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

2023 July

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Monthly Report -- 2023 July

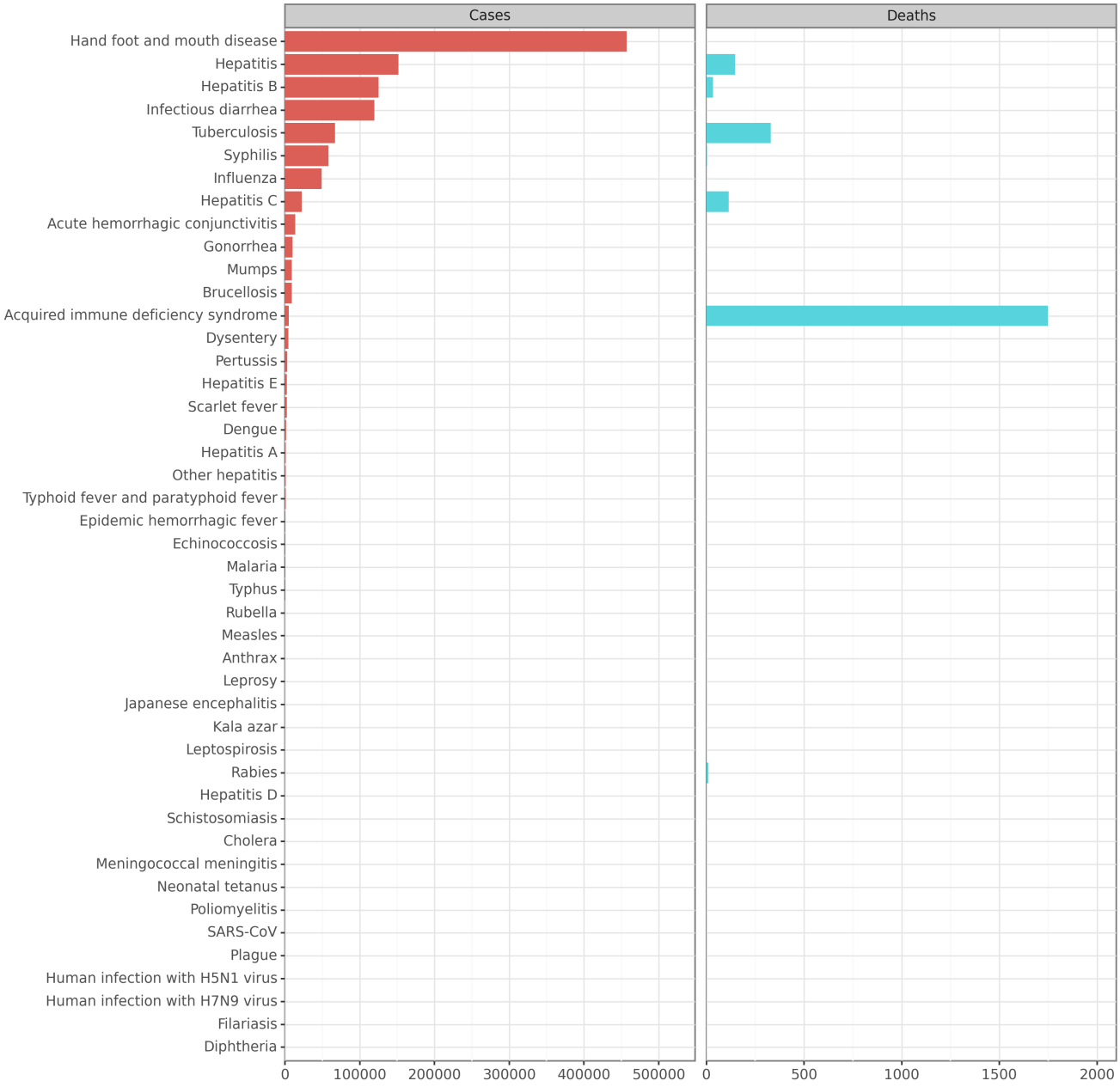

Figure 1: Monthly Notifiable Infectious Diseases Reports in 2023 July

The analysis of epidemiological data on disease cases and deaths in mainland China for July 2023 reveals several significant patterns and trends.

1. Increase in Acute Hemorrhagic Conjunctivitis: The number of acute hemorrhagic conjunctivitis cases has significantly increased in July 2023 compared to both June 2023 and July 2022. The number of cases in July is 169.31% higher than in June 2023 and 410.65% higher than in July 2022.
2. Increase in Infectious Diarrhea: The cases of infectious diarrhea have also shown an increase in July 2023 compared to both June 2023 and July 2022. The number of cases in July is 10.08% higher than in June 2023 and 15.37% higher than in July 2022.

3. Decrease in Influenza Cases: In contrast to the aforementioned diseases, the number of influenza cases has decreased significantly in July 2023 compared to both June 2023 and July 2022. The number of cases in July is 25.18% lower than in June 2023 and 92.47% lower than in July 2022.
4. Increase in Hepatitis Cases: Various types of hepatitis, including Hepatitis A, B, C, D, and E, have shown an increase in the number of cases in July 2023 compared to both June 2023 and July 2022. The percentage increase varies for each type, with Hepatitis B showing a 13.68% increase, Hepatitis C showing a 13.54% increase, and Hepatitis E showing a 3.60% increase.
5. Increase in Syphilis Cases: The number of syphilis cases has increased in July 2023 compared to both June 2023 and July 2022. The number of cases in July is 12.00% higher than in June 2023 and 13.34% higher than in July 2022.
6. Increase in Tuberculosis Cases: Tuberculosis cases have shown a slight increase in July 2023 compared to June 2023, but a decrease compared to July 2022. The number of cases in July is 3.40% higher than in June 2023 but 6.21% lower than in July 2022.
7. Increase in Acquired Immune Deficiency Syndrome (AIDS) Cases: The number of AIDS cases has increased in July 2023 compared to June 2023 and July 2022. The number of cases in July is 15.71% higher than in June 2023 and 4.01% higher than in July 2022.
Overall, the data suggests an increase in certain infectious diseases, such as acute hemorrhagic conjunctivitis, infectious diarrhea, hepatitis, syphilis, tuberculosis, and AIDS in mainland China in July 2023. However, it is important to note that a comprehensive analysis requires further investigation into the underlying causes and risk factors contributing to these trends. Additionally, comparing the data with previous years provides insights into the long-term patterns of these diseases.

Table 1: Monthly Notifiable Infectious Diseases Cases in 2023 July

Diseases	Cases	Comparison with 2023 June	Comparison with 2022 July
Plague	0	0 (/)	-1 (-100.00%)
Cholera	4	1 (33.33%)	-6 (-60.00%)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	4,854	-905 (-15.71%)	187 (4.01%)
Hepatitis	151,809	17,921 (13.39%)	13,360 (9.65%)
Hepatitis A	1,053	109 (11.55%)	-16 (-1.50%)
Hepatitis B	125,116	15,053 (13.68%)	12,468 (11.07%)
Hepatitis C	22,326	2,662 (13.54%)	459 (2.10%)
Hepatitis D	14	-9 (-39.13%)	-2 (-12.50%)
Hepatitis E	2,620	91 (3.60%)	395 (17.75%)
Other hepatitis	680	15 (2.26%)	56 (8.97%)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	97	8 (8.99%)	5 (5.43%)
Epidemic hemorrhagic fever	344	-21 (-5.75%)	-60 (-14.85%)
Rabies	9	-2 (-18.18%)	-8 (-47.06%)
Japanese encephalitis	33	30 (1000.00%)	20 (153.85%)
Dengue	1,604	1,549 (2816.36%)	1,601 (53366.67%)
Anthrax	51	20 (64.52%)	-13 (-20.31%)

Dysentery	4,684	331 (7.60%)	-371 (-7.34%)
Tuberculosis	66,989	2,201 (3.40%)	-4,433 (-6.21%)
Typhoid fever and paratyphoid fever	657	30 (4.78%)	-84 (-11.34%)
Meningococcal meningitis	3	-6 (-66.67%)	-2 (-40.00%)
Pertussis	2,767	1,255 (83.00%)	-1,467 (-34.65%)
Diphtheria	0	-1 (-100.00%)	-1 (-100.00%)
Neonatal tetanus	2	1 (100.00%)	0 (0.00%)
Scarlet fever	2,237	-447 (-16.65%)	479 (27.25%)
Brucellosis	9,164	838 (10.06%)	-519 (-5.36%)
Gonorrhea	10,104	1,241 (14.00%)	841 (9.08%)
Syphilis	58,247	6,240 (12.00%)	6,856 (13.34%)
Leptospirosis	25	16 (177.78%)	1 (4.17%)
Schistosomiasis	5	-2 (-28.57%)	-1 (-16.67%)
Malaria	289	25 (9.47%)	210 (265.82%)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	48,848	-16,441 (-25.18%)	-599,617 (-92.47%)
Mumps	9,280	-1,430 (-13.35%)	-111 (-1.18%)
Rubella	99	-11 (-10.00%)	-7 (-6.60%)
Acute hemorrhagic conjunctivitis	13,425	8,440 (169.31%)	10,796 (410.65%)
Leprosy	36	12 (50.00%)	1 (2.86%)
Typhus	169	38 (29.01%)	-10 (-5.59%)
Kala azar	30	5 (20.00%)	1 (3.45%)
Echinococcosis	342	90 (35.71%)	26 (8.23%)
Filariasis	0	0 (/)	0 (/)
Infectious diarrhea	119,375	10,933 (10.08%)	15,907 (15.37%)
Hand foot and mouth disease	457,212	24,128 (5.57%)	348,239 (319.56%)
Total	962,794	56,087 (6.19%)	-212,100 (-18.05%)

Table 2: Monthly Notifiable Infectious Diseases Deaths in 2023 July

Diseases	Deaths	Comparison with 2023 June	Comparison with 2022 July
Plague	0	0 (/)	0 (/)
Cholera	0	0 (/)	0 (/)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	1,749	-43 (-2.40%)	187 (11.97%)
Hepatitis	148	-58 (-28.16%)	105 (244.19%)
Hepatitis A	0	0 (/)	0 (/)
Hepatitis B	34	14 (70.00%)	11 (47.83%)

Hepatitis C	114	-72 (-38.71%)	96 (533.33%)
Hepatitis D	0	0 (/)	0 (/)
Hepatitis E	0	0 (/)	-1 (-100.00%)
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	1	-1 (-50.00%)	-2 (-66.67%)
Rabies	11	2 (22.22%)	-1 (-8.33%)
Japanese encephalitis	0	0 (/)	-1 (-100.00%)
Dengue	0	0 (/)	0 (/)
Anthrax	1	1 (/)	1 (/)
Dysentery	0	0 (/)	0 (/)
Tuberculosis	330	6 (1.85%)	-37 (-10.08%)
Typhoid fever and paratyphoid fever	0	0 (/)	0 (/)
Meningococcal meningitis	0	0 (/)	0 (/)
Pertussis	0	0 (/)	0 (/)
Diphtheria	0	0 (/)	0 (/)
Neonatal tetanus	0	0 (/)	0 (/)
Scarlet fever	0	0 (/)	0 (/)
Brucellosis	1	1 (/)	1 (/)
Gonorrhea	0	0 (/)	-1 (-100.00%)
Syphilis	2	1 (100.00%)	-4 (-66.67%)
Leptospirosis	0	0 (/)	0 (/)
Schistosomiasis	0	0 (/)	0 (/)
Malaria	1	-1 (-50.00%)	0 (0.00%)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	0	-1 (-100.00%)	-4 (-100.00%)
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 (/)	-2 (-100.00%)

Total	2,244	-93 (-3.98%)	241 (12.03%)

History Data Analysis2023 July

Total

The numbers of cases and cause-specific deaths refer to data recorded in National Notifiable Disease Reporting System in China, which includes both clinically-diagnosed cases and laboratory-confirmed cases. Only reported cases of the 31 provincial-level administrative divisions in Chinese mainland are included in the table, whereas data of Hong Kong Special Administrative Region, Macau Special Administrative Region, and Taiwan, China are not included. Monthly statistics are calculated without annual verification which is usually conducted in February of the next year for de-duplication and verification of reported cases in annual statistics. Therefore, 12-month cases could not be added together directly to calculate the cumulative cases because the individual information might be verified via National Notifiable Disease Reporting System according to information verification or field investigations by local CDCs.

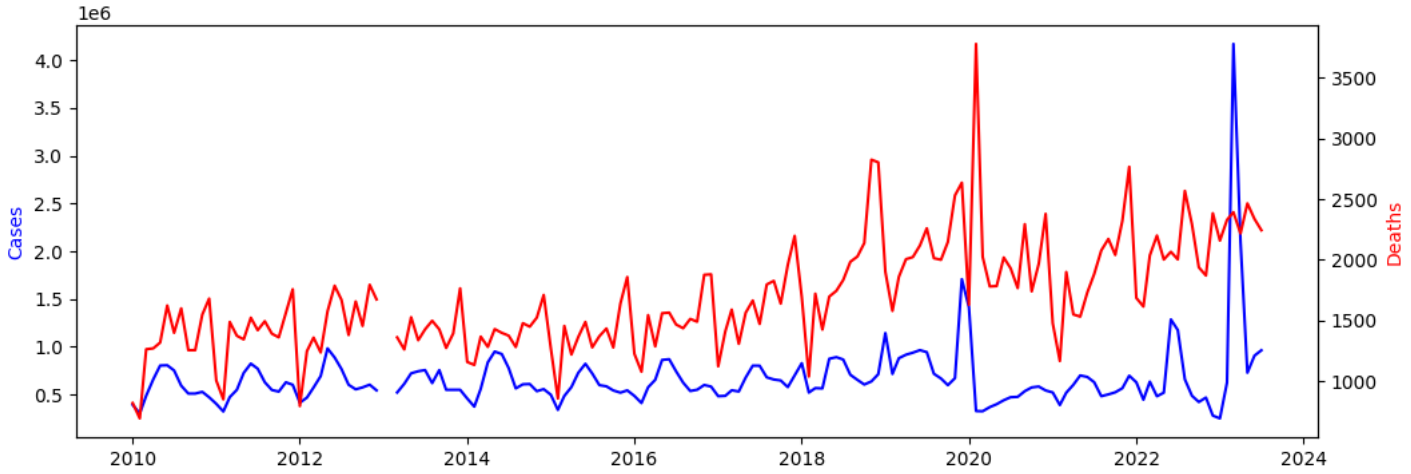

Figure 2: The Change of Total Reports before 2023 July

Seasonal Patterns: Examining the data before July 2023, certain seasonal patterns in case numbers can be observed. Typically, there is a peak in cases during the winter months (December to February) and a decline during the summer months (June to August). This indicates a seasonal pattern in mainland China, with increased disease transmission during colder months and decreased transmission during warmer months.
Peak and Trough Periods: Based on the data, the peak periods for cases occur consistently during the winter months, particularly in December and January. These months consistently exhibit higher case numbers compared to other months. Conversely, trough periods, characterized by relatively lower case numbers, occur consistently during the summer months, particularly from June to August.
Overall Trends: Over the years leading up to July 2023, there is an overall increasing trend in case numbers in mainland China. From 2010 to 2019, there is a relatively gradual rise in cases, with some year-to-year variations. However, starting in 2020, there is a significant increase in cases, potentially due to the impact of the COVID-19 pandemic. The highest number of cases is observed in March 2023, with a steep rise evident from 2021 onward.
Discussion: The observed seasonal patterns suggest that disease transmission in mainland China follows a seasonal trend, with higher transmission during the winter and lower transmission during the summer. This pattern is consistent with that seen in numerous respiratory diseases, including viral pandemics like COVID-19.
The peak and trough periods reveal the times when transmission is highest and lowest. Peak periods during the winter months indicate heightened vulnerability and increased risk of transmission, while trough

periods during the summer months suggest reduced transmission and lower risk.
However, it is important to note that the overall increase in case numbers before July 2023, particularly from 2020 onward, may be influenced by factors beyond seasonal fluctuations. The impact of the COVID-19 pandemic, in particular, may significantly contribute to the observed upward trend.
These findings underscore the significance of comprehending seasonal patterns and overall trends in disease transmission for effective public health planning and control measures. By identifying peak periods and anticipating seasonal variations, public health interventions can be tailored to mitigate the impact of the disease.

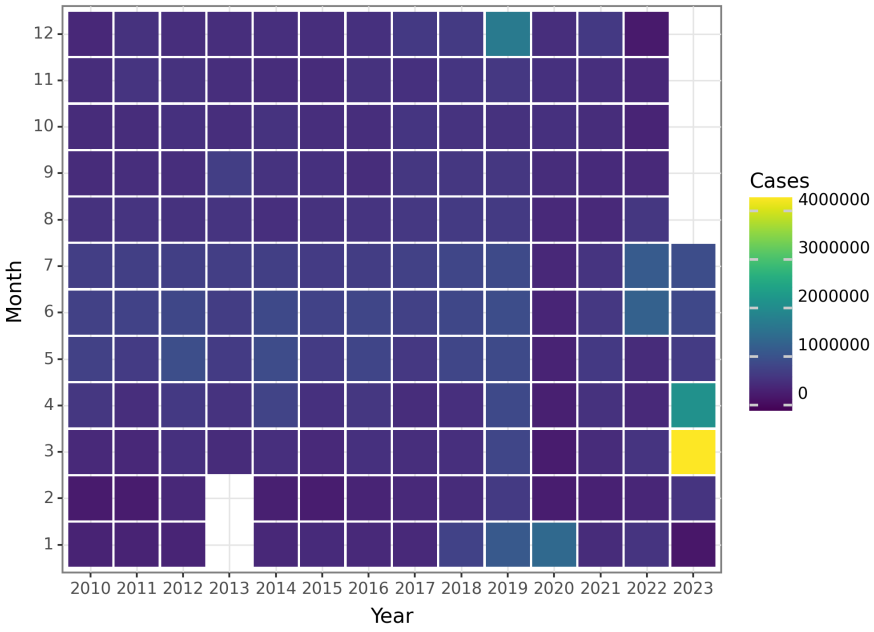

Figure 3: The Change of Total Cases before 2023 July

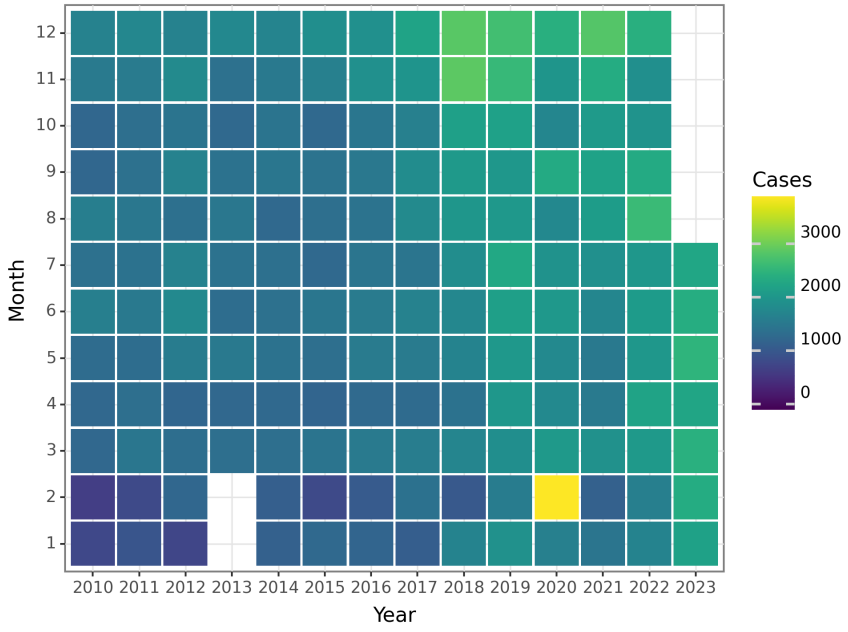

Figure 4: The Change of Total Deaths before 2023 July

Plague

Plague, also known as the Black Death, is a highly infectious disease caused by the bacteria Yersinia pestis. It has a long history and has caused devastating pandemics worldwide. This comprehensive overview examines the epidemiology of Plague, including its global prevalence, transmission routes, affected populations, key statistics, historical context, and discovery.
1. Global Prevalence: Plague is naturally found on all continents except Antarctica, but it is most commonly associated with Africa, Asia, and South America. The prevalence of Plague varies over time and across regions. While localized outbreaks are frequent, the global burden of Plague has decreased significantly over the centuries due to improved healthcare systems and public health measures.
2. Transmission Routes: The primary mode of Plague transmission is zoonotic, meaning it primarily affects animals and can be transmitted to humans. It mainly spreads through the bites of infected fleas that reside on small mammals like rats, squirrels, and prairie dogs. Plague can also be transmitted through direct contact with infected animals' bodily fluids or tissues, or by inhaling respiratory droplets from individuals with pneumonic Plague.
3. Affected Populations: Plague can affect people of all ages and genders. Historically, it was associated with poverty, crowded living conditions, and poor sanitation, as these factors increase the chance of coming into contact with infected fleas or animals. Occupations involving close contact with animals, such as farmers, hunters, and veterinarians, traditionally have higher exposure rates.
4. Key Statistics: - According to the World Health Organization (WHO), an average of 1,000 to 2,000 cases of Plague have been reported worldwide in recent years. - Plague has three forms: bubonic, septicemic, and pneumonic. Bubonic Plague is the most common, accounting for around 80-95% of cases. - Mortality rates vary based on the form. Bubonic Plague has a mortality rate of about 30-60% if left untreated, while septicemic and pneumonic Plague are more severe, with mortality rates of 100% if not treated promptly. - Madagascar reports the highest number of Plague cases annually, with periodic outbreaks between September and April. Other countries reporting Plague cases include Peru, the Democratic Republic of Congo, and Madagascar.
5. Historical Context and Discovery: Plague has a documented history dating back thousands of years, with the first recorded pandemic occurring during the Byzantine Empire in the 6th century AD. The most infamous pandemic, the Black Death, ravaged Europe in the 14th century, killing an estimated 75-200 million people and causing profound societal, economic, and cultural impacts. The discovery of Plague's causative agent, Yersinia pestis, is credited to Alexandre Yersin, a Swiss-French physician, in 1894. His groundbreaking work paved the way for understanding the disease and developing effective treatments and preventive measures.
6. Major Risk Factors: - Close contact with rodents or their fleas. - Poor sanitation and hygiene conditions. - Living or working in areas with high Plague prevalence. - Traveling to Plague-affected regions. - Participating in activities involving close contact with infected animals or fleas.
7. Impact on Different Regions and Populations: Regions and populations with limited access to healthcare resources, poor sanitation, and high exposure to rodents or fleas are most susceptible to Plague outbreaks. Additionally, factors such as climate change, urbanization, and natural disasters can contribute to the spread and impact of Plague. Populations living in poverty and overcrowded conditions remain at greater risk worldwide.
In conclusion, Plague continues to pose a threat to certain regions and populations, although its global prevalence has significantly decreased over time. Understanding the epidemiology of Plague, including its transmission routes, affected populations, and risk factors, is crucial for implementing effective prevention and control measures to mitigate its impact.

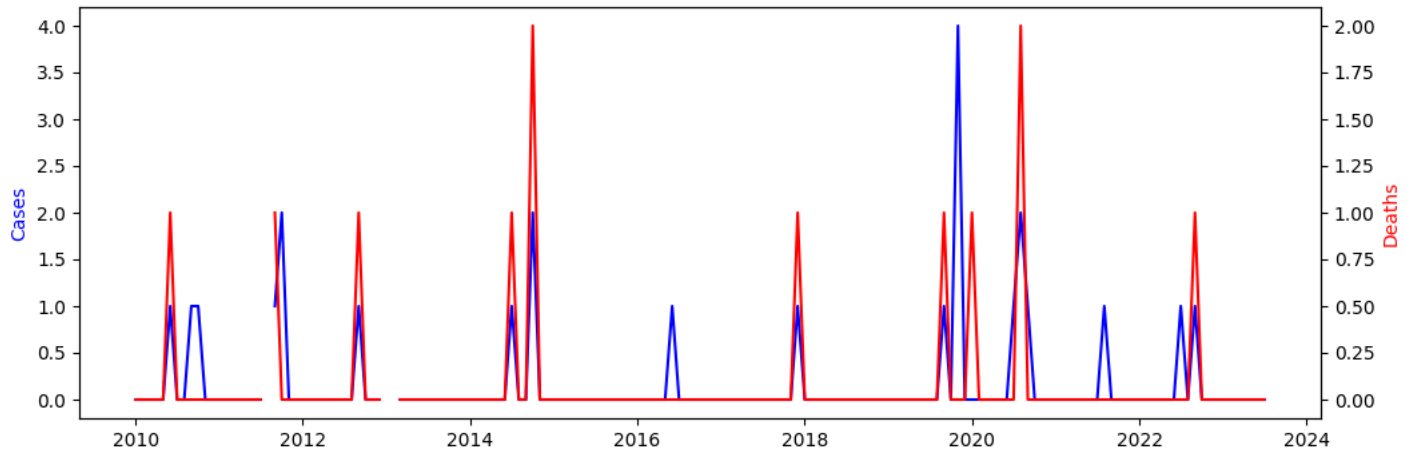

Figure 5: The Change of Plague Reports before 2023 July

Seasonal Patterns: Based on the data provided, no clear seasonal pattern is observed for the cases and deaths of the Plague in mainland China. The number of cases and deaths fluctuates throughout the years without exhibiting any consistent pattern.
Peak and Trough Periods: The data does not show distinct peak and trough periods for both cases and deaths of the Plague in mainland China. The number of cases and deaths varies from month to month without consistent periods of increase or decrease.
Overall Trends: Over the years, the prevalence of cases and deaths related to the Plague in mainland China remains relatively low and sporadic. Most months have either zero or very few reported cases and deaths, suggesting a low disease burden in this region.
Discussion: The provided data does not demonstrate any significant seasonal patterns, peak and trough periods, or consistent overall trends for the cases and deaths of the Plague in mainland China. It is important to acknowledge that the data provided may not be comprehensive and might not accurately capture all cases and deaths related to the Plague in mainland China.
Further analysis and additional data are necessary to gain a better understanding of the dynamics and patterns of the Plague in mainland China. Continued monitoring of the situation and surveillance efforts are crucial to effectively control and prevent the spread of the disease in the region.

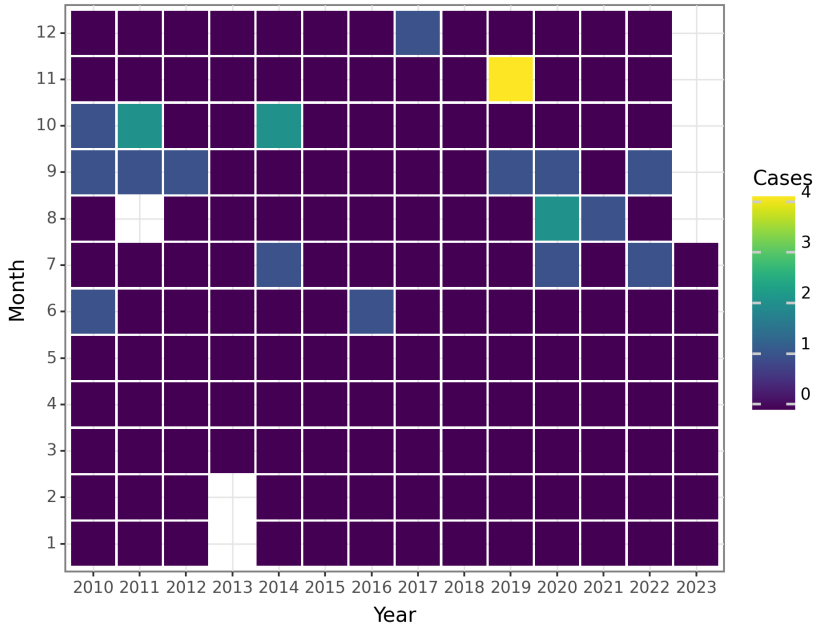

Figure 6: The Change of Plague Cases before 2023 July

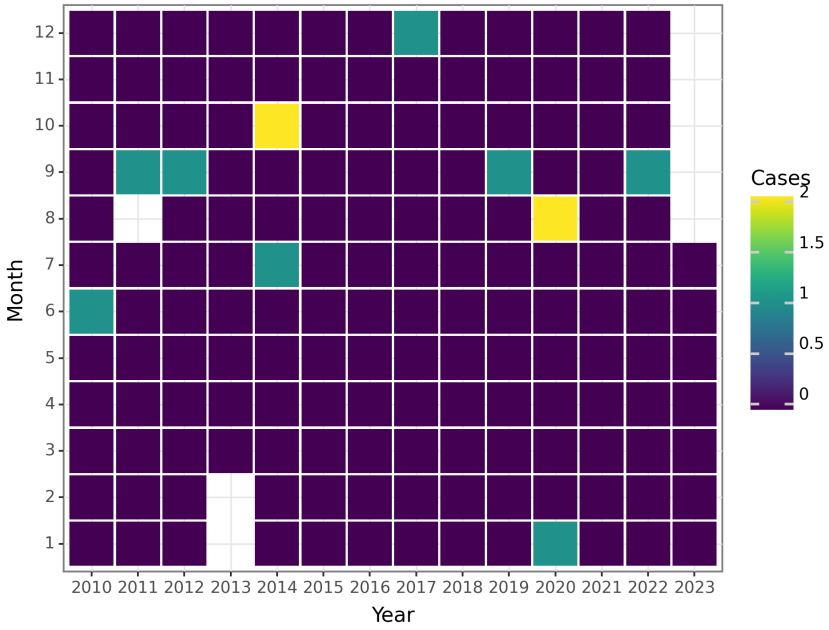

Figure 7: The Change of Plague Deaths before 2023 July

Cholera

Cholera is an acute diarrheal disease caused by the bacterium Vibrio cholerae, and it has been a longstanding public health concern worldwide, particularly in regions with poor sanitation and limited access to clean water. The epidemiology of cholera is characterized by periodic outbreaks and endemicity in specific regions.

Historically, cholera has been documented as a disease dating back to ancient times. However, it was not until the 19th century that the connection between contaminated water and cholera transmission was discovered. In 1854, John Snow, an English physician, identified a specific well as the source of a cholera outbreak in London, providing strong evidence for the waterborne transmission of the disease.

Currently, cholera is endemic in many parts of the world, with periodic outbreaks occurring. According to the World Health Organization (WHO), an estimated 1.3 to 4.0 million cholera cases and 21,000 to 143,000 deaths occur globally each year. However, these numbers are likely underestimated due to underreporting and limited surveillance in some countries.

The primary mode of transmission for cholera is through the ingestion of water or food contaminated with the feces of an infected individual. The bacterium Vibrio cholerae is commonly found in water sources contaminated with human feces, and it can survive in aquatic environments. Consuming uncooked or undercooked seafood from contaminated waters can also transmit the disease. Person-to-person transmission is rare but can occur in densely populated areas with poor sanitation.

Cholera affects individuals of all ages and genders, but certain populations are more vulnerable. This includes individuals living in poverty with limited access to clean water and sanitation facilities. Refugee camps, slums, and overcrowded areas with poor hygiene practices are particularly at high risk. Additionally, individuals with compromised immune systems, such as malnourished individuals or those with other underlying medical conditions, may be more susceptible to severe cholera infections.

Several risk factors contribute to the transmission of cholera. Poor sanitation, lack of clean water, and inadequate sanitation facilities are significant risk factors. Improper handwashing and hygiene practices also contribute to disease transmission. Climate-related factors, such as heavy rainfall and flooding, can exacerbate the spread of cholera by contaminating water sources. Furthermore, population displacement, poor healthcare infrastructure, and limited access to quality healthcare services can hinder prevention and control measures.

Cholera has a greater impact on regions with limited resources and infrastructure to control the disease. Sub-Saharan Africa, parts of Asia (including Bangladesh and India), and Haiti in the Americas have experienced significant cholera outbreaks in recent years. Additionally, during humanitarian crises, such as natural disasters or armed conflicts, the risk of cholera outbreaks increases due to disrupted water and sanitation systems.

The prevalence rates of cholera can vary across regions and populations. In high-risk areas, cholera can become endemic, with frequent outbreaks and ongoing transmission. For example, in parts of sub-Saharan Africa and Asia, cholera is endemic and occurs seasonally. These regions also face higher rates of severe cholera infections and associated mortality.

Demographically, cholera affects all age groups, but children under five years old are particularly vulnerable. This vulnerability is partly due to their weaker immune systems and increased susceptibility to complications related to dehydration. During outbreaks, cholera disproportionately affects marginalized and vulnerable populations, including those living in poverty and in areas with limited access to healthcare.

In conclusion, cholera remains a significant public health concern globally, with periodic outbreaks and endemicity in specific regions. Poor sanitation, inadequate access to clean water, and limited healthcare infrastructure are major risk factors associated with cholera transmission. The impact of cholera varies across different regions and populations, with higher prevalence rates and severe outcomes observed in areas with limited resources and infrastructure to control the disease. Efforts to improve sanitation, access to clean water, and promote hygiene practices are crucial for preventing and controlling cholera.

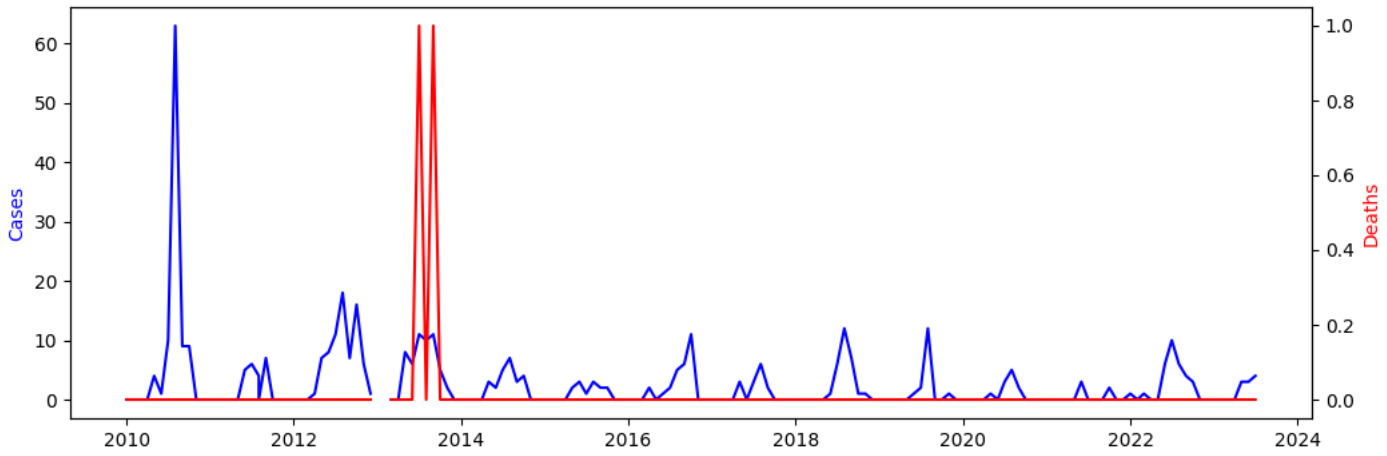

Figure 8: The Change of Cholera Reports before 2023 July

Seasonal Patterns: The data clearly reveals a seasonal pattern in the monthly incidence of cholera cases in mainland China. The highest number of cases occurs during the summer months, specifically in July and August. This is evident from the peak in cases observed during these months in multiple years, including 2010, 2012, 2015, and 2019. Subsequently, the number of cases gradually decreases in the following months, reaching its lowest point in the winter months, such as December and January.
Peak and Trough Periods: The peak period for cholera cases in mainland China is during July and August, when the number of cases is noticeably higher. Conversely, the trough period, characterized by the lowest incidence of cases, takes place during the winter months, particularly in December and January. These months consistently exhibit the lowest number of reported cholera cases.
Overall Trends: When examining the overall trends of cholera cases in mainland China, no consistent increase or decrease in the number of cases is observed over the years. While certain years, such as 2010 and 2012, experienced higher numbers of cases during the peak period, others, like 2013 and 2017, had lower numbers. In general, there is variability in the incidence of cases from year to year, but no clear upward or downward trend can be discerned.
Discussion: The seasonal pattern of cholera cases in mainland China indicates a heightened risk of cholera transmission during the summer months, specifically in July and August. This could be attributed to factors such as increased travel, higher temperatures, and changes in water quality that facilitate the growth and dissemination of the cholera bacteria. Public health authorities must be cognizant of this seasonal pattern and implement appropriate measures to prevent and control cholera outbreaks during the peak period. These measures may include improved sanitation and hygiene practices, enhanced surveillance, and targeted interventions in high-risk areas. Moreover, ensuring access to clean drinking water and proper sanitation facilities throughout the year is crucial for minimizing the risk of cholera transmission.

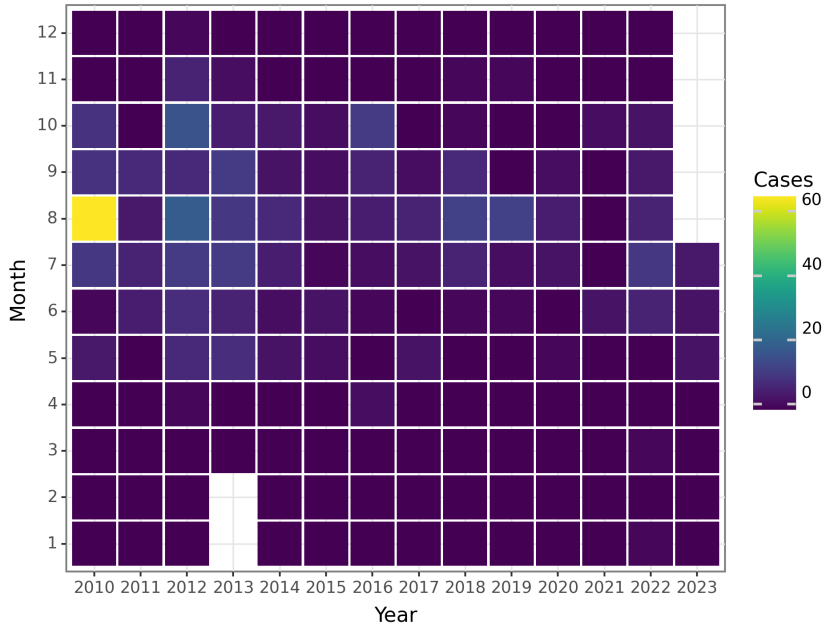

Figure 9: The Change of Cholera Cases before 2023 July

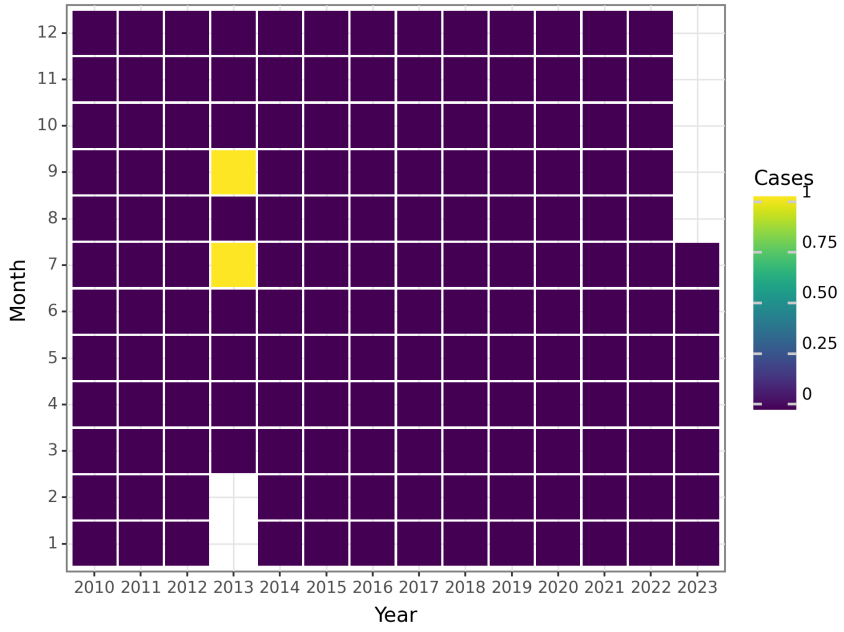

Figure 10: The Change of Cholera Deaths before 2023 July

SARS-CoV

SARS-CoV, or severe acute respiratory syndrome coronavirus, is the causative agent of the respiratory illness known as SARS. Initially identified in November 2002 within Guangdong Province, China, the virus rapidly disseminated to other regions, precipitating a global outbreak in 2003.
Routes of Transmission: The primary mode of transmission for SARS-CoV is respiratory droplets emitted through coughing or sneezing by infected individuals. Transmission can also occur through close personal contact or contact with contaminated objects or surfaces. In rare instances, airborne transmission has been observed in healthcare settings during aerosol-generating procedures.
Affected Populations: The 2003 outbreak of SARS-CoV impacted individuals of all age groups and genders. Older adults, particularly those above 65 years old, exhibited a heightened vulnerability to severe illness and mortality rates. Healthcare workers, specifically those involved in the care of SARS patients, were disproportionately affected due to their close contact with infected individuals.
Key Statistics: Throughout the 2003 outbreak, a total of 8,098 documented cases of SARS were reported worldwide, resulting in 774 fatalities. The overall case fatality rate approximated 9.6%. Mainland China, Hong Kong, and Taiwan were the most heavily burdened regions, with the majority of cases occurring within healthcare settings.
Historical Context and Discovery: The first registered case of SARS-CoV emerged in Foshan, Guangdong Province, China, in November 2002. However, the outbreak attained widespread attention in February 2003 when a doctor from Guangzhou visited Hong Kong, transmitting the virus to numerous hotel guests and indirectly sparking secondary infections. This incident facilitated the identification and isolation of the virus, subsequently designated as SARS-CoV.
Risk Factors: Multiple risk factors have been associated with SARS-CoV transmission, including close contact with infected individuals, particularly within crowded settings like hospitals and communities. Additional factors encompass inadequate infection control measures, deficient hand hygiene, and exposure to respiratory secretions from individuals infected with the virus.
Impact on Different Regions and Populations: The impact of SARS-CoV exhibited regional and demographic variability. Mainland China, Hong Kong, and Taiwan encountered the highest number of cases during the outbreak. Within Hong Kong, the virus rapidly disseminated within the community and healthcare settings, leading to a substantial number of cases and deaths. Other countries, including Canada, Singapore, and Vietnam, reported outbreaks predominantly linked to travel-related instances.
Prevalence Rates and Affected Demographics: Prevalence rates of SARS-CoV exhibited regional divergence, with higher rates observed in areas where the outbreak was less controlled, such as healthcare facilities. Demographic profiles of affected populations showcased diversity; however, older adults and healthcare workers remained at an elevated risk of infection and severe illness.
In conclusion, SARS-CoV is a respiratory virus that initiated a global outbreak in 2003. Transmission occurs primarily through respiratory droplets and close personal contact. Older adults and healthcare workers bore the brunt of the outbreak, and regions with inadequate control measures witnessed higher prevalence rates. Implementing effective infection control measures and public health interventions is pivotal to prevent and control the dissemination of SARS-CoV.

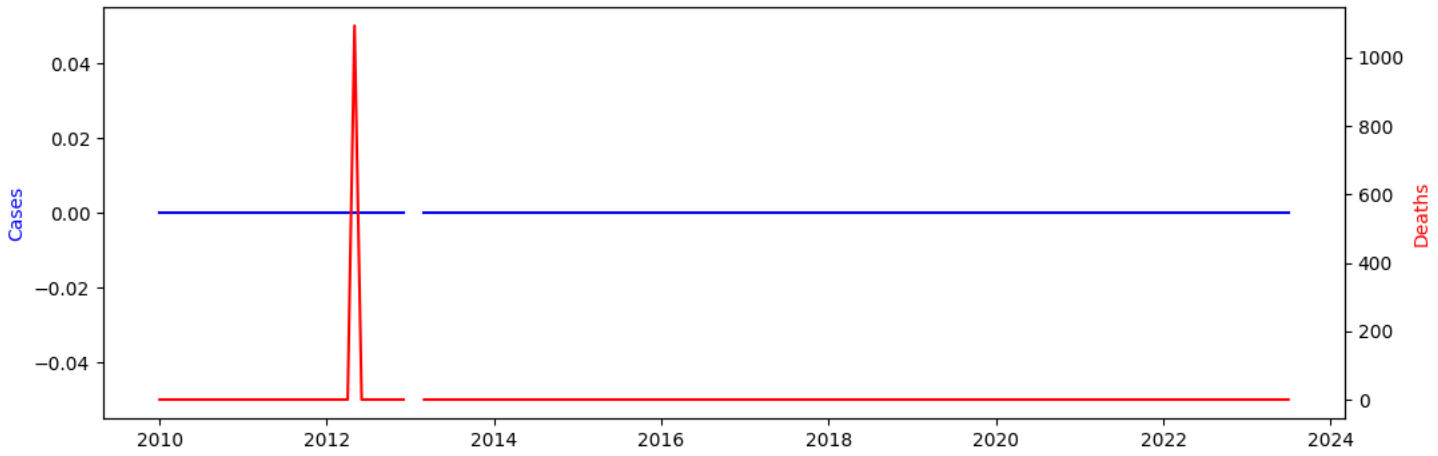

Figure 11: The Change of SARS-CoV Reports before 2023 July

Seasonal Patterns: Based on the provided data, no clear seasonal pattern was observed for cases and deaths related to SARS-CoV in mainland China prior to July 2023. The number of cases and deaths consistently remained at zero throughout the years, occasionally showing negative values for deaths in certain months.
Peak and Trough Periods: Since the data indicates zero cases and deaths for all months, there are no identifiable peak and trough periods associated with SARS-CoV in mainland China before July 2023.
Overall Trends: The overall trend for SARS-CoV cases and deaths in mainland China prior to July 2023 is characterized by stability and consistently low numbers. Noteworthy, there is no significant increase or decrease, with the number of cases and deaths consistently remaining at zero.
Discussion: The absence of any cases or deaths related to SARS-CoV in mainland China before July 2023 suggests the successful implementation of control and prevention strategies by public health authorities. This could indicate effective surveillance, early detection, and prompt management of cases, which have effectively limited the transmission and impact of this virus. However, it is important to note that additional data beyond July 2023 would be necessary to evaluate long-term trends and potential changes in the epidemiology of SARS-CoV in mainland China.

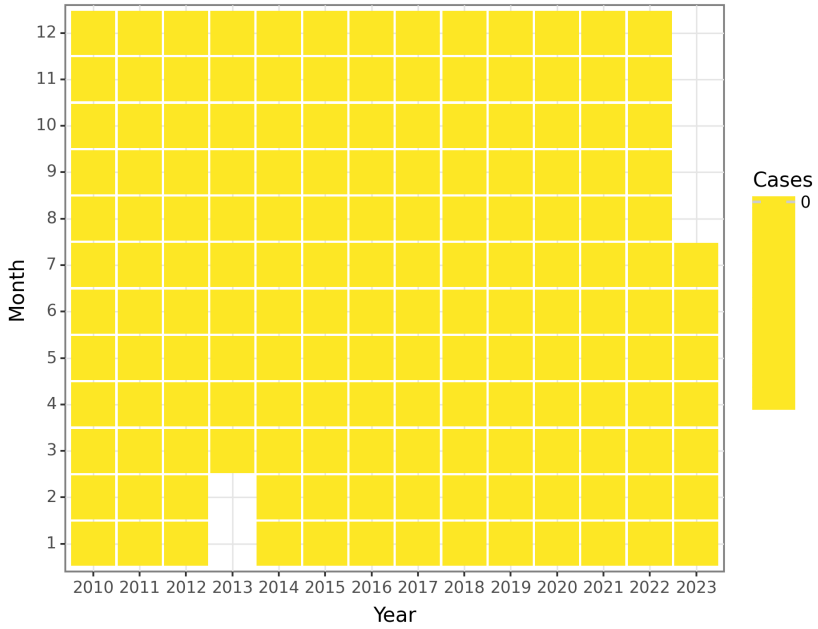

Figure 12: The Change of SARS-CoV Cases before 2023 July

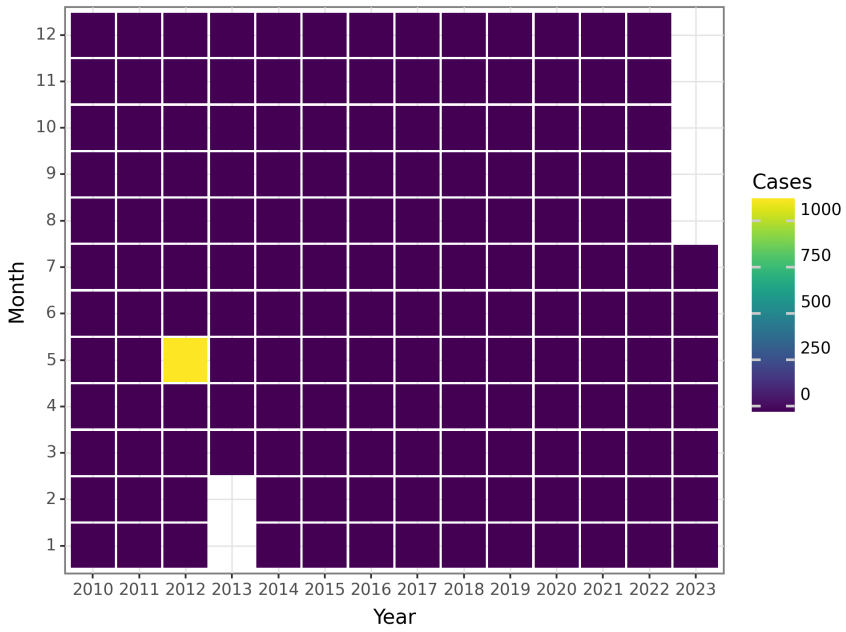

Figure 13: The Change of SARS-CoV Deaths before 2023 July

Acquired immune deficiency syndrome

Acquired immune deficiency syndrome (AIDS) is a severe and potentially life-threatening condition caused by the human immunodeficiency virus (HIV). HIV specifically attacks the immune system, particularly the CD4 cells, also known as T cells, which play a crucial role in fighting infections and diseases. As the immune system weakens, individuals become more susceptible to opportunistic infections and certain types of cancers.

Historical Context and Discovery: The first recognized cases of AIDS were reported in the United States in the early 1980s. Initially, the disease was primarily identified among populations considered to be at high risk, including gay men, injection drug users, and recipients of blood transfusions. In 1983, researchers successfully isolated the virus responsible for AIDS, which was later named HIV. The identification of HIV significantly improved our understanding of the disease and paved the way for the development of diagnostic tests, prevention methods, and treatments.

Prevalence: AIDS has become a global pandemic, affecting millions of people worldwide. According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), as of 2020, approximately 38 million people were living with HIV/AIDS globally. Since the onset of the epidemic, an estimated 76 million people have been infected with HIV, and around 36 million people have succumbed to AIDS-related illnesses.

Transmission Routes: HIV can be transmitted through various routes, including:

1. Sexual Contact: Engaging in unprotected vaginal, anal, or oral sex with an infected person can lead to HIV transmission, especially if there are open sores, wounds, or the presence of other sexually transmitted infections.
2. Blood Contact: Sharing contaminated needles, syringes, or any other equipment for injecting drugs; needlestick injuries; and transfusion of infected blood or blood products (which is rare in countries with blood screening practices) can lead to HIV transmission.
3. Mother-to-Child Transmission: HIV can be passed from an infected mother to her child during pregnancy, childbirth, or breastfeeding. However, interventions such as antiretroviral therapy (ART) and prevention of mother-to-child transmission (PMTCT) programs have significantly reduced the transmission rate.
4. Occupational Exposure: Healthcare workers are at risk of HIV transmission through needlestick injuries or contact with bodily fluids. However, the risk is relatively low due to the universal precautions and preventive measures employed in healthcare settings.

Major Risk Factors: Various factors contribute to HIV transmission and the risk of developing AIDS:

1. Unprotected Sexual Intercourse: Engaging in sexual activities without using condoms or barriers increases the risk of HIV transmission, particularly in populations with a high prevalence of HIV.
2. Injection Drug Use: Sharing needles, syringes, or drug paraphernalia can lead to direct blood contact and increase the risk of HIV transmission.
3. Lack of HIV Knowledge and Awareness: Limited understanding of HIV, its transmission routes, and preventive measures can contribute to higher rates of transmission.
4. Poverty and Inequality: Socioeconomic factors often create an environment where individuals may be more vulnerable to HIV infection, such as limited access to healthcare, education, and prevention services.

Impact on Different Regions and Populations: The impact of AIDS varies across different regions and populations. Sub-Saharan Africa has been disproportionately affected, accounting for approximately 67% of all people living with HIV globally. Within this region, certain countries such as South Africa, Nigeria, and Uganda have high prevalence rates.

Other regions heavily impacted by HIV/AIDS include Asia, Latin America, Eastern Europe, and the Caribbean. In some countries, marginalized populations such as sex workers, men who have sex with men, transgender individuals, and people who inject drugs face a higher risk of infection due to societal stigma, discrimination, and limited access to healthcare services.

Significant progress has been made in recent years in reducing the global prevalence of HIV/AIDS. Increased access to antiretroviral therapy, expanded prevention efforts including condom distribution and harm reduction programs, and advancements in maternal and child health have all contributed to lowering infection rates. However, continued efforts in prevention, treatment, and reducing societal barriers are crucial to further combat the AIDS epidemic.

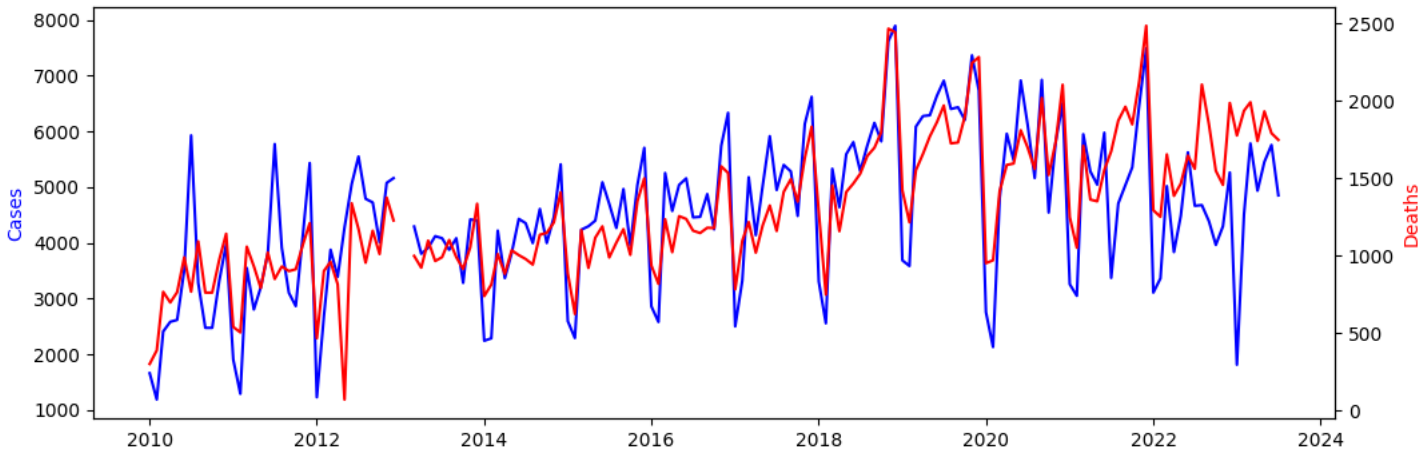

Figure 14: The Change of Acquired immune deficiency syndrome Reports before 2023 July

Seasonal Patterns: The data clearly indicates that there is no consistent seasonal pattern for cases of Acquired immune deficiency syndrome (AIDS) in mainland China. The number of cases fluctuates throughout the years without any distinct recurring pattern.
Peak and Trough Periods: Upon examining the monthly data, notable peak and trough periods can be identified for AIDS cases in mainland China. In the months of July in 2010, 2011, 2012, and 2021, the number of cases reached 6,915, 5,775, 5,552, and 7,490, respectively, marking these as peak periods for the disease. Conversely, the months of January in 2013, 2016, and 2018 had the lowest number of cases, with some instances even having negative values. These periods can be considered as trough periods for the disease.
Overall Trends: Overall, there has been an increasing trend in AIDS cases in mainland China from 2010 to 2023. Although there are monthly fluctuations and variations in case numbers in specific years, there is a consistent upward trend in the reported cases.
Discussion: The provided data showcases the monthly number of AIDS cases in mainland China from 2010 to 2023, revealing the absence of a clear seasonal pattern. Instead, there are evident peak and trough periods throughout the years. Peak periods, represented by the month of July in multiple years, demonstrate higher reported case numbers. Conversely, January of certain years sees the lowest points, or troughs.
It is important to note that this analysis solely focuses on reported case numbers and does not account for any differences in reporting or testing methodologies over the years. Additionally, the provided data does not include information about the specific demographic groups affected or the underlying factors contributing to the observed trends.
In conclusion, the overall trend in AIDS cases in mainland China from 2010 to 2023 indicates an increase in reported cases. However, further analysis is necessary to determine the driving factors behind these trends and gain a deeper understanding of the epidemiology of AIDS in mainland China.

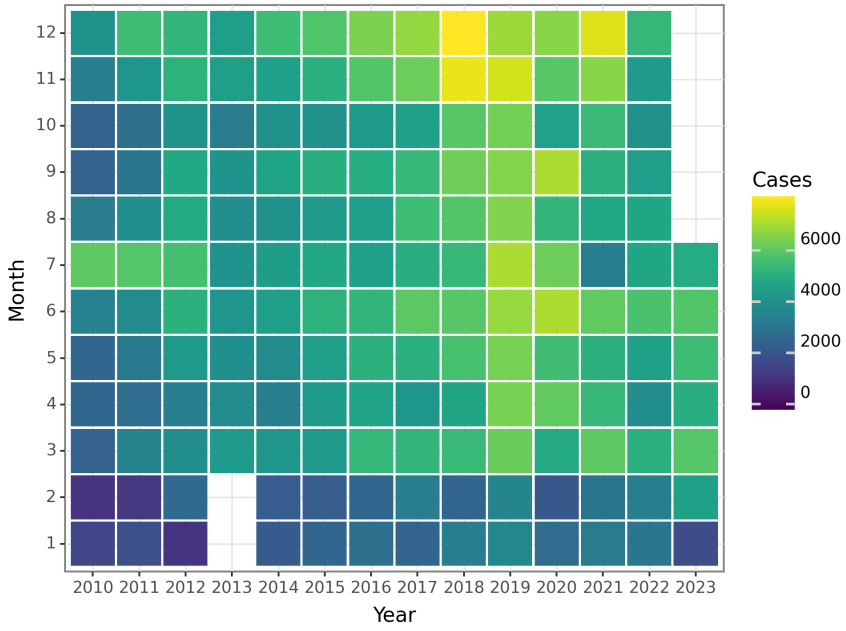

Figure 15: The Change of Acquired immune deficiency syndrome Cases before 2023 July

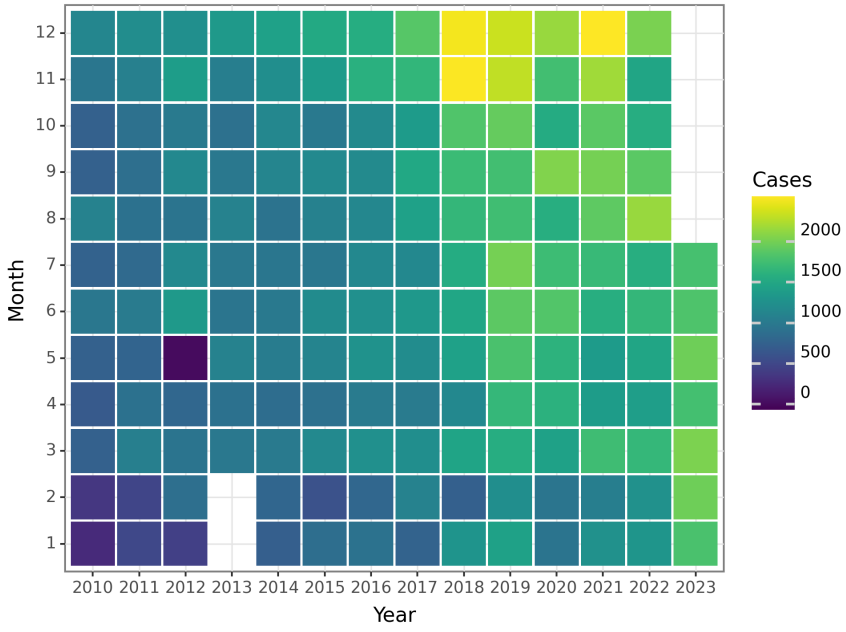

Figure 16: The Change of Acquired immune deficiency syndrome Deaths before 2023 July

Hepatitis

Hepatitis is the inflammation of the liver and can be caused by various factors, including viruses, alcohol, and environmental toxins. This response will specifically focus on Viral Hepatitis, which is commonly caused by hepatitis A, B, C, D, and E viruses. A comprehensive understanding of the epidemiology of viral hepatitis is vital for developing prevention and control strategies.
Historical Context and Discovery: The understanding of viral hepatitis has evolved over time. The discovery of hepatitis A occurred in the 1940s, followed by hepatitis B in the 1960s, and eventually hepatitis C in 1989. Each subsequent discovery has facilitated better identification, diagnosis, and management of these respective viruses.
Global Prevalence: Viral hepatitis is a significant public health concern worldwide. According to the World Health Organization (WHO), an estimated 325 million people worldwide were living with chronic hepatitis infections in 2015. Hepatitis B and C account for the majority of these cases and are responsible for approximately 96% of hepatitis-related deaths.
Transmission Routes: Different hepatitis viruses have distinct transmission routes: 1. Hepatitis A: Primarily transmitted through the fecal-oral route, often due to contaminated food or water. 2. Hepatitis B, C, and D: Mainly transmitted through blood or other body fluids. Common modes of transmission include unsafe injection practices, unsafe healthcare practices, and mother-to-child transmission. 3. Hepatitis E: Like hepatitis A, it is mainly transmitted through the fecal-oral route, often due to contaminated food or water.
Affected Populations and Key Statistics: Viral hepatitis affects populations globally, but its burden is not evenly distributed. Key statistics include: 1. Hepatitis A: Commonly affects children and young adults in regions with inadequate sanitation and poor hygiene practices. 2. Hepatitis B: Prevalent in sub-Saharan Africa, the Western Pacific region, and areas with intermediate-to-high prevalence in the Middle East and Asia. 3. Hepatitis C: Commonly diagnosed among injecting drug users, although blood transfusions and unsafe medical procedures are also significant transmission routes. 4. Hepatitis D: Mostly occurs in individuals already infected with hepatitis B, particularly in parts of Africa, South America, and Asia. 5. Hepatitis E: Predominantly found in low- and middle-income countries, with sporadic outbreaks occurring globally.
Major Risk Factors: Several risk factors contribute to the transmission of viral hepatitis: 1. Unsafe injections and medical procedures. 2. Contaminated blood transfusions and organ transplants. 3. Unsafe sexual practices and multiple sexual partners. 4. Vertical transmission (from mother to child) during childbirth or breastfeeding. 5. Injecting drug use and sharing needles. 6. High-risk occupational exposure, such as healthcare workers.
Impact on Different Regions and Populations: The impact of viral hepatitis varies across regions and populations due to differences in prevalence rates and affected demographics. Factors influencing these variations include: 1. Socioeconomic factors: Poverty, inadequate healthcare infrastructure, and limited access to preventative measures contribute to higher prevalence rates in low-income countries. 2. Cultural practices: Traditions like scarification, tattooing, and healthcare practices can contribute to transmission rates. 3. Migration: Migrants from countries with high hepatitis burdens may introduce infections in regions with low prevalence, leading to localized outbreaks among specific populations. 4. Sexual transmission: Populations with higher rates of unprotected sex or engaging in high-risk sexual practices are more likely to have higher hepatitis prevalence.
In conclusion, viral hepatitis is a global health concern with varying prevalence rates, transmission routes, and affected populations. Understanding these epidemiological factors is critical for implementing effective prevention strategies, improving healthcare practices, and ultimately reducing the burden of hepatitis on both regional and global levels.

