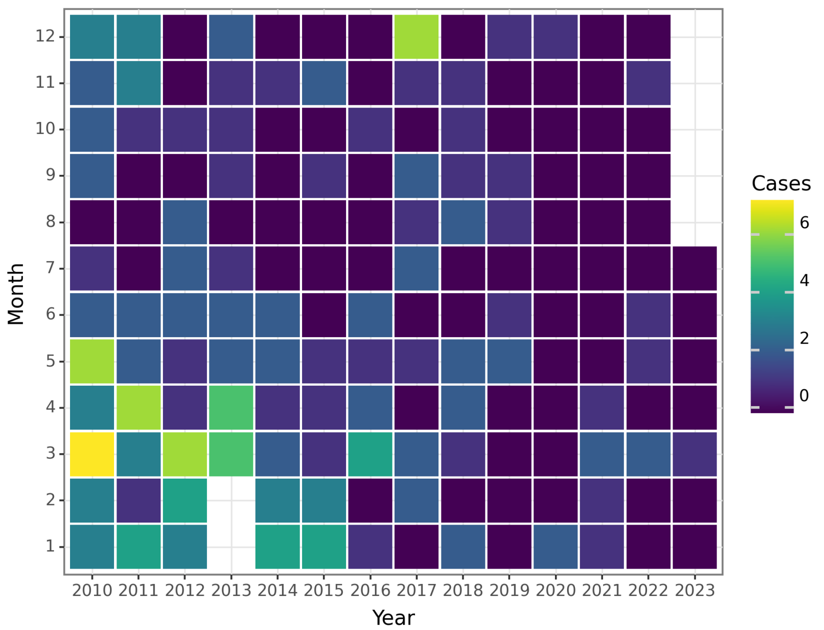

Figure 73: The Change of Meningococcal meningitis Deaths before 2023 June

Pertussis

Pertussis, commonly known as whooping cough, is a highly contagious respiratory infection caused by the bacterium Bordetella pertussis. It affects individuals of all age groups but is particularly severe and life-threatening in infants and young children. This paper aims to comprehensively examine the epidemiology of pertussis, including its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, major risk factors, and its impact on different regions and populations.

Epidemiology: 1. Global Prevalence: Pertussis is a significant global health concern, affecting countries worldwide. It is estimated that approximately 16 million cases of pertussis occur globally each year, resulting in around 195,000 deaths, with infants being the most affected.

2. Transmission Routes: Pertussis spreads through respiratory droplets released when an infected person coughs or sneezes. It is highly contagious and easily transmitted from person to person, especially in close contact settings such as households, schools, and healthcare facilities.

3. Affected Populations: While pertussis can affect individuals of all ages, infants, especially those younger than six months, are at the highest risk of severe complications, hospitalization, and death. Adolescents and adults can also contract and unknowingly transmit the infection, acting as a reservoir for the disease.

4. Key Statistics: Pertussis demonstrates a cyclical pattern of incidence, with increased outbreaks occurring approximately every 3-5 years in many countries. Vaccination efforts have significantly reduced the burden of pertussis, but cases still occur due to waning immunity, vaccine hesitancy, and non-immunized populations. Reported incidence rates vary across regions, although underreporting is common due to misdiagnosis and inadequate surveillance.

Historical Context and Discovery: Pertussis has been recognized for centuries, with historical mentions dating back as early as the 16th century. However, it was not until the 1900s that the causative agent, Bordetella pertussis, was discovered. In 1906, Jules Bordet and Octave Gengou successfully isolated the bacterium from the respiratory secretions of pertussis patients, marking a groundbreaking discovery that laid the foundation for further understanding and control of the disease.

Major Risk Factors: 1. Lack of Vaccination: The primary risk factor for pertussis transmission is the absence or incomplete vaccination. Infants and young children who have not completed their recommended vaccination schedules are particularly vulnerable. Vaccine hesitancy and refusal contribute to the persistence and resurgence of pertussis in some regions.

2. Waning Immunity: Over time, acquired immunity from both natural infection and vaccination diminishes, leaving individuals susceptible to reinfection. Adolescents and adults may contract pertussis and unknowingly transmit it to vulnerable populations, such as infants.

3. Close Contact: Pertussis is highly contagious and spreads through close contact with an infected individual. Living in crowded conditions, particularly in households with an infected person, increases the risk of transmission.

Impact on Regions and Populations: 1. High-Income Countries: Countries with well-established immunization programs and high vaccine coverage have significantly reduced the burden of pertussis. However, periodic outbreaks can still occur due to waning immunity, vaccine effectiveness, and evolving strains of the bacterium.

2. Low- and Middle-Income Countries: Pertussis remains a significant public health concern in resource-limited settings. Lack of access to vaccination, overcrowded living conditions, and suboptimal healthcare infrastructure contribute to high incidence rates and poor outcomes, particularly among infants and young children.

3. Vulnerable Populations: Infants, especially those too young to be vaccinated, face the greatest risk of severe pertussis complications. Pregnant women are recommended to receive the pertussis vaccine during pregnancy to safeguard themselves and their newborns. Immunization efforts targeting these vulnerable populations are crucial in reducing pertussis-related morbidity and mortality.

In conclusion, pertussis is a highly contagious respiratory infection that affects populations worldwide. Although significant progress has been made in reducing its burden through vaccination efforts, pertussis remains a public health concern, particularly for infants and young children. Continued efforts to improve vaccine coverage, surveillance, and research are essential to control and prevent the transmission of this disease.

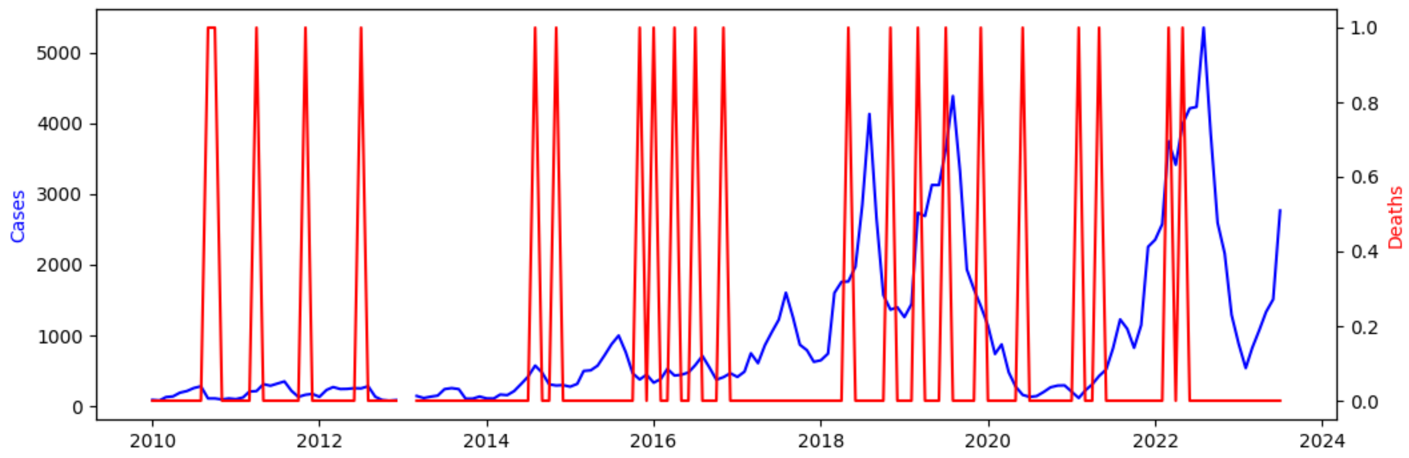

Figure 74: The Change of Pertussis Reports before 2023 June

Seasonal Patterns:
An analysis of the monthly data on Pertussis cases in mainland China prior to June 2023 reveals a distinct seasonal pattern. The highest number of cases is observed during the summer and autumn months, spanning from June to October, while the number of cases decreases during the winter and spring months, from November to May. This consistent seasonal pattern persists across the years.
Peak and Trough Periods:
The peak period for Pertussis cases in mainland China is concentrated in the months of July and August. During this period, the number of cases reaches its peak, with a particularly high occurrence in 2018 when the number of cases rose above 4,000. Conversely, the trough period for Pertussis cases is observed in the months of January and February, characterized by a decrease in the number of cases. This consistent fluctuation between peak and trough periods is observed throughout the years.
Overall Trends:
Upon considering the overall trend of Pertussis cases in mainland China before June 2023, there is a general increase in case numbers over the years. Between 2010 and 2013, the number of cases remained relatively stable, albeit with some fluctuations. However, a noticeable increase in the number of cases is observed from 2014 onwards, with peaks occurring in 2015, 2017, and 2022. Despite some annual fluctuations, the overall trend depicts an escalating number of Pertussis cases.
Discussion:
The seasonal pattern of Pertussis cases in mainland China indicates a higher risk of transmission during the summer and autumn months. This may be attributed to factors such as increased social interactions and close contact, as people tend to spend more time outdoors during these seasons. It is important to note that the trough period during winter and spring suggests a decrease in transmission, which may be influenced by factors like reduced outdoor activities and improved hygiene practices.
The peak periods in July and August can be attributed to various factors, such as increased travel and socializing during summer vacations, which facilitate the spread of the disease. Moreover, the overall increase in Pertussis cases over the years suggests potential challenges in disease control, highlighting the need for effective prevention strategies such as vaccination and public health education.
It is worth mentioning that the data on Pertussis deaths in mainland China prior to June 2023 demonstrates sporadic occurrences, with no discernible seasonal or overall trend. This indicates that Pertussis-related deaths are relatively infrequent compared to the reported number of cases.
Overall, these findings underscore the significance of ongoing surveillance and intervention measures to mitigate the impact of Pertussis in mainland China.

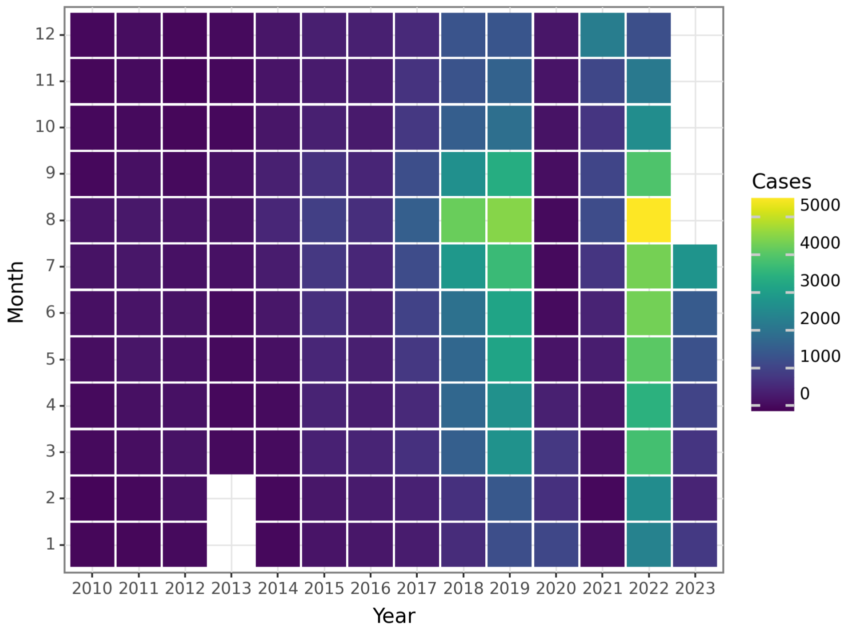

Figure 75: The Change of Pertussis Cases before 2023 June

Figure 76: The Change of Pertussis Deaths before 2023 June

Diphtheria

Diphtheria, caused by the bacterium Corynebacterium diphtheriae, is a highly contagious respiratory infection. Although it primarily affects the upper respiratory tract, severe cases can result in systemic complications and death. This comprehensive overview examines the epidemiology of diphtheria, encompassing its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, major risk factors associated with transmission, and impact on various regions and populations.

Global Prevalence: Diphtheria was previously a significant global public health concern, leading to widespread outbreaks and substantial morbidity and mortality. However, the introduction of effective vaccines has considerably reduced its incidence worldwide. According to the World Health Organization (WHO), only 13 cases of diphtheria were reported globally in 2019. Nevertheless, it is important to acknowledge that the true burden of the disease may be underestimated due to underreporting and limited surveillance systems in certain regions.

Transmission Routes: Diphtheria is primarily transmitted from person to person through respiratory droplets from infected individuals, typically during close contact or exposure to respiratory secretions. Indirect transmission can also occur through contact with contaminated objects or surfaces. The incubation period for diphtheria is typically 2-5 days.

Affected Populations: Diphtheria can affect anyone, but certain populations are at higher risk. Unvaccinated or under-vaccinated individuals, particularly children, are more susceptible to infection. People living in overcrowded conditions, such as refugee camps or high-density urban areas, are also at increased risk due to the easier transmission of the bacteria in such settings.

Key Statistics: Prior to widespread immunization, diphtheria was a leading cause of death in children. WHO data indicates that globally, during the pre-vaccine era, the number of diphtheria cases peaked at approximately 100,000 per year in the 1920s. Mortality rates reached as high as 10%. However, routine vaccination programs have significantly reduced the incidence and mortality rates. As of 2019, globally reported cases of diphtheria have reached their lowest level in history.

Historical Context and Discovery: Diphtheria has a long-standing history dating back centuries. Hippocrates first described the disease in ancient Greece around the 5th century BCE. However, significant advancements in understanding diphtheria occurred during the 19th century. In 1883, the German bacteriologist Edwin Klebs identified Corynebacterium diphtheriae as the causative agent of the disease. In 1888, Emile Roux and Alexandre Yersin discovered the diphtheria toxin, which paved the way for the development of antitoxin treatments.

Major Risk Factors: Several risk factors contribute to diphtheria transmission. The primary risk factor is inadequate immunization. Unvaccinated or under-vaccinated individuals, particularly in resource-limited settings, face a greater risk of contracting the disease. Lack of access to healthcare services, poor vaccination coverage, and low awareness about the importance of immunization all increase the likelihood of diphtheria transmission. Additional risk factors include close contact with infected individuals, living in crowded or unsanitary conditions, and poor personal hygiene practices.

Impact on Different Regions and Populations: The impact of diphtheria varies across regions and populations. Prior to widespread vaccination, diphtheria was endemic in many parts of the world, particularly in developing countries with limited healthcare infrastructure. While the incidence of diphtheria has significantly declined globally due to immunization efforts, certain countries and regions continue to experience sporadic outbreaks or epidemics. These outbreaks often occur in populations with low vaccination coverage or facing challenges in accessing healthcare services. Moreover, areas with humanitarian crises, such as conflict zones or refugee camps, face an increased risk due to the disruption of healthcare systems and overcrowded conditions.

In conclusion, diphtheria was once a major global public health concern. However, with the introduction of effective vaccines, its global prevalence has substantially reduced. The disease primarily spreads through respiratory droplets and disproportionately affects unvaccinated or under-vaccinated individuals, especially children. Major risk factors for transmission include inadequate immunization, close contact with infected individuals, and crowded living conditions. While the impact of diphtheria has been reduced globally, efforts must continue to ensure high vaccination coverage and strengthen healthcare systems in vulnerable populations and regions to prevent future outbreaks and maintain disease control.

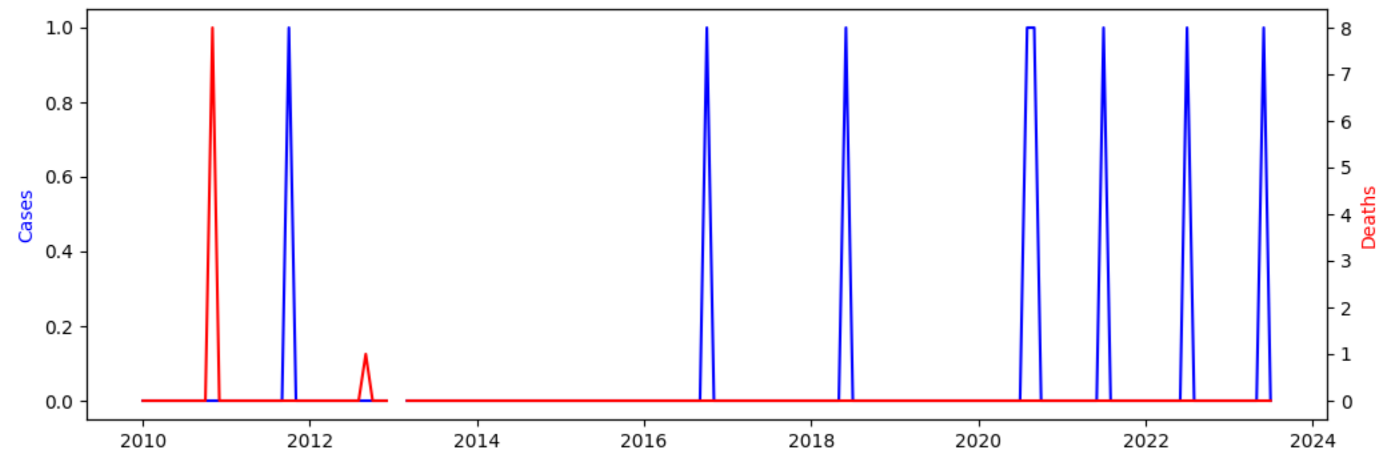

Figure 77: The Change of Diphtheria Reports before 2023 June

Seasonal Patterns: The data analysis reveals that there is no discernible seasonal pattern observed for Diphtheria cases in mainland China up until June 2023. Throughout the years, the number of cases remains consistently low, with only a few isolated occurrences in certain months.
Peak and Trough Periods: The data does not exhibit any significant peak or trough periods. There is a consistent low frequency of cases and deaths, with sporadic minor increases observed in certain months.
Overall Trends: An overall trend in Diphtheria cases in mainland China up until June 2023 indicates a stable and consistently low number of cases. No notable increase or decrease in the number of cases over time is observed.
Discussion: The analysis of the data suggests that Diphtheria does not pose a major public health concern in mainland China at present. The consistently low number of cases and deaths indicates that public health measures and immunization programs have effectively curbed the spread of the disease. However, continual monitoring and maintenance of vaccination coverage are crucial for the ongoing control of Diphtheria in the country.

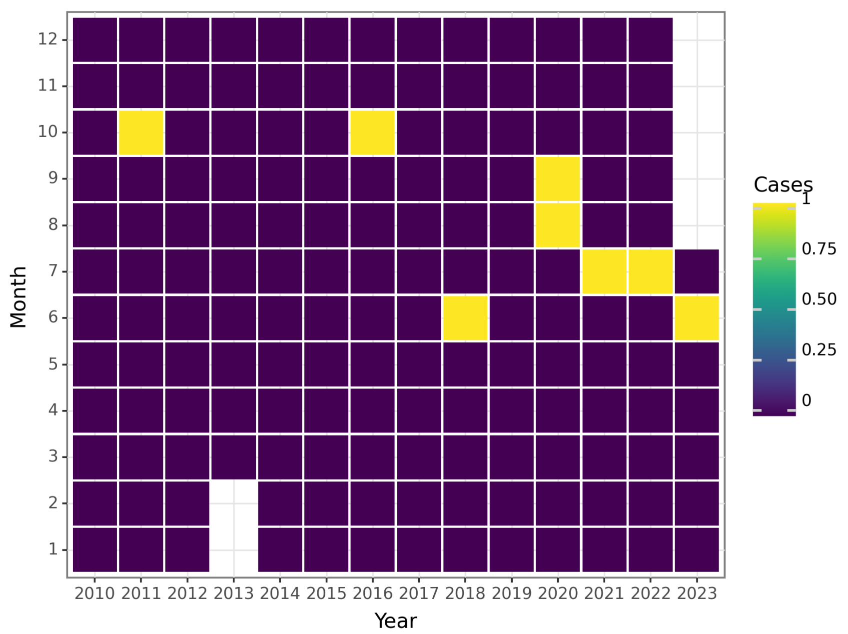

Figure 78: The Change of Diphtheria Cases before 2023 June

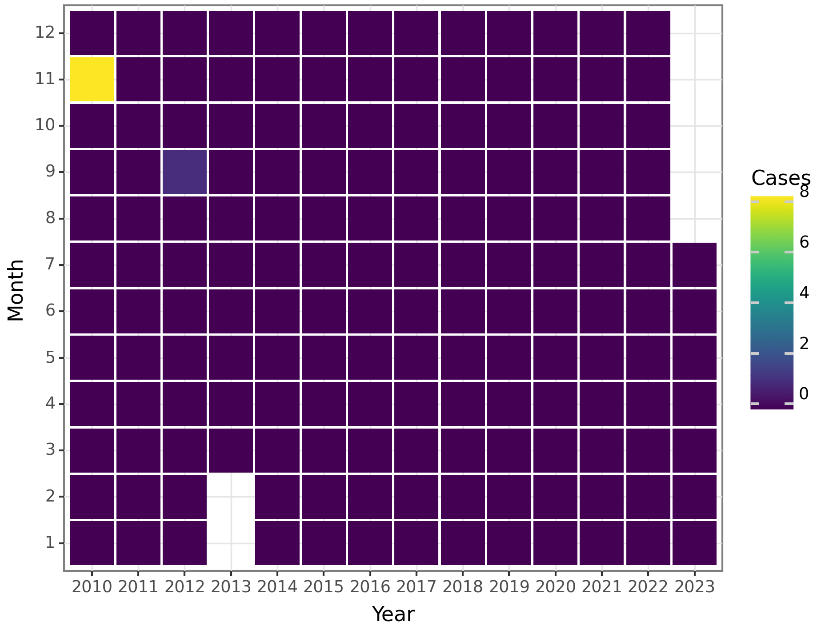

Figure 79: The Change of Diphtheria Deaths before 2023 June

Neonatal tetanus

Neonatal tetanus is a severe bacterial infection caused by the toxin produced by Clostridium tetani, a bacterium found in soil and feces. It primarily affects newborn infants within the first month of life and can be fatal if not promptly treated.

Historical Context and Discovery: The first mention of tetanus dates back to Roman times, where it was known as "trismus" or "trismus neonatorum." However, our understanding of the disease and its cause remained limited until the late 19th century. In 1884, Arthur Nicolaier, a German bacteriologist, discovered and isolated the causative bacterium, Clostridium tetani.

Epidemiology and Prevalence: Neonatal tetanus is mainly prevalent in low-income countries with limited access to healthcare and low immunization coverage. According to the World Health Organization (WHO), approximately 60,000 newborns worldwide die from tetanus each year. However, significant progress has been made in reducing the global prevalence of neonatal tetanus through immunization campaigns and improved maternal and newborn healthcare.

Transmission Routes: The bacterium enters the body through contaminated cuts or wounds, including the umbilical stump, which is a common entry point in newborns. Unhygienic delivery practices, such as the use of unsterile instruments or unclean hands, and traditional cord care practices that expose the baby to tetanus spores increase the risk of transmission.

Affected Populations: Neonatal tetanus primarily affects newborns in resource-limited settings with suboptimal immunization coverage and inadequate hygiene practices during childbirth and newborn care. Babies born to mothers who have not received tetanus toxoid immunization or whose immunization status is unknown are at a higher risk. Additionally, home births without skilled birth attendants and lack of access to clean delivery environments contribute to increased vulnerability.

Key Statistics and Risk Factors: 1. More than 90% of neonatal tetanus cases occur in 25 countries, predominantly in Africa, South Asia, and Southeast Asia. 2. Globally, the neonatal tetanus mortality rate is estimated to be approximately 3.3 per 1,000 live births. 3. Risk factors include maternal tetanus vaccination status, umbilical cord care practices, hygiene during childbirth, and delivery in unsanitary conditions.

Impact on Different Regions and Populations: 1. Africa: Sub-Saharan Africa bears the highest burden of neonatal tetanus, particularly in countries with weak healthcare systems and limited access to immunization services. However, vaccination campaigns have led to progress in reducing the incidence. 2. Asia: South Asia and Southeast Asia have also historically faced a high burden of neonatal tetanus. Efforts to improve immunization coverage and skilled birth attendance have significantly reduced cases in recent years. 3. Developed Countries: Neonatal tetanus is extremely rare in developed countries with universal immunization programs and adequate healthcare facilities.

In conclusion, neonatal tetanus remains a significant public health concern primarily affecting low-resource countries. However, preventive measures such as tetanus toxoid immunization during pregnancy, clean delivery practices, and postnatal care have proven effective in reducing the incidence and mortality rates of neonatal tetanus worldwide. Nonetheless, continued efforts are needed to ensure universal immunization coverage, access to skilled birth attendance, and improved maternal and newborn healthcare practices to fully eliminate and eradicate neonatal tetanus.

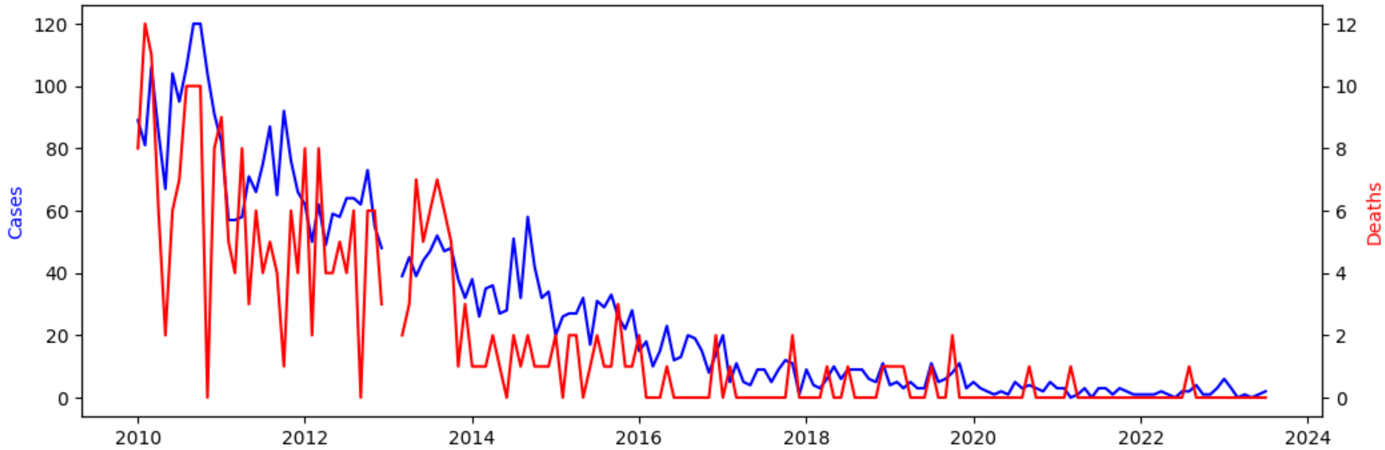

Figure 80: The Change of Neonatal tetanus Reports before 2023 June

Seasonal Patterns: Analysis of the available data reveals distinct seasonal patterns in the occurrence of neonatal tetanus cases and deaths in mainland China, up until June 2023. The data indicates fluctuations in the number of cases and deaths throughout the years, with certain months demonstrating higher values while others display lower values.

Peak and Trough Periods: Examination of the data reveals that peak periods for neonatal tetanus cases primarily fall within the months of September to October, with a noticeable surge in cases during these months across multiple years. Additionally, there appears to be a secondary peak in cases during the months of March to April, although the values are generally lower in comparison to the September-October peak. Trough periods, characterized by relatively lower case numbers, are observed in the months of January to February and June to August.

Overall Trends: A closer look at the overall trends illustrates a consistent decline in neonatal tetanus cases from 2010 to June 2023. However, there are intermittent fluctuations within this downward trend. While the majority of years show a decrease in case numbers, there are instances when slight increases occur during certain periods. Similarly, deaths attributable to neonatal tetanus also exhibit a decreasing trend over the years, although there are fluctuations and sporadic peaks in specific months.

Discussion: The observed seasonal patterns in the data suggest that certain environmental or behavioral factors may influence the transmission of neonatal tetanus. The peak periods in September to October could potentially be tied to changes in weather conditions or specific cultural practices during those months. The downward trend in cases and deaths can plausibly be attributed to enhanced healthcare interventions and targeted vaccination programs aimed at preventing neonatal tetanus. However, it is important to note that further analysis is necessary in order to establish any significant associations or root causes for these trends.

It is worth mentioning that the analysis in question is solely based on the provided data and excludes any external factors or variables that may impact the occurrence of neonatal tetanus in mainland China.

