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

2023 August

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Monthly Report -- 2023 August

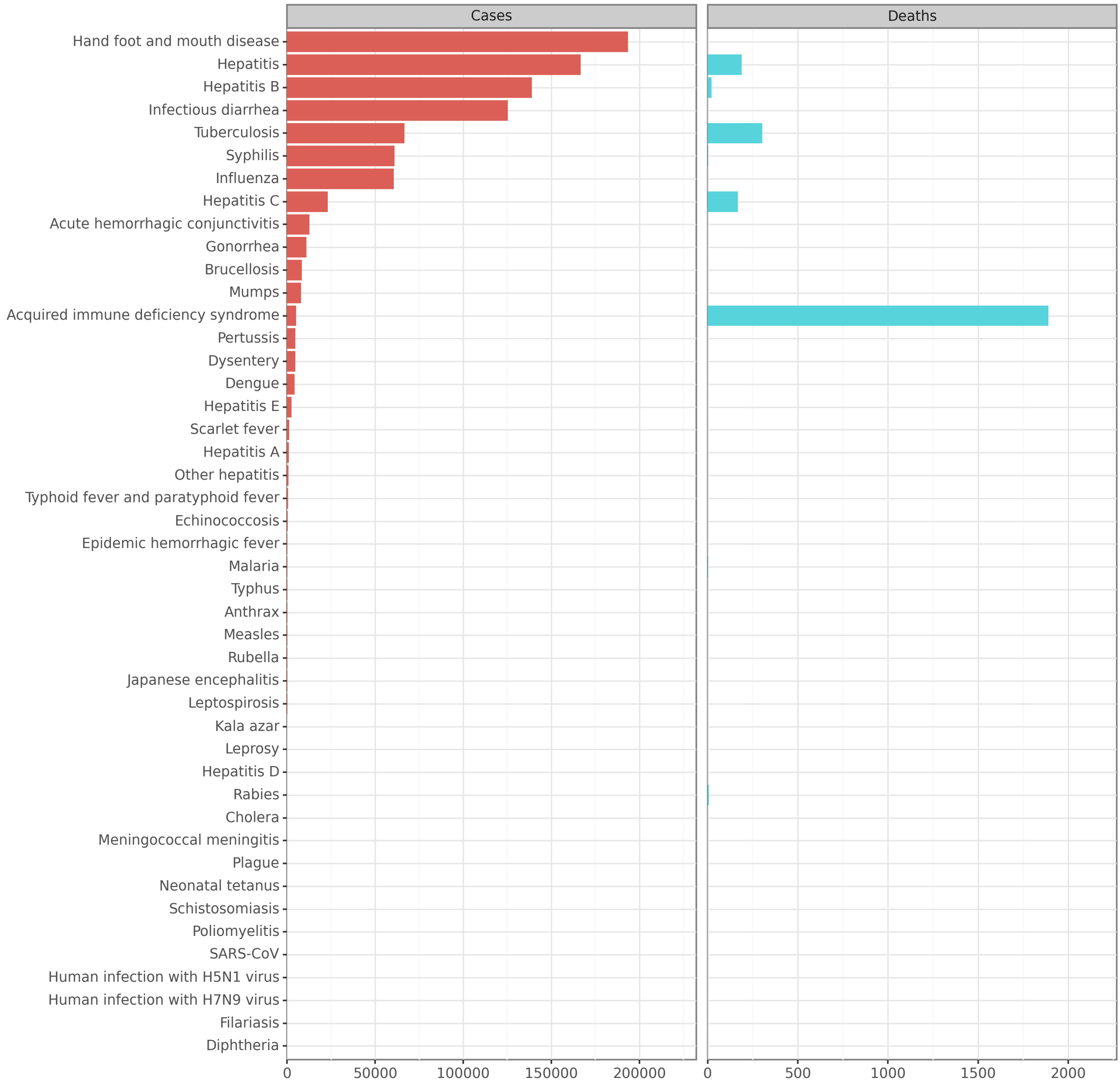

Figure 1: Monthly Notifiable Infectious Diseases Reports in 2023 August

In August 2023, mainland China reported a total of 735,782 disease cases, resulting in 2,400 deaths. The data will now be analyzed to identify significant patterns or trends.
1. Disease Cases: - The total number of disease cases decreased by 23.58% compared to July 2023, indicating a decline in disease incidence. - In comparison to August 2022, there was an 11.79% increase in the total number of cases, suggesting a higher disease burden than the previous year.
2. Acute Hemorrhagic Conjunctivitis: - There were 12,742 reported cases, demonstrating a 5.09% decrease compared to July 2023. - Interestingly, there was a significant 462.06% increase compared to August 2022, indicating a major outbreak or improved surveillance and reporting.

3. Anthrax: - The number of cases increased by 141.18% compared to July 2023, signifying a sudden rise in anthrax infections. - Compared to August 2022, there was a 68.49% increase, suggesting a higher incidence of anthrax cases than the previous year.
4. Hepatitis: - Hepatitis cases increased by 9.75% compared to July 2023, indicating a slight rise in hepatitis infections. - In comparison to August 2022, there was a 17.89% increase in hepatitis cases, suggesting a higher disease burden compared to the previous year. - Hepatitis B showed an 11.00% increase compared to July 2023, while Hepatitis C increased by 3.98% during the same period.
5. Hand, Foot, and Mouth Disease (HFMD): - The number of cases saw a significant 57.67% decrease compared to July 2023, indicating a substantial decline in HFMD infections. - However, when compared to August 2022, there was a significant 254.93% increase, suggesting a higher incidence compared to the previous year.
6. Tuberculosis (TB): - The number of TB cases decreased by 0.64% compared to July 2023. - In comparison to August 2022, there was a 3.56% decrease in TB cases, indicating a slight decline in TB incidence.
7. Acquired Immune Deficiency Syndrome (AIDS): - AIDS cases increased by 5.52% compared to July 2023, suggesting a continuing trend of AIDS infections. - When compared to August 2022, there was a 9.47% increase in AIDS cases, indicating a higher disease burden compared to the previous year.
8. Measles: - The number of measles cases increased by 8.25% compared to July 2023, suggesting a rise in measles infections. - However, when compared to August 2022, there was a 6.25% decrease in measles cases, indicating a slight decline compared to the previous year.

In summary, mainland China experienced a decline in overall disease cases in August 2023 compared to the previous month, but an increase compared to the same period in the previous year. Specific diseases such as acute hemorrhagic conjunctivitis, anthrax, hepatitis, and HFMD showed significant changes compared to both the previous month and the previous year. These findings emphasize the importance of ongoing monitoring, surveillance, and preventive measures to effectively control and manage these diseases.

Table 1: Monthly Notifiable Infectious Diseases Cases in 2023 August

Diseases	Cases	Comparison with 2023 July	Comparison with 2022 August
Plague	4	4 (/)	4 (/)
Cholera	8	4 (100.00%)	2 (33.33%)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	5,122	268 (5.52%)	443 (9.47%)
Hepatitis	166,606	14,797 (9.75%)	25,282 (17.89%)
Hepatitis A	1,111	58 (5.51%)	-5 (-0.45%)
Hepatitis B	138,875	13,759 (11.00%)	23,500 (20.37%)
Hepatitis C	23,214	888 (3.98%)	1,323 (6.04%)
Hepatitis D	21	7 (50.00%)	-9 (-30.00%)
Hepatitis E	2,618	-2 (-0.08%)	363 (16.10%)
Other hepatitis	767	87 (12.79%)	110 (16.74%)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	105	8 (8.25%)	-7 (-6.25%)
Epidemic hemorrhagic fever	240	-104 (-30.23%)	5 (2.13%)
Rabies	12	3 (33.33%)	-8 (-40.00%)

Japanese encephalitis	80	47 (142.42%)	23 (40.35%)
Dengue	4,198	2,594 (161.72%)	4,197 (419700.00%)
Anthrax	123	72 (141.18%)	50 (68.49%)
Dysentery	4,626	-58 (-1.24%)	121 (2.69%)
Tuberculosis	66,563	-426 (-0.64%)	-2,456 (-3.56%)
Typhoid fever and paratyphoid fever	678	21 (3.20%)	-52 (-7.12%)
Meningococcal meningitis	6	3 (100.00%)	4 (200.00%)
Pertussis	4,793	2,026 (73.22%)	-562 (-10.49%)
Diphtheria	0	0 (/)	0 (/)
Neonatal tetanus	2	0 (0.00%)	0 (0.00%)
Scarlet fever	1,209	-1,028 (-45.95%)	269 (28.62%)
Brucellosis	8,354	-810 (-8.84%)	467 (5.92%)
Gonorrhea	10,924	820 (8.12%)	1,649 (17.78%)
Syphilis	61,068	2,821 (4.84%)	10,586 (20.97%)
Leptospirosis	57	32 (128.00%)	9 (18.75%)
Schistosomiasis	1	-4 (-80.00%)	-3 (-75.00%)
Malaria	234	-55 (-19.03%)	17 (7.83%)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	60,530	11,682 (23.92%)	-122,815 (-66.99%)
Mumps	7,919	-1,361 (-14.67%)	-553 (-6.53%)
Rubella	103	4 (4.04%)	-25 (-19.53%)
Acute hemorrhagic conjunctivitis	12,742	-683 (-5.09%)	10,475 (462.06%)
Leprosy	23	-13 (-36.11%)	-9 (-28.12%)
Typhus	217	48 (28.40%)	12 (5.85%)
Kala azar	26	-4 (-13.33%)	4 (18.18%)
Echinococcosis	352	10 (2.92%)	85 (31.84%)
Filariasis	0	0 (/)	0 (/)
Infectious diarrhea	125,319	5,944 (4.98%)	25,212 (25.19%)
Hand foot and mouth disease	193,538	-263,674 (-57.67%)	139,010 (254.93%)
Total	735,782	-227,012 (-23.58%)	77,581 (11.79%)

Table 2: Monthly Notifiable Infectious Diseases Deaths in 2023 August

Diseases	Deaths	Comparison with 2023 July	Comparison with 2022 August
Plague	1	1 (/)	1 (/)
Cholera	0	0 (/)	0 (/)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	1,890	141 (8.06%)	-216 (-10.26%)

Hepatitis	190	42 (28.38%)	116 (156.76%)
Hepatitis A	0	0 (/)	-1 (-100.00%)
Hepatitis B	22	-12 (-35.29%)	-4 (-15.38%)
Hepatitis C	167	53 (46.49%)	122 (271.11%)
Hepatitis D	0	0 (/)	0 (/)
Hepatitis E	1	1 (/)	-1 (-50.00%)
Other hepatitis	0	0 (/)	0 (/)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	0	0 (/)	0 (/)
Epidemic hemorrhagic fever	0	-1 (-100.00%)	-1 (-100.00%)
Rabies	8	-3 (-27.27%)	-3 (-27.27%)
Japanese encephalitis	1	1 (/)	1 (/)
Dengue	0	0 (/)	0 (/)
Anthrax	0	-1 (-100.00%)	-2 (-100.00%)
Dysentery	0	0 (/)	0 (/)
Tuberculosis	303	-27 (-8.18%)	-62 (-16.99%)
Typhoid fever and paratyphoid fever	0	0 (/)	0 (/)
Meningococcal meningitis	0	0 (/)	0 (/)
Pertussis	1	1 (/)	1 (/)
Diphtheria	0	0 (/)	0 (/)
Neonatal tetanus	0	0 (/)	-1 (-100.00%)
Scarlet fever	0	0 (/)	0 (/)
Brucellosis	0	-1 (-100.00%)	-1 (-100.00%)
Gonorrhea	0	0 (/)	0 (/)
Syphilis	3	1 (50.00%)	-1 (-25.00%)
Leptospirosis	0	0 (/)	0 (/)
Schistosomiasis	0	0 (/)	0 (/)
Malaria	2	1 (100.00%)	2 (/)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	0	0 (/)	-3 (-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	1	1 (/)	1 (/)
Echinococcosis	0	0 (/)	0 (/)

Filariasis	0	0 (/)	0 (/)
Infectious diarrhea	0	0 (/)	0 (/)
Hand foot and mouth disease	0	0 (/)	0 (/)
Total	2,400	156 (6.95%)	-168 (-6.54%)

History Data Analysis2023 August

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.