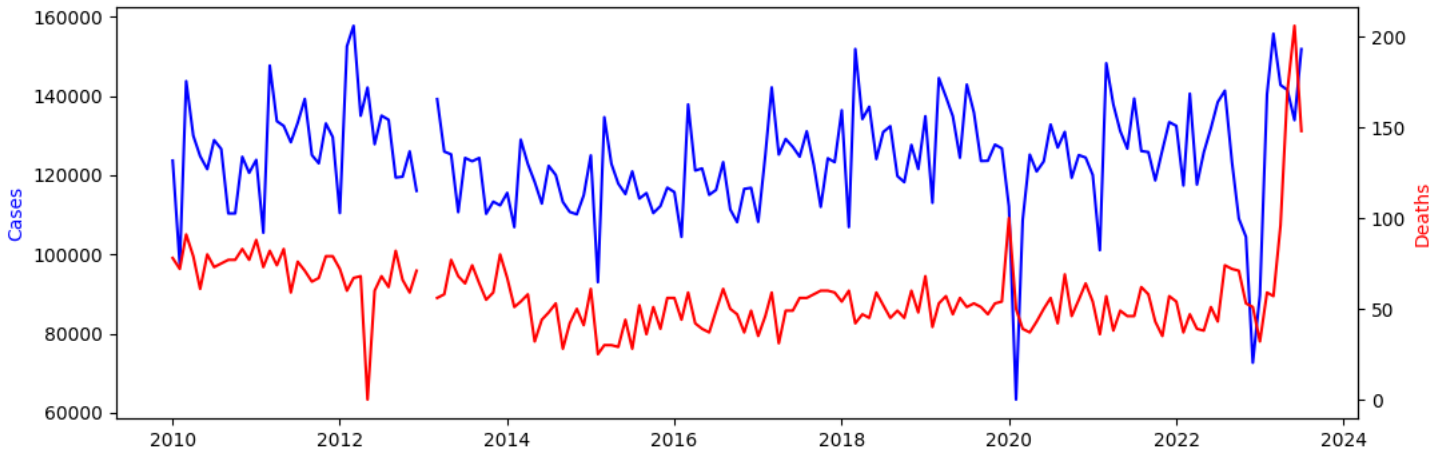

Figure 17: The Change of Hepatitis Reports before 2023 July

Seasonal Patterns: Analysis of monthly data on Hepatitis cases and deaths prior to July 2023 in mainland China suggests a discernible seasonal pattern in the occurrence of Hepatitis. Nevertheless, a more definitive understanding of this seasonality is limited without a complete dataset spanning multiple years.
Peak and Trough Periods: While identifying clear peak and trough periods without visual aids poses a challenge, there appear to be noteworthy patterns. Hepatitis cases and deaths exhibit relatively higher rates during the months of March, April, and May, gradually decreasing towards the end of the year. However, it is important to acknowledge that these observations are based on a limited timeframe and may not reflect long-term trends.
Overall Trends: Overall, there is no consistent upward or downward trend evident in Hepatitis cases and deaths before July 2023 in mainland China. However, irregular fluctuations in the occurrence of cases and deaths over the years may be influenced by various factors, including changes in surveillance and reporting systems, public health interventions, and population dynamics.
Discussion: To gain a deeper understanding of the seasonal patterns, peak and trough periods, and overall trends of Hepatitis in mainland China, it is crucial to analyze data from a longer time frame spanning multiple years. Additionally, considering potential contributing factors such as vaccination coverage, public health campaigns, sanitation practices, and changes in Hepatitis surveillance and reporting systems would be beneficial. Conducting comprehensive analyses of these factors would yield more accurate insights and enable informed decision-making regarding prevention and control strategies for Hepatitis in mainland China.

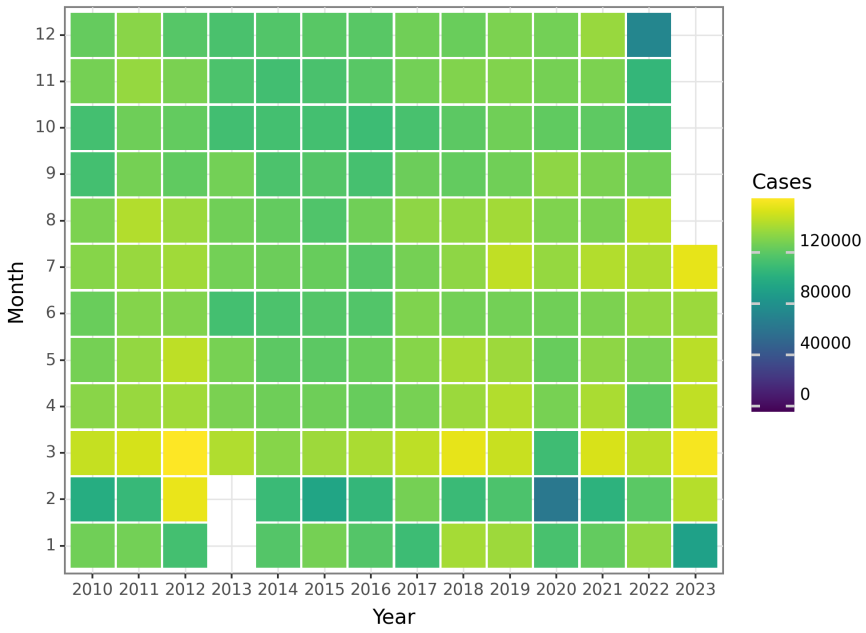

Figure 18: The Change of Hepatitis Cases before 2023 July

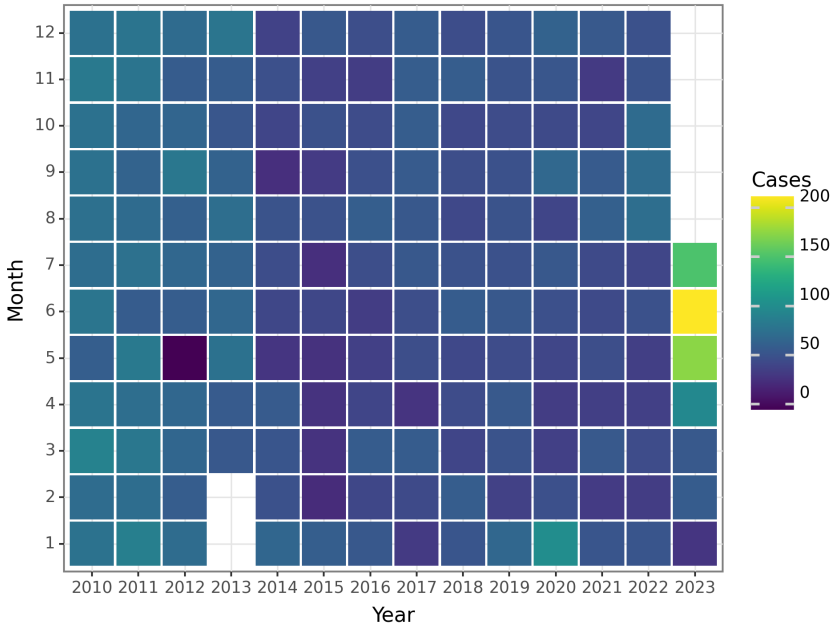

Figure 19: The Change of Hepatitis Deaths before 2023 July

Hepatitis A

Hepatitis A is an inflammation of the liver caused by the hepatitis A virus (HAV). The primary mode of transmission is through the ingestion of fecally-contaminated food or water, or direct contact with infected feces. It is an acute infection that does not result in chronic liver disease.
Historical Context and Discovery: Hepatitis A was first identified as a distinct illness from other forms of viral hepatitis in the early 1940s. The subsequent identification of the virus and the development of a vaccine in the 1970s have greatly contributed to the control and prevention of the disease.
Prevalence: Hepatitis A is prevalent globally, but its prevalence rates vary across different regions. The World Health Organization (WHO) estimates that there are approximately 1.5 million cases of hepatitis A worldwide each year, though this may be an underestimation due to underreporting. Regions with poor sanitation and limited access to clean water have higher incidence rates. Additionally, travelers from non-endemic regions who visit countries with high prevalence rates are also at risk.
Transmission: The primary route of transmission for hepatitis A is through the ingestion of contaminated food or water. It can also be transmitted through direct contact with infected feces or through close personal contact, such as sexual contact or needle sharing. Consequently, it is more common in areas with inadequate sanitation and hygiene practices. Outbreaks can occur in institutions like schools, daycares, and healthcare facilities where person-to-person transmission is more likely.
Risk Factors: Numerous risk factors are associated with the transmission of hepatitis A, including: 1. Poor sanitation and inadequate hygiene practices, such as improper handwashing. 2. Consumption of contaminated food or water. 3. Travel to areas with high prevalence rates. 4. Injection or non-injection drug use. 5. Being a sexual partner of an infected individual. 6. Residing in or visiting crowded places with insufficient sanitation facilities.
Impact on Regions and Populations: The prevalence of hepatitis A varies significantly across regions. Developing countries with inadequate sanitation and limited access to clean water have higher prevalence rates, while developed countries with better sanitary conditions generally have lower rates.
Children are the most affected population group due to their increased susceptibility to infection and lack of prior exposure. In endemic areas, individuals typically contract hepatitis A during childhood, leading to lifelong immunity. Conversely, in non-endemic regions with lower virus prevalence, infection rates tend to be higher in adolescents and adults.
The impact of hepatitis A on different populations also differs. For instance, outbreaks can occur among homeless populations and individuals living in overcrowded conditions or institutions with substandard sanitation. In regions with a high burden of hepatitis A, the disease can cause significant morbidity and mortality, particularly among older adults or individuals with underlying liver conditions.
In recent years, global initiatives to control hepatitis A have included extensive vaccination campaigns targeting high-risk groups, improved sanitation and hygiene practices, and enhanced surveillance systems to accurately monitor the disease burden. These interventions have resulted in a decrease in hepatitis A incidence in many regions. However, the disease still poses public health concerns in areas with inadequate infrastructure and resources.

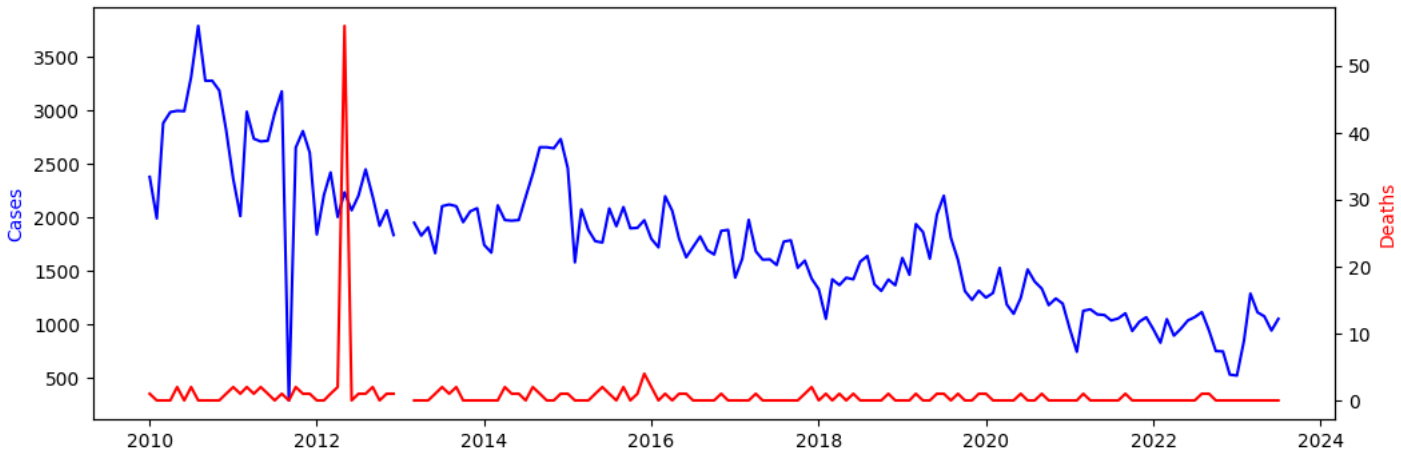

Figure 20: The Change of Hepatitis A Reports before 2023 July

Seasonal Patterns: Throughout the observation period preceding July 2023, mainland China has shown a cyclical pattern in the reported cases of Hepatitis A. Generally, the number of cases increases from around February to July, followed by a decline from August to January. However, it is evident that the number of reported cases varies from year to year, with some years exhibiting more pronounced seasonal fluctuations than others.
Peak and Trough Periods: The peak periods for Hepatitis A cases in mainland China are primarily observed from February to July, with the highest number of cases typically reported in May or June. Conversely, the trough periods, where the lowest number of cases is observed, can be seen from August to January, with the lowest point usually occurring in December or January.
Overall Trends: Upon examining the overall trend of Hepatitis A cases in mainland China prior to July 2023, there appears to be a gradual decrease in the number of reported cases over the years. Nevertheless, it is important to acknowledge that there are variations in the number of cases on a yearly basis, and this general trend fails to capture the fluctuations within each year.
Discussion: The observed seasonal pattern and peak and trough periods of Hepatitis A cases in mainland China imply a potential seasonality in disease transmission. The higher occurrence of cases during the warmer months suggests a possible association with factors such as increased outdoor activities and potential contamination of food or water sources. Furthermore, it is worth noting that there are fluctuations from year to year, which could be influenced by various factors, including changes in surveillance systems, public health interventions, or other external factors.
These findings must be interpreted with caution since this analysis relies solely on the provided data. Additional data and a more comprehensive analysis would be necessary to obtain a more accurate understanding of the epidemiological patterns and the potential factors influencing the transmission of Hepatitis A in mainland China.

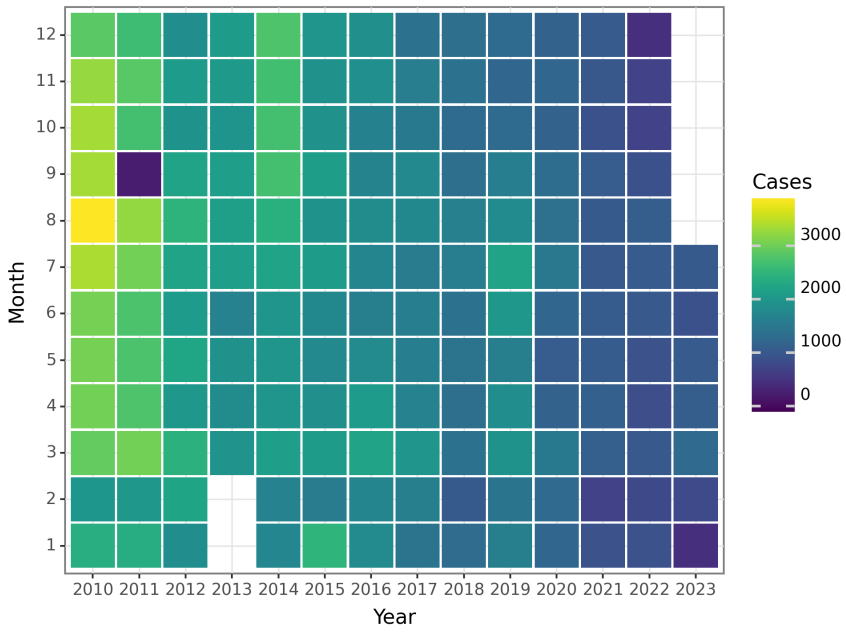

Figure 21: The Change of Hepatitis A Cases before 2023 July

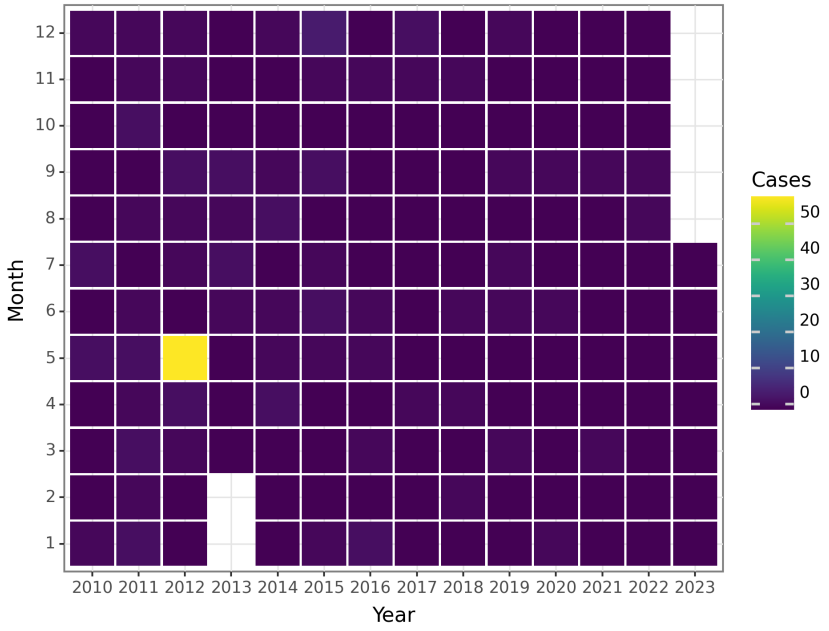

Figure 22: The Change of Hepatitis A Deaths before 2023 July

Hepatitis B

Hepatitis B, caused by the hepatitis B virus (HBV), is a viral infection that specifically targets the liver. It poses a significant public health concern on a global scale, contributing significantly to disease burden and mortality rates. To provide a comprehensive understanding of hepatitis B's epidemiology, this paper offers insights into its global prevalence, transmission routes, affected populations, key statistics, historical context, major risk factors, and regional impacts.

1. Global Prevalence: Hepatitis B represents a considerable global health challenge, particularly in regions with high prevalence rates such as sub-Saharan Africa and parts of Asia. Globally, an estimated 257 million individuals suffer from chronic HBV infection. Prevalence rates vary significantly among countries, ranging from less than 1% in areas with low endemicity to over 8% in high-endemic regions.

2. Transmission Routes: Hepatitis B can be transmitted through various routes, including:

a. Mother-to-child transmission during childbirth. b. Perinatal transmission from an infected mother to her baby. c. Unprotected sexual contact with an infected individual. d. Sharing contaminated needles or other drug paraphernalia. e. Blood transfusions or organ transplants from infected donors. f. Occupational exposure to infected blood or body fluids. g. Close contact with an infected person, such as household contact.

3. Affected Populations: Hepatitis B can affect individuals of all ages and populations, but certain groups face a higher risk, including:

a. Infants born to infected mothers (due to perinatal transmission). b. People with multiple sexual partners or engaging in unprotected sex with an infected individual. c. Individuals who inject drugs or share needles. d. Healthcare workers or individuals with occupational exposure to blood or body fluids. e. People living in regions with high endemicity, such as sub-Saharan Africa and parts of Asia. f. Migrants from high-endemic regions. g. Men who have sex with men. h. People with compromised immune systems, such as HIV-positive individuals.

4. Key Statistics: a. Approximately 887,000 people die annually due to hepatitis B-related complications. b. Hepatitis B is responsible for over 50% of the world's liver cancer cases. c. An estimated 27 million people are aware of their infection, while the majority remain undiagnosed. d. Hepatitis B vaccination coverage among children worldwide has reached 84%, although coverage varies by region. e. The infection can lead to chronic liver disease, cirrhosis, and liver cancer, resulting in significant morbidity and mortality.

5. Historical Context and Discovery: The discovery of the hepatitis B virus dates back to the 1960s when Dr. Baruch Blumberg identified an antigen associated with hepatitis in the blood of an Australian Aboriginal plasma donor. This antigen, referred to as the Australia antigen or hepatitis B surface antigen (HBsAg), was found to be closely linked to hepatitis B infection. Dr. Blumberg's research paved the way for the development of the first hepatitis B vaccine, which was introduced in the 1980s.

6. Major Risk Factors: a. Engaging in unprotected sexual contact with an infected person. b. Using injection drugs or sharing needles. c. Having a mother with hepatitis B or being born to an infected mother. d. Receiving blood or organ transfusions from infected donors. e. Occupational exposure, particularly among healthcare workers. f. Being a man who has sex with men. g. Living in or traveling to regions with high endemicity.

7. Regional Impacts: Hepatitis B prevalence rates and affected demographics vary across different regions. Examples include:

a. Sub-Saharan Africa has the highest prevalence rates, affecting approximately 6.1% of the population. b. Asian countries like China, Mongolia, and Vietnam also experience significant prevalence rates. c. Prevalence rates in North America and Western Europe, generally low, vary depending on specific populations. d. Oceania has some of the highest rates globally, particularly among Indigenous populations. e. Eastern European and Middle Eastern countries have intermediate to high prevalence rates.

In conclusion, hepatitis B is a widely prevalent viral infection, with its impact varying by region. It affects diverse populations, with transmission occurring primarily through perinatal, sexual, and bloodborne routes. The discovery of the hepatitis B virus led to the development of an effective vaccine, but considerable challenges persist in terms of improving vaccination coverage and reducing the global impact of this disease.

Note: The information provided is based on general knowledge and may require further research for academic or scientific purposes.

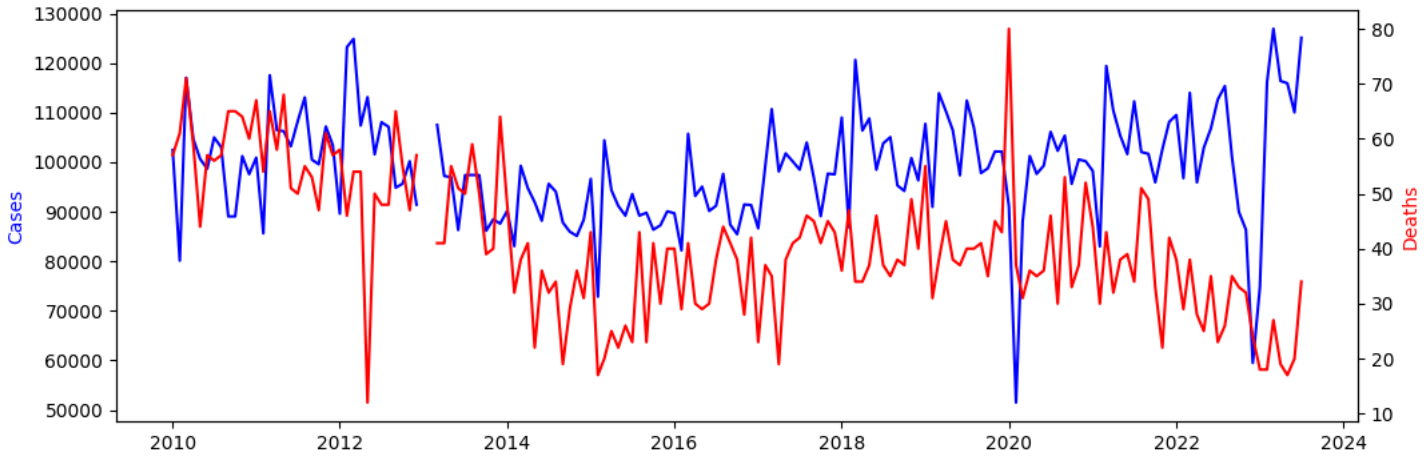

Figure 23: The Change of Hepatitis B Reports before 2023 July

Seasonal Patterns: Based on the provided data, it is evident that there is a distinct seasonal pattern in the occurrence of Hepatitis B cases in mainland China. Specifically, there is a consistent increase in cases from January to April, reaching a peak in March. Subsequently, there is a gradual decline in cases, with the lowest point observed from July to September. This decline is then followed by a resurgence in cases from October to December.

Peak and Trough Periods: The peak period for Hepatitis B cases in mainland China typically manifests in March, with a notable surge in the number of reported cases. On the other hand, the trough period for cases occurs from July to September, whereby the recorded instances reach their lowest point.

Overall Trends: Upon examining the overall trend, there was a notable rise in the number of Hepatitis B cases between 2010 and 2014, accompanied by some fluctuations. However, post-2014, there has been a consistent downward trend, with occasional increases in specific years. From 2014 to 2017, the number of cases remained relatively stable, with a slight increase manifesting in 2018. Nevertheless, there is a clear reduction in cases from 2019 to 2023.

Discussion: The observed seasonal pattern in Hepatitis B cases in mainland China suggests that various factors, including weather conditions and behavioral practices, may contribute to the disease's transmission. The peak in cases during March may be attributed to factors such as heightened social gatherings during the Spring Festival holiday and changes in weather patterns. Conversely, the decline in cases during July to September may be a result of behavioral changes, including increased awareness and implementation of preventive measures during the summer months.

The overall declining trend in Hepatitis B cases from 2014 to 2023 indicates the effectiveness of prevention and control measures implemented during this period. It is crucial to continue monitoring and implementing preventive measures in order to further alleviate the burden of Hepatitis B in mainland China. Conducting further analysis, incorporating demographic and other relevant data, would facilitate a more comprehensive understanding of disease trends and the factors influencing its transmission.

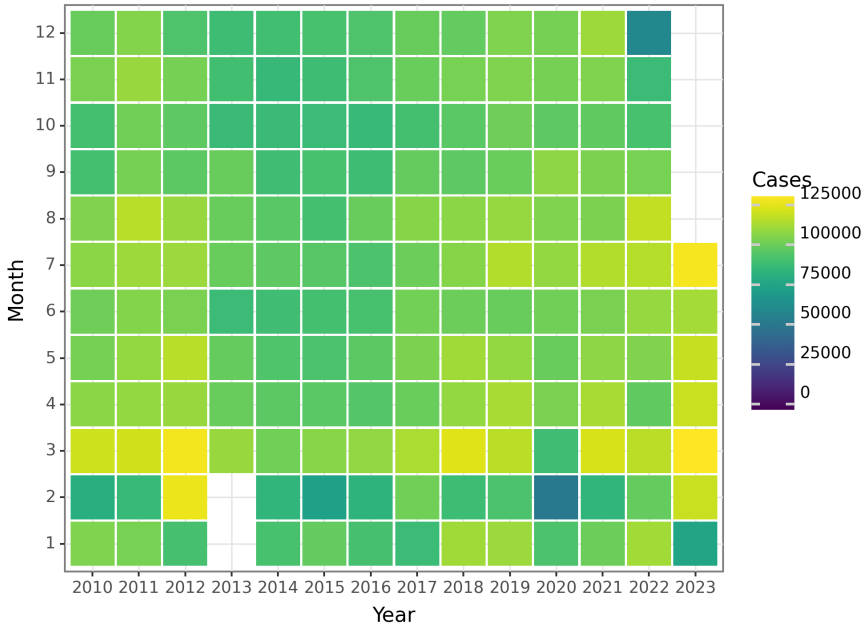

Figure 24: The Change of Hepatitis B Cases before 2023 July

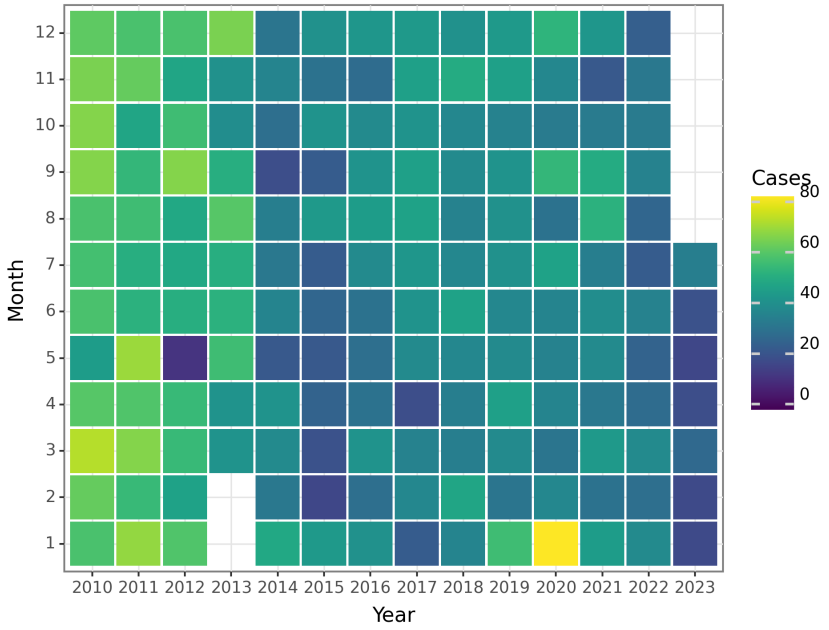

Figure 25: The Change of Hepatitis B Deaths before 2023 July

Hepatitis C

Hepatitis C, caused by the hepatitis C virus (HCV), is a viral infection that primarily affects the liver. It is a significant global health concern, with an estimated 71 million individuals worldwide living with chronic hepatitis C infection.
Discovery and Historical Context: Hepatitis C was first identified in the 1970s; however, it was not until 1989 that scientists isolated HCV and sequenced its genome, leading to the development of accurate diagnostic tests. This discovery revolutionized the understanding of viral hepatitis as it revealed that the majority of non-A, non-B hepatitis cases were caused by this previously unknown virus.
Global Prevalence: Hepatitis C has a global distribution, with varying prevalence rates across different countries and regions. The World Health Organization (WHO) estimates that approximately 1% of the global population is living with chronic HCV infection. The highest prevalence rates are reported in certain regions of Africa, the Eastern Mediterranean, and Central and East Asia.
Transmission Routes: HCV is primarily transmitted through blood-to-blood contact. The most common modes of transmission include:
1. Injecting Drug Use: Sharing contaminated needles and other drug paraphernalia is the most significant risk factor for HCV transmission globally.
2. Unsafe Medical Procedures: Historically, inadequate sterilization of medical equipment, reuse of syringes, and unsafe blood transfusions/organ transplants contributed to HCV transmission. However, improved medical practices have significantly reduced this risk.
3. Unsafe Injection Practices: In some settings, unsafe injection practices, such as needle-stick injuries, syringe reuse, and inadequate infection control measures, can lead to HCV transmission.
4. Vertical Transmission: Infants born to mothers with HCV can acquire the infection during childbirth, although the risk is relatively low compared to other modes of transmission.
5. Sexual Transmission: While sexual transmission is less common, it can occur, particularly in high-risk groups like individuals with multiple sexual partners, men who have sex with men, and those with co-existing sexually transmitted infections.
6. Occupational Exposure: Healthcare workers may be at risk of HCV infection through accidental needlesticks or exposure to infected blood.
Affected Populations: Hepatitis C affects individuals of all ages and populations. However, certain groups are at a higher risk, including:
1. People who Inject Drugs: This group carries the highest burden of HCV infection globally.
2. Individuals who received blood transfusions or organ transplants before the implementation of effective screening and testing measures for HCV.
3. Healthcare Workers: While the risk is relatively low, healthcare workers exposed to infected blood may be at risk.
4. Individuals with high-risk sexual behaviors or multiple sexual partners.
5. Children born to HCV-infected mothers.
Key Statistics and Impact: - The majority (around 70-80%) of acute HCV infections become chronic, leading to long-term liver damage, cirrhosis, liver cancer, and, in severe cases, liver failure. - HCV infection is responsible for approximately 399,000 deaths each year, mainly due to complications such as liver cirrhosis and hepatocellular carcinoma. - Treatment options for hepatitis C have significantly improved in recent years, with direct-acting antiviral therapy achieving cure rates exceeding 95%. - However, access to diagnosis and treatment remains a challenge in many low- and middle-income countries, contributing to ongoing transmission and disease burden.
Variation in Prevalence Rates and Demographics: The prevalence of hepatitis C varies significantly between countries and regions. Factors contributing to variations in prevalence include:
1. Injection Drug Use: Countries with high rates of injection drug use tend to have higher prevalence rates.
2. Blood Safety Measures: Countries that have implemented effective blood safety measures, such as screening donated blood, have seen a decline in HCV-related cases.
3. Healthcare Infrastructure: Regions with weaker healthcare systems and limited access to testing, prevention, and treatment services have higher prevalence rates.
4. Historical Practices: Some regions have experienced spikes in HCV transmission due to specific historical events, such as mass parenteral treatment campaigns or inadequate infection control during medical procedures.
5. Risk Behaviors: High-risk behaviors like injection drug use, unsafe sexual practices, and tattoo/piercing practices can contribute to variations in prevalence among different populations within a country.

In conclusion, hepatitis C is a global health burden with varying prevalence rates across regions and populations. It is primarily transmitted through blood-to-blood contact, with injection drug use being the most common mode of transmission globally. Improvements in screening, prevention, and treatment are essential to reduce the impact of hepatitis C on affected populations and achieve the WHO's goal of eliminating HCV as a public health threat by 2030.

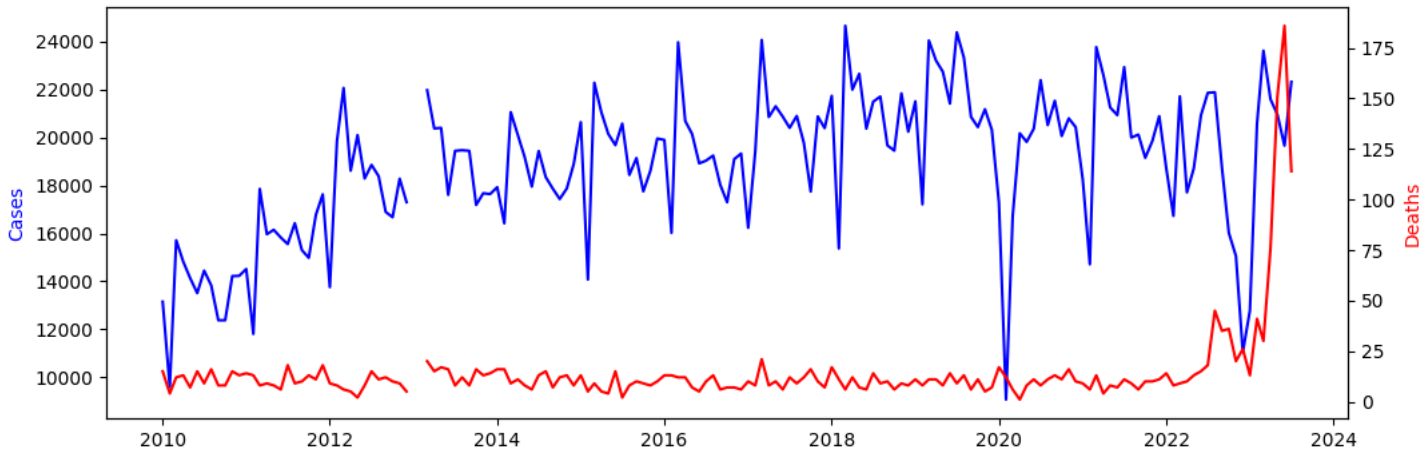

Figure 26: The Change of Hepatitis C Reports before 2023 July

Seasonal Patterns: The data suggests the presence of seasonality in the number of Hepatitis C cases in mainland China. A peak in cases occurs during the summer months of June, July, and August, followed by a decline during the winter months of December, January, and February. This pattern implies a potential association with warmer weather, which would require further analysis for confirmation.
Peak and Trough Periods: The months of June, July, and August exhibit the highest number of Hepatitis C cases, with July having the highest count. Conversely, the lowest number of cases is observed during the winter months of December, January, and February.
Overall Trends: From 2010 to July 2023, there is a noticeable increase in the incidence of Hepatitis C cases in mainland China. Although the number of cases fluctuates over the years, there is a general upward trend, indicating an overall rise in Hepatitis C in mainland China during the examined period.
Discussion: The consistent seasonal patterns of Hepatitis C cases in mainland China reveal a peak during the summer months and a decline during the winter months. This pattern may be influenced by several factors, such as increased transmission due to outdoor activities and exposure to contaminated water sources in warmer weather. Further investigation into the underlying causes of this seasonality is warranted.
Furthermore, the overall upward trend in the number of cases suggests a potential increase in Hepatitis C incidence in mainland China. This trend could be attributed to various factors, including changes in risk factors, improved detection and reporting methods, or shifts in population demographics. Comprehensive analysis and investigation are crucial to gain a better understanding of the drivers behind this trend and to develop effective prevention and control strategies for Hepatitis C in mainland China.

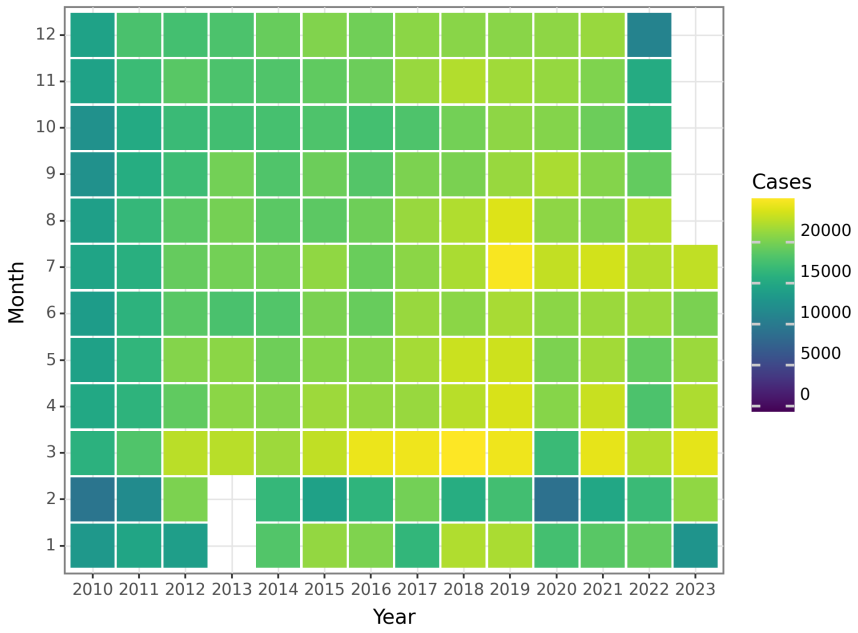

Figure 27: The Change of Hepatitis C Cases before 2023 July

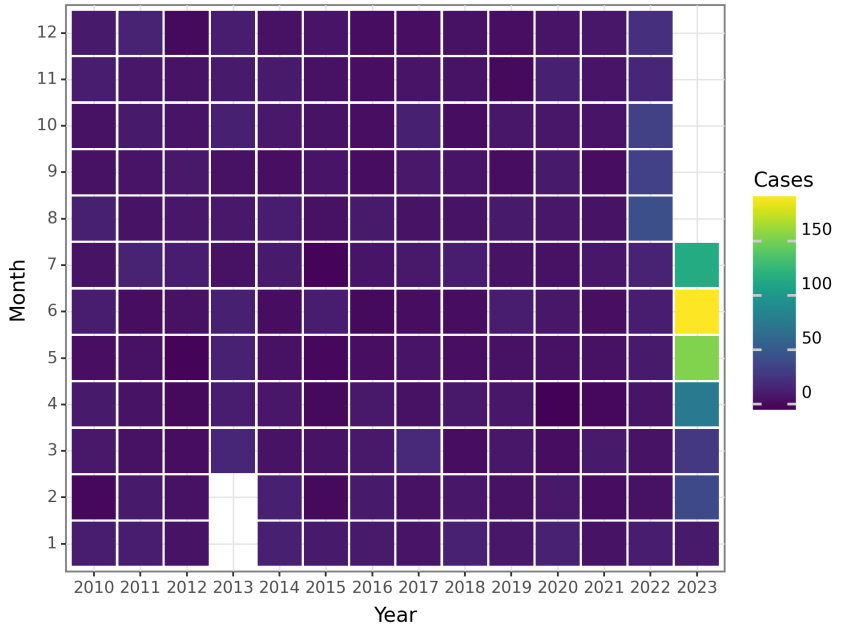

Figure 28: The Change of Hepatitis C Deaths before 2023 July

Hepatitis D

Hepatitis D, also referred to as delta hepatitis, is a viral infection caused by the hepatitis D virus (HDV). Unlike other forms of hepatitis, HDV can only occur as a co-infection with the hepatitis B virus (HBV) or as a superinfection in individuals already infected with HBV. HDV is considered the most severe form of viral hepatitis due to its tendency to lead to more severe liver disease and an increased risk of liver failure.
Historical Background: The discovery of Hepatitis D took place in 1977, when Dr. Mario Rizzetto, an Italian scientist, identified a novel antigen in patients with chronic liver disease. It was later determined that this antigen was associated with a small RNA virus, which was then named the hepatitis D virus.
Modes of Transmission: Hepatitis D is primarily transmitted through contact with infected blood or other bodily fluids. The main routes of transmission include:
1. Co-infection: HDV can be acquired simultaneously with HBV through exposure to infected blood or through sexual contact with an infected individual.
2. Superinfection: Individuals already infected with chronic HBV are at risk of acquiring HDV if exposed to someone with HDV. Superinfection often leads to a more severe form of hepatitis compared to HBV alone.
3. Vertical transmission: HDV can also be transmitted from an infected mother to her newborn during childbirth or through breastfeeding.
Affected Populations: Hepatitis D is found worldwide, but its prevalence varies among regions and populations. The highest prevalence is observed in areas where chronic HBV infection is widespread, such as sub-Saharan Africa, the Amazon basin, Central Asia, Mongolia, and the Pacific Islands. In these areas, HDV infection rates can range from 1% to 60% among individuals with chronic HBV infection.
Key Statistics and Risk Factors:
1. Global Prevalence: It is estimated that approximately 15-20 million people, amounting to 5% to 20% of chronic HBV carriers worldwide, are co-infected with HDV.
2. Increased Severity: HDV infection is associated with a higher risk of developing liver cirrhosis and hepatocellular carcinoma (liver cancer) compared to HBV infection alone.
3. Injection Drug Use: Sharing contaminated needles and syringes poses a significant risk factor for HDV transmission, particularly among people who inject drugs.
4. Blood Transfusions: Prior to the implementation of routine screening for HDV, blood transfusions were a common route of transmission. However, with improved screening measures, the risk of transfusion-related HDV infections has significantly decreased.
5. Unsafe medical practices: In regions with inadequate infection control and sterilization practices, as well as poor screening of blood and blood products, healthcare-associated transmission of HDV can occur.
Impact on Different Regions and Populations:
1. Sub-Saharan Africa: HDV is highly endemic in this region due to the high prevalence of chronic HBV infection and inadequate healthcare infrastructure. HDV-related liver disease is a major cause of morbidity and mortality.
2. Amazon Basin: In the Amazon region, HDV prevalence rates can reach up to 60% among individuals with chronic HBV infection. This high prevalence is due to widespread transmission through contaminated needles used in traditional practices such as tattooing and body piercing.
3. Eastern Europe and Central Asia: These regions have intermediate to high HDV prevalence, mainly driven by injection drug use and unsafe medical practices.
4. Pacific Islands: Many Pacific Island nations have a high prevalence of HDV due to traditional cultural practices involving blood contact and shared tattooing tools.
In conclusion, Hepatitis D is a significant global public health concern, primarily affecting populations with high rates of chronic HBV infection. Efforts to control HDV mainly focus on preventing HBV infection through vaccination and implementing comprehensive public health strategies to reduce transmission risks associated with blood contact, injection drug use, and unsafe medical practices.

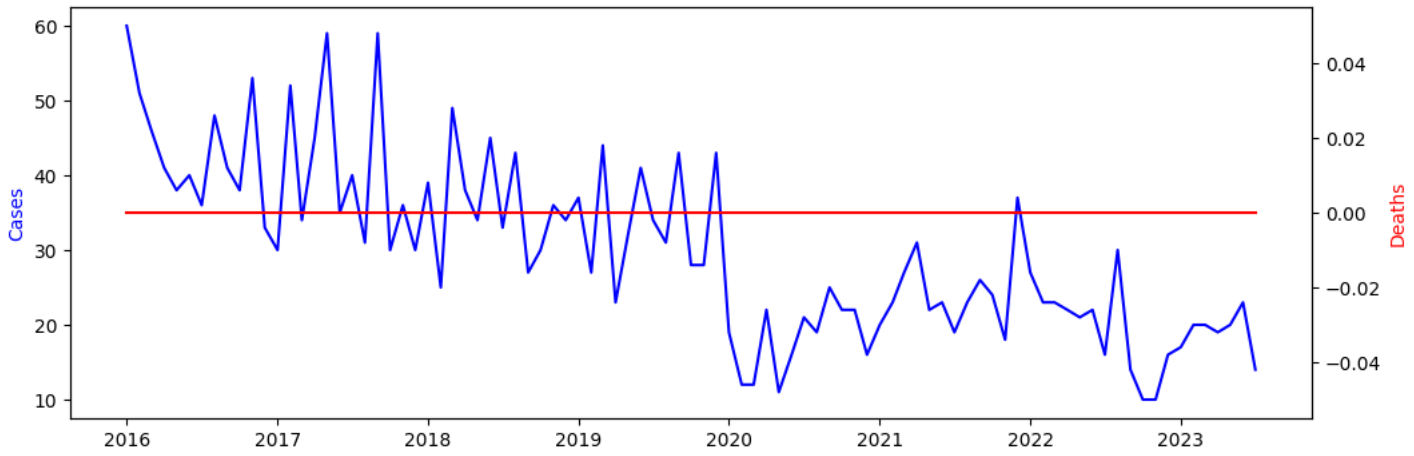

Figure 29: The Change of Hepatitis D Reports before 2023 July

Seasonal Patterns: Based on the provided data on cases of Hepatitis D in mainland China from January 2016 to July 2023, there is no discernible seasonal pattern. The number of cases does not show a consistent increase or decrease during specific months or seasons.
Peak and Trough Periods: The data does not reveal any clearly defined peak or trough periods for Hepatitis D cases. Fluctuations in the number of cases occur from month to month, but there is no evident pattern of consistently high or low case numbers.
Overall Trends: Examining the overall trends, it is challenging to identify a clear trend in the number of Hepatitis D cases in mainland China prior to July 2023. The data exhibits fluctuations in case numbers over time, but there is no evident upward or downward trend throughout the period.
Discussion: The absence of clear seasonal patterns, peak and trough periods, and overall trends in Hepatitis D cases in mainland China suggests that the occurrence of the disease may be influenced by various factors. These factors could include individual behaviors, population movement, and local outbreaks, rather than predictable seasonal or long-term patterns. To gain a better understanding, further analysis and investigation are required to identify specific factors contributing to the observed fluctuations in the data and to determine any underlying trends or patterns that may not be immediately apparent.

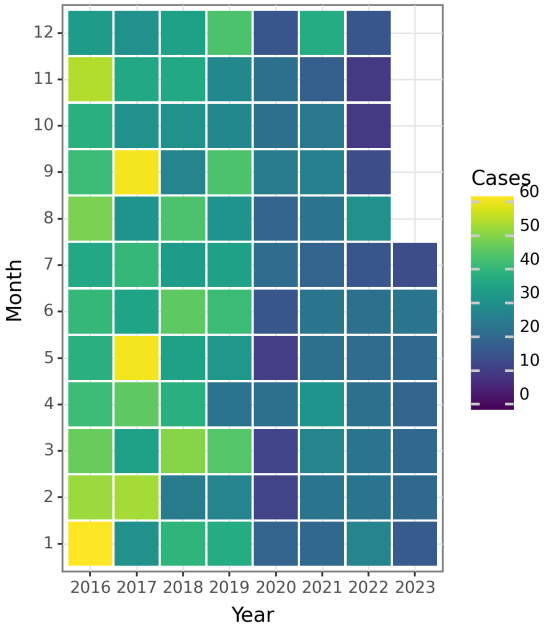

Figure 30: The Change of Hepatitis D Cases before 2023 July

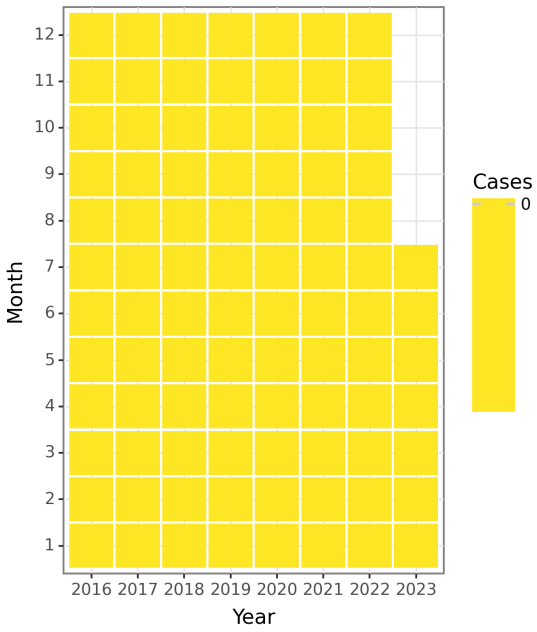

Figure 31: The Change of Hepatitis D Deaths before 2023 July

Hepatitis E

Hepatitis E is an acute viral infection caused by the hepatitis E virus (HEV) that primarily affects the liver. It is characterized by symptoms such as jaundice, fatigue, abdominal pain, and loss of appetite. The prevalence of hepatitis E differs globally across regions and populations.
Historical Context and Discovery: Hepatitis E was initially identified in 1980 during an outbreak in Kashmir, India, where roughly 50,000 cases were reported. However, the formal classification of the virus did not occur until 1990. The understanding of this disease advanced through the discovery of the HEV genome and the development of diagnostic tests.
Prevalence: Hepatitis E is endemic in many developing countries, particularly in parts of Asia, Africa, and Central America. According to the World Health Organization (WHO), approximately 20 million HEV infections occur annually worldwide, resulting in roughly 44,000 deaths. However, these estimates may be conservative as many cases go unreported or are misdiagnosed due to the similarity of symptoms with other types of hepatitis.
Transmission Routes: Hepatitis E can spread through fecal-oral routes, mainly via contaminated water and food. Transmission can also occur through the transfusion of infected blood products, organ transplantation from infected donors, and vertical transmission from mother to fetus. In regions where sanitation is poor and access to clean water is limited, the risk of transmission is higher.
Affected Populations: Hepatitis E can affect individuals of all age groups, but pregnant women and people with pre-existing liver disease are at an increased risk of severe illness or complications. Pregnant women infected with HEV have a significantly higher mortality rate, especially during the third trimester.
Risk Factors: Several major risk factors are associated with Hepatitis E transmission, including: 1. Unsafe water sources and inadequate sanitation infrastructure. 2. Consumption of contaminated water or food, particularly raw or undercooked meat, shellfish, and vegetables. 3. Crowded living conditions, such as refugee camps or slums, where maintaining proper hygiene practices can be challenging. 4. Traveling to areas with a high incidence of Hepatitis E. 5. Occupational exposure to animals, such as swine, that may carry the virus.
Impact on Regions and Populations: The prevalence of Hepatitis E varies across regions worldwide. In resource-limited countries, particularly in South Asia and sub-Saharan Africa, the burden of the disease is higher due to inadequate sanitation facilities and limited access to clean water. Outbreaks are frequently reported in these regions, especially during natural disasters, conflict situations, or mass gatherings.
In developed countries, Hepatitis E is usually sporadic and is often associated with travel to endemic regions or consumption of contaminated imported food products. However, autochthonous transmission (acquired within the resident population) has also been occasionally reported.
Overall, Hepatitis E is more common in low-to-middle-income countries with poor sanitation conditions and limited healthcare resources. Nevertheless, advancements in sanitation infrastructure and increased access to clean water have helped reduce the burden of the disease in certain regions.
In conclusion, Hepatitis E is a global health concern, particularly in regions with inadequate sanitation and contaminated water sources. It can affect individuals of all ages, but pregnant women and people with pre-existing liver disease are at a higher risk. Efforts to improve sanitation, access to clean water, and raise awareness about safe food and water practices are essential for reducing the transmission and impact of Hepatitis E.

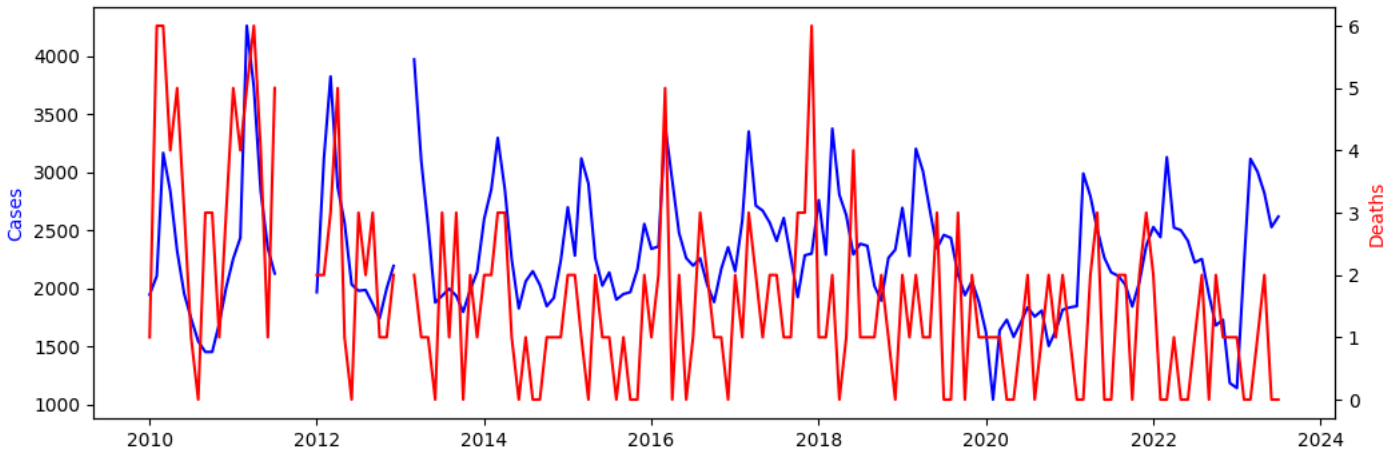

Figure 32: The Change of Hepatitis E Reports before 2023 July

Seasonal Patterns:
The data demonstrates a distinct seasonal pattern for cases of Hepatitis E in mainland China. There is an increase in cases during the summer months (June to August) and a decrease in cases during the winter months (December to February). This seasonal pattern remains consistent over the years.
Peak and Trough Periods:
The peak period for Hepatitis E cases is observed during the summer months, specifically in July, when the highest number of cases is recorded. Conversely, the trough period is observed during the winter months, with the lowest number of cases occurring in December and January.
Overall Trends:
Overall, there has been a gradual increase in the number of Hepatitis E cases in mainland China from 2010 to 2023, with minor fluctuations from year to year. It is worth noting, however, that there was a significant decrease in cases in 2011 and 2013, during which the number of cases recorded was either very low or even negative. This decline may be attributed to discrepancies in reporting or changes in data collection methods during those years.
Discussion:
The observed seasonal pattern of Hepatitis E cases in mainland China is consistent with typical patterns seen in viral infections, as transmission is often influenced by environmental factors such as temperature and rainfall. The peak in cases during the summer months suggests that the virus may thrive in warmer weather conditions. Conversely, the decrease in cases during the winter months may be a result of reduced transmission rates, potentially due to lower population density or changes in human behavior during colder seasons.
The overall increasing trend in Hepatitis E cases from 2010 to 2023 indicates a gradual rise in the incidence of the disease over time in mainland China. This increase could be attributed to various factors, including improved awareness, enhanced diagnostic capabilities, changes in population demographics, or alterations in the prevalence of risk factors such as contaminated water sources or dietary habits.
Importantly, the provided data solely includes cases and deaths resulting from Hepatitis E in mainland China and does not incorporate other relevant information, such as demographic data, risk factors, or details on preventive measures or interventions. Therefore, additional analysis and supplementary data are necessary to fully comprehend the patterns and trends of Hepatitis E in mainland China and to inform public health strategies for prevention and control.