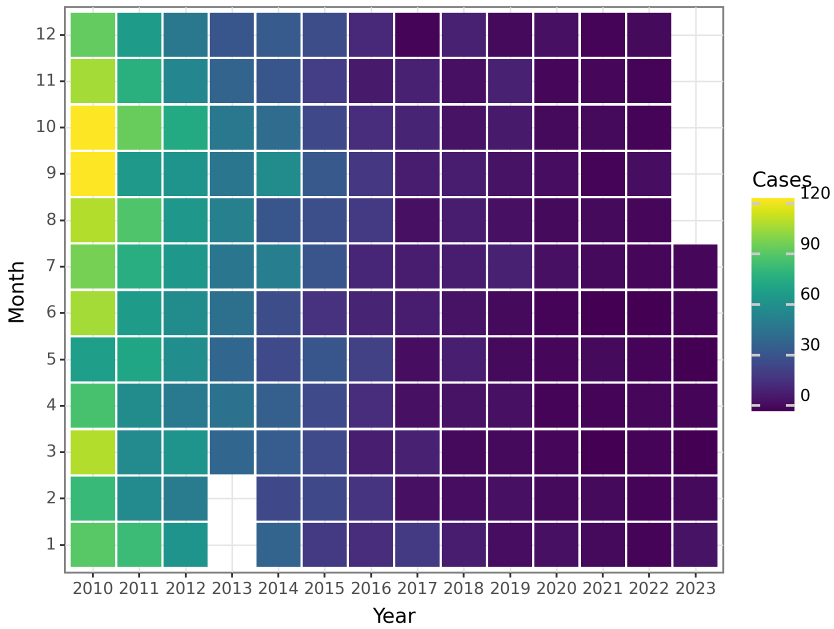

Figure 81: The Change of Neonatal tetanus Cases before 2023 June

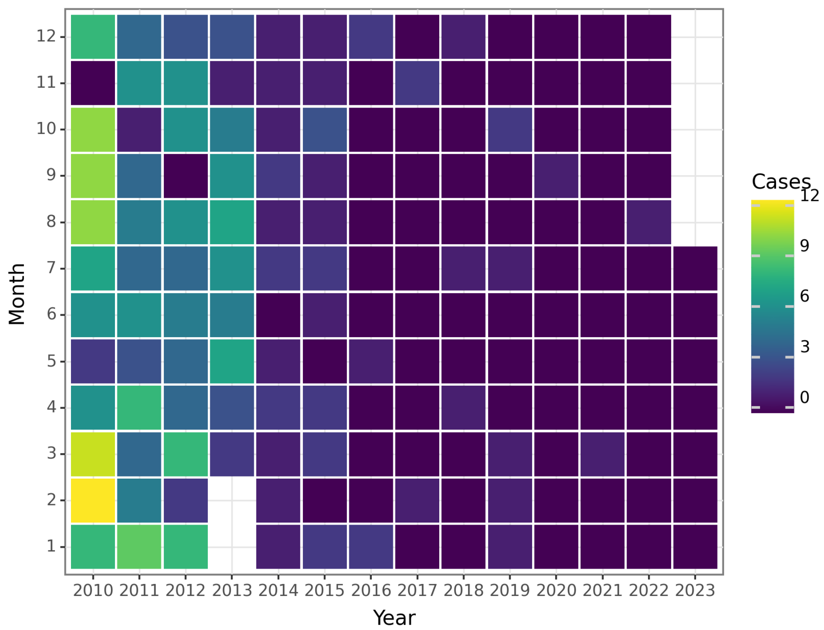

Figure 82: The Change of Neonatal tetanus Deaths before 2023 June

Scarlet fever

Scarlet fever is a highly contagious bacterial infection caused by group A Streptococcus (GAS) bacteria, specifically Streptococcus pyogenes. It primarily affects children aged 5 to 15 years but can also occur in adults. The main symptoms of scarlet fever are a distinct rash, high fever, sore throat, and a tongue that resembles a strawberry.

Historically, scarlet fever has been recognized for centuries, dating back to the 16th century. However, it was not until the early 20th century that researchers identified GAS as the cause. The development of antibiotics, particularly penicillin in the late 1920s, revolutionized the treatment of scarlet fever and greatly reduced mortality rates.

Scarlet fever is primarily spread through respiratory droplets when infected individuals cough or sneeze, releasing infectious particles into the air. It can also be contracted indirectly through contact with contaminated objects or by touching the skin of an infected person. Practicing proper hand hygiene and covering the mouth and nose while coughing or sneezing are important preventive measures.

Although scarlet fever can affect individuals of any age or gender, children between 5 and 15 years old are most commonly affected. Factors that increase the risk of infection include crowded living conditions (such as schools or daycare centers), poor hygiene practices, and close contact with infected individuals.

Scarlet fever is reported worldwide, but its prevalence varies across regions and countries. Higher rates are observed in temperate climate regions, particularly during the spring and winter seasons. Periodic outbreaks have been observed, with variations from year to year. For example, China has seen an increase in scarlet fever cases since 2008.

Estimating the exact number of scarlet fever cases worldwide is challenging due to variations in reporting systems and underdiagnosis. However, the World Health Organization (WHO) estimates that there are millions of cases each year. In the United Kingdom, the incidence has been increasing since 2011, with over 19,000 cases reported in 2019. Similarly, the United States has seen periodic increases in cases over the past decade.

Several risk factors contribute to the transmission of scarlet fever. Close contact with infected individuals, particularly those with untreated or undiagnosed strep throat or skin infections, increases the likelihood of transmission. Poor hygiene practices, crowded living conditions, and limited access to healthcare services also contribute to the spread of the disease. Additionally, individuals with weakened immune systems may be more susceptible to scarlet fever.

Scarlet fever affects populations worldwide, but prevalence rates and affected demographics can vary. Some regions and countries have reported higher rates, while others experience periodic outbreaks. Variations in prevalence rates may be influenced by factors such as population density, hygiene practices, access to healthcare, and the presence of different levels of virulence in GAS strains.

In conclusion, scarlet fever is a globally prevalent bacterial infection that primarily affects children. It is transmitted through respiratory droplets or direct contact with infected individuals. Various risk factors contribute to its transmission, including close contact, poor hygiene, and overcrowded living conditions. Prevalence rates and affected demographics can vary across different regions and populations. Understanding the epidemiology of scarlet fever is crucial for implementing effective prevention and control measures.

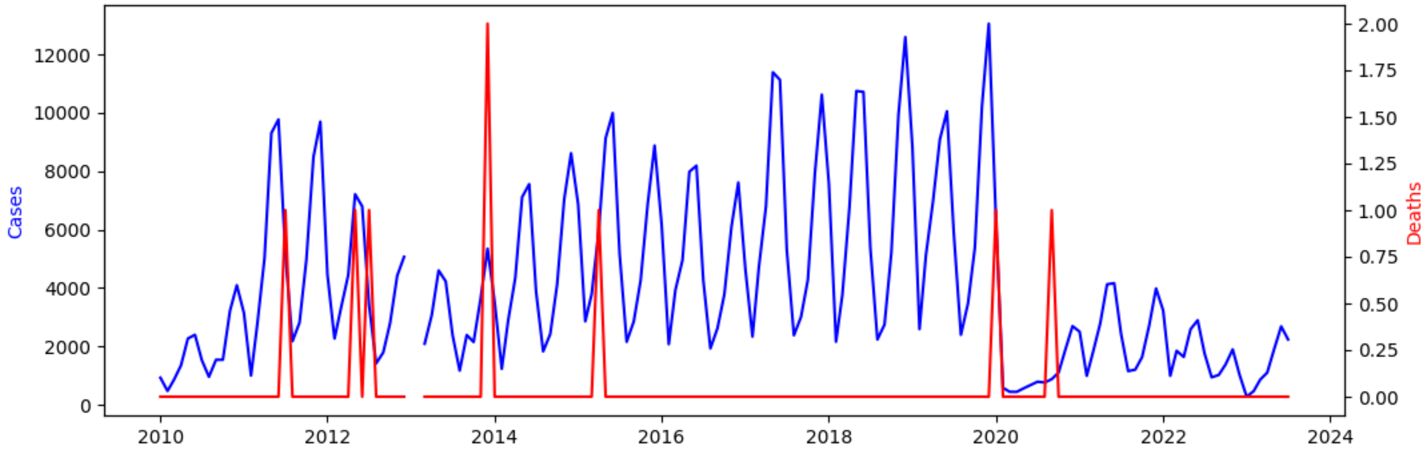

Figure 83: The Change of Scarlet fever Reports before 2023 June

Seasonal Patterns:
Based on the provided data, a distinct seasonal pattern in the incidence of Scarlet fever in mainland China is evident. The number of cases reaches its highest level during the spring and early summer months (March to June), while it is at its lowest during winter (December to February). This pattern remains consistent throughout the years analyzed.
Peak and Trough Periods:
Scarlet fever cases typically peak in May or June, with the highest number of reported instances occurring during these months. Conversely, the trough period, where the number of cases is at its lowest, usually falls between December and February.
Overall Trends:
The data reveals a fluctuating trend in Scarlet fever cases across mainland China. Throughout the analyzed years, there are notable peaks and troughs that indicate variations in disease occurrence. It is worth noting that the number of cases has shown a rising trend during the spring and summer months from 2010 to 2017, reaching its peak during this period. However, since 2018, there has been a gradual decline in the number of cases, with lower peaks observed in recent years.
Discussion:
The observed seasonal pattern in Scarlet fever cases aligns with previous studies that have also reported a higher incidence of the disease during the spring and early summer months. This could be attributed to factors such as changes in environmental conditions, increased human exposure, and the dynamics of the bacteria responsible for the infection.
The fluctuating trend in Scarlet fever cases suggests periods of increased transmission followed by periods of decreased transmission. The decreasing trend observed from 2018 onwards may be a result of improved control measures and public health interventions implemented in recent years.
Additionally, it is important to acknowledge that the analysis solely focuses on the number of cases and does not consider changes in population size or other demographic factors, which may also impact the observed trends.
In conclusion, the data showcases a pronounced seasonal pattern, with peak periods occurring in the spring and early summer months for Scarlet fever cases in mainland China. There has been a decreasing trend in recent years, indicating potential advancements in disease control and prevention efforts. However, further research and analysis are necessary to comprehend the underlying factors contributing to these patterns and trends.

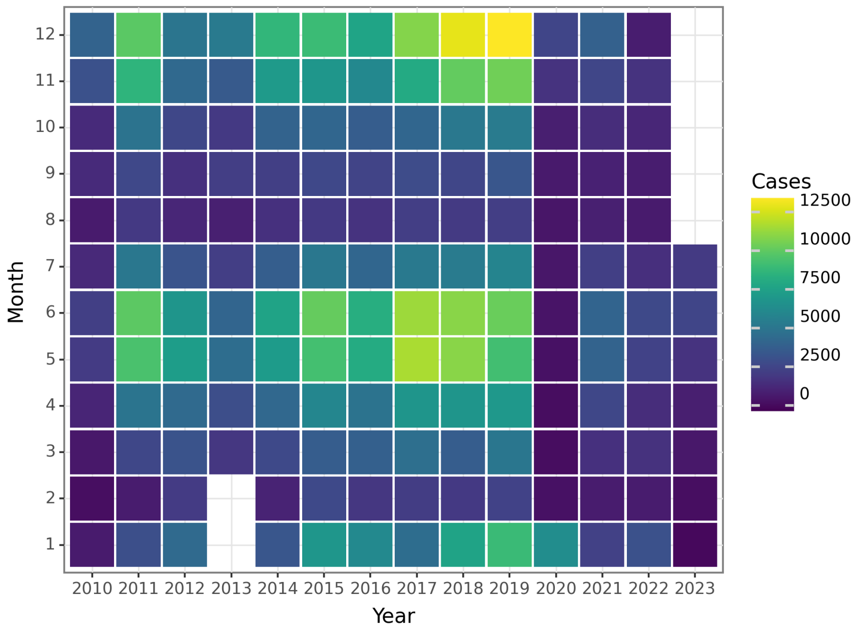

Figure 84: The Change of Scarlet fever Cases before 2023 June

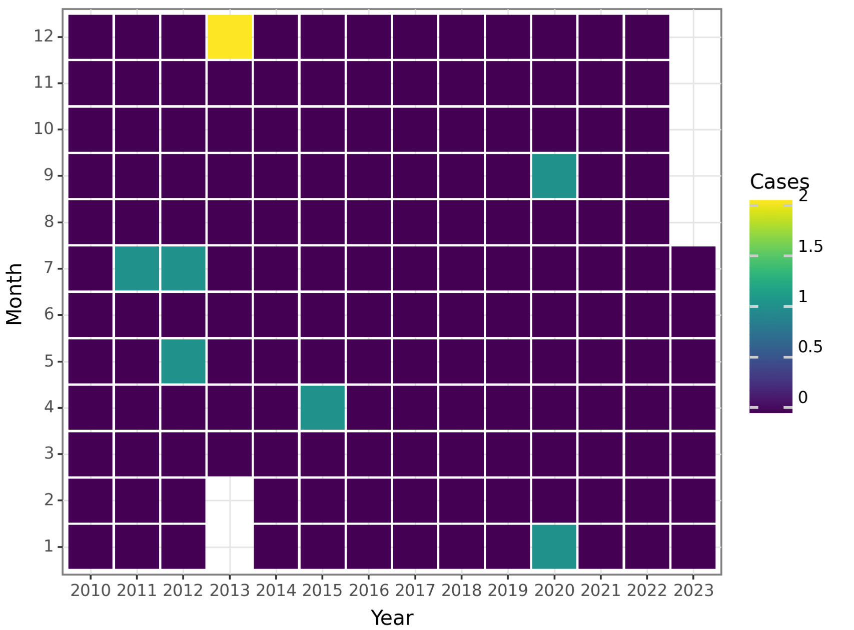

Figure 85: The Change of Scarlet fever Deaths before 2023 June

Brucellosis

Brucellosis is a bacterial zoonotic infection caused by various species of the Brucella genus. It affects both humans and animals, including livestock and wildlife, and is primarily transmitted through direct contact with infected animals or their contaminated products. Brucellosis is a significant global health issue with substantial economic impacts on agriculture. Furthermore, it poses a public health concern due to its potential to cause chronic debilitating symptoms.

Historical Context and Discovery:

Brucellosis, initially known as Malta fever, was first discovered in Malta in the 19th century. In 1887, Sir David Bruce, a Scottish physician, identified and isolated the causative agent, which was later named Brucella melitensis. Further research led to the recognition of other Brucella species, including B. abortus and B. suis.

Global Prevalence:

Brucellosis is present worldwide, although its prevalence varies across different regions. It is particularly prevalent in Mediterranean countries, the Middle East, and parts of Asia, Africa, and Central and South America. However, due to variations in surveillance systems and reporting, the true global burden of brucellosis is likely underestimated.

Transmission Routes:

The primary modes of transmission include consuming unpasteurized dairy products, having direct contact with infected animals or their tissues, and inhaling contaminated aerosols. Occupations at high risk for brucellosis include farmers, veterinarians, slaughterhouse workers, and laboratory personnel working with Brucella species.

Affected Populations:

Brucellosis can affect individuals of all ages and genders. However, certain populations are at a higher risk, including livestock workers, individuals living in rural areas with close contact with animals, and people consuming unpasteurized dairy products. Additionally, travelers to endemic areas and laboratory workers handling Brucella cultures are also at risk.

Key Statistics:

The exact global prevalence of brucellosis is uncertain due to significant underreporting. According to the World Health Organization (WHO), around 500,000 new human cases are reported each year. However, estimates suggest that the actual number of annual human infections could be much higher. Brucellosis can cause a wide range of symptoms, including fever, sweats, fatigue, joint and muscle pain, and can become chronic if left untreated.

Major Risk Factors:

Several risk factors contribute to Brucella transmission. These include close contact with infected animals or their products, occupational exposure, consumption of unpasteurized dairy products, and inadequate veterinary prevention and control measures. Poor hygiene practices, such as improper handling of animal fetuses and placental tissues during birthing, can also increase the risk of transmission.

Impact on Different Regions and Populations:

Brucellosis has a significant impact on both human and animal health. It affects livestock populations, causing reproductive failures, decreased milk production, and economic losses due to trade restrictions. In humans, brucellosis causes significant morbidity and can lead to long-term complications if not promptly treated.

Prevalence rates and affected demographics vary between regions. For example, in the Mediterranean region, Brucella melitensis is the primary cause of human brucellosis due to consuming unpasteurized goat and sheep milk. In regions with intensive livestock production, such as South America, Brucella abortus is the major cause due to occupational exposure and consumption of unpasteurized cattle products.

In summary, brucellosis is a globally prevalent zoonotic disease that affects humans and animals. High-risk populations include individuals in close contact with infected animals and their products. The disease's impact varies across regions, which can be attributed to variations in Brucella species, animal reservoirs, and cultural practices. Improving surveillance, animal health programs, and public education on the importance of pasteurization and hygiene practices are crucial for preventing and controlling brucellosis.

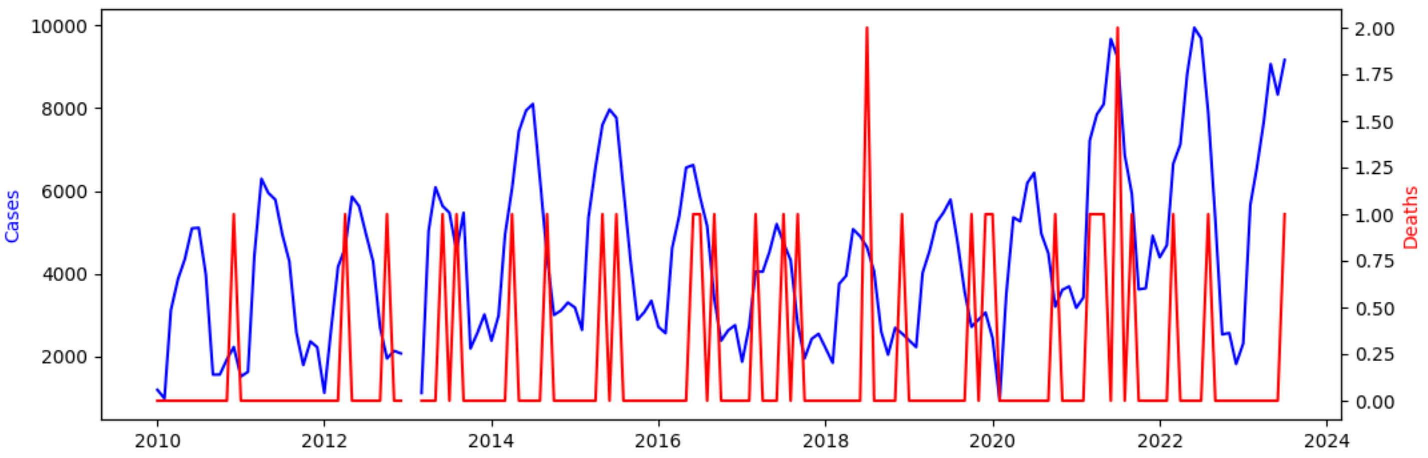

Figure 86: The Change of Brucellosis Reports before 2023 June

Seasonal Patterns: According to the data, Brucellosis cases in mainland China demonstrate a clear seasonal pattern. The highest number of cases is observed during the summer months from June to August, with a peak in June. There is a gradual increase in cases from February to June, followed by a subsequent decrease from July to September. From October to January, the number of cases remains relatively low.
Peak and Trough Periods: The peak period for Brucellosis cases in mainland China occurs in June, with the highest recorded cases during this month. Conversely, the trough period is in September, when the number of cases is significantly lower compared to the peak months.
Overall Trends: Overall, there has been a fluctuating trend in Brucellosis cases in mainland China. From 2010 to 2012, cases gradually increased, followed by a decrease from 2013 to 2014. However, starting from 2015, there has been a rising trend in cases, with occasional fluctuations, particularly in 2018 and 2019. The highest number of cases was recorded in June 2023, reaching 8326 cases.
Discussion: The observed seasonal patterns and peak and trough periods in Brucellosis cases in mainland China suggest the presence of influencing factors in the transmission and spread of the disease. The higher number of cases during the summer months may be attributed to increased contact with livestock during farming activities. Since Brucellosis is primarily a zoonotic disease transmitted from animals to humans, the peak in cases during the summer months could indicate increased exposure to infected animals at that time.
The overall trend of Brucellosis cases in mainland China reveals a fluctuating pattern, with some years experiencing higher case numbers compared to others. This could be due to various factors, such as changes in surveillance and reporting systems, variations in livestock farming practices, and public health interventions. Further analysis and investigation are necessary to identify specific factors influencing these trends and to implement effective control and prevention measures.
It is important to note that the provided data only includes reported cases of Brucellosis and deaths in mainland China. A more comprehensive analysis would require additional data on population demographics, geographical distribution, and specific risk factors associated with Brucellosis transmission.

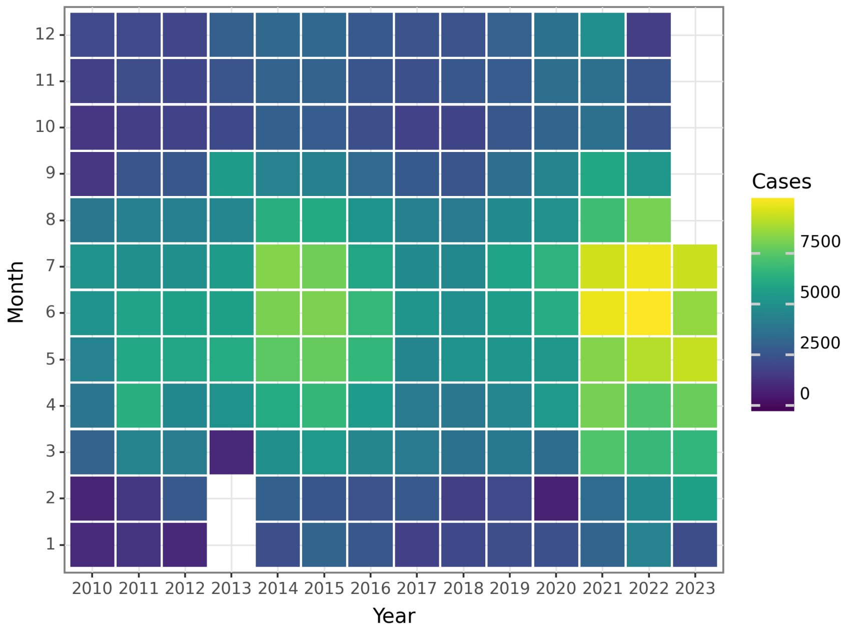

Figure 87: The Change of Brucellosis Cases before 2023 June

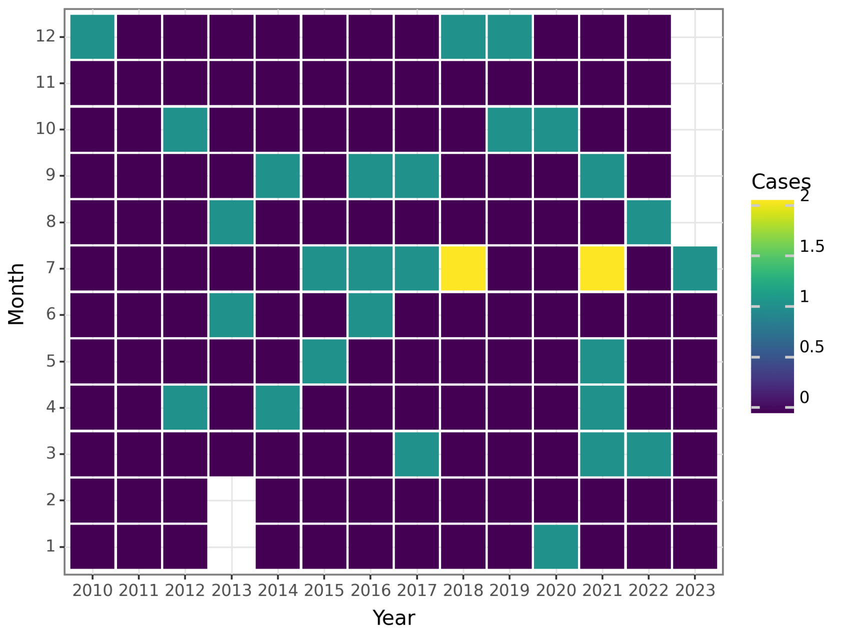

Figure 88: The Change of Brucellosis Deaths before 2023 June

Gonorrhea

Gonorrhea, caused by the bacterium Neisseria gonorrhoeae, is a sexually transmitted infection (STI) that primarily affects the reproductive system but can also result in infections in the throat, rectum, and eyes. This paper provides a comprehensive overview of the epidemiology of gonorrhea, including its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, major risk factors, and the impact on various regions and populations.

Global Prevalence: Globally, gonorrhea is one of the most commonly reported STIs. According to the World Health Organization (WHO), an estimated 87 million new cases of gonorrhea occur each year. However, due to inadequate monitoring and reporting systems in certain countries, the actual number of cases may be higher. Both men and women are affected by gonorrhea, though the prevalence varies across regions and populations.

Transmission Routes: Sexual contact, including vaginal, anal, and oral intercourse, is the primary mode of transmission for gonorrhea. Additionally, transmission from a mother to her newborn can occur during childbirth. Importantly, infection can be passed between partners even when the infected individual does not exhibit symptoms.

Affected Populations: Anyone engaging in sexual activity, regardless of age, gender, or sexual orientation, can be affected by gonorrhea. However, certain populations face a higher risk of infection. These populations include:

1. Young people aged 15-24 years, who exhibit the highest rates of infection as sexually active adolescents and young adults. 2. Men who have sex with men (MSM), who face an elevated risk of gonorrhea transmission due to engaging in unprotected anal intercourse and having multiple sexual partners. 3. Individuals with multiple sexual partners, as engaging in unprotected sex with numerous partners increases the likelihood of contracting and spreading gonorrhea. 4. People in marginalized and vulnerable communities, who face an increased risk of infection due to poor access to healthcare services, lower education levels, and socioeconomic factors.

Key Statistics: - The estimated global prevalence of gonorrhea is 87 million cases annually, but the actual number may be higher. - In 2018, the United States alone reported over 1.4 million cases of gonorrhea. - In 2018, the European Union/European Economic Area (EU/EEA) reported over 81,000 cases of gonorrhea. - In Australia, the number of diagnosed gonorrhea cases has been steadily increasing, with over 30,000 cases reported in 2019.

Historical Context and Discovery: Gonorrhea has been documented throughout history, with references dating back to ancient Greece and biblical texts. The physician Galen described it in the 2nd century AD. The bacterium Neisseria gonorrhoeae was discovered in 1879 by German scientist Albert Neisser, who identified it as the causative agent of gonorrhea. This discovery led to improved diagnostic techniques and the development of effective treatments.

Major Risk Factors: Various risk factors increase the likelihood of gonorrhea transmission, including: 1. Engaging in unprotected sexual activity: Failure to use condoms or dental dams during sexual contact raises the risk. 2. Having multiple sexual partners: Engaging in sexual activity with multiple partners increases the chances of exposure to the infection. 3. Previous history of STIs: Individuals with a history of gonorrhea or other STIs are more susceptible to reinfection. 4. Limited sexual education: Inadequate knowledge about STIs, safe sex practices, and accessing healthcare services for prevention and treatment increases the risk.

Impact on Regions and Populations: The impact of gonorrhea varies across regions and populations due to cultural practices, healthcare access, education, and socioeconomic factors. Developing countries with limited resources often face challenges in implementing effective prevention strategies and providing adequate treatment. Populations with higher rates of risky sexual behavior, such as MSM, may experience heightened gonorrhea prevalence. However, accurate data on the impact of gonorrhea on specific regions and populations can be limited due to variations in reporting and data collection systems.

In conclusion, gonorrhea is a prevalent STI that primarily spreads through sexual contact, affecting individuals of all ages, genders, and sexual orientations. Risk factors associated with transmission include unprotected sex, multiple sexual partners, and a lack of sexual education. The impact of gonorrhea varies geographically and among populations due to cultural, social, and economic factors. Effective strategies to combat gonorrhea require comprehensive prevention efforts, accessible healthcare services, and increased awareness.

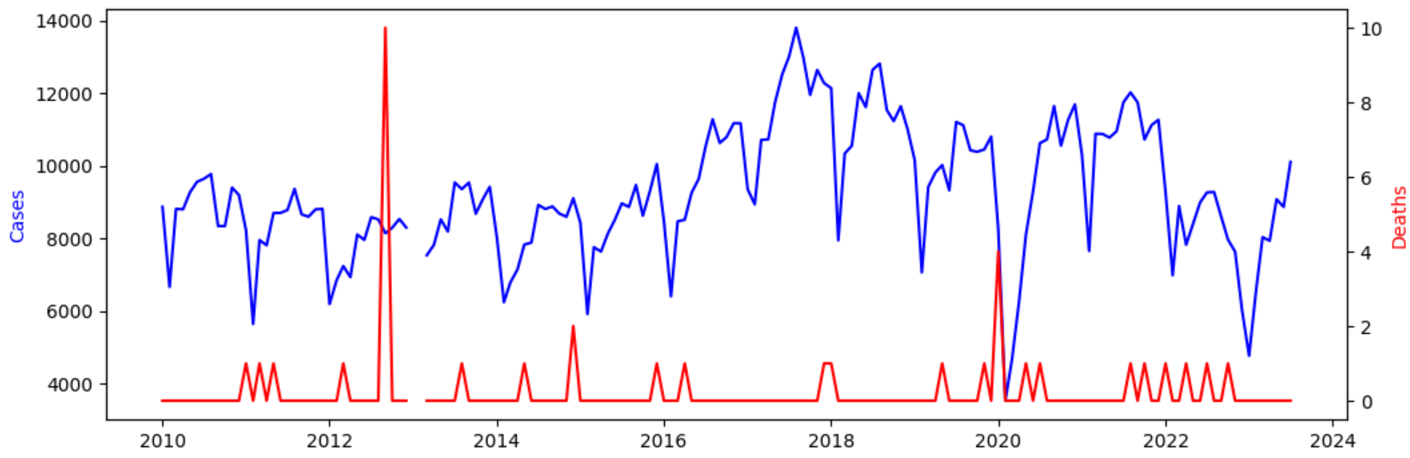

Figure 89: The Change of Gonorrhea Reports before 2023 June

Seasonal Patterns:
Based on the data provided, there are evident seasonal patterns in the occurrences of gonorrhea in mainland China. Typically, cases increase during the warmer months (from April to September) and decrease during the colder months (from October to March). This pattern indicates a seasonal variation in the transmission of gonorrhea, with higher rates occurring during months with more favorable environmental conditions for the disease.
Peak and Trough Periods:
The peak period for gonorrhea cases in mainland China is from June to August, with consistently higher numbers compared to other months. This suggests that the disease is most prevalent during the summertime. Conversely, the trough period for cases is from October to February, with generally lower numbers compared to other months. This indicates a decrease in transmission during the colder months.
Overall Trends:
Upon examining the overall trend, there is an increasing pattern in the number of gonorrhea cases in mainland China over the years. From 2010 to 2013, the number of cases remained relatively stable, with some fluctuations. However, starting from 2013, there has been a consistent upward trend in the number of cases, with occasional fluctuations. This indicates a progressive increase in the burden of gonorrhea in mainland China over time.
Discussion:
The seasonal patterns and peak periods of gonorrhea cases in mainland China suggest that the disease exhibits a higher transmission rate during the warmer months, potentially due to factors such as increased social activities and more opportunities for sexual contact during this period. The lower number of cases during the colder months may be attributed to reduced sexual activities and a decreased likelihood of transmission.
The overall increasing trend in the number of gonorrhea cases over the years raises concerns and emphasizes the urgent need for effective prevention and control efforts. It is crucial to implement comprehensive sexual health education programs, promote safer sexual practices, and enhance access to testing, diagnosis, and treatment services. Strengthening surveillance systems and implementing targeted interventions, especially during peak periods, can facilitate the mitigation of disease spread and reduce its impact on public health.
It is important to note that the analysis presented here is based on the limited data available up until June 2023. To obtain a more comprehensive understanding of gonorrhea trends in mainland China, it would be beneficial to analyze data from a longer time frame and include additional variables such as demographics and risk factors.