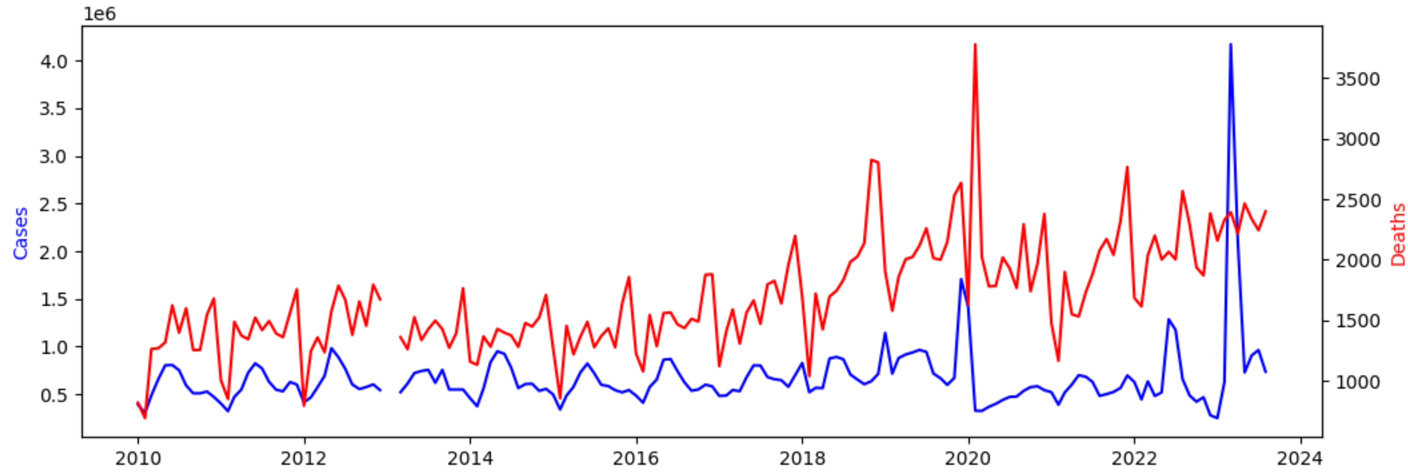

Figure 2: The Change of Total Reports before 2023 August

Seasonal Patterns: The provided data clearly demonstrates the existence of seasonal patterns in the number of cases in mainland China. In general, there is a higher prevalence of cases during the winter months (December to February), while the summer months (June to August) see a decrease. These seasonal patterns can be attributed to various factors, including climate, population behavior, and viral transmission dynamics.
Peak and Trough Periods: In mainland China, the peak periods for case numbers are typically observed during the winter months, particularly in January and February. This is evident from consistently high case numbers during these months across multiple years. Conversely, trough periods, characterized by a lower number of cases, occur in the summer months from June to August.
Overall Trends: An examination of the overall trend reveals an increase in the number of cases in mainland China throughout the years. From 2010 to August 2023, there is a general upward trend, with some fluctuations from year to year. However, it is worth noting that the data includes a significant spike in cases during the COVID-19 pandemic in 2020 and 2021.
Discussion: The seasonal patterns in case numbers in mainland China align with observations typically made with respiratory viruses like the flu. These patterns indicate that viral transmission may be influenced by climatic factors and human behavior, such as increased indoor gatherings during colder months. The peak periods during the winter months suggest a higher risk of transmission, emphasizing the importance of public health interventions like vaccination campaigns and enhanced surveillance.
The overall upward trend in case numbers highlights the ongoing challenge of infectious diseases within the population of mainland China. Factors like population density, travel patterns, and potential changes in

healthcare-seeking behavior may contribute to this increasing trend. It is crucial for public health authorities to continuously monitor and assess these trends in order to implement effective control measures and mitigate the impact of infectious diseases on the population.

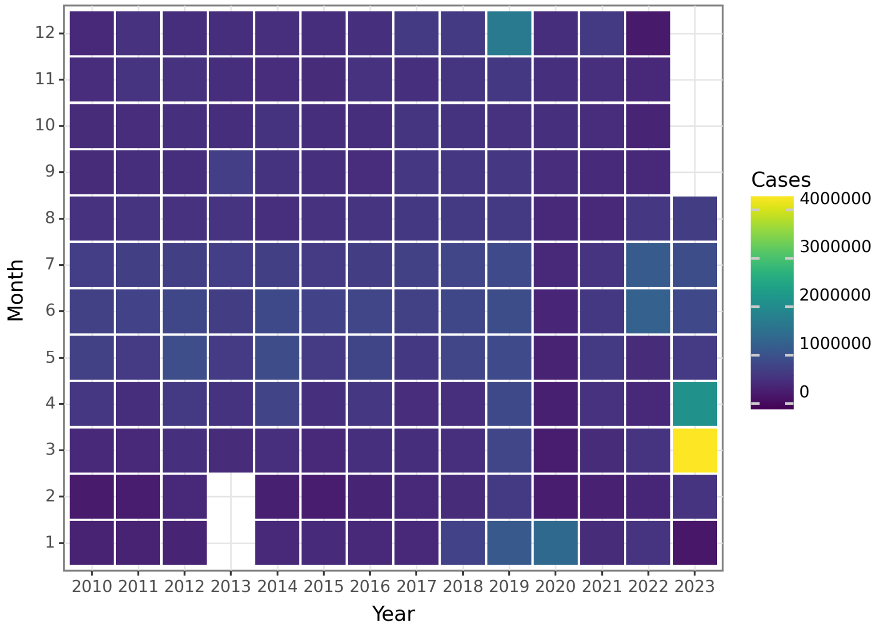

Figure 3: The Change of Total Cases before 2023 August

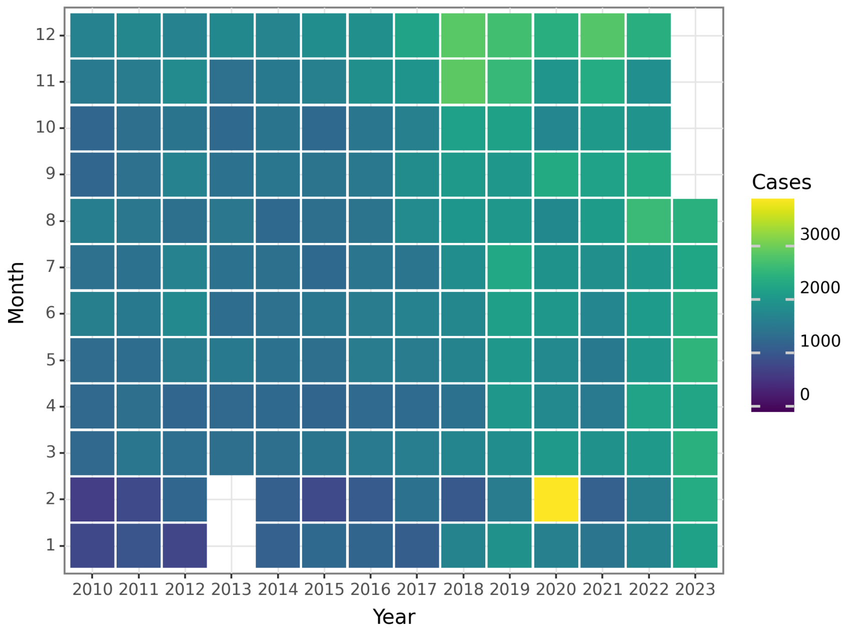

Figure 4: The Change of Total Deaths before 2023 August

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.

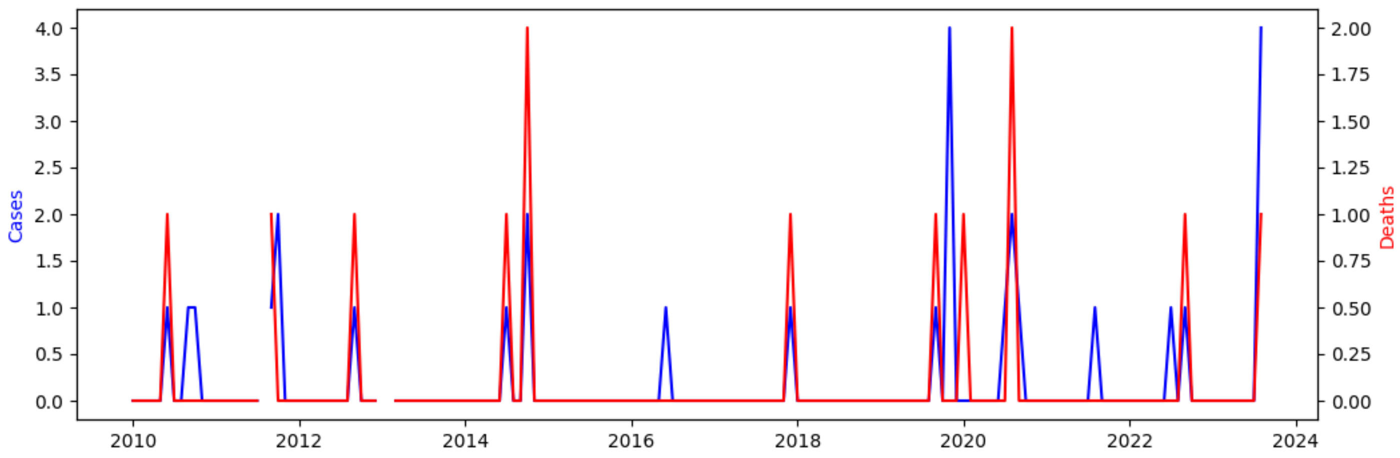

Figure 5: The Change of Plague Reports before 2023 August

Seasonal Patterns: Based on the provided data, it is apparent that there are no discernible seasonal patterns in the occurrence of Plague cases and deaths in mainland China. The number of cases and deaths fluctuate randomly throughout the years, without any observable consistent patterns.
Peak and Trough Periods: The data does not allow for distinct identification of peak and trough periods as the number of cases and deaths remain low and infrequent. Although there have been several instances of slight increases in the number of cases and deaths, such as in August 2010, August 2014, and August 2023, they do not exhibit any consistent trends or significant spikes.
Overall Trends: From 2010 to August 2023, the frequency of cases and deaths resulting from Plague in mainland China have been sporadic and relatively low. There is no discernible upward or downward trend, and the pattern of incidence lacks consistency with no significant increase over time.
Discussion: The available data suggests that Plague has been of minimal concern within mainland China as only occasional cases and deaths have been documented. Despite the extended time frame of the dataset, the frequency of cases and deaths has remained low. This may indicate that successful preventative measures have been implemented to avoid widespread outbreaks. However, a more comprehensive analysis of additional data may be necessary to confirm this conclusion and identify the contributing factors that influence the occurrence of Plague within mainland China.