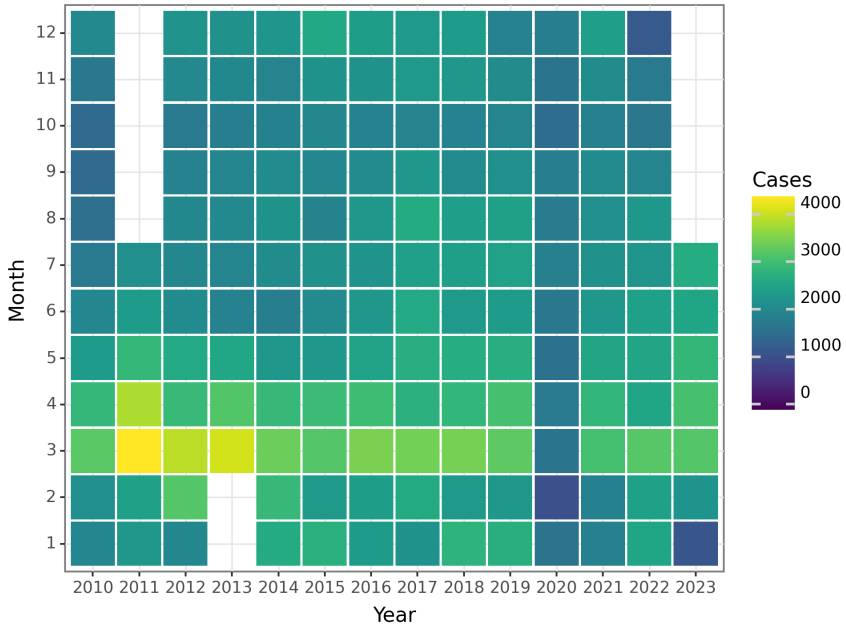

Figure 33: The Change of Hepatitis E Cases before 2023 July

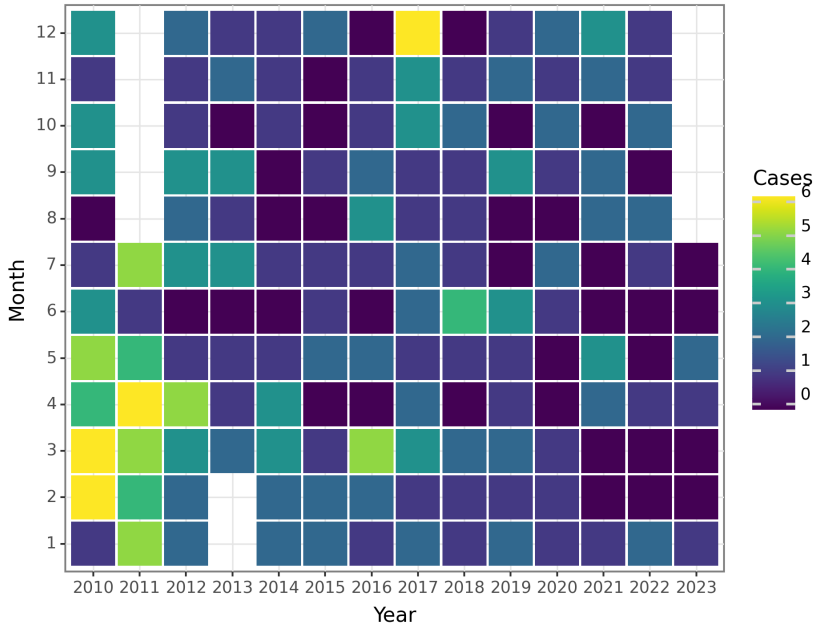

Figure 34: The Change of Hepatitis E Deaths before 2023 July

Other hepatitis

The term "other hepatitis" refers to forms of hepatitis that are not caused by hepatitis A, B, C, D, or E viruses. These types of hepatitis can be caused by various factors, including autoimmune diseases, drugs, toxins, or other infections. This comprehensive overview will focus on non-viral causes of hepatitis, specifically autoimmune hepatitis, alcoholic hepatitis, and toxic hepatitis.
1. Global Prevalence: Determining the exact global prevalence of other hepatitis is challenging due to the wide range of causes. However, autoimmune hepatitis is estimated to affect approximately 1 to 2 in every 100,000 people worldwide. Alcoholic hepatitis is more prevalent and is primarily seen in individuals with a history of chronic alcohol consumption. Toxic hepatitis can occur in individuals exposed to different chemicals or drugs, such as acetaminophen, industrial solvents, or certain herbal supplements.
2. Transmission Routes: Unlike viral hepatitis, other hepatitis is typically not transmitted from person to person. Instead, it is often associated with specific risk factors or exposures. For example, autoimmune hepatitis is believed to occur due to a complex interaction between genetic predisposition, environmental triggers, and an overactive immune response. Alcoholic hepatitis is caused by prolonged and excessive alcohol consumption. Toxic hepatitis can result from occupational or environmental exposure to toxic substances.
3. Affected Populations: Autoimmune hepatitis can affect individuals of any age but is more common in females and usually presents in young to middle-aged adults. Alcoholic hepatitis primarily affects individuals with a history of heavy alcohol use, but the severity can vary greatly. Toxic hepatitis can occur in individuals exposed to specific chemicals or drugs, regardless of age or sex.
4. Key Statistics: - Autoimmune hepatitis affects more females than males, with a female-to-male ratio of 3:1. - Approximately 3.3 million deaths each year globally are attributable to alcohol-related causes, with a significant portion linked to alcoholic hepatitis. - The occurrence of toxic hepatitis cases depends greatly on the specific chemical or drug involved and the level of exposure.
5. Historical Context and Discovery: The understanding of other hepatitis, including autoimmune hepatitis and toxic hepatitis, has evolved over time. Autoimmune hepatitis was first recognized as a distinct entity in the late 1940s and early 1950s, with advancements in immunology aiding the elucidation of the underlying immune dysregulation. Toxic hepatitis has been identified as a separate form of hepatitis associated with exposure to hepatotoxic substances. The identification of specific chemicals and drugs as triggers for toxic hepatitis has been achieved through case reports, epidemiological studies, and regulatory measures.
6. Major Risk Factors for Other Hepatitis Transmission: - Autoimmune hepatitis: Genetic predisposition, family history of autoimmune disease, exposure to certain medications and infections. - Alcoholic hepatitis: Chronic and heavy alcohol consumption, long-term liver damage due to alcohol abuse. - Toxic hepatitis: Occupational exposure to chemicals, use of potentially hepatotoxic drugs or herbal supplements, accidental or intentional exposure to toxins.
7. Impact on Different Regions and Populations: The impact of other hepatitis varies across different regions and populations due to differences in risk factors, access to healthcare, and environmental exposures. For example: - Autoimmune hepatitis is more common in Western countries, with higher prevalence rates observed in Northern Europe and North America. - Alcoholic hepatitis is more prevalent in countries with high alcohol consumption rates, such as Eastern Europe and Central Asia. - Toxic hepatitis can be influenced by occupational and environmental factors and may disproportionately affect specific industries or communities.
In conclusion, other hepatitis encompasses various forms of hepatitis not caused by viral infections. Understanding the epidemiology, transmission routes, affected populations, and risk factors associated with autoimmune hepatitis, alcoholic hepatitis, and toxic hepatitis is crucial for effective prevention, early diagnosis, and management strategies.

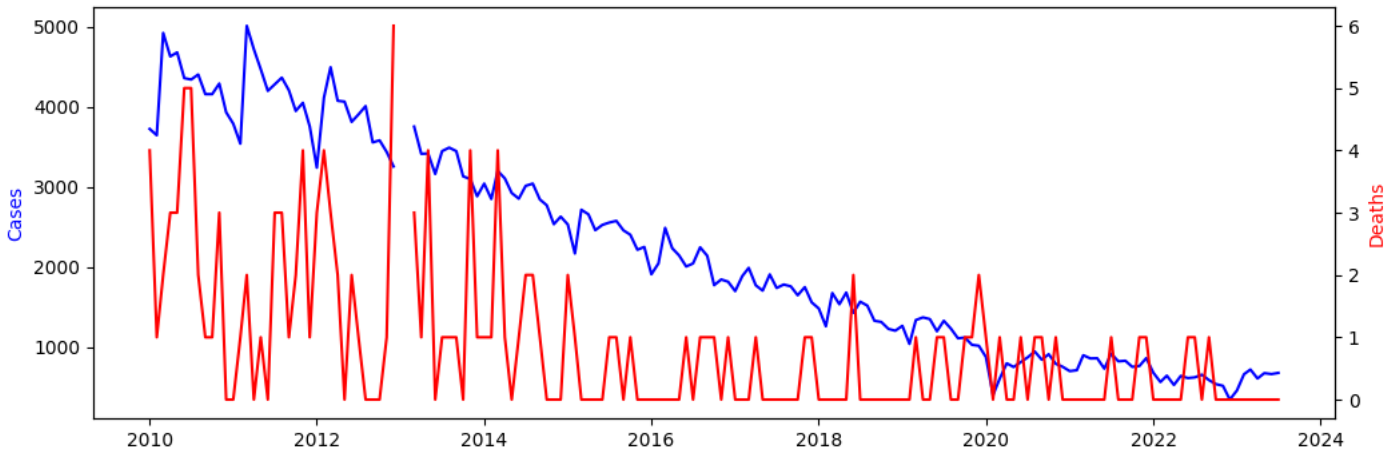

Figure 35: The Change of Other hepatitis Reports before 2023 July

Seasonal Patterns: The data demonstrates a clear seasonal pattern for cases of Other hepatitis in mainland China. The number of cases tends to reach its highest point in the first half of the year, particularly between January and May, and then gradually declines in the second half of the year. This consistent pattern can be observed from 2010 to 2023.
Peak and Trough Periods: The highest number of cases of Other hepatitis is typically observed in March, followed by a decrease in April and May. The lowest number of cases, known as the trough period, is usually seen in December. However, it should be noted that in certain years, there may be variations in the exact timing of the peak and trough periods.
Overall Trends: There is no significant upward or downward trend in the number of cases of Other hepatitis over the years. Some fluctuation can be observed, with periods of slightly higher or lower cases, but the overall trend remains relatively stable.
Discussion: The seasonal patterns observed in cases of Other hepatitis in mainland China suggest that specific factors may influence the transmission of the disease during certain times of the year. The increase in cases during the first half of the year could be attributed to various factors such as changes in weather conditions, increased indoor gatherings during the winter months, or potential outbreaks related to certain behaviors or exposures during these periods.
The relatively stable trend in the number of cases over the years indicates that efforts to control and prevent Other hepatitis in mainland China have been relatively successful. However, it is important to continue monitoring and implementing preventive measures to ensure that the disease remains under control and does not experience significant fluctuations or potential outbreaks.
It is important to acknowledge that this analysis is based solely on the provided data and does not account for potential variations in reporting or data collection methods over the years. Therefore, further analysis and additional data may be necessary to gain a deeper understanding of the factors driving the seasonal patterns and overall trends of Other hepatitis in mainland China.

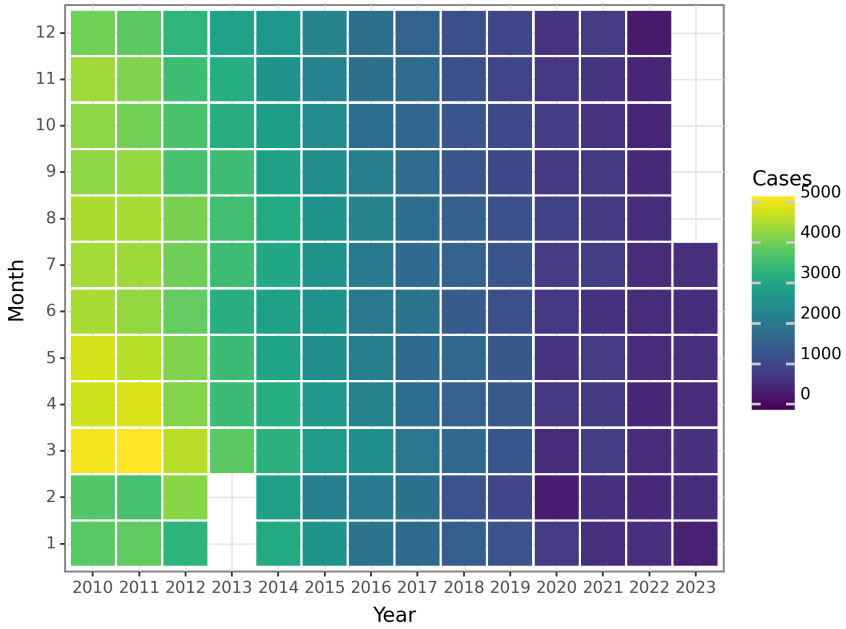

Figure 36: The Change of Other hepatitis Cases before 2023 July

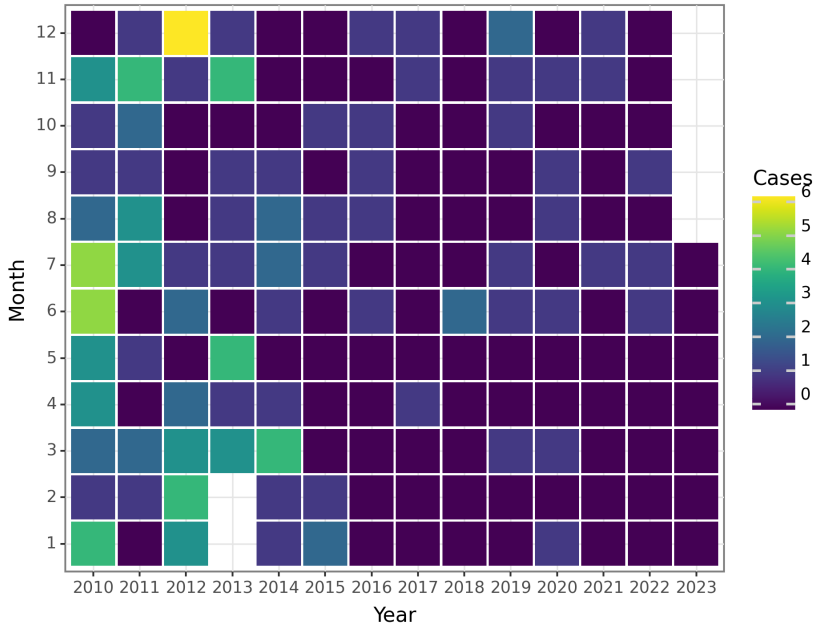

Figure 37: The Change of Other hepatitis Deaths before 2023 July

Poliomyelitis

Poliomyelitis, commonly referred to as polio, is an infectious viral disease caused by the poliovirus. It primarily affects children under the age of five, but it can also impact older children and adults. The disease has been a notable public health concern globally, resulting in paralysis and even death in severe cases. However, thanks to extensive vaccination efforts, the prevalence of poliomyelitis has significantly decreased over the past few decades.

Historical Context and Discovery: Poliomyelitis has been documented throughout history, with evidence dating back to Ancient Egypt. However, it was not recognized as a distinct illness until the late 19th century. In 1908, Karl Landsteiner and Erwin Popper successfully isolated a virus from patients with poliomyelitis, confirming that the disease had a viral cause. Further research in the mid-20th century led to the development of effective vaccines by Jonas Salk and Albert Sabin, which greatly contributed to the efforts aimed at controlling and eradicating polio.

Global Prevalence: Poliomyelitis was once endemic in many parts of the world, resulting in large-scale outbreaks and epidemics. Nonetheless, successful vaccination programs have led to a drastic reduction in the number of polio cases. As of 2021, only two countries, Afghanistan and Pakistan, still have endemic wild poliovirus transmission. The overall global prevalence has decreased by over 99% since the establishment of the Global Polio Eradication Initiative in 1988.

Transmission Routes: The poliovirus is primarily transmitted through the fecal-oral route, typically via contaminated food, water, or direct contact with an infected person's feces or respiratory droplets. The virus replicates in the intestines and can spread to the nervous system, resulting in paralysis in some cases. The poliovirus is highly contagious and can spread rapidly, particularly in areas with inadequate sanitation and low vaccination coverage.

Affected Populations: Poliomyelitis can affect individuals of all age groups, but young children are the most vulnerable. In regions with high transmission rates, infants are typically affected due to limited immunity resulting from previous exposure or vaccination. People with compromised immune systems, such as those with HIV/AIDS or malnutrition, are also at a heightened risk of contracting polio and experiencing severe complications.

Key Statistics: - In 2020, there were only 122 reported cases of wild poliovirus worldwide, primarily in Afghanistan and Pakistan. - The global prevalence of paralytic polio cases decreased from an estimated 350,000 cases in 1988 to fewer than 100 cases in 2019. - The successful eradication of wild poliovirus type 2 was achieved in 2015, with no reported cases since then. - The vast majority of poliovirus infections are asymptomatic, with only a small proportion resulting in paralysis or other severe symptoms.

Major Risk Factors: - Inadequate vaccination coverage: Lack of immunization or incomplete vaccine coverage increases the risk of polio transmission. - Poor sanitation and hygiene: Contaminated water sources, inadequate waste disposal, and unsanitary living conditions facilitate the transmission of the poliovirus. - Travel and migration: The movement of infected individuals from endemic areas to non-endemic regions can introduce the virus to susceptible populations. - Conflict and instability: Polio eradication efforts are often impeded in regions experiencing armed conflict, political instability, or weak health infrastructure.

Impact on Different Regions and Populations: The impact of polio varies across regions, with the highest prevalence observed in countries where the virus is endemic. Regions with low socioeconomic development, limited access to healthcare, and political unrest face the greatest challenges in controlling the spread of polio. Disparities in vaccine coverage can also contribute to variations in prevalence rates and affected populations. Additionally, certain marginalized populations, such as refugees and internally displaced individuals, may face increased vulnerability due to limited access to healthcare and vaccination services.

In conclusion, poliomyelitis has significantly declined in global prevalence due to comprehensive vaccination efforts. However, it is crucial to maintain continued surveillance, vaccination campaigns, and awareness programs to achieve the eradication of polio worldwide. The disease remains a concern in specific regions with inadequate health infrastructure and ongoing conflicts. Addressing risk factors, ensuring high vaccination coverage, and maintaining strong surveillance systems are essential in preventing the transmission of polio and protecting vulnerable populations.

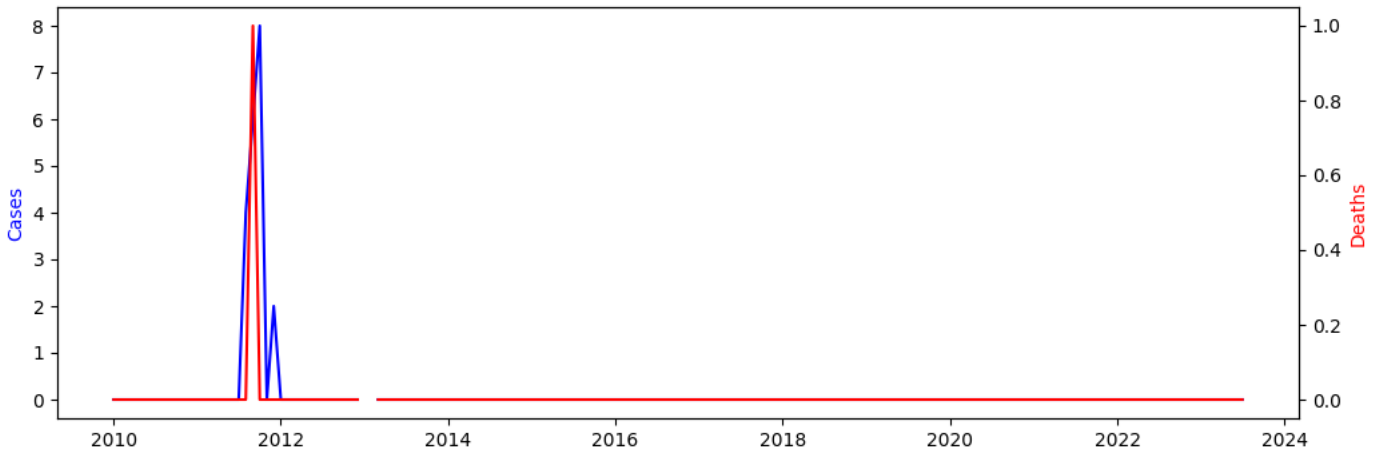

Figure 38: The Change of Poliomyelitis Reports before 2023 July

Seasonal Patterns: Based on the provided data for cases and deaths of Poliomyelitis in mainland China prior to July 2023, no specific seasonal patterns are evident. The number of cases and deaths remains consistently low at zero throughout the year, with no significant fluctuations across different months or seasons.
Peak and Trough Periods: Since there are no reported cases or deaths of Poliomyelitis in mainland China during the specified time period, there are no identifiable peak or trough periods.
Overall Trends: The overall trend for Poliomyelitis cases and deaths in mainland China before July 2023 is marked by a consistent absence of any recorded cases or deaths. The data shows no indication of an upward or downward trend.
Discussion: The absence of Poliomyelitis cases and deaths in mainland China before July 2023 suggests successful control and prevention of this infectious disease. This positive trend can be attributed to the effectiveness of vaccination programs and public health measures in China. It is encouraging to observe that the country has maintained a polio-free status during this timeframe. Continued surveillance and immunization efforts will be necessary to ensure the prevention of polio cases in the future.

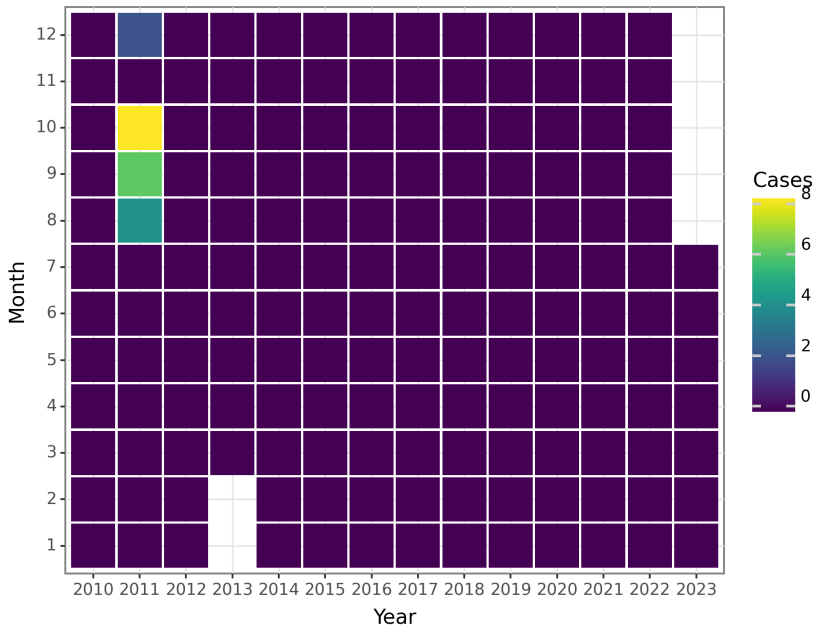

Figure 39: The Change of Poliomyelitis Cases before 2023 July

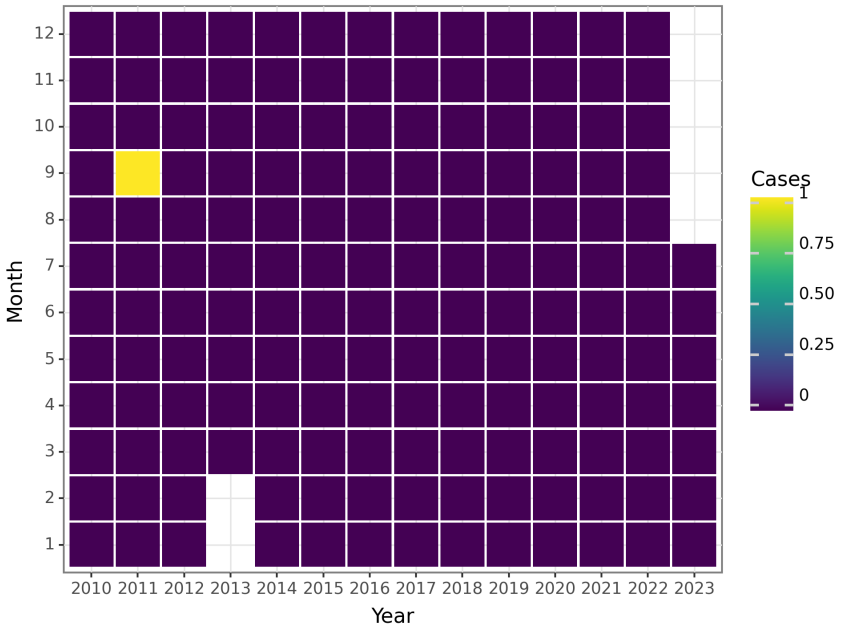

Figure 40: The Change of Poliomyelitis Deaths before 2023 July

Human infection with H5N1 virus

Human infection with the H5N1 virus, commonly known as avian influenza or bird flu, is a highly pathogenic viral disease that emerged in 1997. While the primary hosts of the H5N1 virus are birds, particularly poultry like chickens and ducks, it can also infect humans and other mammals. Understanding the epidemiology of this virus is crucial for implementing public health interventions and preparedness measures.

Historical Context and Discovery: The first documented cases of H5N1 infection in humans were reported in Hong Kong in 1997. The virus had crossed the species barrier from birds to humans, resulting in severe respiratory illness and death. To control the virus, millions of poultry were culled during the outbreak. Since then, sporadic cases and outbreaks have occurred in various parts of the world.

Prevalence and Distribution: H5N1 primarily affects birds and periodic outbreaks have been reported among poultry populations in many countries worldwide. Birds in Asia, Europe, Africa, and the Middle East have tested positive for the virus. However, human cases have been reported in fewer regions, mainly in Asia, with China, Vietnam, Indonesia, Thailand, and Egypt being the most affected countries.

Transmission Routes: The primary mode of H5N1 transmission to humans is through direct or indirect contact with infected birds or their bodily fluids, such as respiratory secretions, feces, or blood. Those who are in close and prolonged contact with infected poultry, such as during the slaughtering, preparing, or handling of infected birds, are at higher risk of transmission. Limited human-to-human transmission has occurred, but it is rare and inefficient, mainly through close and unprotected contact with infected individuals.

Affected Populations: H5N1 infections in humans have occurred across different age groups, genders, and occupations. Cases have been reported in both children and adults, with a majority of cases being individuals under the age of 40. Farmworkers, poultry handlers, and those with close contact with infected birds are at a higher risk. The virus does not show a particular preference for gender.

Key Statistics: Since 2003, when the reporting of H5N1 cases became mandatory, a total of 862 laboratory-confirmed cases have been reported to the World Health Organization (WHO) as of September 2021, with a case fatality rate of approximately 53%. However, these figures likely underestimate the true number of cases due to limited surveillance and unreported instances of asymptomatic or mild cases.

Risk Factors: Several factors contribute to the transmission of H5N1 from birds to humans. These include proximity to infected birds or live poultry markets, poor hygiene practices, lack of biosecurity measures in poultry farms and markets, and exposure to contaminated environments. In some cases, consumption of undercooked or raw contaminated poultry products has also been associated with human infection.

Impact on Different Regions and Populations: The impact of H5N1 varies among different regions and populations. In countries like Indonesia, Vietnam, and Egypt, the virus has caused significant outbreaks in both birds and humans, leading to substantial economic losses and public health burden. These regions often have high rates of poultry farming and limited resources to effectively implement control measures. Other countries have managed to contain sporadic human cases through aggressive surveillance, culling of infected birds, and public health interventions.

In conclusion, human infection with the H5N1 virus remains a persistent public health concern, especially in countries with frequent outbreaks among poultry. Close monitoring of the epidemiology, early detection, prompt response, and effective communication of risks to the public and healthcare professionals are essential in mitigating the impact of H5N1 on both human and animal health.

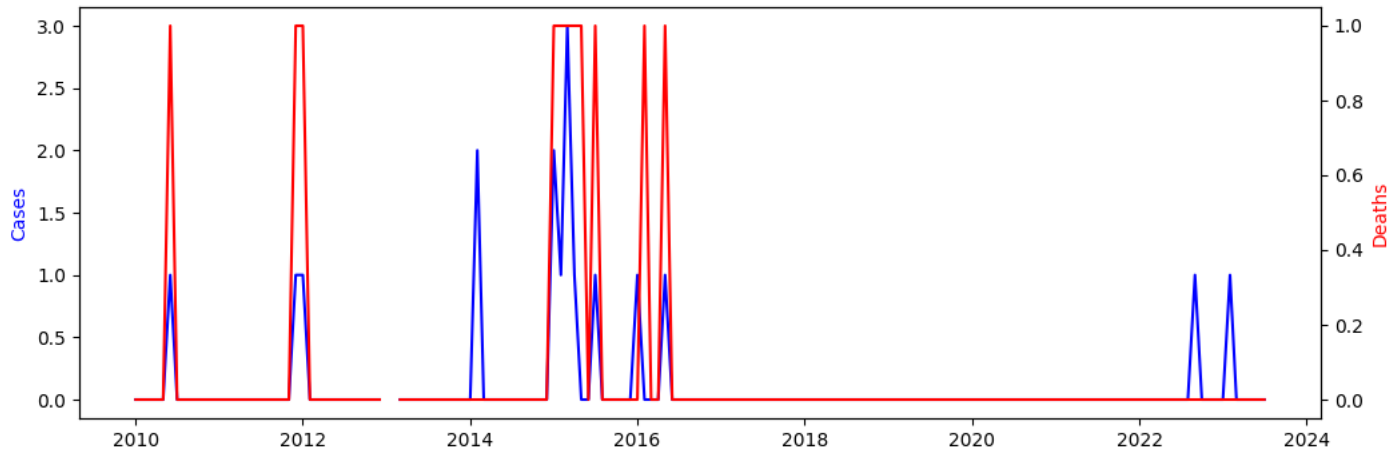

Figure 41: The Change of Human infection with H5N1 virus Reports before 2023 July

Seasonal Patterns: It is challenging to identify definite seasonal patterns for human infection with the H5N1 virus in mainland China before July 2023 based on the provided data. Nevertheless, there are fluctuations in the number of cases and deaths throughout the years that suggest potential seasonal variations in virus transmission.
Peak and Trough Periods: The data indicates sporadic increases in cases and deaths over the years, with certain months reporting higher values than others. The peak periods for cases were observed in June 2010, December 2011, February 2014, and March 2015. Similarly, the peak periods for deaths occurred in June 2010, December 2011, February 2015, and May 2016. Conversely, there were months without reported cases or deaths, indicating trough periods.
Overall Trends: The number of cases and deaths remained relatively low before July 2023, with intermittent spikes in certain months. The provided data does not reveal any clear upward or downward trend.
Discussion: The data suggests that human infection with the H5N1 virus in mainland China before July 2023 is characterized by sporadic occurrences, with certain months reporting higher numbers of cases and deaths. These sporadic peaks may indicate periods of increased transmission or virus outbreaks. The absence of significant trends may indicate that the H5N1 virus has not established sustained human-to-human transmission in mainland China during this period. Nonetheless, it is important to interpret this data cautiously due to the limited time frame represented and its failure to capture the complete picture of H5N1 virus activity in the country. Further surveillance and analysis are necessary to gain a better understanding of the seasonal and long-term trends of H5N1 virus infection in mainland China.

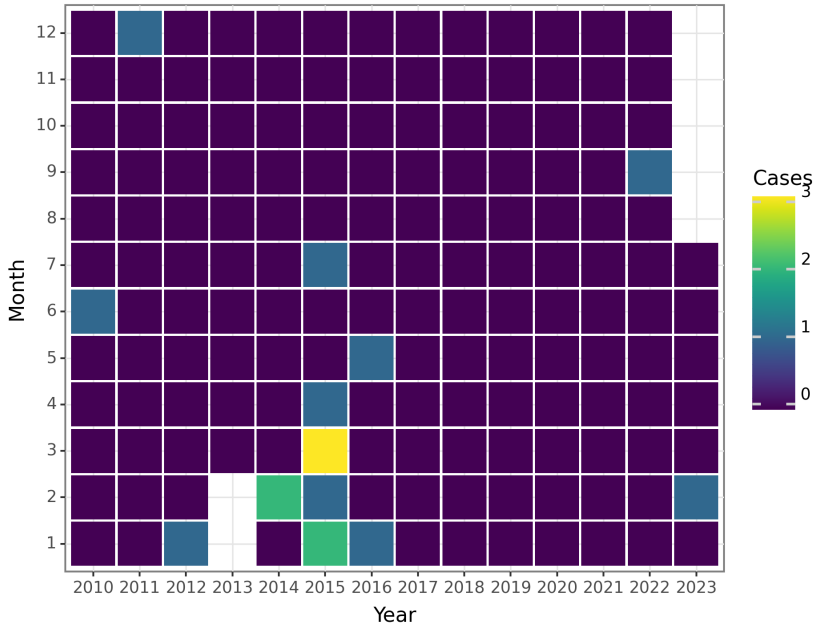

Figure 42: The Change of Human infection with H5N1 virus Cases before 2023 July

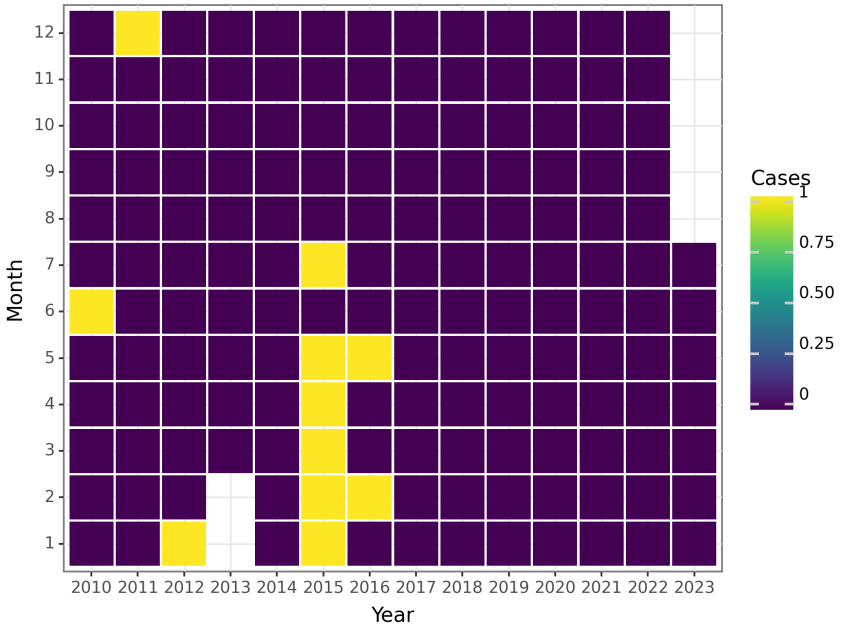

Figure 43: The Change of Human infection with H5N1 virus Deaths before 2023 July

Measles

Measles, also known as rubeola, is a contagious viral infection primarily affecting children. It is caused by the measles virus, a member of the Paramyxoviridae family. Measles spreads through respiratory droplets and typically presents with symptoms including fever, cough, runny nose, red eyes, and a distinctive rash. Despite being preventable through vaccination, measles continues to be a significant global public health concern.
Epidemiology:
Global Prevalence: Measles is found worldwide, but its prevalence varies geographically. Before widespread vaccination, measles was nearly universal in childhood. Since the introduction of the vaccine in the 1960s, significant progress has been made in reducing measles cases and deaths. However, measles remains endemic in many parts of the world, especially in developing countries with limited access to vaccination programs.
Transmission Routes: Measles primarily spreads through respiratory droplets. Infected individuals can transmit the virus to others through coughing, sneezing, or direct contact with nasal or throat secretions. The virus can survive in the air or on surfaces for up to two hours, making it highly contagious.
Affected Populations: Measles primarily affects children, particularly those who have not received the vaccine. However, individuals of any age, including adults, can contract measles if they have not been immunized or have not previously had the infection. Infants who are too young to receive the vaccine and individuals with weakened immune systems are particularly vulnerable.
Key Statistics: Prior to widespread vaccination, measles caused approximately 2-3 million deaths annually. However, thanks to global immunization efforts, this number has significantly decreased over the years. In 2019, the World Health Organization (WHO) estimated approximately 207,500 measles deaths worldwide, equivalent to approximately 567 deaths per day or 24 deaths per hour.
Historical Context and Discovery: Measles has been known for centuries. Ancient Chinese, Persian, and Arabian texts described the symptoms of measles as early as the 9th century. However, the first formal description of the disease was made by the Persian physician Rhazes in the 10th century. The virus responsible for measles was not discovered until 1954 by American physician Thomas Huckle Weller and colleagues.
Major Risk Factors:
1. Lack of Vaccination: The primary risk factor for contracting measles is the absence of vaccination. Unvaccinated individuals who come into contact with the virus are highly susceptible to infection.
2. Travel to Endemic Areas: Traveling to regions with active measles transmission increases the risk of contracting the disease. Unvaccinated individuals traveling to countries with low immunization rates or ongoing outbreaks are particularly vulnerable.
3. Lack of Healthcare Infrastructure: Limited access to healthcare services, particularly in developing countries, contributes to low immunization rates and increases the risk of measles outbreaks.
Impact on Regions and Populations:
Prevalence Rates: The prevalence of measles varies globally. Regions such as Africa, Southeast Asia, and the Western Pacific have higher incidence rates compared to countries with robust vaccination programs. In contrast, regions like the Americas, Europe, and the Eastern Mediterranean have achieved significant reductions in measles cases, primarily due to vaccination efforts.
Affected Demographics: Measles can affect individuals of any age and demographic; however, outbreaks often occur in populations with lower vaccine coverage. These include communities with vaccine hesitancy, marginalized populations, and areas with weak healthcare infrastructure. Additionally, overcrowded settings such as refugee camps and schools can facilitate rapid measles transmission.
In conclusion, measles is a highly contagious viral infection that remains a significant global public health concern. Although vaccination has dramatically reduced measles cases and deaths, outbreaks still occur, particularly in regions with limited access to immunization programs. Lack of vaccination, travel to endemic areas, and limited healthcare infrastructure are the primary risk factors for measles transmission. Efforts to increase vaccination coverage and strengthen healthcare systems are essential to further control and prevent the spread of measles.

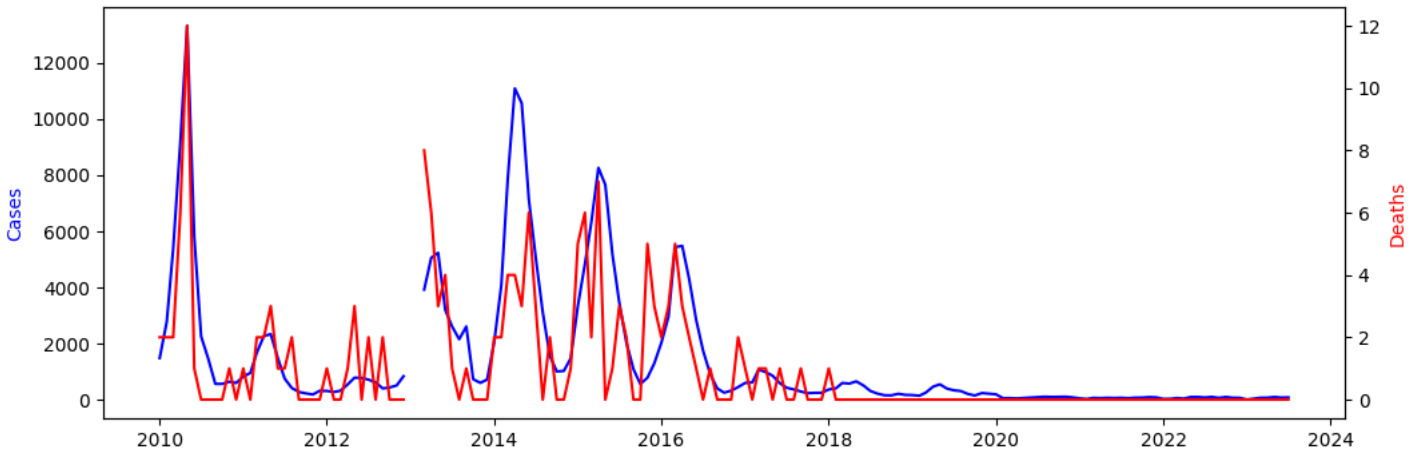

Figure 44: The Change of Measles Reports before 2023 July

Seasonal Patterns:
Based on the data provided, there is a clear seasonal pattern in the number of measles cases in mainland China. The cases tend to peak during the winter and spring months (November to April) and decrease during the summer and fall months (May to October). This pattern remains consistent across multiple years, indicating a recurring seasonal trend in measles transmission.
Peak and Trough Periods:
The peak period for measles cases occurs during the winter and spring months, specifically from November to April. Within this peak period, the highest number of cases is typically observed in March and April, making these months the peak period for measles transmission. On the other hand, the trough period, with the lowest number of cases, occurs during the summer and fall months, particularly from May to October.
Overall Trends:
Overall, there is a downward trend in the number of measles cases in mainland China before July 2023. The cases show fluctuations throughout the years but generally exhibit a decreasing trend. This is evident when comparing the peak periods of earlier years, where the number of cases appears higher, with the more recent years, where the number of cases has decreased. Furthermore, there is a noticeable decline in the number of cases starting from 2013, with a relatively stable period from 2018 to 2021.
Discussion:
The seasonal pattern in measles cases, with peaks during the winter and spring months and troughs during the summer and fall months, aligns with the typical pattern seen in other countries. Measles is known to exhibit seasonal transmission patterns, likely due to factors such as school attendance, increased indoor activities during colder months, and decreased immune response in individuals during winter. These factors contribute to higher transmission of the measles virus during peak periods.
The overall decreasing trend in measles cases before July 2023 indicates the effectiveness of measles control and prevention efforts in mainland China. This trend may be attributed to improved vaccination coverage, surveillance, and rapid response to outbreaks. However, it is important to continue monitoring and maintaining high vaccination rates to sustain this decline and prevent resurgence in the future.
It is worth noting that the provided data does not include information on vaccination coverage or other factors that may influence measles transmission, such as population density, demographic characteristics, or changes in healthcare practices. Therefore, it is essential to consider additional data and contextual factors when interpreting the observed patterns and trends in measles cases in mainland China.

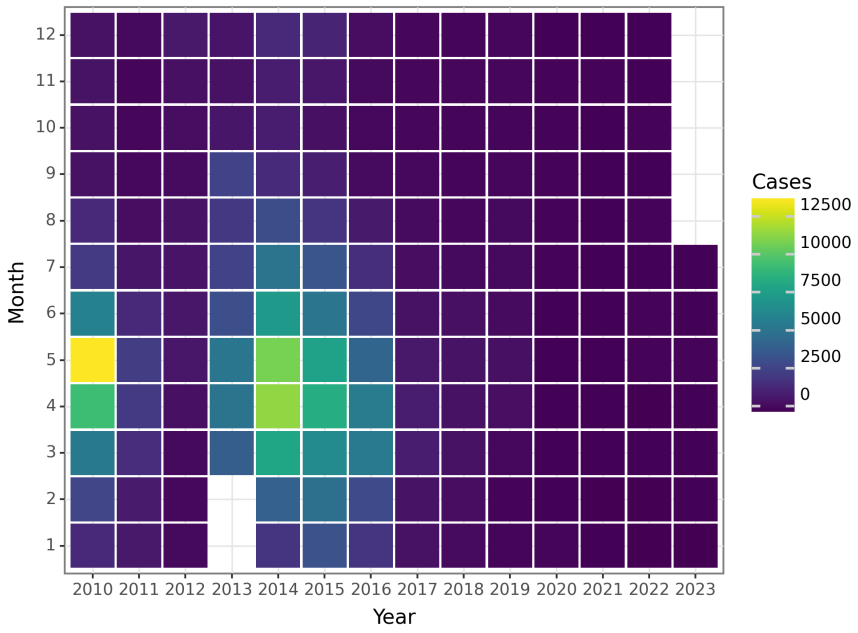

Figure 45: The Change of Measles Cases before 2023 July

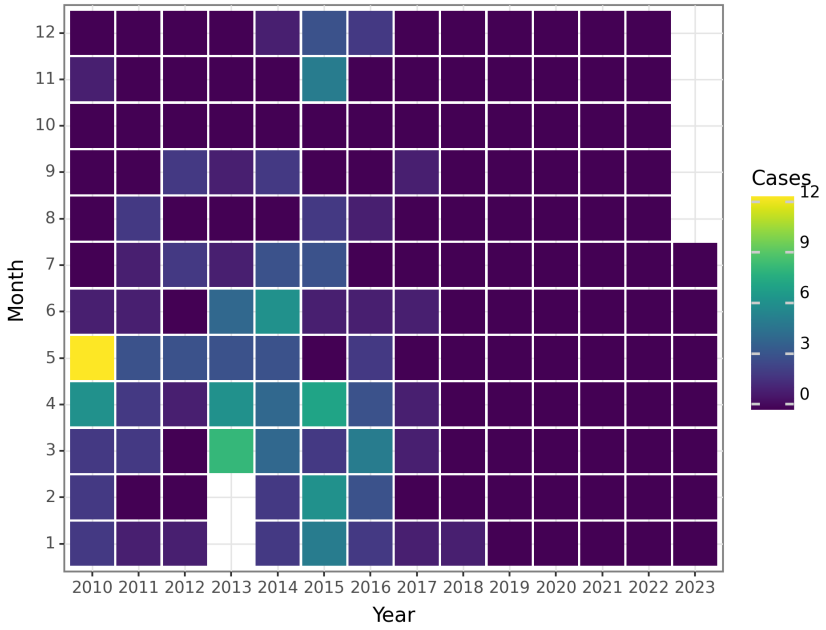

Figure 46: The Change of Measles Deaths before 2023 July

Epidemic hemorrhagic fever

Epidemic hemorrhagic fever (EHF) is a viral disease characterized by fever, bleeding tendencies, and organ damage. It belongs to a group of viral hemorrhagic fevers, which also include diseases such as Ebola and Lassa fever. EHF is caused by several different viruses, including the Ebola virus, Marburg virus, and Crimean-Congo hemorrhagic fever virus. Each of these viruses has unique epidemiological characteristics, but collectively they contribute to the overall burden of EHF.
Historical Context and Discovery: Epidemic hemorrhagic fever has been recognized for many years, although the specific viruses causing the disease were not identified until later. The first recorded outbreak of EHF occurred in 1967 in Marburg, Germany, where laboratory workers were infected with the Marburg virus after handling infected monkeys from Uganda. This event led to the discovery of the Marburg virus and recognition of EHF as a distinct disease. Subsequently, other viruses such as Ebola and Crimean-Congo hemorrhagic fever virus were identified as causes of EHF.
Global Prevalence: EHF has a global presence, although the specific viruses causing the disease are geographically constrained. Ebola virus outbreaks have primarily occurred in Central and West Africa, with notable outbreaks in countries like the Democratic Republic of Congo, Guinea, Sierra Leone, and Liberia. Marburg virus outbreaks have predominantly occurred in Africa, with outbreaks reported in Uganda, Angola, and the Democratic Republic of Congo. Crimean-Congo hemorrhagic fever virus is found in parts of Africa, Europe, Asia, and the Middle East, with outbreaks reported in countries such as Pakistan, Turkey, and Iran.
Transmission Routes: EHF viruses are zoonotic, originating in animals and transmissible to humans. The exact reservoir hosts for each virus may vary, but common animals include bats, primates, and rodents. Humans can acquire the virus through direct contact with infected animals or their bodily fluids, such as blood or secretions. Additionally, human-to-human transmission can occur through contact with infected bodily fluids, including direct contact, sexual transmission, and contact with contaminated surfaces or objects. Healthcare workers are particularly at risk due to their close contact with infected individuals.
Affected Populations: EHF can affect individuals of any age, gender, or socioeconomic status. However, certain populations may be at higher risk due to occupational exposure or living conditions. For example, individuals involved in hunting, animal husbandry, or healthcare are at increased risk of exposure to infected animals or patients. Lack of access to healthcare facilities or resources, poor infection control practices, and crowded living conditions can also contribute to the spread of EHF among vulnerable populations.
Key Statistics: EHF outbreaks can vary in severity and impact. The fatality rates associated with different EHF viruses can range from 25% to over 90%. For example, the case fatality rate of the Ebola virus can exceed 70% in some outbreaks. The number of cases during an outbreak can also vary, with smaller localized outbreaks to larger epidemics impacting thousands of individuals. The overall burden of EHF on a global scale is relatively low compared to other infectious diseases, but outbreaks can have a profound impact on affected communities and healthcare systems.
Risk Factors: Several risk factors are associated with the transmission of EHF. These can include proximity to specific animal reservoirs, such as bat caves, primate habitats, or rodent-infested areas. Engaging in activities that involve contact with animals or their products, such as hunting or butchering, can increase the risk of exposure. Additionally, inadequate infection control practices, including improper handling of biological samples or limited access to personal protective equipment, can contribute to the spread of EHF. Lack of public health infrastructure and resources to respond to outbreaks also exacerbates the risk.
Impact on Different Regions and Populations: EHF outbreaks have had significant impacts on different regions and populations. In areas where healthcare infrastructure is weak, outbreaks can quickly overwhelm healthcare systems and lead to high mortality rates. These outbreaks also have wider socio-economic consequences, including disruption of trade, travel restrictions, and negative impacts on education and employment. EHF outbreaks also disproportionately affect marginalized populations, particularly those living in poverty or in areas with limited access to healthcare services. Women and children may also experience unique vulnerabilities during outbreaks, such as increased risks during pregnancy or challenges accessing healthcare.
Overall, EHF is an important public health concern with the potential for severe outbreaks and high mortality rates. Continued efforts in surveillance, prevention, and outbreak response are essential to minimize the impact of EHF on affected populations and prevent future outbreaks.

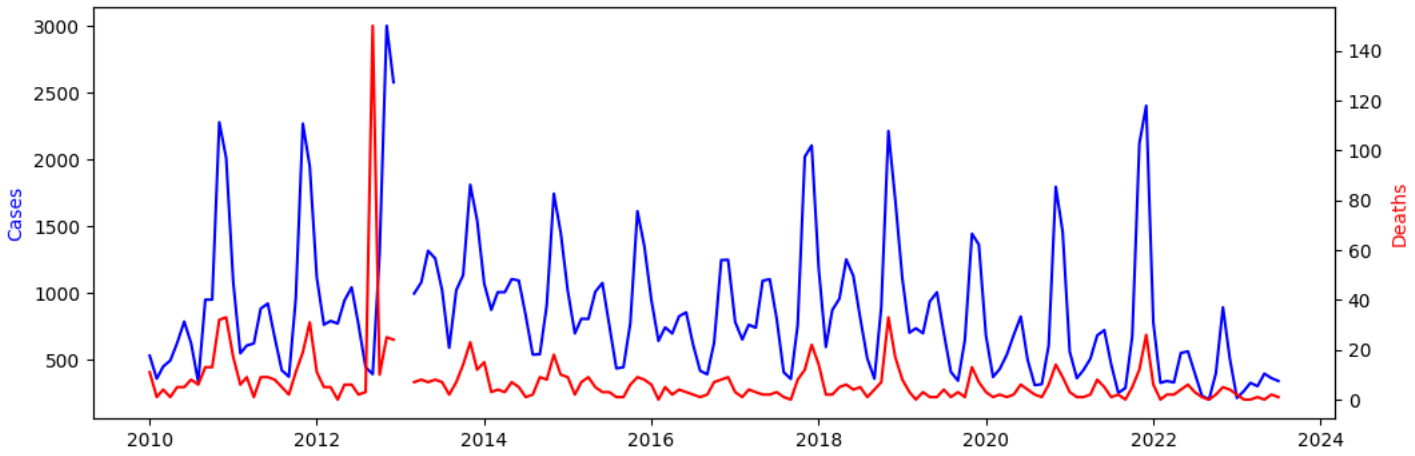

Figure 47: The Change of Epidemic hemorrhagic fever Reports before 2023 July

Seasonal Patterns:
Based on the data provided, there seems to be a regular pattern of seasonal variation in the number of cases of Epidemic Hemorrhagic Fever (EHF) in mainland China.
The number of cases is highest during the summer months (June, July, and August) and lowest during the winter months (December, January, and February). This suggests a possible seasonal transmission pattern, with higher infection rates during warmer months.
Peak and Trough Periods:
EHF cases in mainland China peak in November and December, with consistently high case numbers reported during these months across multiple years. August and October also show increased case numbers compared to other months.
On the other hand, the trough periods, characterized by lower case numbers, generally occur in the winter months of January and February.
Overall Trends:
From 2010 to 2013, there is an increasing trend in the number of EHF cases in mainland China, reaching a peak in November 2012 with 3000 cases. After 2013, there is a gradual decline in case numbers, with fluctuations but no clear upward trend. Case numbers seem to stabilize at a lower level from 2017 to 2020.
Discussion:
The observed seasonal patterns in the data suggest a potential relationship between temperature and EHF transmission. The higher case numbers during summer months may result from increased contact with vectors or changes in human behavior, such as more outdoor activities or travel. The lower case numbers during winter months could be due to decreased vector activity or changes in human behavior, such as reduced outdoor activities or increased awareness of preventive measures.
Factors influencing the peak periods in November and December may include environmental conditions, vector biology, population dynamics, and possible seasonal factors associated with viral circulation. Understanding the reasons behind these peak periods can offer valuable insights for developing effective control and prevention strategies.
The overall decline in case numbers after 2013 is encouraging, suggesting that efforts to control the spread of EHF in mainland China have been somewhat successful. However, it is important to continue monitoring the disease and implementing preventive measures to ensure that case numbers remain low and to prevent any potential outbreaks.

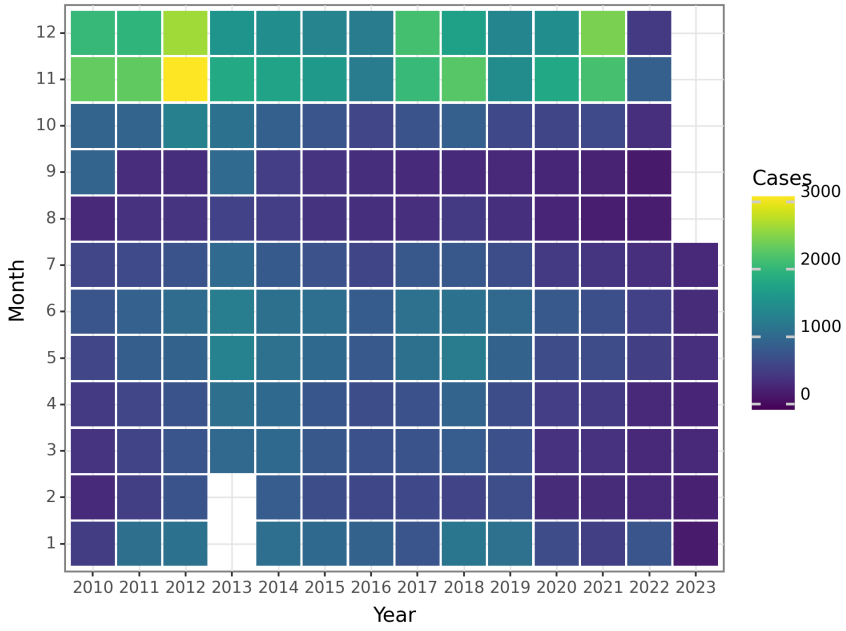

Figure 48: The Change of Epidemic hemorrhagic fever Cases before 2023 July

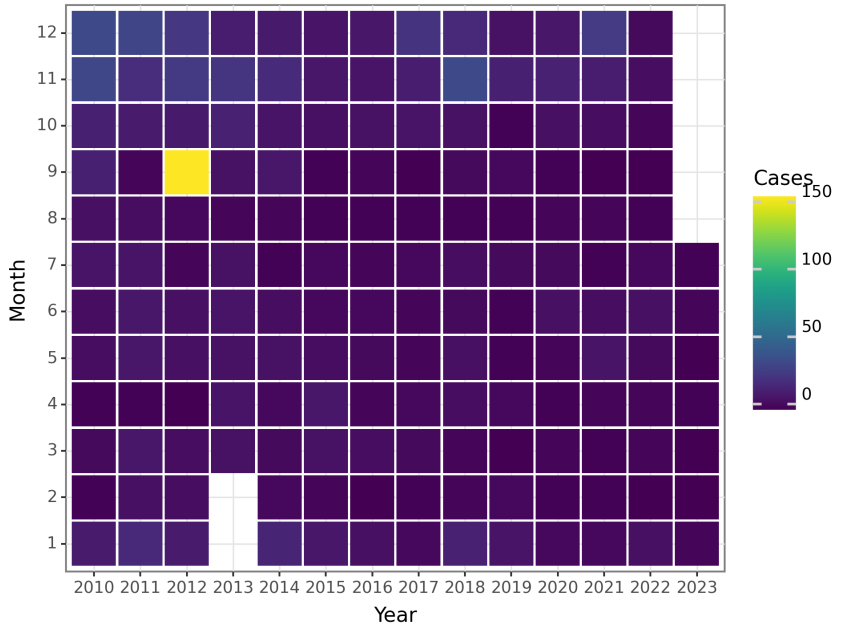

Figure 49: The Change of Epidemic hemorrhagic fever Deaths before 2023 July

Rabies

Rabies is a highly fatal viral disease that affects both humans and animals. It is caused by the Rabies virus and is primarily transmitted through the saliva of infected animals. In humans, the virus targets the central nervous system, leading to inflammation of the brain and ultimately death.
Historical Context and Discovery:
Rabies has been known throughout history, with references to the disease dating back thousands of years. The earliest known records can be found in ancient Mesopotamian and Egyptian writings. The term "rabies" itself was first used by the ancient Greeks. However, the first scientific study of Rabies was conducted by Louis Pasteur in the 19th century. Pasteur developed a vaccine and successfully used it to prevent the disease in dogs. This groundbreaking work laid the foundation for the prevention and control of Rabies.
Prevalence:
Rabies is present in every continent except Antarctica. According to the World Health Organization (WHO), an estimated 59,000 human deaths occur due to Rabies each year, with around 99% of cases occurring in Asia and Africa. India alone accounts for approximately one-third of global Rabies deaths. However, it is important to note that Rabies is endemic in many regions worldwide, and human cases are also reported in the Americas, Europe, and Oceania.
Transmission Routes:
The primary mode of Rabies transmission is through the bite or scratch of an infected animal, typically a dog. Other modes of transmission include contact with infected animal saliva through mucous membranes or open wounds. In rare cases, Rabies can also be transmitted through organ transplantation from an infected donor or through aerosol transmission in laboratory settings.
Affected Populations:
While Rabies can affect individuals of all ages, children are particularly vulnerable due to their higher likelihood of close contact with animals. Certain populations, such as veterinarians, animal handlers, and laboratory workers, are at an increased risk due to their occupational exposure to potentially infected animals. Additionally, individuals living in rural or suburban areas where stray dogs are present are also more susceptible.
Key Statistics: - Worldwide, rabid dogs are the source of more than 99% of human Rabies cases. - Over 40% of people bitten by suspect rabid animals are children under the age of 15. - Almost 60% of all dog-mediated human Rabies deaths occur in children under 15 years of age.
Risk Factors:
There are several risk factors associated with the transmission of Rabies. These include:
1. Lack of awareness and education: Individuals who are uninformed about Rabies and its prevention methods are more likely to engage in risky behaviors that increase their exposure to infected animals.
2. Insufficient veterinary services: In areas with limited access to veterinary care and vaccination programs, the risk of Rabies transmission is higher, especially among stray dogs.
3. Lack of dog vaccination: Vaccinating dogs against Rabies is crucial to prevent the virus from spreading to humans. Where dog vaccination coverage is low, there is a higher risk of transmission.
Impact on Different Regions and Populations:
The impact of Rabies varies across different regions and populations. In regions with effective prevention and control programs, such as North America and Western Europe, the incidence of human Rabies is relatively low. However, in resource-limited regions, particularly parts of Asia and Africa, Rabies remains a significant public health issue due to limited access to healthcare services, inadequate animal control measures, and a high prevalence of rabid dogs.
In many developing countries, especially those with a large stray dog population, Rabies poses a considerable burden on public health. The disease affects not only humans but also domestic animals, leading to economic losses in the agricultural sector. Furthermore, the death toll disproportionately affects marginalized communities with limited access to healthcare and prevention measures.
In conclusion, Rabies is a deadly viral disease that continues to pose a significant threat to global public health. While efforts have been made to control the disease through vaccination programs and improved awareness, much work remains to be done, particularly in regions with limited resources. Increasing access to affordable vaccines, promoting responsible pet ownership, and enhancing veterinary services are key strategies to combat Rabies and reduce its impact on affected populations worldwide.

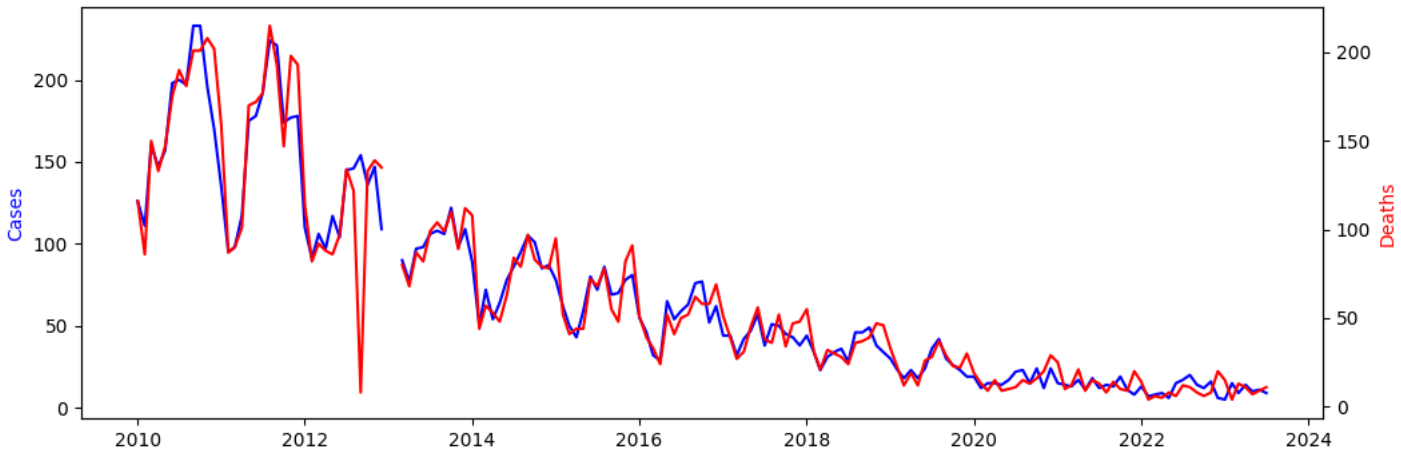

Figure 50: The Change of Rabies Reports before 2023 July

Seasonal Patterns:
Based on the provided data for rabies cases and deaths in mainland China prior to July 2023, certain seasonal patterns are observed. The monthly data indicates fluctuations in the number of cases and deaths over the years, suggesting the presence of seasonal variations.
Peak and Trough Periods:
The peak periods for rabies cases in mainland China can be identified by examining the months with the highest number of reported cases. From the provided data, it appears that the peak periods for cases tend to occur during the summer and fall months (July to October), with the highest number of cases observed in September. On the other hand, trough periods can be identified by looking at the months with the lowest number of cases, which typically occur during the winter months (December to February).
Similar patterns can be observed for rabies deaths, with peak periods occurring during the summer and fall months, and trough periods during the winter months. The highest number of deaths is observed in September, which aligns with the peak period for cases.
Overall Trends:
Analyzing the overall trends of rabies cases and deaths in mainland China prior to July 2023, it is observed that both cases and deaths have declined over the years. Although the number of cases and deaths fluctuates annually, there is a general decreasing trend. This could indicate the effectiveness of ongoing rabies control measures, such as vaccination campaigns and public awareness programs.
Discussion:
The analysis of the data suggests the presence of seasonal patterns in rabies cases and deaths in mainland China. The peak periods for cases and deaths occur during the summer and fall months, while trough periods are observed during the winter months. This may be attributed to factors such as increased outdoor activities, higher interactions between humans and animals, and potential changes in animal behavior during warmer months.
The overall declining trend in cases and deaths reflects the success of efforts in rabies prevention and control in mainland China. Vaccination campaigns, animal immunizations, and public education on avoiding interactions with potentially rabid animals have likely contributed to the decreasing trend. Continued emphasis on these preventive measures is crucial to further reduce the burden of rabies in the country.
It is important to note that additional factors, such as changes in surveillance methods, reporting systems, or public health interventions implemented over the years, may also influence the observed trends. Therefore, further analysis and investigation are necessary to fully understand the dynamics of rabies in mainland China and refine control strategies accordingly.