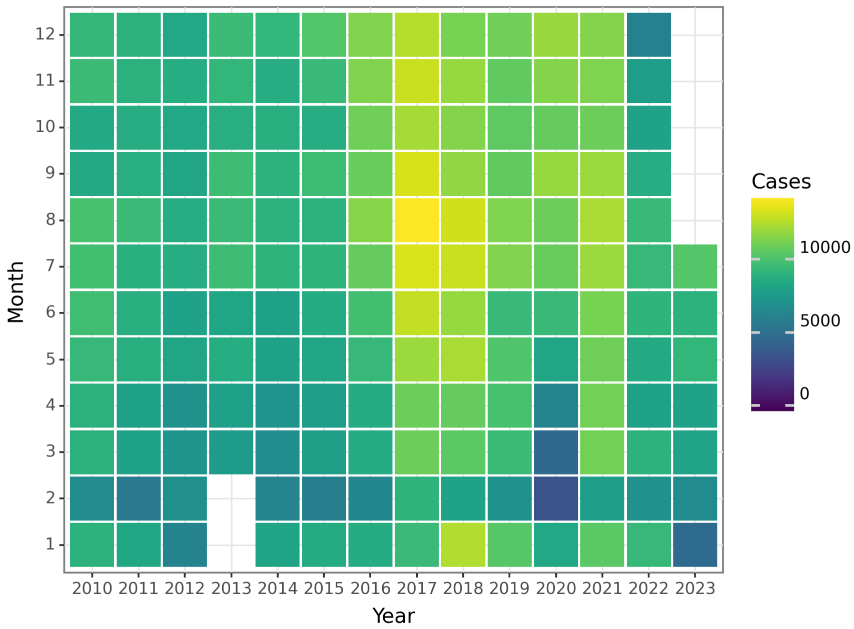

Figure 90: The Change of Gonorrhea Cases before 2023 June

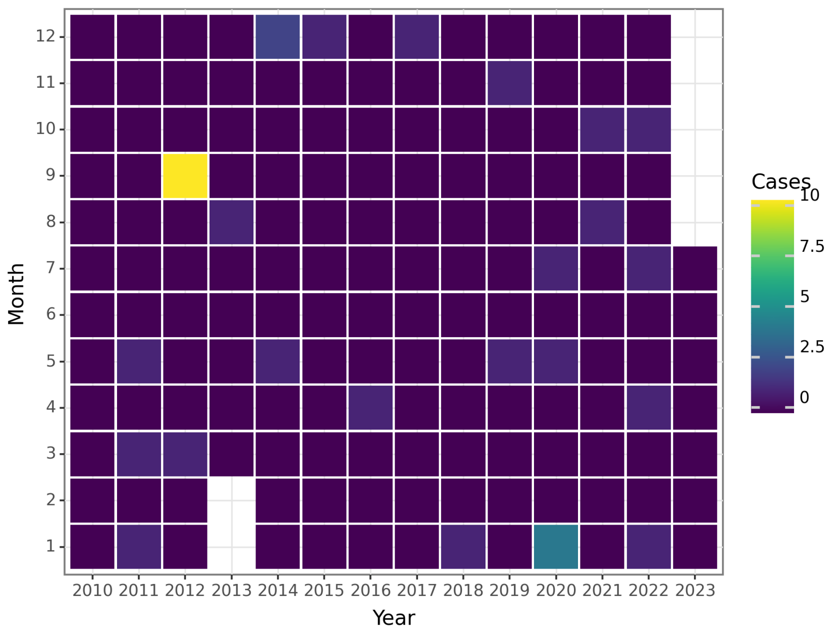

Figure 91: The Change of Gonorrhea Deaths before 2023 June

Syphilis

Syphilis, caused by the bacterium Treponema pallidum, is a sexually transmitted infection (STI) that presents various stages and symptoms and can harm multiple organ systems if left untreated. This paper provides a comprehensive overview of syphilis epidemiology, including global prevalence, transmission routes, affected populations, key statistics, historical context, and discovery.

1. Prevalence: Syphilis is a major global health concern, with millions of new cases reported worldwide annually. According to the World Health Organization (WHO), the estimated number of new syphilis cases globally in 2016 was 6.3 million. The highest burden of syphilis is found in low- and middle-income countries, particularly sub-Saharan Africa and parts of Asia. However, it remains a significant health issue in resource-rich countries as well.

2. Transmission Routes: Syphilis primarily spreads via sexual contact, including vaginal, anal, and oral sex. It can be transmitted when syphilis sores or rashes come into direct contact with the mucosal membranes or broken skin of another person. Additionally, syphilis can be transmitted from an infected mother to her fetus during pregnancy, leading to congenital syphilis.

3. Affected Populations: Syphilis can affect individuals of all genders, ages, and sexual orientations. However, specific populations are at higher risk, including men who have sex with men (MSM), individuals engaging in unprotected sex with multiple partners, sex workers, injection drug users, and those living in poverty or unstable social conditions.

4. Key Statistics: - Globally, the incidence of syphilis increased by 71% between 2012 and 2016. - In 2016, 930,000 cases of syphilis were reported among pregnant women, causing an estimated 350,000 adverse birth outcomes. - In the United States, the rate of syphilis infections has been steadily rising since the early 2000s, particularly among MSM. - Recent years have also seen an increase in reported cases of congenital syphilis.

5. Historical Context and Discovery: Syphilis emerged in Europe in the late 15th century and quickly spread worldwide due to military campaigns and trade routes during the Age of Discovery. It gained the name "Great Pox." Historians and researchers debate its origins, with some suggesting it originated in the New World and was brought back to Europe by Christopher Columbus' crew, while others believe it existed globally before that.

The disease was named syphilis after a poem by Italian physician and poet Girolamo Fracastoro. The poem described a mythical shepherd named Syphilus, who suffered a disfiguring disease as punishment for disrespecting the sun god. Initially considered incurable, syphilis became treatable with antibiotics in the mid-20th century.

6. Major Risk Factors: - Engaging in unprotected sex or having multiple sexual partners increases the risk of syphilis transmission. - Drug use, particularly injection drug use, poses a risk due to shared needles and increased risky behavior. - Having a sexual partner already infected with syphilis. - Poverty, lack of access to healthcare, and STI education. - Homophobia, stigma, and discrimination negatively affect testing and treatment seeking, especially among MSM populations.

7. Impact on Different Regions and Populations: Prevalence and affected demographics of syphilis vary across regions due to cultural practices, healthcare infrastructure, socioeconomic conditions, and access to prevention and treatment services. For example: - Syphilis disproportionately affects certain populations, such as MSM, who often have higher infection rates than the general population. - Limited access to prenatal care and testing contributes to congenital syphilis as a significant concern in low- and middle-income countries. - Successful syphilis control programs have been implemented in some regions, resulting in decreased prevalence rates. However, sustainable reduction of the global burden remains challenging.

In conclusion, syphilis continues to pose a significant global public health concern, with millions of new cases reported annually. It primarily spreads through sexual contact and can affect people of all genders and ages. Risk factors include unprotected sex, multiple sexual partners, drug use, and socioeconomic disparities. Syphilis has had a profound historical impact and continues to affect various populations and regions differently. Effective prevention, testing, and treatment strategies are necessary to control the transmission of syphilis and minimize its impact on affected populations.

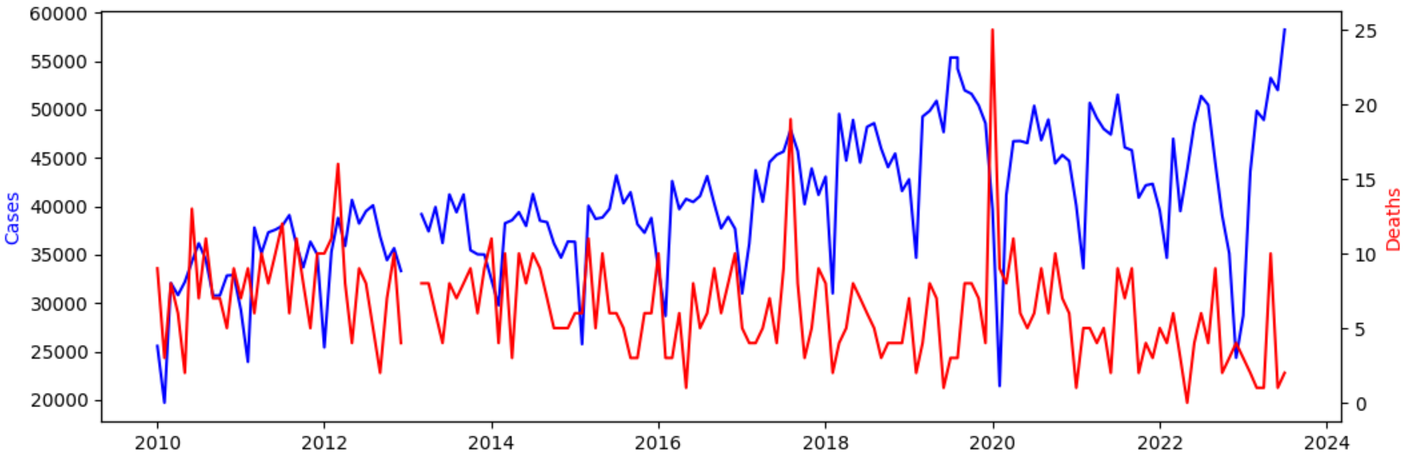

Figure 92: The Change of Syphilis Reports before 2023 June

Seasonal Patterns: Based on the data provided, there is evidence of a seasonal pattern in the incidence of Syphilis cases and fatalities in mainland China. Typically, the number of cases and deaths is higher during the summer months (June to August) and lower during the winter months (December to February). This pattern remains consistent across the years.
Peak and Trough Periods: The peak period for Syphilis cases and deaths in mainland China is observed in July during the summer months. This is when the number of cases and deaths reaches its highest point. Conversely, the trough period for Syphilis cases and deaths is observed in January and February during the winter months, when the lowest numbers are recorded.
Overall Trends: Overall, there is a steady increase in the incidence of Syphilis cases in mainland China from 2010 to 2023. Although there are fluctuations throughout the years, the general trend shows a gradual rise in the number of cases.
Discussion: The seasonal patterns observed, with higher numbers of Syphilis cases and deaths during the summer months and lower numbers during the winter months, may be influenced by various factors. It is possible that during the summer, increased social activities and more opportunities for disease transmission contribute to the higher incidence. Additionally, factors such as warm weather and increased travel may also play a role in the higher numbers during this period.
The increasing trend in the number of Syphilis cases over the years emphasizes the importance of ongoing efforts in prevention, education, and treatment interventions. It is crucial for public health authorities to monitor and address the growing burden of Syphilis in mainland China.
It is worth mentioning that some months, especially in early 2013, show negative values for the number of cases and deaths. These negative values may be the result of data collection or reporting issues, and it is important to consider these anomalies when interpreting the overall trends.
Overall, further analysis and investigation are necessary to fully comprehend the underlying factors contributing to the seasonal patterns, peak and trough periods, and increasing incidence of Syphilis in mainland China. This information can guide targeted interventions to prevent and control the spread of the disease.

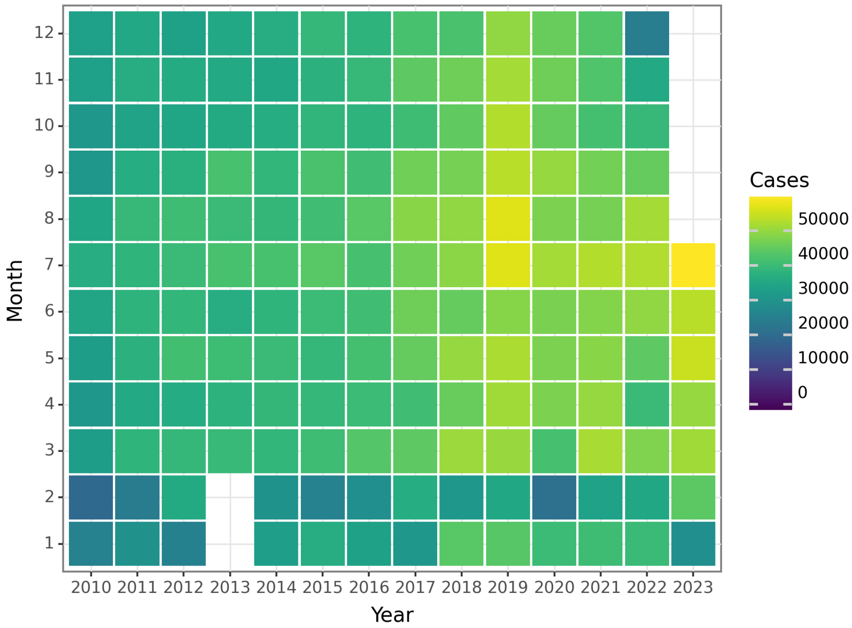

Figure 93: The Change of Syphilis Cases before 2023 June

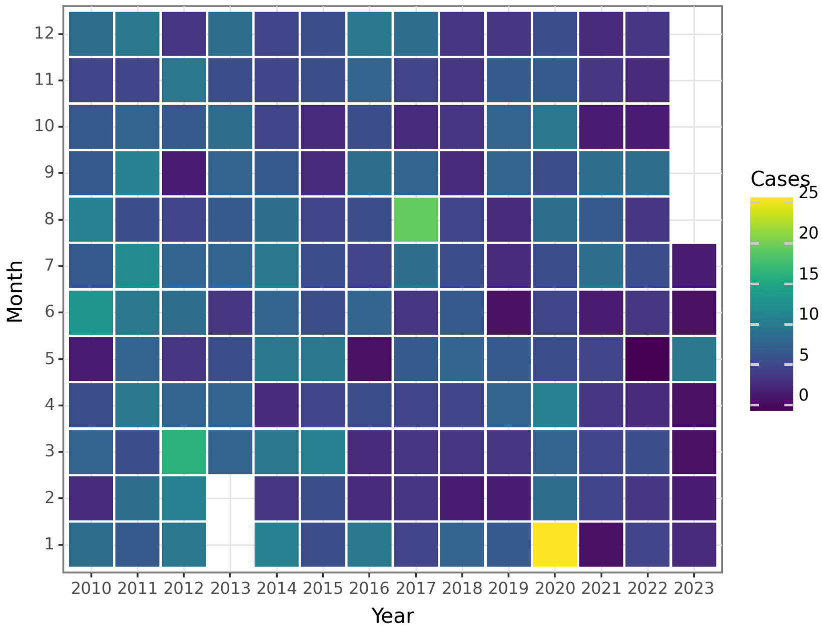

Figure 94: The Change of Syphilis Deaths before 2023 June

Leptospirosis

Leptospirosis is a zoonotic bacterial disease caused by various serovars of the spirochete bacterium Leptospira. It affects animals and humans and is prevalent worldwide, particularly in tropical and subtropical regions with high humidity and rainfall.

Historically, leptospirosis was first described in 1886 by Adolf Weil, a German physician, who documented an outbreak of an unknown febrile illness associated with jaundice. In 1907, Inada and Ido identified the causative agent as a bacterium and named it Leptospira icterohaemorrhagiae. Since then, numerous serovars have been identified, classified, and linked to various animal reservoirs worldwide.

Leptospirosis has a global distribution and affects both developed and developing countries. However, the incidence varies considerably between regions. According to the World Health Organization (WHO), an estimated 1 million severe cases occur annually, resulting in approximately 60,000 deaths. However, the actual burden of leptospirosis is likely underestimated due to underreporting and misdiagnosis.

Leptospirosis is primarily transmitted through contact with urine or other bodily fluids from infected animals, particularly rodents such as rats and mice. It can occur through direct contact with contaminated soil, water, food, or surfaces. Humans can acquire the infection through cuts, abrasions, or mucous membranes exposed to contaminated environments. Occupational exposure, such as working in agriculture, farming, sewage systems, and animal husbandry, is a significant risk factor for transmission.

Leptospirosis affects individuals of all ages, genders, and socio-economic backgrounds. However, populations at higher risk include rural and impoverished communities with limited access to clean water and sanitation facilities. Outdoor workers, including farmers, miners, and military personnel, are also at increased risk due to their occupational exposure. Individuals engaging in recreational activities such as swimming, kayaking, or fishing in contaminated water bodies can also be affected.

Key Statistics: - Leptospirosis accounts for a significant burden of morbidity and mortality globally, particularly in resource-poor settings. - The case fatality rate can range from 5% to 30% or even higher during outbreaks. - While leptospirosis is found worldwide, prevalence rates vary significantly across regions. - Some high-risk areas include South and Southeast Asia, South America, the Caribbean, and Pacific Islands. - Outbreaks commonly occur after heavy rainfall and flooding, which facilitate the spread of the bacterium and increase human exposure.

Major Risk Factors: - Environmental conditions: High humidity, rainfall, and warm temperatures promote bacterial survival and increase the risk of transmission. - Poor sanitation: Inadequate sewage systems and lack of access to clean water contribute to the spread of the disease. - Urbanization and deforestation: These activities can disrupt ecosystems and bring humans into closer contact with animal reservoirs, increasing the likelihood of transmission. - Occupation and recreational activities: Certain occupations and behaviors expose individuals to contaminated environments, increasing their risk. - Pre-existing conditions: Individuals with weakened immune systems or chronic diseases may be more susceptible to severe forms of leptospirosis.

The impact of leptospirosis varies globally, with higher prevalence in regions where risk factors are more common. In tropical regions, outbreaks often coincide with heavy rainfall and flooding, resulting in an increased number of cases. Various studies have shown that socio-economic factors, such as poverty and lack of access to healthcare, influence the burden of leptospirosis in affected areas.

In urban settings, leptospirosis can also occur as localized outbreaks due to rat infestations and poor sanitation. In rural agricultural communities, occupational exposure is a significant risk factor. Additionally, variations in healthcare infrastructure, diagnostic capabilities, and reporting systems contribute to variations in prevalence rates and affected demographics.

In conclusion, leptospirosis is a significant global public health concern. It is prevalent in specific regions and populations, primarily affecting individuals with occupational exposure, poor sanitation, and limited access to healthcare. Historical discoveries have provided insight into the disease's etiology, transmission routes, and prevention strategies. Continued efforts are necessary to enhance surveillance, improve access to healthcare, and implement preventive measures to reduce the burden of leptospirosis worldwide.

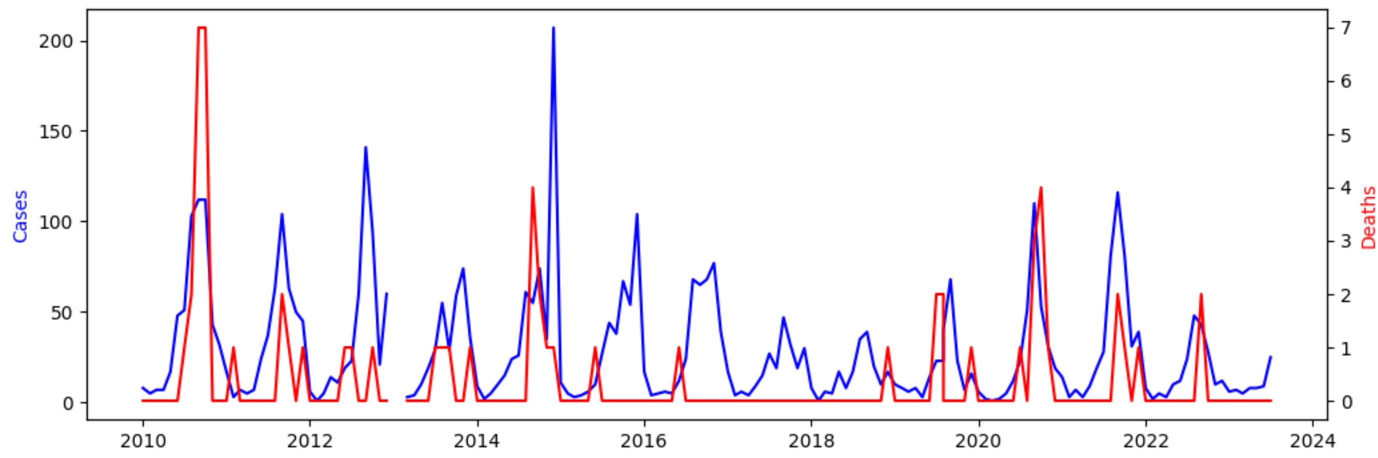

Figure 95: The Change of Leptospirosis Reports before 2023 June

Seasonal Patterns:
Based on the data, there is evidence of a seasonal pattern in the occurrences of Leptospirosis in mainland China. The number of cases tends to be higher in the summer and autumn months, while it decreases in the winter and spring. This pattern remains consistent throughout the years.
Peak and Trough Periods:
Peak periods for Leptospirosis cases in mainland China typically fall between July and September, during which there is a considerable increase in the reported cases. Conversely, trough periods, characterized by the lowest number of cases, tend to occur between December and February.
Overall Trends:
The overall trend in the number of Leptospirosis cases in mainland China exhibits fluctuations over the years. From 2010 to 2023, there is an initial increase in cases from 2010 to 2011, followed by a period of relative stability with fluctuations between 2011 and 2014. Subsequently, there is a significant rise in cases from 2014 to 2015, followed by a generally declining trend until approximately 2020. After 2020, there is a renewed upward trend in case numbers.
Discussion:
The observed seasonal patterns, peak and trough periods, and overall trends suggest that Leptospirosis is more likely to be transmitted during the warmer months in mainland China. This could be attributed to various factors, such as increased outdoor activities, greater exposure to contaminated water sources, or favorable weather conditions for the survival and transmission of the Leptospira bacteria.
The fluctuations in the overall trends over the years may be influenced by several factors, including variations in environmental conditions, public health interventions, and reporting practices. It is crucial to consider these factors when interpreting the data.
These observations emphasize the importance of continuous surveillance and preventive measures for Leptospirosis in mainland China, particularly during peak seasons. Timely and accurate reporting of cases, along with targeted interventions to minimize exposure and transmission, can effectively mitigate the impact of this disease on public health.

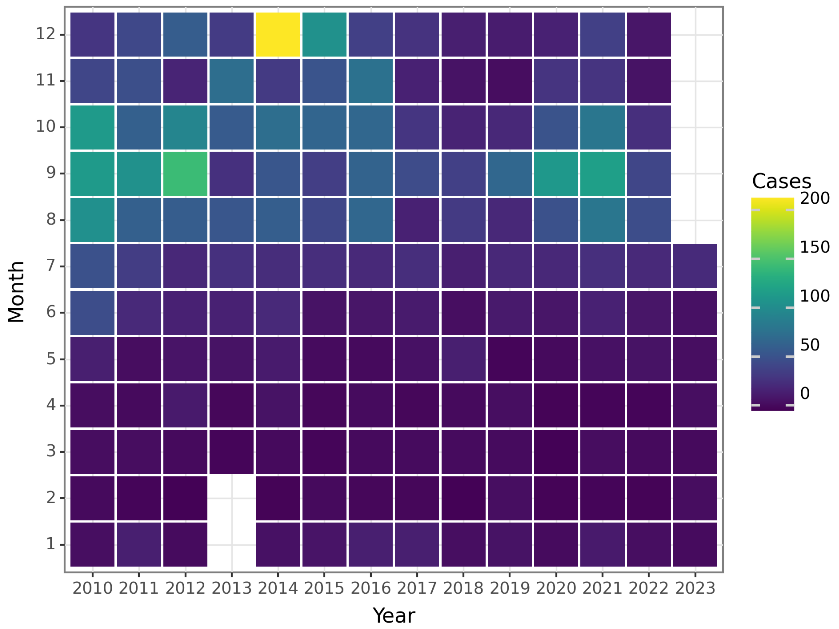

Figure 96: The Change of Leptospirosis Cases before 2023 June

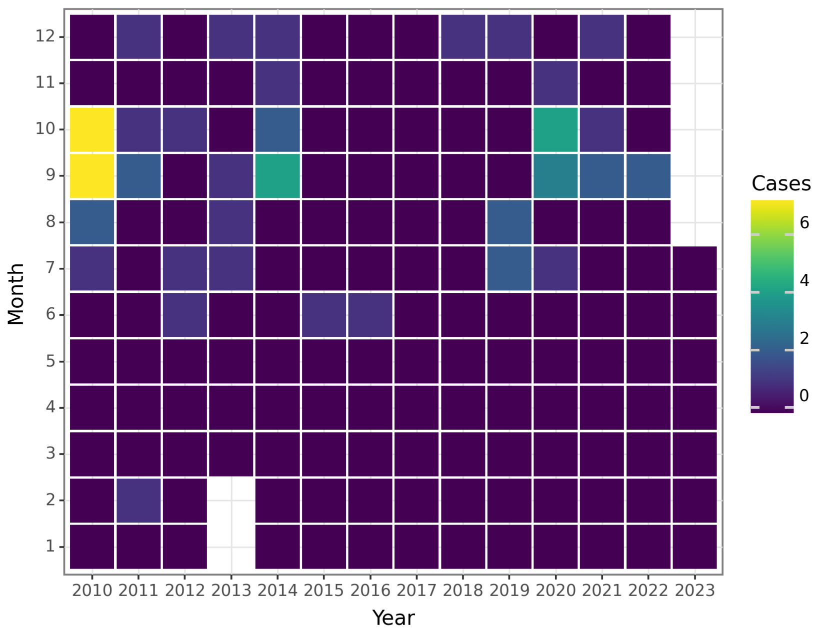

Figure 97: The Change of Leptospirosis Deaths before 2023 June

Schistosomiasis

Schistosomiasis, also known as bilharzia, is a neglected tropical disease caused by parasitic worms of the genus Schistosoma. It is estimated that over 200 million people are currently infected worldwide, with the majority of cases occurring in sub-Saharan Africa. Schistosomiasis is considered endemic in 78 countries, mainly in tropical and subtropical regions.

Schistosoma parasites have a complex life cycle involving freshwater snails as intermediate hosts and humans as definitive hosts. The primary mode of transmission occurs when individuals come into contact with water contaminated by feces or urine of infected individuals containing Schistosoma eggs. These eggs hatch in water and release larvae, called cercariae, which can penetrate the skin of people swimming, bathing, or working in contaminated water. Once inside the human body, the larvae develop into adult worms that reside in the blood vessels, particularly those surrounding the intestines or bladder, depending on the Schistosoma species.

Various factors contribute to the transmission of Schistosomiasis. Poor sanitation practices, lack of access to clean water, inadequate hygiene, and absence of proper waste management systems increase the risk of infection. Activities such as agriculture, fishing, and water-related recreational activities also contribute to exposure to contaminated water.

The impact of Schistosomiasis varies across different regions and populations. Sub-Saharan Africa is the most heavily affected region, accounting for approximately 90% of global cases. However, the disease is also endemic in parts of South America, the Caribbean, the Middle East, and Southeast Asia.

Children are particularly vulnerable to Schistosomiasis due to their frequent contact with contaminated water during play, household chores, and agricultural activities. Chronic infections can lead to several health complications, including anemia, malnutrition, impaired cognitive development, and organ damage. Specifically, urogenital schistosomiasis, caused by Schistosoma haematobium, has been associated with an increased risk of bladder cancer and reproductive tract abnormalities.

The historical context of Schistosomiasis dates back to ancient times, with evidence of infection found in Egyptian mummies from over 4,000 years ago. However, the discovery of the causative agents, Schistosoma parasites, was not made until the late 19th century by Theodor Bilharz, a German physician working in Egypt. Bilharz's findings laid the groundwork for understanding the epidemiology and pathogenesis of the disease.