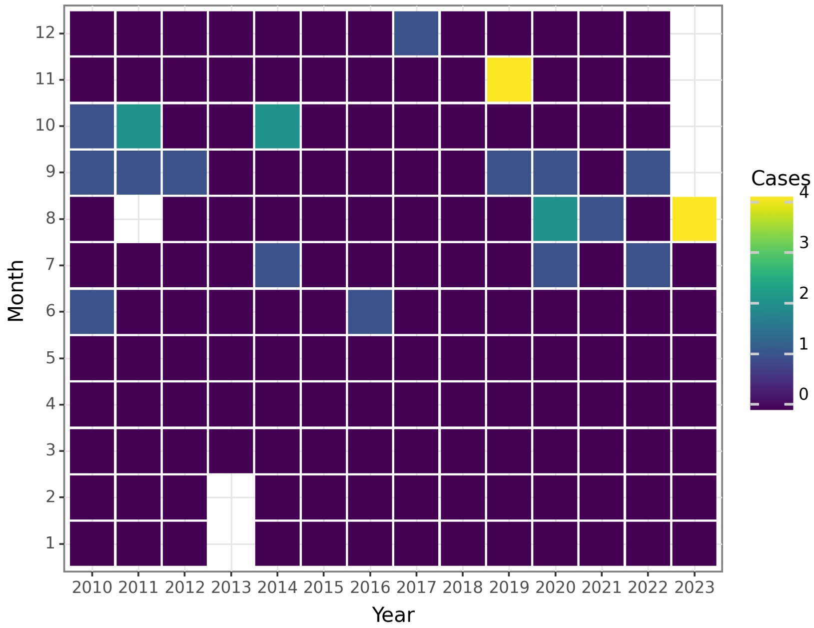

Figure 6: The Change of Plague Cases before 2023 August

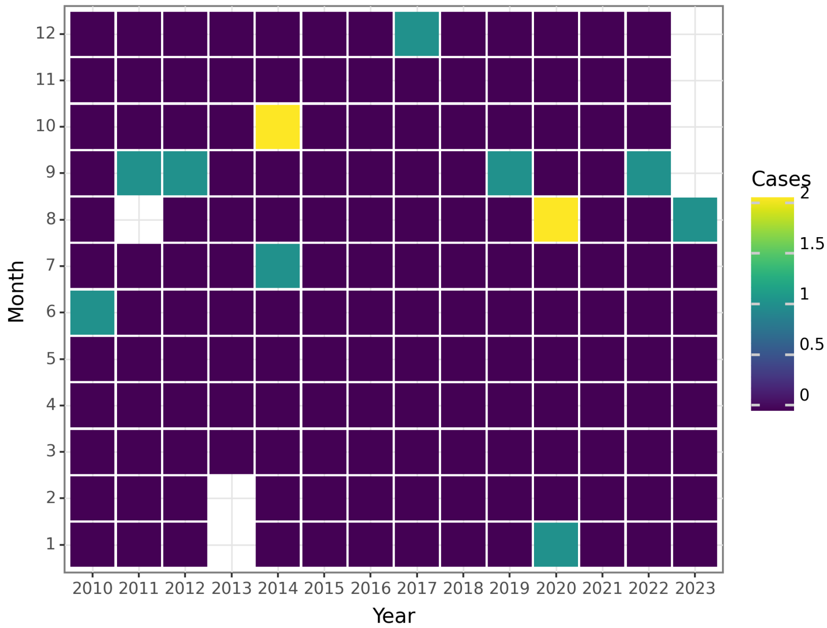

Figure 7: The Change of Plague Deaths before 2023 August

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.

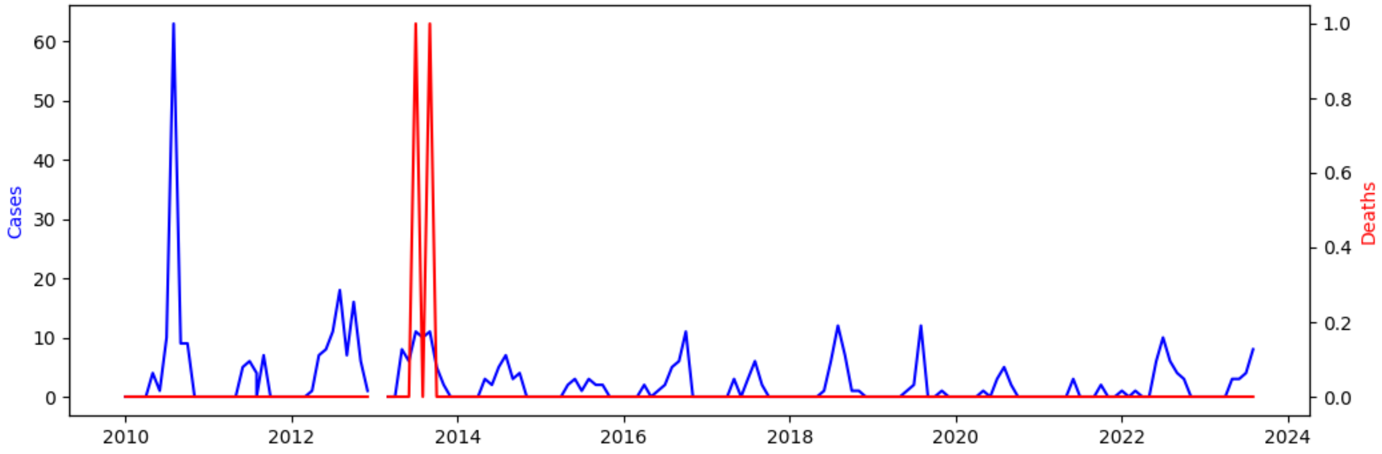

Figure 8: The Change of Cholera Reports before 2023 August

Seasonal Patterns:
Based on the monthly data for cholera cases in mainland China before August 2023, it is evident that there is a distinct seasonal pattern in the occurrence of cases. Cholera cases are more prevalent during the summer months and decrease during the winter months. This aligns with the known transmission patterns of cholera, as the bacteria responsible for the disease thrive in warm water and contaminated food, which are typically more abundant during the summer.
Peak and Trough Periods:
The peak period for cholera cases in mainland China is observed during the summer months, particularly in July and August. During these months, there is a notable surge in the number of cases, with the highest recorded value in August 2010, when 63 cases were reported. Conversely, the trough period for cholera cases is observed during the winter months, from December to February, in which consistently very few or even zero cases are reported.
Overall Trends:
Examining the overall trend of cholera cases in mainland China before August 2023, there is a general fluctuation in the number of cases from year to year. The number of cases ranges from 0 to 18 per month, with sporadic spikes in certain months. However, there is no clear upward or downward trend observed over the years. It is important to note that the data for 2023 is incomplete, as it only includes data up to August.
The seasonal patterns of cholera cases in mainland China underscore the significance of understanding the environmental factors that contribute to the disease's transmission. In this case, the increase in cases during the summer months can be attributed to factors such as warmer temperatures and elevated water and food contamination. This information can be invaluable for public health authorities when planning and implementing targeted interventions to prevent and control cholera outbreaks in mainland China.
However, it is crucial to acknowledge that the overall trend of cholera cases does not exhibit a consistent pattern of increase or decrease over time. This suggests the possibility of other influencing factors, including variations in reporting or surveillance systems, changes in population vulnerability, or the effectiveness of cholera prevention and control measures. Further analysis and investigation are necessary to identify and comprehend these factors, ultimately leading to the development of more effective strategies for cholera prevention and control in mainland China.

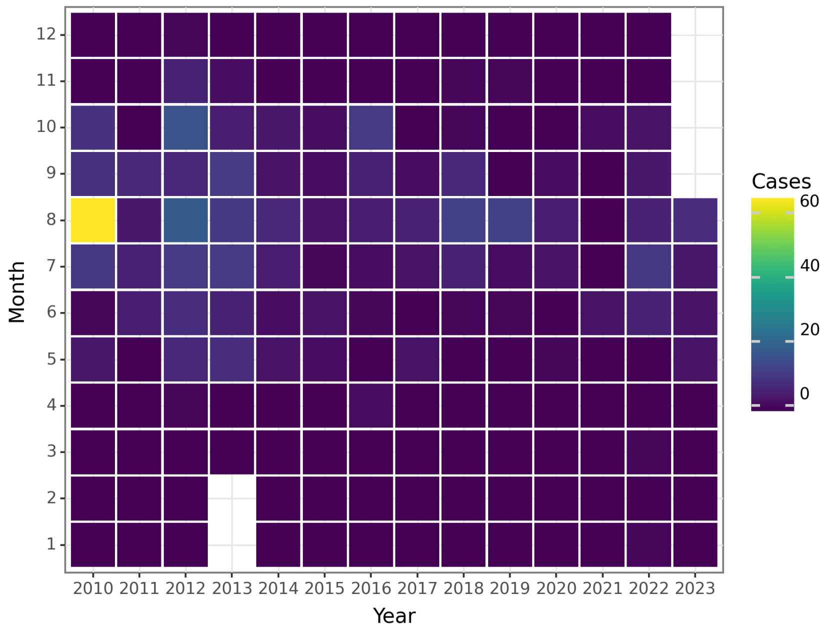

Figure 9: The Change of Cholera Cases before 2023 August

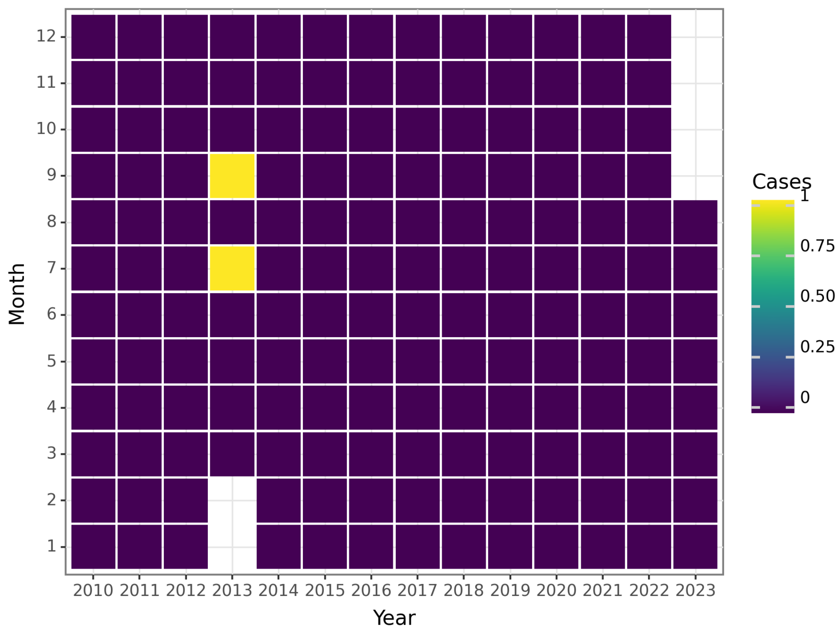

Figure 10: The Change of Cholera Deaths before 2023 August

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.