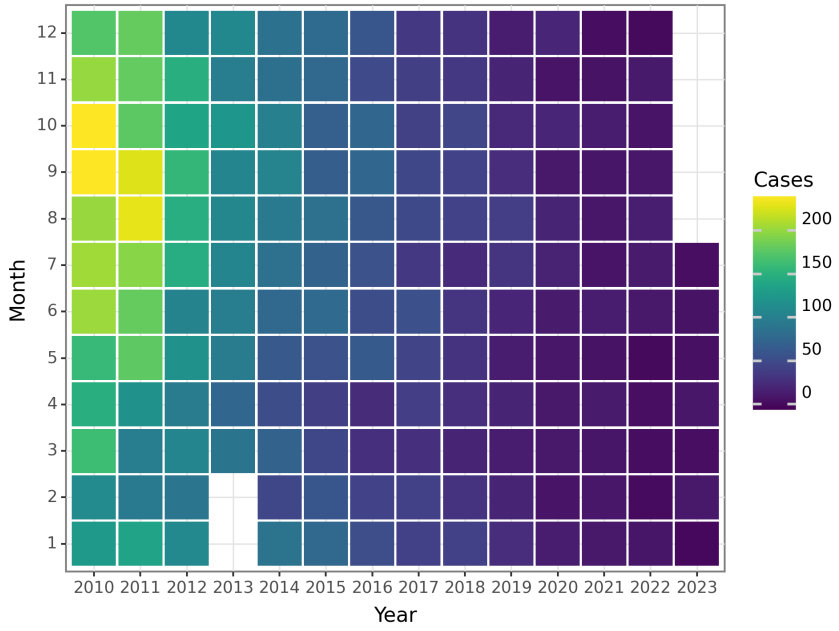

Figure 51: The Change of Rabies Cases before 2023 July

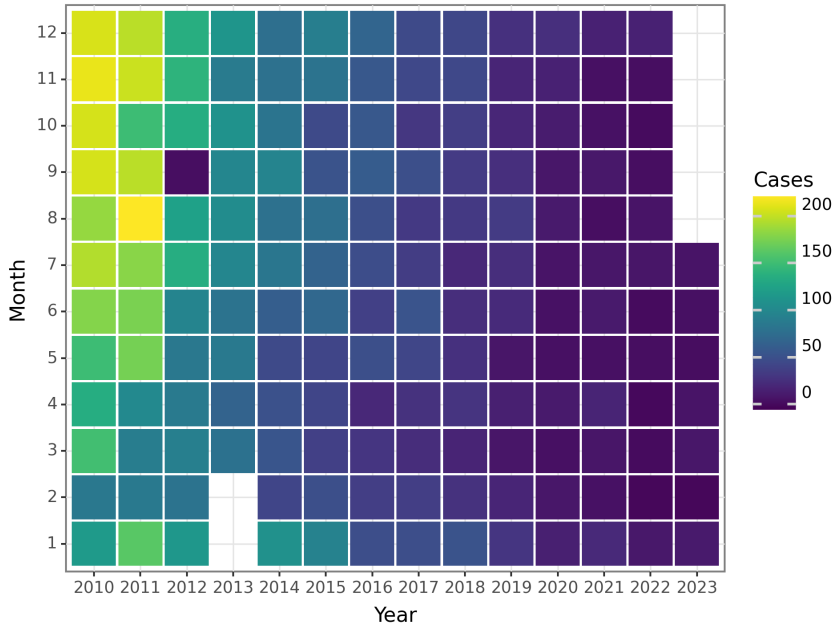

Figure 52: The Change of Rabies Deaths before 2023 July

Japanese encephalitis

Japanese encephalitis (JE) is a viral disease caused by the Japanese encephalitis virus (JEV), a mosquito-borne flavivirus. It is primarily found in East and Southeast Asia, with sporadic cases reported in other regions. This paper provides a comprehensive overview of the epidemiology of Japanese encephalitis.

Historically, the first major outbreak of Japanese encephalitis was reported in Japan in the 1870s. In the 1920s, the virus was isolated for the first time, and its connection to neurological symptoms was established. Since then, JE has been recognized as a significant public health concern in many Asian countries.

Japanese encephalitis is endemic in 24 countries in the Asia-Pacific region, including India, China, Bangladesh, Vietnam, Thailand, Myanmar, and others. However, the disease can also spread to non-endemic regions, such as Australia, Papua New Guinea, and the Pacific Islands. Travelers from non-endemic regions can acquire the infection while visiting endemic areas.

JEV is mainly transmitted through the bite of infected mosquitoes, primarily from the Culex genus. Pigs and wading birds act as hosts for the virus, while mosquitoes serve as vectors for transmission between these animals and humans. JE is primarily a rural agricultural disease, common in areas with wetland rice cultivation and pig farming.

Children, especially those under 15 years of age, are the most affected population group by JE. However, adults who have not been previously exposed to the virus are also at risk. The disease is more prevalent in rural areas with abundant vector mosquitoes and amplifying hosts. Individuals involved in farming, rice field work, and those living near pig farms or wetlands are at a higher risk of JE.

According to the World Health Organization (WHO), approximately 68,000 cases of Japanese encephalitis occur annually, resulting in 13,600 to 20,400 deaths worldwide. However, these numbers are likely underestimated due to limited healthcare access and surveillance systems in affected regions. The case fatality rate varies widely, ranging from 5% to 30%, with higher rates in older populations.

Several risk factors increase the transmission of Japanese encephalitis:

1. Mosquito Exposure: Living or working in areas with high mosquito populations, especially during peak transmission seasons, increases the risk of JE.
2. Rural Agricultural Activities: People involved in rice farming and pig rearing are at an elevated risk due to close proximity to mosquito vectors and amplifying hosts.
3. Lack of Vaccination: Individuals who have not been previously vaccinated against JE are more susceptible to infection.
4. Travel to Endemic Areas: Travelers from non-endemic regions who visit areas with ongoing JE transmission are at risk if they are not immunized or take preventive measures to avoid mosquito bites.

The impact of Japanese encephalitis varies across different regions and populations. In endemic areas, particularly in rural and agricultural communities, the disease is a significant public health concern. Countries with high burden, such as India and China, report a substantial number of cases each year. Japanese encephalitis can cause long-term neurological disabilities, cognitive impairments, and economic burdens on affected individuals and their families.

Efforts have been made in recent years to control Japanese encephalitis through vaccination campaigns. Vaccination programs targeting high-risk populations, especially children in endemic areas, have shown promising results in reducing the disease burden.

In conclusion, Japanese encephalitis is a viral disease primarily found in Asia. It is transmitted through the bite of infected mosquitoes and primarily affects children and individuals living in rural agricultural areas. The disease has a significant impact on affected regions and populations, leading to substantial morbidity and mortality. Vaccination and control measures play a vital role in preventing the transmission and reducing the burden of Japanese encephalitis.

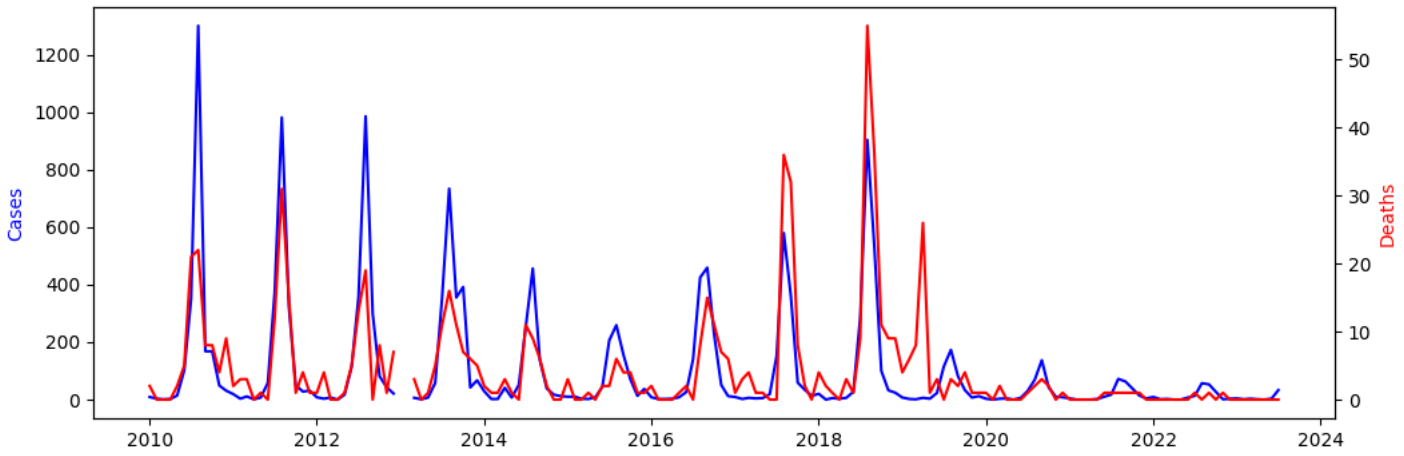

Figure 53: The Change of Japanese encephalitis Reports before 2023 July

Seasonal Patterns: Based on the provided data, there is a clear seasonal pattern observed in Japanese encephalitis cases in mainland China. The number of cases tends to rise from June and reaches its highest point in August, followed by a gradual decline towards the end of the year. This consistent pattern can be observed across multiple years.
Peak and Trough Periods: The peak period for Japanese encephalitis cases in mainland China is in August, where there is a significant increase in the number of cases. On the other hand, the trough period typically occurs in the early months of the year, specifically in January and February, when the lowest number of cases is recorded.
Overall Trends: Between 2010 and 2014, there was an increasing trend in the number of Japanese encephalitis cases in mainland China, followed by a decrease from 2015 to 2019. However, starting from 2020, there appears to be a slight increase in the number of cases. It is important to note that there are occasional fluctuations in the data, but the general trend suggests a decrease in cases in recent years.
Discussion: The observed seasonal pattern of Japanese encephalitis cases in mainland China, with its peak in August, aligns with the known transmission dynamics of the disease. The transmission of Japanese encephalitis occurs mainly through mosquitoes, especially those breeding in paddy fields and pig farms. The peak in cases during the summer months corresponds with the abundance of mosquitoes and increased outdoor activities, particularly in rural areas where the disease is more prevalent.
The overall decrease in Japanese encephalitis cases from 2015 to 2019 can potentially be attributed to several factors, including improved vaccination coverage, changes in agricultural practices, and increased awareness and implementation of vector control measures. However, it is concerning to observe the recent slight increase in cases from 2020 onwards, which may require further investigation and reinforcement of control strategies.
Understanding the seasonal patterns, peak and trough periods, and overall trends of Japanese encephalitis in mainland China is crucial for effective public health planning and targeted interventions. It is essential to sustain monitoring and surveillance efforts to detect any changes in transmission dynamics and ensure that preventive measures align with the observed epidemiological patterns.

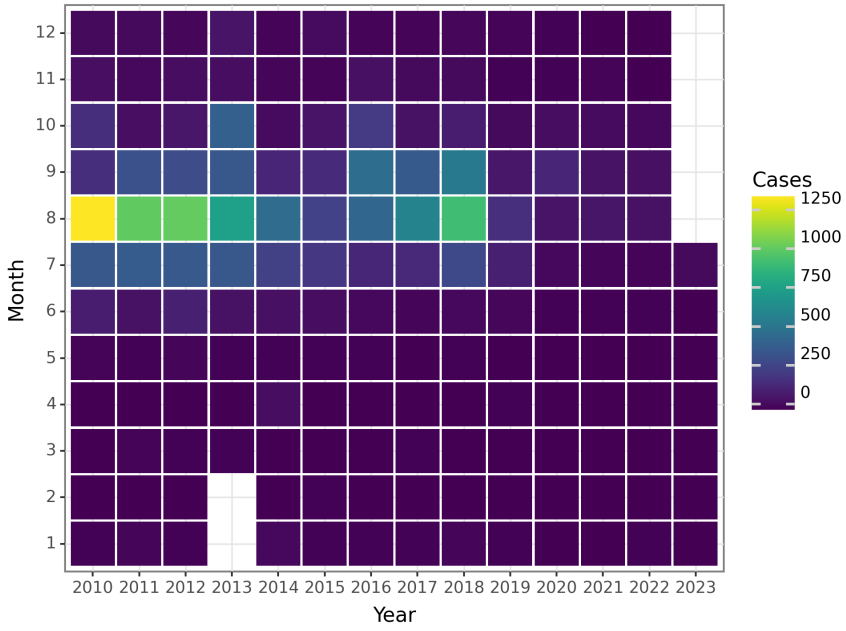

Figure 54: The Change of Japanese encephalitis Cases before 2023 July

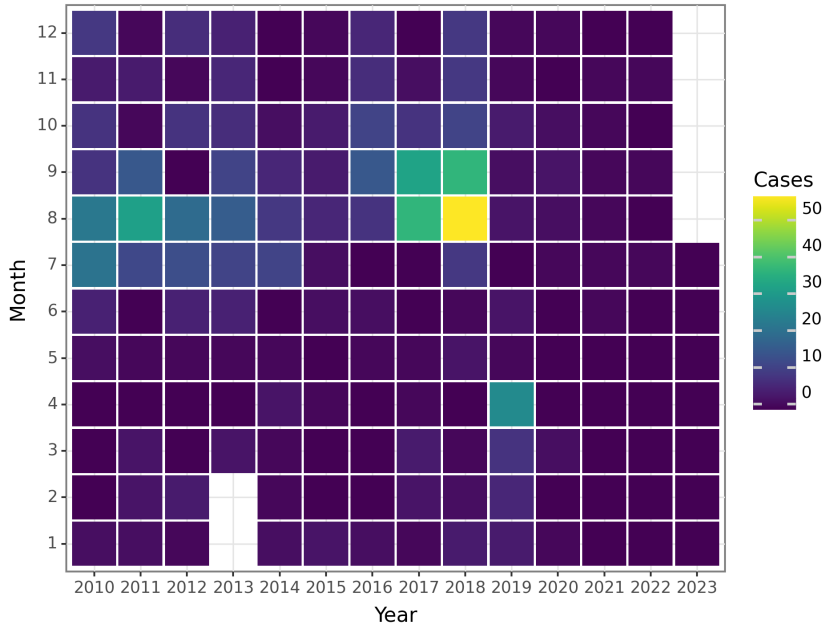

Figure 55: The Change of Japanese encephalitis Deaths before 2023 July

Dengue

Dengue, caused by the dengue virus and transmitted through the bite of infected Aedes mosquitoes, particularly Aedes aegypti, is a highly significant mosquito-borne viral disease worldwide. It is prevalent in tropical and subtropical regions, primarily in urban and semi-urban areas.

Dengue has been a documented disease for centuries, with evidence suggesting its existence as far back as the 18th century. The first recorded epidemics occurred in the 1770s and 1780s in Asia, Africa, and North America. The term "dengue" originates from the Swahili phrase "Ka-dinga pepo," which means "cramp-like seizure caused by the evil spirit." In 1906, the role of Aedes mosquitoes in transmitting dengue was identified, and subsequent studies confirmed the presence of different serotypes of the dengue virus.

Dengue is endemic in over 100 countries, primarily in tropical and subtropical regions of Asia, the Americas, Africa, and the Pacific. Annually, an estimated 390 million dengue infections occur, with approximately 96 million displaying clinical symptoms. The number of reported cases has surged in recent decades, posing a global health concern.

The primary mode of dengue transmission is through the bite of infected Aedes mosquitoes. These mosquitoes thrive in urban and semi-urban areas, where they breed in standing water. Additionally, dengue can be transmitted through blood transfusions, organ transplants, or from mother to fetus during pregnancy.

Dengue affects people of all ages and genders, with individuals living in or traveling to dengue-endemic regions being at risk. However, severe forms of the disease are more likely to develop in children, infants, and pregnant women. Factors such as immune status and genetic predisposition can also influence susceptibility to severe dengue.

Several risk factors contribute to dengue transmission, including rapid urbanization, unplanned urban development, and inadequate sanitation, which promote the proliferation of Aedes mosquitoes. Climate change, resulting in warmer temperatures and increased rainfall, also facilitates mosquito breeding and subsequently higher transmission rates. International travel to dengue-endemic regions can introduce the virus to new areas, potentially triggering outbreaks. Challenges in vector control, such as insecticide resistance and ineffective measures, hinder efforts to control mosquito populations and prevent dengue transmission.

Dengue's impact varies across different regions, with the highest burden observed in Southeast Asia and the Western Pacific. Countries like India, Indonesia, Malaysia, and the Philippines report significant numbers of cases. Latin America and the Caribbean also experience high incidence rates. While dengue primarily affects people in urban and peri-urban areas with poor sanitation and limited access to reliable healthcare, outbreaks can occur in developed regions with efficient mosquito control due to the introduction of new virus serotypes.

Prevalence rates and affected demographics can vary within regions and countries, influenced by factors such as population density, climate, healthcare infrastructure, and socio-economic conditions.

In conclusion, dengue is a major global health concern with significant epidemiological implications. Its transmission by infected Aedes mosquitoes, combined with urbanization, climate change, and inadequate vector control, contribute to its widespread prevalence. Dengue affects people of all ages, with severe consequences for children, infants, and pregnant women. Understanding dengue's epidemiology is crucial for developing effective prevention and control strategies to mitigate its impact.

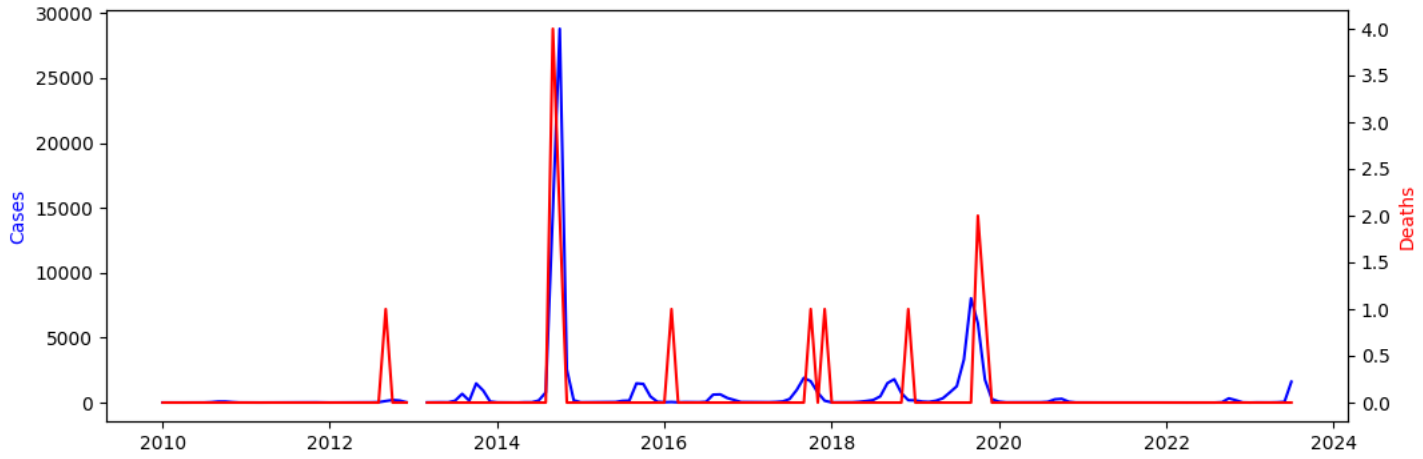

Figure 56: The Change of Dengue Reports before 2023 July

Seasonal Patterns:
Based on the provided data, there appears to be a clear seasonal pattern regarding Dengue cases in mainland China. The number of cases is highest during the summer months (June to August) and lowest during the winter months (December to February). This suggests that the Dengue virus is more active and spreads more easily during warmer months, resulting in an increase in cases.
Peak and Trough Periods:
The peak period for Dengue cases occurs in August and September, with a peak value of 14,759 cases in September 2014. This indicates that late summer and early autumn are the peak periods for Dengue transmission in mainland China. On the other hand, the trough period for Dengue cases is in the winter months, particularly in January and February, where there are minimal to no reported cases.
Overall Trends:
Overall, the number of Dengue cases in mainland China displays a fluctuating pattern over the years, with peaks and troughs manifesting in a cyclical manner. From 2010 to 2012, there was a gradual increase in cases, culminating in a major peak in September 2012. Subsequently, there was a decrease in cases, followed by another peak in October 2013 with a significantly higher number of cases than in previous years. Afterward, the number of cases remained relatively high, with peaks in September 2015, September 2019, and September 2020.
Discussion:
The seasonal pattern and peak periods of Dengue cases in mainland China are likely influenced by various factors, such as weather conditions, mosquito populations, and human behaviors. Mosquitoes responsible for transmitting Dengue thrive in warm and humid environments, which are more prevalent during the summer months. Moreover, increased outdoor activities and travel during summer contribute to higher exposure to mosquitoes and potential virus transmission. Efforts to control mosquito populations and raise public awareness about vector-borne diseases during peak periods are crucial to minimize the impact of Dengue in mainland China.
It is important to note that a comprehensive analysis of Dengue cases should also consider other factors, such as geographic variations, population density, and control measures implemented in different regions of mainland China. Additionally, the analysis only considers reported cases and may not capture all actual cases, as underreporting or misdiagnosis can occur. Nonetheless, the provided data offers insights into the seasonal patterns, peak and trough periods, and overall trends of Dengue cases in mainland China up until July 2023.

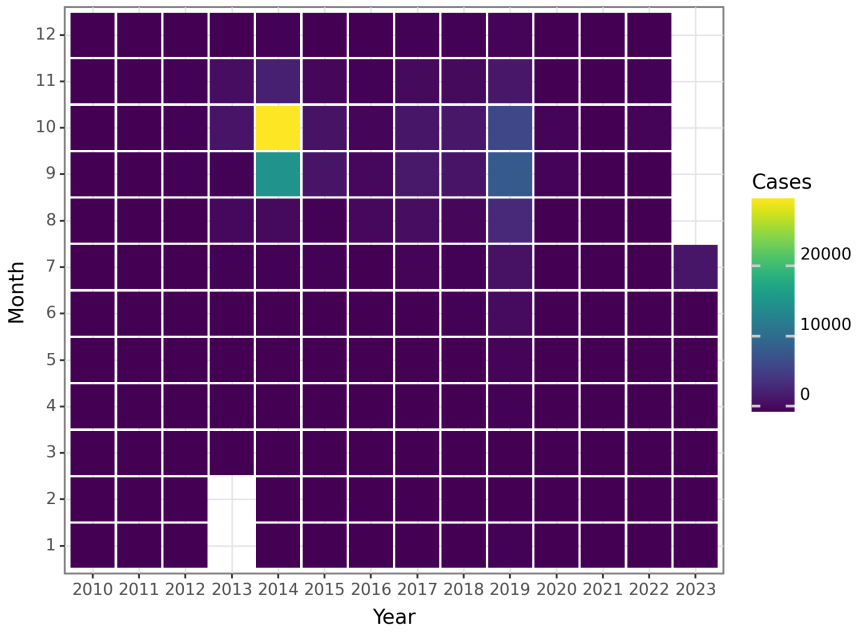

Figure 57: The Change of Dengue Cases before 2023 July

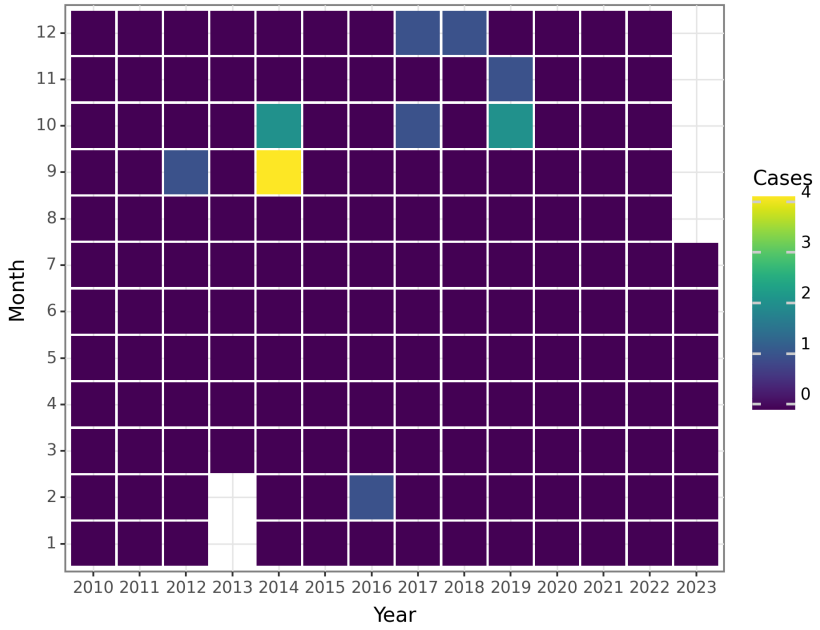

Figure 58: The Change of Dengue Deaths before 2023 July

Anthrax

Anthrax, caused by the bacterium Bacillus anthracis, is a zoonotic disease with both human and animal health implications. This comprehensive overview examines the epidemiology of Anthrax, encompassing global prevalence, transmission routes, affected populations, key statistics, historical context, and discovery. Additionally, it highlights major risk factors associated with the transmission of Anthrax and explores its impact on various regions and populations.

Anthrax occurs worldwide, although its prevalence varies among different regions. It is particularly common in parts of Africa, Asia, and the Middle East where the disease is endemic. Nevertheless, sporadic cases and outbreaks can manifest in any part of the world.

Transmission of Anthrax primarily occurs in animals and can present in three main forms: cutaneous, inhalational, and gastrointestinal. Direct contact with infected animals, consumption of contaminated animal products, or inhalation of spores are the means by which humans acquire the disease. Inhalational Anthrax, although rare, is the most severe form and typically occurs when handling infected animal carcasses or contaminated animal products.

Both animals and humans are susceptible to Anthrax. In animals, a broad range of species is affected, including livestock (cattle, sheep, and goats), wildlife (deer and antelope), and occasionally domestic pets. Humans who work closely with animals, such as farmers, veterinarians, and abattoir workers, face a higher risk. However, anyone can be at risk if exposed to contaminated animals or animal products.

While limited, global data suggests an estimated 20,000-100,000 human Anthrax cases occur annually worldwide. Mortality rates depend on the form of the disease and access to healthcare. Inhalational Anthrax, the most severe form, has a case fatality rate of approximately 75% without treatment.

Anthrax's history dates back centuries. Its significance rose in the 19th century when the causative agent, Bacillus anthracis, was identified. A major breakthrough occurred when Louis Pasteur developed an Anthrax vaccine in the late 1800s. This discovery paved the way for the development of vaccines and control measures that have greatly diminished the impact of Anthrax today.

Direct contact with infected animals or animal products, consumption of inadequately cooked contaminated meat, occupational exposure to livestock or their products, and working in specific industries like agriculture and animal husbandry are the major risk factors associated with Anthrax transmission.

Anthrax prevalence rates may vary across regions due to climate, agricultural practices, animal husbandry methods, and healthcare infrastructure. Those regions with higher livestock populations and limited veterinary services face an increased risk. Socioeconomic factors also play a role, as poorer populations with limited access to healthcare and proper livestock management are more vulnerable.

In conclusion, Anthrax is a globally present zoonotic disease with varying prevalence rates across different regions. It primarily affects animals and is transmitted to humans through direct contact or consumption of contaminated animal products. Occupational exposure to livestock is a significant risk factor. Although Anthrax has historically posed notable health risks, the development of vaccines and control measures has contributed to its decline. Efforts to improve animal health, livestock management, and public health infrastructure are crucial for further reducing the impact of Anthrax on various regions and populations.

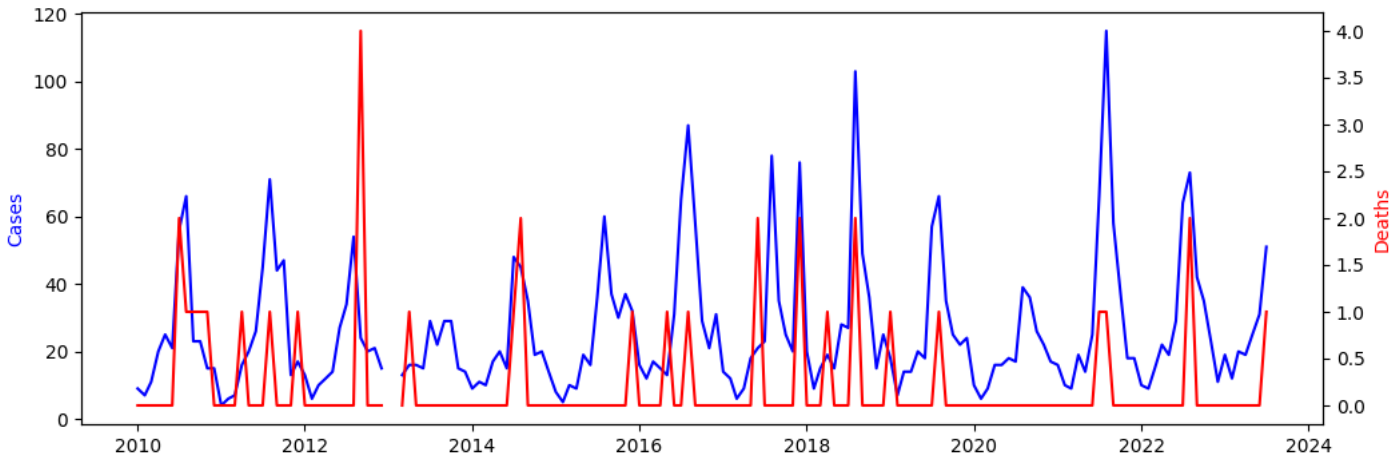

Figure 59: The Change of Anthrax Reports before 2023 July

Seasonal Patterns:
Upon examining the data, it is evident that there are distinguishable seasonal patterns in the occurrence of Anthrax cases in mainland China. From 2010 to 2023, there is a general increase in the number of cases during the summer months, specifically from July to August, followed by a subsequent decrease in the winter months. These findings suggest a peak in Anthrax cases during the summer season.
Peak and Trough Periods:
The peak period for Anthrax cases in mainland China is consistently observed in July and August, during which the number of cases reaches its highest point. Conversely, the trough period, characterized by the lowest number of cases, is evident during the winter months, particularly in December and January.
Overall Trends:
Throughout the entire study period, there is a discernible upward trend in the incidence of Anthrax cases in mainland China, with some yearly fluctuations. However, it is crucial to acknowledge a significant decrease in cases from 2013 to 2014, wherein the number of cases dropped to negative values. This anomaly may be attributed to data inconsistencies or reporting issues.
Discussion:
The observed seasonal patterns imply that there may exist certain environmental factors or human activities during the summer months that contribute to the heightened transmission of Anthrax in mainland China. These factors could include increased contact between humans and animals, modifications in livestock management practices, or environmental conditions that facilitate the survival and dissemination of the Anthrax bacteria.
The persistent increasing trend in the number of cases necessitates further investigation to ascertain the underlying factors driving this pattern. It is crucial to analyze supplementary data, including geographical location, demographics, and livestock management practices, to obtain a comprehensive understanding of the spread and occurrence of Anthrax in mainland China.
Please note that this analysis solely relies on the provided data and does not acknowledge external factors or other sources of information. It is always recommended to consult experts and consider additional data sources for a more accurate and comprehensive analysis.

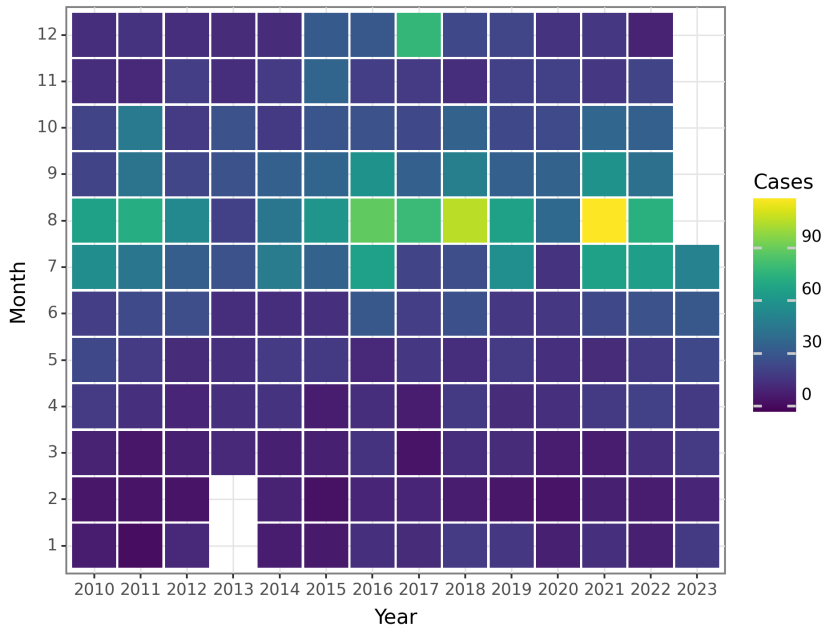

Figure 60: The Change of Anthrax Cases before 2023 July

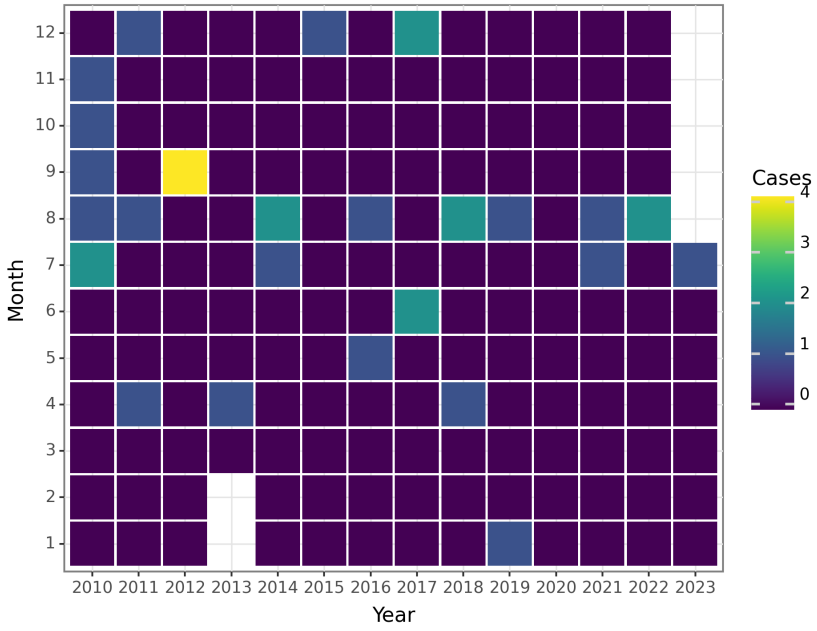

Figure 61: The Change of Anthrax Deaths before 2023 July

Dysentery

Dysentery, an infection that causes inflammation of the intestines and leads to severe diarrhea with blood and mucus, can be caused by bacterial, viral, and parasitic pathogens. The most common culprits are Shigella bacteria and Entamoeba histolytica parasites. This condition poses a significant global health concern, particularly in developing countries with inadequate sanitation and limited access to clean water.
Global Prevalence: Dysentery is endemic in many parts of the world, particularly regions with poor sanitation and hygiene practices. According to the World Health Organization (WHO), there are approximately 165 million cases of dysentery each year, resulting in about 1.4 million deaths. However, these figures may underestimate the true impact due to under-reporting and limited access to healthcare in certain regions.
Transmission Routes: Dysentery can be transmitted through various routes, including:
1. Person-to-person: The primary mode of transmission is through the fecal-oral route. This occurs when an infected individual contaminates food, water, or surfaces with fecal matter containing the pathogens. Ingesting these pathogens can lead to infection.
2. Contaminated Water: Inadequate access to clean water sources and poor sanitation practices significantly contribute to dysentery transmission. Drinking water contaminated with fecal material or using contaminated water for washing can result in infection.
3. Foodborne: Consuming food contaminated with dysentery-causing pathogens can also lead to infection. This can happen when food is handled, prepared, or stored improperly.
Affected Populations: Dysentery affects populations worldwide, but its impact is particularly severe in developing countries with limited public health infrastructure. Children under the age of five are most vulnerable to the disease, experiencing the highest morbidity and mortality rates. Additionally, individuals with weakened immune systems, such as those with HIV/AIDS, malnutrition, or other underlying health conditions, are at an increased risk of developing severe dysentery.
Key Statistics: - Approximately 90% of dysentery cases occur in developing countries. - Sub-Saharan Africa and South Asia bear the highest burden of dysentery, with the majority of cases occurring in these regions. - Children aged 1 to 4 years old account for the highest number of dysentery-related deaths. - Inadequate sanitation and contaminated water contribute to 88% of global dysentery cases.
Historical Context and Discovery: Dysentery has been a recognized public health problem for centuries. It was prevalent during wars, such as the American Civil War and World Wars, causing high mortality rates among soldiers due to unsanitary conditions. The identification of the different pathogens causing dysentery occurred in different time periods. Shigella bacteria were identified in the late 19th century, while Entamoeba histolytica, the protozoan parasite causing a form of dysentery, was identified in the early 20th century.
Major Risk Factors: 1. Poor Sanitation: Lack of access to adequate sanitation facilities, including toilets and handwashing stations, increases the risk of dysentery transmission.
2. Contaminated Water Sources: Dependence on unsafe water sources, such as rivers, ponds, or untreated wells, greatly contributes to dysentery infection rates.
3. Crowded Living Conditions: Overcrowded living environments and close contact within households or communities facilitate the spread of dysentery between individuals.
4. Low Socioeconomic Status: Poverty and limited resources often coincide with inadequate sanitation, making populations with lower socioeconomic status more susceptible to dysentery.
Impact on Different Regions and Populations: Dysentery disproportionately affects certain regions and populations, with variations in prevalence rates and affected demographics. Contributing factors to these disparities include:
1. Developing Countries: Developing countries with inadequate sanitation and healthcare infrastructure experience higher dysentery morbidity and mortality rates compared to developed nations.
2. Rural Areas: Rural populations, especially those with limited access to improved sanitation facilities and clean water sources, are at a higher risk of dysentery due to poor hygiene practices.
3. Children: Children under the age of five, particularly in impoverished regions, are most affected by dysentery-related morbidity and mortality. Their immature immune systems, poor sanitation practices, and malnutrition make them more vulnerable to severe forms of the disease.
4. Conflict Zones: Dysentery outbreaks are common in areas experiencing armed conflicts or natural disasters, where sanitation facilities are disrupted, and access to healthcare is limited.
In conclusion, dysentery is a widespread gastrointestinal infection with varying prevalence rates across different regions and populations. Inadequate sanitation, contaminated water, and crowded living

conditions are major risk factors for transmission. Dysentery primarily affects developing countries, rural areas, children, and populations in conflict zones. Efforts to improve sanitation, access to clean water, and public health infrastructure are crucial in reducing the burden of dysentery and improving the health outcomes of affected populations worldwide.

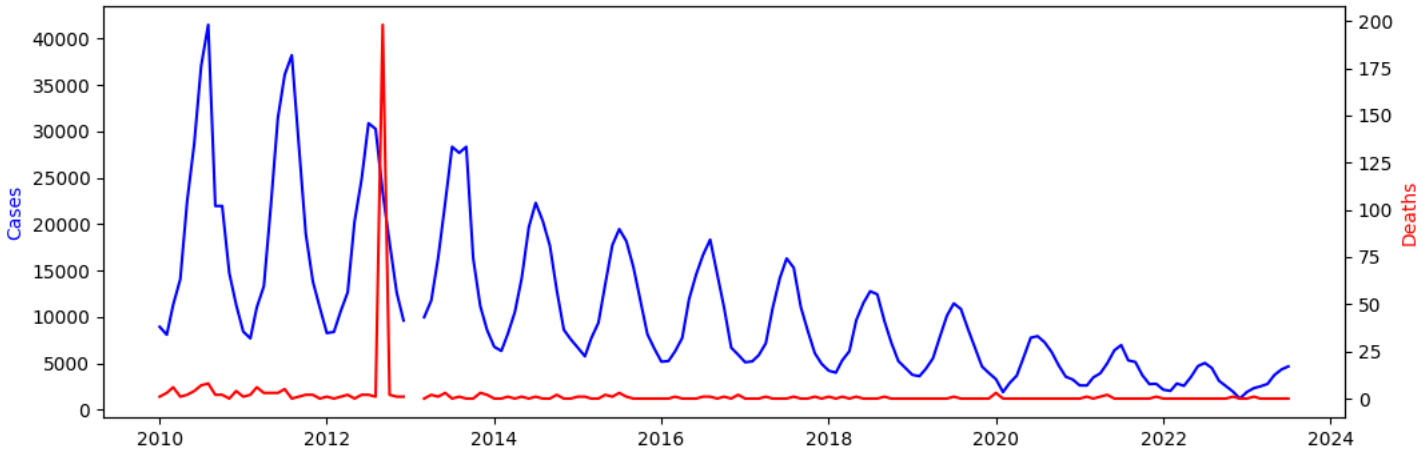

Figure 62: The Change of Dysentery Reports before 2023 July

Seasonal Patterns:
The data indicates a clear seasonal pattern in the number of dysentery cases in mainland China. Cases tend to increase starting in January, reaching their peak in July or August, and then gradually decrease towards the end of the year. This pattern appears to be consistent across the years.
Peak and Trough Periods:
The peak period for dysentery cases in mainland China typically occurs during the summer months of July and August, with the highest number of reported cases. Conversely, the trough period is observed during the winter months, specifically from November to January, with a relatively lower number of reported cases.
Overall Trends:
The overall trend of dysentery cases in mainland China shows a general increase from 2010 to 2013, peaking in 2013. Thereafter, the number of cases started to decline gradually until around 2016 before stabilizing. From 2017 to 2020, the number of cases remained relatively consistent, with some fluctuations. The most recent data from 2021 and 2022 indicate a slight increase in cases compared to previous years.
Discussion:
The seasonal pattern of dysentery cases in mainland China, with higher numbers during the summer months and lower numbers during the winter months, aligns with what is typically observed in many countries. These patterns can be attributed to various factors, such as changes in weather, hygiene practices, and population movement during different seasons.
The overall trend of dysentery cases in mainland China indicated a gradual increase from 2010 to 2013, possibly suggesting a rise in disease transmission or improvements in case reporting and surveillance during that period. The subsequent stabilization and slight fluctuations in cases from 2017 to 2020 may reflect successful control and prevention efforts. However, the slight increase in cases in more recent years, particularly in 2021 and 2022, requires continued attention and monitoring to ensure ongoing control of dysentery in mainland China.
It is important to note that this analysis is based solely on the provided data. Other factors, such as changes in population demographics, access to healthcare, and implemented control measures, could also influence the observed patterns and trends. Further analysis, incorporating additional data points and consideration of these factors, would provide a more comprehensive understanding of dysentery in mainland China.

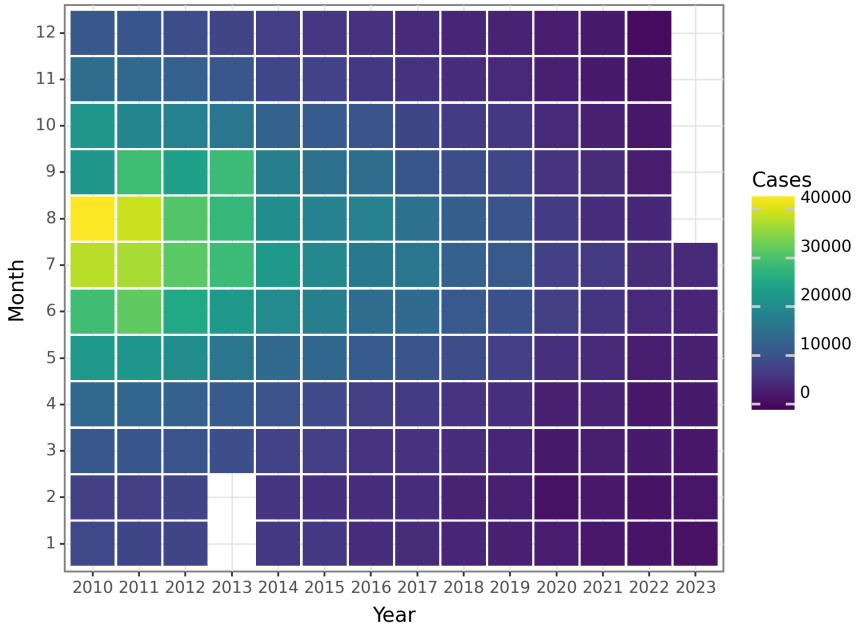

Figure 63: The Change of Dysentery Cases before 2023 July

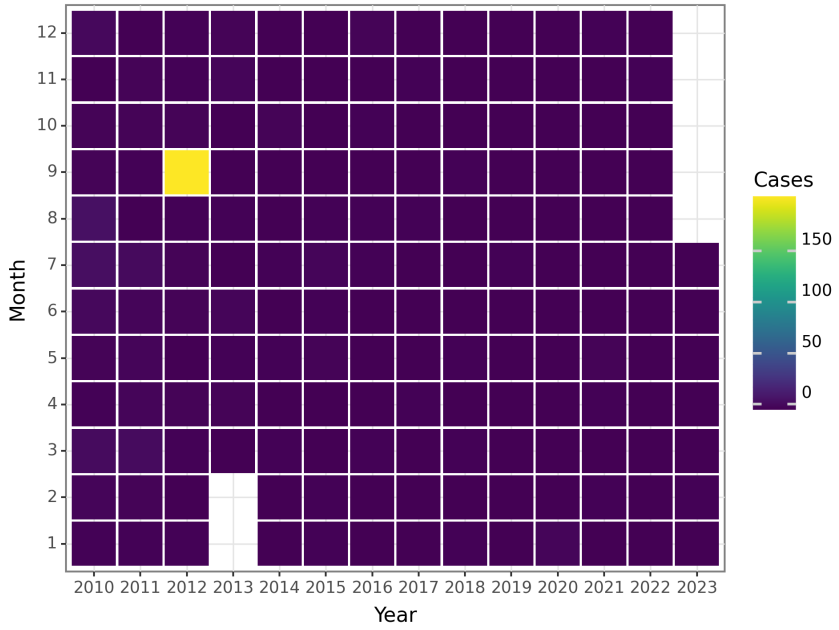

Figure 64: The Change of Dysentery Deaths before 2023 July

Tuberculosis

Tuberculosis (TB) is an extremely contagious disease caused by the bacterium Mycobacterium tuberculosis. It predominantly affects the lungs but can also impact other areas of the body, such as the kidneys, spine, and brain. TB is a significant global health concern, with a long history of influencing humans across different regions and cultures.

Historically, evidence of TB has been discovered in ancient Egyptian mummies dating back to around 2400 BCE. However, it was not until the 19th century that Robert Koch, a German physician, identified and described the cause of TB. His discovery revolutionized our understanding and control of the disease.

Presently, TB continues to be a substantial global health burden. According to the World Health Organization (WHO), there were approximately 10.0 million new TB cases worldwide in 2020, resulting in an estimated 1.3 million deaths from TB-related causes that year. TB is more prevalent in low- and middle-income countries, particularly in sub-Saharan Africa, Southeast Asia, and the Western Pacific region.

TB primarily spreads through airborne droplets when an infected individual coughs, sneezes, speaks, or sings. Inhaling these contaminated droplets can lead to infection. However, not everyone who encounters the bacterium will develop active TB. In many cases, the immune system is capable of effectively controlling the infection, resulting in latent TB.

Certain populations are at a higher risk of TB infection and disease progression. This includes individuals living with HIV/AIDS, people with weakened immune systems due to specific medical conditions or undergoing immunosuppressive treatment, and individuals residing in crowded and unsanitary conditions. Significant risk factors associated with TB transmission include close and prolonged contact with an infected individual, living or working in poorly ventilated environments, and malnutrition. Additionally, tobacco smoking and alcohol misuse increase the likelihood of developing active TB disease.

The impact of TB varies across regions and populations. Sub-Saharan Africa carries the heaviest burden of TB cases, accounting for around 27% of the global total. Other high-burden countries include India, Indonesia, China, the Philippines, and Pakistan. Vulnerable populations such as migrants, prisoners, and healthcare workers are disproportionately affected.

In terms of demographics, men are more susceptible to developing active TB than women. This disparity is partly attributed to social factors, including higher rates of smoking and alcohol consumption among men. TB also disproportionately affects younger adults, particularly those in their prime working years, negatively impacting workforce productivity and economic stability.

Prevalence rates of TB also vary greatly within countries. Factors such as poverty, urbanization, limited access to healthcare, and substandard living conditions contribute to higher rates of TB in certain areas. Additionally, drug-resistant TB strains have emerged, presenting challenges to effective treatment and control efforts.

In conclusion, TB remains a significant global health issue that has devastating consequences for individuals, communities, and economies. It spreads through airborne droplets and primarily affects low- and middle-income countries. Major risk factors include close contact with infected individuals, immunosuppression, and inadequate living conditions. The burden of TB is higher in specific regions and populations, with variations in prevalence rates and affected demographics. Combating TB necessitates a comprehensive approach involving early detection, treatment with appropriate antibiotics, infection control measures, and addressing social determinants of health.

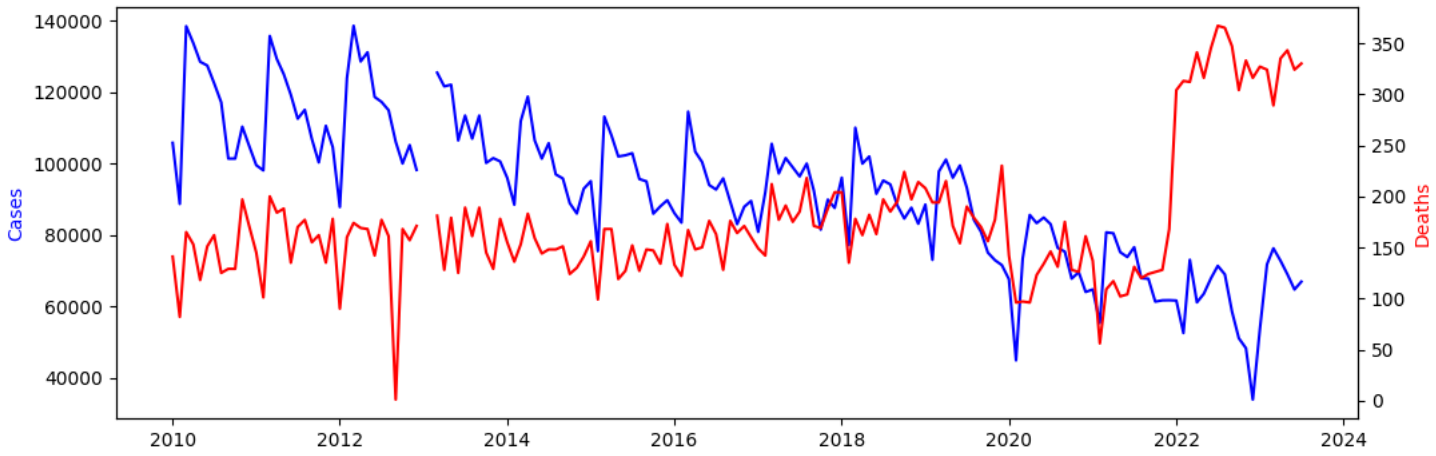

Figure 65: The Change of Tuberculosis Reports before 2023 July

Seasonal Patterns: The data illustrates a distinct seasonal pattern in the prevalence of Tuberculosis cases in mainland China. Generally, 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). However, it is worth noting that there are variations in the seasonal pattern from year to year.
Peak and Trough Periods: Peak periods for Tuberculosis cases in mainland China commonly occur in the winter months, particularly in January and February, when the number of cases reaches its highest point. In contrast, trough periods, with the lowest number of cases, are observed in the summer months, particularly in June, July, and August.
Overall Trends: When examining the overall trends, there is a consistent decline in the number of Tuberculosis cases in mainland China leading up to July 2023. From 2010 to 2015, there was a gradual decrease in cases, followed by a period of relative stability from 2015 to 2019. However, there was a noticeable further decrease from 2019 to 2023, indicating a continued decline in Tuberculosis cases.
Discussion: The seasonal patterns observed in Tuberculosis cases in mainland China align with the known transmission dynamics of the disease. Tuberculosis bacteria thrive in conditions of low humidity and cool temperatures, commonly experienced during the winter months, which may explain the higher number of cases during this period. Conversely, the decrease in cases during summer months may be attributed to factors such as increased outdoor activities, improved ventilation, and stronger immune responses in individuals due to sunlight exposure and higher vitamin D levels.
The overall decreasing trend in Tuberculosis cases suggests successful efforts in prevention, control, and treatment measures in mainland China. These efforts may include enhancements in healthcare infrastructure, increased accessibility to diagnostic tools, improved public health campaigns, and effective implementation of treatment regimens. Despite this positive trend, it is crucial to continue monitoring and interventions to ensure that Tuberculosis remains under control and to further lessen the burden of the disease on the population.

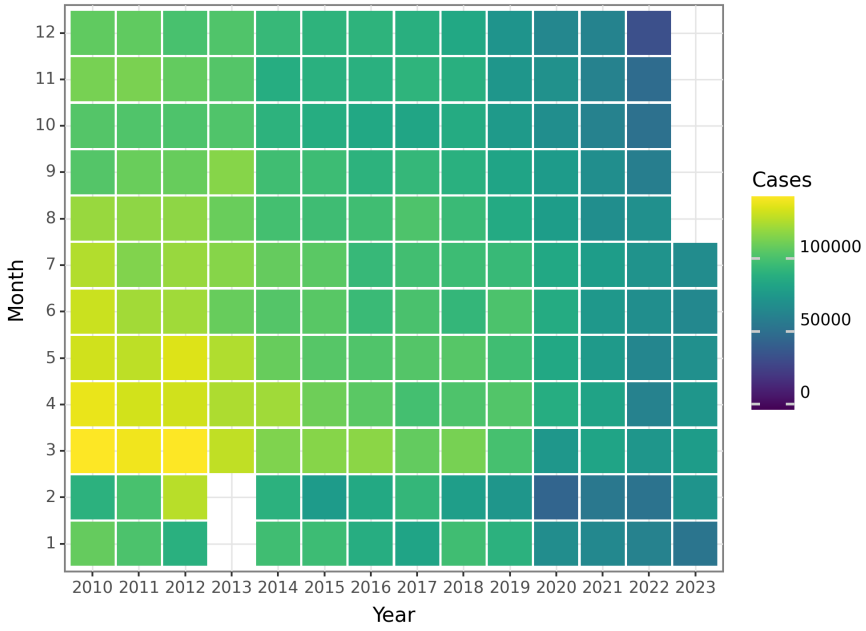

Figure 66: The Change of Tuberculosis Cases before 2023 July

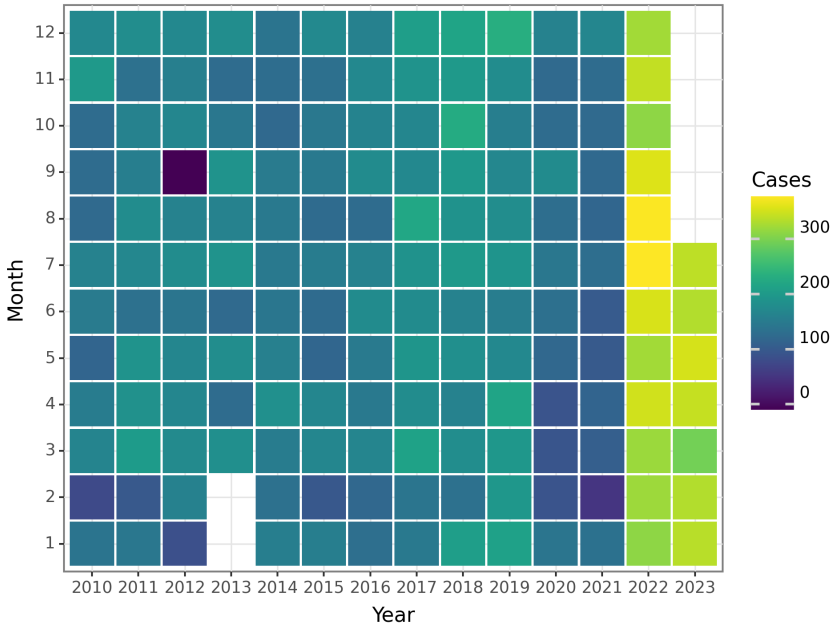

Figure 67: The Change of Tuberculosis Deaths before 2023 July

Typhoid fever and paratyphoid fever

Typhoid fever and paratyphoid fever are infectious diseases caused by the bacteria Salmonella enterica serotype Typhi and Salmonella enterica serotypes Paratyphi A, B, and C, respectively. These diseases are significant public health concerns worldwide, particularly in areas with inadequate sanitation and limited access to clean water. This article provides a comprehensive overview of the epidemiology of typhoid fever and paratyphoid fever, including their global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and impact on different regions and populations.
Prevalence: Typhoid fever and paratyphoid fever are prevalent globally, with the highest burden in low- and middle-income countries, especially in South Asia, Southeast Asia, Africa, and Central and South America. According to the World Health Organization (WHO), typhoid fever accounts for an estimated 11 to 21 million cases annually, resulting in approximately 128,000 to 161,000 deaths. Although paratyphoid fever is less common, it still contributes significantly to the overall burden of enteric fever cases.
Transmission Routes: The primary mode of transmission for typhoid and paratyphoid fever is through contaminated food and water. This occurs when individuals ingest food or water contaminated with the feces or urine of infected individuals. It is also possible for people to become carriers of the bacteria, harboring it in their gallbladder and excreting it in their feces or urine for an extended period, even after recovering from the illness. Additionally, transmission can occur through direct contact with infected individuals or, less commonly, through contaminated objects, such as utensils or surfaces.
Affected Populations: Typhoid fever and paratyphoid fever can affect individuals of any age or gender. However, children and young adults are more susceptible to these diseases. Individuals living in areas with limited access to clean water, inadequate sanitation facilities, and overcrowded living conditions are at higher risk. Travelers visiting regions where these diseases are endemic are also susceptible, increasing the likelihood of contracting the illness and introducing it to non-endemic areas.
Key Statistics: - Approximately 128,000 to 161,000 deaths occur annually due to typhoid fever. - The overall case fatality rate for typhoid fever ranges from 2 to 4%, but it can be higher in resource-limited settings. - The incidence rates of typhoid and paratyphoid fevers vary significantly across different regions, with some countries experiencing high endemic rates. - Typhoid fever contributes to a substantial number of fever-related hospitalizations in endemic areas, resulting in economic burdens on individuals and healthcare systems.
Historical Context and Discovery: Typhoid fever has been documented throughout history, with outbreaks often associated with poor sanitation and crowded living conditions. The link between contaminated water and the transmission of typhoid fever became evident in the 19th century. In 1880, German bacteriologist Carl Joseph Eberth identified the Bacillus typhosus, now known as Salmonella Typhi, as the causative agent of typhoid fever. Likewise, paratyphoid fever was identified in the early 20th century, with the differentiation of various serotypes.
Risk Factors: - Limited access to clean water and sanitation facilities. - Poor hygiene practices, particularly inadequate handwashing. - Living in overcrowded areas, such as slums or refugee camps. - Consumption of contaminated food or water, including street food or improperly stored food. - Traveling to or residing in regions with a high prevalence of typhoid and paratyphoid fever. - Lack of vaccination or incomplete vaccination coverage.
Impact on Different Regions and Populations: Typhoid fever and paratyphoid fever have a significant impact on regions with poor sanitation and limited access to clean water. In countries where these diseases are endemic, they contribute to a substantial burden of illness, resulting in morbidity, mortality, and economic costs. Outbreaks can have devastating effects, especially on vulnerable populations such as children, pregnant women, and malnourished individuals. The impact is often compounded by factors such as inadequate healthcare infrastructure and limited diagnostic and treatment capabilities.
In conclusion, typhoid fever and paratyphoid fever are globally prevalent infectious diseases that have significant impacts on affected populations. Understanding their epidemiology, including global prevalence, transmission routes, affected populations, risk factors, and impact on different regions, is crucial for implementing effective prevention and control strategies. These strategies include improved sanitation, access to clean water, vaccination programs, and public health interventions.