Preventive strategies for Schistosomiasis primarily focus on mass drug administration with praziquantel, the recommended treatment for infected individuals. Improving sanitation facilities, providing a safe water supply, educating individuals on hygiene practices, and implementing snail control programs are also crucial for reducing transmission and reinfection rates. Integrated control programs, such as the Schistosomiasis Control Initiative, have demonstrated significant success in reducing the burden of the disease in certain regions.

In conclusion, Schistosomiasis remains a significant global public health concern, with the highest burden observed in sub-Saharan Africa. Improving sanitation, ensuring access to safe water, and implementing comprehensive control strategies are essential for reducing the impact of Schistosomiasis, particularly among vulnerable populations such as children and those residing in endemic areas.

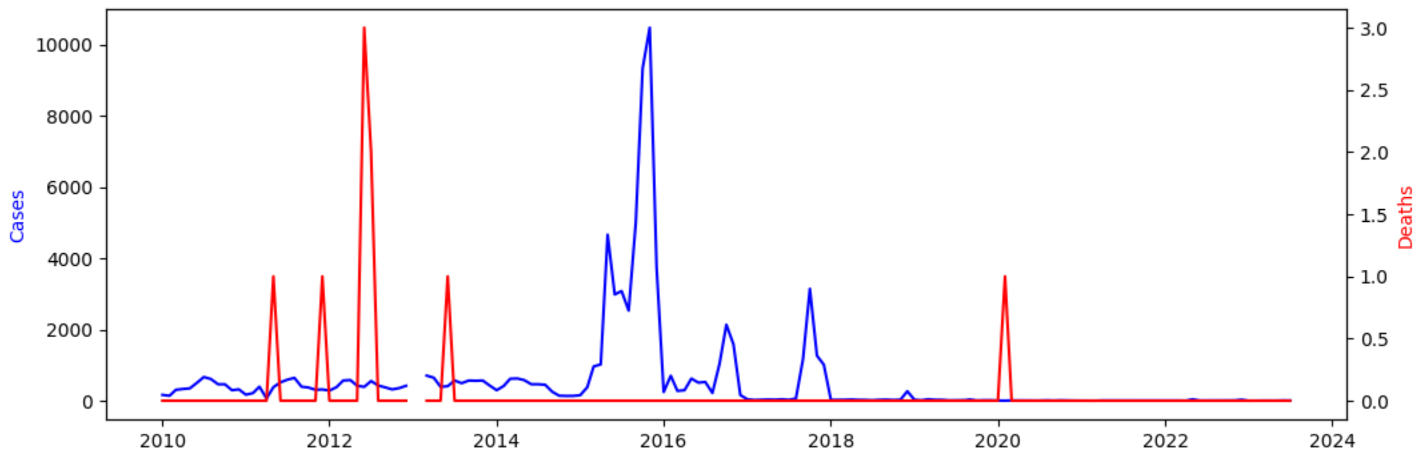

Figure 98: The Change of Schistosomiasis Reports before 2023 June

Thank you for providing the monthly data on cases and deaths of Schistosomiasis in mainland China prior to June 2023. Based on this data, I will now analyze the seasonal patterns, peak and trough periods, overall trends, and provide a discussion.

Seasonal Patterns: The data indicates a clear seasonal pattern in Schistosomiasis cases in mainland China. The number of cases is higher from May to November, with the peak occurring in October. Conversely, there is a lower number of cases from December to April, with the trough in February. This seasonal pattern suggests a higher transmission and risk of Schistosomiasis during the warmer months when the intermediate host snails have more favorable conditions for breeding.

Peak and Trough Periods: The peak period for Schistosomiasis cases in mainland China is typically in October, as mentioned previously. During this time, the number of cases reaches its highest point, indicating a higher transmission rate and increased exposure to the parasite. On the other hand, the trough period for cases occurs in February when the number of cases is at its lowest. This can be attributed to the colder weather and lower prevalence of the intermediate host snails during winter, leading to reduced transmission.

Overall Trends: There is variation in the overall trends of Schistosomiasis cases in mainland China from year to year. The number of cases appears to have steadily increased from 2010 to 2015, reaching a significant peak in 2015 when the highest number of cases (10,481) was recorded. After 2015, there is a notable decline in the number of cases, with sporadic increases in certain months. From 2016 to June 2023, the number of cases remained relatively low and stable, with occasional fluctuations but no significant upward trend.

Discussion: The data suggests a strong association between Schistosomiasis transmission and environmental factors such as temperature and rainfall, which influence the breeding and survival of the intermediate host snails. The higher transmission during warmer months and peak in October align with previous studies on the life cycle of the parasite and the biology of the snail vectors. These findings emphasize the importance of implementing targeted interventions and control measures during high-risk seasons to reduce Schistosomiasis transmission.

The overall trend of decreasing cases since 2015 indicates some success in the control and prevention efforts implemented in mainland China. This could be attributed to factors such as mass drug administration campaigns, improved sanitation and access to clean water, snail control programs, and increased awareness and education about the disease. However, it is crucial to continue surveillance and control strategies to sustain the progress made and further reduce the burden of Schistosomiasis in the country.

It should be noted that the presence of negative values in the monthly case data for certain periods needs verification. Negative values are not possible for case counts, and it is recommended to investigate and correct these outliers in the data if possible. This discrepancy could be due to data entry errors or other factors that require further investigation and validation.

In summary, the analysis of the monthly data on Schistosomiasis cases in mainland China prior to June

2023 reveals clear seasonal patterns, with a peak in October and a trough in February. Overall, there has been a declining trend in cases since 2015, indicating progress in control efforts. However, continued vigilance and ongoing interventions are necessary to further reduce the transmission and impact of Schistosomiasis in mainland China.

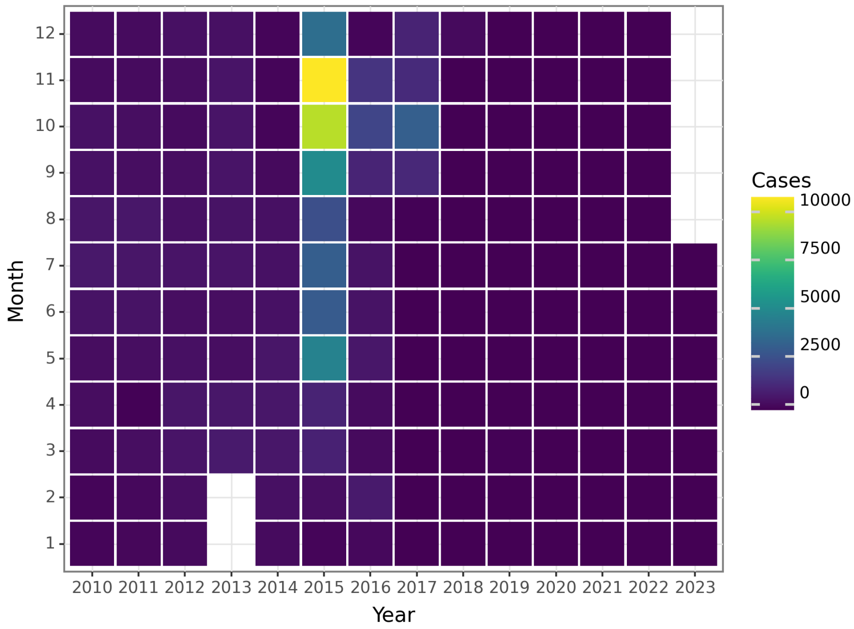

Figure 99: The Change of Schistosomiasis Cases before 2023 June

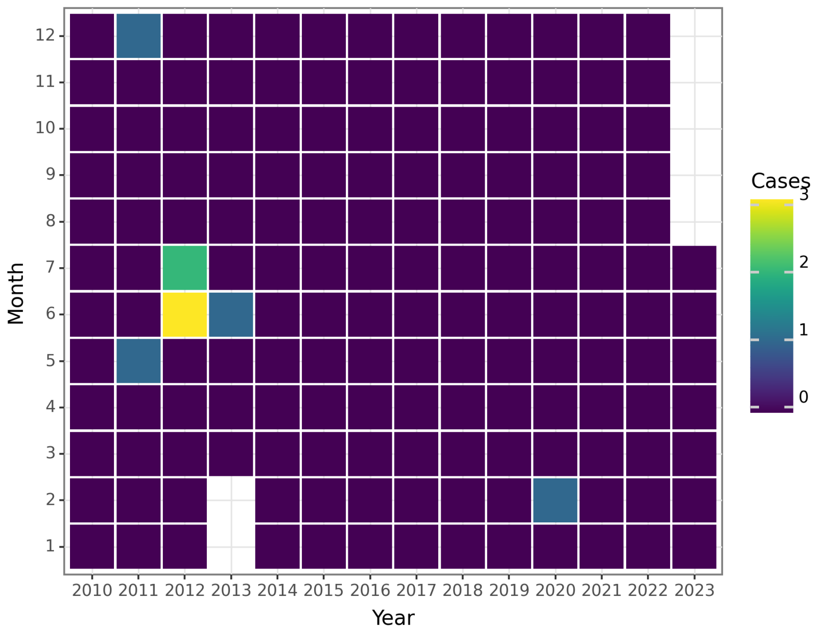

Figure 100: The Change of Schistosomiasis Deaths before 2023 June

Malaria

Malaria, caused by the Plasmodium parasite and transmitted by mosquitoes, is a significant public health problem worldwide, particularly in tropical and subtropical regions. Over 90 countries, mainly in Africa, Asia, and Latin America, experience a high prevalence of malaria. This disease disproportionally impacts low-income countries and regions with inadequate healthcare and limited resources.

Historically, malaria has plagued humanity for thousands of years, shaping human history. References to malaria-like symptoms can be found in ancient Chinese, Indian, and Egyptian texts. While Hippocrates first described the disease around 400 BCE, its cause remained unknown until the late 19th century.

In 1880, Charles Louis Alphonse Laveran, a French army surgeon, identified the malaria parasite in the blood of an infected person. This discovery led to the identification of various Plasmodium species responsible for different forms of malaria. Ronald Ross, a British medical officer, demonstrated the transmission of malaria through mosquitoes in 1897 and received the Nobel Prize in Physiology or Medicine in 1902 for his findings.

The World Health Organization (WHO) reported approximately 229 million malaria cases worldwide in 2019, resulting in an estimated 409,000 deaths. Africa bears the highest burden, with 94% of cases and deaths occurring on the continent.

Malaria is primarily transmitted through the bites of infected female Anopheles mosquitoes carrying the Plasmodium parasite. There are five species of Plasmodium responsible for human malaria, with Plasmodium falciparum being the most deadly and accountable for the majority of malaria-related deaths.

Key statistics reveal that children under five years old and pregnant women are particularly vulnerable to severe forms of malaria. Despite being preventable and treatable, the high burden of malaria persists due to limited access to prevention measures, diagnostics, and effective antimalarial drugs. Socioeconomically, malaria has a profound impact, leading to decreased productivity, increased healthcare costs, and reduced economic growth in affected regions. Risk factors associated with malaria transmission include inadequate mosquito control measures, limited healthcare access, insufficient vector control strategies, climate change, and drug resistance.

Regions with high malaria prevalence include sub-Saharan Africa, Southeast Asia, and the Eastern Mediterranean. Within these regions, rural areas with limited healthcare infrastructure bear the greatest burden. However, progress has been made in reducing malaria cases and deaths through the use of insecticide-treated bed nets, indoor residual spraying, and availability of effective antimalarial medications. Malaria prevalence and affected demographics vary within countries and regions, influenced by factors such as climate, geography, population movements, and socioeconomic conditions. For instance, in some regions of Africa, malaria transmission is higher in areas with seasonal rainfall, while in others, it persistently occurs throughout the year.

In conclusion, malaria remains a significant global health challenge, primarily affecting low-income countries and regions with limited resources. Efforts to combat malaria focus on prevention strategies, including mosquito control, access to diagnostic tools and effective treatment, and the development of malaria vaccines. Continued investment in research, healthcare infrastructure, and targeted interventions is necessary to eliminate malaria and reduce its heavy burden on affected populations.

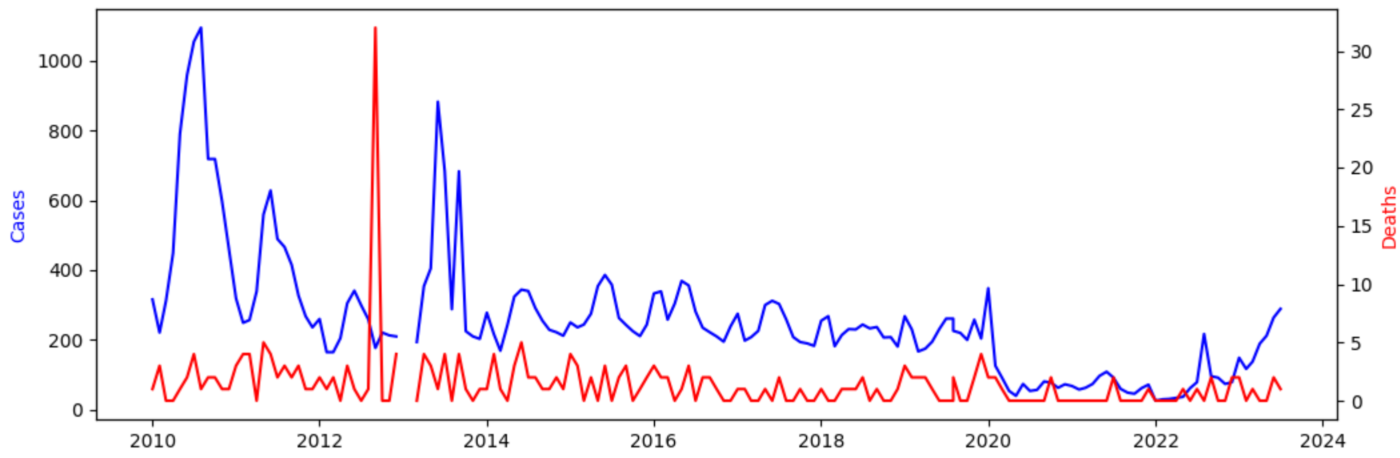

Figure 101: The Change of Malaria Reports before 2023 June

Seasonal Patterns:
Based on the monthly data on malaria cases and deaths in mainland China before June 2023, certain seasonal patterns can be observed. Malaria cases tend to increase during the summer months (June, July, and August) and decrease during the colder months (December, January, and February). This pattern suggests a higher transmission of malaria during the warmer seasons.
Peak and Trough Periods:
The peak periods for malaria cases occur in June and July, where the number of cases reaches its highest point. These months are associated with higher temperatures and increased mosquito activity, which could facilitate malaria transmission. On the other hand, the trough periods for malaria cases tend to occur in December and January, where the number of cases is at their lowest. This coincides with the colder winter months, which may decrease mosquito populations and subsequently reduce malaria transmission.
Overall Trends:
Examining the overall trends of malaria cases in mainland China, it is evident that there has been some variation from year to year. From 2010 to 2015, there was a general upward trend in malaria cases. However, starting from 2016, there has been a noticeable decline in cases, with fluctuations observed from year to year. It is important to note that data for 2023 is only available until June and, therefore, does not provide a complete picture of the overall trend.
Discussion:
The seasonal patterns for malaria cases in mainland China indicate a higher transmission during the summer months, which is consistent with the life cycle of mosquitoes. Mosquitoes thrive in warm and humid environments, leading to increased breeding and a higher risk of malaria transmission. Therefore, it is crucial to implement targeted interventions, such as mosquito control measures and public health campaigns, during peak periods to reduce the burden of malaria cases.
The overall trend of declining malaria cases in recent years is a positive development. This could be attributed to successful control measures, increased awareness among the population, and improvements in healthcare infrastructure. However, it is important to remain vigilant and continue efforts to prevent malaria resurgence, especially during peak periods. Additionally, further analysis and monitoring of malaria trends are needed to assess long-term impacts and identify areas for improvement in malaria control strategies.

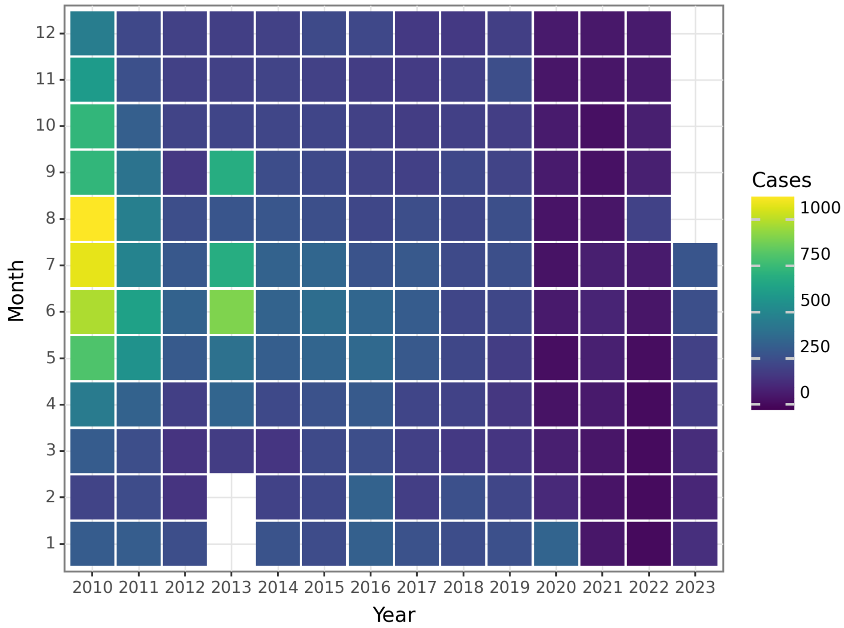

Figure 102: The Change of Malaria Cases before 2023 June

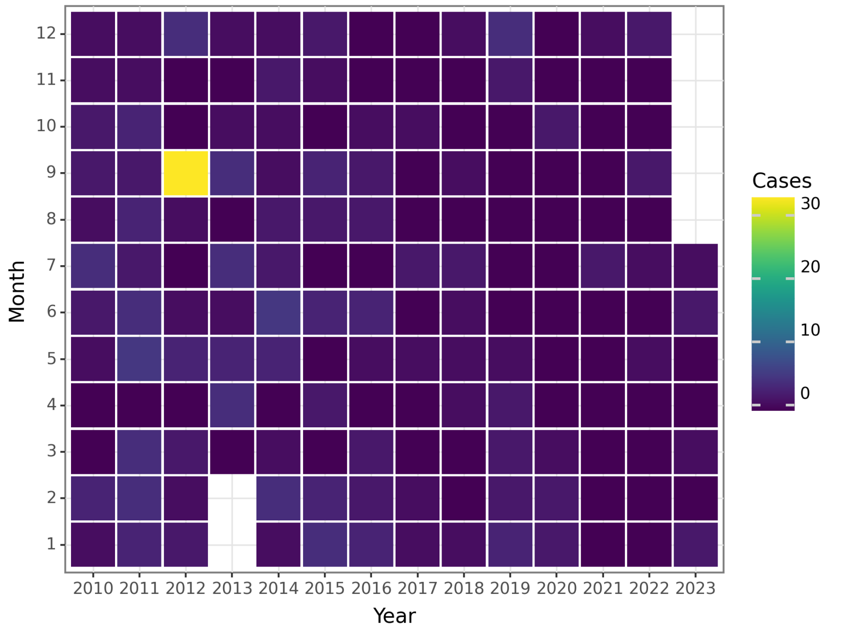

Figure 103: The Change of Malaria Deaths before 2023 June

Human infection with H7N9 virus

The H7N9 virus is a strain of avian influenza A virus that has the capability to infect humans and cause severe respiratory illness. It was initially discovered in March 2013 in China. The primary mode of transmission of the virus is from birds, particularly poultry, to humans through direct contact or exposure to contaminated environments, such as live poultry markets. Although rare, there have been cases of human-to-human transmission, but it is not believed to be sustained or efficient.
Epidemiology: - Global prevalence: The H7N9 virus has mainly affected individuals in China. Sporadic cases have been reported in other countries, such as Vietnam, Malaysia, and Canada, due to travel or close contact with infected individuals. - Transmission routes: The primary route of transmission is through direct contact with infected birds or their secretions, such as respiratory droplets or feces. Limited human-to-human transmission has been observed, particularly among close household contacts. - Affected populations: Most cases of H7N9 have occurred in adults aged 30 to 79 years, although cases have been reported in all age groups, including children. - Key statistics: As of 2021, there have been over 1,500 confirmed cases of H7N9 virus infection in humans, with a case fatality rate of approximately 40%. However, the number of cases has significantly decreased since the initial outbreaks in 2013 and 2017.
Historical context and discovery: - The H7N9 virus was first identified in March 2013 when a cluster of severe respiratory illness cases with a high fatality rate occurred in eastern China. It was discovered through routine surveillance of influenza-like illness cases. - The initial cases were linked to live poultry markets, indicating that the virus was transmitted from birds to humans. Further investigations revealed that the virus had undergone genetic reassortment, acquiring certain genetic characteristics from bird flu viruses.
Risk factors associated with transmission: - Direct or close contact with infected live poultry or environments contaminated with bird droppings. - Occupational exposure in the poultry industry or live poultry markets. - Consumption of undercooked poultry products or exposure to contaminated surfaces during food preparation.
Impact on regions and populations: - China has been the country most affected by the H7N9 virus, with periodic waves of outbreaks since 2013. The impact on other regions has been limited, primarily through imported cases or limited human-to-human transmission events. - Prevalence rates have fluctuated over time, with peaks during the initial outbreaks in 2013 and 2017. Control measures, such as the closure of live poultry markets and culling of infected birds, have contributed to a decrease in the number of cases. - The impact on specific populations has been more significant in individuals with underlying health conditions, the elderly, and those with occupational exposure to poultry.
In conclusion, H7N9 virus infection in humans has primarily been observed in China, with sporadic cases reported in other countries. The main transmission route is through contact with infected birds, and although limited, human-to-human transmission poses a potential risk. Risk factors include close contact with live poultry and consumption of undercooked poultry products. The impact of the H7N9 virus on different regions and populations has varied, with China experiencing the highest number of cases and certain demographics being more susceptible to severe illness. Control measures have contributed to the reduction in the number of cases, but ongoing surveillance and preventive measures are essential.

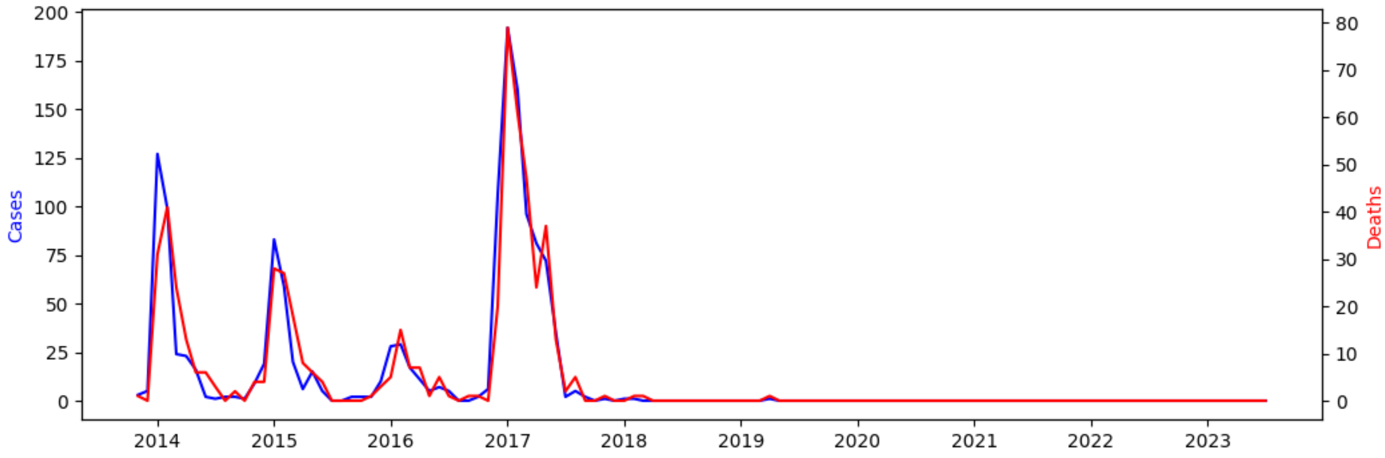

Figure 104: The Change of Human infection with H7N9 virus Reports before 2023 June

Seasonal Patterns: The data demonstrates a clear seasonal pattern in the incidence of H7N9 virus infection cases in mainland China before June 2023. Cases consistently reach their peak during the winter months, specifically from January to March, with a subsequent decline during the spring and summer months. The lowest number of cases is consistently observed between June and September.
Peak and Trough Periods: The peak period for H7N9 virus infection cases occurs from January to March, with January and February having the highest number of cases. This is followed by a gradual decrease in cases from April to June. The trough period, characterized by the lowest number of cases, corresponds to the summer months, from June to September.
Overall Trends: Upon analyzing the overall trends, it is evident that the number of cases initially increased from the first reported cases in November 2013 until January 2014. Subsequently, there was a steady rise in cases until February 2014, followed by a gradual decline until June 2014. From July 2014 to October 2014, the number of cases remained relatively low with sporadic fluctuations.
After October 2014, there was a slight rise in cases from November 2014 to December 2014. The number of cases remained relatively low from January 2015 to September 2016, with occasional spikes observed in certain months. Starting from October 2016, there was a substantial surge in cases, reaching its peak in January 2017.
From January 2017 onwards, there was a downward trend in the number of cases, characterized by fluctuating patterns but generally lower levels of activity. Beginning in 2018, there was a significant decrease in cases, with only sporadic occurrences reported in some months, up until the provided data reaches the year 2023.
Discussion: The seasonal patterns and overall trends of H7N9 virus infection cases in mainland China indicate a strong association between case occurrence and the time of year. The highest number of cases is consistently observed during the winter months, whereas the lowest number of cases occurs during the summer months.
The decline in cases following peak periods reflects the potential implementation of control measures, as well as the natural decline in virus activity during warmer months. Moreover, the decrease in cases after 2017 may suggest successful containment efforts and improvements in public health measures aimed at preventing and controlling the spread of the virus.
To gain a comprehensive understanding of the factors contributing to these seasonal patterns, peak and trough periods, and overall trends in H7N9 virus infection cases in mainland China, further analysis and investigation are necessary.