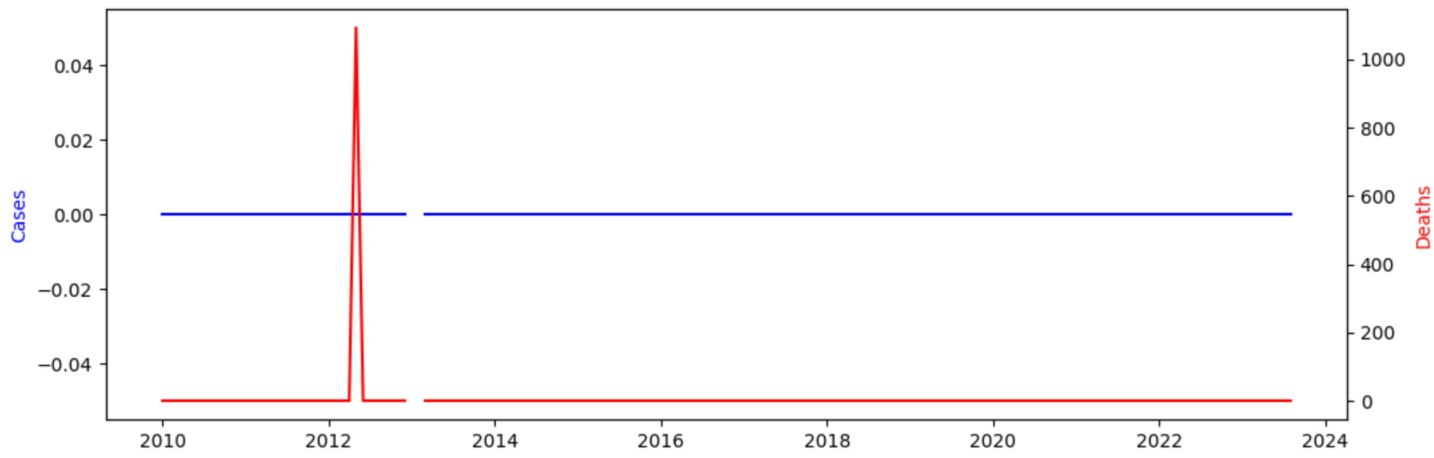

Figure 11: The Change of SARS-CoV Reports before 2023 August

Seasonal Patterns: According to the data provided, there is no discernible seasonal pattern for SARS-CoV cases and deaths in mainland China. Over the years, the number of cases and deaths remains consistently low, with no significant fluctuations during specific months or seasons.
Peak and Trough Periods: The data does not reveal any identifiable peak or trough periods. Most months show the number of cases and deaths consistently at zero, indicating a low and stable prevalence of SARS-CoV in mainland China.
Overall Trends: Based on the data prior to August 2023, both SARS-CoV cases and deaths in mainland China consistently remain at a low and stagnant level. There is no notable increase or decrease in the number of cases and deaths over time.
Discussion: The provided data suggests that SARS-CoV has a very low presence in mainland China, as there are no reported cases or deaths recorded before August 2023. This could be attributed to effective measures implemented by public health authorities to prevent the spread of the virus, such as strict surveillance and containment strategies. It is important to note that the absence of reported cases and deaths does not necessarily indicate the complete absence of the virus, as some cases may go undetected or unreported. Continuous monitoring and surveillance are necessary to maintain control over SARS-CoV in mainland China.

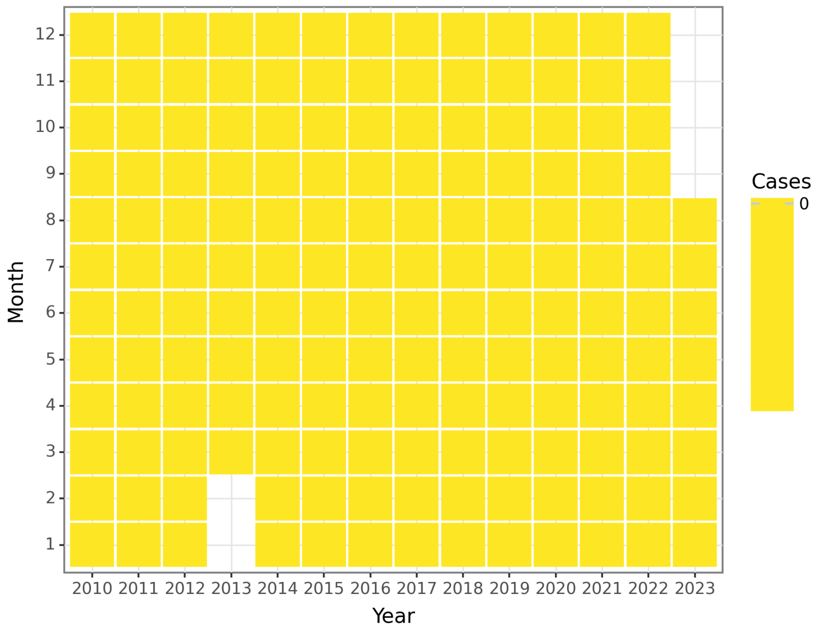

Figure 12: The Change of SARS-CoV Cases before 2023 August

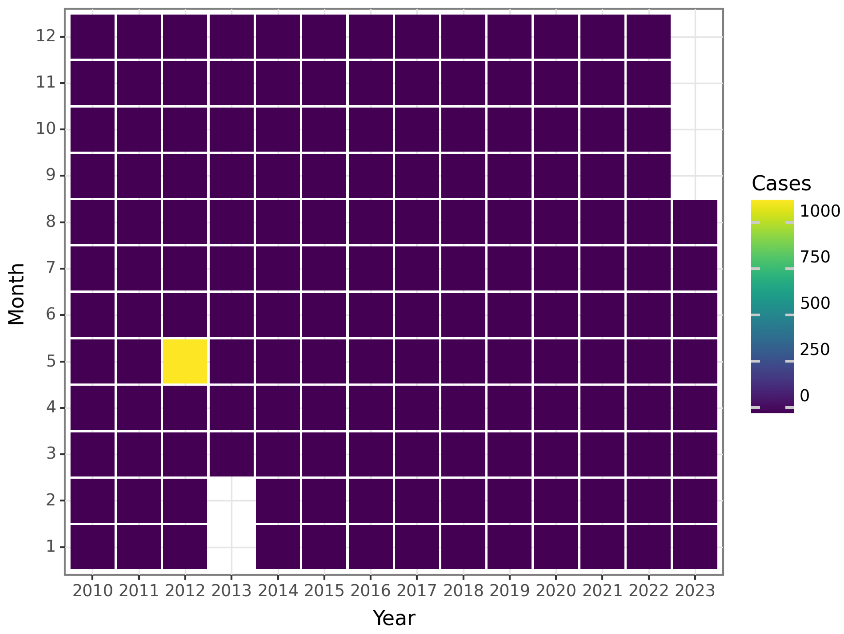

Figure 13: The Change of SARS-CoV Deaths before 2023 August

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.

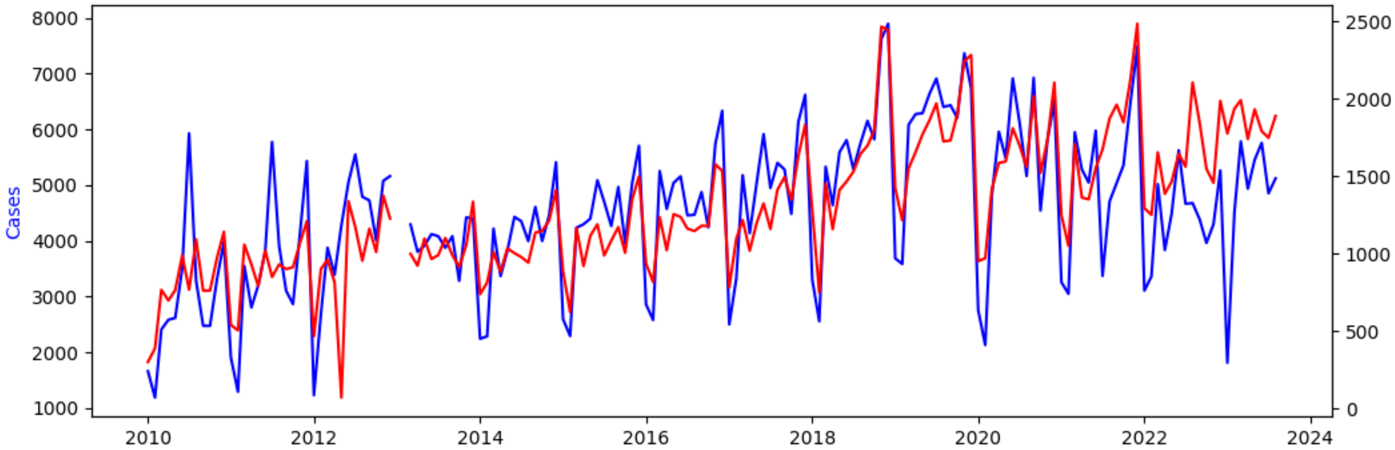

Figure 14: The Change of Acquired immune deficiency syndrome Reports before 2023 August

Seasonal Patterns: The data reveals a clear seasonal pattern for Acquired Immune Deficiency Syndrome (AIDS) in mainland China. The number of cases and deaths tends to reach its peak during the summer months, particularly in June and July, and then gradually decreases towards the end of the year. The fewest cases and deaths typically occur in January and February.
Peak and Trough Periods: The peak period for AIDS cases and deaths in mainland China occurs during the summer months of June and July. During these months, there is a significant increase in the number of cases and deaths compared to the rest of the year. On the other hand, the trough period, where the number of cases and deaths is at its lowest, is observed in January and February.
Overall Trends: When examining the overall trends of AIDS cases and deaths in mainland China, there is a general upward trend in the number of cases and deaths from 2010 to 2018. However, after 2018, a fluctuating pattern emerges, with certain years showing higher numbers of cases and deaths compared to others. Importantly, it should be noted that the data for January and February 2013 indicates negative values for cases, which may be attributed to issues with data reporting.
Discussion: The observed seasonal patterns in AIDS cases and deaths in mainland China imply a potential influence of environmental factors and social behaviors on disease transmission. The peak during the summer months might be linked to increased social activities and higher-risk behaviors, such as unprotected sexual contacts or intravenous drug use. The lower numbers during January and February could be a result of reduced social interaction during the winter months.
The rising trend in AIDS cases and deaths from 2010 to 2018 emphasizes the ongoing challenge of controlling and preventing the spread of the disease in mainland China. It is crucial to continue implementing targeted public health interventions, including the promotion of safe sex practices, expanded access to HIV testing and counseling, and the provision of effective treatment and care for individuals living with HIV/AIDS.
However, the fluctuating pattern observed after 2018 calls for further investigation and analysis. Factors such as changes in surveillance systems, reporting practices, or differences in data collection methods might contribute to these fluctuations. Epidemiologists and public health authorities should closely monitor and evaluate the data to ensure accurate tracking of the disease burden and to inform effective prevention and control strategies.