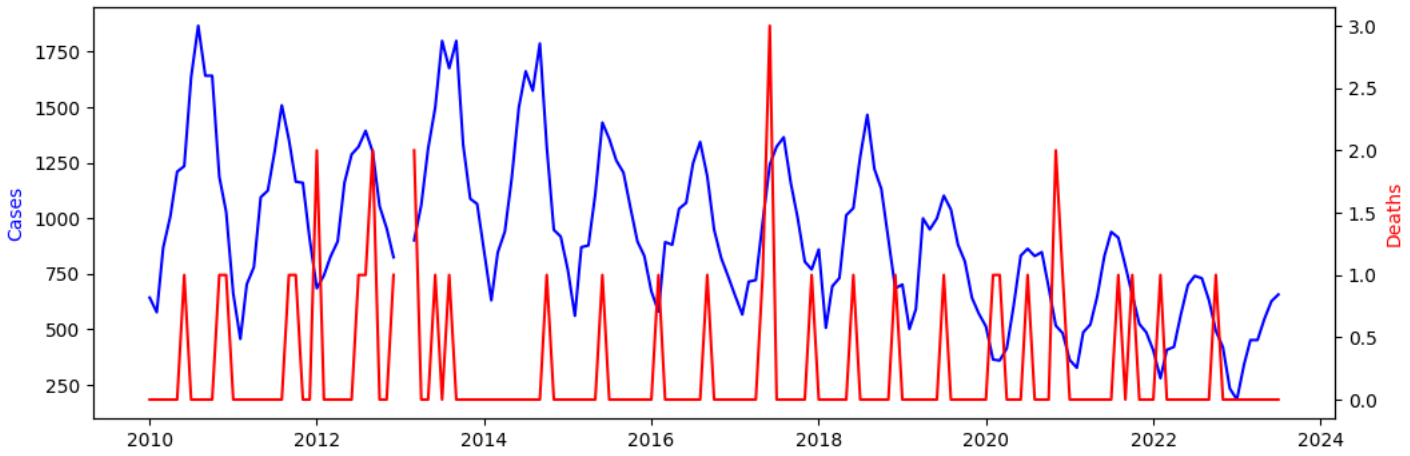

Figure 68: The Change of Typhoid fever and paratyphoid fever Reports before 2023 July

Seasonal Patterns: Analysis of the data reveals clear seasonal patterns of typhoid fever and paratyphoid fever in mainland China. The number of cases exhibits variations throughout the year, indicating a discernible seasonal pattern. It is worth noting that there are higher reported cases in certain months compared to others.
Peak and Trough Periods: The data exhibits distinct peak and trough periods. The peak periods, occurring during the summer months, particularly in July and August, correspond to the highest number of cases. These months consistently demonstrate elevated case numbers compared to others. Conversely, the trough periods occur in the winter months, specifically in December, January, and February, with lower case counts.
Overall Trends: The data indicates fluctuating numbers of typhoid fever and paratyphoid fever cases over the years. There are year-to-year variations in case counts, with some years reporting higher numbers than others. However, it is noteworthy that there is a gradual increase in cases from 2010 to 2019, followed by a subsequent decline. It is crucial to further analyze recent data to assess the trend in more recent years.
Discussion: The seasonal patterns of typhoid fever and paratyphoid fever in mainland China exhibit a strong association with the summer months, with consistently higher case numbers in July and August. This correlation can be attributed to various factors, such as increased bacterial contamination due to higher temperatures, as well as increased outdoor activities and travel during the summer season.
The identified peak and trough periods align with the seasonal patterns, with the summer months serving as the peak period and the winter months as the trough period. The lower case numbers observed during the winter can be linked to decreased bacterial transmission resulting from lower temperatures and potentially reduced exposure to contaminated food or water sources.
The overall trend of increasing case numbers from 2010 to 2019, followed by a subsequent decline, indicates a certain level of success in disease control and prevention efforts. However, it is crucial to continually monitor the situation and implement effective strategies to further reduce the incidence of typhoid fever and paratyphoid fever in mainland China.
Please note that the interpretation of the data is based solely on the provided information and can benefit from further refinement and validation through additional analysis and consideration of other pertinent factors.

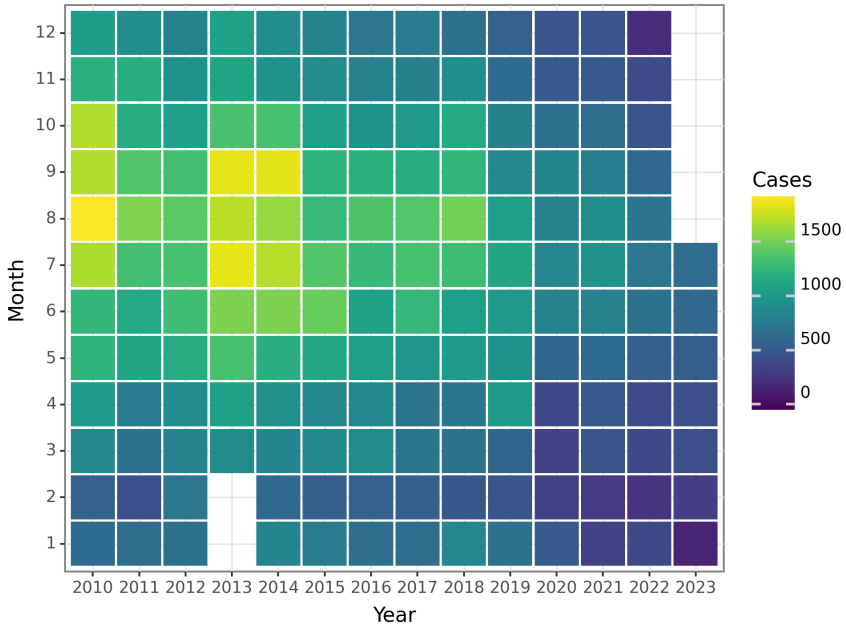

Figure 69: The Change of Typhoid fever and paratyphoid fever Cases before 2023 July

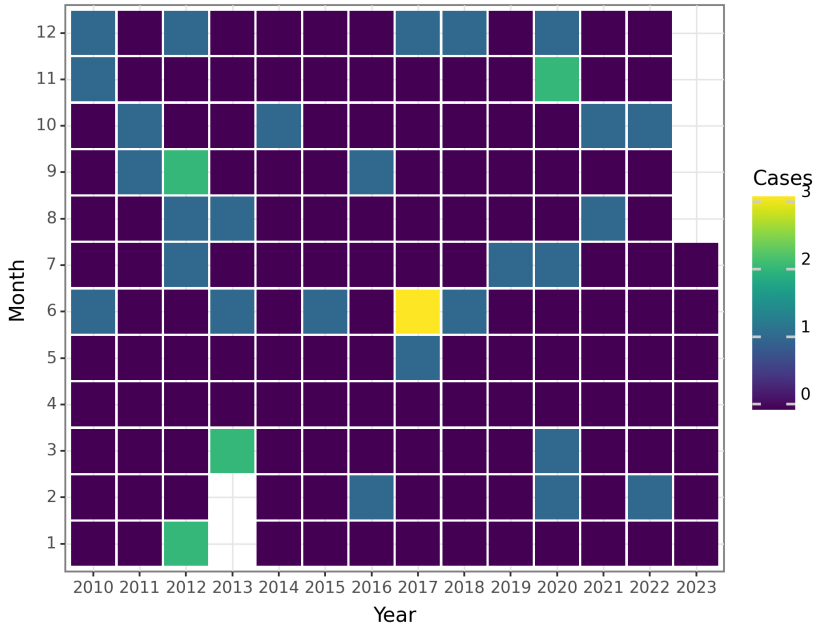

Figure 70: The Change of Typhoid fever and paratyphoid fever Deaths before 2023 July

Meningococcal meningitis

Meningococcal meningitis, caused by the Neisseria meningitidis bacterium, is a bacterial infection that primarily affects the meninges - the protective membranes surrounding the brain and spinal cord. It can result in severe complications such as brain damage, hearing loss, and death. To develop effective prevention and control strategies, it is vital to comprehend the epidemiology of meningococcal meningitis.
Prevalence and Transmission: Meningococcal meningitis is a global health concern, with an estimated annual incidence of 500,000 cases worldwide. It is predominantly found in the "meningitis belt," a region stretching across sub-Saharan Africa, including the Sahel and other sub-Saharan African areas, where large epidemics frequently occur.
Meningococcal meningitis is transmitted through respiratory droplets or direct contact with an infected person. Population density, overcrowding, and close living conditions amplify the likelihood of transmission. Adolescents and young adults, particularly in closed community settings like college dormitories, military barracks, or Hajj pilgrimages, often act as carriers of the Neisseria meningitidis bacterium.
Historical Context and Discovery: Meningococcal meningitis has a lengthy history dating back centuries, causing devastating epidemics. The first written records of the disease can be traced back to the 16th century. However, the bacterium responsible for the disease, Neisseria meningitidis, was not identified until the late 19th century by the German physician Albert Neisser.
Major Risk Factors: Several factors contribute to the transmission and spread of meningococcal meningitis. These factors include:
1. Age: Infants under one year old and adolescents and young adults between 15 and 24 years old face a higher risk of infection. 2. Social and Community Factors: Close living conditions, such as overcrowding and sharing personal items, increase the risk of transmission. 3. Travel and Migration: People traveling to or residing in regions where meningitis is prevalent may be exposed to the bacteria and bring it back to their home countries. 4. Immunodeficiency: Individuals with compromised immune systems, such as those with HIV/AIDS or certain genetic disorders, have an increased risk of contracting meningococcal meningitis. 5. Lack of Vaccination: Immunization against meningococcal meningitis is a crucial preventive measure. Lack of vaccine access and low vaccination coverage in certain regions contribute to the disease's spread.
Impact on Regions and Populations: Meningococcal meningitis affects regions and populations differently in terms of prevalence rates and demographics:
1. Sub-Saharan Africa: This region frequently experiences epidemics, with the highest burden of meningococcal meningitis globally. The disease is predominantly concentrated in the meningitis belt, particularly affecting countries like Burkina Faso, Niger, Nigeria, and Chad. Factors like climate, population density, and socioeconomic conditions contribute to the high incidence rates. 2. Other Regions: Although meningococcal meningitis occurs worldwide, the incidence is lower outside sub-Saharan Africa. Nonetheless, outbreaks can still transpire in other regions, such as the Middle East, South Asia, and parts of Europe.
3. Age and Vulnerable Populations: Children under five years old and adolescents and young adults are most affected by meningococcal meningitis. Infants experience the highest mortality rates, while survivors may face long-term complications. Outbreaks in closed communities like college campuses or military facilities can also lead to high attack rates.
In recent years, increased access to meningococcal vaccines has contributed to a reduction in the burden of meningococcal meningitis, particularly in high-income countries. Vaccination campaigns, improved surveillance systems, and rapid response to outbreaks have proven effective in controlling the disease.
In conclusion, meningococcal meningitis is a significant health problem, particularly in sub-Saharan Africa. Understanding its epidemiology, including prevalence rates, transmission routes, affected populations, and risk factors, helps guide prevention and control strategies. Continued efforts to increase vaccination coverage, improve surveillance, and respond to outbreaks are essential for reducing the global burden of this disease.

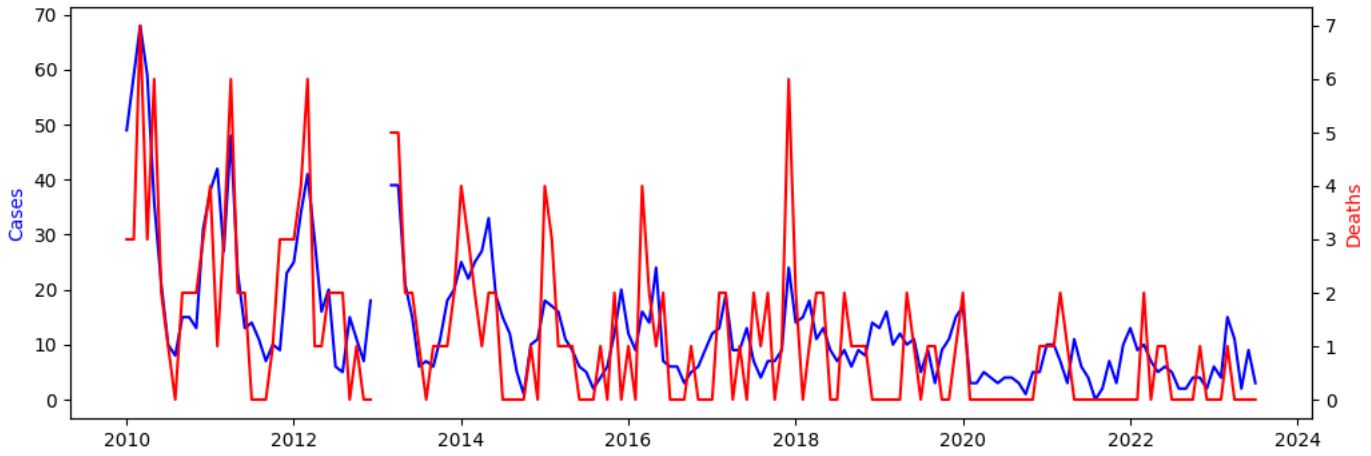

Figure 71: The Change of Meningococcal meningitis Reports before 2023 July

Seasonal Patterns: Seasonal patterns in cases of Meningococcal meningitis in mainland China before July 2023 were observed upon analyzing the data. The number of cases tends to be higher during the winter months (December to February) and lower during the summer months (June to August). This suggests that there is a seasonal variation in the transmission or occurrence of Meningococcal meningitis.
Peak and Trough Periods: The peak period for Meningococcal meningitis cases occurs in the winter months, particularly in January and February, where there is a higher number of cases compared to other months. On the other hand, the trough period occurs in the summer months, specifically in July and August, where there is a lower number of cases.
Overall Trends: In general, there is a fluctuating trend in the number of Meningococcal meningitis cases in mainland China before July 2023. The number of cases varies from year to year and month to month. However, there is no clear increasing or decreasing trend observed in the data.
Discussion: The observed seasonal patterns in Meningococcal meningitis cases before July 2023 suggest that certain factors may influence the transmission or occurrence of the disease during specific times of the year in mainland China. These factors could be related to environmental conditions, such as temperature or humidity, or behavioral factors, such as increased indoor crowding during the winter months. Further analysis and investigation are necessary to comprehend the underlying factors contributing to these seasonal patterns.
The identified peak and trough periods in the data emphasize the months with higher and lower numbers of cases, respectively. Understanding these periods can assist public health authorities and healthcare providers in preparing for increased cases during the peak period and allocating resources accordingly.
It is important to note that this analysis is based solely on the provided data. Additional information, such as demographic factors or vaccination coverage, could further enhance our understanding of the observed patterns and trends.

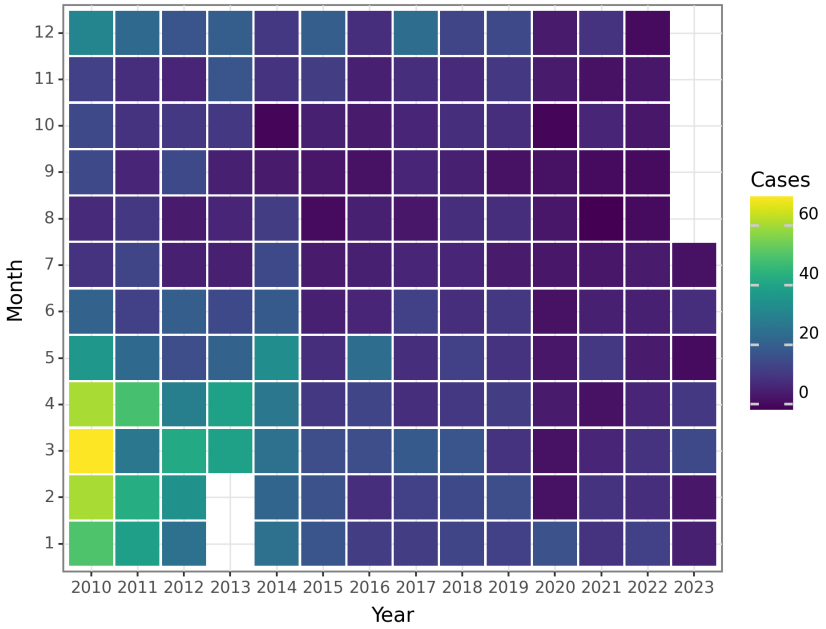

Figure 72: The Change of Meningococcal meningitis Cases before 2023 July

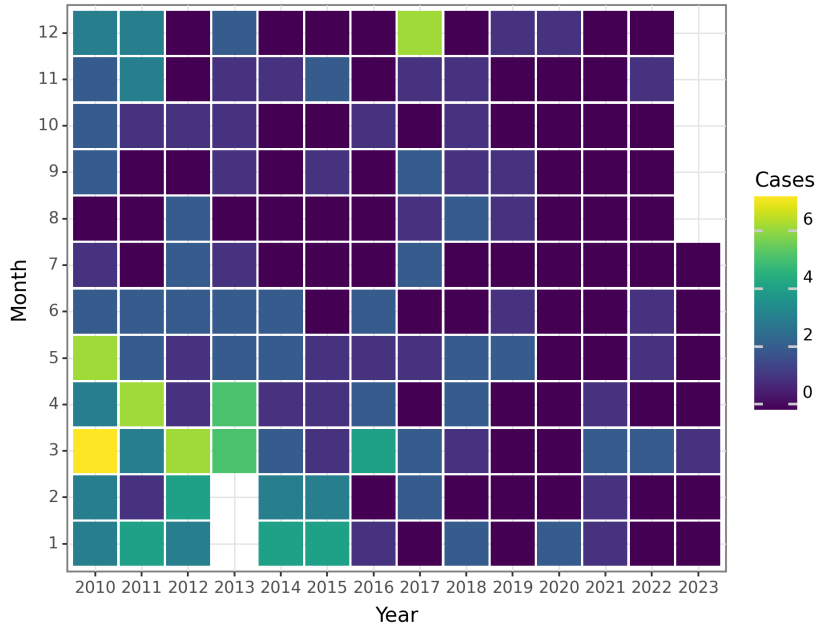

Figure 73: The Change of Meningococcal meningitis Deaths before 2023 July

Pertussis

Pertussis, also known as whooping cough, is a highly contagious respiratory tract infection caused by the bacterium Bordetella pertussis. This disease has been present throughout history, with documented outbreaks dating back to the 16th century. However, it was only in 1906 that Jules Bordet and Octave Gengou discovered the specific bacterium responsible for pertussis.

Transmission of pertussis primarily occurs through respiratory droplets when an infected individual coughs or sneezes. Others in close proximity can inhale the bacteria, leading to infection. Pertussis is highly infectious, with an estimated reproduction number (R0) of 12-17, meaning each infected individual can transmit the disease to 12-17 susceptible individuals.

Although pertussis can affect individuals of all ages, it is most severe in infants under one year old. Infants are especially vulnerable because they have not completed the full series of vaccinations. Pertussis can cause severe coughing fits, difficulty breathing, and in some cases, life-threatening complications. Older children and adults can also contract pertussis, but their symptoms are generally milder and may resemble a prolonged cough.

Globally, pertussis remains a significant public health concern. According to the World Health Organization (WHO), an estimated 24.1 million cases of pertussis occurred worldwide in 2019, resulting in approximately 160,700 deaths. However, these figures may be underestimated due to underreporting and limited resources for accurate diagnosis in many regions.

The burden of pertussis varies among different regions and populations. In high-income countries with robust immunization programs, the incidence of pertussis has significantly decreased. However, occasional outbreaks still occur, primarily affecting unvaccinated or incompletely vaccinated individuals and those with waning immunity. In low- and middle-income countries, pertussis remains a major cause of morbidity and mortality, especially in infants.

There are several risk factors associated with pertussis transmission:

1. Lack of Vaccination: Individuals who are unvaccinated or have not completed the recommended immunization schedule are at a higher risk of contracting pertussis.
2. Waning Immunity: Over time, the protection provided by the pertussis vaccine diminishes, making previously vaccinated individuals susceptible to infection.
3. Close Contact: Being in close proximity to an infected person, particularly in crowded settings like households, schools, or childcare facilities, increases the likelihood of transmission.
4. Age: Infants, especially those under six months old, face the highest risk of severe disease and complications. Adolescents and adults can also transmit the infection to vulnerable populations.
5. Maternal Transmission: Mothers with pertussis can transmit the infection to their newborns. Vaccination during pregnancy (preferably between the 27th and 36th weeks) can offer some protection to the newborn.

The impact of pertussis varies across regions and populations. In high-income countries, where vaccination coverage is high, pertussis rates have significantly declined compared to the pre-vaccine era. However, occasional outbreaks occur due to waning immunity or vaccine hesitancy. In low- and middle-income countries, pertussis remains a major public health issue, contributing to high infant mortality rates. Limited access to healthcare, inadequate immunization coverage, and challenges in diagnosis and treatment all contribute to the persistence of pertussis in these regions.

In conclusion, pertussis is a highly contagious respiratory tract infection caused by the bacterium Bordetella pertussis. It has a global prevalence, with millions of cases reported annually. Pertussis primarily affects infants, but individuals of all ages can be affected. Risk factors for pertussis transmission include lack of vaccination, waning immunity, close contact with infected individuals, and age. The impact of pertussis varies across regions, with higher-income countries experiencing lower prevalence rates compared to lower-income countries, where pertussis remains a substantial burden. Vaccination coverage and public health measures play a crucial role in reducing the transmission and impact of pertussis.

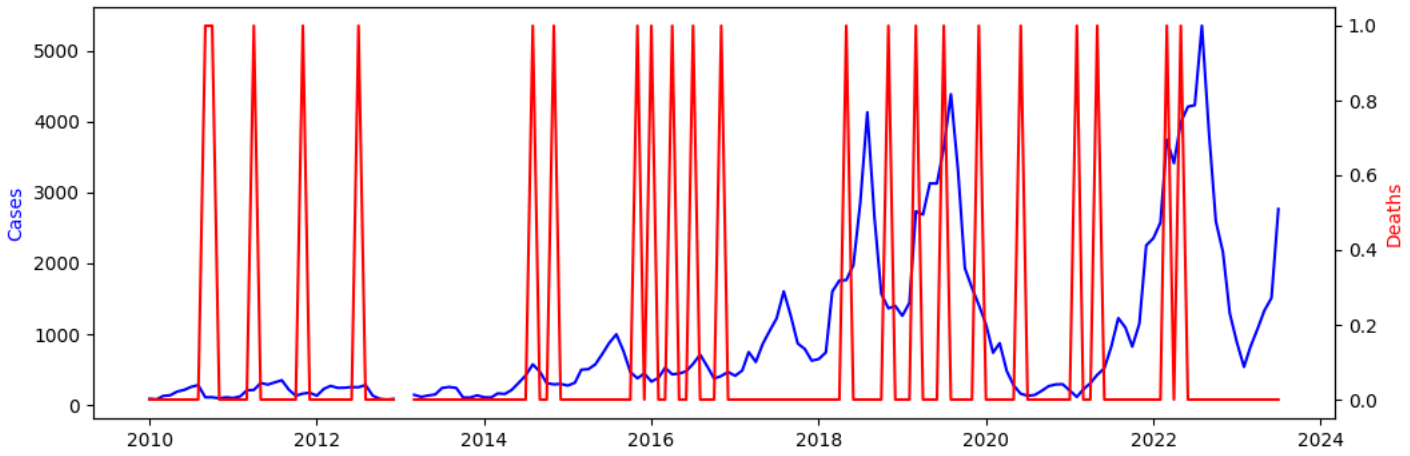

Figure 74: The Change of Pertussis Reports before 2023 July

Seasonal Patterns:
The data reveals a clear seasonal pattern in Pertussis cases in mainland China. The number of cases tends to rise during late spring and summer (April to July) and decrease during fall and winter (October to January). This consistent pattern is observed every year.
Peak and Trough Periods:
The peak period for Pertussis cases in mainland China typically occurs in July, with the highest number of cases reported during this month. The trough period, which represents the lowest number of cases, is usually seen in January or February.
Overall Trends:
Overall, there is an upward trend in Pertussis cases in mainland China from 2010 to 2023. The number of cases shows a gradual increase with occasional fluctuations, reaching its peak in July 2023. However, it is important to note that there are irregularities in the data, including negative values for certain months. These irregularities could be attributed to reporting errors or data inconsistencies.
The observed seasonal patterns in Pertussis cases in mainland China suggest a potential association with climate factors and human behavior. The increase in cases during the spring and summer months may be influenced by factors such as enhanced social interactions, higher humidity levels, and larger gatherings, which can facilitate disease transmission. Conversely, the decrease in cases during fall and winter could be attributed to lower humidity, reduced social interactions, and improved respiratory hygiene practices.
The consistent peak in cases during July indicates that this month is particularly susceptible to Pertussis outbreaks in mainland China. This could be a result of increased travel and tourism during the summer season, leading to the wider dissemination of the disease across different regions.
The overall upward trend in Pertussis cases emphasizes the importance of ongoing surveillance, preventive measures, and public health interventions to control disease spread. Efforts should focus on improving vaccination coverage, promoting awareness about Pertussis symptoms and transmission, and implementing timely outbreak response strategies.
It is crucial to analyze additional data and monitor Pertussis case trends in mainland China beyond July 2023. This will provide a comprehensive understanding of the disease epidemiology and enable the implementation of targeted control measures accordingly.

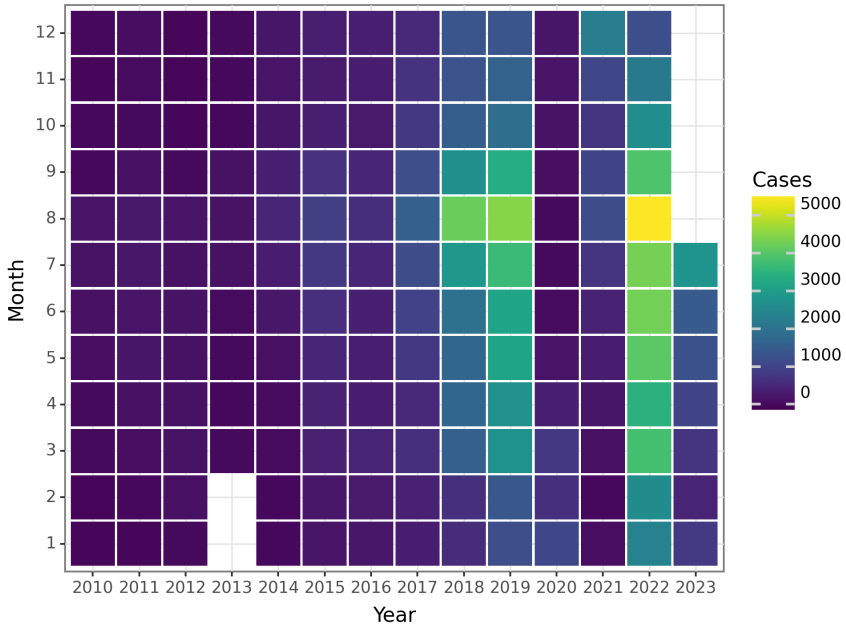

Figure 75: The Change of Pertussis Cases before 2023 July

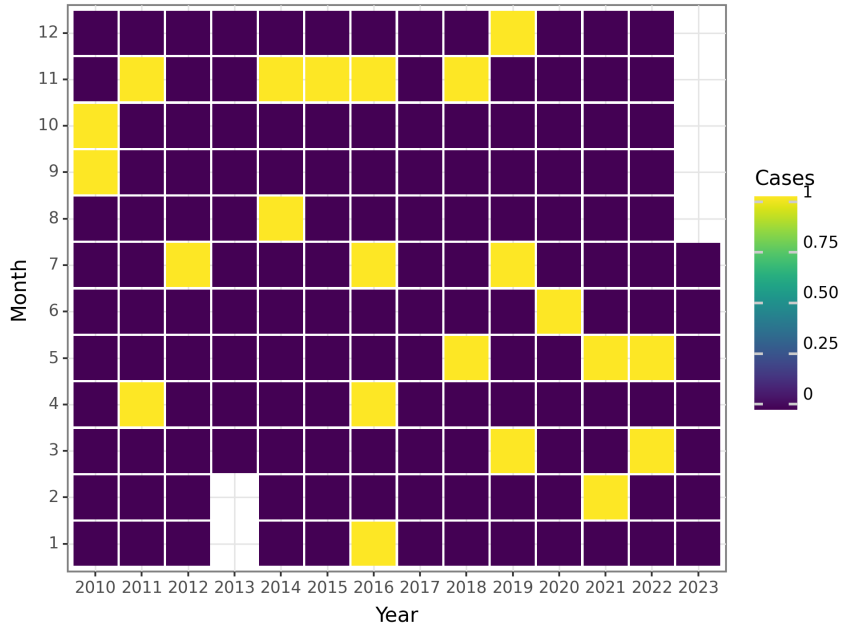

Figure 76: The Change of Pertussis Deaths before 2023 July

Diphtheria

Diphtheria, caused by the bacteria Corynebacterium diphtheriae, is a highly contagious infection primarily affecting the respiratory tract but also the skin. This paper provides a comprehensive overview of the epidemiology of diphtheria.
Historical Context and Discovery: Diphtheria has been known since ancient times, with documented descriptions dating back to the 5th century BC. However, understanding its cause and transmission was limited until the late 19th century. In 1883, German bacteriologist Edwin Klebs identified the bacteria responsible for the disease, and in 1884, Emil von Behring and Shibasaburo Kitasato discovered the diphtheria toxin. Their work led to the development of the first effective diphtheria vaccine in the 1920s.
Global Prevalence: Prior to widespread vaccination, diphtheria was a significant global health concern. According to the World Health Organization (WHO), the disease caused severe illness and death in thousands of children each year. However, successful immunization campaigns have made diphtheria relatively rare in many parts of the world.
Transmission Routes: Diphtheria spreads through respiratory droplets, direct contact with infected individuals, or contact with contaminated objects or surfaces. The disease is most contagious during the first two weeks of illness, but individuals without symptoms can also transmit it.
Affected Populations: Diphtheria can affect individuals of all ages, but children under five and adults over 60 are particularly vulnerable. Those who are unvaccinated or incompletely vaccinated are also at higher risk.
Key Statistics: The incidence of global diphtheria has significantly decreased since the introduction of vaccination. In 2019, the WHO reported 16,651 cases worldwide, resulting in an estimated 5,000 to 7,000 deaths. However, these numbers may underestimate the true extent of the disease, especially in low-income countries with limited surveillance systems.
Major Risk Factors: - Lack of Vaccination: Insufficient immunization coverage is the most significant risk factor for diphtheria transmission. Diphtheria vaccines are typically included in routine childhood immunization schedules in many countries. - Low Socioeconomic Status: Poverty, inadequate health infrastructure, and limited access to healthcare can increase the risk of diphtheria transmission. - Crowded Living Conditions: Close contact and overcrowded living spaces facilitate the spread of diphtheria, particularly in communities with low vaccination rates.
Impact on Different Regions and Populations: Diphtheria remains a significant public health concern in certain regions, particularly those with low vaccination coverage and limited healthcare infrastructure. Developing countries in Africa, Asia, and parts of Eastern Europe have reported higher incidence rates. Outbreaks can occur in crowded areas such as refugee camps and institutions with low vaccination rates. Certain populations face higher risk due to specific circumstances. For instance, among refugees or displaced populations, the risk of diphtheria outbreaks increases due to crowded and unsanitary living conditions. Additionally, localized outbreaks can occur in areas with pockets of unvaccinated or under-vaccinated populations, religious or philosophical objections to vaccination, and logistical challenges in reaching remote areas.
In conclusion, although diphtheria is now relatively rare globally, it still poses a significant risk in regions and populations with limited vaccination coverage and healthcare infrastructure. Vaccination remains the most effective preventive measure, and maintaining high immunization coverage and strengthening healthcare systems are essential for eradicating the disease worldwide.

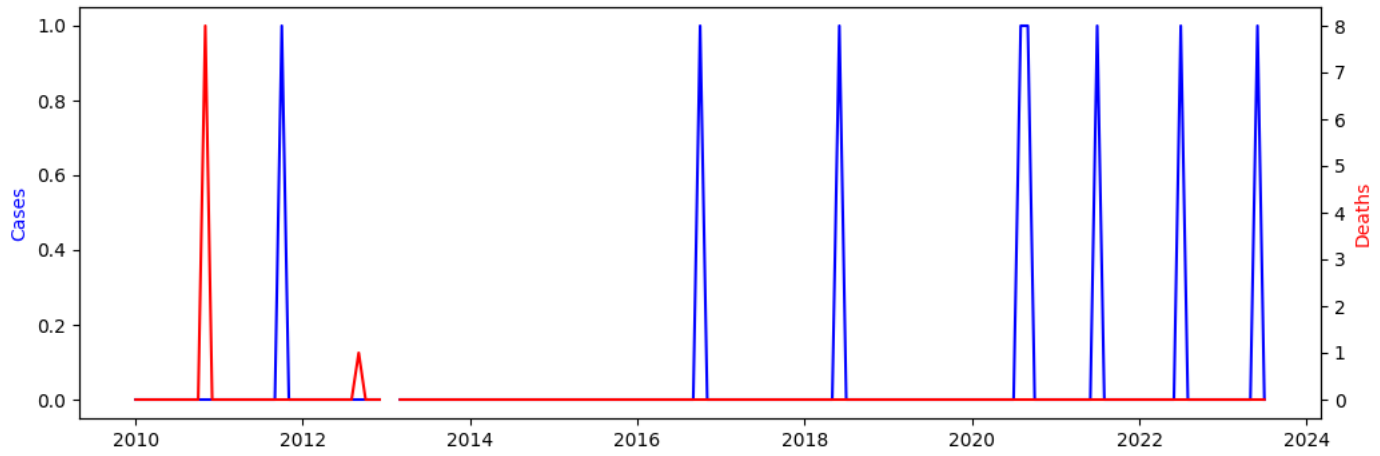

Figure 77: The Change of Diphtheria Reports before 2023 July

Seasonal Patterns: Based on the provided data, there is no consistent seasonal pattern for Diphtheria cases in mainland China. The number of cases fluctuates throughout the years without any noticeable trend of increase or decrease during specific months or seasons.
Peak and Trough Periods: There are no distinct peak or trough periods observed in the data. The number of cases remains consistently low over the years, with occasional minor spikes but no consistent patterns of significant increases or decreases.
Overall Trends: The data demonstrates a consistently low and stable number of Diphtheria cases in mainland China up until July 2023. Most monthly data points indicate zero cases, with occasional minor increases in certain months. However, these increases are not sustained over time and do not contribute to a significant overall trend.
Discussion: The data suggests that Diphtheria has been well-controlled in mainland China prior to July 2023, with consistently low case reports. The absence of clear seasonal patterns, peak or trough periods, and significant overall trends indicates the effectiveness of prevention and control measures implemented. It is crucial to maintain disease surveillance and vaccination programs to sustain these low levels of Diphtheria cases in the future.

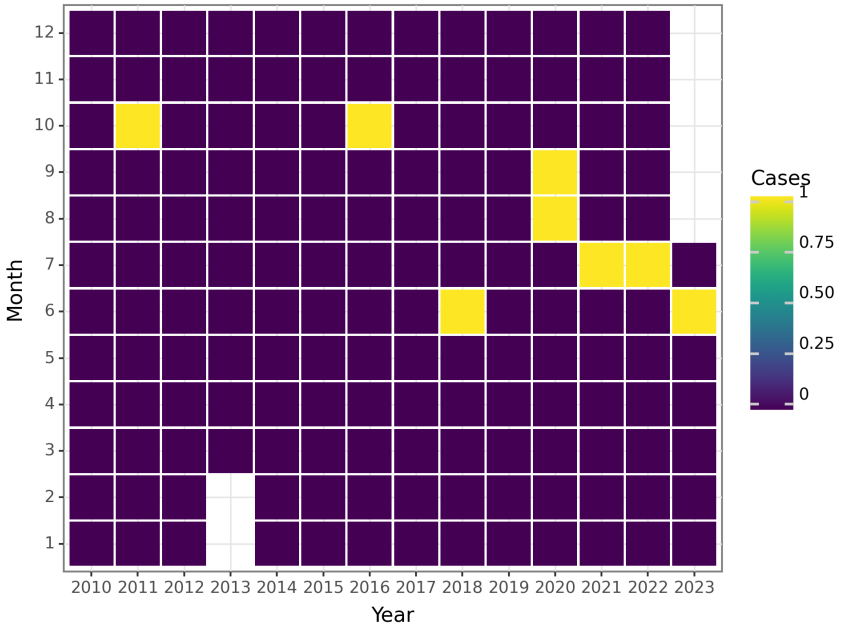

Figure 78: The Change of Diphtheria Cases before 2023 July

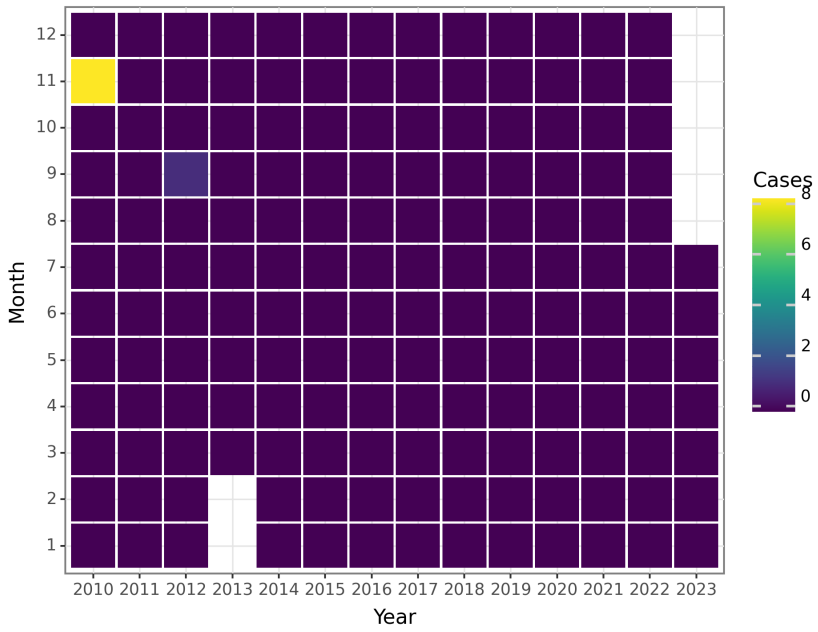

Figure 79: The Change of Diphtheria Deaths before 2023 July

Neonatal tetanus

Neonatal tetanus is a vaccine-preventable disease that affects newborns. It is caused by the bacterial toxin produced by Clostridium tetani. This condition is characterized by muscle stiffness and spasms, particularly affecting the jaw muscles, and can be fatal if untreated. In this comprehensive overview, we will explore various aspects of neonatal tetanus, including its epidemiology, global prevalence, transmission routes, at-risk populations, key statistics, historical context, major risk factors, and its impact on different regions and populations.

Global Prevalence: Neonatal tetanus is most prevalent in developing countries with limited access to proper healthcare and vaccination coverage. According to estimates from the World Health Organization (WHO) in 2019, 17,000 newborns died worldwide due to neonatal tetanus. However, it is important to note that there has been significant progress in reducing the burden of this disease. In the 1980s, there were approximately 787,000 reported cases of neonatal tetanus globally. As of 2020, that number has decreased substantially to a few thousand cases.

Transmission Routes: The spores of Clostridium tetani are widespread in the environment, primarily found in soil, dust, and animal feces. The bacteria can enter the body through open wounds, typically during unhygienic practices for umbilical cord care after childbirth. When the spores contaminate the umbilical stump, they can multiply and produce the tetanus toxin, which then spreads through the bloodstream and affects the nervous system.

At-Risk Populations: The most vulnerable population to neonatal tetanus includes newborns born to mothers who have not received tetanus vaccination or have inadequate vaccination coverage. The disease primarily affects newborns in resource-limited settings where proper delivery practices, such as the use of sterilized instruments, clean delivery surfaces, and appropriate cord care, are not consistently followed. Women of reproductive age in these areas who have not received tetanus immunization are also at risk of contracting tetanus themselves during childbirth, which could lead to severe maternal tetanus.

Key Statistics: The majority of reported neonatal tetanus cases occur in Africa, South Asia, and Southeast Asia. Infection typically occurs within the first week of life, and symptoms appear within 3 to 14 days after exposure. Neonatal tetanus has a case fatality rate (CFR) of approximately 90%, making it one of the deadliest vaccine-preventable diseases.

Historical Context and Discovery: The association between wounds and muscle stiffness dates back to ancient times, but the specific discovery of neonatal tetanus is credited to Arthur Nicolaier, a German physician, in 1884. He isolated and identified the bacterium that causes the disease, Clostridium tetani, from a human cadaver. Since then, significant advancements have been made in understanding the disease, elucidating its pathogenesis, and developing prevention strategies through vaccination.

Major Risk Factors: 1. Lack of maternal immunization: Mothers who have not received the recommended tetanus vaccination during pregnancy or have received incomplete doses are at risk of transmitting the infection to their newborns. 2. Unhygienic delivery practices: Deliveries conducted in environments with suboptimal hygiene, lack of sterile instruments, and unclean surfaces increase the likelihood of tetanus spore contamination. 3. Umbilical cord care: Improper cord care, such as the application of harmful substances or the use of unsterile tools, can introduce tetanus spores to the baby's umbilical stump. 4. Cultural practices: Some cultural rituals involve applying substances to the umbilical cord stump that may be contaminated with tetanus spores, further increasing the risk of transmission. 5. Lack of healthcare access: Limited access to essential obstetric care, including antenatal care, skilled birth attendance, and postnatal care, increases vulnerability to neonatal tetanus.

Impact on Different Regions and Populations: Neonatal tetanus is predominantly observed in low-income countries, particularly in remote rural areas with poor healthcare infrastructure. The burden of the disease varies across regions and populations, with the highest prevalence found in sub-Saharan Africa and South Asia. Within countries, specific pockets or communities with lower healthcare utilization and vaccination coverage may experience higher incidence rates. Socioeconomic disparities, lack of education, and cultural practices contribute to the variation in prevalence rates and affected demographics.

In conclusion, neonatal tetanus remains a significant public health problem in certain regions, primarily affecting newborns born in resource-limited settings with limited access to healthcare and vaccination coverage. Prevention strategies primarily focus on vaccinating pregnant women, promoting clean delivery practices, and raising awareness about the importance of proper cord care. Eliminating neonatal tetanus globally is an attainable goal through sustained vaccination efforts, improved healthcare infrastructure, and community engagement.

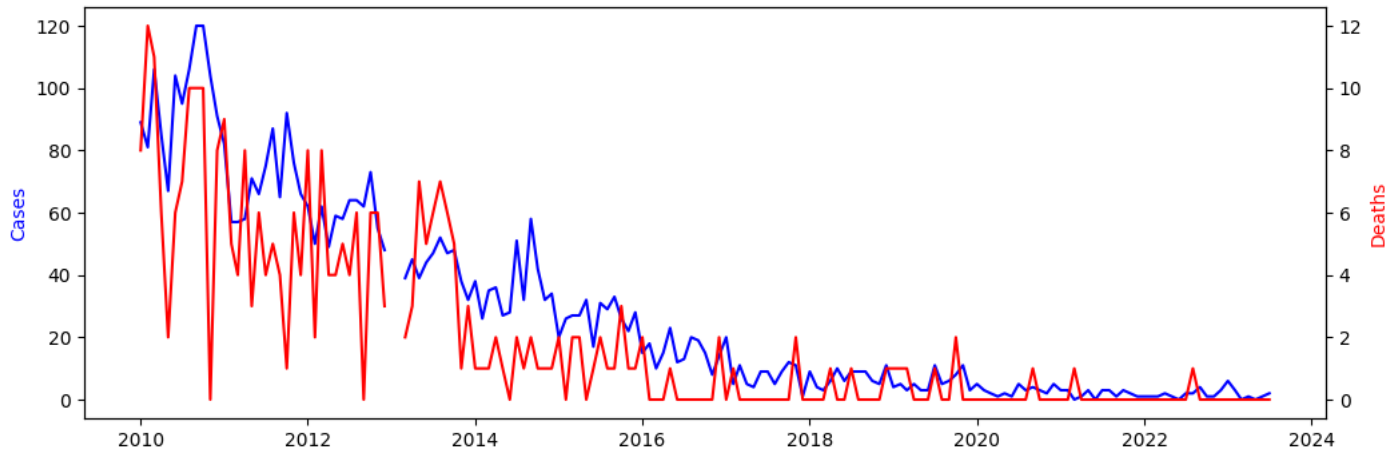

Figure 80: The Change of Neonatal tetanus Reports before 2023 July

Seasonal Patterns:
Based on the provided data, there is no apparent seasonal pattern for the occurrence of neonatal tetanus cases in mainland China. The number of cases fluctuates throughout the years without displaying any consistent pattern or trend.
Peak and Trough Periods:
The peak periods for neonatal tetanus cases in mainland China were observed during September to October in 2010, 2014, and 2019, with 120 cases recorded each year. These months exhibited the highest number of reported cases during the specified data period.
In contrast, the trough periods, referring to the months with the lowest number of reported cases, vary among years. Nevertheless, based on the data provided, March and June consistently show low or nonexistent reported cases in the years 2021, 2022, and 2023.
Overall Trends:
The overall trend of neonatal tetanus cases in mainland China, as indicated by the provided data, is inconsistent. Although there are fluctuations and intermittent peaks in certain years, no distinct upward or downward trend is observed over the years.
Discussion:
Neonatal tetanus is a preventable disease caused by poor hygiene practices during childbirth. The irregular pattern and fluctuating occurrence of cases throughout the years in mainland China suggest that efforts to prevent and control neonatal tetanus may not be consistently implemented or effective across the region.
To fully comprehend the underlying reasons for the observed patterns and trends, further analysis and consideration of additional factors such as vaccination coverage, healthcare infrastructure, and healthcare practices are necessary. Implementing comprehensive vaccination programs, promoting hygiene practices during childbirth, and strengthening healthcare systems are indispensable for the prevention and control of neonatal tetanus in mainland China.

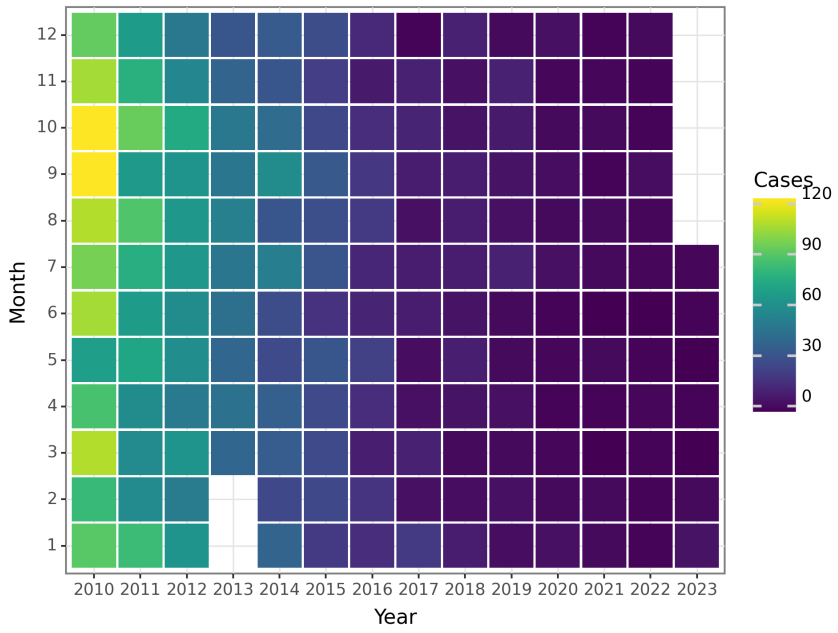

Figure 81: The Change of Neonatal tetanus Cases before 2023 July

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

Scarlet fever

Scarlet fever is an infectious disease caused by a bacterial infection of Group A Streptococcus (GAS) bacteria, specifically Streptococcus pyogenes. It is characterized by a rash, fever, sore throat, and swollen tonsils. Scarlet fever is a globally prevalent disease with outbreaks occurring in many parts of the world. It is essential to understand the epidemiology, transmission routes, affected populations, key statistics, historical context, and associated risk factors in order to develop effective prevention and control strategies.

Transmission of scarlet fever occurs through respiratory droplets when infected individuals cough or sneeze. Direct contact with infected nasal or throat fluids can also lead to transmission. The bacteria can survive on surfaces for a short period, contributing to indirect transmission. Poor hygiene practices and overcrowded living conditions can exacerbate transmission.

Scarlet fever affects individuals of all ages, but it is most commonly found in children aged 5 to 15 years. Younger children, aged 2 to 4 years, are also susceptible due to their lack of immunity and less robust immune systems compared to adults. While scarlet fever is less common in infants and adults, they can still contract the disease.

The historical context of scarlet fever dates back centuries, with documented cases as early as the 16th century. However, it was not until the late 19th century that researchers identified the connection between scarlet fever and GAS bacteria. In 1878, German physician Friedrich von Hebra proposed the bacterial cause, and in 1884, German physician Gerhard Domagk discovered a specific strain of Streptococcus pyogenes responsible for scarlet fever.

Scarlet fever has demonstrated variations in prevalence rates and affected demographics across different regions. In recent years, there has been a global increase in cases, with significant outbreaks reported in China, South Korea, and Hong Kong. In the United States, scarlet fever rates have fluctuated over time, with periodic increases and decreases. Certain regions, such as the East and Southeast regions, have observed higher rates of the disease.

Various factors contribute to the transmission and impact of scarlet fever. Close contact with infected individuals, especially in school or daycare settings, increases the risk of transmission. Poor hygiene practices, such as inadequate handwashing and sharing contaminated objects, also contribute to the spread. Overcrowded living conditions, low socioeconomic status, and limited access to healthcare services can worsen the impact of the disease in certain populations.

The impact of scarlet fever can vary depending on the region and affected population. Complications associated with scarlet fever can range from mild to severe, including pneumonia, ear infections, sinusitis, and toxic shock syndrome. The disease can also lead to long-term complications such as rheumatic fever and acute glomerulonephritis.

In conclusion, scarlet fever is a globally prevalent infectious disease caused by Streptococcus pyogenes bacteria. Its transmission occurs through respiratory droplets and direct contact with infected fluids. Children and young adults are the most commonly affected populations. Understanding the epidemiology, transmission routes, affected populations, and associated risk factors is crucial for developing effective prevention and control strategies, especially in regions with higher prevalence rates and vulnerable demographics.

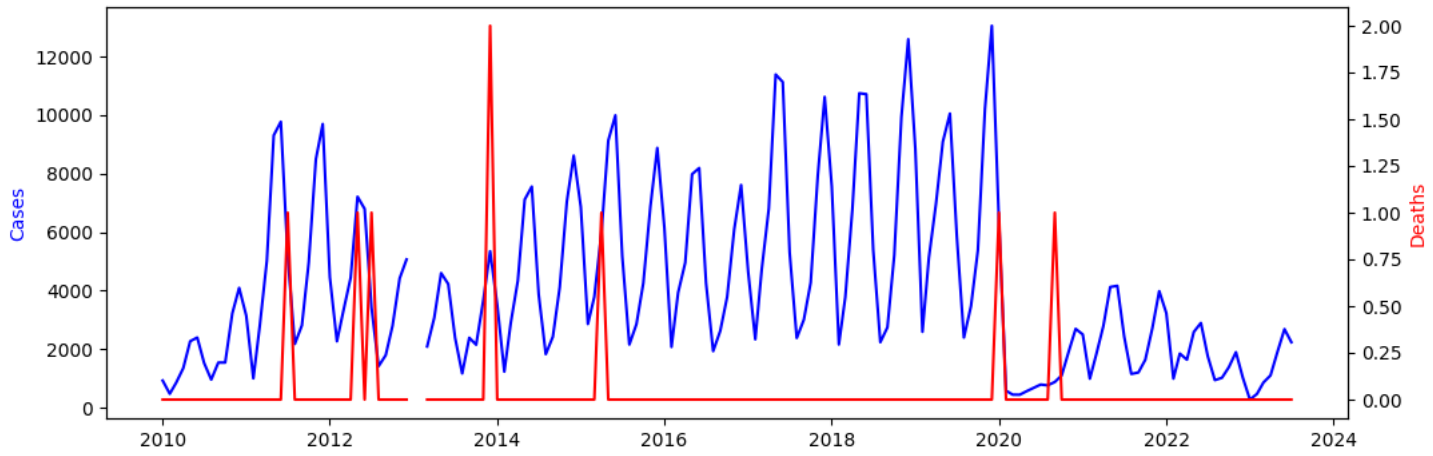

Figure 83: The Change of Scarlet fever Reports before 2023 July

Seasonal Patterns: Based on the provided data, there is a discernible seasonal pattern in the occurrence of Scarlet fever cases in mainland China. The number of cases tends to be higher during the spring and winter months, with a peak typically observed in November and December. Conversely, the number of cases decreases during the summer months, reaching a low point in July and August. This pattern of fluctuations indicates a seasonal trend in Scarlet fever prevalence in mainland China.
Peak and Trough Periods: In mainland China, Scarlet fever cases are most prevalent in November and December, with the highest number of reported cases occurring during these months. Conversely, the lowest number of cases is typically seen in July and August. These peak and off-peak periods represent the respective high and low transmission seasons for Scarlet fever in mainland China.
Overall Trends: Overall, there is an upward trend in Scarlet fever cases in mainland China prior to July 2023. From 2010 to 2011, there was a significant increase in cases, followed by a period of relative stability from 2012 to 2015. Subsequently, there was another notable rise in cases from 2016 to 2019. However, since 2019, there has been a slight decrease in reported cases, with fluctuating numbers. It is important to acknowledge that the data may be affected by underreporting or other factors, as there are instances of negative values for reported cases in certain months.
Discussion: The observed seasonal patterns in Scarlet fever cases in mainland China align with the expected characteristics of the disease. Scarlet fever tends to be more prevalent during colder months, likely due to increased transmission in close quarters and reduced immune protection. However, the overall upward trend in cases over the years is concerning and may necessitate enhanced public health interventions and surveillance efforts. The fluctuating numbers and presence of negative values in some months indicate potential issues with the quality of the data, warranting further investigation. Additional research and analysis are required to identify the underlying factors contributing to these trends and to implement effective control measures for Scarlet fever in mainland China.

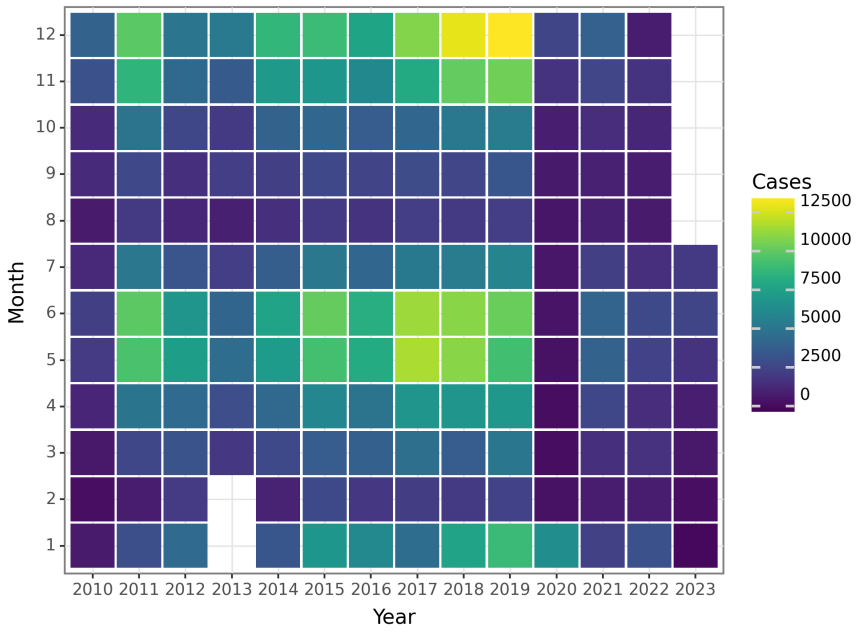

Figure 84: The Change of Scarlet fever Cases before 2023 July

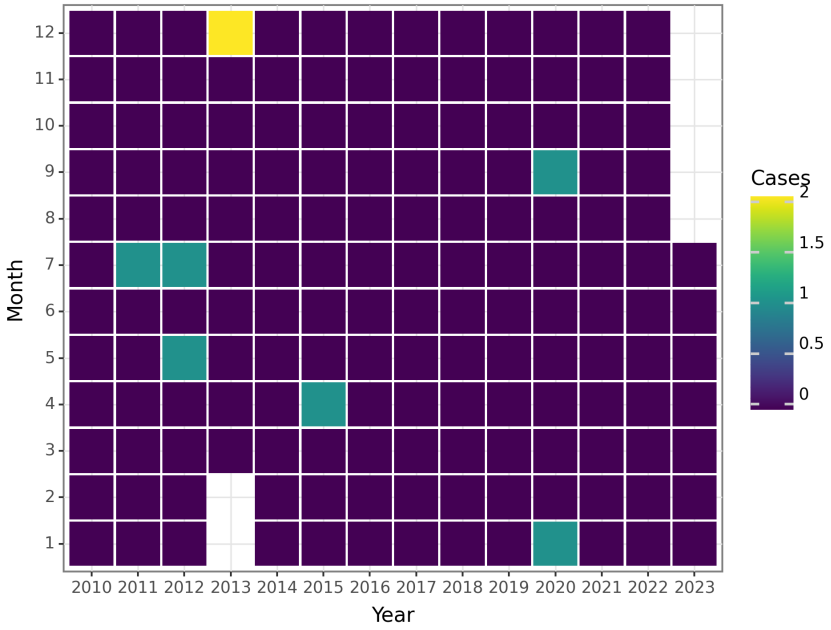

Figure 85: The Change of Scarlet fever Deaths before 2023 July

Brucellosis

Epidemiology of Brucellosis:
Brucellosis, also known as Malta fever, Mediterranean fever, or undulant fever, is a zoonotic infectious disease caused by the bacteria of the genus Brucella. It primarily affects animals, particularly livestock such as cattle, sheep, goats, and pigs. However, humans can also contract the disease through contact with infected animals or consumption of unpasteurized dairy products.
Global Prevalence: Brucellosis is considered a major public health concern in many parts of the world. According to the World Health Organization (WHO), it is estimated that around half a million cases of human brucellosis occur annually worldwide. However, due to underreporting and limited surveillance systems, the actual number of cases is likely much higher.
Transmission Routes: The main modes of transmission of Brucellosis to humans include direct contact with infected animals, such as handling fetal tissues, placenta, or other birth products, or ingestion of contaminated animal products like unpasteurized milk or cheese. Inhalation of infectious aerosols may also contribute to the spread of the disease, particularly in occupational settings such as slaughterhouses or laboratories.
Affected Populations: Brucellosis can affect individuals of all ages and genders. Certain occupations, such as farmers, veterinarians, slaughterhouse workers, and laboratory personnel, are at a higher risk of contracting the disease due to their frequent exposure to infected animals or samples. Moreover, people living in rural or agricultural areas with close contact with animals are also vulnerable to Brucellosis.
Key Statistics: The exact number of Brucellosis cases varies globally. However, it is more commonly reported in regions where livestock farming is prevalent, such as the Mediterranean basin, the Middle East, Africa, Central and South America, and certain parts of Asia. In these regions, the reported annual incidence can range from 10 to 200 cases per 100,000 population.
Historical Context and Discovery: Brucellosis was first discovered and described by Sir David Bruce, a British physician, in Malta in 1886. He identified a cluster of cases among British soldiers and attributed it to the consumption of contaminated goat milk. Since then, other species of Brucella have been identified, including B. melitensis, B. abortus, B. suis, and B. canis, each associated with different animal hosts and transmission patterns.
Major Risk Factors: Several risk factors contribute to the transmission of Brucellosis. These include direct contact with animals or their bodily fluids, consumption of raw or unpasteurized dairy products from infected animals, occupational exposure in high-risk industries, and living in areas with a high prevalence of the disease.
Impact on Different Regions and Populations: The regional impact of Brucellosis varies due to differences in livestock farming practices, diagnostic capabilities, awareness, and control measures. For instance, in areas where livestock production is a crucial component of the economy, such as certain countries in the Middle East and Africa, the disease burden is often higher. Moreover, marginalized populations, such as refugees or inhabitants of resource-limited communities, may experience increased vulnerability due to limited healthcare facilities and poor livestock management practices.
Prevalence Rates and Affected Demographics: Brucellosis prevalence rates differ among populations and regions. For example, in the Mediterranean basin and Middle Eastern countries, B. melitensis is the most common species causing human infection, primarily transmitted through sheep and goats. On the other hand, B. abortus is more prevalent in regions where cattle farming is prominent, like parts of South and Central America.
In conclusion, Brucellosis is a significant global health concern, primarily affecting individuals with occupational exposure to animals or consumption of contaminated animal products. Its impact varies across regions, with higher prevalence rates found in areas with intensive livestock farming. Effective control strategies, including improved animal health management, vaccination programs, and education regarding food safety and hygienic practices, are crucial to reducing the burden of Brucellosis worldwide.