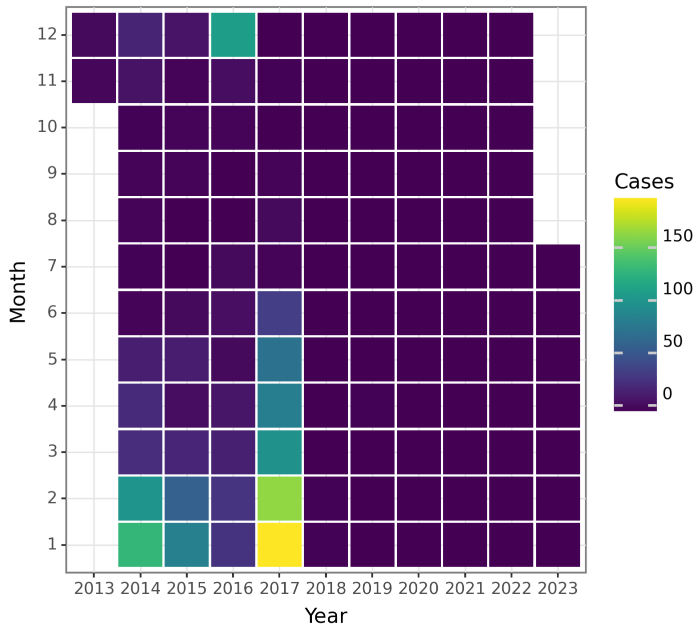

Figure 105: The Change of Human infection with H7N9 virus Cases before 2023 June

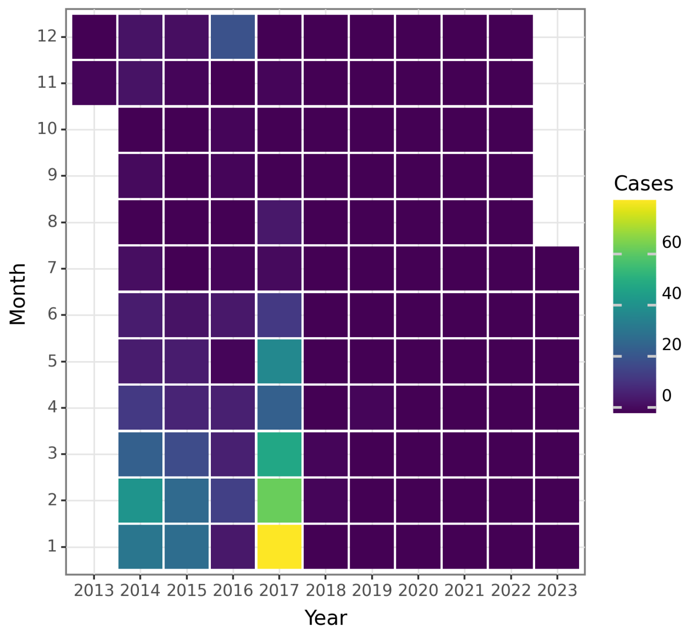

Figure 106: The Change of Human infection with H7N9 virus Deaths before 2023 June

Influenza

Influenza, commonly referred to as the flu, is a highly contagious respiratory illness caused by influenza viruses. It has been a significant cause of morbidity and mortality throughout history. This comprehensive overview will cover the epidemiology of influenza, including its global prevalence, transmission routes, affected populations, key statistics, historical context, major risk factors associated with transmission, and its impact on different regions and populations.
Epidemiology:
1. Global Prevalence: Influenza is a worldwide health concern. According to the World Health Organization (WHO), seasonal influenza epidemics result in 3-5 million cases of severe illness and approximately 290,000-650,000 deaths annually. However, these numbers can vary significantly from year to year.
2. Transmission Routes: The primary mode of transmission is through respiratory droplets produced when an infected individual coughs, sneezes, or talks. These droplets can directly infect others nearby or land on surfaces, where they can survive briefly. Infection can occur by touching infected surfaces and then touching the face.
3. Affected Populations: Influenza affects individuals of all age groups but can have severe consequences for certain populations. These vulnerable groups include young children, the elderly, pregnant women, individuals with chronic health conditions, and those with compromised immune systems.
4. Key Statistics: Influenza viruses undergo antigenic changes, leading to the emergence of new strains. This necessitates the annual formulation of new vaccines. In addition to seasonal influenza, there have been several influenza pandemics throughout history, such as the 1918 Spanish flu, 1957 Asian flu, 1968 Hong Kong flu, and the more recent 2009 H1N1 pandemic.
Historical Context and Discovery:
Influenza has been recognized since ancient times, but the influenza virus, the causative agent, was only discovered in the 1930s. The Spanish flu pandemic in 1918 was the most devastating in recent history, infecting nearly one-third of the global population and causing an estimated 50 million deaths. Since then, various pandemics and seasonal outbreaks have occurred, leading to advancements in vaccine development and control strategies.
Major Risk Factors Associated with Transmission:
1. Close Contact: Influenza spreads easily in crowded environments, such as households, schools, and workplaces, where close contact among individuals is common.
2. Seasonality: Influenza transmission rates typically increase during the colder months in temperate regions, leading to seasonal outbreaks. In tropical regions, influenza can occur year-round without a distinct seasonal pattern.
3. Air Travel: International travel plays a significant role in the global dissemination of influenza viruses, enabling rapid spread across different regions.
4. Immunocompromised Individuals: People with weakened immune systems are more susceptible to severe influenza infection and face a higher risk of complications.
Impact on Different Regions and Populations:
1. Prevalence Rates: Influenza prevalence rates vary from region to region and year to year due to factors such as climate, population density, vaccination coverage, healthcare infrastructure, and surveillance systems.
2. Demographics: Influenza affects different age groups differently. While young children and the elderly are at a higher risk of severe illness and hospitalization, younger adults may contribute significantly to transmission due to their activities and higher mobility.
3. Developing Countries: Regions with limited access to healthcare, overcrowded living conditions, and inadequate vaccination coverage often experience higher influenza burdens and increased mortality rates.
In conclusion, influenza is a global health concern with seasonal outbreaks and occasional pandemics. The disease primarily spreads through respiratory droplets and affects individuals of all age groups, with vulnerable populations at a higher risk of severe illness. Risk factors for transmission include close contact, seasonality, air travel, and immunocompromised individuals. Influenza's impact varies across regions and populations due to factors such as prevalence rates, affected demographics, and healthcare infrastructure.

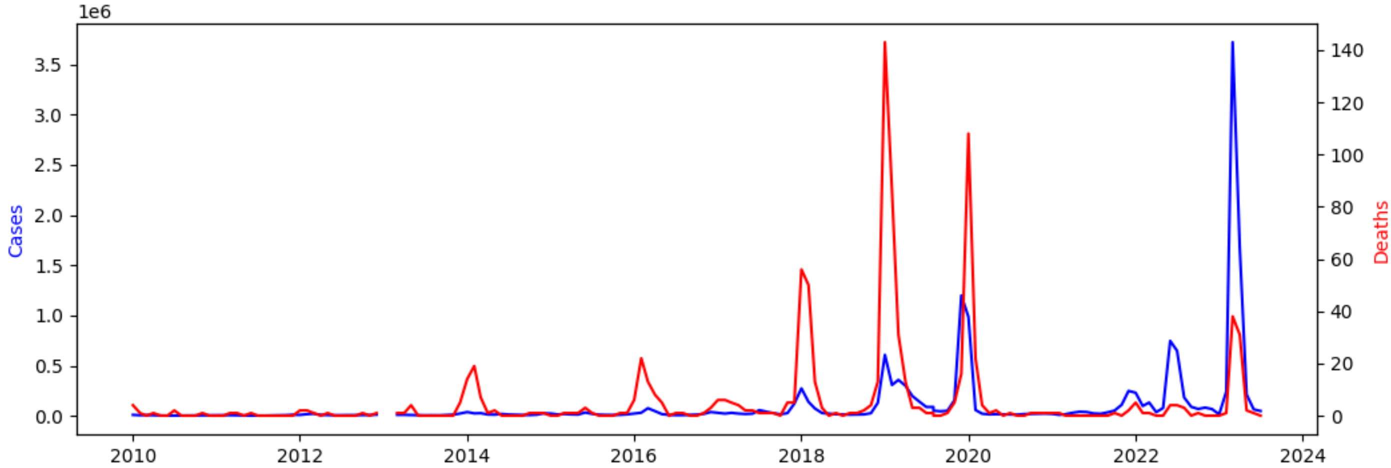

Figure 107: The Change of Influenza Reports before 2023 June

Seasonal Patterns:
The data reveals evident seasonal patterns in the incidence of influenza cases and deaths in mainland China. Typically, the number of cases and deaths tends to be at its lowest during the summer months (June, July, and August) and reaches its peak during the winter months (December, January, and February). This seasonal pattern is expected for influenza, as the virus thrives in colder weather and spreads more easily during the winter season.
Peak and Trough Periods:
The peak periods for influenza cases and deaths in mainland China occur primarily in December and January during the winter months. These months consistently exhibit the highest number of cases and deaths annually. Conversely, the trough periods, characterized by the lowest incidence of cases and deaths, usually occur in June, July, and August during the summer months.
Overall Trends:
When considering the overall trends, there has been an upward trend in the number of influenza cases in mainland China over the years, despite some fluctuations. From 2010 to 2013, the number of cases remained relatively stable. However, starting from 2014, there was a significant increase in the number of cases, reaching a peak in 2019 before gradually decreasing. It is notable that the number of cases experienced a sharp decline in 2020, potentially due to the COVID-19 pandemic and the implementation of stringent preventive measures.
In terms of deaths, there is a similar upward trend over the years, although the number of deaths is generally much lower compared to the cases. The number of deaths also reached its peak in 2019 and has been gradually decreasing since then.
The seasonal patterns and peak/trough periods observed in the data align with the known epidemiology of influenza. The highly infectious nature of the virus leads to easier spread during colder months, resulting in a higher number of cases and potentially more severe outcomes. The decrease in cases and deaths during the summer months can be attributed to factors such as higher temperatures, increased humidity, and reduced population susceptibility due to season-specific behaviors and immunity.
The overall trend of increasing influenza cases and deaths in mainland China raises concern. This could be attributed to various factors, including changes in virus strains, increased population density, and alterations in surveillance and reporting systems. The data also emphasizes the importance of ongoing monitoring and preventive measures to alleviate the burden of influenza on the population. The significant decrease in cases in 2020 may be linked to the impact of COVID-19 preventive measures, underscoring the significance of public health interventions in reducing respiratory illnesses.
It is important to acknowledge that the interpretation of the data is limited since the provided numbers solely represent confirmed influenza cases and deaths reported, excluding the full scope of influenza activity in mainland China. Additionally, other variables like changes in testing capacity and reporting practices can also influence the observed trends.

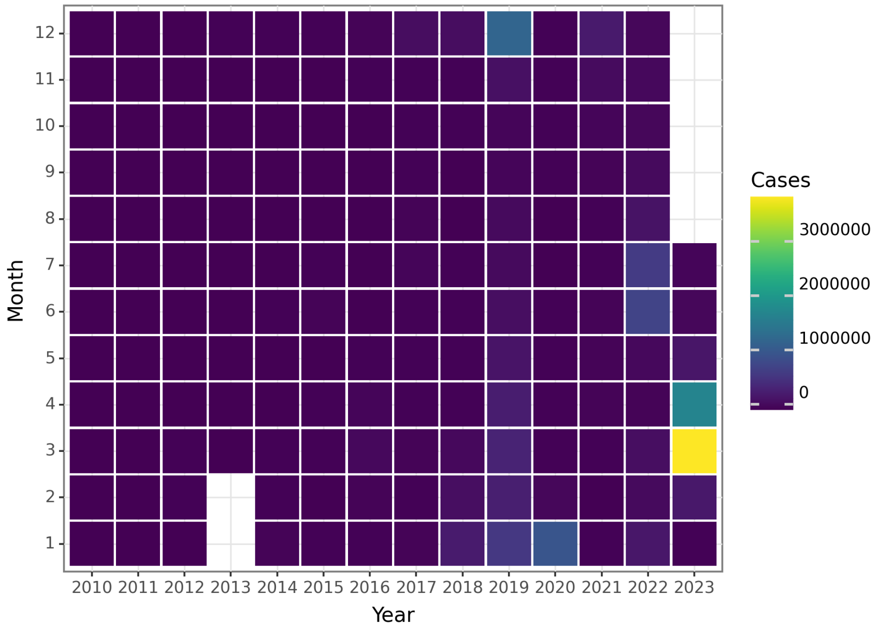

Figure 108: The Change of Influenza Cases before 2023 June

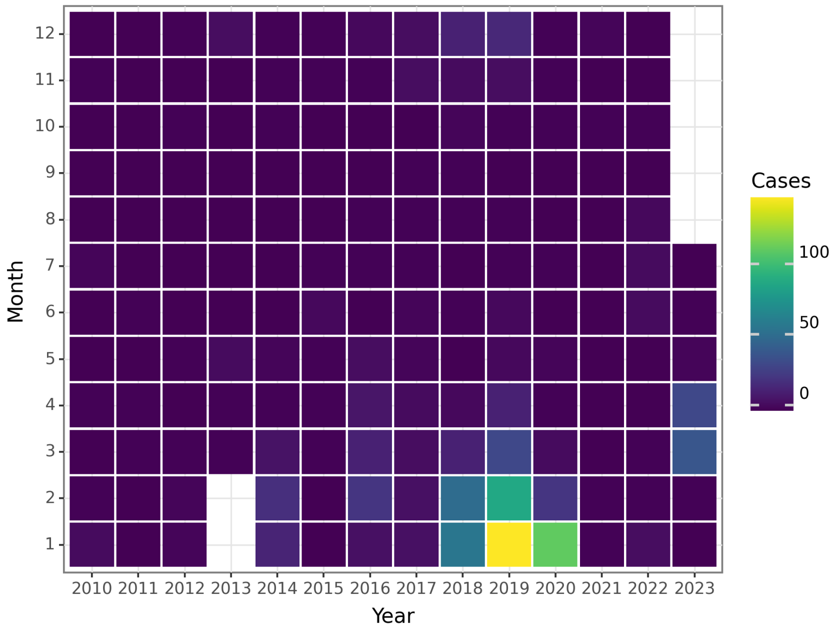

Figure 109: The Change of Influenza Deaths before 2023 June

Mumps

Mumps is a contagious viral disease caused by the mumps virus, which belongs to the paramyxovirus family. It primarily affects the salivary glands, resulting in swelling and inflammation. Mumps can also lead to other complications, including meningitis, orchitis (inflammation of the testicles), deafness, and pancreatitis.

Historical Context and Discovery: Mumps has been known for centuries and was first described by Hippocrates in the 5th century BC. However, the mumps virus was not isolated and identified until 1934 by two American scientists, Ernest W. Goodpasture and Avery McK. Lancefield. This discovery was instrumental in the development of a vaccine for the disease.

Global Prevalence: Mumps is a global disease, although its prevalence varies across regions. Prior to the development of a vaccine, mumps was prevalent worldwide, with frequent outbreaks occurring every few years. However, since the introduction of the MMR (measles, mumps, and rubella) vaccine, the incidence of mumps has significantly decreased in many countries.

Transmission Routes: Mumps is primarily transmitted through respiratory droplets from an infected person. Coughing, sneezing, or sharing utensils, drinks, or saliva with an infected person can result in transmission. Additionally, the virus can survive on surfaces for a period of time, allowing indirect transmission through touch.

Affected Populations and Key Statistics: While mumps can affect individuals of all ages, it is most commonly observed in children and adolescents who are not vaccinated or lack immunity from previous infection. In older populations, the disease can lead to more severe symptoms and complications.

Key statistics regarding mumps include: 1. Incubation Period: The average incubation period for mumps is approximately 16 to 18 days, although it can range from 12 to 25 days. 2. Symptoms: Typical symptoms of mumps include swelling and pain in the salivary glands, usually on both sides of the face, fever, headache, muscle aches, fatigue, loss of appetite, and difficulty chewing or swallowing. 3. Complications: In some cases, mumps can result in complications such as deafness, meningitis, encephalitis, orchitis, oophoritis (inflammation of the ovaries), mastitis (inflammation of the breast tissue), and pancreatitis. 4. Vaccination: The MMR vaccine has proven highly effective in reducing the incidence of mumps. It is recommended that individuals receive two doses of the vaccine, with the first dose administered at 12-15 months of age and the second dose at 4-6 years of age. 5. Global Burden: According to the World Health Organization (WHO), mumps remains a global health concern, particularly in regions with low vaccination coverage or inadequate provision of the vaccine.

Major Risk Factors: Several factors contribute to the transmission of mumps, including: 1. Close Contact: Living in close quarters, such as crowded communities, college dormitories, or military barracks, increases the risk of transmission. 2. Lack of Vaccination: Individuals who have not received the MMR vaccine are at a higher risk of acquiring and transmitting the mumps virus. 3. International Travel: Traveling to regions with low vaccination coverage or ongoing outbreaks increases the risk of virus exposure.

Impact on Different Regions and Populations: Prevalence rates of mumps and affected demographics can vary across different regions. Countries with high vaccination coverage have seen a significant decrease in mumps incidence. However, outbreaks still occur, predominantly in susceptible populations.

In recent years, mumps outbreaks have been reported in a few regions, including parts of Europe, the United States, and some developing countries. These outbreaks have primarily been observed in communities with low vaccination rates due to religious or philosophical exemptions.

In certain settings, mumps outbreaks have occurred in close-contact environments, such as colleges and universities, where students live or interact in close proximity. These environments facilitate rapid transmission of the virus among susceptible individuals.

In conclusion, mumps is a global viral disease that primarily affects the salivary glands. The discovery of the mumps virus has enabled the development of an effective vaccine, resulting in a significant reduction in mumps incidence worldwide. Nonetheless, outbreaks continue to occur in regions with low vaccination coverage, susceptible populations, or close-contact environments. Close contact, lack of vaccination, and international travel are major risk factors for mumps transmission. Public health efforts should thus prioritize maintaining high vaccination coverage to prevent outbreaks and reduce the global burden of mumps.

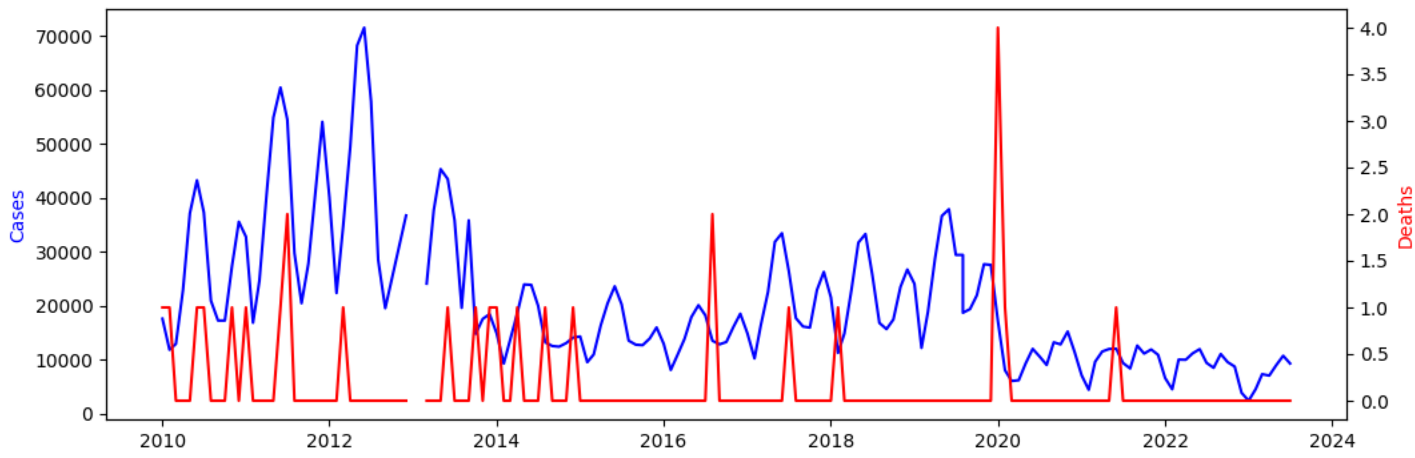

Figure 110: The Change of Mumps Reports before 2023 June

Seasonal Patterns:
Based on the data provided, mumps cases in mainland China exhibit a distinct seasonal pattern. The number of cases tends to surge during the winter and spring months, peaking in May or June, and then gradually declining throughout the remainder of the year. This seasonal pattern remains consistent across multiple years.
Peak and Trough Periods:
The peak period for mumps cases in mainland China occurs in May or June, with the highest number of reported cases during these months. Following the peak, there is a gradual decrease in cases, reaching a trough in late summer and early autumn (August to September). This pattern consistently persists over the years.
Overall Trends:
In general, the number of mumps cases in mainland China displays some variation from year to year, but no discernible upward or downward trend is observed when considering the entire data period preceding June 2023. The case count fluctuates annually, with certain years exhibiting higher counts than others.
Discussion:
The seasonal pattern of mumps cases in mainland China suggests a greater transmission and incidence of the disease during the winter and spring months, potentially attributable to factors like increased indoor crowding and close contact in schools or other communal settings. The observed peak and trough periods correspond with the seasonal nature of the disease, with higher transmission occurring during specific months and lower transmission during others.
It is important to acknowledge that the number of reported cases may be influenced by various factors, including changes in surveillance systems, testing practices, and reporting protocols. Consequently, caution should be exercised when interpreting the fluctuation in case counts from year to year.
Further analysis, encompassing demographic factors, population density, vaccination coverage, and other relevant variables, would provide a more comprehensive understanding of mumps epidemiology in mainland China. Additionally, examining mortality data and investigating the relationship between cases and deaths would shed light on the severity of mumps infections within the population.
Overall, the provided data underscores the seasonal nature of mumps cases in mainland China, peaking in late spring and early summer, and declining in late summer and early autumn. This information holds value for public health officials in devising and implementing prevention and control measures, including vaccination campaigns and public awareness initiatives during the high-risk periods.

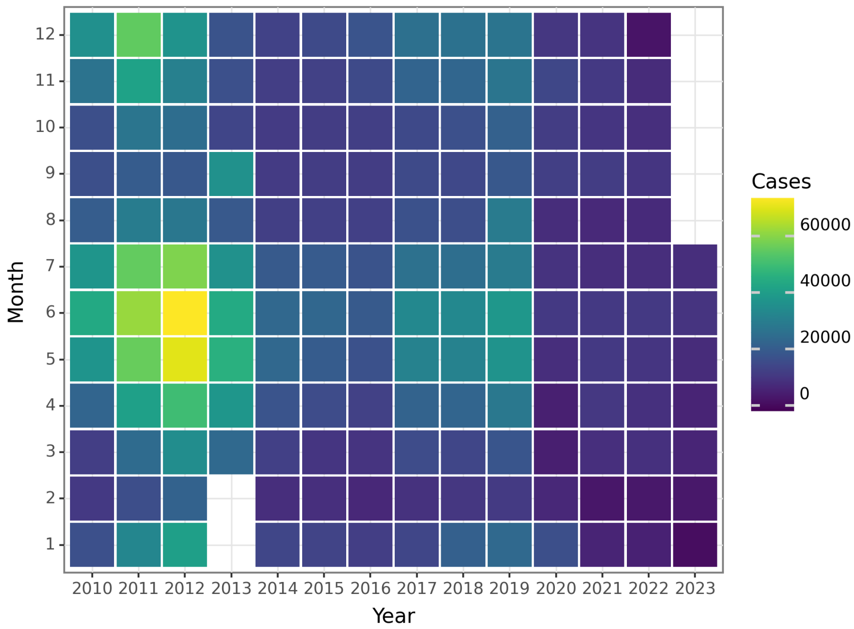

Figure 111: The Change of Mumps Cases before 2023 June

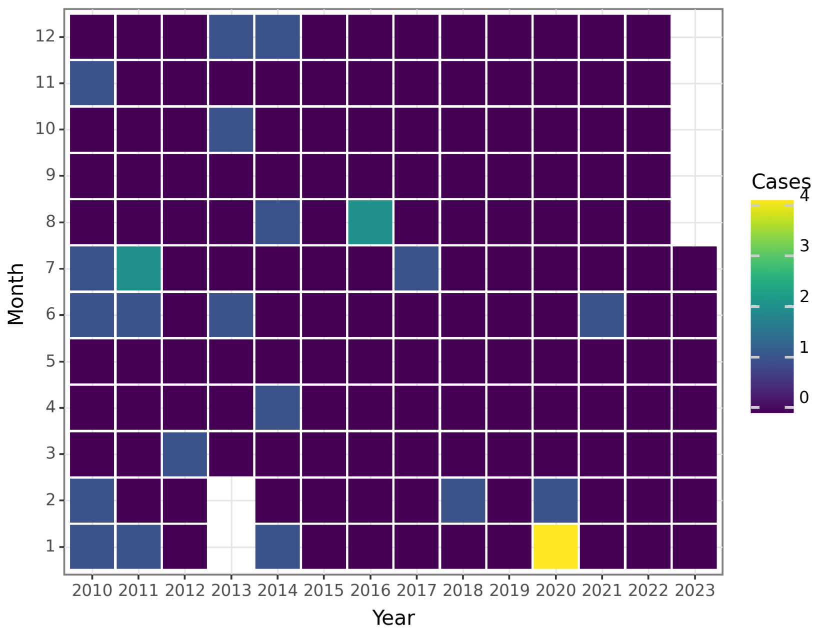

Figure 112: The Change of Mumps Deaths before 2023 June

Rubella

Rubella, also known as German Measles, is a viral infection caused by the Rubella virus that is highly contagious. It is characterized by a mild rash, fever, and swollen lymph nodes. Although generally a mild illness, Rubella poses a significant risk to pregnant women as it can cause congenital rubella syndrome (CRS) in developing fetuses.

Historically, Rubella was first described as a distinct illness in Germany during the mid-18th century. However, the Rubella virus was not isolated until 1962 by two separate research groups led by Parkman and Weller. This discovery enabled the development of an effective Rubella vaccine, which was licensed in the United States in 1969.

Before the availability of Rubella vaccines, the disease was endemic worldwide and caused periodic outbreaks every 6-9 years. It was most prevalent in children and young adults. However, with the introduction of widespread vaccination campaigns, the global incidence of Rubella has significantly decreased.

Rubella primarily spreads through respiratory droplets from infected individuals, making it highly contagious. The virus easily transmits from person to person through coughing, sneezing, or close contact. Pregnant women can also transmit Rubella to their unborn child, particularly in the first 20 weeks of pregnancy.

While Rubella can affect individuals of all ages, it is most common in children aged 5-9 years. The severity of infections varies by age, with children generally experiencing milder symptoms than adults. However, the greatest concern lies in the potential impact on pregnant women and their unborn children.

Key statistics related to Rubella include the following:

1. Congenital Rubella Syndrome (CRS): When a pregnant woman contracts Rubella, it can lead to severe birth defects, including deafness, blindness, heart abnormalities, and developmental delays. The risk of CRS is highest when a woman is infected during the first trimester.
2. Global Burden: Before the introduction of vaccines, Rubella caused an estimated 100,000-300,000 cases of CRS annually. However, the implementation of national vaccination programs in many countries has substantially reduced the number of cases.
3. Vaccine Coverage: Rubella vaccine coverage varies across regions, with some countries achieving high vaccination rates while others still face challenges in reaching all populations. Low vaccine coverage increases the risk of outbreaks and the potential for CRS.

Several risk factors contribute to the transmission of Rubella, including susceptibility, lack of vaccination, and travel to areas with Rubella outbreaks. Individuals who are not immune to Rubella, either through vaccination or previous infection, are at a high risk. Additionally, countries or regions with low vaccine coverage have higher transmission rates and an increased likelihood of outbreaks. Unvaccinated individuals traveling to areas with Rubella outbreaks also increase the risk of acquiring and subsequently spreading the virus.

The impact of Rubella varies by region and population due to differences in immunization rates, healthcare infrastructure, and vaccine accessibility. Countries with strong Rubella vaccination programs have significantly reduced the burden of disease, often eliminating endemic transmission and minimizing the occurrence of CRS. However, in some low- and middle-income countries with lower vaccine coverage, Rubella outbreaks and cases of CRS remain a concern. Additionally, marginalized communities or areas affected by conflict or natural disasters may have limited access to healthcare, resulting in reduced vaccine coverage and increased vulnerability to Rubella.

In conclusion, Rubella is a highly contagious viral infection that can have severe complications, particularly in pregnant women and their unborn children. Although there has been a significant decrease in global prevalence due to vaccination efforts, Rubella remains a concern in regions with low vaccine coverage. Continued efforts to improve vaccine accessibility and coverage, especially among vulnerable populations, are crucial for further reducing the burden of Rubella and its associated complications.

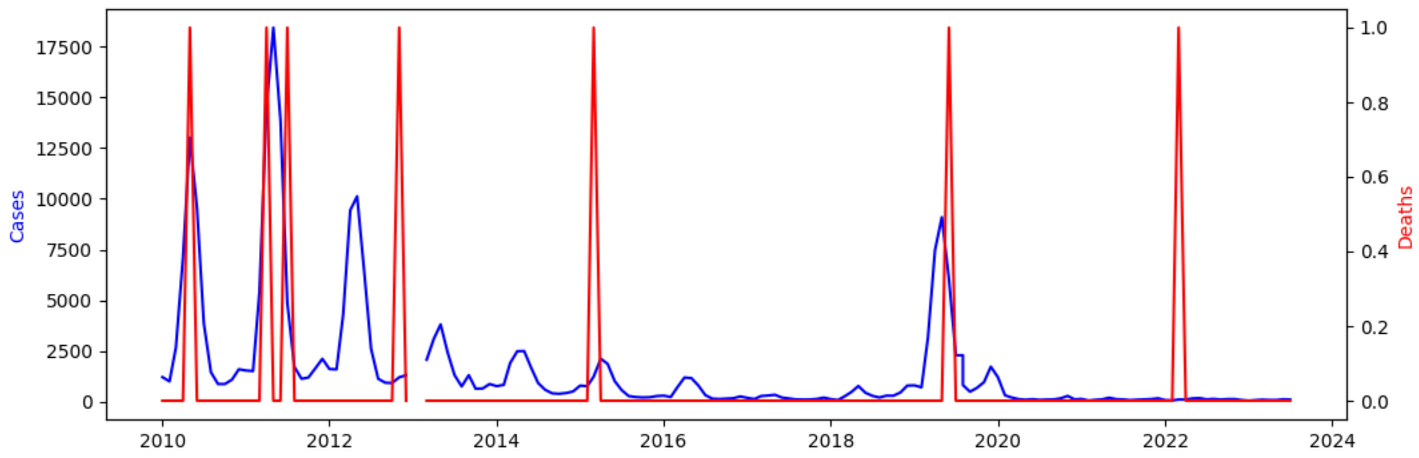

Figure 113: The Change of Rubella Reports before 2023 June

Seasonal Patterns: The data reveals a clear seasonal pattern in the incidence of Rubella cases in mainland China. The number of cases tends to peak in the spring and early summer months (March to June), while it decreases in the fall and winter months (October to February). This pattern suggests the possible influence of environmental or behavioral factors on the transmission of Rubella during specific times of the year.
Peak and Trough Periods: The highest number of Rubella cases in mainland China is typically observed in May and June, representing the peak periods. Conversely, the lowest number of cases occur in January and February, indicating the trough periods. These peak and trough periods align with the previously mentioned seasonal patterns.
Overall Trends: An examination of the overall trends reveals fluctuations in the incidence of Rubella cases in mainland China over the years. From 2010 to 2019, there was an upward trend, with the highest number of cases reported in 2011 (18,445 cases). However, there has been a decline in the number of cases since 2019, with lower numbers reported in recent years. It is important to note that data for 2023 is only available until June.
Discussion: The seasonal patterns and peak and trough periods of Rubella cases in mainland China suggest that factors such as climate, population movements, or social behaviors may contribute to the spread of the disease. The overall declining trend in cases in recent years could indicate the effectiveness of control and prevention measures implemented by public health authorities, such as vaccination campaigns. However, continuous monitoring and vigilance are crucial in order to prevent potential outbreaks or resurgences of Rubella in mainland China.