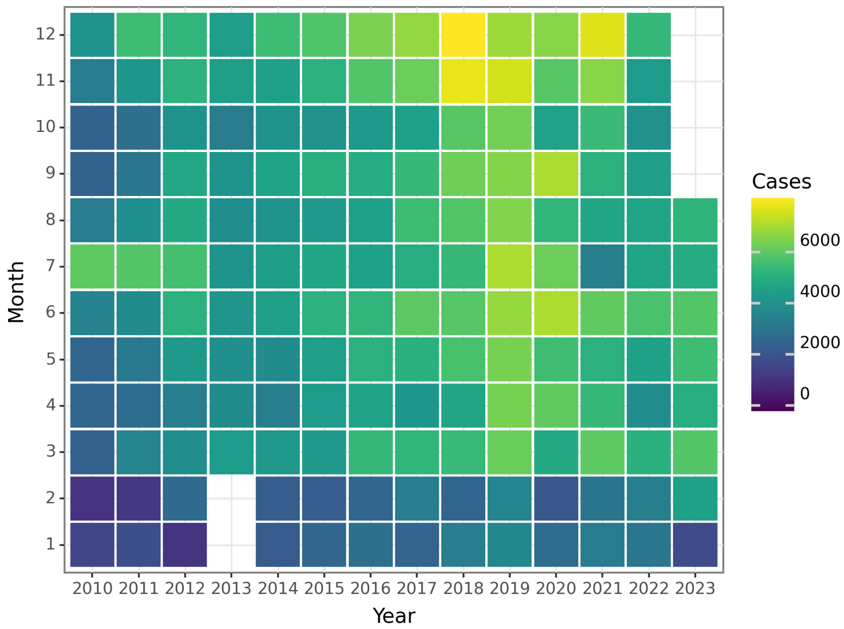

Figure 15: The Change of Acquired immune deficiency syndrome Cases before 2023 August

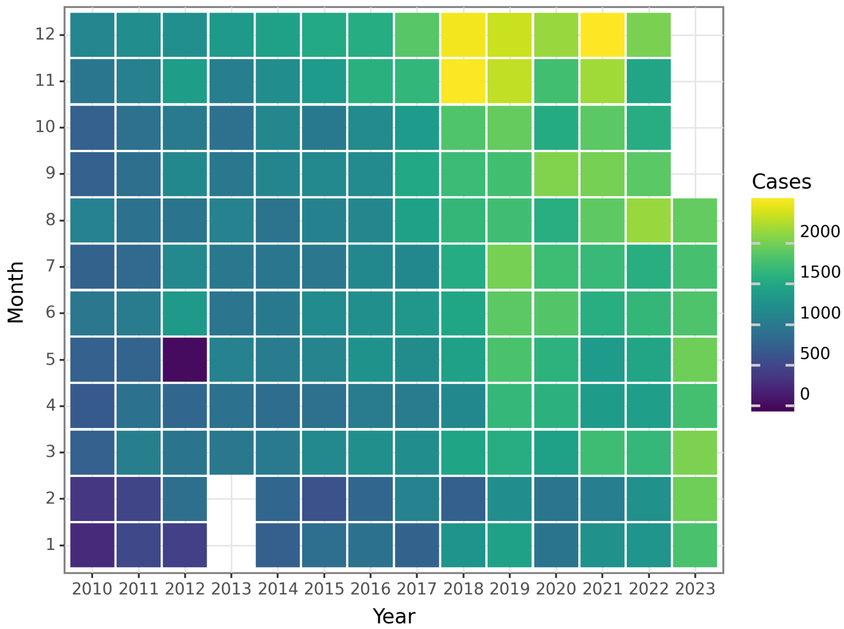

Figure 16: The Change of Acquired immune deficiency syndrome Deaths before 2023 August

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.

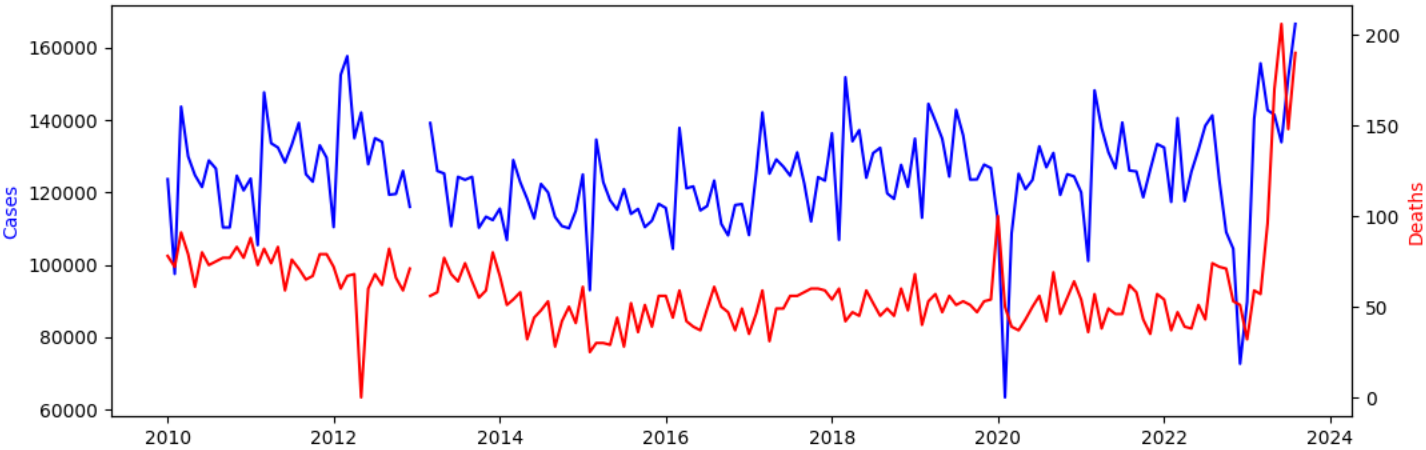

Figure 17: The Change of Hepatitis Reports before 2023 August

The data reveals a discernible seasonal pattern in the incidence of hepatitis cases in mainland China. Typically, the number of cases peaks in the summer months (June, July, and August) and declines during the winter months (December, January, and February). This trend may be indicative of the influence of seasonal fluctuations in behavior or climatic factors on hepatitis transmission.

With regard to peak and trough periods, August exhibits the most significant number of reported cases, followed by July and June. Conversely, the period with the lowest number of cases occurs during December, January, and February.

A gradual increase in the incidence of hepatitis cases from 2010 to 2015 is evident, although there has been a degree of fluctuation since that time. While some years have seen slightly higher or lower numbers than the preceding year, no consistent upward or downward trend is discernible from 2016 to 2023.

The observed seasonal patterns strongly suggest that particular lifestyle behaviors or environmental conditions may contribute to hepatitis transmission during certain times of the year. For example, a higher incidence of cases during the summer months may be linked to increased travel, outdoor activities, or changes in food consumption habits. Conversely, the lower incidence of cases during the winter months may be a consequence of decreased outdoor activities and potentially better hygiene practices.

Overall, the apparent stability of the trend from 2016 to 2023, with no significant increase in the incidence of cases, may be indicative of successful prevention and control efforts. However, continued monitoring and intervention are crucial to maintaining this stability and further reducing the burden of the disease. Moreover, further exploration of the seasonal patterns and potential risk factors associated with hepatitis transmission could inform targeted prevention strategies during peak periods.

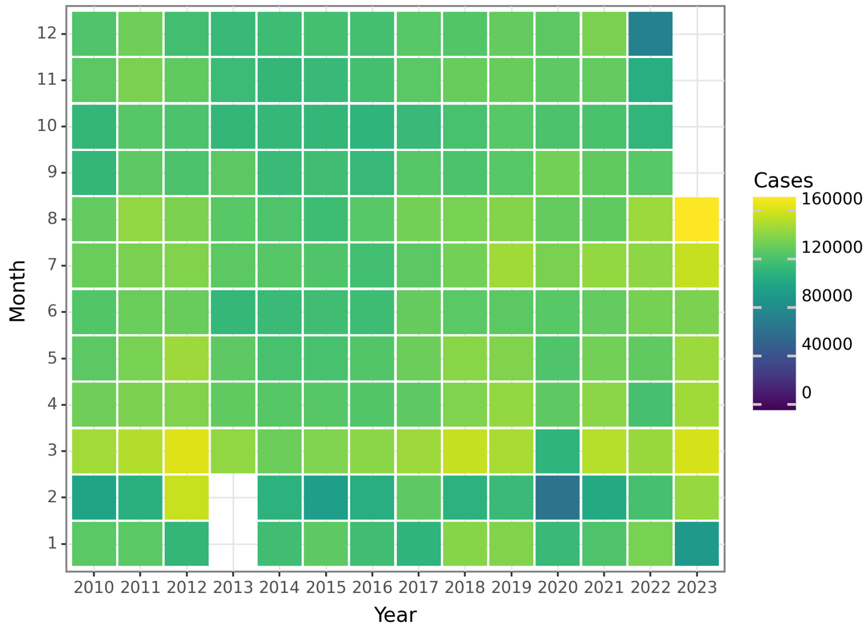

Figure 18: The Change of Hepatitis Cases before 2023 August

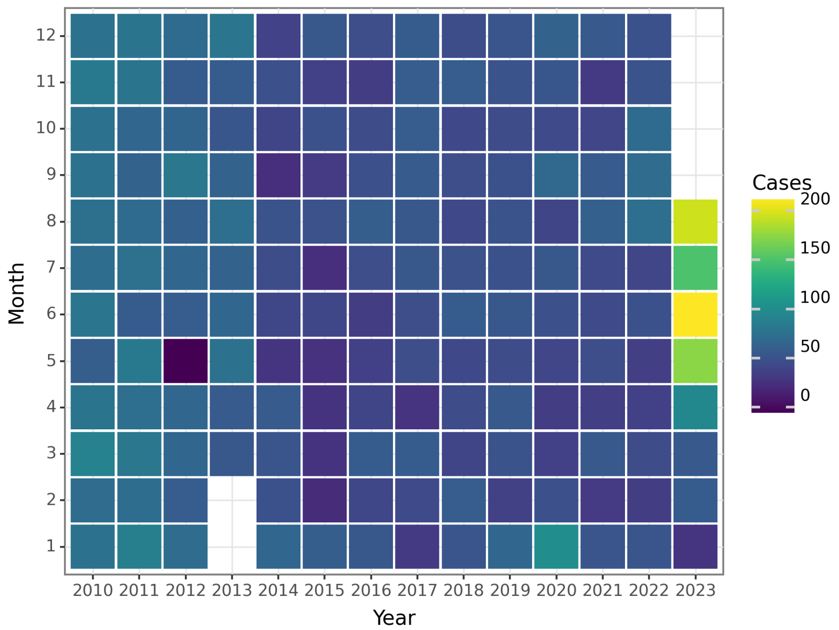

Figure 19: The Change of Hepatitis Deaths before 2023 August

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.