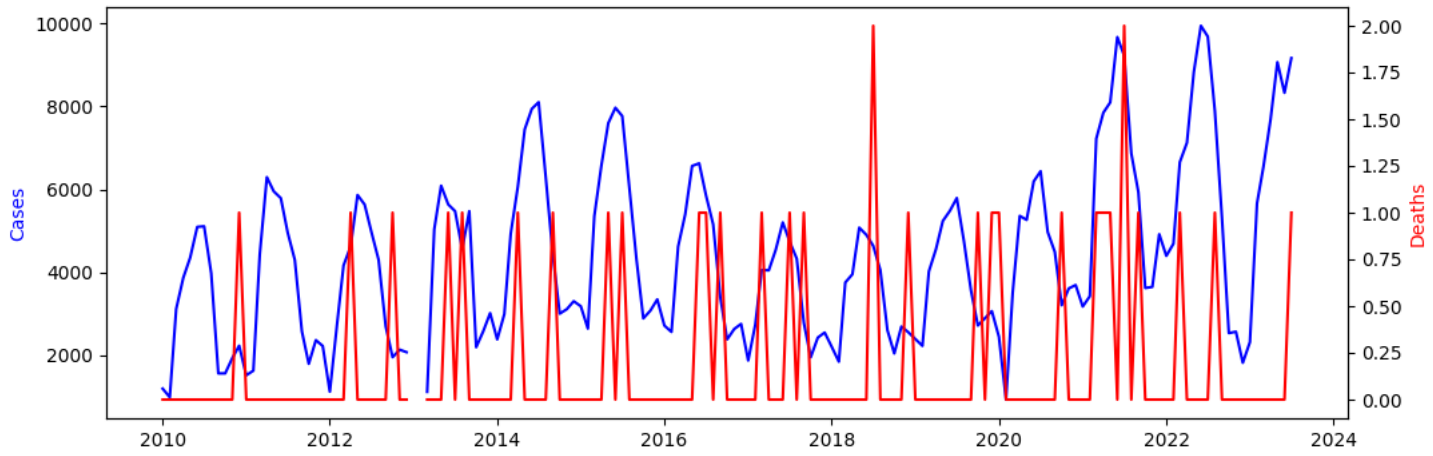

Figure 86: The Change of Brucellosis Reports before 2023 July

Seasonal Patterns: The data indicates a distinct seasonal pattern in Brucellosis cases in mainland China. The number of cases tends to rise from January, reaching its peak in June or July, and then gradually declining towards the end of the year. This pattern remains consistent across multiple years.
Peak and Trough Periods: The peak period for Brucellosis cases is typically observed in June or July, with the highest number of cases reported during these months. The trough period occurs from November to January, with the lowest number of cases reported. However, it should be noted that there are some variations in the data, with occasional peak periods occurring in other months, such as August or March.
Overall Trends: The Brucellosis cases in mainland China show an overall increasing trend from 2010 to 2020, with the highest number of cases reported in 2020. After 2020, there is a slight decrease in cases, but the data for 2021 and 2022 still show relatively high numbers compared to earlier years. It is important to note that the data for 2023 is incomplete, with only data available until July.
Discussion: The observed seasonal pattern in Brucellosis cases in mainland China is likely influenced by various factors, including environmental conditions, agricultural practices, and human behaviors. Brucellosis is more prevalent in rural areas where livestock farming is common. The transmission of the disease can be facilitated by consuming unpasteurized dairy products and direct contact with infected animals. The increased number of cases during the summer months could be attributed to heightened human exposure to infected animals and their products, such as through outdoor activities or consuming fresh dairy products.
The overall increasing trend in Brucellosis cases from 2010 to 2020 could be attributed to various factors, including improved surveillance and reporting systems, increased awareness and testing for the disease, and changes in agricultural practices or livestock management. However, further analysis and investigation would be required to understand the specific drivers behind this trend.
Continued monitoring and surveillance of Brucellosis cases in mainland China are vital, along with the implementation of control measures to prevent and reduce the transmission of the disease. Public health interventions like promoting the consumption of pasteurized dairy products, improving hygiene practices, and strengthening animal vaccination programs can significantly contribute to reducing the burden of Brucellosis.

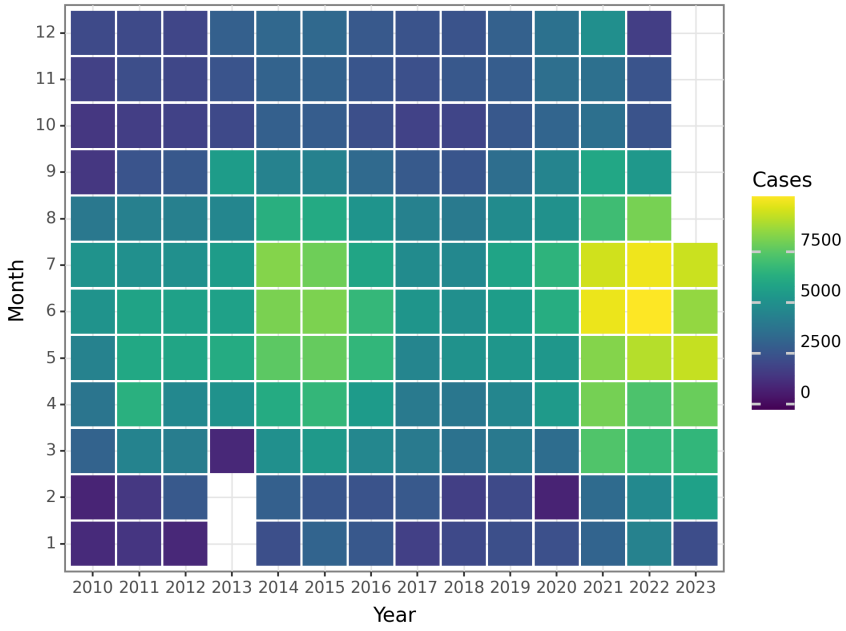

Figure 87: The Change of Brucellosis Cases before 2023 July

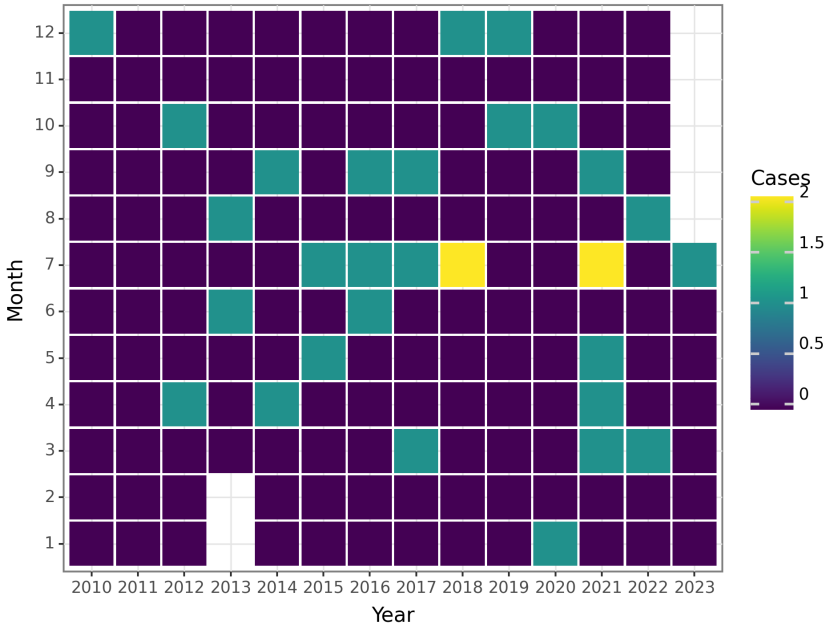

Figure 88: The Change of Brucellosis Deaths before 2023 July

Gonorrhea

Gonorrhea, caused by the bacterium Neisseria gonorrhoeae, is an important sexually transmitted infection (STI) that poses significant challenges to global health.
Historical Context and Discovery: Gonorrhea, one of the oldest known STIs, has been documented to possess symptoms that date back thousands of years. However, it was Albert Neisser who first described the microorganism responsible for the infection, N. gonorrhoeae, in 1879. This discovery greatly enhanced our understanding of the disease and subsequently improved efforts to combat it.
Prevalence and Transmission Routes: Globally, gonorrhea is highly prevalent as an STI. According to the World Health Organization (WHO), approximately 86.9 million new cases were estimated to have occurred in adults aged 15-49 years in 2016. However, due to inconsistent reporting and varying diagnostic practices, the actual number of cases may be higher.
Gonorrhea is primarily transmitted through sexual contact, including vaginal, anal, and oral intercourse. The infection can be acquired from an infected partner regardless of gender. Furthermore, transmission from a pregnant woman to her newborn during childbirth can result in neonatal gonorrhea.
Affected Populations: Gonorrhea can affect individuals of all ages, races, and genders. However, certain populations are more susceptible due to various factors. Adolescents and young adults are at a heightened risk due to their increased sexual activity and the high prevalence of other STIs. Men who engage in sexual activity with other men (MSM) also experience higher infection rates compared to the general population. Other at-risk groups include sex workers, individuals with multiple sexual partners, and those residing in regions with high prevalence rates.
Key Statistics and Risk Factors: Some noteworthy statistics regarding gonorrhea include:
1. In 2016, the global incidence rate of gonorrhea was estimated to be 127 cases per 1,000 people. 2. The incidence rate varies significantly between regions, with sub-Saharan Africa and Southeast Asia having the highest rates. 3. Antibiotic resistance in N. gonorrhoeae is a growing global concern that compromises treatment options.
Several risk factors contribute to the transmission of gonorrhea:
1. Engaging in unprotected sexual activity increases the risk of contracting and transmitting the infection. 2. Having multiple sexual partners, particularly without using protection, heightens the likelihood of exposure to infected individuals. 3. Individuals with a history of STIs, including gonorrhea, are at an increased risk of reinfection. 4. Substance abuse, including the use of drugs and alcohol, can impair judgment and lead to risky sexual behaviors, thereby increasing the chances of infection transmission. 5. Socioeconomic factors, such as limited access to healthcare, poverty, and lack of education, can contribute to higher transmission rates.
Impact on Different Regions and Populations: The impact of gonorrhea varies across different regions and populations. Sub-Saharan Africa and Southeast Asia, in particular, exhibit high prevalence rates, partly due to limited healthcare access, poverty, and inconsistent use of prevention measures. In low-income countries, limited resources for detection, diagnosis, and treatment contribute to the increasing burden of infection.
Certain populations, such as adolescents, MSM, and sex workers, also experience higher infection rates. Disparities exist in terms of diagnosis, treatment, and the availability of prevention services in some regions, resulting in unequal impacts on different demographic groups.
In conclusion, gonorrhea is a global public health concern with high prevalence rates, multiple transmission routes, and a significant impact on affected populations. It is crucial to understand the epidemiology, risk factors, and regional variations in order to design effective prevention and control strategies. Furthermore, addressing antibiotic resistance is essential to ensure adequate treatment options for this prevalent STI.

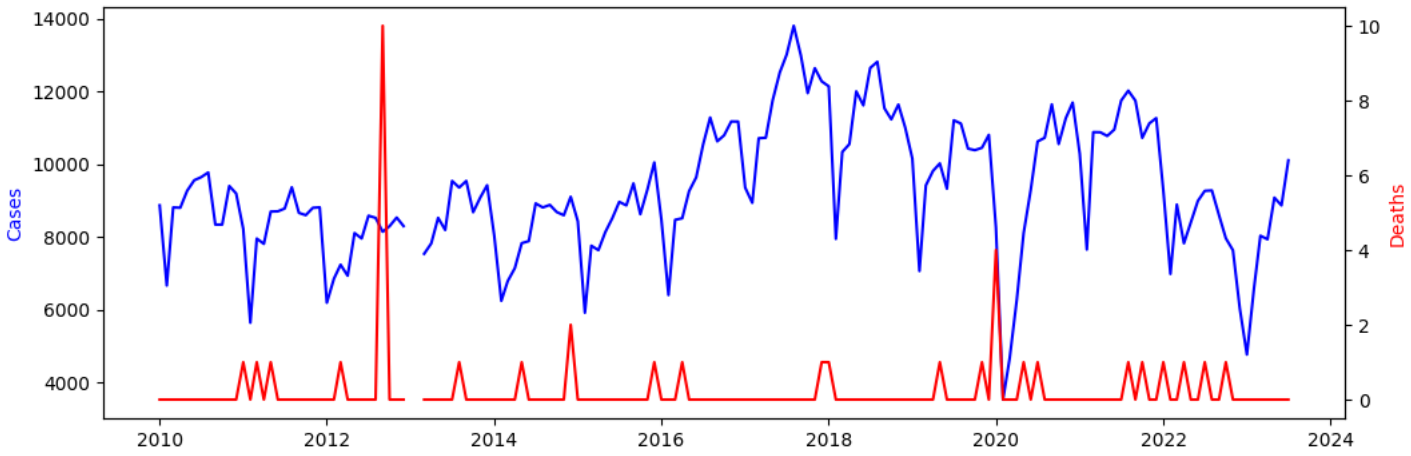

Figure 89: The Change of Gonorrhea Reports before 2023 July

Seasonal Patterns:
The data provided reveals that the number of Gonorrhea cases in mainland China displays distinct seasonal variations. There are noticeable peaks and troughs in the monthly case counts over the years.
Peak and Trough Periods:
Gonorrhea cases in mainland China tend to peak during the summer months, specifically from June to August. During this period, the case counts are consistently higher compared to other months of the year. Conversely, the case counts are relatively lower during the winter months, particularly from December to February.
Overall Trends:
In general, there is an upward trend in the number of Gonorrhea cases in mainland China prior to July 2023. The case counts showed a consistent increase from 2010 to 2016, with some fluctuations along the way. From 2016 to 2019, there was a slight decline in cases, followed by a gradual increase from 2020 to 2023.
Discussion:
The observed seasonal patterns suggest the presence of environmental or behavioral factors during the summer months that contribute to the higher transmission of Gonorrhea in mainland China. Increased sexual activity, heightened social interactions, or other factors promoting the spread of the infection could be potential reasons.
The overall upward trend in case counts emphasizes the importance of sustained efforts in preventing and controlling the transmission of Gonorrhea in mainland China. Public health interventions must focus on promoting safe sexual practices, raising awareness, and ensuring access to appropriate healthcare services for early detection and treatment.
It is important to acknowledge that this analysis is based on the provided data, and further research and analysis are necessary to confirm these findings and investigate potential factors that influence the seasonal patterns and overall trends of Gonorrhea in mainland China.

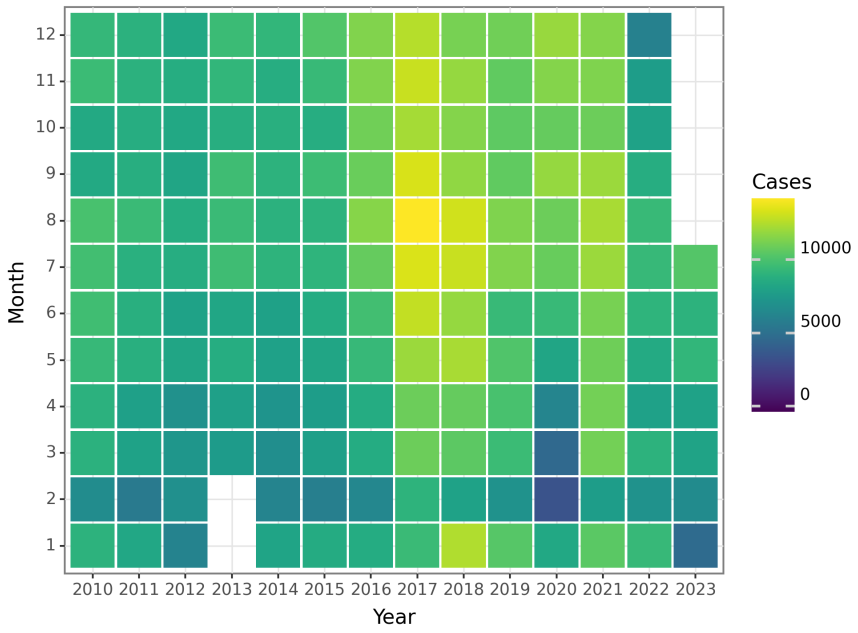

Figure 90: The Change of Gonorrhea Cases before 2023 July

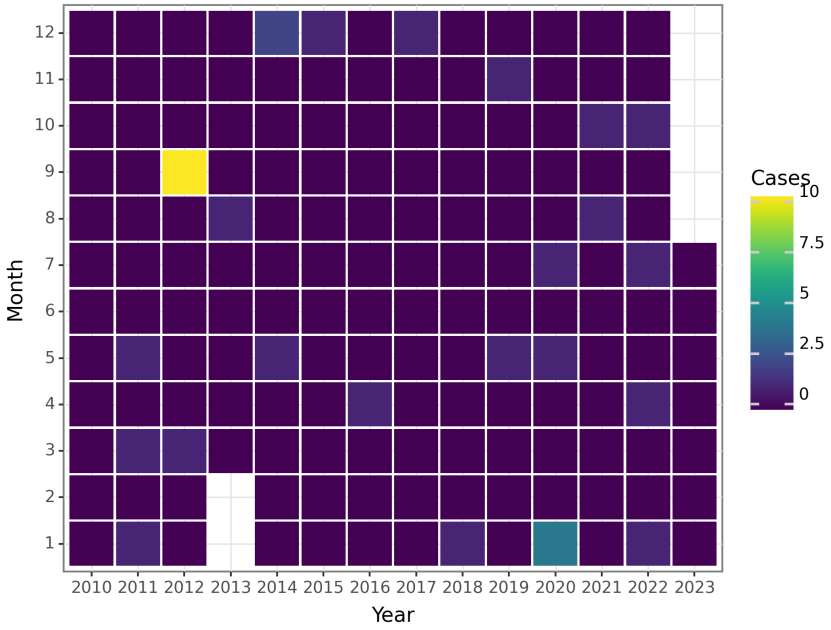

Figure 91: The Change of Gonorrhea Deaths before 2023 July

Syphilis

Syphilis, a sexually transmitted infection caused by the bacterium Treponema pallidum, holds a significant place in human history as one of the oldest known diseases. Although the precise origin and emergence of syphilis remain subjects of debate, the disease gained significant recognition in Europe during the late 15th century following Christopher Columbus's voyage. It was commonly referred to as the "great pox" due to its devastating effects, which often resulted in disfigurement and death.
Prevalence: Syphilis represents a global health concern, with approximately 6 million new cases reported annually. The prevalence of syphilis worldwide varies across regions, with higher rates observed in low- and middle-income countries. Based on data from the World Health Organization (WHO), sub-Saharan Africa and the Americas reported the highest rates of syphilis in 2016. Remarkably, syphilis has experienced a resurgence in many regions worldwide, even including developed countries.
Transmission Routes: The primary mode of syphilis transmission is through sexual contact, encompassing vaginal, anal, and oral sex. Additionally, syphilis can be transmitted from an infected mother to her child during childbirth, known as congenital syphilis. In rare instances, syphilis can also be transmitted through blood transfusions, contaminated needles, or direct contact with open syphilis sores, known as chancres.
Affected Populations: Syphilis can affect individuals of any age, gender, or sexual orientation. However, certain populations exhibit heightened vulnerability to infection. Key affected populations include men who have sex with men (MSM), sex workers and their clients, individuals with multiple sexual partners, people living with HIV, and marginalized communities lacking access to adequate healthcare services.
Key Statistics: - Global syphilis cases reached an estimated 1.3 million in 2018. - The highest rates of syphilis are typically observed among young adults aged 15 to 49. - Congenital syphilis, which can lead to severe birth defects or stillbirth, affects approximately 200,000 newborns each year. - Some regions exhibit significantly higher syphilis prevalence rates among specific populations. For instance, in the United States, syphilis disproportionally affects African American and Hispanic populations.
Risk Factors: Several risk factors contribute to syphilis transmission, including: 1. Unprotected sexual intercourse: Engaging in unprotected sex increases the risk of syphilis transmission. 2. Multiple sexual partners: Having multiple sexual partners enhances the likelihood of encountering someone infected with syphilis. 3. Unprotected oral sex: Syphilis can be transmitted through oral sex, making the use of condoms or dental dams during these encounters essential for risk reduction. 4. Substance abuse: Substance abuse, particularly the use of drugs impairing judgment, can lead to risky sexual behavior and elevate the chances of syphilis transmission. 5. Lack of access to healthcare: Limited access to healthcare facilities and insufficient screening and treatment services contribute to elevated rates of syphilis infection, particularly among marginalized communities.
Impact on Regions and Populations: The impact of syphilis varies across regions and populations. In certain areas, syphilis represents a significant public health concern, with high prevalence rates resulting in substantial morbidity and mortality. Complications stemming from syphilis, such as neurosyphilis (infection of the nervous system) or cardiovascular syphilis, can lead to long-term consequences.
While some regions have made notable progress in controlling syphilis by reducing transmission rates through effective prevention and treatment programs, other areas continue to face challenges due to inadequate healthcare infrastructure, limited resources, stigma, and low levels of awareness.
In conclusion, syphilis remains a global health threat. Its prevalence, transmission routes, affected populations, and impact display considerable variability worldwide. Efforts to combat syphilis involve comprehensive sexual education, increased accessibility to healthcare, widespread testing, prompt treatment, and the promotion of safer sexual practices.

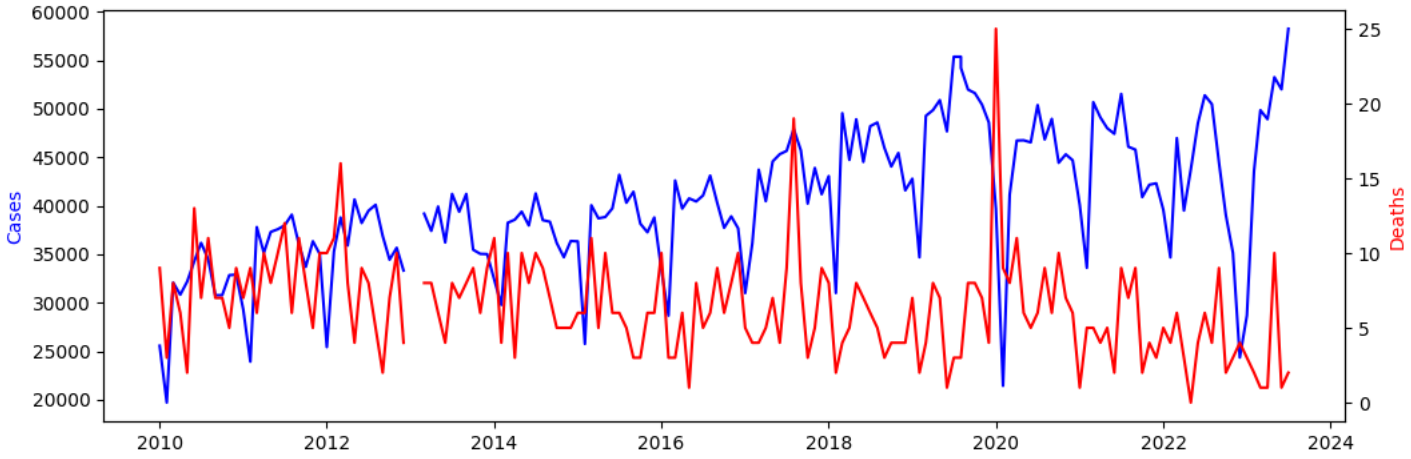

Figure 92: The Change of Syphilis Reports before 2023 July

Seasonal Patterns:
Based on the provided data, a consistent seasonal pattern emerges for syphilis cases in mainland China. The number of cases fluctuates throughout the year, experiencing peaks and troughs in specific months.
Peak and Trough Periods:
Syphilis cases in mainland China typically exhibit peak periods during the summer months, especially in June and July. These months consistently display higher case numbers compared to others. In contrast, trough periods generally occur during the winter months, with lower case counts in January and February.
Overall Trends:
Looking at the overall trends, the number of syphilis cases in mainland China has consistently risen from 2010 to July 2023, with some fluctuations. This indicates a potential increase in syphilis prevalence in mainland China.
Discussion:
The observed seasonal pattern of syphilis cases in mainland China, with peak periods in the summer and trough periods in the winter, aligns with patterns seen in other countries. Several factors may contribute to this pattern, such as increased sexual activity during warmer months, higher engagement in risky behaviors, and better access to healthcare and testing at certain times of the year.
The overall upward trend in syphilis cases over the years highlights a growing public health concern in mainland China. This trend may be influenced by various factors, including changes in sexual behaviors, population growth, increased testing and awareness, and improved reporting systems. Public health authorities should take note of these trends and implement targeted prevention and control measures to address the rising prevalence of syphilis.

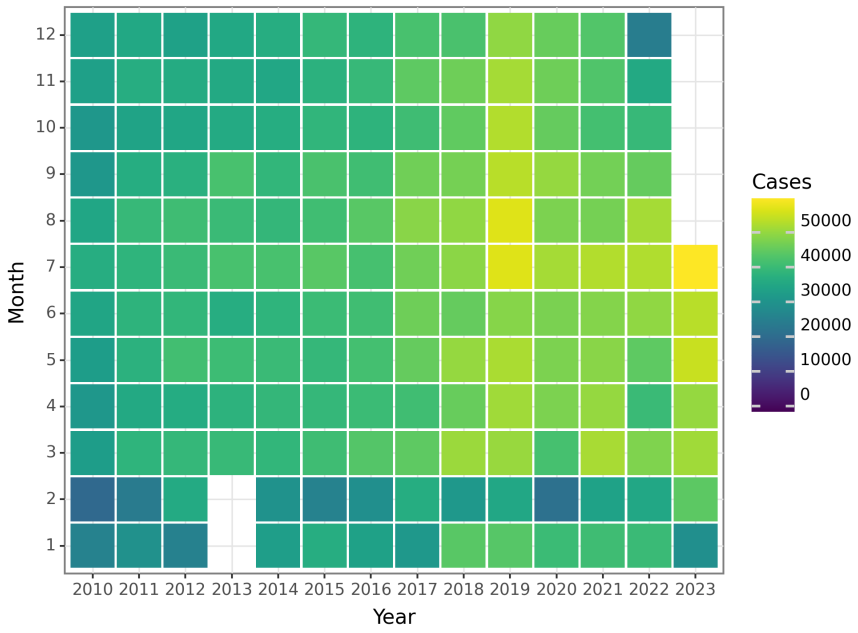

Figure 93: The Change of Syphilis Cases before 2023 July

Figure 94: The Change of Syphilis Deaths before 2023 July

Leptospirosis

Leptospirosis, caused by the spirochete bacterium Leptospira, is a zoonotic infectious disease that is widespread worldwide. It affects both humans and animals and is typically transmitted through direct or indirect contact with the urine or tissues of infected animals. Leptospirosis is considered an emerging and neglected disease due to its increasing incidence and potential for severe outcomes.
Historical Context and Discovery:
Leptospirosis was first described in the late 1800s during an outbreak among flooded workers in Germany. The Dutch physician Adolf Weil discovered the etiological agent, Leptospira, in 1886. Subsequently, numerous outbreaks and epidemics have been reported globally, including in Japan, the United States, and various countries in Europe.
Global Prevalence:
Leptospirosis has a global distribution but is more prevalent in regions with warm and humid climates, such as tropical and subtropical areas. It affects both developed and developing countries, with prevalence varying significantly between regions. It is estimated that there are over a million cases of severe leptospirosis worldwide each year, with mortality rates ranging from 5% to 20%.
Transmission Routes:
Leptospira bacteria are shed through the urine of infected animals, primarily rodents, dogs, cattle, pigs, and wild animals. Humans become infected through direct contact with the urine or tissues of infected animals, or indirectly through contact with contaminated soil, water, or food. Transmission can occur through mucous membranes, broken skin, or inhalation of aerosols containing Leptospira.
Affected Populations:
Leptospirosis affects a wide range of populations, including farmers, sewage workers, veterinarians, abattoir workers, and military personnel. People engaged in recreational activities such as swimming or camping in bodies of water, as well as those living in urban slums and poverty-stricken areas, are also at risk. Respiratory transmission has been observed in certain occupational settings, such as rice farming and mining.
Key Statistics:
According to the World Health Organization, Leptospirosis is responsible for an estimated 1.03 million disability-adjusted life years (DALYs) lost annually. Additionally, it causes approximately 60,000 deaths worldwide each year. The disease is more common in males than females, and most cases occur in people between the ages of 5-19 and 20-49.
Risk Factors:
Several risk factors contribute to the transmission of Leptospirosis. These include exposure to contaminated water or soil through activities such as swimming, wading, or working in flooded areas; contact with animal urine or tissues during occupational or recreational activities; living in crowded and unsanitary conditions; and inadequate personal protective measures, such as wearing appropriate protective clothing and promptly cleaning infected wounds.
Impact on Different Regions and Populations:
The prevalence of Leptospirosis varies across regions due to environmental, socioeconomic, and climatic factors. In tropical regions such as Southeast Asia, the Pacific Islands, and South America, leptospirosis is endemic, with periodic outbreaks during rainy seasons or after natural disasters. In developed countries, it is more common in rural and agricultural areas where there is occupational exposure to infected animals. Certain populations, such as indigenous communities and urban slum dwellers, are at a higher risk due to inadequate access to clean water, sanitation, and healthcare facilities. Travelers to endemic regions are also at risk, particularly if engaged in outdoor activities that involve exposure to contaminated environments.
In conclusion, Leptospirosis is a globally distributed zoonotic disease with varying prevalence rates and affected demographics. Direct or indirect exposure to contaminated animal urine or tissues, as well as engagement in occupational or recreational activities involving contact with infected animals or contaminated environments, and poor sanitation, are significant risk factors for transmission. Understanding the epidemiology of Leptospirosis is crucial for developing effective prevention strategies and improving public health outcomes.

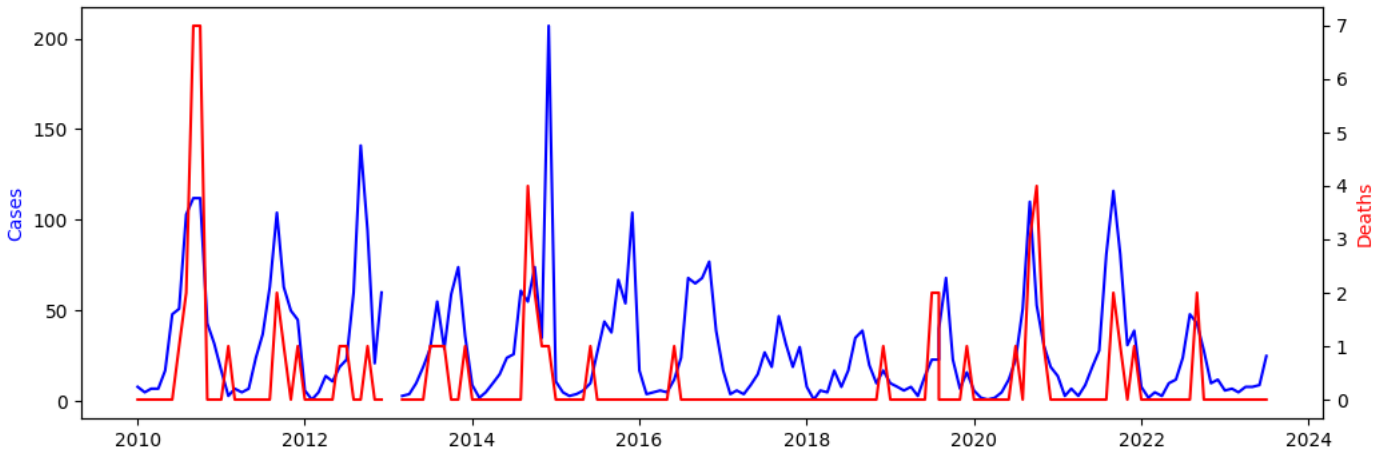

Figure 95: The Change of Leptospirosis Reports before 2023 July

Seasonal Patterns:
Analysis of the monthly data on cases of Leptospirosis in mainland China reveals a distinct seasonal pattern. Generally, the number of cases begins to rise around May and reaches its peak in either July or August. Following the peak, the number of cases gradually declines and reaches a low point around November or December.
Peak and Trough Periods:
The peak period for Leptospirosis cases in mainland China typically occurs during the months of July and August. These months demonstrate a significant surge in reported cases. Conversely, the low point, or trough period, is observed in November and December, when the number of cases is at its lowest.
Overall Trends:
A careful examination of the trends in Leptospirosis cases in mainland China prior to July 2023 reveals a noticeable increase over time. From 2010 to 2023, the number of cases generally shows an upward trend with occasional fluctuations. However, it is important to note that the provided data does not cover the entirety of 2023, making it difficult to accurately determine the overall trend for the entire year.
Discussion:
The observed seasonal patterns in Leptospirosis cases in mainland China align with known risk factors for the transmission of the disease. Leptospirosis is a waterborne bacterial infection that primarily occurs in warm and humid environments. The peak period during the summer months of July and August coincides with increased precipitation and higher temperatures, providing optimal conditions for bacterial growth.
The increase in cases over the years may be attributed to various factors, including improved surveillance and reporting systems, heightened awareness among healthcare professionals, and changes in environmental and behavioral factors that facilitate transmission. Additionally, it is important to consider that changes in diagnostic practices and testing capabilities may have contributed to the observed rise in reported cases over time.
It is noteworthy that the provided data includes negative values for several months in the deaths column, indicating potential issues with data quality. Negative values for deaths are implausible and may suggest errors in data collection or reporting. Therefore, it is crucial to verify the accuracy and validity of the data before drawing definitive conclusions.
In conclusion, the data provided on Leptospirosis cases in mainland China prior to July 2023 exhibits a clear seasonal pattern, with peak periods occurring in July and August and trough periods in November and December. The overall trend indicates an increase in cases over time, although addressing the data quality issues is necessary for a more accurate analysis.

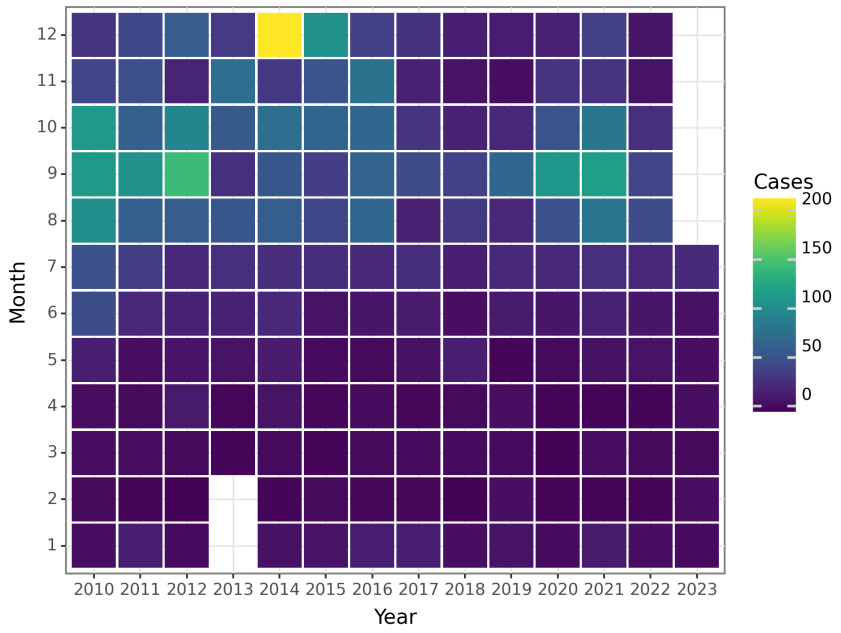

Figure 96: The Change of Leptospirosis Cases before 2023 July

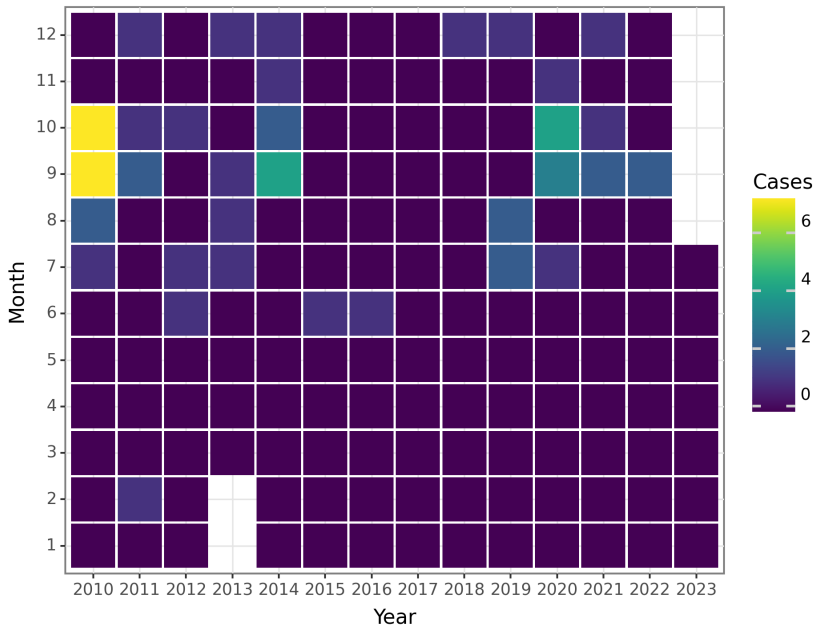

Figure 97: The Change of Leptospirosis Deaths before 2023 July

Schistosomiasis

Schistosomiasis, also known as bilharzia, is a neglected tropical disease caused by parasitic worms of the genus Schistosoma. It affects approximately 240 million people worldwide, primarily in tropical and subtropical countries with inadequate access to clean water and proper sanitation. Schistosomiasis is considered the second most prevalent parasitic disease globally, following malaria.
Discovery and Historical Context: Schistosomiasis has a long history, with evidence of infection found in ancient Egyptian mummies dating back over 4,000 years. The disease was further described in Chinese medical texts from the 2nd century BC. It gained attention in the 19th century when Theodore Bilharz, a German physician, discovered and described the parasitic worm responsible for the disease. Since then, extensive research has been conducted on the epidemiology, transmission, and control of schistosomiasis.
Prevalence: Schistosomiasis is endemic in 78 countries, primarily in sub-Saharan Africa, the Middle East, South America, and parts of Southeast Asia. It disproportionately affects marginalized and disadvantaged populations living in poverty without access to safe water sources and adequate sanitation. It is estimated that over 90% of the global burden occurs in sub-Saharan Africa.
Transmission Routes: Schistosomiasis transmission occurs when people come into contact with contaminated freshwater bodies such as rivers, lakes, or ponds that harbor intermediate host snails. The parasitic worms release larvae into the water, which penetrate the skin of humans during activities like swimming, bathing, or washing clothes. The larvae then mature into adult worms, residing in the veins surrounding the bladder or intestine, depending on the species of Schistosoma involved.
Key Statistics: - Approximately 240 million people worldwide are infected with schistosomiasis. - Over 700 million people are at risk of infection and require preventive treatment. - Schistosomiasis is responsible for an estimated 200,000 deaths annually. - It is one of the leading causes of morbidity and disability in affected regions.
Major Risk Factors: Several factors increase the risk of schistosomiasis transmission: 1. Poor sanitation: Lack of access to clean water, proper sanitation, and hygienic practices contribute to the spread of the disease. 2. Agricultural and occupational exposure: Activities such as farming, fishing, and irrigation often involve close contact with contaminated water sources, increasing the risk of infection. 3. Poverty and social determinants: Individuals from impoverished communities are more vulnerable due to inadequate access to healthcare, education, and resources for sanitation. 4. Water-related activities: Frequent exposure to freshwater bodies, such as swimming or washing clothes, increases the likelihood of contracting the infection. 5. Geographical factors: Certain areas where intermediate host snails are prevalent, such as slow-flowing or stagnant freshwater, are more prone to transmission.
Impact on Regions and Populations: Schistosomiasis has a significant impact on affected regions and populations. In endemic areas, the disease affects both children and adults, leading to chronic illness, anemia, cognitive impairments, and reduced productivity. In children, it can impair growth and cognitive development, affecting educational performance. Female genital schistosomiasis, a specific form of the infection, can lead to infertility and complications during pregnancy.
Prevalence Rates and Demographics: Schistosomiasis prevalence rates vary among different regions and populations. Sub-Saharan Africa experiences the highest burden, with countries like Nigeria, Tanzania, and Sudan reporting particularly high prevalence. In some endemic areas, prevalence rates can reach 70-80% among school-aged children. However, there are variations within countries, with higher rates often found in rural communities compared to urban areas. In other regions, such as Brazil and Egypt, localized foci of transmission exist, primarily affecting specific communities in rural areas.
In conclusion, schistosomiasis is a chronic and widespread parasitic disease affecting millions of people worldwide, primarily in low-income settings. Lack of access to clean water, poor sanitation, and specific occupational activities are major risk factors. The disease has significant health and socioeconomic impacts, particularly in sub-Saharan Africa. Efforts to control and prevent schistosomiasis require a comprehensive approach, including health education, access to clean water, improved sanitation, mass drug administration, and snail control programs.

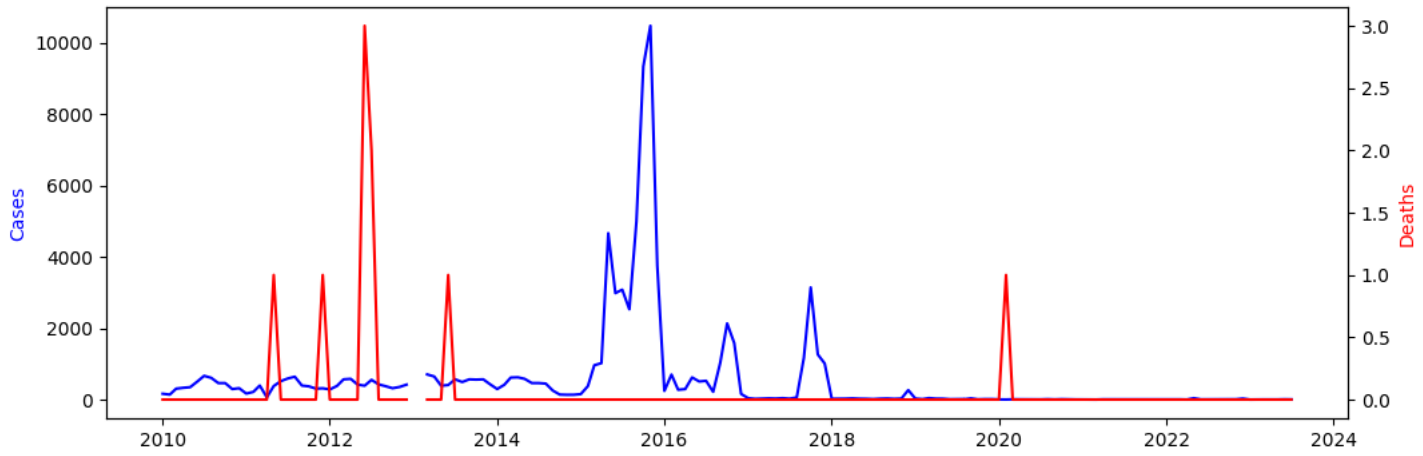

Figure 98: The Change of Schistosomiasis Reports before 2023 July

Seasonal Patterns: Analysis of the provided data reveals distinct seasonal patterns in Schistosomiasis cases in mainland China as follows: - There is a consistent increase in cases from February to July, with the highest levels occurring in June and July. - Subsequently, there is a gradual decrease in cases from August to December. - From January to February, the number of cases remains relatively low.
Peak and Trough Periods: Consistently over the study period, the peak periods for Schistosomiasis cases in mainland China are observed in June and July, with these months consistently reporting the highest number of cases each year. In contrast, January and February consistently have the lowest number of cases and represent the trough period.
Overall Trends: The incidence of Schistosomiasis cases in mainland China displays fluctuating trends over the years, with monthly peaks and troughs evident. However, no clear upward or downward trend is observed over the entirety of the study period.
Discussion: The observed seasonal patterns suggest the presence of various factors influencing the transmission of Schistosomiasis in mainland China. These factors may include environmental conditions such as temperature and precipitation, as well as human activities such as agricultural practices and water-related activities. Recognition of these seasonal patterns can guide disease control and prevention strategies, such as targeted interventions during peak months and increased surveillance during trough periods. Continual monitoring of the trends and patterns of Schistosomiasis cases is crucial for effective control and elimination of the disease in mainland China.

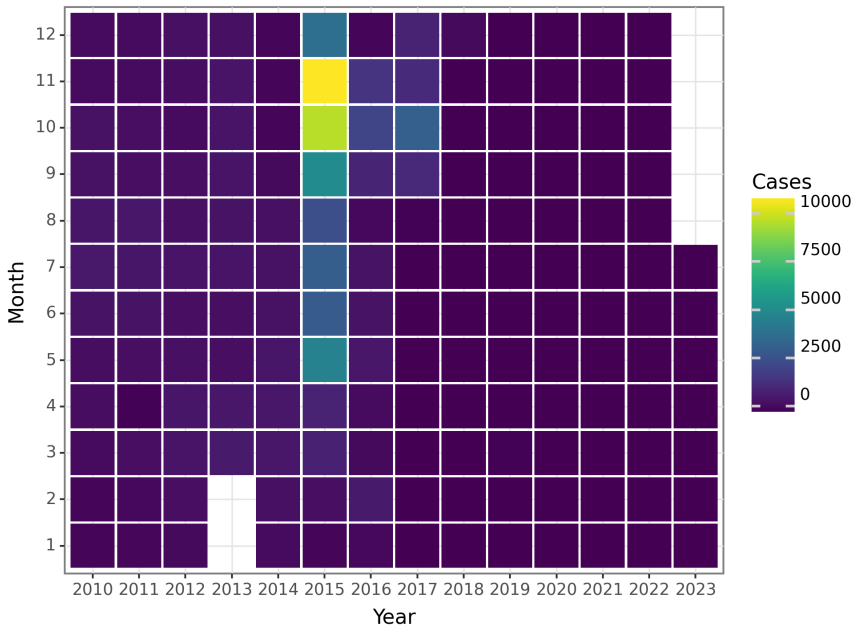

Figure 99: The Change of Schistosomiasis Cases before 2023 July

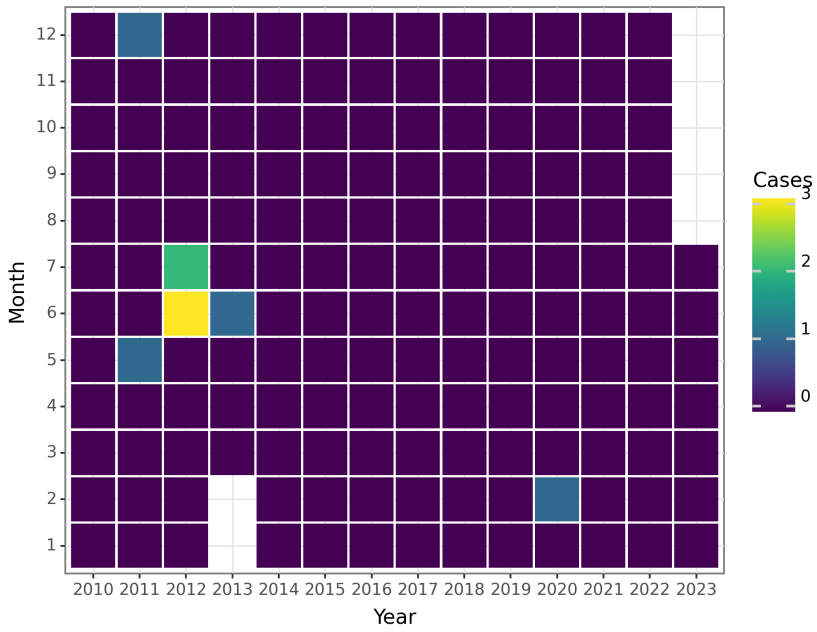

Figure 100: The Change of Schistosomiasis Deaths before 2023 July

Malaria

Malaria is a life-threatening disease caused by parasites of the Plasmodium species, which is transmitted to humans through the bites of infected female Anopheles mosquitoes. It is a prevalent infectious disease that particularly affects tropical and subtropical regions worldwide. Malaria has a significant impact on global health, posing a risk to millions of individuals and leading to hundreds of thousands of deaths annually.

Historically, malaria has been a major public health concern. The disease was first identified in ancient China around 2700 BC, and descriptions of malaria-like symptoms can be found in ancient Egyptian writings and Indian Ayurvedic texts. In the 17th century, European colonizers encountered malaria in tropical regions, including areas now known as the Americas and Africa. The term "malaria" originated from the Italian words "mala aria," which means "bad air," as it was believed that the disease was caused by foul-smelling air in swampy areas. It was not until the late 19th century that Sir Ronald Ross, an English physician, discovered that the true cause of malaria was the mosquito as the vector transmitting the disease.

Malaria is present in approximately 90 countries, with sub-Saharan Africa, South Asia, and parts of Central and South America experiencing the highest burden of the disease. According to the World Health Organization (WHO), there were an estimated 228 million cases of malaria worldwide and over 400,000 deaths in 2018. However, it is important to acknowledge that these figures may underestimate the actual burden due to under-reporting and limited access to healthcare in many affected regions.

The primary mode of malaria transmission is through the bite of infected female Anopheles mosquitoes. There are five species of Plasmodium that can cause malaria in humans, with P. falciparum being the most lethal and responsible for the majority of malaria-related deaths. In addition to mosquito bites, malaria can also be transmitted through blood transfusion, sharing of contaminated needles, or from mother to child during pregnancy and childbirth.

Malaria affects individuals of all age groups, but young children and pregnant women are particularly vulnerable. In areas with high malaria transmission, children under the age of five are at the greatest risk of severe illness and death. Pregnant women are also more susceptible to malaria, and the infection can result in adverse outcomes such as maternal anemia, low birth weight, and an increased risk of infant mortality.

Key statistics pertaining to malaria include the following: - In 2018, approximately 94% of malaria cases and deaths occurred in the WHO African Region. - Two-thirds of malaria deaths worldwide were children under five years old. - In regions with high transmission, such as sub-Saharan Africa, the disease is a leading cause of morbidity and mortality.

Multiple factors contribute to the transmission and spread of malaria, including mosquito breeding sites like stagnant water bodies such as puddles, swamps, and irrigated fields. Inadequate use of insecticide-treated bed nets, indoor residual spraying, and larval control measures also contribute to increased mosquito populations and higher transmission rates. Additionally, climate and geography play a role, as malaria transmission is influenced by factors such as rainfall patterns, temperature, and altitude. Socioeconomic conditions, limited access to healthcare, and inadequate diagnostic and treatment facilities further contribute to the persistence of malaria in endemic regions.

Malaria disproportionately impacts certain regions and populations, with sub-Saharan Africa bearing the highest burden with about 93% of malaria cases and deaths worldwide. Within this region, children under five, pregnant women, and individuals living with HIV/AIDS are particularly vulnerable. In Asia, countries like India, Indonesia, and Myanmar have a high malaria burden. Central and South America, including the Amazon Basin region, are also affected by the disease. However, the prevalence and severity of malaria can vary across countries and even within regions due to differences in malaria control measures, local mosquito species and their ability to transmit malaria, availability of diagnostic tools and effective treatment, and access to healthcare services.

In conclusion, malaria remains a significant global public health issue, especially in tropical and subtropical regions. Its high prevalence, transmission through infected mosquitoes, and impact on vulnerable populations make it a major cause of illness and death. Efforts to combat malaria include vector control measures, early diagnosis, prompt treatment, and research into new interventions such as vaccines.

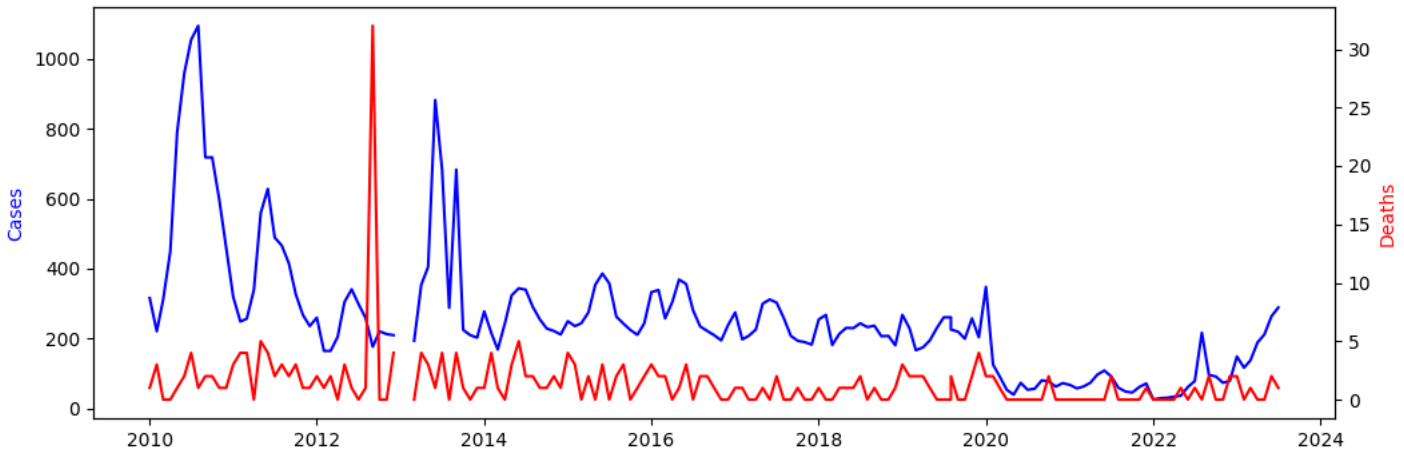

Figure 101: The Change of Malaria Reports before 2023 July

Seasonal Patterns: The provided data clearly indicates a distinct seasonal pattern in the occurrence of malaria cases in mainland China. Cases tend to increase during the summer months (June to August) and decrease during the winter months (December to February). This pattern is likely attributed to the life cycle of the mosquitoes responsible for transmitting the malaria parasite, as mosquito populations thrive in warm and humid conditions.
Peak and Trough Periods: Malaria cases in mainland China reach their peak during the summer months, particularly in July and August, consistently showing the highest number of reported cases. Conversely, trough periods, with the lowest number of cases, can be observed during the winter months, especially in December and January.
Overall Trends: An examination of the overall trends reveals a general decline in the number of malaria cases in mainland China from 2010 to 2023. In the early years (2010-2012), there was considerable variability in case numbers. However, from 2013 onwards, a consistent downward trend can be observed, albeit with occasional fluctuations. Similarly, the number of deaths caused by malaria also exhibits a declining trend over time.
Discussion: The observed seasonal pattern in the data aligns with the known biology and behavior of the mosquito species responsible for malaria transmission. Mosquitoes thrive in warm and humid conditions, which are prevalent during summer months in mainland China. Therefore, the transmission of malaria is more likely to occur during this period.
The patterns of peak and trough periods coincide with the seasonal pattern, with the highest number of cases occurring during the peak summer months and the lowest number of cases in winter. This information is valuable for public health professionals in planning and implementing effective measures to control malaria, such as mosquito control, bed nets, and preventive treatment during high-risk periods.
The overall decreasing trend in both malaria cases and deaths suggests that the control measures implemented in mainland China have effectively reduced the burden of malaria. It is crucial to continue monitoring and implementing targeted interventions to sustain and further reduce the transmission of malaria.
It is important to note that negative values are reported for the number of malaria cases and deaths in some months. This may be attributed to data reporting issues or potential errors during data entry. These discrepancies should be taken into consideration when interpreting the data.
In conclusion, this analysis provides valuable insights into the seasonal patterns, peak and trough periods, and overall trends of malaria in mainland China.

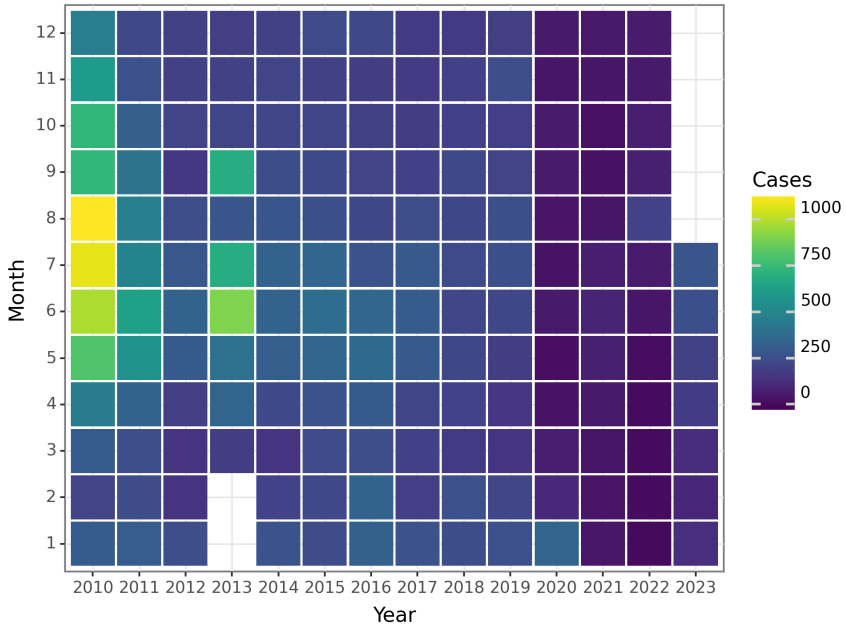

Figure 102: The Change of Malaria Cases before 2023 July

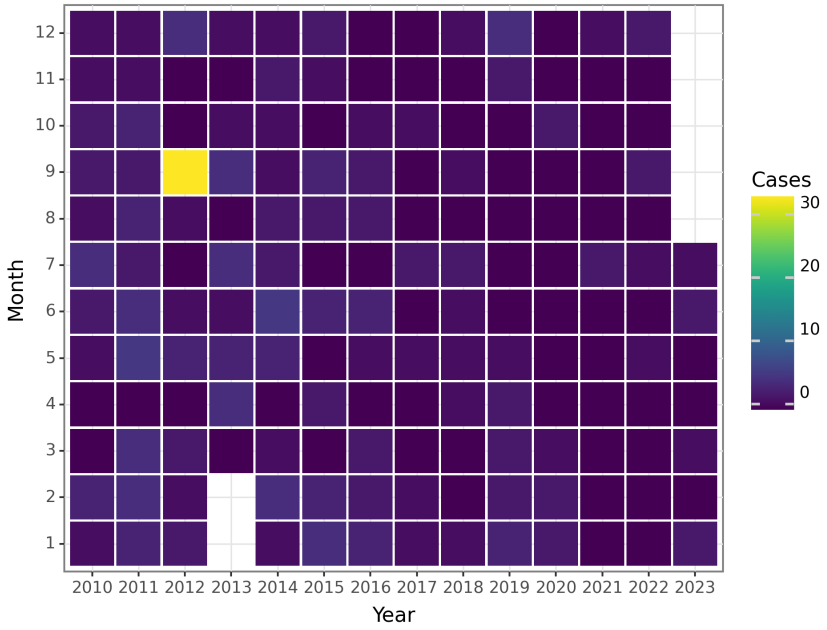

Figure 103: The Change of Malaria Deaths before 2023 July

Human infection with H7N9 virus

Human infection with the H7N9 virus, a subtype of avian influenza, was first identified in China in 2013. The emergence of H7N9 raised concerns due to its potential to cause severe illness and high fatality rate. This comprehensive overview aims to provide information on the global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and the impact of H7N9 virus on different regions and populations.

Epidemiology of H7N9 Virus Infection: 1. Global Prevalence: Since its discovery in 2013, human cases of H7N9 infection have primarily been reported in China. However, a few imported cases have been detected outside of China, including Hong Kong, Taiwan, Canada, Malaysia, and the United States.

2. Transmission Routes: The primary mode of H7N9 virus transmission is through direct contact with infected poultry, particularly in live poultry markets. Human-to-human transmission of the H7N9 virus is limited and has mainly been observed among close household contacts of infected individuals.

3. Affected Populations: H7N9 infection primarily affects individuals who have direct or indirect contact with poultry, such as workers in live poultry markets, poultry farmers, and those with exposure to contaminated environments. Most reported cases have occurred in older adults (average age 58 years) with underlying medical conditions, such as diabetes, chronic respiratory diseases, or immunosuppression. While children are comparatively less affected, cases have been reported in all age groups.

4. Key Statistics: As of February 2021, a total of 1,568 laboratory-confirmed cases of H7N9 infection have been reported globally, with a fatality rate of approximately 39%. The majority of cases have occurred in mainland China, with only a few cases reported in other countries.

Historical Context and Discovery: The first cases of human infection with the H7N9 virus were reported in China in March 2013. These cases were initially identified in Shanghai and later spread to several other provinces in eastern China. The rapid detection and identification of the virus were made possible by the strengthening of China's surveillance systems following the H5N1 avian influenza outbreak in 2003.

Risk Factors Associated with H7N9 Transmission: 1. Direct or Indirect Contact with Poultry: The primary risk factor for H7N9 transmission is close contact with infected poultry or contaminated environments in live poultry markets or poultry farms. Individuals working in the poultry industry have a higher risk of infection.

2. Low Awareness and Protective Measures: Individuals with limited awareness of preventive measures, such as proper hand hygiene, use of personal protective equipment, and avoidance of live poultry markets, are at a higher risk of H7N9 infection.

3. Underlying Medical Conditions: Individuals with pre-existing medical conditions, especially diabetes, chronic respiratory diseases, cardiovascular diseases, and immunosuppression, are more susceptible to severe illness and complications from H7N9 infection.

Impact on Different Regions and Populations: The impact of the H7N9 virus varies across regions and populations. Mainland China has observed the highest number of cases and fatalities. Prevalence rates have been higher in provinces with intensive poultry production and live poultry markets. The elderly population and individuals with underlying medical conditions have experienced higher mortality rates compared to healthier individuals.

Outside of China, imported cases have been reported, but human-to-human transmission has been limited, resulting in a lesser impact on other regions. Timely detection, surveillance, and public health interventions have contributed to preventing widespread outbreaks in these areas.