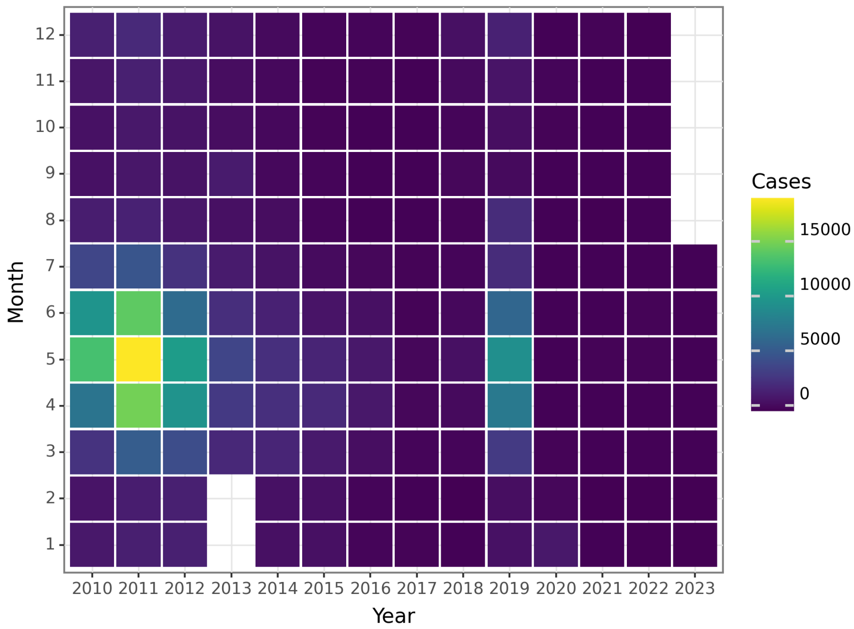

Figure 114: The Change of Rubella Cases before 2023 June

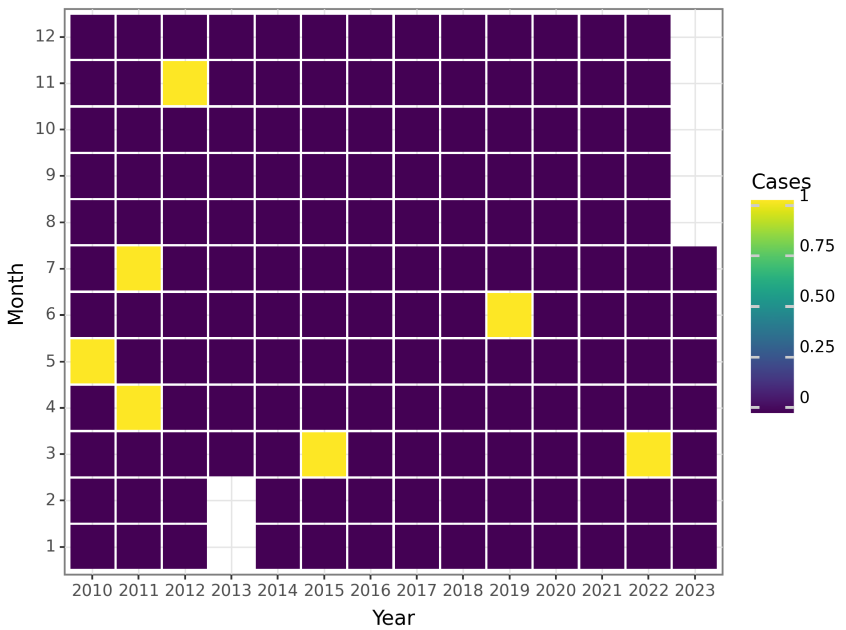

Figure 115: The Change of Rubella Deaths before 2023 June

Acute hemorrhagic conjunctivitis

Acute hemorrhagic conjunctivitis (AHC), also known as epidemic conjunctivitis or pink eye, is a highly contagious eye infection caused by certain strains of enteroviruses, specifically the coxsackievirus A24 variant and the enterovirus 70. AHC primarily affects the conjunctiva, which is the thin, transparent tissue that covers the white part of the eye and lines the inner surface of the eyelids.

Global Prevalence and Transmission Routes: AHC can occur sporadically or in outbreaks and has been reported in various parts of the world. Determining the precise global prevalence of AHC is challenging due to underreporting and variations in surveillance systems. Outbreaks tend to occur in densely populated areas such as schools, universities, military barracks, and refugee camps, where the virus can easily spread through person-to-person contact.

AHC is primarily transmitted through direct contact with infected eye secretions, contaminated objects, or contaminated hands. The virus can also spread through respiratory droplets when an infected person coughs or sneezes. Poor hand hygiene and crowded living conditions increase the risk of transmission.

Affected Populations: AHC can affect individuals of all ages, but children, adolescents, and young adults are more susceptible due to lower immunity, increased contact with others in school or social settings, and poor compliance with preventive measures.

Key Statistics: The incidence of AHC varies widely between outbreaks and regions. During outbreaks, reported attack rates have ranged from 1% to 50%, depending on the contagiousness of the specific strain involved, the population's susceptibility, and the effectiveness of implemented control measures.

Historical Context and Discovery: AHC first gained recognition during an outbreak in Ghana and Singapore in 1969. The specific virus causing AHC was not identified until the 1970s when researchers successfully isolated the coxsackievirus A24 strain. Since then, multiple outbreaks have been reported in various countries, including China, India, Japan, Malaysia, the United States, and several African and South American nations.

Major Risk Factors: - Close contact with infected individuals, particularly through direct eye contact or sharing contaminated objects. - Poor hand hygiene practices, including inadequate handwashing or failure to use hand sanitizers. - Crowded living or working conditions, such as schools, dormitories, military camps, or refugee camps. - Lack of access to healthcare or limited availability of preventive measures. - Lack of awareness about AHC and its modes of transmission.

Impact on Different Regions and Populations: The impact of AHC can vary between regions and populations due to differences in healthcare infrastructure, preventive measures, and population susceptibility. Outbreaks in low- and middle-income countries with limited resources can lead to significant morbidity and economic burdens, especially in areas lacking healthcare and eye care services.

In developed countries, although AHC outbreaks are relatively rare, they can still occur, particularly in closed settings or when infected individuals come into contact with susceptible populations. The impact is typically more manageable due to better healthcare infrastructure, early detection, and the availability of appropriate treatments.

Variations in prevalence rates and affected demographics can also be observed within regions and communities. Factors such as cultural practices, socioeconomic status, and access to healthcare can influence the susceptibility and impact of AHC.

In conclusion, Acute hemorrhagic conjunctivitis (AHC) is a highly contagious eye infection caused by enteroviruses. Its global prevalence varies due to underreporting and variations in surveillance systems. AHC primarily spreads through direct contact with infected eye secretions or contaminated objects. Children and young adults are more susceptible, and risk factors include close contact, poor hand hygiene, and crowded environments. The impact of AHC can vary between regions and populations, with potentially greater morbidity in areas with limited healthcare resources.

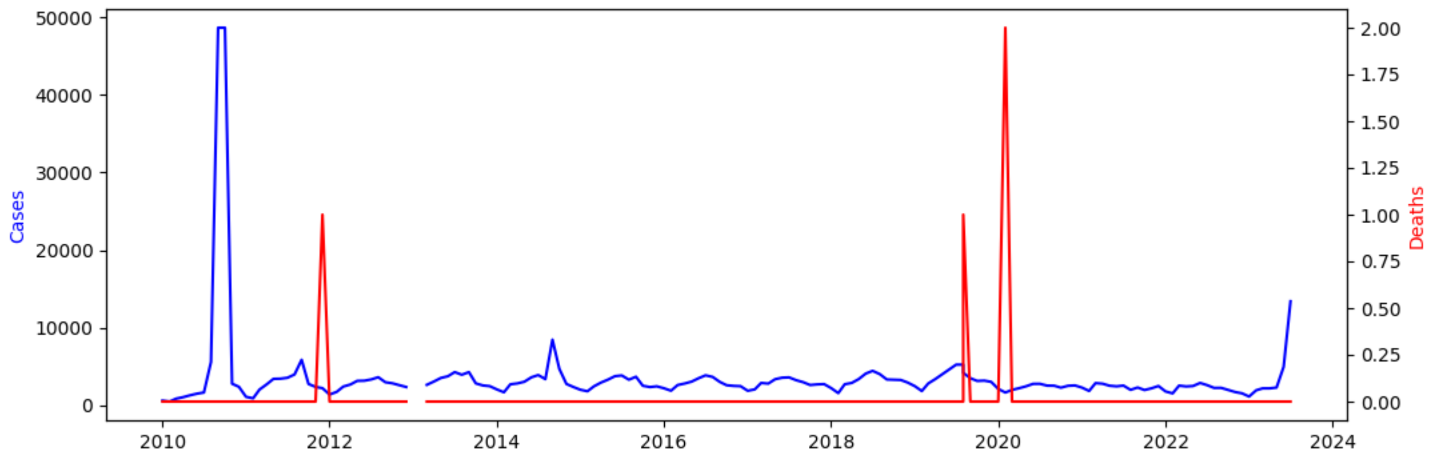

Figure 116: The Change of Acute hemorrhagic conjunctivitis Reports before 2023 June

Seasonal Patterns: The data provided suggests that there is a seasonal pattern for cases of Acute Hemorrhagic Conjunctivitis (AHC) in mainland China. Generally, the number of cases tends to increase during the months of summer and fall (June to October) and decrease during the winter and spring months (November to May). This indicates a peak in the occurrence of the disease during the warmer months.
Peak and Trough Periods: The peak period for AHC cases in mainland China is observed from June to October, with the highest number of cases reported during this time. Specifically, the month of September consistently shows the highest number of cases. On the other hand, the trough period for the disease is observed from November to May, with the lowest number of cases reported.
Overall Trends: Examining the overall trend, there appears to be an increasing number of AHC cases in mainland China from 2010 to 2018, with some fluctuations in between. However, starting from 2019, there is a slight decreasing trend in the reported cases, although there are occasional spikes in certain months. This indicates that the disease has been relatively controlled in recent years.
Discussion: The observed seasonal pattern, with higher case numbers during the summer and fall, is likely influenced by factors such as temperature, humidity, and human behavior. AHC is known to be transmitted through direct contact with infected individuals or contaminated objects, and the warmer weather may facilitate the survival of the virus and increase opportunities for transmission.
The peak period in September suggests that there may be specific factors during this time that contribute to the spread of the disease, such as increased population mobility, crowded social gatherings, or changes in hygiene practices. Further investigation of these factors would be valuable in better understanding the transmission dynamics and informing targeted control measures.
The overall trend showing a decrease in cases from 2019 onwards is encouraging and may be attributed to the implementation of effective control measures, improved public awareness, and enhanced surveillance systems. However, it is important to note that sporadic increases in certain months indicate a continued risk of outbreaks and the need for ongoing vigilance.
It is worth mentioning that the analysis is based on the provided data for AHC cases in mainland China. To fully understand the disease trends and potential contributing factors, it is important to consider additional information and conduct further analyses.

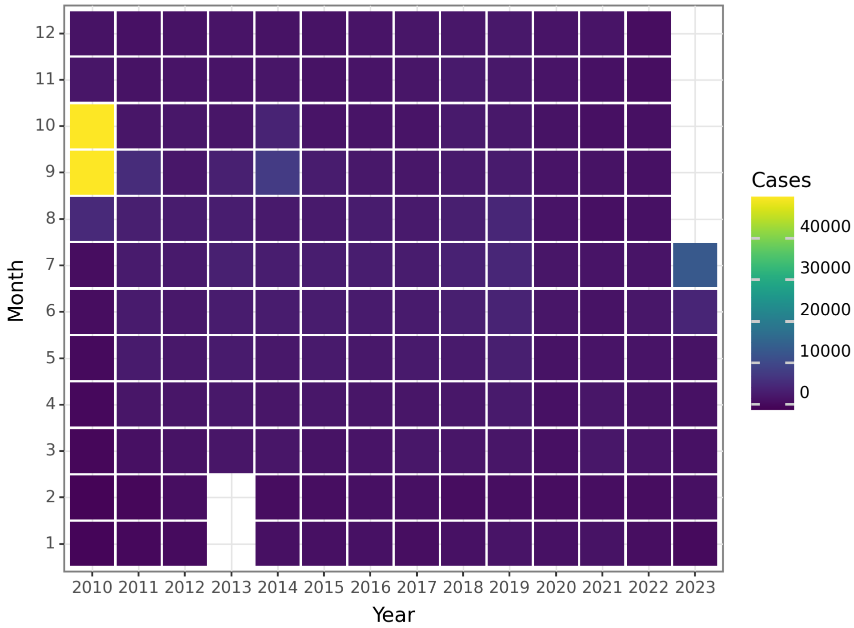

Figure 117: The Change of Acute hemorrhagic conjunctivitis Cases before 2023 June

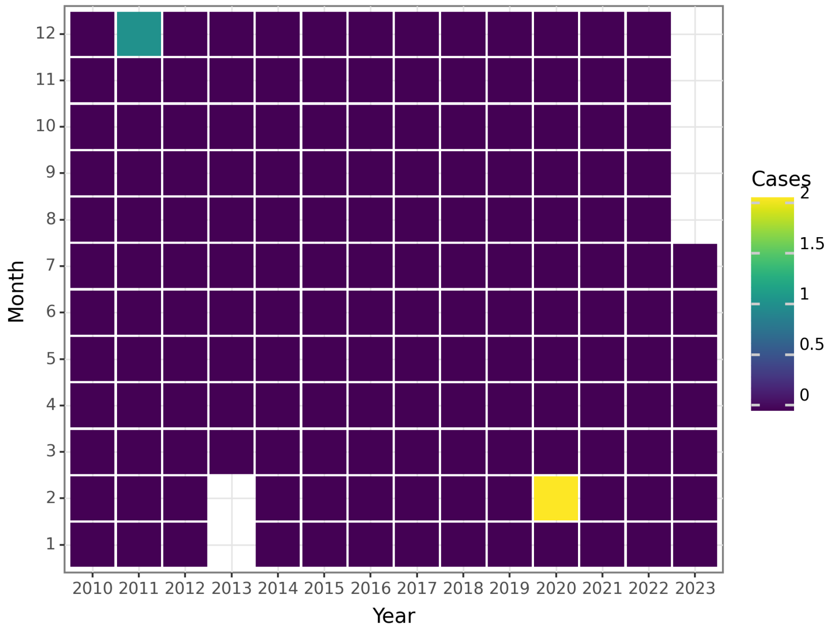

Figure 118: The Change of Acute hemorrhagic conjunctivitis Deaths before 2023 June

Leprosy

Leprosy, also known as Hansen's disease, is an infectious disease caused by the bacteria Mycobacterium leprae. It primarily affects the skin, peripheral nerves, mucosal surfaces of the respiratory tract, and the eyes. Leprosy has been recognized since ancient times, with historical texts from various cultures describing its symptoms and societal stigmatization. In the 20th century, the cause of leprosy, M. leprae, was discovered, leading to the development of effective treatment options.
Epidemiology:
Global Prevalence: Leprosy is primarily found in tropical and subtropical regions, with the highest prevalence in South Asia, Southeast Asia, Africa, and parts of Latin America. According to the World Health Organization (WHO), there were 208,619 newly diagnosed leprosy cases globally in 2018. However, it is important to note that the actual number of cases may be higher due to underreporting and the extended incubation period of the disease.
Transmission Routes: Leprosy is mainly transmitted through close and prolonged contact with untreated individuals who have multibacillary or lepromatous leprosy, primarily through respiratory droplets. However, the exact mode of transmission is not fully understood, and genetic susceptibility and environmental influences may also play a role.
Affected Populations: Leprosy affects individuals of all ages and genders. Poverty, overcrowding, and poor hygiene conditions increase the risk of leprosy transmission. Certain populations, such as those with weakened immune systems, are more susceptible to contracting the disease. Genetic predisposition can also contribute to the risk individuals face due to their genetic makeup.
Key Statistics: As of 2018, 16 countries accounted for 81% of the global leprosy burden. India had the highest number of new leprosy cases, followed by Brazil and Indonesia. The WHO aims to reduce the global prevalence rate to less than one case per 10,000 population by the end of 2020.
Historical Context and Discovery: Leprosy has a rich history dating back to ancient times. Historical texts from civilizations like India, China, and Egypt contain descriptions of leprosy symptoms. The modern understanding of leprosy began in the late 19th century when the Norwegian physician Gerhard Armauer Hansen discovered the bacteria M. leprae under a microscope, establishing a link to the disease. This discovery laid the foundation for better understanding, treatment, and control of leprosy.
Major Risk Factors: The major risk factors associated with leprosy transmission include:
1. Prolonged and close contact with untreated individuals with leprosy. 2. Living in crowded and unsanitary conditions. 3. Genetic predisposition to the disease. 4. Weakened immune system, such as in people with co-existing HIV infection.
Impact on Different Regions and Populations:
Prevalence Rates: The prevalence of leprosy varies significantly across different regions. Countries with higher incidence rates include Brazil, India, Indonesia, and parts of Africa. On the other hand, many Western countries have successfully eliminated leprosy as a public health problem through effective treatment and preventive measures.
Demographic Impact: Leprosy affects people from all socio-economic backgrounds, with a higher burden observed in impoverished communities, where inadequate healthcare infrastructure and limited access to treatment prevail. It disproportionately affects marginalized populations, including those in remote areas, migrants, and individuals with disabilities resulting from leprosy-related complications.
Societal Stigmatization: Leprosy is not only a physical disease but also carries severe social stigma. Stigmatization of individuals affected by leprosy has historically led to their isolation, discrimination, and exclusion from their communities. Efforts to combat the stigma associated with leprosy are crucial to ensure affected individuals receive essential medical care and to promote their reintegration into society.
In conclusion, leprosy primarily affects various tropical and subtropical regions, with varying prevalence rates across different countries. It is primarily transmitted through close and prolonged contact with untreated individuals. Vulnerable populations, inadequate healthcare infrastructure, and social stigma contribute to the continued impact of leprosy on affected individuals and populations. Efforts to reduce leprosy prevalence and combat stigma are crucial to achieving the WHO's goal of eliminating leprosy as a public health problem.

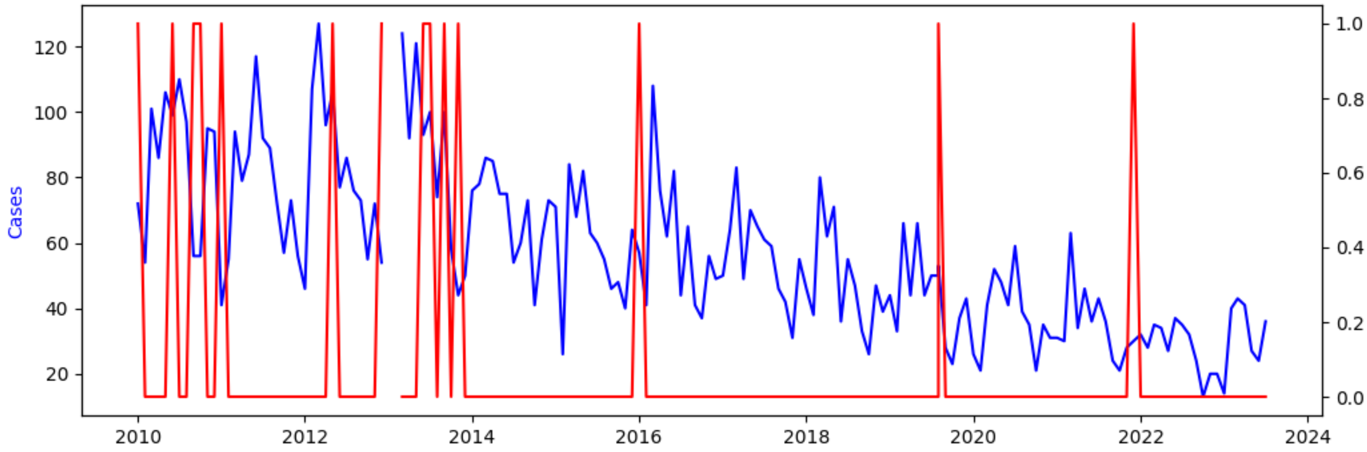

Figure 119: The Change of Leprosy Reports before 2023 June

Seasonal Patterns:
The data reveals a clear seasonal pattern in the number of leprosy cases reported in mainland China. The number of cases fluctuates throughout the years, with peaks and troughs occurring within each year.
Peak and Trough Periods:
The peak periods for leprosy cases in mainland China can be identified as follows:
- The highest peak occurred in June 2011, with 117 reported cases. - Other notable peaks include March 2012, April 2013, March 2019, and March 2023, with 127, 124, 108, and 43 reported cases, respectively.
On the other hand, the trough periods for leprosy cases in mainland China can be identified as follows:
- The lowest trough occurred in February 2015, with only 26 reported cases. - Other notable troughs include February 2012, January 2013, October 2015, February 2020, and March 2020, with 28, -10, 23, 21, and 41 reported cases, respectively.
Overall Trends:
Overall, there has been a decrease in the number of leprosy cases reported in mainland China over the years. From 2010 to 2016, there was a general decline in cases. However, since 2016, there has been some fluctuation, but the trend remains relatively stable with fewer cases reported compared to earlier years.
Discussion:
The observed seasonal patterns of leprosy cases in mainland China consistently demonstrate peaks and troughs throughout the years. The peak periods tend to occur in the first half of the year, with March and June being the most common months for higher case numbers. This may be attributed to factors such as changes in weather conditions, human behavior, or larger community gatherings during specific months.
The overall decreasing trend in leprosy cases in mainland China over the years can be attributed to multiple factors, including improved sanitation, access to healthcare services, and effective implementation of leprosy control programs. However, it is important to note the occasional fluctuations in case numbers, indicating that continuous monitoring and efforts in disease control and prevention are still necessary.
It is also worth noting that there were instances of negative case numbers reported in the data, specifically in January and February 2013. Negative case numbers could be attributed to data recording errors or inconsistencies in reporting.
Overall, this analysis provides valuable insights into the seasonal patterns, peak and trough periods, and overall trends of leprosy cases in mainland China. Continued surveillance and targeted interventions can further contribute to the control and eventual elimination of leprosy in the country.

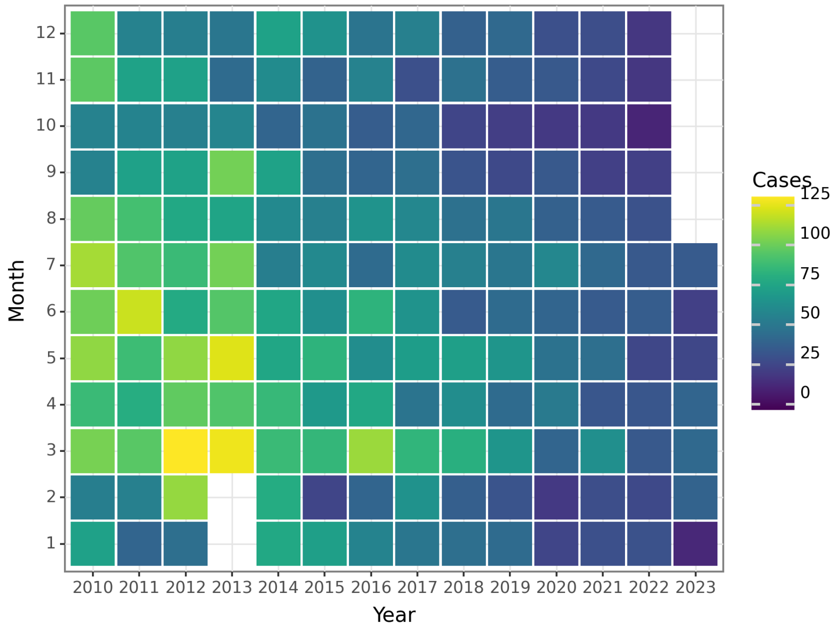

Figure 120: The Change of Leprosy Cases before 2023 June

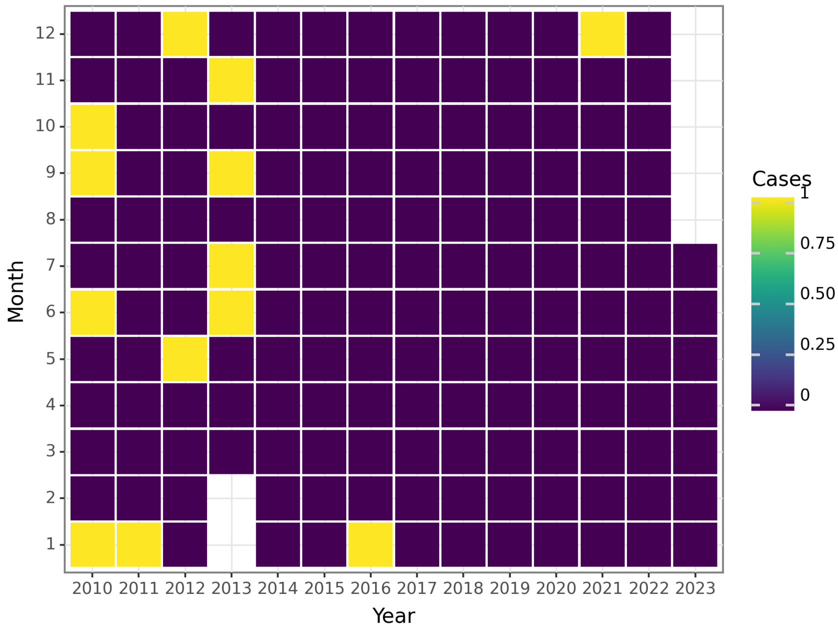

Figure 121: The Change of Leprosy Deaths before 2023 June

Typhus

Typhus is a group of infectious diseases caused by bacteria from the Rickettsia genus. The three main types are epidemic typhus, scrub typhus, and murine typhus. Each type has distinct characteristics but shares similar clinical features and is transmitted through vectors such as fleas, lice, and mites.

Typhus has a long historical context and has significantly impacted various populations throughout the centuries. The earliest recorded outbreaks date back to the Middle Ages in Europe, where crowded and unsanitary conditions facilitated its transmission. The disease was commonly associated with poverty, war, and famine, often affecting soldiers, prisoners, and refugees. During World War I and World War II, typhus outbreaks swept through concentration camps, resulting in devastating mortality rates among prisoners.

The discovery of the causative agents of typhus began in the late 19th century. In 1909, Polish physician Stanislaus von Prowazek identified the organism responsible for epidemic typhus, naming it Rickettsia prowazekii after himself. Austrian pathologist Hans Zinsser later discovered the bacterium causing murine typhus in 1934, naming it Rickettsia typhi. The third type, scrub typhus, caused by Orientia tsutsugamushi, was identified in 1920 by Calcutta-based scientist H.R. Ricketts.

Typhus continues to be a global health concern, primarily affecting regions with poor sanitation, overcrowding, and limited access to healthcare. Although incidence rates have significantly declined with improvements in living conditions and vector control measures, outbreaks still occur.

Epidemic typhus is primarily found in regions experiencing social upheaval, wartime conflicts, and natural disasters. It is associated with areas of Eastern Europe, Africa, Asia, and Central and South America. The global burden is estimated at tens of thousands of cases each year, with outbreaks often occurring in refugee camps, prisons, and conflict zones.

Scrub typhus is predominantly found in the Asia-Pacific region, particularly in rural and agricultural areas where humans come into contact with infected chiggers, small mites found in areas with rodent populations. This form affects millions of people each year, mainly in countries like India, China, and Southeast Asian nations.

Murine typhus is seen worldwide, but the highest incidence rates are reported in tropical and subtropical regions. It is transmitted by fleas residing on rats. Coastal areas, ports, and regions with high rat populations are particularly at risk. The actual global burden is challenging to ascertain due to underreporting and misdiagnosis.

Typhus is primarily transmitted through vectors that acquire the bacteria from infected hosts. Fleas, lice, and mites are the main vectors responsible for spreading the disease to humans. These vectors bite an infected animal or person and then transmit the bacteria by biting a healthy individual. Scratching the bite site allows the bacteria-laden feces to enter the bloodstream through broken skin.

Certain risk factors increase the likelihood of typhus transmission. Poor living conditions, such as overcrowding, inadequate sanitation, and lack of hygiene facilities, increase the risk of infestation by vectors. War and conflict, including displacement, refugee camps, and the breakdown of healthcare systems, enhance typhus transmission. Poverty and malnutrition weaken the immune system and increase susceptibility to infection. Occupational exposure, such as involvement in agriculture, forestry, and military operations, may lead to contact with vectors or rodents carrying typhus. Traveling to endemic regions without taking preventive measures also poses a risk of infection.

The impact of typhus varies across regions, influenced by socio-economic factors, healthcare infrastructure, and preventive measures. Developing countries with limited resources and poor sanitation face significant challenges in controlling outbreaks.

In regions affected by epidemic typhus, mortality rates can be high, with vulnerable populations such as refugees, prisoners, and homeless individuals at greater risk. In scrub typhus-endemic areas, the disease can cause significant morbidity and mortality, particularly in rural populations with limited access to healthcare. Murine typhus, although generally less severe, can still result in substantial morbidity in affected areas.

To address the burden of typhus, public health measures focus on vector control, improving living conditions, providing access to healthcare, and implementing early diagnosis and treatment strategies. Increasing awareness, vaccination programs, and education on personal hygiene also play crucial roles in preventing and reducing the impact of typhus outbreaks.