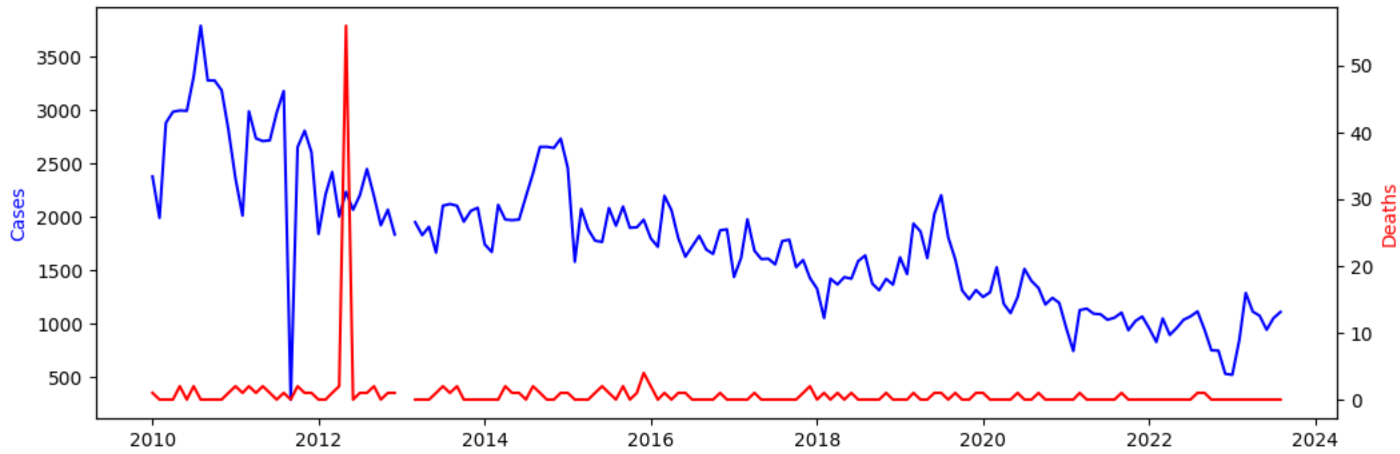

Figure 20: The Change of Hepatitis A Reports before 2023 August

Seasonal Patterns: The data provided suggests the presence of a noticeable seasonal pattern in the incidence of Hepatitis A cases in mainland China. Typically, there is a higher number of cases during the summer months (June to August) and a lower number during the winter months (December to February). This indicates a peak in cases during the summer season and a decline during the winter season.
Peak and Trough Periods: In mainland China, the peak period for Hepatitis A cases occurs in the summer months of June to August. During this time, there is a significant increase in the number of cases, as evidenced by the data from 2010 to 2023. On the other hand, the trough period is observed in the winter months of December to February, where the number of cases consistently decreases compared to the peak period.
Overall Trends: When analyzing the overall trend of Hepatitis A cases in mainland China, it is clear that there is variability from year to year. However, it is important to acknowledge that the provided data may not include all months and years. Considering this, there seems to be a fluctuating pattern over time, with some years showing higher or lower numbers of cases. This suggests the presence of certain factors or conditions that contribute to the interannual variation in Hepatitis A cases.
Discussion: The seasonal pattern observed in Hepatitis A cases in mainland China highlights a heightened risk of transmission during the summer months. This may be attributed to factors such as increased travel and tourism, higher temperatures which promote virus survival, or changes in behavior that increase the likelihood of transmission (e.g., outdoor gatherings and food consumption practices). Conversely, the lower number of cases during the winter months can be attributed to reduced opportunities for transmission due to factors like decreased social interactions, improved hygiene practices, and potentially increased population immunity.
However, it is important to note that this analysis solely focuses on the reported cases and fatalities, without considering the underlying population at risk or the specific factors contributing to the transmission of Hepatitis A. Thus, to gain a more comprehensive understanding of the epidemiology of Hepatitis A in mainland China, additional information and context are required for a thorough analysis and interpretation of the data.

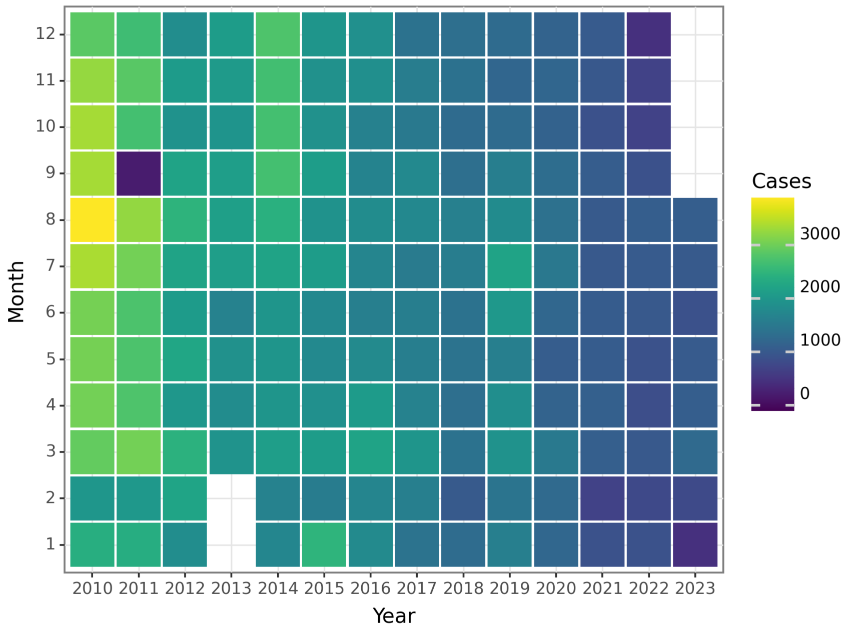

Figure 21: The Change of Hepatitis A Cases before 2023 August

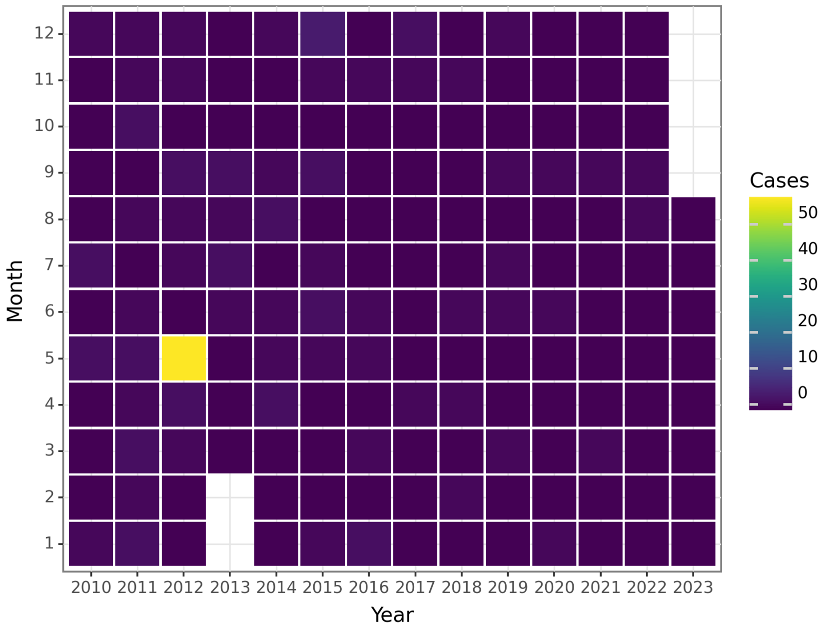

Figure 22: The Change of Hepatitis A Deaths before 2023 August

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.

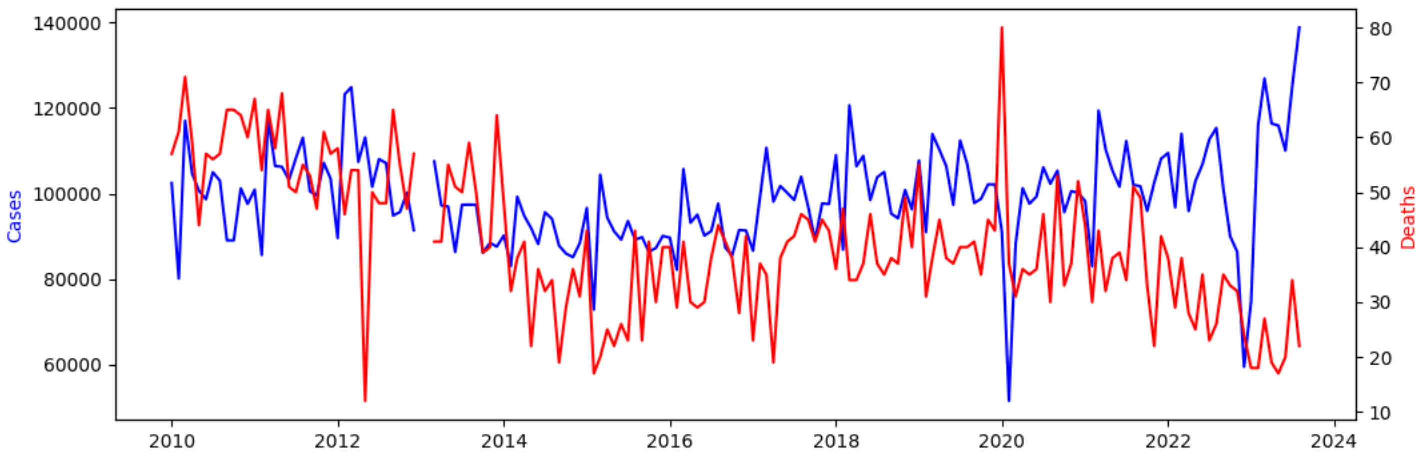

Figure 23: The Change of Hepatitis B Reports before 2023 August

Seasonal Patterns: According to the provided data, there is a consistent seasonal pattern in the number of Hepatitis B cases in mainland China. Generally, there is a higher number of cases during January to March, followed by a decrease during April to June. The number of cases then increases again from July to August, before decreasing again from September to December. This indicates a cyclic pattern of fluctuating transmission of Hepatitis B throughout the year.
Peak and Trough Periods: The peak periods for Hepatitis B cases in mainland China occur during January to March and July to August, as these months consistently have a higher number of cases compared to other months. These can be seen as the peak seasons for Hepatitis B transmission in the country. On the other hand, the trough periods, or times of lower transmission, can be observed during April to June and September to December, when the number of cases tends to decrease.
Overall Trends: Analyzing the overall trend of Hepatitis B cases in mainland China, there has been some variation over time. From 2010 to 2013, there was a gradual increase in the number of cases, followed by a decrease in 2014. The number of cases then remained relatively stable from 2014 to 2016, with slight fluctuations. From 2017 to 2019, there was a somewhat increasing trend in the number of cases, which then started to decrease again in 2020. In 2021, there was a slight increase in cases, followed by a decrease in 2022. Finally, in 2023, there was a sharp increase in cases, reaching a peak in August of that year.
Discussion: The observed seasonal patterns of Hepatitis B cases in mainland China suggest that there are specific times of the year when the transmission of the disease is more likely. The peak periods in January to March and July to August could be attributed to factors such as changes in weather, population movement during holidays and festivals, or seasonal behaviors that increase the risk of transmission.
The overall trend of Hepatitis B cases shows fluctuations and variations over time. There have been periods of increasing cases, followed by periods of stability or decreasing cases. These trends could be influenced by various factors, including changes in preventive measures, implementation of vaccination programs, healthcare practices, awareness campaigns, and population demographics.
It is important to note that the analysis of seasonal patterns, peak and trough periods, and overall trends in Hepatitis B cases can provide valuable insights for public health interventions and planning. This information can assist in targeting prevention strategies, optimizing resource allocation, and improving surveillance and control measures to reduce the burden of Hepatitis B in mainland China.