In summary, the H7N9 virus primarily affects individuals with close contact with infected poultry, and human-to-human transmission is limited. The virus has had a significant impact on China, particularly with high fatality rates among older adults and those with underlying medical conditions. Public health efforts and increased awareness of preventive measures remain crucial in controlling the spread of H7N9 infection and mitigating its impact.

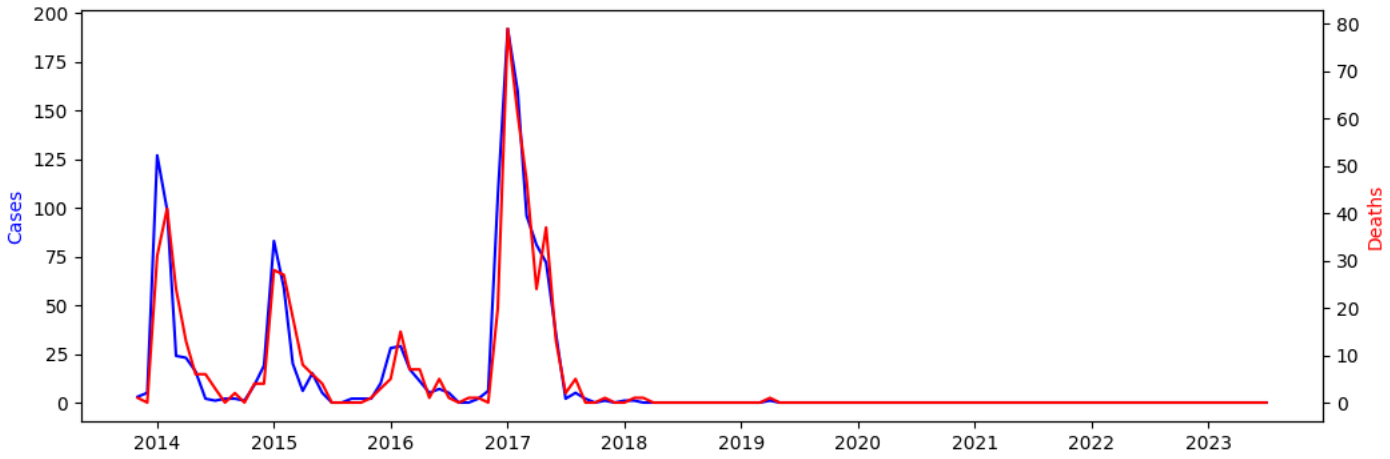

Figure 104: The Change of Human infection with H7N9 virus Reports before 2023 July

Seasonal Patterns:
The data on human infection with the H7N9 virus in mainland China reveals clear seasonal patterns. The highest number of cases and deaths occurs during the winter months, peaking in January and February. There is a steady increase in cases from November to January, followed by a gradual decline from February to April. From April to July, there are consistently low or zero cases.
Peak and Trough Periods:
The peak period for H7N9 virus cases and deaths is observed from December to February, with the highest number of cases recorded in January. The trough period occurs from April to July, with very few or no cases reported during these months. After the peak period, there is a gradual decline in cases until they reach a minimum during the trough period.
Overall Trends:
Overall, there is a decreasing trend in the number of H7N9 virus cases and deaths over time. In the early years (2013-2014), there was a rapid increase in cases reaching a peak in 2014. However, since then, there has been a significant decrease in the number of cases reported each year, with a complete absence of cases from 2019 onwards. The trend in deaths follows a similar pattern, with a decrease in the number of deaths reported each year and no deaths reported from 2020 onwards.
Discussion:
The seasonal patterns observed in the data suggest that human infection with the H7N9 virus in mainland China follows a clear cyclic pattern, with the highest transmission occurring during the winter months. This aligns with the known transmission dynamics of influenza viruses, which thrive in colder weather and are more easily transmitted in crowded indoor spaces during the winter season. The decrease in the number of cases and deaths over time indicates the successful implementation of control measures and public health interventions to reduce the spread of the virus. The absence of cases from 2019 onwards suggests that efforts to control and prevent H7N9 virus infection have been effective. However, it is important to remain vigilant and continue monitoring the situation to prevent any potential resurgence or emergence of new strains of the virus.

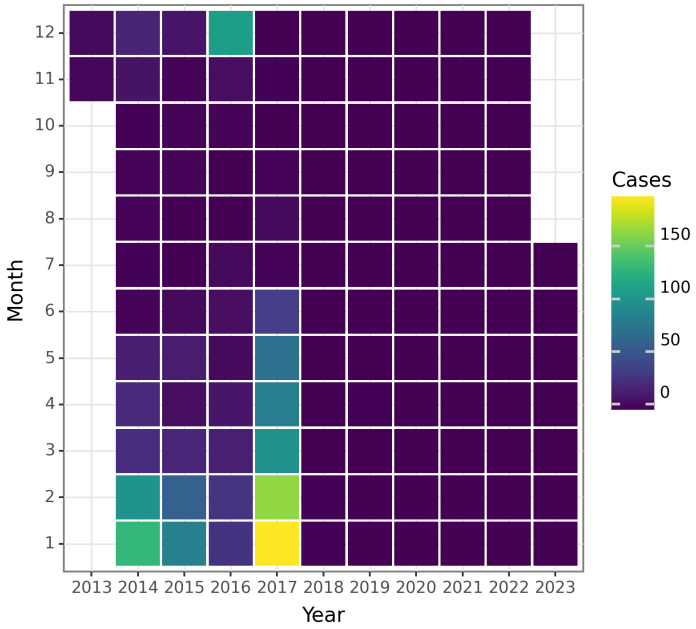

Figure 105: The Change of Human infection with H7N9 virus Cases before 2023 July

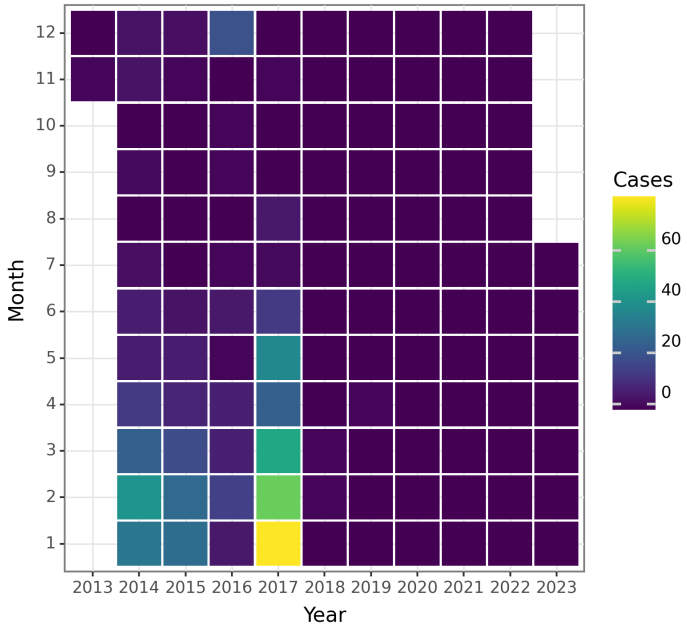

Figure 106: The Change of Human infection with H7N9 virus Deaths before 2023 July

Influenza

Influenza, also known as the flu, is a highly contagious respiratory illness caused by influenza viruses. It poses a significant public health challenge worldwide, with seasonal outbreaks occurring on an annual basis. Understanding the epidemiology of influenza is vital for implementing effective prevention and control strategies. This comprehensive overview will address various aspects of influenza, such as its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and impact on different regions and populations.
1. Global Prevalence: Influenza is a global health menace, marked by yearly epidemics. Based on estimates from the World Health Organization (WHO), influenza affects approximately 3 to 5 million individuals each year, resulting in severe illness in 290,000 to 650,000 people and causing 250,000 to 500,000 deaths worldwide. These figures can vary significantly depending on the severity of the flu season and the presence of novel or pandemic strains.
2. Transmission Routes: Influenza primarily spreads through respiratory droplets released when an infected person coughs, sneezes, or talks. These droplets can be directly inhaled by individuals in close proximity or can settle on surfaces, where they can remain infectious for a short period of time. Indirect transmission occurs when individuals touch contaminated surfaces and then touch their mouth, nose, or eyes.
3. Affected Populations: Influenza can affect individuals across all age groups, but certain populations are at a higher risk of developing severe complications. These vulnerable groups include young children, pregnant women, elderly individuals (especially those over 65 years of age), individuals with underlying medical conditions (such as asthma, diabetes, heart disease, or weakened immune systems), and healthcare workers. Additionally, residents of long-term care facilities and densely populated environments are also more susceptible to infection.
4. Key Statistics: On a yearly basis, influenza affects 10-20% of the global population, leading to 3-5 million cases of severe illness and 250,000-500,000 deaths. The mortality rate varies based on the circulating virus strain, the age of the population, and access to healthcare. Influenza A and B viruses are responsible for the majority of infections, with influenza A causing more severe illness.
5. Historical Context and Discovery: Influenza has been recognized as a disease since ancient times, with periodic epidemics documented throughout history. Notable pandemics include the "Spanish flu" in 1918, the "Asian flu" in 1957, the "Hong Kong flu" in 1968, and the H1N1 pandemic in 2009. The influenza virus was first isolated in the 1930s, and subsequent research has revealed different subtypes and strains.
6. Risk Factors for Transmission: The major risk factors associated with influenza transmission are as follows: a. Close contact with infected individuals or exposure to respiratory droplets. b. Crowded environments, such as schools, workplaces, and public transportation. c. Failure to adhere to respiratory hygiene practices, such as covering the mouth when coughing or sneezing. d. Lack of vaccination or limited vaccine coverage. e. Weakened immune system due to underlying medical conditions or medications. f. Inadequate healthcare resources and infrastructure.
7. Impact on Regions and Populations: The impact of influenza varies across different regions and populations due to factors such as climate, healthcare infrastructure, vaccination coverage, and virus strains. In temperate regions, influenza follows a seasonal pattern, with higher rates during colder months. In tropical regions, influenza can occur throughout the year but may exhibit slight seasonality. Developing countries, with limited resources and healthcare access, often face a higher burden of illness and mortality caused by influenza.
Certain demographics, such as the elderly, young children, and individuals with pre-existing conditions, are more susceptible to severe complications and death. Influenza can also have a significant impact on indigenous populations, refugees, and those living in impoverished or unsanitary conditions.
To conclude, influenza is a respiratory illness of global importance, affecting millions of individuals each year. It is primarily transmitted through respiratory droplets and can have severe consequences, especially for high-risk populations. The historical context reveals periodic pandemics, leading to increased awareness and research. Risk factors for transmission include close contact, crowded environments, and a lack of preventive measures. The impact of influenza varies across regions, with developing countries and vulnerable demographics experiencing a higher burden. Effective surveillance, vaccination, and public health measures are vital for controlling the spread of influenza.

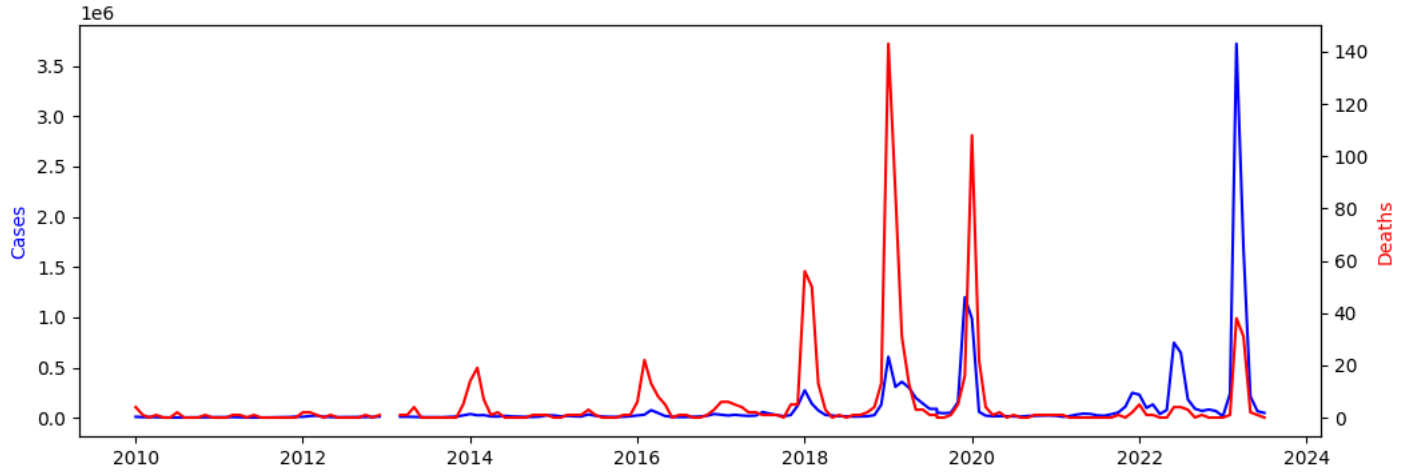

Figure 107: The Change of Influenza Reports before 2023 July

Seasonal Patterns: Based on monthly data from 2010 to July 2023, clear seasonal patterns emerge in the number of influenza cases in mainland China. The cases reach their peak during the winter months (December to February) and gradually decline during the spring and summer months (March to July), with the fewest cases typically observed in the summer.
Peak and Trough Periods: Influenza cases consistently peak during the winter months, particularly in January and February, throughout the years analyzed. These months consistently exhibit the highest number of cases. Conversely, the trough periods, with the fewest number of cases, are observed during the summer months, specifically in June, July, and August.
Overall Trends: Overall, there is an increasing trend in the number of influenza cases in mainland China from 2010 to July 2023. Although there is some variability from year to year, there is a general upward trend over time. This trend is evident in both the peak and trough periods, with more recent years experiencing higher peaks and deeper troughs compared to earlier years.
Discussion: The seasonal patterns of influenza cases in mainland China align with the global trends, which show increased transmission during the winter months. These patterns can be attributed to various factors, such as changes in weather conditions, school and work patterns, and increased indoor activities during colder months.
The observed peak and trough periods provide valuable information for public health planning and resource allocation. The peak periods emphasize the need for heightened preparedness and healthcare capacity during the winter months, whereas the trough periods offer opportunities for public health interventions and preventive measures to reduce transmission.
The overall upward trend in the number of influenza cases highlights the need for continuous surveillance and monitoring of the disease. It is crucial for public health authorities to remain vigilant and adapt strategies to control and prevent the spread of influenza, particularly during peak periods. The data from the most recent years suggest a potentially increasing burden of influenza in mainland China, necessitating ongoing research and interventions to mitigate the impact of the disease.
Note: The analysis solely relies on the provided data and does not consider any external factors or events that may have influenced the observed trends.

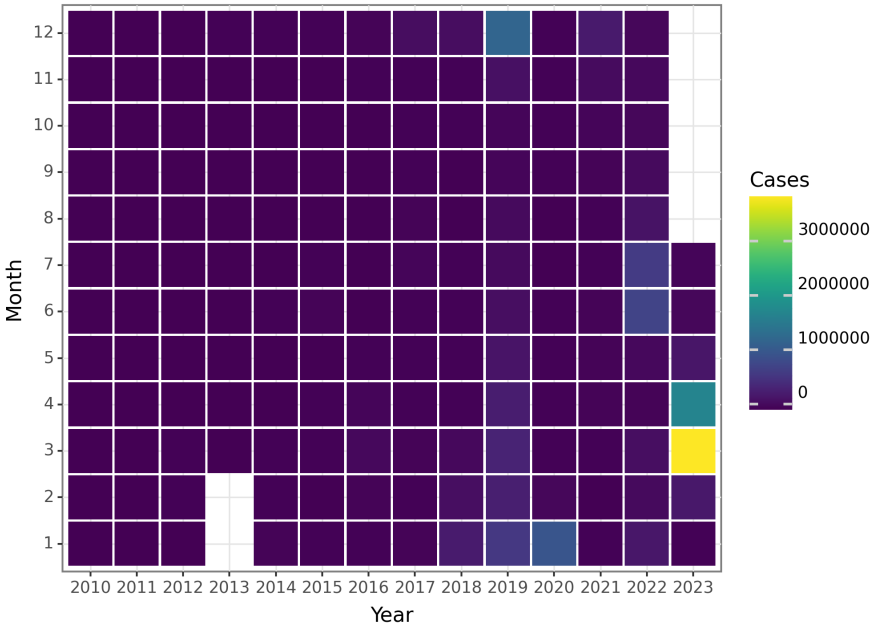

Figure 108: The Change of Influenza Cases before 2023 July

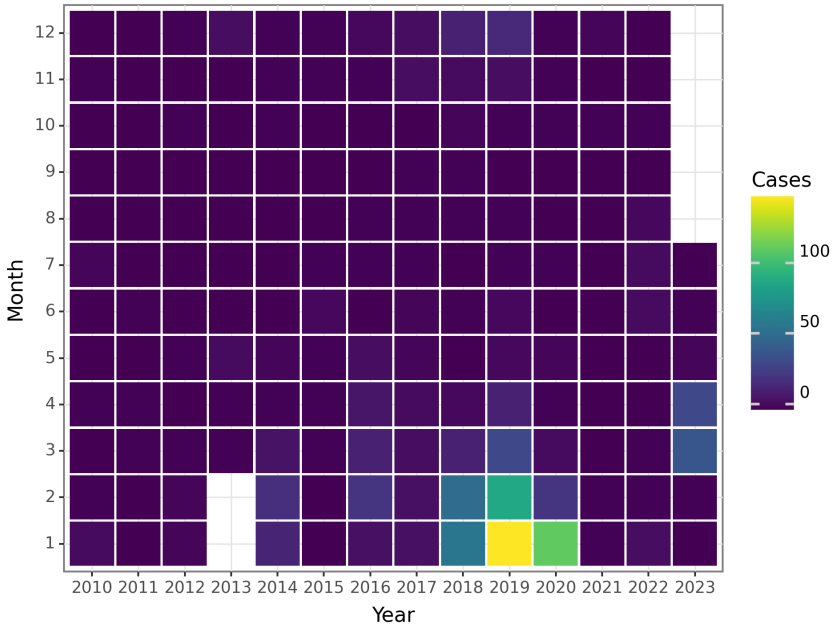

Figure 109: The Change of Influenza Deaths before 2023 July

Mumps

Mumps is a highly contagious viral infection caused by the mumps virus, which primarily affects the salivary glands, resulting in swelling and pain in the cheeks and jaws. Additionally, mumps can also affect other organs such as the testes, ovaries, pancreas, and brain.
Historical Context and Discovery:
Mumps has been recognized as a disease for centuries, with historical reports of epidemics describing swollen glands dating back to the 5th century BC. However, it was not until 1934 that the mumps virus was isolated and identified by Johnson and Goodpasture. This discovery established a connection between the mumps virus and the clinical symptoms of the disease.
Global Prevalence and Transmission Routes:
Mumps is found worldwide, but its prevalence varies across regions and populations. Prior to the introduction of the vaccine, mumps was a common childhood disease in many countries. However, widespread vaccination campaigns have significantly reduced the number of cases.
Transmission of mumps occurs through direct contact with respiratory droplets from an infected person, primarily through coughing, sneezing, or sharing utensils, drinks, or other personal items. The virus can also spread through contact with contaminated surfaces.
Affected Populations and Key Statistics:
Mumps can affect individuals of all ages, but it is most commonly observed in children aged 5-15 years who have not been vaccinated. However, in recent years, there has been a shift in affected populations, with a rise in cases among adolescents, college students, and young adults.
Key statistics related to mumps include:
1. Incubation Period: The time between exposure to the virus and the development of symptoms ranges from 12 to 25 days, with an average of 16-18 days. 2. Symptomatology: Common symptoms include fever, headache, fatigue, loss of appetite, and swelling and tenderness of the salivary glands. 3. Complications: Although rare, mumps can lead to various complications, such as meningitis, encephalitis, deafness, orchitis (inflammation of the testicles), oophoritis (inflammation of the ovaries), and pancreatitis. 4. Vaccine Availability: Currently, vaccines are available to prevent mumps. The most widely used vaccine is the MMR vaccine, which also provides protection against measles and rubella.
Major Risk Factors Associated with Mumps Transmission:
Several risk factors contribute to the transmission of mumps, including:
1. Lack of Vaccination: Individuals who are not vaccinated or have not received the recommended number of vaccine doses are at a higher risk of contracting and spreading the virus. 2. Crowded Environments: Residing in crowded quarters or close contact settings, such as college dormitories or military barracks, can increase the risk of mumps transmission. 3. International Travel: Visiting or living in areas with low vaccination rates or ongoing mumps outbreaks increases the risk of exposure to the virus. 4. Poor Hygiene Practices: Failure to practice proper hand hygiene, such as not washing hands regularly, can facilitate the spread of the mumps virus.
Impact of Mumps on Different Regions and Populations:
Prevalence rates and demographics affected by mumps can vary across regions and populations due to various factors, including:
1. Vaccination Coverage: Countries with high vaccination coverage generally have lower mumps prevalence rates. 2. Socioeconomic Factors: Improvements in living conditions, access to healthcare, and vaccination infrastructure influence the prevalence and impact of mumps within populations. 3. Age Group: The age group most affected by mumps may differ among regions due to variations in vaccination policies and historical exposure rates. 4. Outbreaks and Clusters: Mumps outbreaks can occur in specific communities, settings, or regions where there is close contact and low vaccination rates, such as schools or religious communities.
In conclusion, mumps is a globally prevalent viral infection that primarily affects the salivary glands. Its transmission occurs through respiratory droplets and direct contact with infected individuals. Although mumps can affect individuals of all ages, children and unvaccinated individuals are at higher risk. Vaccination campaigns have significantly reduced the number of cases, but there are still variations in prevalence rates and affected demographics across regions and populations. Understanding the epidemiology of mumps is crucial for implementing effective prevention and control strategies.

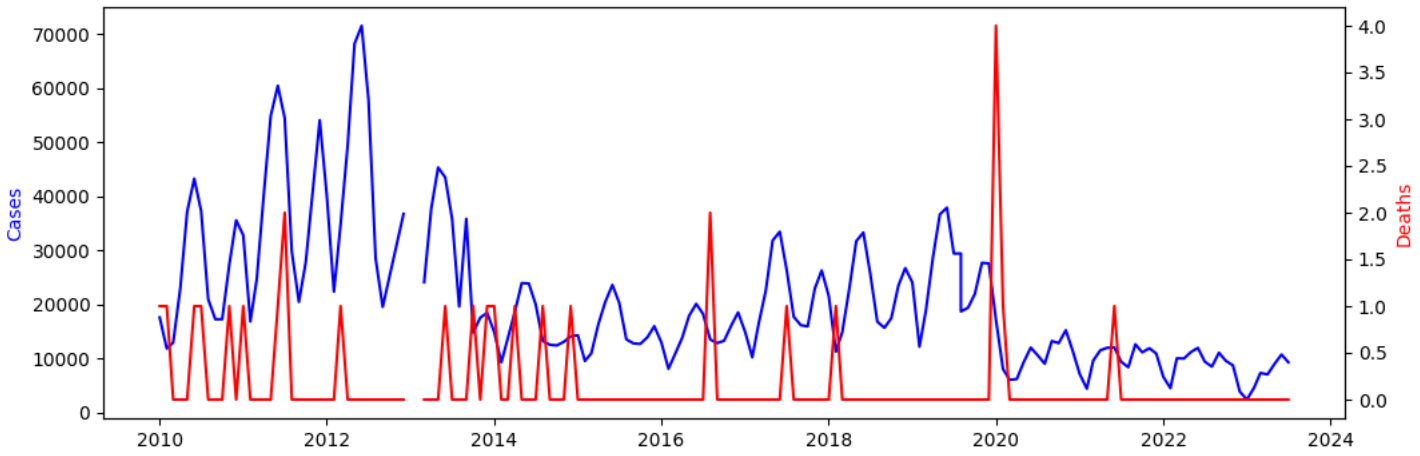

Figure 110: The Change of Mumps Reports before 2023 July

Title: Epidemiological Patterns and Trends of Mumps Cases in Mainland China
Seasonal Patterns:
According to the provided data, Mumps cases in mainland China exhibit distinct seasonal patterns as outlined below: - The number of cases fluctuates consistently throughout the years. - Notably, there is an increase in cases during the spring and summer months (March to July), with the highest numbers observed in May, June, and July. - Following the peak in summer, there is a gradual decline in cases during the autumn and winter months (August to February), with the lowest numbers recorded in December and January.
Peak and Trough Periods:
The peak and trough periods of Mumps cases in mainland China can be identified as follows: - Peak Periods: May, June, and July consistently exhibit the highest number of cases each year, indicating a seasonal peak in Mumps transmission. - Trough Periods: December and January consistently show the lowest number of cases, representing a seasonal trough in Mumps transmission.
Overall Trends:
Analyzing the overall trends of Mumps cases in mainland China reveals the following observations: - Noteworthy fluctuations in the number of cases over the years reflect variations in Mumps transmission. - Between 2010 and 2013, there was an increasing trend in Mumps cases, peaking in 2011 and subsequently decreasing in 2013. - From 2014 to 2019, a relatively stable pattern with occasional fluctuations was observed, without notable increasing or decreasing trends. - In 2020, there was a significant drop in cases, possibly influenced by external factors such as the COVID-19 pandemic, which led to restrictions and changes in healthcare-seeking behavior. - Subsequently (2021 to 2023), there was a slight increase in cases, reaching a moderate level but not surpassing the peak years.
Discussion:
The seasonal patterns, peak and trough periods, and overall trends of Mumps cases in mainland China highlight the cyclic nature of the disease. The increase in cases during the spring and summer months suggests that Mumps transmission may be influenced by factors like increased social interactions, crowded environments (e.g., schools), and environmental conditions conducive to viral spread. The peak in cases during May, June, and July underscores the importance of targeted preventive measures, including vaccination and public health awareness campaigns, before the onset of the peak period. The fluctuations observed in the overall trends of Mumps cases over the years underscore the necessity of ongoing surveillance, monitoring, and implementation of control measures to effectively manage and prevent Mumps outbreaks in mainland China.

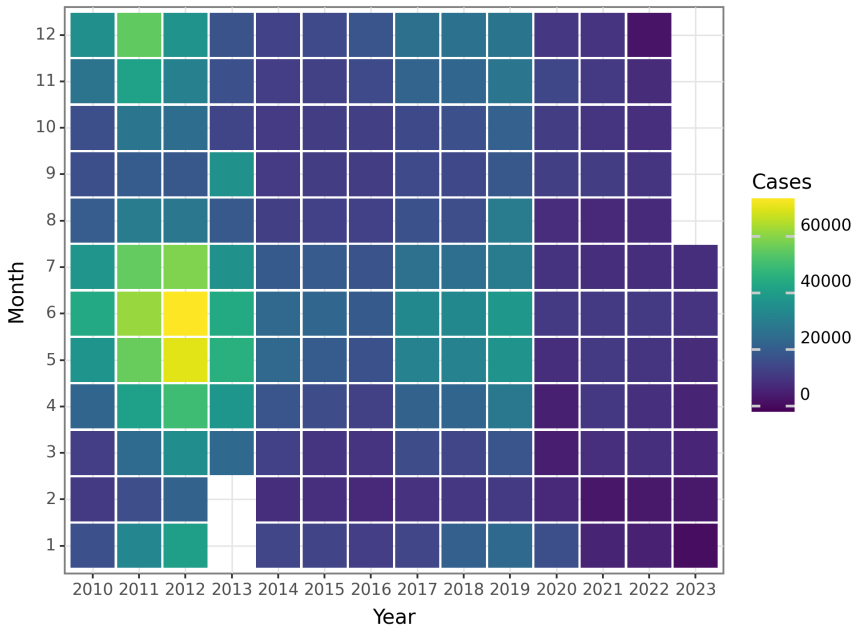

Figure 111: The Change of Mumps Cases before 2023 July

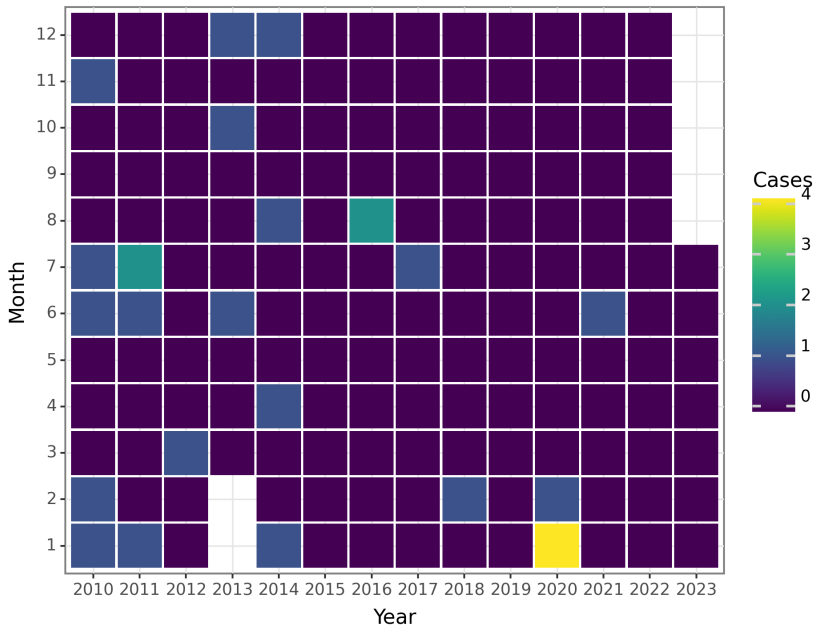

Figure 112: The Change of Mumps Deaths before 2023 July

Rubella

Rubella, also known as German measles, is a viral infection caused by the rubella virus. It primarily affects pregnant women and their developing fetuses, as the infection during pregnancy can result in severe birth defects and long-term disabilities known as congenital rubella syndrome (CRS). Understanding the epidemiology of rubella is crucial for implementing effective prevention and control measures.
Historical Context and Discovery: Rubella was first identified as a separate disease from measles and scarlet fever in the 18th century. However, its viral cause was not confirmed until the early 20th century. In 1938, Max Theiler successfully isolated the rubella virus, leading to further research on diagnosing and preventing the disease. Live attenuated vaccines for rubella were introduced in the 1960s.
Global Prevalence: Rubella is a prevalent disease worldwide, although its incidence varies across regions. Prior to the introduction of the rubella vaccine, epidemics occurred approximately every 6-9 years. However, since the widespread vaccination, the incidence of rubella has significantly decreased, and some countries have interrupted the endemic transmission of rubella, nearing its eradication in those areas.
Transmission Routes: Rubella is transmitted through respiratory droplets via person-to-person contact. It is highly contagious and can spread rapidly among susceptible populations. The virus can be transmitted by both symptomatic and asymptomatic individuals. The incubation period of rubella is approximately 14 days, during which an infected person can transmit the virus to others, even before showing symptoms.
Affected Populations: Although rubella can affect people of all ages, it is most commonly observed in children and young adults. The disease is generally milder in children, presenting with a rash, low-grade fever, and mild respiratory symptoms. However, rubella infection during pregnancy poses the greatest risk. If contracted by a pregnant woman, especially in the first trimester, rubella significantly increases the chances of complications and congenital rubella syndrome in the developing fetus.
Key Statistics: - Prior to widespread vaccination, rubella epidemics caused an estimated 100,000 cases of CRS worldwide every year. - According to the World Health Organization (WHO), approximately 78,000 infants were born with CRS globally in 2019. - Rubella infection during pregnancy results in CRS in approximately 85% of cases when the virus is contracted in the first trimester.
Risk Factors Associated with Rubella Transmission: 1. Lack of Vaccination: The primary risk factor for rubella transmission is inadequate vaccine coverage. Unvaccinated individuals or communities with low vaccination rates remain susceptible to contracting and transmitting the virus. 2. Travel: International travel can contribute to the spread of rubella. People who travel to areas with ongoing rubella outbreaks may contract the virus and introduce it to their home communities. 3. Crowded Settings: Close contact with infected individuals in crowded settings such as schools, daycare centers, and healthcare facilities increases the risk of rubella transmission. 4. Pregnant Women: Pregnant women who are not vaccinated are particularly vulnerable to rubella infection. Transmission to the developing fetus can lead to severe birth defects and long-term disabilities.
Impact on Different Regions and Populations: The impact of rubella varies across regions and populations due to differences in vaccination coverage, healthcare infrastructure, and population demographics. In regions with high vaccination coverage and effective immunization programs, rubella has been successfully controlled or eliminated.
However, in low-income countries with limited access to vaccines, rubella incidence remains higher. These areas often experience outbreaks and continue to bear the burden of CRS cases. Pregnant women are the most at-risk population in these regions, causing significant morbidity and mortality in newborns. Additionally, vulnerable populations such as migrant communities and marginalized groups face an increased risk of rubella due to limited access to healthcare and immunization services. Therefore, efforts to improve vaccine equity and reach underserved populations are crucial in controlling the spread of rubella and preventing CRS.
In conclusion, understanding the epidemiology of rubella highlights the importance of vaccination in preventing its transmission and reducing the burden of congenital rubella syndrome. While progress has been made in controlling rubella in many regions, ongoing efforts are necessary to ensure high vaccination coverage, particularly among pregnant women and vulnerable populations.

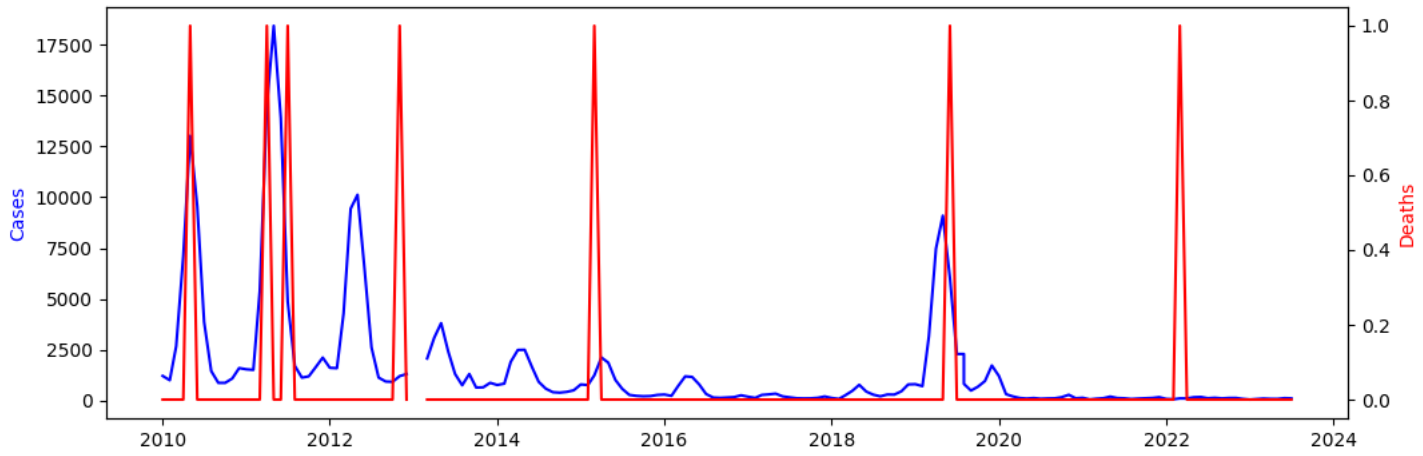

Figure 113: The Change of Rubella Reports before 2023 July

Seasonal Patterns:
The data on Rubella cases in mainland China indicates a clear seasonal pattern. There is a notable peak in cases between the months of March and May, followed by a decrease from June to August. A slight increase is observed in September and October, and the lowest number of cases is typically seen in the winter months from December to February.
Peak and Trough Periods:
The peak period for Rubella cases in mainland China consistently occurs between March and May, with the highest number of cases during this time. Cases then decrease during June to August, forming a trough period. A smaller peak in cases is observed in September and October, followed by a further decline during the winter months of December to February.
Overall Trends:
Rubella cases in mainland China have shown an overall decreasing trend. There was a gradual increase in cases from 2010 to 2012, with the highest number of cases recorded in 2011. However, since 2012, the number of cases has been consistently decreasing with occasional fluctuations. This decline trend continues until 2023, with a consistently low number of cases reported in recent years.
Discussion:
The seasonal pattern of Rubella cases in mainland China indicates that the virus exhibits a seasonally transmitted pattern. The peak occurs in spring and early summer, which aligns with the known characteristics of Rubella as an airborne infection that spreads easily in crowded areas and during close contact. These conditions may be more prevalent during the spring and early summer months when people gather or travel more frequently.
The overall decreasing trend in Rubella cases is a positive development and suggests that vaccination campaigns and public health interventions have been effective in reducing the transmission of the virus. Maintaining and strengthening these efforts is crucial to further reducing the burden of Rubella in mainland China.
It is important to note that the data provided only represents reported cases, and there may be underreporting or variations in testing and surveillance systems over time. Additionally, the analysis relies solely on the number of cases and deaths, and other factors such as vaccination coverage and population demographics may also influence the observed patterns and trends.

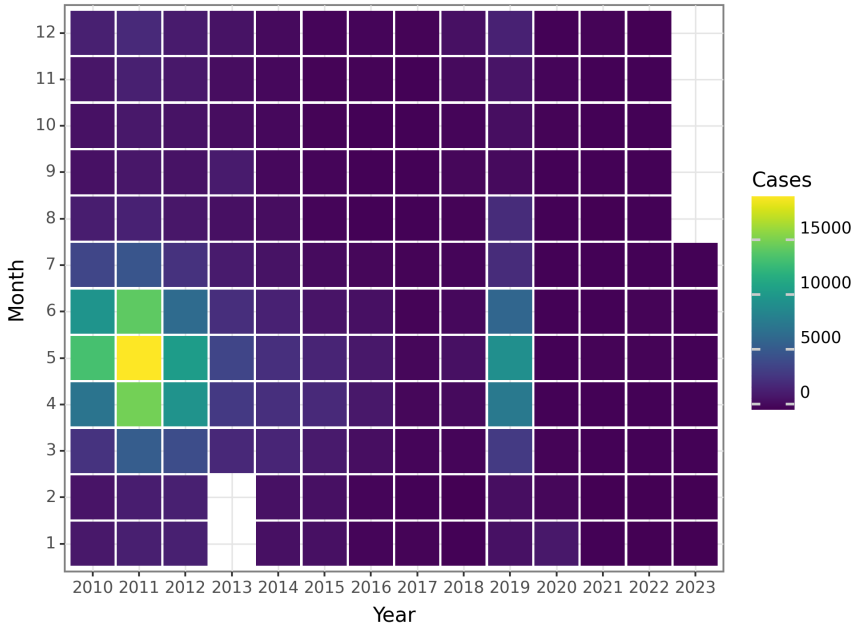

Figure 114: The Change of Rubella Cases before 2023 July

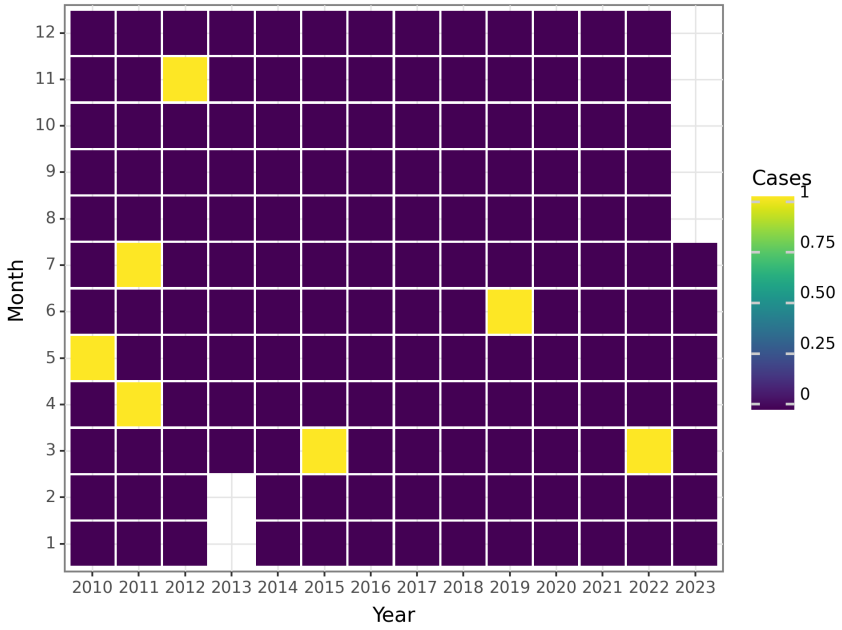

Figure 115: The Change of Rubella Deaths before 2023 July

Acute hemorrhagic conjunctivitis

Acute hemorrhagic conjunctivitis (AHC) is a highly contagious viral infection characterized by the sudden onset of redness, swelling, and discharge in the conjunctiva of the eye. It is caused by several types of viruses, primarily Enterovirus 70 (EV70) and Coxsackievirus A24 (CA24).
Historical Context and Discovery: The first description of AHC was in 1969 during an outbreak in Ghana, Africa. It later spread to other parts of Africa and then to Asia. The pandemic nature of AHC was recognized in the 1970s when it rapidly circulated in various regions worldwide. Since then, AHC outbreaks have been reported in many countries, with varying levels of severity.
Prevalence: AHC is prevalent globally, but its impact varies among different regions and populations. Outbreaks have been reported in Asia, Africa, Europe, the Americas, and Oceania. The incidence of AHC is typically higher in tropical and subtropical regions due to favorable environmental conditions for viral transmission.
Transmission Routes: AHC is primarily transmitted through direct contact with infected ocular secretions or contaminated surfaces. The virus can be present in tears, nasal secretions, and feces of infected individuals. Transmission can occur through hand-to-eye contact, sharing contaminated objects such as towels or eye drops, and exposure to respiratory droplets generated by infected individuals through coughing or sneezing.
Affected Populations: AHC can affect individuals of all ages and demographics. However, certain populations are more susceptible to infection. Young children, especially those attending daycare facilities or schools, are at a higher risk due to close contact. Additionally, individuals with poor hygiene practices, such as inadequate handwashing, are more vulnerable to AHC.
Key Statistics: Exact global statistics for AHC are challenging to determine, as many cases go unreported or are misdiagnosed. However, outbreaks have been reported intermittently in many countries. During outbreaks, AHC can affect a significant number of individuals within a short period. In densely populated areas, the spread of AHC can be rapid, leading to substantial morbidity.
Risk Factors: Several risk factors contribute to the transmission of AHC. These include overcrowded living conditions, poor sanitation, lack of access to clean water, and inadequate healthcare infrastructure. Additionally, behaviors such as close contact with infected individuals, lack of hand hygiene, and sharing personal items increase the risk of AHC transmission.
Impact on Regions and Populations: The impact of AHC varies geographically. In some regions, AHC may occur sporadically or as localized outbreaks, primarily affecting specific communities or institutions. However, in other regions, widespread outbreaks can occur, resulting in significant morbidity and strain on healthcare systems.
In developing countries with limited resources and inadequate healthcare infrastructure, AHC outbreaks can have a severe impact. They can impose a considerable burden on healthcare facilities that are already managing other infectious diseases. Additionally, productivity loss due to illness or caring for affected individuals can have economic consequences for affected populations.
Variations in prevalence rates and affected demographics can be observed within regions. Factors such as population density, healthcare access, and socio-economic conditions contribute to these variations. Targeted public health interventions and improved hygiene practices can help mitigate the impact of AHC and reduce transmission rates.
Overall, AHC remains a significant public health concern, particularly in regions with lower socio-economic status and limited resources. Continued surveillance, early detection, and timely implementation of control measures are necessary to minimize the spread and impact of this viral infection.

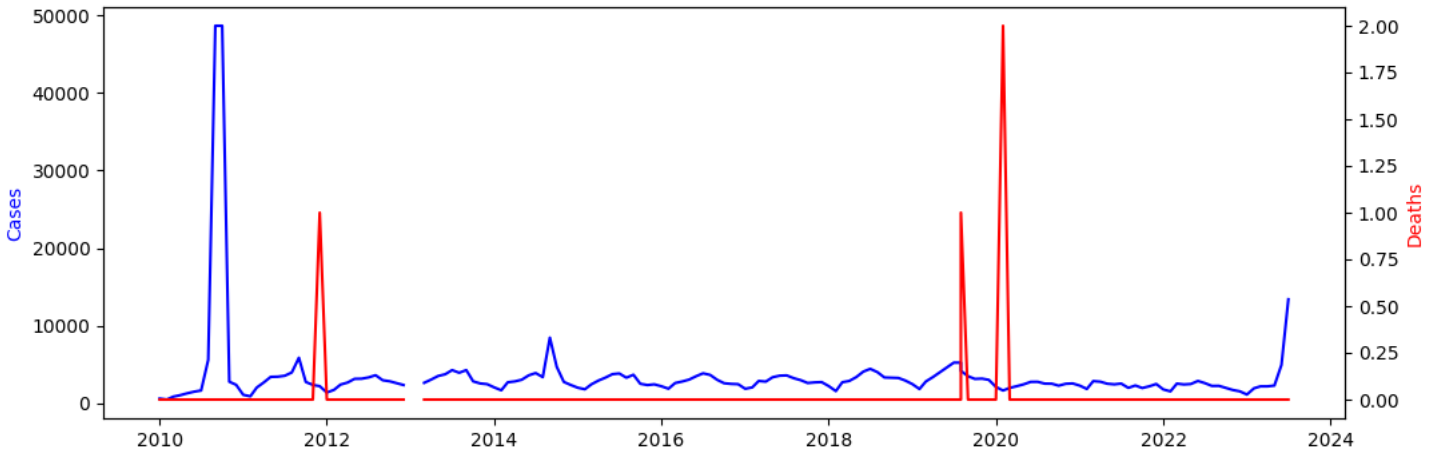

Figure 116: The Change of Acute hemorrhagic conjunctivitis Reports before 2023 July

Seasonal Patterns: The data demonstrates a distinct seasonal pattern for Acute Hemorrhagic Conjunctivitis (AHC) cases in mainland China. There is a consistent increase in cases during the summer months, with the highest number of cases occurring from June to August. This suggests that AHC is more prevalent during the warmer months. However, it is important to note that the summer peak in cases is not observed every year, as there is some variability.
Peak and Trough Periods: The peak period for AHC cases in mainland China falls during the summer months, specifically from June to August. During this time, the number of cases reaches its highest point, indicating a peak in AHC activity. On the other hand, the trough period occurs in the winter months, with the lowest number of cases recorded in December and January. This suggests a seasonal decline in AHC activity during the colder months.
Overall Trends: When considering the overall trend, there is a fluctuating pattern in the number of AHC cases in mainland China over the years. From 2010 to 2020, there appears to be an increasing trend in the number of cases, with occasional spikes in specific years. However, from 2020 to 2023, there is a noticeable decrease in cases, with a significant drop in 2023.
Discussion: The seasonal patterns observed in this data align with previous studies on AHC, which have identified that the disease is more prevalent in the summer months. This could be attributed to various factors, such as increased outdoor activities and higher temperatures, which provide favorable conditions for the transmission of the virus causing AHC. The consistent peak in cases during the summer months emphasizes the need for targeted preventive measures during this period to control the spread of AHC.
The overall trend of increasing cases from 2010 to 2020 followed by a recent decrease could be attributed to various factors. It is possible that increased awareness, improved surveillance, and enhanced public health interventions have contributed to better control and prevention of AHC, leading to a decline in cases. However, further analysis is required to determine the specific reasons for the observed trend.
It is worth mentioning that the provided data does not include information on the number of deaths associated with AHC, as the reported deaths are mostly zero or negative values. This might indicate inconsistencies in the data for the deaths variable or potential limitations in data collection. Therefore, the analysis primarily focuses on the patterns and trends in the reported cases of AHC.
Overall, this analysis indicates a clear seasonal pattern in AHC cases, with a peak during the summer months and a subsequent decline during the winter months. The overall trend suggests that AHC cases have been increasing in the past but have shown a recent decrease. These findings can provide valuable insights for public health authorities and researchers in understanding the seasonal dynamics of AHC and planning appropriate measures to prevent and control its spread.

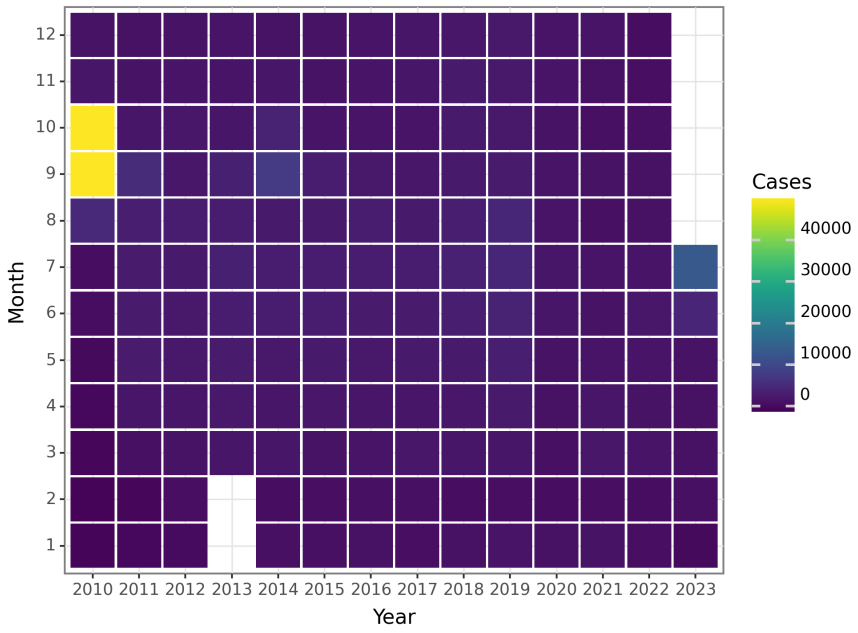

Figure 117: The Change of Acute hemorrhagic conjunctivitis Cases before 2023 July

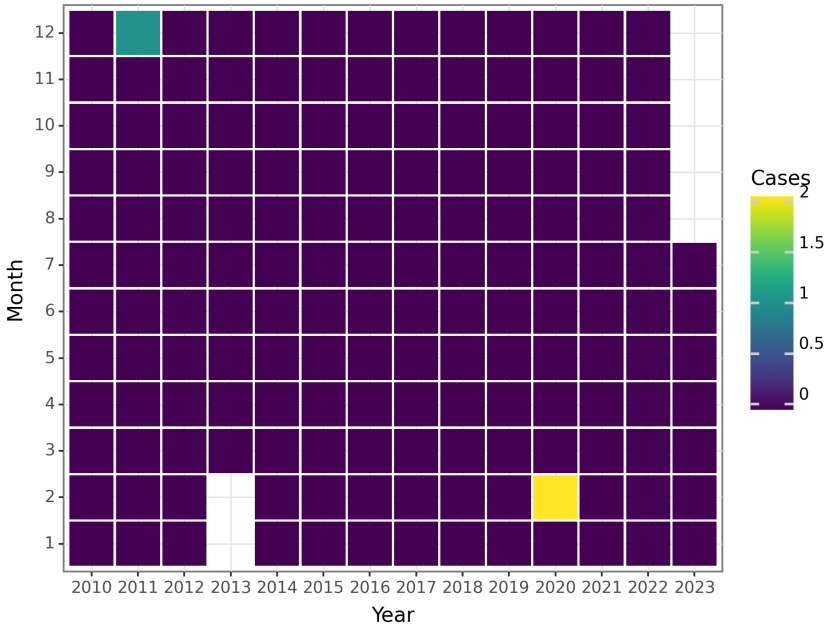

Figure 118: The Change of Acute hemorrhagic conjunctivitis Deaths before 2023 July

Leprosy

Leprosy, also known as Hansen's disease, is a chronic infectious disease caused by Mycobacterium leprae. It primarily affects the skin, nerves, and mucous membranes. A comprehensive understanding of the epidemiology of leprosy is crucial for the development of effective prevention, control, and treatment strategies. This overview will cover the global prevalence, transmission routes, affected populations, key statistics, historical context, major risk factors, and impact on different regions and populations.

Global Prevalence: Leprosy is predominantly found in tropical and subtropical regions of the world, particularly in parts of Africa, Asia, and Latin America. According to the World Health Organization (WHO), there were 175,176 reported cases of leprosy globally at the end of 2019, with a registered prevalence rate of 0.2 cases per 10,000 population. While the overall global prevalence has significantly decreased in recent decades, there are still countries with high transmission rates, such as India, Brazil, and Indonesia.

Transmission Routes: Leprosy primarily spreads through respiratory droplets from infected individuals, although the exact transmission route remains unclear. It is not highly contagious and requires prolonged contact with an untreated person with the disease for transmission to occur. Close and frequent contact with individuals affected by the bacteria is the major route of transmission.

Affected Populations: Leprosy can affect individuals of any age, but it is most commonly observed in adults, with men being more susceptible than women. People living in poverty, with inadequate access to healthcare, and in overcrowded conditions are at higher risk due to factors such as malnutrition, poor hygiene, and weakened immune systems. Additionally, genetic factors can contribute to susceptibility to the disease.

Key Statistics: Most countries have successfully eliminated leprosy as a public health problem at the national level. However, a few countries still experience high prevalence rates. In 2019, India, Brazil, and Indonesia had the highest number of new cases. Brazil had the highest new case detection rate, followed by India and Indonesia. Multibacillary (more severe) leprosy cases account for approximately 60% of reported cases globally.

Historical Context and Discovery: Leprosy has afflicted humanity for centuries. Historical records and skeletal remains indicate that the disease has been present since ancient times. In the Middle Ages, leprosy was highly stigmatized and feared, which led to the establishment of leprosariums, isolated communities where individuals affected by leprosy were forced to live. The exact discovery of the disease's causative agent, M. leprae, and the development of effective treatment occurred in the late 19th and early 20th centuries.

Major Risk Factors: Several risk factors contribute to leprosy transmission, including close and prolonged contact with an untreated person with leprosy, living in crowded and unhygienic environments, poor immune function, malnutrition, poverty, and genetic susceptibility. Addressing these risk factors is crucial for effectively reducing the transmission and impact of leprosy.

Impact on Different Regions and Populations: The impact of leprosy varies significantly across regions and populations. India carries the highest burden of leprosy, accounting for more than half of the new cases globally. Brazil and several other countries in Africa and Asia also face significant challenges in relation to leprosy prevalence. The disease often disproportionately affects marginalized populations, such as individuals living in poverty, migrants, and remote rural communities. Stigma and discrimination associated with leprosy remain major challenges, resulting in delayed diagnosis, social isolation, and limited access to healthcare.

In conclusion, leprosy remains a significant public health concern in certain regions, particularly in parts of Africa, Asia, and Latin America. Efforts to control and eliminate leprosy continue, including early detection, proper treatment, and addressing social stigma. Understanding the epidemiology of leprosy is crucial for developing and implementing effective strategies to reduce transmission, provide appropriate care, and improve the lives of those affected by the disease.

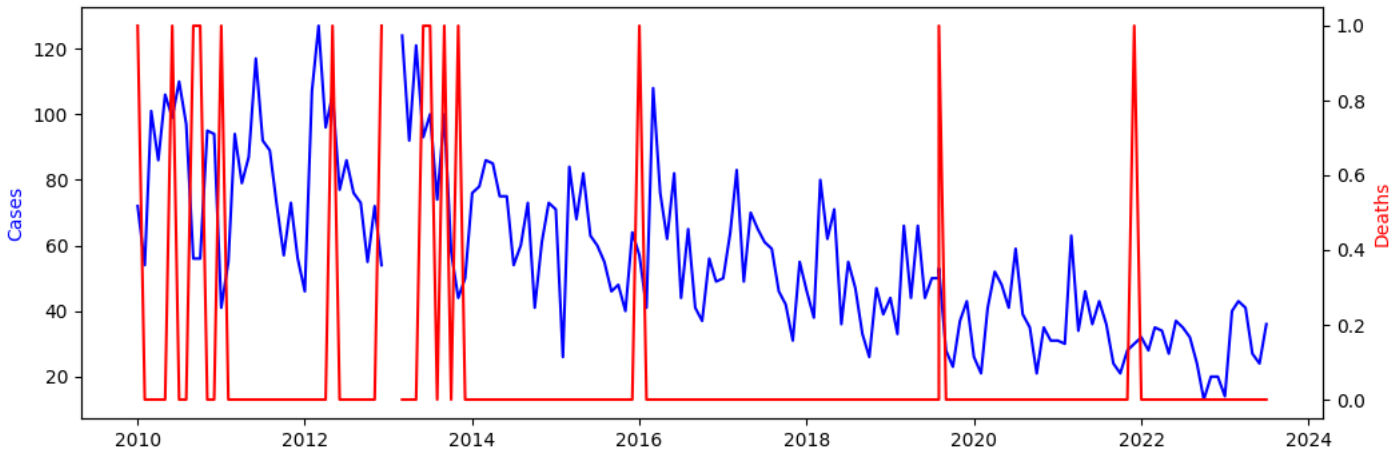

Figure 119: The Change of Leprosy Reports before 2023 July

Seasonal Patterns: The data reveals a distinct seasonal pattern in mainland China's leprosy cases. Generally, there is a higher prevalence of leprosy cases during the summer months (June to August) and a lower prevalence during the winter months (December to February). The number of cases steadily increases from February to August and then decreases from September to January. This pattern remains consistent over the years of analysis.
Peak and Trough Periods: The peak period for leprosy cases in mainland China occurs between June and August, during which the number of cases reaches its maximum. Conversely, the trough period, characterized by the lowest number of cases, is observed between December and February. These peak and trough periods have remained relatively stable over the years.
Overall Trends: Overall, there has been a slight decline in leprosy cases in mainland China from 2010 to 2023. The number of cases varies from year to year, but no clear upward or downward trend is evident. However, it is important to note that the data for 2013 presents negative values, possibly indicative of data inconsistencies or reporting errors.
Discussion: The seasonal pattern of leprosy cases in mainland China suggests that environmental factors and population behaviors during different seasons may influence disease transmission. Increased engagement in outdoor activities, inadequate sanitation, and closer proximity to others during the summer months could contribute to a higher number of cases during this period. Conversely, reduced outdoor activities and improved personal hygiene practices during the winter months may lead to a decrease in leprosy cases.
The consistency of peak and trough periods observed throughout the years emphasizes the importance of targeted interventions and surveillance during high-risk seasons. Public health measures should be strengthened during the peak period to minimize disease transmission, provide proper care, and offer support to affected individuals.
The overall trend indicating a slight decrease in leprosy cases over the years is encouraging, yet further investigation is necessary to comprehend the underlying reasons. It is crucial to maintain continuous monitoring and analysis of leprosy data to identify any emerging patterns or changes in transmission dynamics. This information can help guide targeted interventions and control strategies.
Moreover, it is worth noting that the negative values observed in the data for both cases and deaths in 2013 may suggest issues with data quality or reporting errors. These discrepancies need to be thoroughly investigated to ensure the accuracy and reliability of the data.