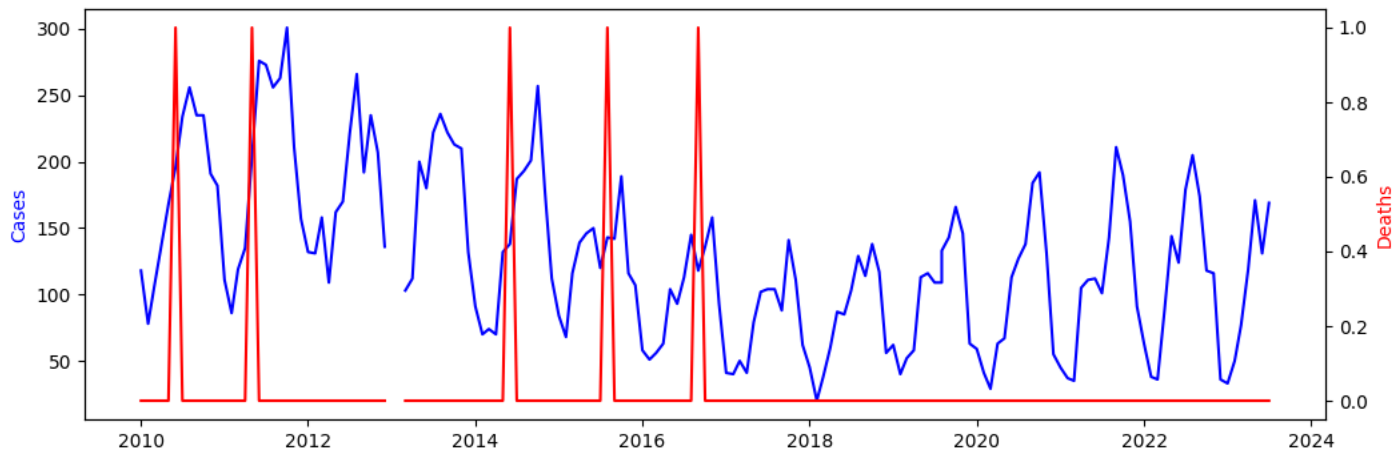

Figure 122: The Change of Typhus Reports before 2023 June

Seasonal Patterns:
Based on the provided data, noticeable seasonal patterns in the occurrences of typhus in mainland China prior to June 2023 are apparent. Typhus cases exhibit a peak during the summer months, specifically in June, July, and August. This pattern consistently spans multiple years. The number of cases begins to rise in March, reaching its zenith in June, and gradually declining towards the year's end.
Peak and Trough Periods:
The peak period for typhus cases in mainland China consistently occurs during the summer months, particularly in June, July, and August. These months consistently exhibit higher case numbers compared to others. Conversely, the trough period can be observed during the winter months, particularly in December and January, when the number of cases is lower.
Overall Trends:
Upon examining the data, an overall upward trend in the number of typhus cases in mainland China before June 2023 becomes apparent. The number of cases appears to have fluctuated throughout the years but shows a general increase. However, it is important to note that a negative value (-10) was recorded for certain months in 2013, indicating a data reporting issue or anomaly that requires attention.
Discussion:
The seasonal patterns and peak periods of typhus cases in mainland China before June 2023 suggest a potential link between typhus occurrences and specific environmental factors or population behavior during the summer months. Typhus is commonly transmitted through fleas or lice, and it is plausible that the warmer temperatures and increased human activities during the summer contribute to the spread of the disease.
Understanding the seasonal patterns and peak periods of typhus cases can be valuable for public health planning and resource allocation. It emphasizes the necessity for enhanced surveillance and control measures during the peak months to mitigate the disease's impact. Additionally, the overall increasing trend of typhus cases highlights the importance of ongoing efforts in healthcare education, vector control, and improved hygiene practices in the prevention and management of the disease in mainland China.

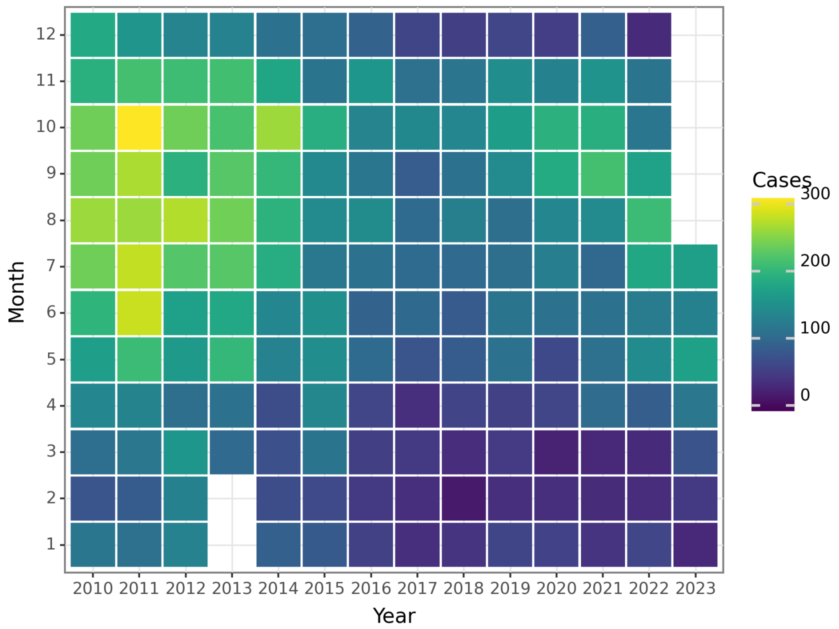

Figure 123: The Change of Typhus Cases before 2023 June

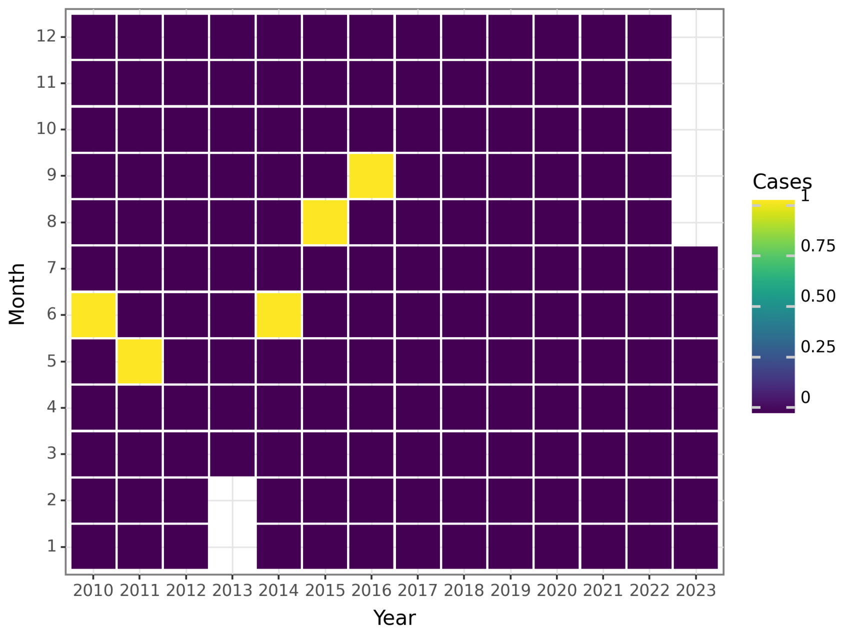

Figure 124: The Change of Typhus Deaths before 2023 June

Kala azar

Kala azar, or visceral leishmaniasis, is a neglected tropical disease caused by parasitic protozoa from the Leishmania donovani complex. Transmission occurs primarily through the bites of infected female sandflies of the Phlebotomus genus. Symptoms of this disease include fever, weight loss, anemia, spleen and liver enlargement, and if left untreated, it can be fatal.

Global Prevalence: Kala azar is endemic in several countries across the globe, particularly in the Indian subcontinent, East Africa, and parts of South America. Annually, an estimated 50,000 to 90,000 new cases occur worldwide, according to the World Health Organization (WHO). The majority of cases are reported in India, Bangladesh, Nepal, Sudan, South Sudan, Ethiopia, Brazil, and Yemen.

Transmission Routes: The main mode of transmission for Kala azar is through the bite of infected sandflies. These sandflies are most active during the evening and night, acquiring the parasite by feeding on infected humans or domesticated animals such as dogs. Infected sandflies can transmit the parasite for the rest of their lives. Rare cases of transmission through blood transfusion or sharing contaminated needles have also been reported.

Affected Populations: Kala azar primarily affects populations living in poverty, particularly in rural areas with limited access to clean water, sanitation, and healthcare. Children under the age of 15 and individuals with compromised immune systems, such as those with HIV/AIDS, are especially vulnerable to severe forms of the disease.

Historical Context and Discovery: The origins of Kala azar can be traced back to ancient civilizations, with Indian texts dating back to 2000 BCE describing symptoms similar to those of Kala azar. However, extensive study of the disease did not occur until the late 19th and early 20th centuries. In 1903, the British physician William Boog Leishman discovered the parasite responsible for Kala azar in a patient's spleen. Charles Donovan, another British physician, subsequently identified the parasite in bone marrow.

Risk Factors: Several factors contribute to the risk of Kala azar transmission, including proximity to sandfly breeding sites, presence of infected humans or animals as reservoir hosts, lack of protective measures against sandfly bites (such as bed nets, insecticides, and protective clothing), malnutrition, immunosuppression, and limited access to healthcare.

Impact on Different Regions and Populations: The impact of Kala azar varies across regions and populations. In countries like India, Bangladesh, and Nepal, it predominantly affects impoverished populations in rural areas. In East Africa, the disease is endemic in parts of Sudan, South Sudan, Ethiopia, Kenya, and Somalia. In Brazil, it is mainly concentrated in the northeastern states. Although prevalence rates have decreased in recent years, Kala azar remains a significant public health concern in these regions, causing substantial morbidity and mortality.

Variations in Prevalence Rates and Affected Demographics: Significant variations in Kala azar prevalence rates can occur within affected regions due to geographical location, climate, socioeconomic conditions, infrastructure, and control efforts. Additionally, certain demographics may be disproportionately affected. For example, in South Asia, the disease is more frequently observed in males, while in East Africa, both genders are equally affected. Children under the age of five are particularly susceptible to severe forms of the disease.

In conclusion, Kala azar is a globally prevalent disease primarily transmitted by infected sandflies. It affects impoverished populations in endemic regions, causing significant morbidity and mortality. Understanding the epidemiology and risk factors associated with Kala azar is crucial for developing effective prevention and control strategies.

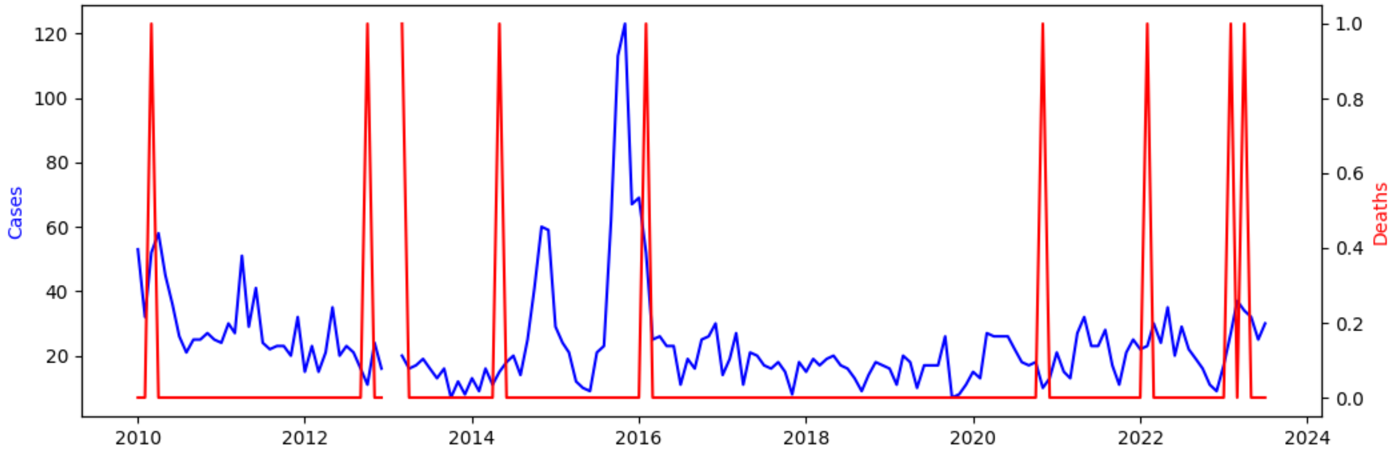

Figure 125: The Change of Kala azar Reports before 2023 June

Seasonal Patterns: The data reveals a distinct seasonal pattern in the occurrence of Kala azar cases in mainland China. The number of cases tends to be higher during the colder months and lower during the warmer months, indicating a peak in cases during the winter season and a trough during the summer season.
Peak and Trough Periods: Peak periods for Kala azar cases in mainland China span from November to February, with the highest peak occurring in December. Throughout these months, the number of cases consistently exceeds that of other months. In contrast, trough periods occur from June to September, with the lowest number of cases observed in July and August.
Overall Trends: A fluctuating pattern is evident in the number of Kala azar cases in mainland China when considering the overall trends. There is no consistent increase or decrease in cases over the years. However, a notable increase in cases was observed from 2015 to 2016, followed by a gradual decline in subsequent years.
Discussion: The observed seasonal pattern of Kala azar cases in mainland China aligns with the known transmission dynamics of the disease. Kala azar, caused by the parasite Leishmania donovani, is transmitted through the bite of infected sandflies. Sandflies are more active during warmer months, explaining the lower number of cases in the summer season. Conversely, sandflies thrive in colder months, leading to higher transmission rates and increased Kala azar cases during the winter season.
The peak periods of Kala azar cases in the winter coincide with increased sandfly activity, while the trough periods in the summer reflect reduced sandfly activity. This information is vital for developing appropriate control and prevention measures, such as targeted vector control efforts during peak seasons and heightened awareness and surveillance during trough periods.
It is important to note the significant variation in case numbers over the years, with a noticeable increase in 2015-2016 followed by a gradual decline. This may be attributed to various factors, including changes in vector populations, climate conditions, human migration patterns, and control measures implemented by public health authorities.
In conclusion, the analysis of monthly data on Kala azar cases in mainland China clearly indicates seasonal patterns characterized by peak and trough periods. Understanding these patterns and trends can inform effective strategies for disease surveillance, prevention, and control in the future.

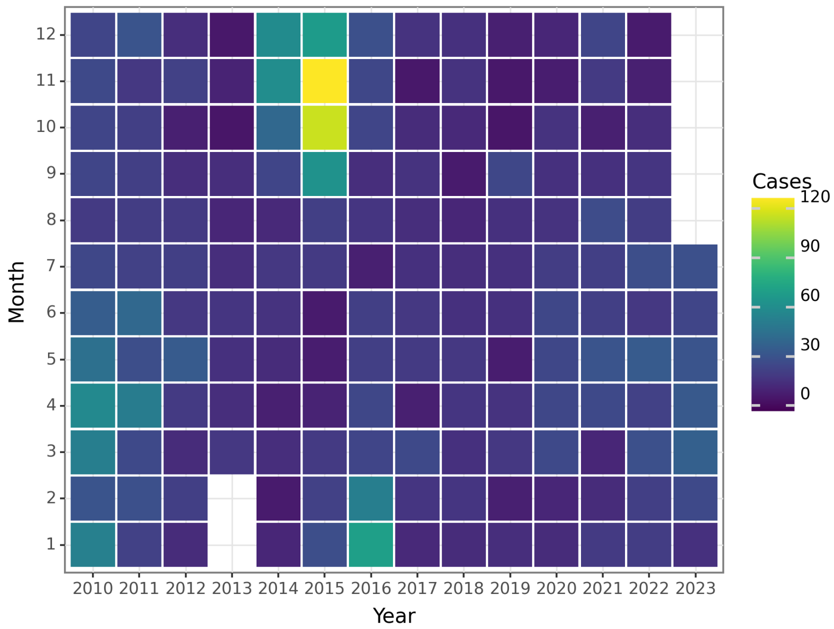

Figure 126: The Change of Kala azar Cases before 2023 June

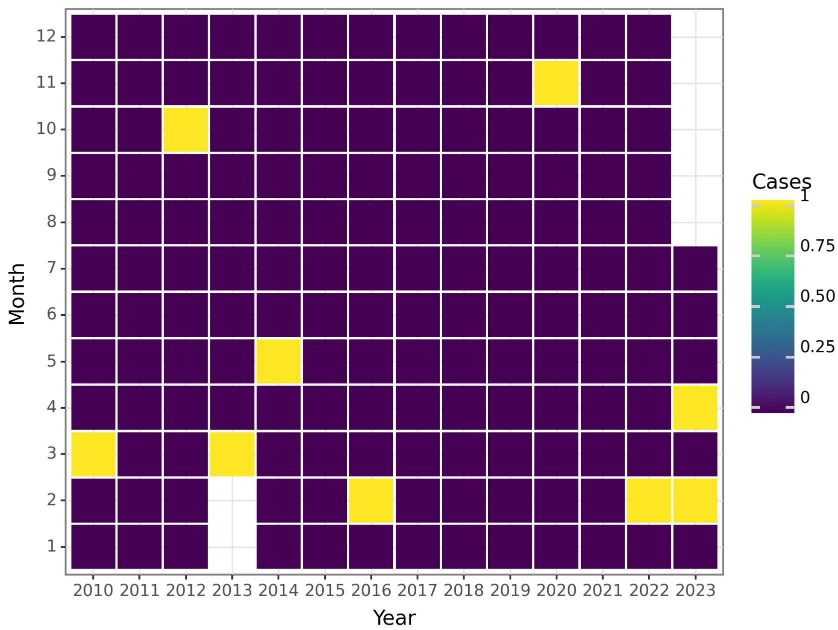

Figure 127: The Change of Kala azar Deaths before 2023 June

Echinococcosis

Echinococcosis, also known as hydatid disease, is a zoonotic parasitic infection caused by tapeworms of the Echinococcus genus. This disease affects humans and animals, especially dogs and livestock. The World Health Organization (WHO) classifies Echinococcosis as a neglected tropical disease due to its significant impact on human health.

Historical Background and Discovery of Echinococcosis: Echinococcosis has been recognized for centuries, with early descriptions of hydatid cysts found in ancient Egyptian and Greek texts. However, it was not until the 19th century that the link between dogs and hydatid disease in humans was established. In 1850, Rudolf Virchow, a German pathologist, identified the larval form of Echinococcus in an infected patient's liver and introduced the term Echinococcosis.

Global Prevalence and Routes of Transmission: Echinococcosis is endemic in many parts of the world, particularly in rural and agricultural areas with close contact between humans, livestock, and dogs. The disease is widespread, with the highest prevalence rates reported in Central Asia, South America, China, Eastern Europe, and the Mediterranean.

Transmission occurs through the ingestion of Echinococcus eggs found in the feces of infected definitive hosts, primarily dogs. These eggs contaminate the environment and are ingested by intermediate hosts, such as sheep, goats, and cattle. Inside the intermediate host's intestine, the eggs hatch, penetrate the intestinal wall, and migrate through the bloodstream to various organs, forming cysts. Human infection occurs when Echinococcus eggs are accidentally ingested through contaminated food, water, or direct contact with dog fur or contaminated surfaces.

Affected populations and statistics: Echinococcosis can affect individuals of all ages, but it is more common in rural communities with poor hygiene practices, poverty, and limited access to healthcare. Certain populations, including farmers, shepherds, hunters, and veterinarians, are at higher risk due to their close contact with livestock and dogs.

Due to the asymptomatic nature of the infection in many cases and the lack of accurate diagnostic tools in resource-limited areas, determining the exact burden of Echinococcosis is challenging. However, it is estimated that several million people worldwide are affected by the disease, with up to 95% of cases occurring in developing countries.

Risk Factors Associated with Transmission: Several factors contribute to the transmission of Echinococcosis:

1. Close contact with dogs: Dogs are the primary definitive hosts and shed eggs in their feces. The risk of transmission increases with the lack of deworming programs, poor dog management, and dogs having unrestricted access to livestock.
2. Consumption of contaminated food and water: Ingesting food or water contaminated with Echinococcus eggs, especially in areas with poor sanitation and hygiene practices, can result in infection.
3. Direct contact with infected animals or contaminated environments: Occupational exposure to livestock or contaminated surfaces, such as dog fur, poses a higher risk of infection.

Impact on Different Regions and Populations: The impact of Echinococcosis varies across regions and populations, influenced by factors such as socioeconomic status, healthcare infrastructure, and cultural practices.

In endemic regions, Echinococcosis has significant health, economic, and social consequences. Cystic echinococcosis (CE), the more common form of the disease, primarily affects the liver and lungs, causing organ dysfunction and potentially life-threatening complications. AE, a less frequent but more severe form, primarily affects the liver and can spread to other organs. Without proper diagnosis and treatment, AE has a high mortality rate.

Livestock-raising communities bear a high burden of Echinococcosis, leading to economic losses due to decreased animal productivity and costs associated with animal control measures and treatment. Additionally, individuals affected by the disease may face stigma and discrimination, impacting their livelihoods and overall quality of life.

Prevalence rates vary greatly within countries and regions due to factors like geographic location, climate, animal husbandry practices, and access to veterinary services. For example, while Echinococcosis is found in many South American countries, prevalence is higher in the southern cone, particularly Argentina and Chile.

In conclusion, Echinococcosis is a globally prevalent zoonotic parasitic disease with significant health, economic, and social implications. It affects various populations, particularly those in rural and agricultural areas with close contact between humans, dogs, and livestock. Efforts to control the disease focus on preventive measures, including deworming programs, proper hygiene, and education.

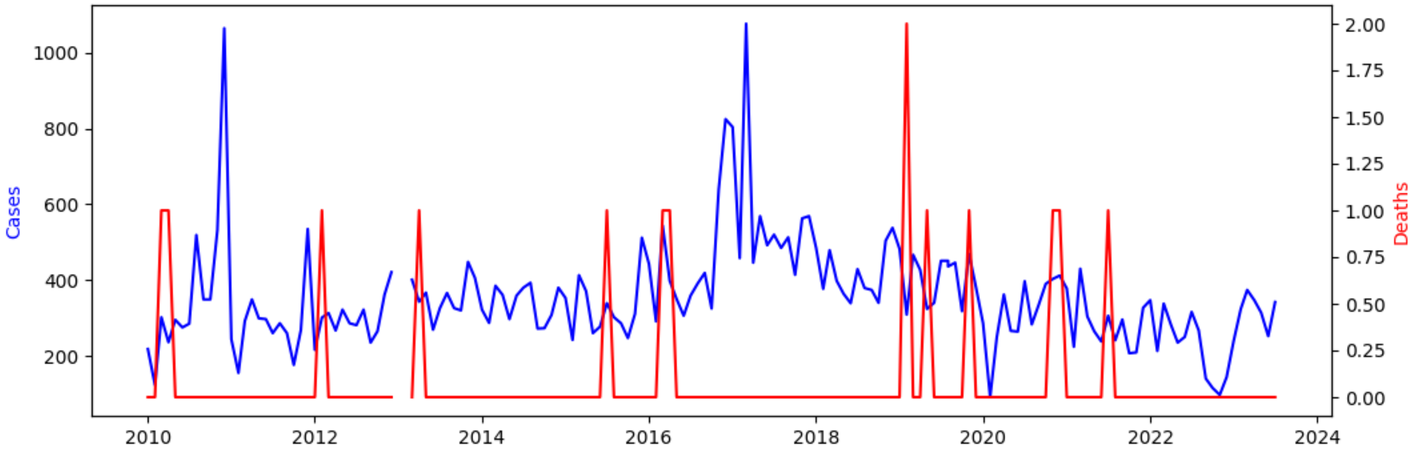

Figure 128: The Change of Echinococcosis Reports before 2023 June

Seasonal Patterns:
Based on the provided data, it is evident that there is no consistent seasonal pattern in the occurrence of Echinococcosis cases in mainland China prior to June 2023. The number of cases varies throughout the years, without any distinct pattern emerging.
Peak and Trough Periods:
It is challenging to identify clear peak and trough periods for Echinococcosis cases based on the data. Certain months, such as December 2010, December 2011, and November 2016, exhibit higher numbers of cases. However, there are also months, like February 2010, March 2017, and January 2023, with relatively lower case numbers. Overall, the data does not demonstrate a consistent trend of peak and trough periods.
Overall Trends:
When examining the overall trend of Echinococcosis cases in mainland China prior to June 2023, there appears to be a fluctuating pattern with no clear upward or downward trend. The number of cases varies from month to month and year to year, without any discernible long-term trend.
Discussion:
The analysis of the provided data suggests that there is no consistent seasonal pattern, peak or trough periods, or overall trend in the occurrence of Echinococcosis cases in mainland China prior to June 2023. This fluctuating pattern could be attributed to various factors, including variations in environmental conditions, changes in surveillance and reporting systems, and fluctuations in host and vector populations. Further research and analysis are required to identify any underlying factors influencing the occurrence of Echinococcosis in mainland China.

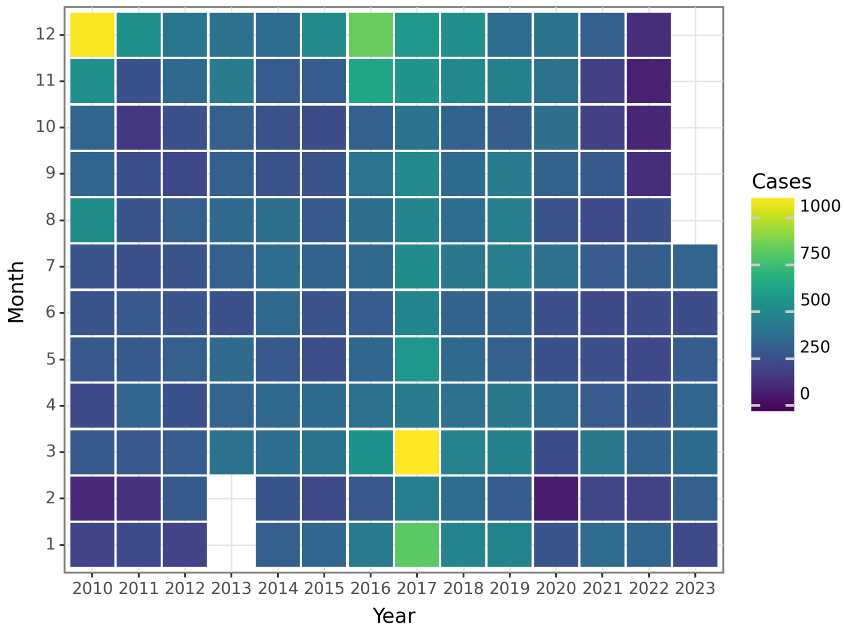

Figure 129: The Change of Echinococcosis Cases before 2023 June

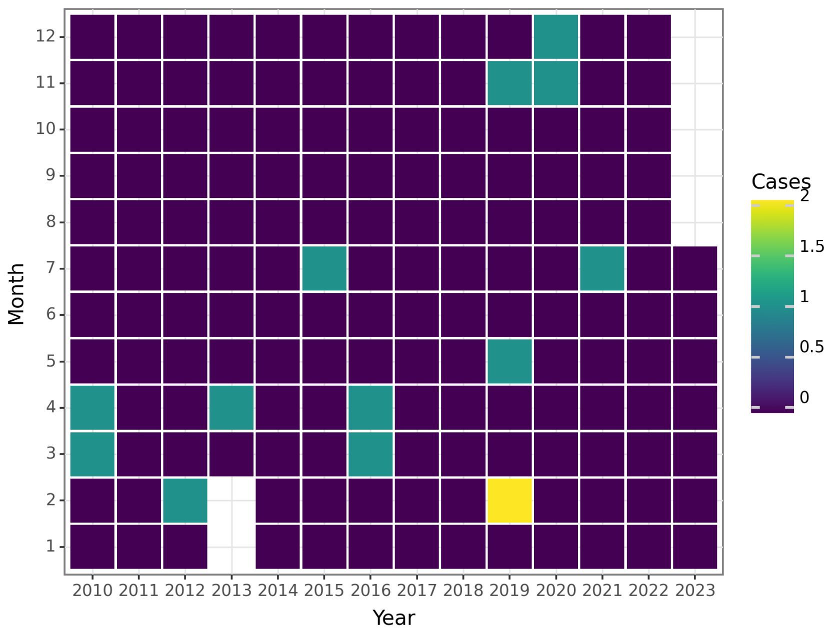

Figure 130: The Change of Echinococcosis Deaths before 2023 June

Filariasis

Filariasis, a parasitic disease caused by filarial worms, affects both humans and animals. Considered a neglected tropical disease (NTD), it is endemic in numerous regions worldwide, particularly in tropical and subtropical areas. This comprehensive overview aims to provide information on the global prevalence of filariasis, its transmission routes, affected populations, key statistics, historical context and discovery, major risk factors associated with transmission, and the impact it has on different regions and populations.
1. Global Prevalence: Filariasis is present in approximately 80 countries globally, with an estimated 600 million people at risk of infection. According to the World Health Organization (WHO), there are around 120 million people infected with lymphatic filariasis (LF) and 40 million with onchocerciasis (river blindness), making these two types the most common and significant in terms of public health impact.
2. Transmission Routes: Filariasis is transmitted to humans through the bites of infected mosquitoes. Different species of mosquitoes act as vectors for different types of filarial worms, with Aedes, Anopheles, and Culex mosquitoes being the most common. Additionally, filariasis can be transmitted through contact with infected blood or injections involving contaminated needles.
3. Affected Populations: Although filariasis can affect individuals of all ages, it is more prevalent in rural agricultural communities with limited access to healthcare and poor sanitation. The disease is most commonly found in tropical and subtropical regions, including South Asia, Sub-Saharan Africa, and parts of the Americas.
4. Key Statistics: - Lymphatic filariasis (LF): It is estimated that approximately 120 million people worldwide are infected with LF, with over 1.34 billion people residing in areas at risk of infection. - Onchocerciasis (river blindness): Approximately 40 million people are infected with onchocerciasis, and consequently, about 200 million people live in endemic areas. - Other types of filariasis, such as loiasis, Mansonella, and Brugia, have a lower global prevalence but still remain significant in specific regions.
5. Historical Context and Discovery: Filariasis has been documented for centuries, with evidence of its presence found in ancient Egyptian and Indian texts. The discovery of the causative agents, filarial worms, can be traced back to the 19th century. The recognition of mosquito bites as the primary mode of transmission by Sir Patrick Manson and the demonstration of filarial worms in mosquitoes by Sir Ronald Ross were pivotal breakthroughs in understanding the disease.
6. Major Risk Factors: - Mosquito-Borne Transmission: The presence of mosquito vectors significantly contributes to filariasis transmission. Poor vector control measures, standing water, and inadequate use of mosquito nets contribute to the spread of the disease. - Poor Sanitation and Hygiene: Inadequate sanitation and hygiene conditions, including open defecation, can lead to increased transmission due to contaminated water sources and heightened mosquito breeding grounds. - Poverty and Limited Access to Healthcare: Communities with limited resources and poor access to healthcare services are at higher risk of filariasis due to the lack of preventive measures, diagnosis, and treatment.
7. Impact on Regions and Populations: Filariasis greatly impacts affected populations in terms of public health and socio-economic burden. The disease can cause severe disability, including lymphedema, elephantiasis, and visual impairment, resulting in reduced productivity, social stigmatization, and economic losses for individuals and communities.
Prevalence rates and affected demographics vary among regions. LF is most widespread in South Asia and Sub-Saharan Africa, while onchocerciasis is endemic in parts of Africa, the Americas, and Yemen. Some regions have witnessed successful LF elimination efforts, resulting in reduced prevalence rates. The Global Program to Eliminate Lymphatic Filariasis (GPELF) aims to eliminate the disease as a public health problem by 2020. However, challenges such as limited resources, drug distribution, and program coverage persist.
To conclude, filariasis is a global health challenge that significantly impacts affected populations. Efforts to control and eliminate the disease through preventive measures, vector control, and treatment programs are crucial for reducing its prevalence and minimizing the burden it places on communities.