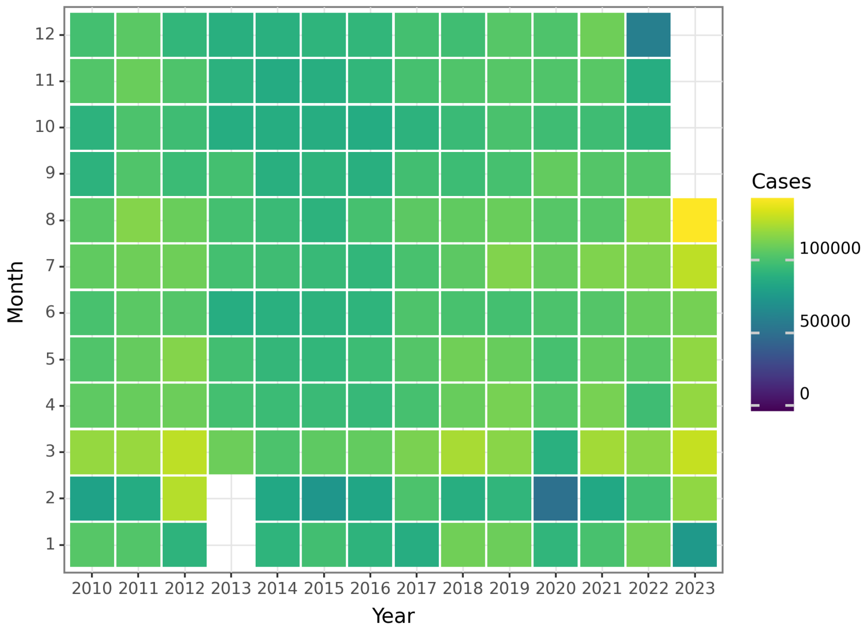

Figure 24: The Change of Hepatitis B Cases before 2023 August

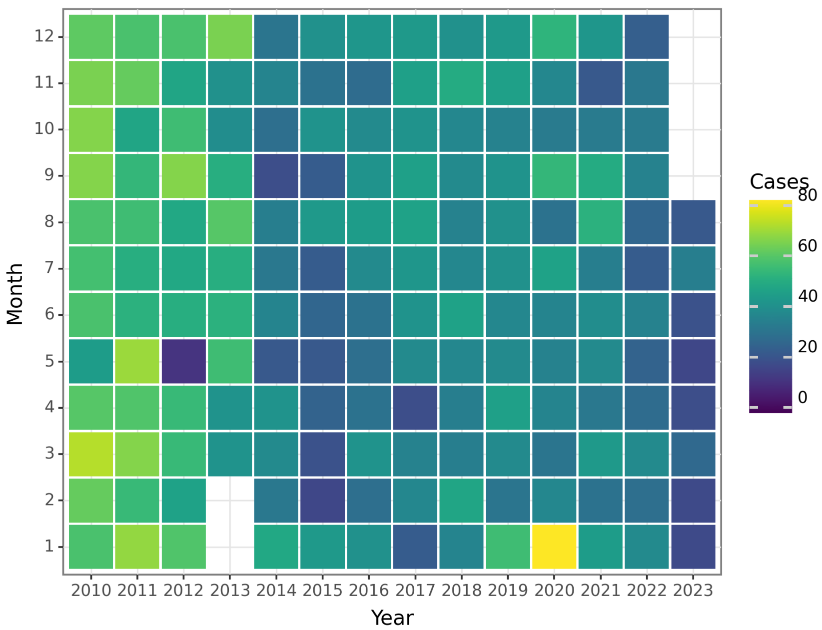

Figure 25: The Change of Hepatitis B Deaths before 2023 August

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.

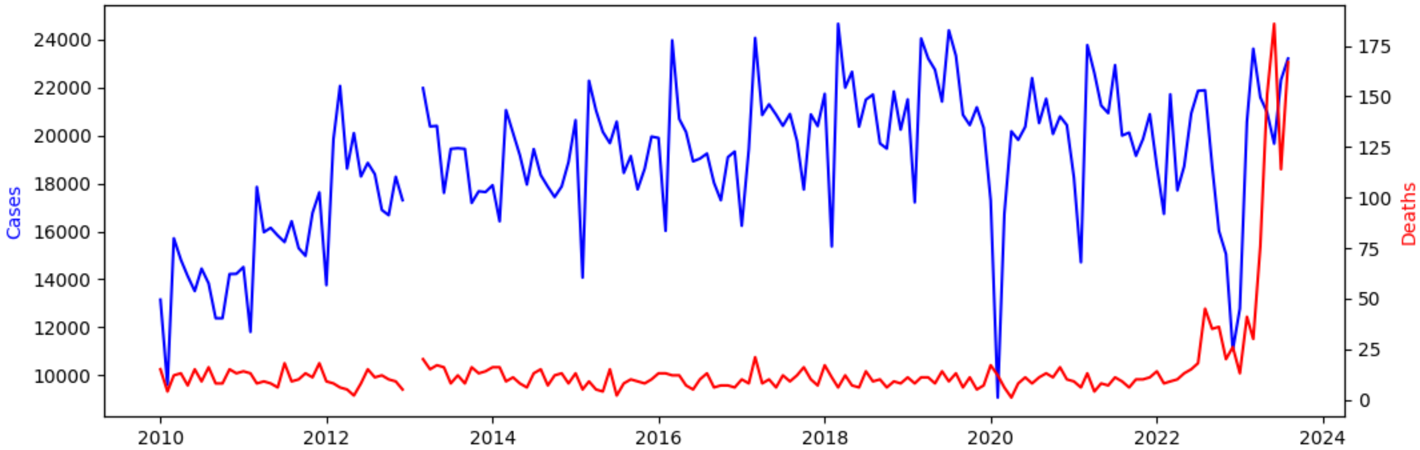

Figure 26: The Change of Hepatitis C Reports before 2023 August

Seasonal Patterns: Based on the data provided, there is a consistent pattern of seasonal variation in Hepatitis C cases and deaths in mainland China. During the winter months (November to February), there is an increase in cases and deaths, while a decrease is observed during the summer months (June to August). This pattern suggests the potential influence of seasons on transmission and progression of the disease.

Peak and Trough Periods: In mainland China, the peak period for Hepatitis C cases occurs in the winter months, particularly in December and January. These months have the highest number of cases. Conversely, the trough period with the lowest number of cases is observed in July and August during the summer months. Similarly, the peak period for Hepatitis C deaths is also observed in the winter months, with the highest number of deaths occurring in December and January. The trough period for deaths is in May and June, when the fewest deaths are reported.

Overall Trends: During the analyzed period, there is a general increasing trend in Hepatitis C cases and deaths in mainland China. From 2010 to August 2023, the number of cases has gradually increased with some fluctuations, reaching its highest point in August 2023. The number of deaths also displays a similar increasing trend, with fluctuations along the way.

Discussion: The observed seasonal patterns in Hepatitis C cases and deaths in mainland China suggest that climatic factors and/or changes in behavior during different seasons may have an influence. The increase in cases and deaths during the winter months could be attributed to factors such as reduced sunlight exposure, decreased immune response, and increased indoor activities, which contribute to a higher risk of transmission. Conversely, the decrease in cases and deaths during the summer months may be due to increased outdoor activities, better immune response, and potentially reduced transmission rates.

The overall increasing trend in Hepatitis C cases and deaths highlights an ongoing public health challenge in mainland China. It underscores the need for continuous efforts in prevention, screening, and treatment interventions to mitigate the burden of this disease. Further analysis, including demographic factors, risk behaviors, and interventions implemented during the study period, would provide a more comprehensive understanding of Hepatitis C epidemiology in mainland China.