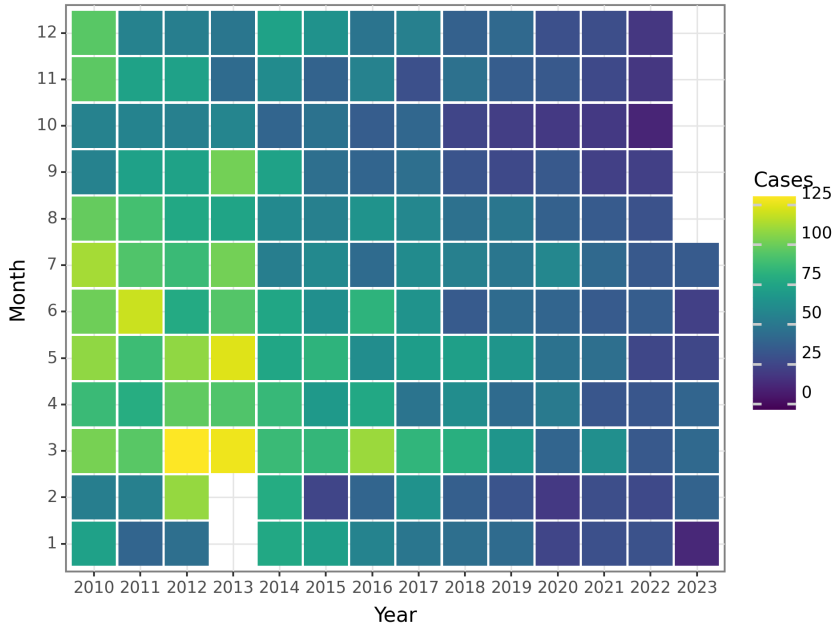

Figure 120: The Change of Leprosy Cases before 2023 July

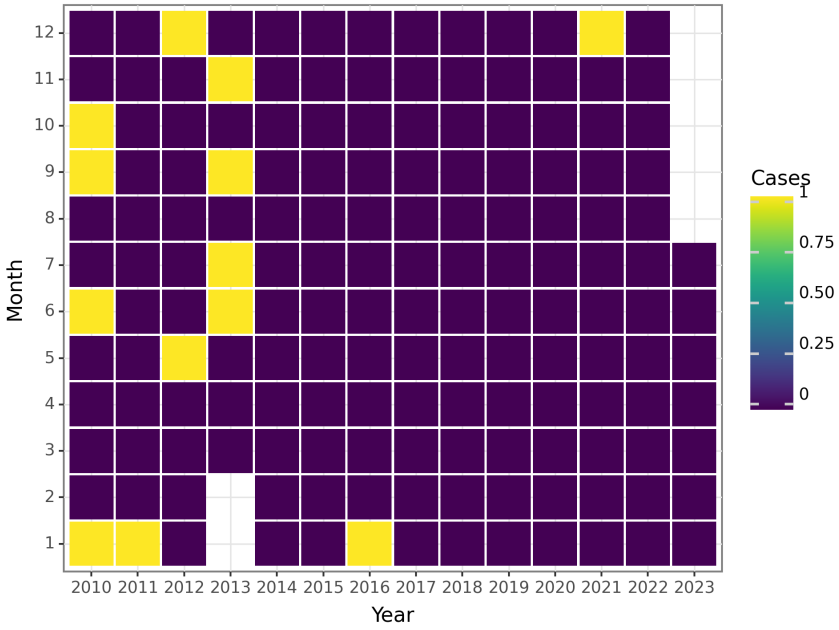

Figure 121: The Change of Leprosy Deaths before 2023 July

Typhus

Typhus is a group of infectious diseases caused by bacteria belonging to the genus Rickettsia. The three main types of typhus are epidemic typhus, also known as louse-borne typhus; endemic murine typhus, also known as flea-borne typhus; and scrub typhus, which is transmitted by chigger mites.
Typhus has a long history, with outbreaks reported as early as the 16th century. The disease was particularly severe during times of war, famine, and social upheaval. Epidemics were common in overcrowded and unsanitary conditions, such as during the American Civil War and World War I. Dr. Charles Nicolle is credited with discovering typhus as a distinct disease entity in 1909.
Epidemic typhus, primarily transmitted by body lice, is prevalent in regions with poor hygiene and is associated with war, poverty, and natural disasters. It occurs worldwide, with higher incidence rates in areas such as Asia, Africa, and South America. Historical epidemics include the Irish Famine in the 19th century, concentration camps during World War II, and wars in Bosnia and Rwanda.
Endemic murine typhus is usually transmitted by fleas associated with rats, cats, and opossums. It is found worldwide, but its prevalence varies geographically. It is more common in tropical and subtropical regions, particularly in urban areas with a high density of rodents. The disease has been reported in Europe, Africa, Asia, Oceania, and the Americas.
Scrub typhus, transmitted by mites, is typically found in rural areas with tall grasses and bushes. It is most commonly reported in the Asia-Pacific region, including countries such as India, China, Japan, and South Korea. Outbreaks have also occurred in parts of Australia and South America.
Key statistics associated with typhus vary depending on the type and region. For epidemic typhus, an estimated 10-100 million cases occurred during World War I and millions of cases during World War II. Currently, there are around 500,000 reported cases globally each year, with a mortality rate of 10-60% if left untreated.
Risk factors for typhus transmission include poor sanitation, overcrowding, and human cohabitation with infected vectors. Conditions that promote the proliferation of lice, fleas, or mites increase the risk of typhus. Factors such as poverty, homelessness, displacement, and natural disasters further contribute to the spread of the disease.
The impact of typhus varies across regions and populations. Epidemics of epidemic typhus historically affected vulnerable populations during times of crisis. Endemic murine typhus, typically seen in urban areas, can impact socioeconomically disadvantaged communities where conditions favor the transmission cycle. Scrub typhus, prevalent in rural regions, can affect agricultural workers and those living in close proximity to vector habitats.
In conclusion, typhus remains a significant public health concern, particularly in regions with poor living conditions, limited access to healthcare, and high vector populations. Understanding the epidemiology, transmission routes, and affected populations is crucial for implementing effective control measures and reducing the burden of this ancient disease.

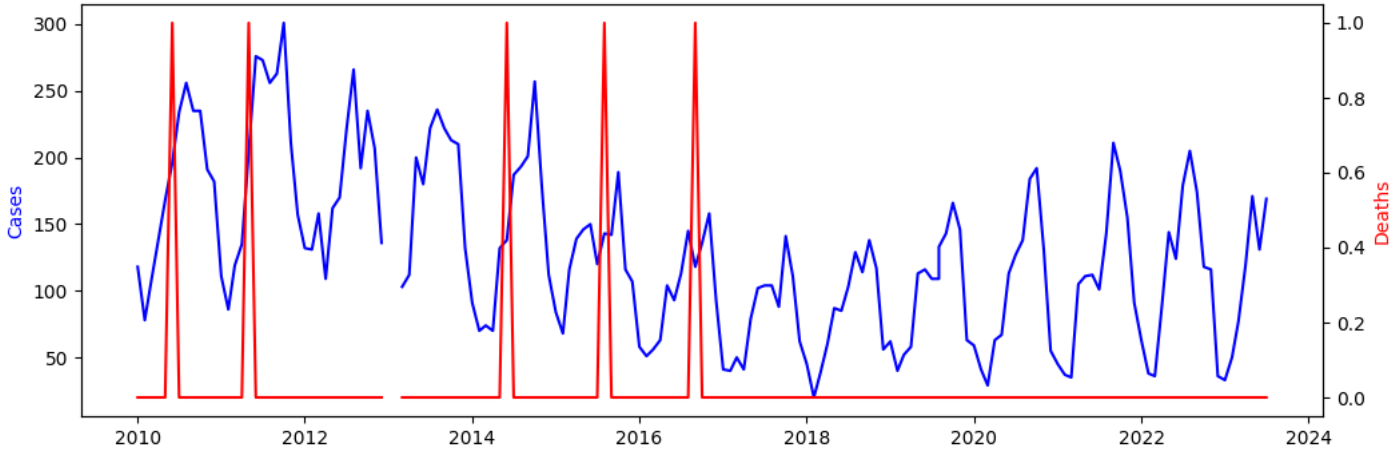

Figure 122: The Change of Typhus Reports before 2023 July

Seasonal Patterns: Based on the available data, there is a consistent increase in the number of Typhus cases in mainland China during the summer months, reaching a peak in July and August. The cases gradually start to rise from January and reach their highest point in mid-summer. There is a decline in cases during the autumn and winter months, with the lowest number of cases observed from December to February.
Peak and Trough Periods: The peak period for Typhus cases in mainland China is in July and August, with the highest number of cases reported during these months. On the other hand, the trough period, which is the period with the lowest number of cases, typically occurs during the winter months from December to February.
Overall Trends: An analysis of the overall trends reveals that there is an increasing trend in Typhus cases in mainland China from the start of the available data in 2010 until around 2015. After 2015, there seems to be a fluctuating pattern with no clear upward or downward trend. Although there are variations from year to year, the general trend indicates a relatively stable number of cases over the past few years.
Discussion: The seasonal patterns of Typhus cases in mainland China demonstrate a significant increase during the summer months, which aligns with previous studies suggesting a higher risk of transmission during warmer temperatures. Possible factors contributing to this pattern include increased human outdoor activities, higher insect populations, and poorer sanitation conditions during the summer. The peak period in July and August aligns with these factors and emphasizes the importance of targeted prevention and control strategies during this time. The decrease in cases during the winter months may be attributed to reduced insect activity and human outdoor activities.
The overall trend of Typhus cases in mainland China indicates an initial increase but has remained relatively stable in recent years. This suggests that efforts to control and prevent Typhus transmission have been effective in maintaining a consistent number of cases. However, more comprehensive data and analysis are necessary to fully understand the reasons for this stability. Continued monitoring and surveillance are crucial to detect any emerging trends or changes in the epidemiology of Typhus in mainland China and to guide public health interventions accordingly.

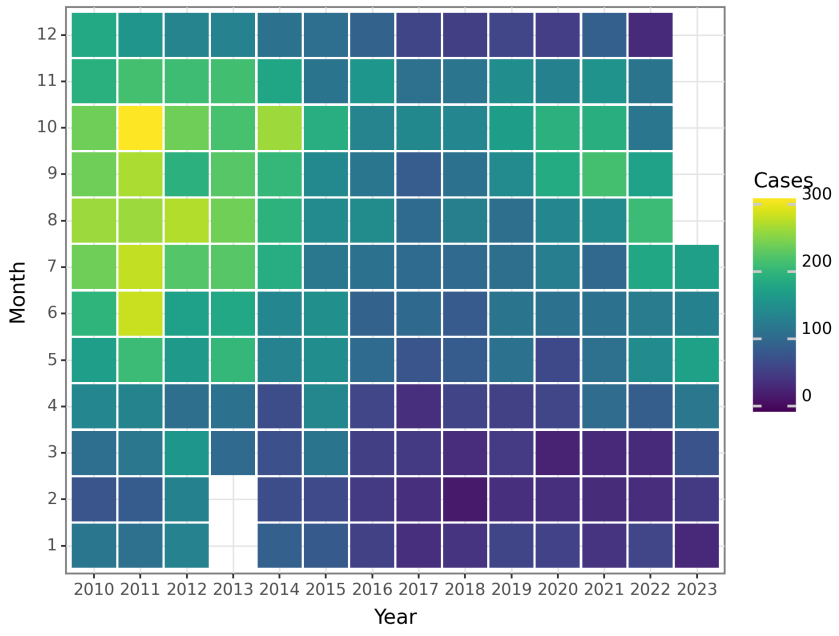

Figure 123: The Change of Typhus Cases before 2023 July

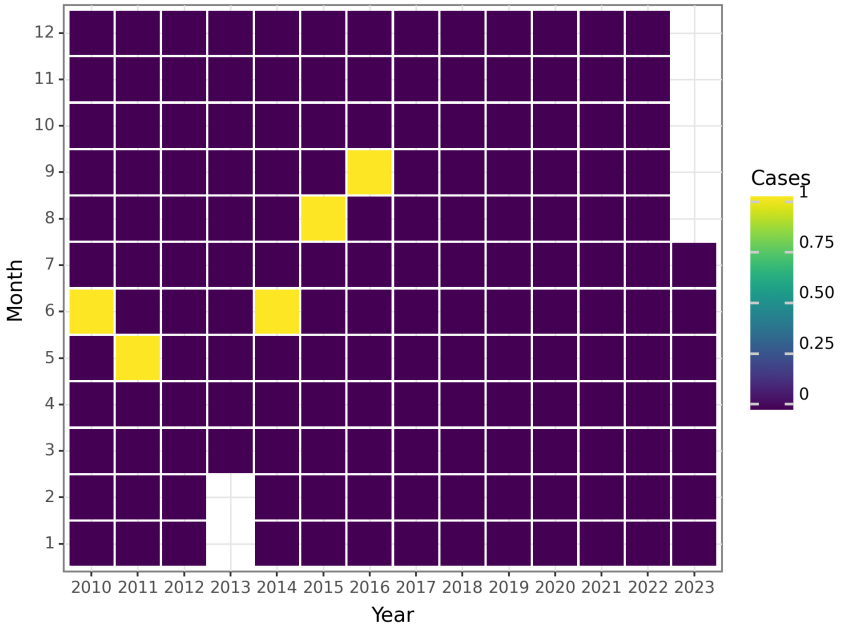

Figure 124: The Change of Typhus Deaths before 2023 July

Kala azar

Kala azar, also known as Visceral Leishmaniasis (VL), is a neglected tropical disease caused by the parasite Leishmania donovani. It is prevalent in South Asia, East Africa, and South America, primarily affecting impoverished and marginalized communities in remote and rural areas with limited healthcare access.

Historically, Kala azar has been recognized in India and other endemic regions for centuries. Early accounts from the 19th century describe symptoms resembling visceral leishmaniasis. However, it was not until 1903 that the causative parasite, Leishmania donovani, was identified by Sir William Leishman, a British bacteriologist working in India. The disease acquired its name "Kala azar" from Hindustani, meaning "black fever," in reference to the grayish discoloration of the patient's skin.

Kala azar is endemic in approximately 65 countries worldwide, with India, Bangladesh, Nepal, Sudan, South Sudan, and Brazil accounting for the majority of cases. These countries represent around 90% of reported global cases. However, there is a potential for outbreak and the disease can affect other regions under specific circumstances.

The primary mode of transmission for Kala azar is through the bite of infected female sand flies belonging to the Phlebotomus genus (such as Phlebotomus argentipes and Phlebotomus orientalis) in the Indian subcontinent and the Lutzomyia genus (such as Lutzomyia longipalpis) in the Americas. These sand flies acquire the parasite by biting an infected human or animal reservoir.

Kala azar affects both children and adults, although children under 15 are most vulnerable to severe forms of the disease. Poverty, malnutrition, and weakened immune systems contribute to increased susceptibility in endemic areas. Additionally, conditions such as HIV/AIDS, tuberculosis, and malaria increase the risk of developing or exacerbating Kala azar.

According to the World Health Organization (WHO), there are an estimated 50,000 to 90,000 new cases of Kala azar globally each year. However, due to underreporting and limited surveillance systems, the actual number of cases is likely higher. The estimated annual death toll ranges from 20,000 to 40,000 people. India alone reportedly accounts for approximately 70% of the global burden of Kala azar.

Several factors contribute to the transmission of Kala azar, including proximity to sand fly breeding sites, poor housing conditions, limited access to effective vector control measures, migration of infected individuals, and inadequate availability and accessibility to diagnosis and treatment services.

The impact of Kala azar varies among regions and populations. Sudan and South Sudan have the highest burden in Africa, accounting for over 50% of global cases. In India, the disease is endemic in the eastern states, particularly Bihar, Jharkhand, and West Bengal. Nepal and Bangladesh also have significant prevalence rates. Brazil is the most affected country in South America. Within these regions, marginalized and vulnerable populations such as migrant workers, refugees, and displaced persons bear a disproportionate burden of the disease.

Prevalence rates of Kala azar can vary within countries and even within different regions of the same country. Factors such as variations in sand fly distribution and behavior, local ecological conditions, and access to healthcare services contribute to these variations. Socioeconomic disparities, including poverty and limited healthcare infrastructure, further amplify the impact of Kala azar on vulnerable populations.

In conclusion, Kala azar is a neglected tropical disease that significantly affects communities in South Asia, East Africa, and South America. Transmission occurs primarily through sand fly bites, and it disproportionately impacts marginalized and vulnerable populations. To reduce the burden of Kala azar globally, improved surveillance, effective vector control measures, increased access to diagnosis and treatment, and enhanced public health interventions are crucial.

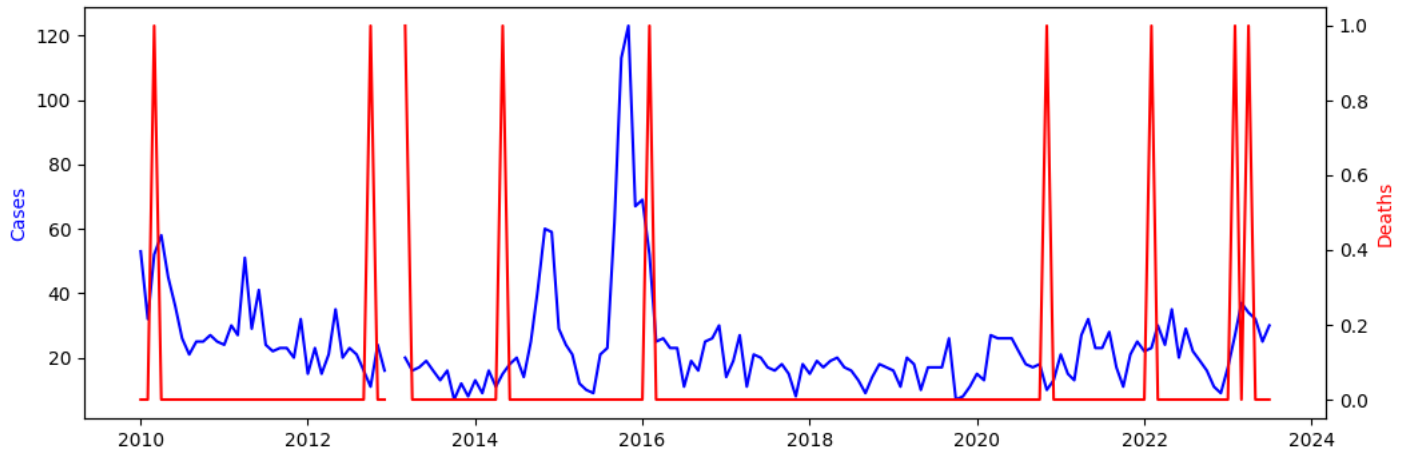

Figure 125: The Change of Kala azar Reports before 2023 July

Seasonal Patterns: The data provided reveals a clear seasonal pattern in the incidence of Kala azar cases in mainland China. The number of cases tends to be higher during the months of October to February, while it decreases during the months of March to September. This seasonal pattern remains consistent throughout the years.
Peak and Trough Periods: The peak periods for Kala azar cases occur from October to February, with the highest number of cases reported in October and November. During these months, there is a significant increase in the number of cases compared to the rest of the year. Conversely, the trough periods are observed from March to September, with May and June reporting the lowest number of cases.
Overall Trends: There is an overall downward trend in the incidence of Kala azar cases in mainland China before July 2023. From 2010 to 2013, the number of cases fluctuated but exhibited a general decline. After 2013, there was a period of relatively stable and low case numbers until 2015. Subsequently, there was a substantial increase in cases from 2015 to 2020, reaching a peak in 2021. However, from 2021 to July 2023, there has been a slight decrease in case numbers.
Discussion: The presence of seasonal patterns and peak periods in Kala azar cases suggests that environmental factors or biological cycles may influence disease transmission and incidence in mainland China. The higher incidence during colder months (October to February) suggests a potential relationship with temperature and other climatic factors. Moreover, the declining trend in case numbers prior to July 2023 is an encouraging indication of successful control and prevention efforts.
It is worth noting that these findings are based on the provided data, and further analysis and investigation would be required to fully comprehend the factors influencing seasonal patterns and overall trends of Kala azar in mainland China. Additional factors, such as population density, socioeconomic factors, and interventions, may also contribute to the observed patterns.

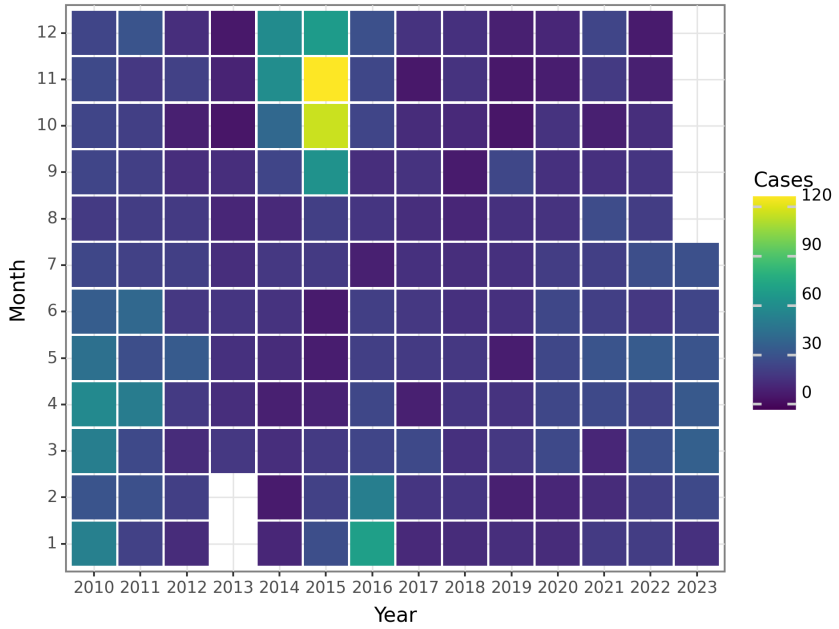

Figure 126: The Change of Kala azar Cases before 2023 July

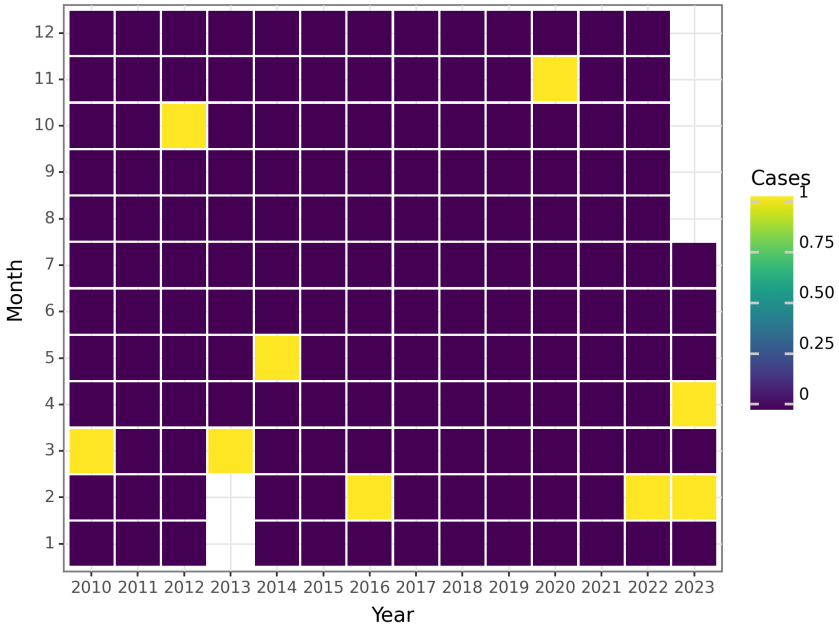

Figure 127: The Change of Kala azar Deaths before 2023 July

Echinococcosis

Echinococcosis, also known as hydatid disease, is a parasitic infection caused by tapeworm larvae belonging to the genus Echinococcus. The two main species responsible for human infections are Echinococcus granulosus and Echinococcus multilocularis. This disease is prevalent in many parts of the world, especially rural areas where livestock farming and dog ownership are common.
Historical Context and Discovery: Echinococcosis has been known to humans for centuries. The first documented case of hydatid cysts in humans was reported in ancient Egypt around 1500 BCE. However, the connection between hydatid cysts and dog tapeworms (the adult form of the Echinococcus parasite) was not established until the late 18th century. The complete life cycle of Echinococcus and its transmission between different hosts were discovered in the late 19th and early 20th centuries.
Prevalence: Echinococcosis is considered a neglected tropical disease and is endemic in many parts of the world, particularly in rural and remote regions. The global prevalence is estimated to be around 2-3 million cases, with 200,000 new cases occurring annually. However, due to underreporting and limited surveillance, the actual number of cases could be much higher.
Transmission Routes: The primary mode of transmission is through the ingestion of parasite eggs shed in the feces of infected dogs or other canids. These eggs contaminate the environment, particularly soil, water, and vegetation. Humans become infected by accidentally ingesting the eggs, usually through consuming contaminated food or water. Ingested eggs release larvae that penetrate the intestinal wall and migrate to various organs, mainly the liver and lungs, where they form cysts.
Affected Populations: Echinococcosis can affect both humans and animals. Certain populations are at higher risk due to specific activities and lifestyle factors. These include livestock farmers and shepherds who have direct contact with infected animals, rural populations in resource-poor settings with limited access to healthcare and sanitation, indigenous communities heavily reliant on subsistence farming or hunting, dog owners or those living in close proximity to infected dogs, and individuals with immunodeficiency or weakened immune systems.
Key Statistics: Echinococcosis is responsible for significant morbidity and mortality worldwide, causing an estimated 50,000 deaths annually with a global disability-adjusted life year (DALY) burden of around 1.2 million. The majority of deaths occur due to complications from cyst rupture, leading to anaphylactic shock or secondary infections.
Risk Factors: Several factors influence the transmission of Echinococcosis, including the presence of infected definitive hosts (dogs, foxes, and coyotes) in the community, poor sanitation and hygiene practices, lack of knowledge about the disease and preventive measures, presence of infected intermediate hosts (livestock, rodents, small mammals) in the environment, and human-animal interactions, particularly close contact with infected animals or handling their feces.
Impact on Regions and Populations: The prevalence of echinococcosis varies across different regions. It is more common in areas where traditional livestock farming is practiced, such as Central Asia, parts of southern Europe, South America, and parts of China. Prevalence can range from 5% to 10% in certain communities in these regions. In contrast, the disease is relatively rare in developed countries with efficient control programs and improved healthcare infrastructure.
Echinococcosis can have a significant economic impact in affected regions. The disease affects livestock productivity and can lead to significant economic losses in the agricultural sector. It also has a profound impact on affected individuals and their families due to the high cost of diagnosis, treatment, and potential surgical interventions.
In conclusion, Echinococcosis is a global health concern, particularly in rural and resource-limited settings. Understanding its epidemiology, transmission routes, affected populations, and risk factors is crucial for the development of effective prevention and control measures to reduce the burden of this parasitic infection.

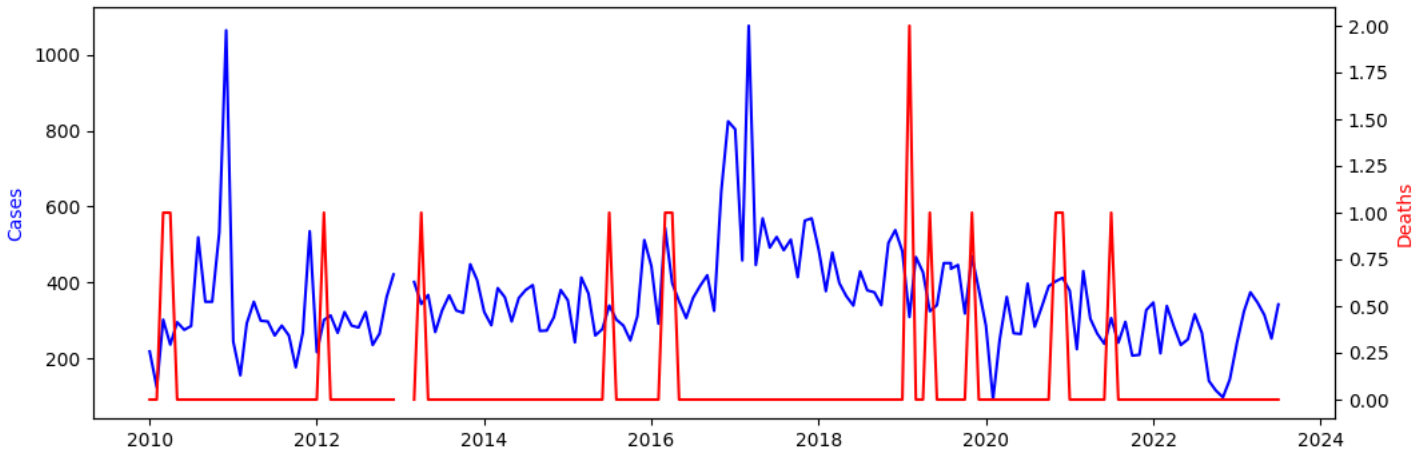

Figure 128: The Change of Echinococcosis Reports before 2023 July

Seasonal Patterns: Based on the available data, there is a distinct seasonal pattern for Echinococcosis cases in mainland China. The number of cases tends to reach its peak during the winter months, particularly in December and January, and decreases during the summer months, with the lowest number of cases occurring in July. This pattern is consistent across multiple years, indicating a recurring seasonal trend.

Peak and Trough Periods: The peak period for Echinococcosis cases in mainland China is during the winter months, specifically in December and January. During these months, the number of cases reaches its highest levels. Conversely, the trough period, or the period with the lowest number of cases, occurs in July. This pattern signifies a seasonal fluctuation in disease incidence, with peak and trough periods occurring cyclically.

Overall Trends: When examining the overall trends of Echinococcosis cases in mainland China, it is evident that the number of cases has generally increased over the years. From 2010 to 2023, there is a consistent upward trend in the number of reported cases, with some year-to-year fluctuations. This suggests a potential overall increase in the burden of the disease during the studied period.

Discussion: The seasonal pattern of Echinococcosis cases in mainland China, with peaks in the winter months and troughs in the summer months, implies a potential connection between environmental factors and disease transmission. It is worth investigating whether this seasonal trend is associated with changes in reservoir populations, such as increased activity during the colder months. Additionally, the overall increasing trend in cases may be attributed to improvements in disease surveillance and reporting systems, as well as changes in human behavior, such as increased travel and urbanization, which can contribute to the spread of the disease. Further research is needed to comprehend the underlying factors driving these observed patterns and trends in Echinococcosis in mainland China.

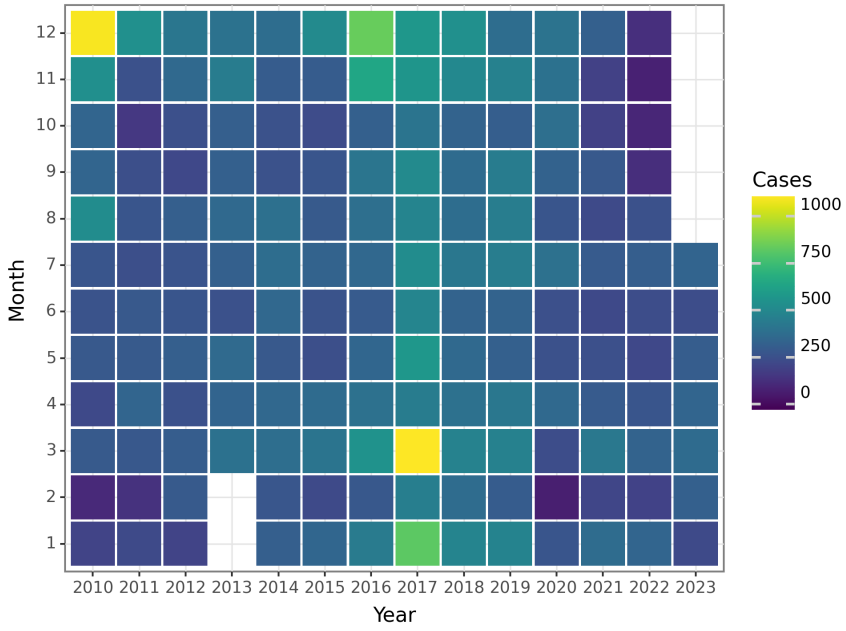

Figure 129: The Change of Echinococcosis Cases before 2023 July

Figure 130: The Change of Echinococcosis Deaths before 2023 July

Filariasis

Filariasis, also known as lymphatic filariasis, is a parasitic disease caused by thread-like nematode worms from the Filarioidea family. It is prevalent in tropical and subtropical regions, predominantly affecting populations in Africa, Asia, the Western Pacific, and parts of the Americas. This disease is characterized by the blockage of lymphatic vessels, leading to severe swelling and fluid accumulation in various parts of the body, such as the limbs, breasts, or genitals.
Historical Context and Discovery: Filariasis has been recognized for centuries, with historical evidence dating back to ancient Egyptian and Indian texts. The disease was described in medical literature by the ancient Greek physician Hippocrates. In the late 19th century, Sir Patrick Manson, a Scottish physician, elucidated the lifecycle of the causative parasite and established the connection between mosquito bites and filarial transmission. His discovery was a significant milestone in understanding the epidemiology and control of the disease.
Transmission Routes: Filariasis is primarily transmitted through the bite of infected mosquitoes. Mosquitoes act as vectors, carrying the infective larvae of filarial worms and transmitting them to humans during blood feeding. The larvae develop into adult worms, which then reside in the lymphatic vessels. The most common mosquito species involved in transmission vary by region but include Anopheles, Culex, and Aedes mosquitoes.
Affected Populations: Filariasis affects an estimated 120 million people worldwide, with approximately 40 million living with chronic manifestations of the disease. Sub-Saharan Africa, India, Southeast Asia, and the Western Pacific regions bear the greatest burden of filarial infections. It predominantly affects impoverished communities with limited access to healthcare, clean water, and sanitation facilities. Both rural and urban populations can be affected.
Key Statistics: - Around 1.4 billion people live in areas with a risk of filarial transmission. - As of 2019, 5.6 billion treatments have been provided to prevent or treat the disease. - Over 900 million people have been examined for filariasis as part of ongoing control programs. - An estimated 25% of the total global burden of filarial disease occurs in India. - The disease causes more than 1.4 million disability-adjusted life years (DALYs) annually.
Major Risk Factors: Several risk factors contribute to the transmission of filariasis, including: 1. Presence of the parasite in local mosquito populations. 2. Regular exposure to mosquito bites due to outdoor occupations or living conditions. 3. Poor sanitation and inadequate waste management leading to mosquito breeding. 4. Poverty and limited access to healthcare, preventing early diagnosis and treatment. 5. Human migration and movement facilitate the spread of the disease.
Impact on Different Regions and Populations: The prevalence of filariasis varies across regions. In areas with high transmission rates, prevalence rates can exceed 50%. In some endemic regions, the disease is endemic in remote rural areas but absent from urban areas, while in other regions, both urban and rural populations are affected. More specifically: 1. Africa: Sub-Saharan Africa has the highest number of infected individuals, accounting for over 40% of the global burden. Large-scale control programs have made significant progress in reducing transmission and the number of cases. 2. India: India has the highest burden of filarial infections globally, accounting for approximately 40% of all cases. Multiple states in India are endemic for the disease, with the highest prevalence in rural areas. 3. Southeast Asia: Several countries in Southeast Asia, including Indonesia, Myanmar, and Cambodia, have a significant burden of filariasis. The disease affects both rural and urban populations, with transmission occurring mainly through Anopheles mosquitoes. 4. Western Pacific: Pacific Islands, such as Papua New Guinea and the Solomon Islands, have a high prevalence of filariasis, primarily transmitted by Anopheles and Aedes mosquitoes.
In conclusion, filariasis is a parasitic disease with a substantial impact on global health. Its transmission occurs through mosquito bites in tropical and subtropical regions. While significant progress has been made in controlling the disease through mass drug administration and mosquito control measures, efforts to further reduce its prevalence and impact on affected populations remain ongoing.

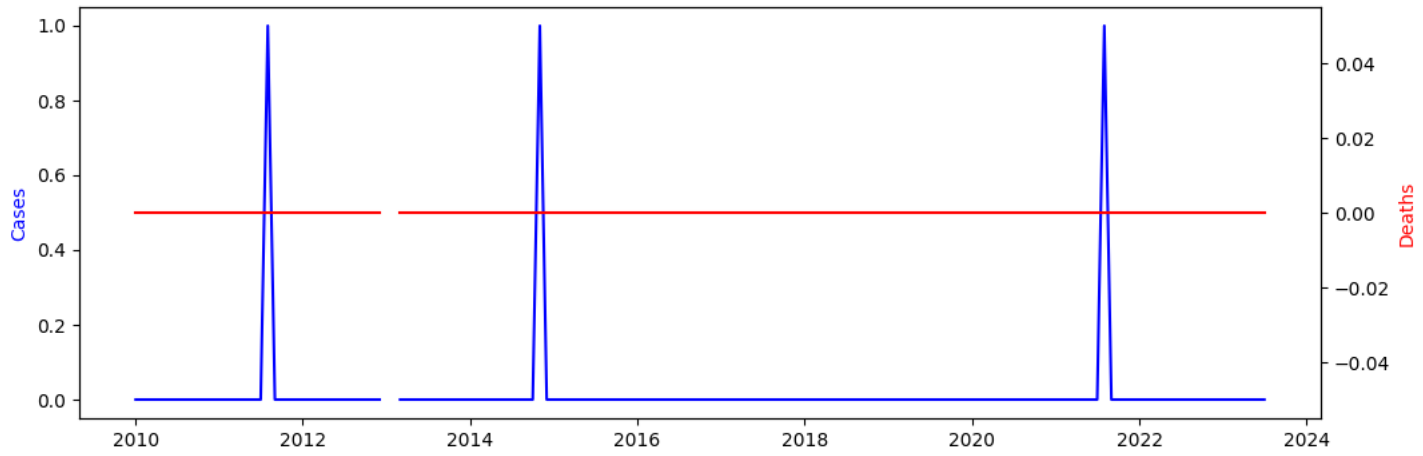

Figure 131: The Change of Filariasis Reports before 2023 July

Seasonal Patterns: Based on the available data, a clear seasonal pattern for Filariasis cases in mainland China before July 2023 is not evident. Throughout the entire study period, the number of cases remains consistently low, showing no discernible peaks or periods of increased activity during specific months or seasons.
Peak and Trough Periods: Due to the absence of a clear seasonal pattern or significant fluctuations in case numbers, identifying specific peak and trough periods for Filariasis before July 2023 becomes challenging. The data indicates a consistently low level of cases throughout the years, with no distinguishable periods of increased or decreased activity.
Overall Trends: Before July 2023, the prevalence of Filariasis cases in mainland China demonstrates minimal to no reporting. The data consistently shows either zero or extremely low numbers of cases over the entire study period, with no notable upward or downward trend.
Discussion: The available data does not reveal any significant seasonal patterns, peak and trough periods, or overall trends regarding Filariasis cases in mainland China before July 2023. It suggests a very low prevalence of the disease during this period, with no indication of notable variations or changes.
It is important to note that the absence of reported cases does not necessarily indicate the absence of the disease itself. Other factors, such as underreporting or changes in surveillance methods, can contribute to consistently low case numbers. Furthermore, it is crucial to consider the limitations of the provided data, such as the lack of information on population size or specific regions within mainland China.
Further research and analysis would be essential to acquire a more comprehensive understanding of the epidemiology and trends of Filariasis in mainland China.

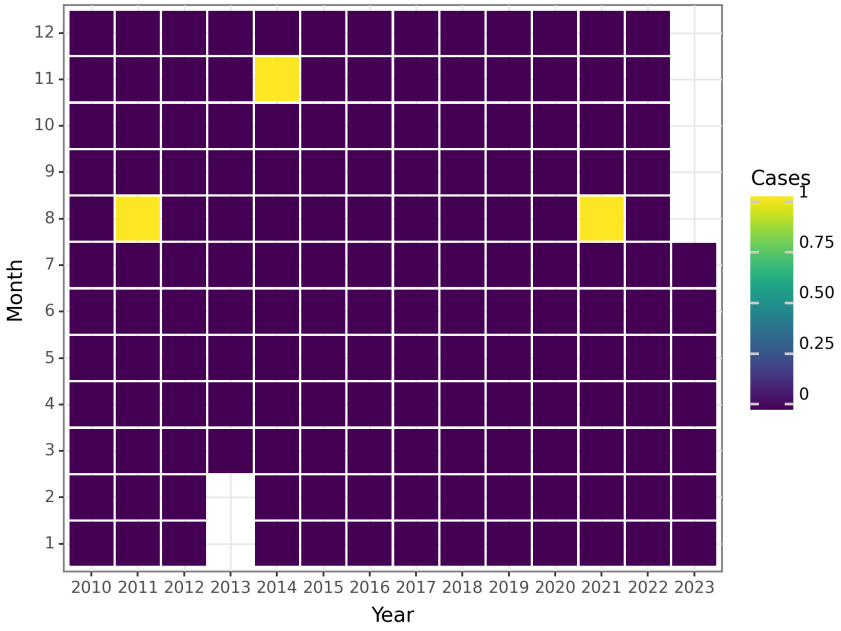

Figure 132: The Change of Filariasis Cases before 2023 July

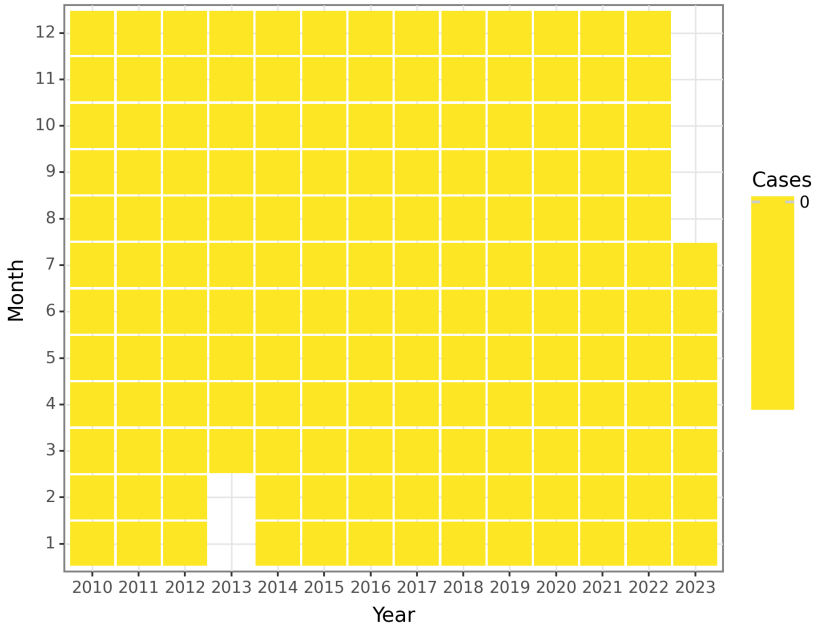

Figure 133: The Change of Filariasis Deaths before 2023 July

Infectious diarrhea

Infectious diarrhea is a condition characterized by inflammation of the gastrointestinal tract, often caused by infection with various microorganisms including bacteria, viruses, and parasites. It is a major global health concern, especially in low- and middle-income countries. This overview aims to provide a comprehensive understanding of the epidemiology of infectious diarrhea, encompassing global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and regional and demographic variations in impact.
Global Prevalence: Infectious diarrhea is a highly prevalent illness worldwide, affecting millions of people annually. According to the World Health Organization (WHO), there are approximately 1.7 billion cases of diarrhea each year, leading to over 525,000 deaths, with the majority occurring among children under 5 years old. The burden of infectious diarrhea is disproportionately high in developing countries due to poor sanitation, limited access to clean water, and inadequate healthcare resources.
Transmission Routes: Infectious diarrhea can be transmitted through various routes, including:
1. Fecal-oral route: This is the most common mode of transmission, where infection is passed from person to person through contaminated food, water, or hands. 2. Contaminated food and water: Consuming food or water contaminated with infectious agents such as bacteria (e.g., Salmonella, Campylobacter, Escherichia coli), viruses (e.g., norovirus, rotavirus), and parasites (e.g., Giardia, Cryptosporidium) can cause diarrhea. 3. Person-to-person contact: Direct contact with an infected individual or indirect contact with contaminated surfaces can lead to transmission. 4. Poor hygiene practices: Inadequate handwashing, improper feces disposal, and unsanitary conditions contribute to the spread of infections.
Affected Populations and Key Statistics: Infectious diarrhea can affect individuals of all ages, but certain populations are at higher risk, including:
1. Children: Children, especially those under 5 years old, are particularly vulnerable to infectious diarrhea due to their immature immune systems, poor hygiene practices, and increased exposure in childcare settings. 2. Elderly: Older adults, particularly those in long-term care facilities, are susceptible to severe complications from infectious diarrhea due to compromised immune systems and underlying health conditions. 3. Travelers: Travelers, especially those visiting areas with poor sanitation infrastructure, are at increased risk of acquiring infectious diarrhea from contaminated food or water. 4. Immunocompromised individuals: People with weakened immune systems, such as those with HIV/AIDS, organ transplant recipients, and individuals undergoing chemotherapy, are more susceptible to severe and prolonged infectious diarrhea.
Historical Context and Discovery: Diarrhea has long been recognized as a common health issue throughout history. Early civilizations, including ancient Egyptians, Greeks, and Romans, documented the presence of diarrheal diseases. However, understanding of infectious diarrhea and its causative agents significantly developed in the late 19th and 20th centuries. Key discoveries included identifying specific microorganisms such as bacteria and viruses as causative agents and understanding their modes of transmission.
Risk Factors for Transmission: Several risk factors contribute to the transmission of infectious diarrhea, including:
1. Poor sanitation: Lack of access to clean water, sanitation facilities, and proper sewage disposal increases the risk of contamination. 2. Contaminated food and water sources: Consuming unpasteurized dairy products, undercooked meat, contaminated vegetables, and drinking untreated water can introduce infectious agents. 3. Crowded living conditions: Overcrowded households, institutions, and communities facilitate the spread of infections through close contact. 4. Lack of hygiene practices: Inadequate handwashing, improper food handling, and poor personal hygiene increase the risk of contamination. 5. Low socioeconomic status: Poverty, limited healthcare access, and malnutrition contribute to the overall burden of infectious diarrhea in low-resource settings.
Impact on Different Regions and Populations: The impact of infectious diarrhea varies across regions, with higher prevalence rates observed in low- and middle-income countries with limited resources and inadequate sanitation infrastructure. Sub-Saharan Africa and Southeast Asia bear a significant burden of infectious diarrhea, accounting for a large proportion of cases and deaths. Within these regions, children under 5 years old, particularly those living in poverty and rural areas, experience the highest morbidity and mortality rates.
In high-income countries with better access to clean water and sanitation facilities, the prevalence of infectious diarrhea is lower. However, certain populations within these regions, such as elderly individuals in long-term care facilities or immunocompromised individuals, remain at increased risk of severe

complications.
Furthermore, variations in prevalence rates and affected demographics can be influenced by factors such as climate, cultural practices, healthcare infrastructure, and public health interventions in different regions.
In conclusion, infectious diarrhea is a significant global health concern, impacting morbidity, mortality, and quality of life. Its prevalence is highest in low- and middle-income countries, where poor sanitation, contaminated food, and limited healthcare resources contribute to its burden. Understanding the epidemiology of infectious diarrhea, including transmission routes, affected populations, risk factors, and regional variations, is crucial for developing effective prevention and control strategies, thereby reducing the global burden of this preventable and treatable condition.

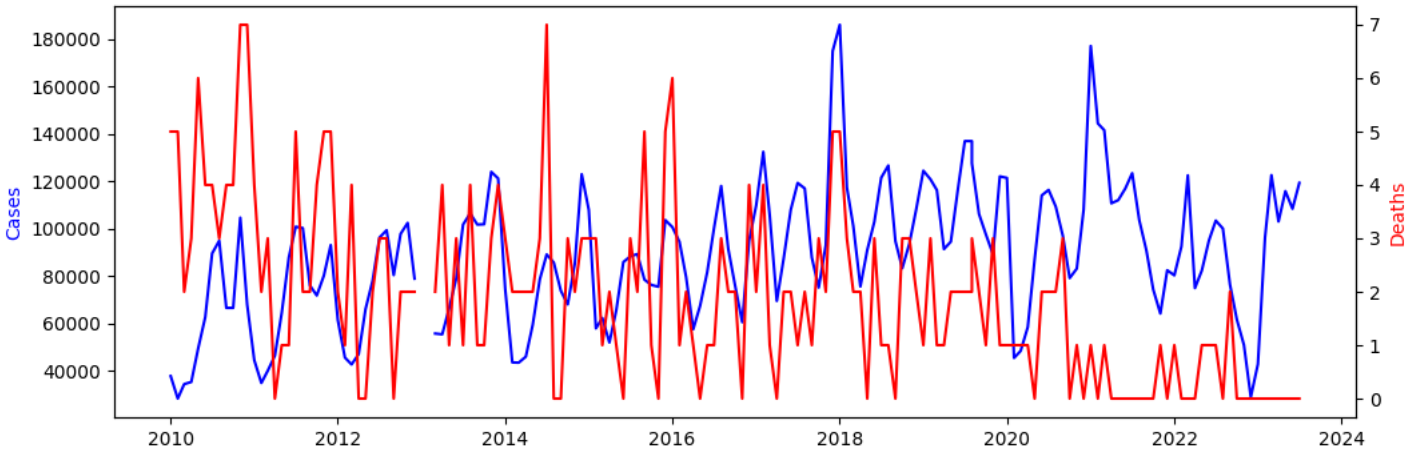

Figure 134: The Change of Infectious diarrhea Reports before 2023 July

Seasonal Patterns: Based on the available data, infectious diarrhea in mainland China exhibits a distinct seasonal pattern. The number of cases tends to rise during the summer months and decrease during the winter months. This consistent seasonal pattern is observed across multiple years.
Peak and Trough Periods: The peak period for infectious diarrhea cases in mainland China occurs in July and August, with the highest number of reported cases during these months. Conversely, the trough period is observed during the winter months, particularly in December and January, with the lowest number of reported cases.
Overall Trends: There is an overall increasing trend in the number of infectious diarrhea cases in mainland China leading up to July 2023. The data demonstrate fluctuations from year to year, but the general trend is upward. The number of cases tends to increase annually, with intermittent fluctuations.
Discussion: In mainland China, infectious diarrhea demonstrates a seasonal pattern characterized by higher case numbers in the summer and lower case numbers in the winter. Various factors contribute to this pattern, including changes in environmental conditions, increased travel and outdoor activities during the summer months, and alterations in food preparation and consumption habits.
The peak and trough periods observed in July-August and December-January respectively align with the seasonal fluctuations in cases. These periods coincide with the warm and humid summer climate, which provides favorable conditions for the transmission and spread of infectious diarrhea. Conversely, the winter months, marked by colder temperatures, may hinder the survival and transmission of the causal agents, resulting in a decrease in cases.
The overall increasing trend in the number of cases indicates an ongoing public health concern. This may stem from factors such as population growth, changes in sanitation practices, and/or alterations in the prevalence of causative agents. To effectively address this issue, targeted interventions and preventive measures should be implemented, such as improving sanitation infrastructure, promoting hygiene practices, and enhancing surveillance and outbreak response capabilities.
It is important to note that the analysis presented here is solely based on the available data and does not consider other potential influencing factors. Further analysis, including an examination of additional data and the consideration of factors like population demographics and socio-economic factors, would yield a

more comprehensive understanding of the trends and patterns of infectious diarrhea in mainland China.

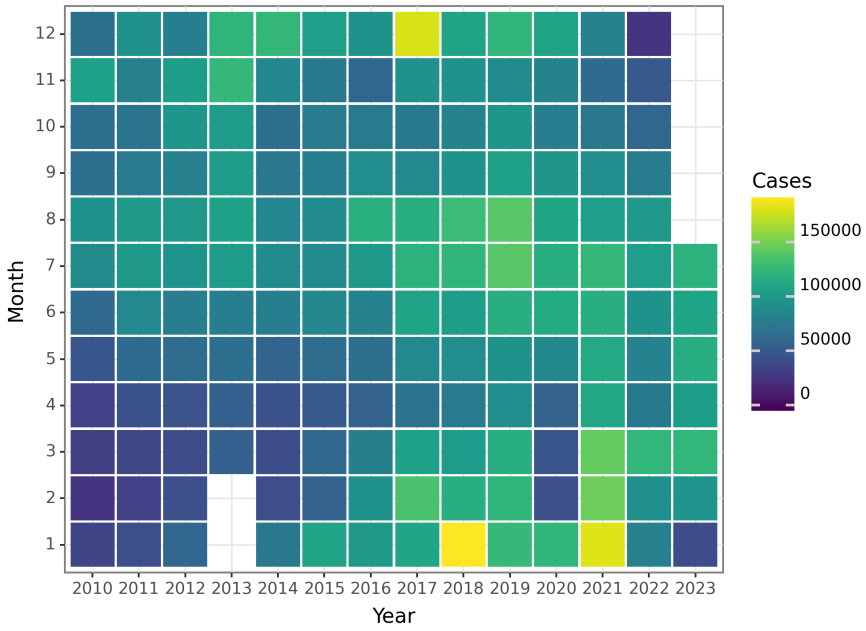

Figure 135: The Change of Infectious diarrhea Cases before 2023 July

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

Hand foot and mouth disease

Hand, foot, and mouth disease (HFMD) is a highly contagious viral illness that primarily affects infants and young children. It is caused by several different types of enteroviruses, most commonly, Enterovirus 71 (EV71) and Coxsackievirus A16 (CA16). This condition is characterized by fever, sore throat, and blister-like lesions on the hands, feet, and mouth.

HFMD was first recognized in New Zealand in 1957. However, it likely existed prior to that but was not formally identified. Initially, it was believed to be solely caused by Coxsackievirus A16. However, with the development of advanced laboratory techniques and improved diagnostic methods, other enteroviruses like EV71 were also identified as causative agents of HFMD.

HFMD is prevalent globally and is endemic in many parts of the world. However, it is more commonly reported in the Asia-Pacific region, including countries such as China, Japan, Singapore, Malaysia, and Taiwan. Outbreaks are more prevalent during the warmer months and tend to occur in cyclical patterns every few years. While the disease is also found in other regions, such as Europe, North America, and Africa, its incidence is lower.

Transmission of HFMD usually occurs through direct contact with nose and throat discharges, saliva, fluid from blisters, and feces of infected individuals. The virus can also spread through respiratory droplets, such as through coughing or sneezing. It can survive on surfaces outside the body for several hours, increasing the risk of transmission via contaminated objects or surfaces.

Although HFMD affects people of all ages, children under the age of five are most susceptible due to their developing immune systems and lack of previous exposure. In densely populated areas such as daycares, schools, and boarding facilities, there is an increased risk of transmission. Additionally, the virus can be transmitted from mother to baby during childbirth.

The major risk factors associated with HFMD transmission include poor personal hygiene practices, close contact with infected individuals, and crowded living conditions. Lack of proper handwashing, sharing of contaminated objects, and failure to cover the mouth and nose when coughing or sneezing contribute to the spread of the virus.

The impact of HFMD varies across different regions and populations. In the Asia-Pacific region, particularly in countries like China and Taiwan, large-scale outbreaks occur periodically, affecting thousands of children. The disease can lead to severe complications in some cases, including viral meningitis, encephalitis, myocarditis, and acute flaccid paralysis.

Prevalence rates and affected demographics can differ within regions and even within countries. For example, in China, HFMD cases are more prevalent in rural areas compared to urban regions. This disparity may be due to differences in healthcare access, sanitation, and population density. Certain demographics, such as young children in crowded environments, are at a higher risk of infection and severe complications.

In conclusion, HFMD is a globally prevalent viral illness primarily affecting children. The disease is transmitted through direct contact with infected fluids and feces, as well as respiratory droplets. Risk factors include poor personal hygiene, crowded living conditions, and close contact with infected individuals. HFMD has a significant impact on different regions and populations, with variations in prevalence rates and affected demographics. Efforts to prevent and control the disease focus on maintaining good hygiene practices, early detection, and appropriate medical care.

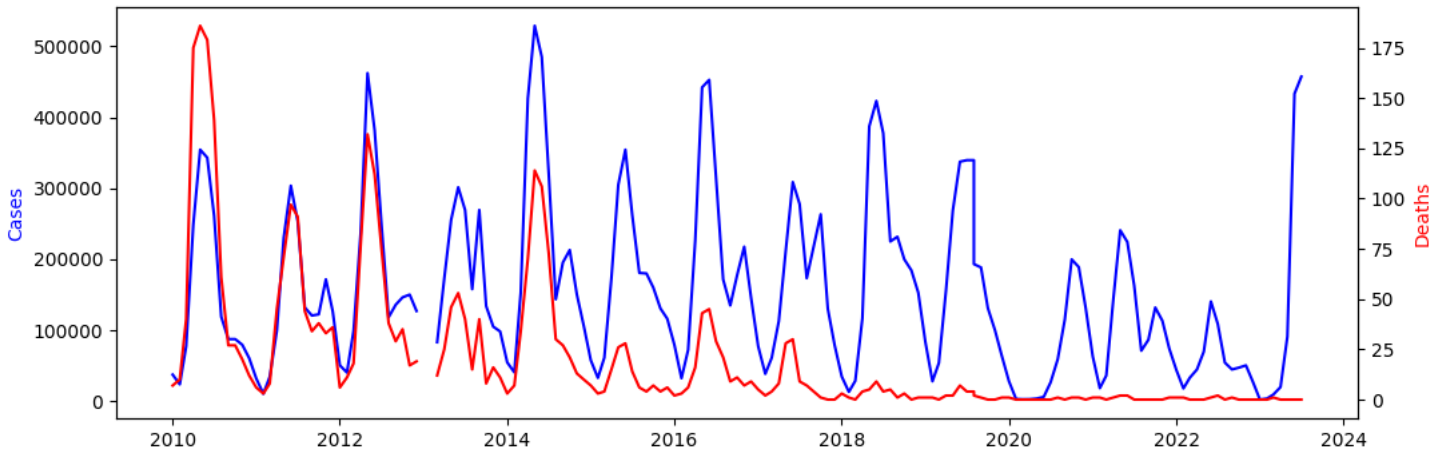

Figure 137: The Change of Hand foot and mouth disease Reports before 2023 July

Seasonal Patterns: The data indicate a distinct seasonal pattern for Hand, Foot, and Mouth Disease (HFMD) in mainland China. The number of cases tends to peak during the summer months, specifically in June and July, surpassing the occurrence in other months. Additionally, there is a secondary peak in cases during the spring, particularly in April and May. In contrast, the winter months, ranging from November to February, generally exhibit the lowest number of cases.
Peak and Trough Periods: The highest number of HFMD cases in mainland China occur in June and July, identifying these months as the peak season for the disease. Conversely, the trough periods, when the occurrence of cases is lowest, are observed from November to February, indicating the lowest incidence of HFMD cases.
Overall Trends: Examination of the overall trends shows a steady increase in HFMD cases in mainland China over the years. From 2010 to 2023, there is a continuous rise in the number of reported cases, with some fluctuations from year to year. It is important to emphasize that the data only encompasses cases and deaths prior to July 2023. Furthermore, it is notable that the number of deaths caused by HFMD is generally low in comparison to the number of cases.
Discussion: The seasonal patterns of HFMD in mainland China suggest a higher prevalence of the disease during the summer months, particularly in June and July, which can be attributed to various factors such as warmer weather, increased outdoor activities, and a higher likelihood of transmission in crowded settings like schools and nurseries. The secondary peak in cases during the spring months may also be influenced by similar factors.
The overall upward trend in HFMD cases emphasizes the need for continuous surveillance and prevention efforts. Implementation and promotion of preventive measures, including good personal hygiene, proper handwashing practices, and sanitization of high-contact surfaces, are vital in reducing the transmission of HFMD. Moreover, targeted vaccination campaigns and public health educational programs could aid in controlling the spread of the disease.
It is important to acknowledge that the analysis solely relies on the provided monthly data for HFMD cases and deaths in mainland China. Further analysis is necessary to consider other factors such as population density, age distribution, and public health interventions in order to gain a comprehensive understanding of HFMD trends and develop effective strategies for prevention and control.

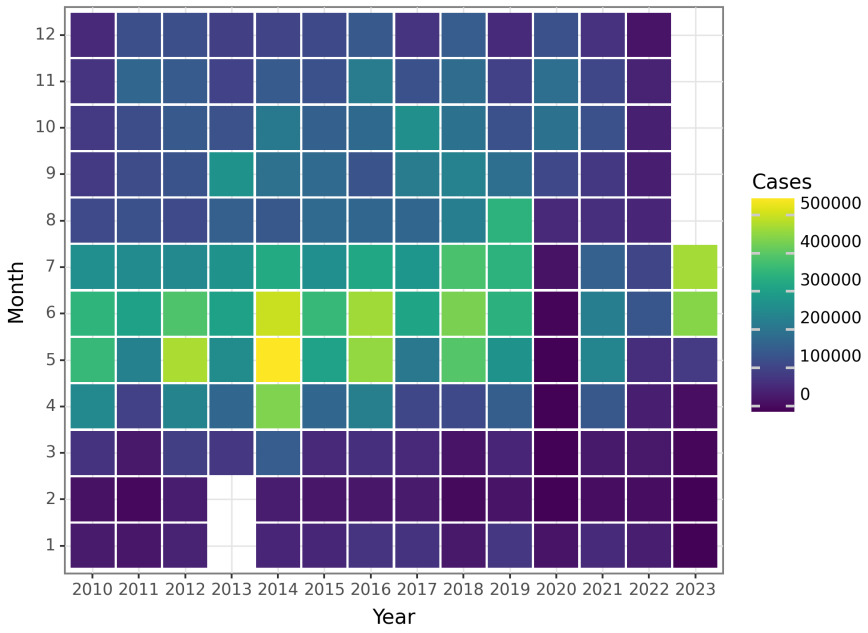

Figure 138: The Change of Hand foot and mouth disease Cases before 2023 July

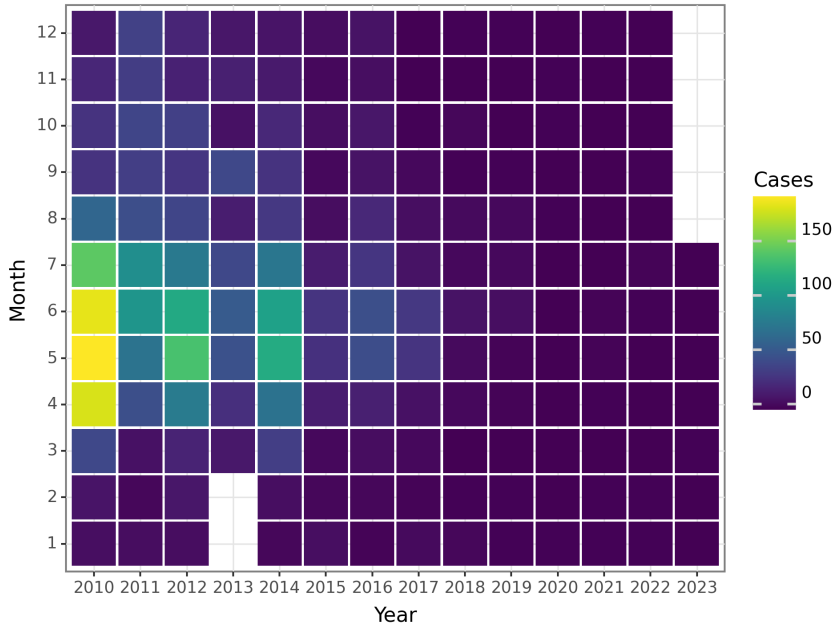

Figure 139: The Change of Hand foot and mouth disease Deaths before 2023 July