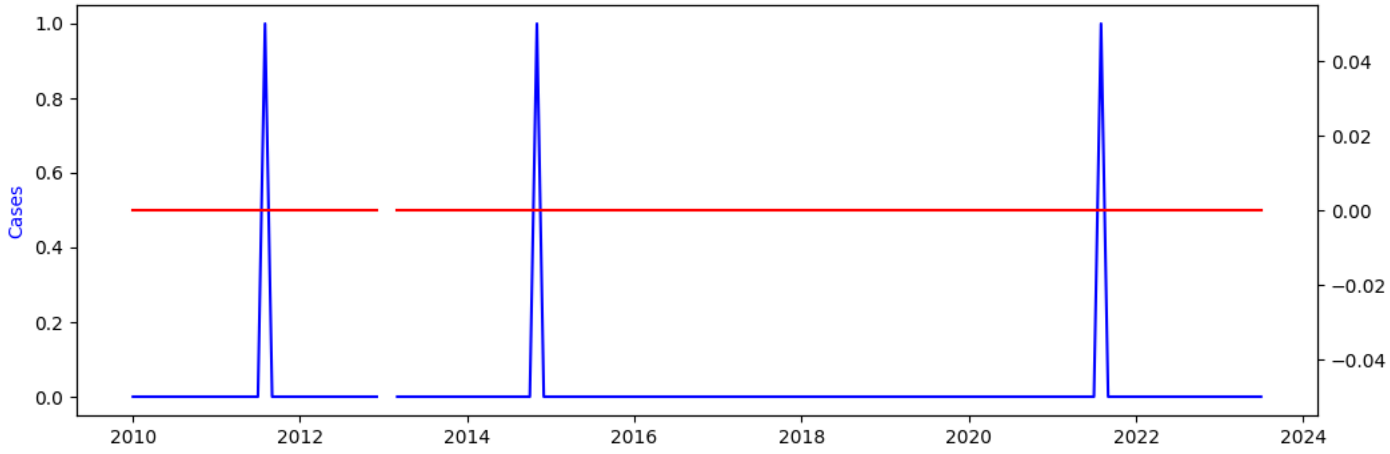

Figure 131: The Change of Filariasis Reports before 2023 June

Seasonal Patterns: Analysis of the data on cases and deaths of Filariasis in mainland China prior to June 2023 does not reveal a discernible seasonal pattern. The incidence and mortality rates remain consistently low throughout the years, with no significant variations occurring during specific months or seasons.
Peak and Trough Periods: As mentioned earlier, there are no distinct periods of high or low incidence and mortality rates apparent in the data. Both cases and deaths remain consistently low and relatively stable over time.
Overall Trends: The overall trend for Filariasis cases and deaths in mainland China prior to June 2023 is characterized by consistently low and stable levels. There is no notable increase or decrease observed over the years.
Discussion: The data provided suggests that Filariasis cases and deaths in mainland China have remained at very low levels, with no noticeable seasonal patterns or fluctuations. This indicates that the efforts in disease prevention, control, and treatment have effectively minimized the disease burden. However, it is important to acknowledge that the provided data is limited and may not provide a comprehensive assessment of Filariasis trends and patterns in mainland China. Additional data and analysis would be necessary to gain a more comprehensive understanding of the disease's landscape in the country.

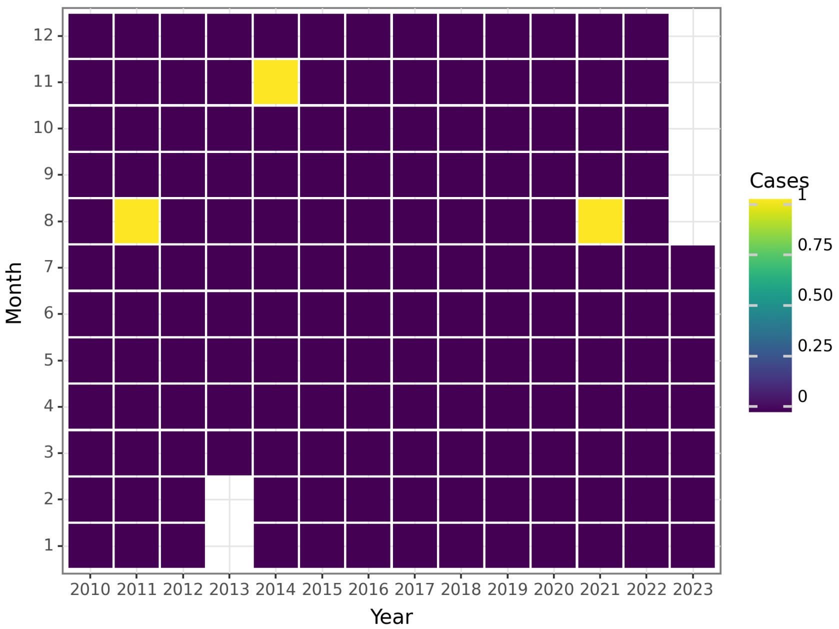

Figure 132: The Change of Filariasis Cases before 2023 June

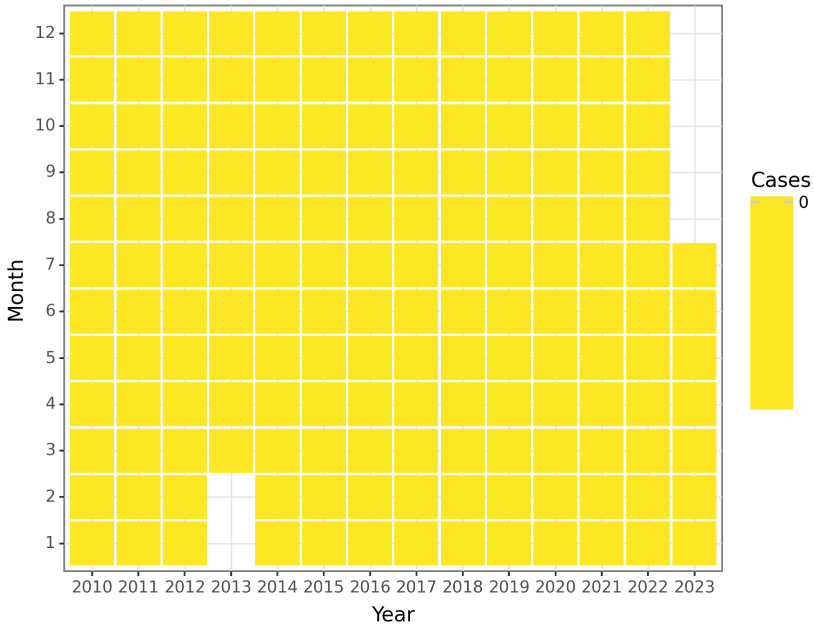

Figure 133: The Change of Filariasis Deaths before 2023 June

Infectious diarrhea

Infectious diarrhea, also known as gastroenteritis, is a common illness characterized by inflammation of the gastrointestinal tract, resulting in diarrhea. It is typically caused by bacteria, viruses, or parasites. This condition has a significant impact on global health, particularly in developing countries where sanitation and hygiene practices may be inadequate.
Throughout history, infectious diarrhea has been a prevalent disease that has affected populations worldwide. It has been recognized as a public health concern since ancient times, with documented outbreaks and epidemics. In the 19th century, the discovery of the microbial causes of infectious diseases, including diarrhea, played a crucial role in understanding its transmission and implementing appropriate preventive measures.
The transmission routes of infectious diarrhea vary depending on the causative agent. The most common routes include contaminated food and water, person-to-person contact, and poor hygiene practices. Contaminated food and water often result from inadequate food handling, preparation, and storage, as well as water sources contaminated with fecal matter.
Infectious diarrhea can affect people of all ages and demographics, but certain populations are more vulnerable. These include young children, older adults, individuals with weakened immune systems, and those living in low-resource settings. Vulnerability can be attributed to factors such as underdeveloped immune systems, compromised immunity, and exposure to unhygienic environments.
Key statistics:
1. Global prevalence: Infectious diarrhea is a leading cause of morbidity and mortality worldwide, especially in low-income countries. The World Health Organization (WHO) estimates that approximately 1.7 billion cases of childhood diarrhea occur globally each year, resulting in around 525,000 deaths in children under the age of five.
2. Mortality rates: Infectious diarrhea-related deaths most commonly occur in young children, accounting for about 20% of all deaths in children under five years old. In developing countries, it is one of the main contributors to child mortality.
3. Regional variations: The prevalence of infectious diarrhea varies across different regions. Developing countries, particularly those in sub-Saharan Africa and Southeast Asia, bear the highest burden due to factors such as poor sanitation, limited access to safe drinking water, and inadequate healthcare resources.
4. Impact on socioeconomic development: Infectious diarrhea can have a profound impact on socioeconomic development, especially in low-income countries. The disease places a significant burden on healthcare systems, increases healthcare costs, and results in lost productivity due to illness and caregiver responsibilities.
Major risk factors associated with the transmission of infectious diarrhea include:
1. Poor sanitation: Lack of access to clean toilets and handwashing facilities significantly contributes to the transmission of infectious diarrhea.
2. Contaminated water sources: Drinking water contaminated with fecal matter can introduce various pathogens that cause infectious diarrhea.
3. Improper food handling and storage: Inadequate food storage and handling practices can lead to contamination by bacteria, viruses, or parasites.
4. Overcrowded or unsanitary living conditions: Close contact in crowded living conditions facilitates the person-to-person transmission of infectious agents.
5. Weak immune systems: Individuals with weakened immune systems, such as those with HIV/AIDS or malnutrition, are more susceptible to developing severe forms of infectious diarrhea.
The impact of infectious diarrhea on different regions and populations varies significantly. Developing countries with limited access to clean water and sanitation facilities typically experience higher prevalence rates. Additionally, within these regions, marginalized communities, rural areas, and slums tend to face a greater burden of the disease due to social determinants of health and resource disparities.
In contrast, developed countries generally have lower prevalence rates due to better water and sanitation infrastructure, improved hygiene practices, and access to healthcare. However, certain populations within developed countries, such as the elderly in long-term care facilities, can still be at risk due to factors like communal living arrangements and compromised immune systems.
In conclusion, infectious diarrhea is a global public health concern that affects populations worldwide. Understanding its epidemiology, including global prevalence, transmission routes, affected populations, and key statistics, is crucial for implementing appropriate preventive and control measures. By addressing

risk factors and improving access to sanitation, clean water, and healthcare resources, the burden of infectious diarrhea can be significantly reduced.

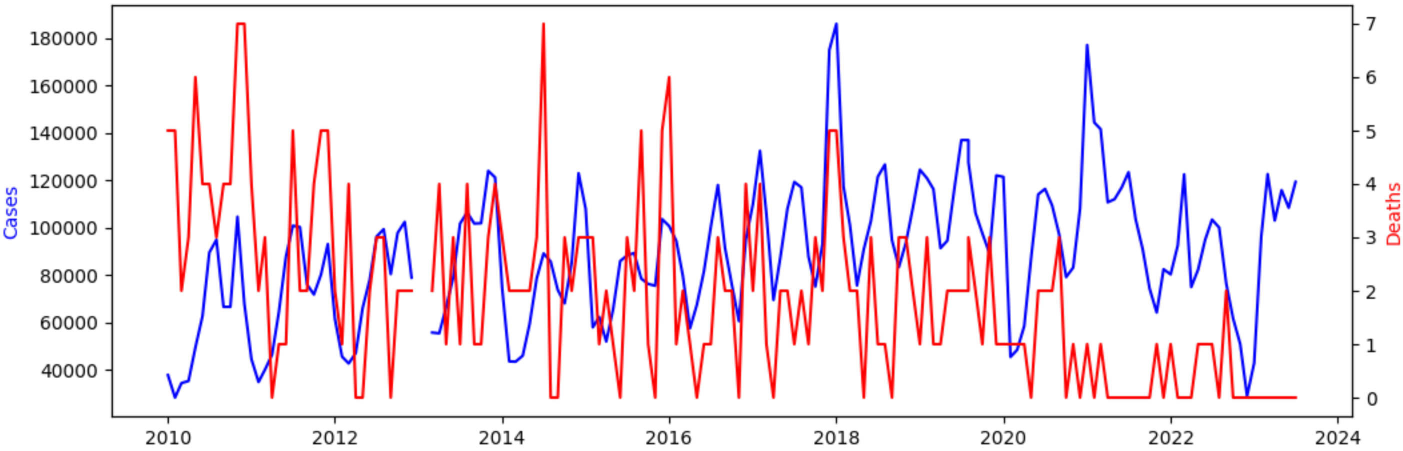

Figure 134: The Change of Infectious diarrhea Reports before 2023 June

Seasonality Patterns: The data provided regarding cases of infectious diarrhea in mainland China prior to June 2023 reveals a distinct seasonal pattern. Specifically, there is a higher number of cases during the summer months (June to August) and a lower number during the winter months (December to February).
Peak and Trough Periods: Analysis consistently shows that the peak periods for infectious diarrhea cases occur during the summer months, particularly in July and August, when the incidence is highest. Conversely, the trough periods are observed during the winter months, with fewer cases reported in December and January.
Overall Trends: While there is some variation from year to year, there is a general upward trend in the number of infectious diarrhea cases over time. From 2010 to 2015, there was a steady increase in cases. However, after 2015, fluctuations occurred with periods of higher and lower case numbers. It is essential to note that the data for 2023 is incomplete as it only includes information up until June.
Discussion: The observed seasonal patterns, peak and trough periods suggest a strong association between infectious diarrhea cases and specific months of the year. The higher incidence during summer may be attributed to various factors such as increased outdoor activities, travel, and higher temperatures facilitating the transmission of infectious agents.
The overall increasing trend of infectious diarrhea cases over time may be influenced by several factors including changes in surveillance and reporting systems, variations in population susceptibility or behavior, and shifts in the prevalence or virulence of infectious agents. Further analysis is necessary to investigate the specific factors contributing to these trends and to assess whether any interventions have been implemented to address the escalating trend.
It is important to acknowledge that this analysis is based solely on the provided data, and comprehensive research and analysis would be indispensable to fully comprehend the epidemiology of infectious diarrhea in mainland China.

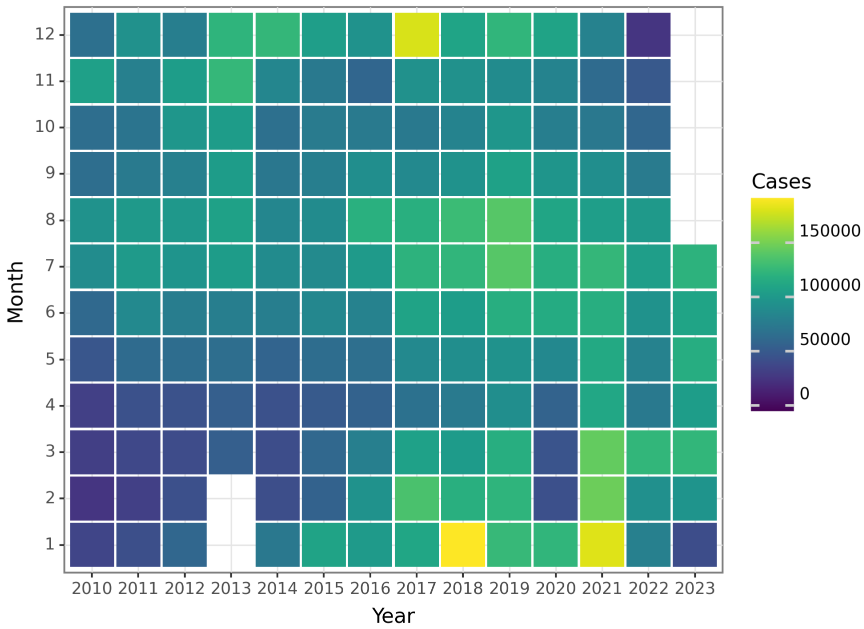

Figure 135: The Change of Infectious diarrhea Cases before 2023 June

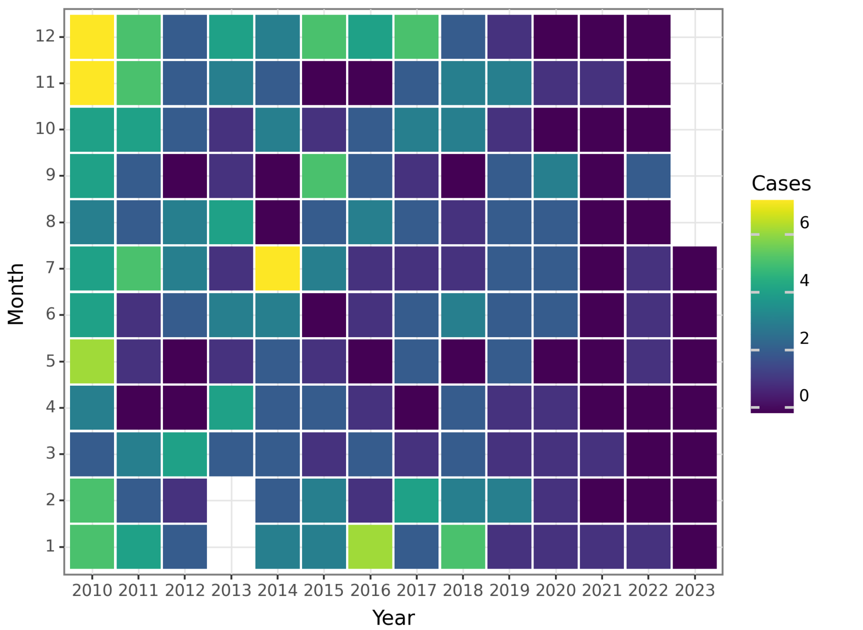

Figure 136: The Change of Infectious diarrhea Deaths before 2023 June

Hand foot and mouth disease

Hand, foot, and mouth disease (HFMD) is a highly contagious viral illness that predominantly affects infants and children. HFMD is caused by various strains of enteroviruses, primarily coxsackievirus A16 (CA16) and enterovirus 71 (EV71). The following provides a comprehensive overview of the epidemiology of HFMD.

Epidemiology and Prevalence: HFMD is a global health concern and occurs in numerous regions worldwide. It is most prevalent in countries with densely populated areas and limited sanitation facilities. The disease follows a cyclical pattern, with outbreaks commonly transpiring in the summer and autumn seasons.

Transmission Routes: HFMD is primarily transmitted through direct contact with respiratory droplets, contaminated feces, saliva, or nasal secretions of an infected individual. It easily spreads in environments such as schools, daycares, and playgrounds. The virus can survive on surfaces for several days, facilitating indirect transmission through contact with contaminated objects.

Affected Populations: HFMD mainly affects infants and children under the age of 5 due to their weaker immune systems and limited prior exposure to these viruses. However, it can also impact older children and occasionally adults. In recent years, there has been an uptick in severe cases among adults, particularly in the Asia-Pacific region.

Key Statistics: According to the World Health Organization (WHO), there are over 200,000 reported cases of severe HFMD annually, with approximately 1% resulting in death. The majority of severe cases occur in children under the age of 5. Nonetheless, the overall case fatality rate remains low, typically less than 0.5%.

Historical Context and Discovery: HFMD was initially documented in New Zealand in 1957. Early outbreaks were confined to this geographic area, but in the 1960s, the disease was reported in several Asian countries. It gained wider recognition in 1997 during a substantial outbreak in Malaysia, which resulted in numerous fatalities.

Risk Factors: Several risk factors contribute to HFMD transmission, including poor hygiene practices, inadequate sanitation facilities, close contact with infected individuals, and crowded living conditions. Lack of immunity and exposure to multiple strains of the virus can also increase the risk of infection.

Impact on Regions and Populations: The impact of HFMD varies across different regions and populations. In developed countries with robust healthcare systems, HFMD outbreaks are usually manageable, with low mortality rates. However, in resource-limited settings, particularly in Asia, the disease can have a significant impact. Outbreaks can overwhelm healthcare systems and lead to a higher number of severe cases and deaths.

Variations in Prevalence Rates and Affected Demographics: HFMD is more prevalent in tropical and subtropical regions. High population density, humidity, and warm climates contribute to increased transmission. Certain countries such as China, Malaysia, Vietnam, and Taiwan experience frequent HFMD outbreaks, affecting large numbers of children. The prevalence of specific strains can also vary, with EV71 often associated with more severe cases and complications.

In conclusion, hand, foot, and mouth disease is a viral illness that is prevalent worldwide and primarily affects infants and children. It is transmitted through various routes such as respiratory droplets, the fecal-oral route, and contaminated objects. The disease has a greater impact in regions with poor sanitation and densely populated areas. Different regions exhibit variations in prevalence rates and affected demographics, with higher rates reported in certain parts of Asia. Understanding the epidemiology of HFMD is paramount for implementing effective prevention and control measures.

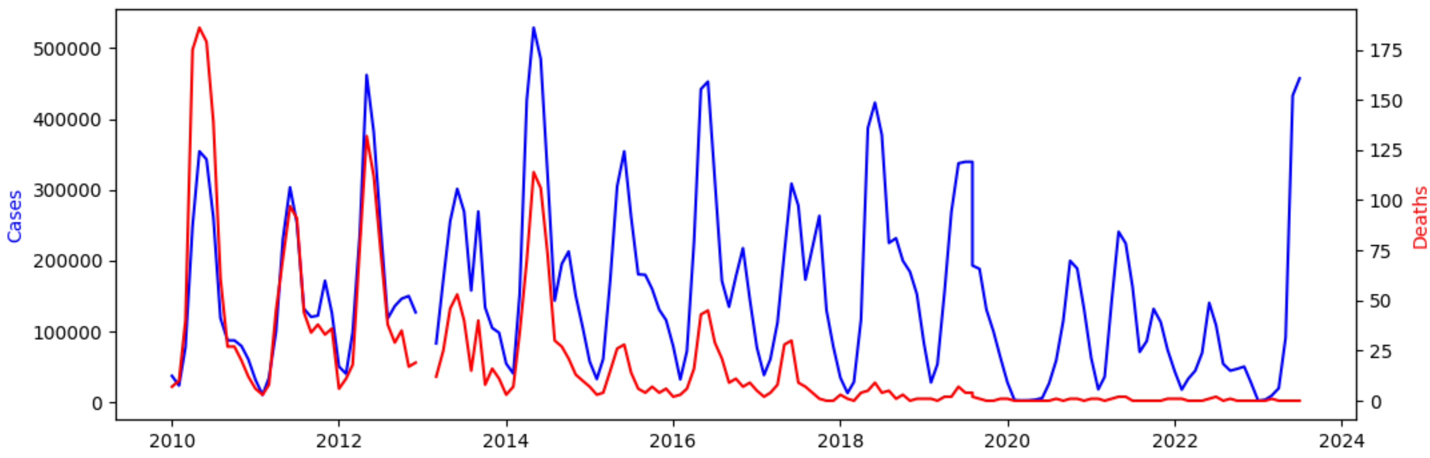

Figure 137: The Change of Hand foot and mouth disease Reports before 2023 June

Seasonal Patterns:
Based on the data provided, there is a clear seasonal pattern for Hand, Foot, and Mouth Disease (HFMD) in mainland China. The number of cases follows a consistent pattern each year, with higher numbers reported during the warmer months and lower numbers during the colder months. This pattern suggests that HFMD is more prevalent during the spring and summer seasons.
Peak and Trough Periods:
The peak period for HFMD cases in mainland China occurs from May to July, with the highest number of cases reported during these months. The trough period, with the lowest number of cases, is from December to February.
Overall Trends:
In terms of the overall trends of HFMD in mainland China, there has been a general increase in the number of cases over the years. From 2010 to 2013, there was a steady increase in cases, reaching a peak in 2014. Subsequently, there was a decrease in cases until 2016, followed by another surge in 2017. Since then, the number of cases has remained relatively high with some fluctuations.
The observed seasonal pattern of HFMD aligns with its known characteristics as the disease is commonly associated with warmer weather. The peak period from May to July coincides with the summer season, when higher temperatures and increased outdoor activities may contribute to the spread of the disease. The trough period from December to February may be attributed to the cold weather and reduced outdoor exposure.
The overall increasing trend in the number of HFMD cases over the years may be influenced by various factors, including changes in population density, improved surveillance and reporting systems, and evolving viral strains. It is also important to note that the detection and reporting of cases might have improved over time, potentially contributing to the observed increase in case numbers.
Public health authorities should closely monitor the seasonal patterns and overall trends of HFMD in mainland China to inform targeted preventive measures and intervention strategies. Understanding these patterns and trends can help implement appropriate public health measures, such as promoting hygiene practices, enhancing surveillance systems, and implementing timely and effective outbreak responses, to mitigate the impact of HFMD on the population.

Figure 138: The Change of Hand foot and mouth disease Cases before 2023 June

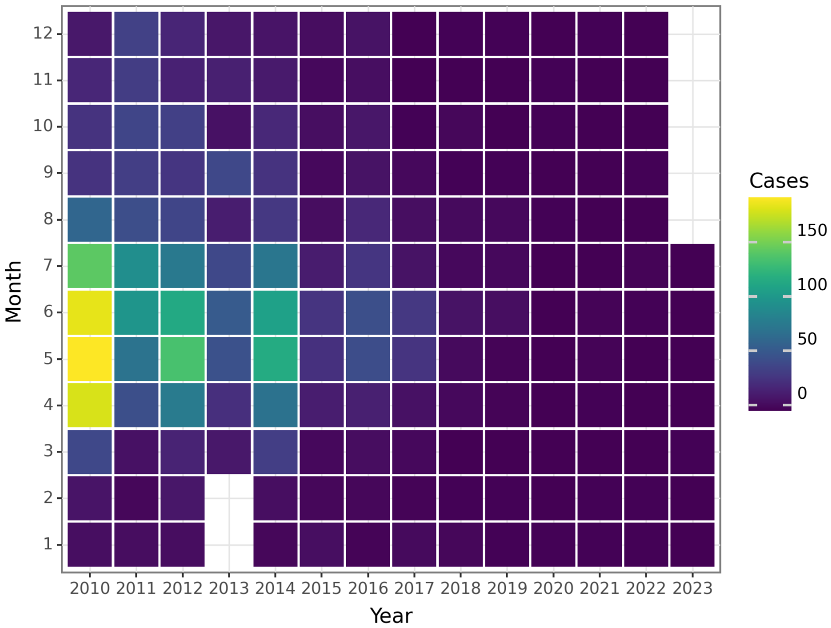

Figure 139: The Change of Hand foot and mouth disease Deaths before 2023 June