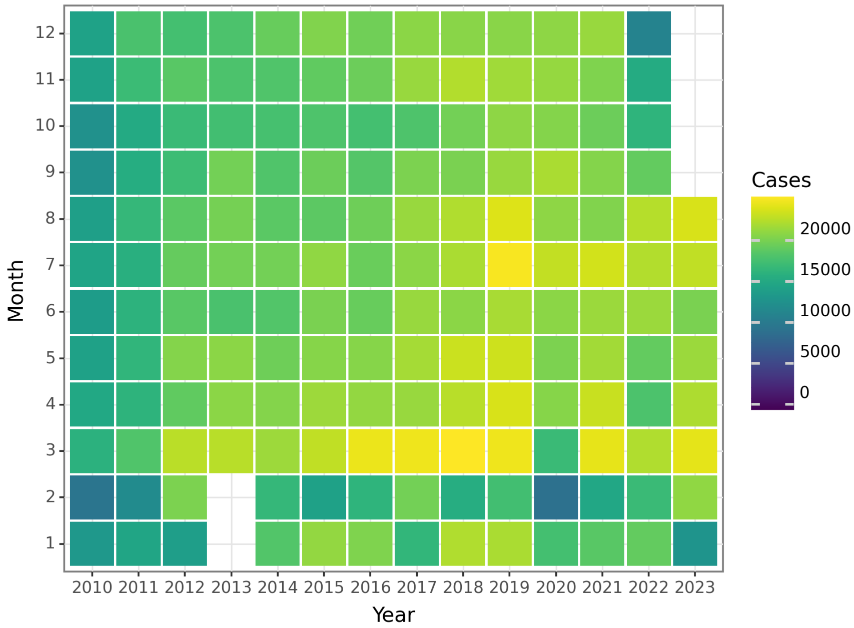

Figure 27: The Change of Hepatitis C Cases before 2023 August

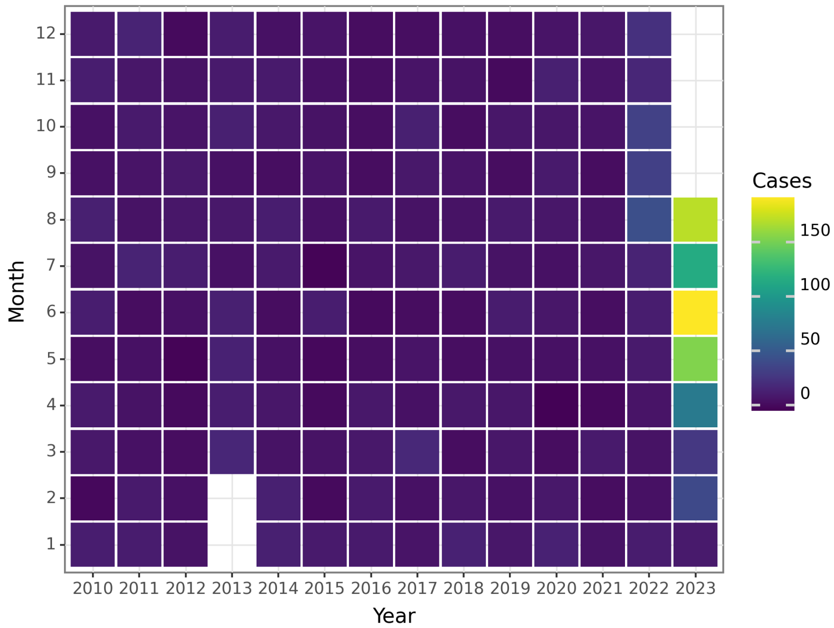

Figure 28: The Change of Hepatitis C Deaths before 2023 August

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.

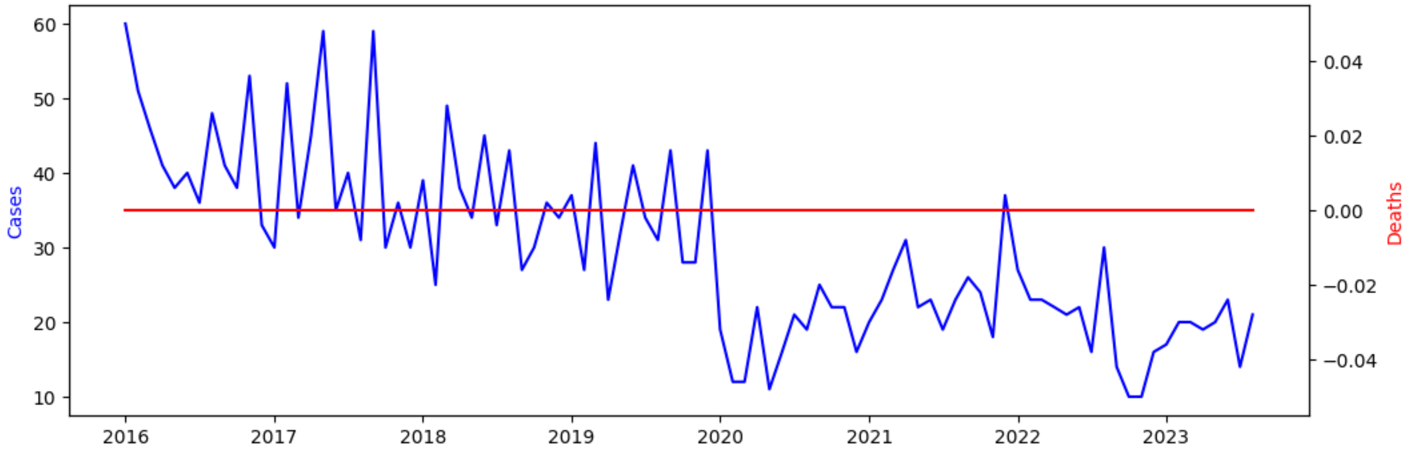

Figure 29: The Change of Hepatitis D Reports before 2023 August

Seasonal Patterns in Hepatitis D Cases in Mainland China:
A consistent seasonal pattern is evident in the monthly data for Hepatitis D cases in mainland China prior to August 2023. The number of cases is lowest during the winter months, with December, January, and February seeing the fewest cases. The number of cases shows a slight increase in March before gradually increasing from March to May. The peak period for Hepatitis D occurs during the summer months, with the highest number of cases recorded during August. After this peak, there is a decline in cases from September to November, with the lowest point of cases observed during the winter months in December, January, and February.
Peak and Trough Periods:
The peak period for Hepatitis D cases in mainland China consistently occurs during June, July, and August. During these months, the highest number of cases are reported. On the other hand, the trough period, or lowest point of cases, is observed during December, January, and February.
Overall Trends:
The fluctuating but relatively stable pattern in Hepatitis D cases in mainland China before August 2023 shows a clear seasonal variation, with increased cases during the summer months and decreased cases during the winter months. Nonetheless, there is no significant trend in the number of cases throughout the years analyzed.
Discussion:
The seasonal pattern identified in this study suggests a possible relationship between environmental factors such as temperature or precipitation and the incidence of Hepatitis D in mainland China. The higher temperatures during the summer months could lead to an increased transmission of the virus, resulting in a higher number of cases. Conversely, the lower temperatures during the winter months may limit viral transmission, leading to fewer cases.
The consistent peak in August each year signifies this month as particularly conducive to the spread of Hepatitis D in mainland China. Such information could be used to inform public health strategies and interventions, for example, heightened surveillance and prevention strategies during the summer months. Further investigation and analysis are required to identify the specific factors contributing to these observed seasonal patterns and peak periods.
It should be noted that this analysis only considers the provided data and does not include other influencing factors such as vaccination rates, population demographics, or changes in surveillance practices over time. Furthermore, the analysis of deaths due to Hepatitis D is not included as the data provided shows zero deaths for all months.

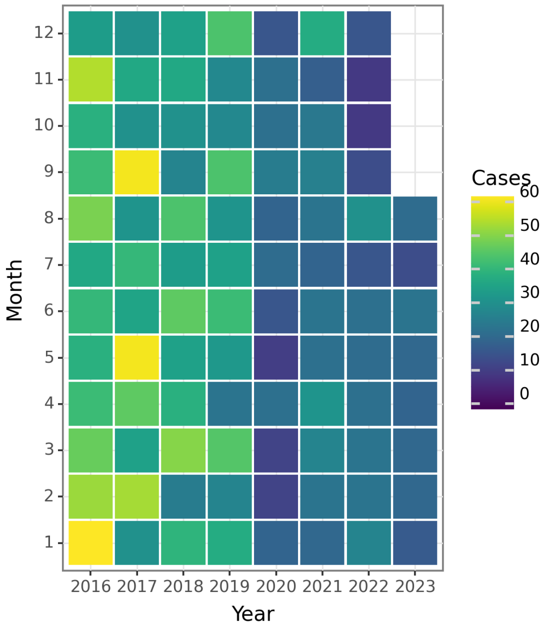

Figure 30: The Change of Hepatitis D Cases before 2023 August

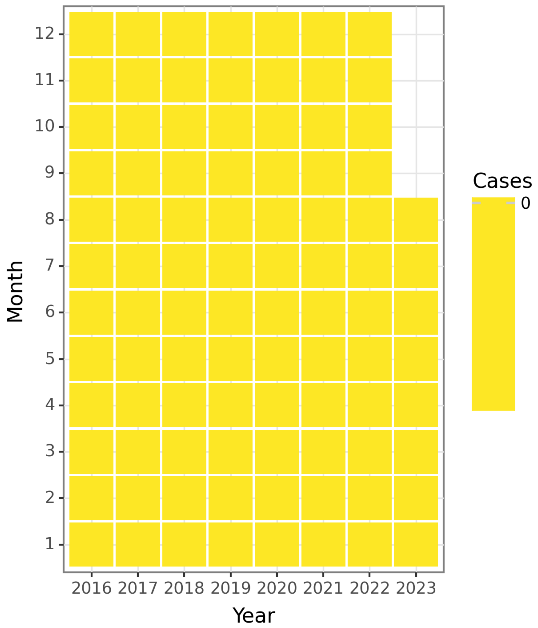

Figure 31: The Change of Hepatitis D Deaths before 2023 August

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.

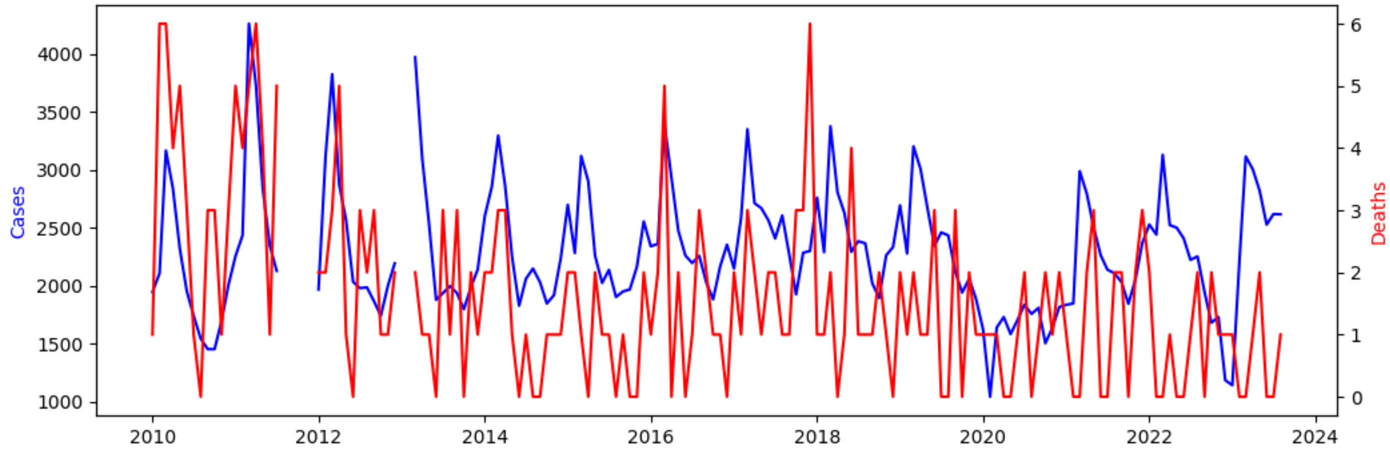

Figure 32: The Change of Hepatitis E Reports before 2023 August

Seasonal Patterns: The data provided reveals a notable seasonal pattern in Hepatitis E cases across mainland China. Reports indicate an increase in cases during the spring and summer months (March to August), followed by a decrease during the fall and winter months (September to February).
Peak and Trough Periods: The peak period for Hepatitis E cases in mainland China typically occurs in March and April, with cases reaching their maximum levels. Following this peak, the number of cases decreases to reach its lowest point during the winter months, specifically in December and January. This pattern of peaks and troughs remains consistent throughout the years covered by the data.
Overall Trends: An examination of the overall trend shows a general rise in Hepatitis E cases in mainland China from 2010 to 2023. However, fluctuations occur within this overall trend, with some years experiencing a higher or lower number of cases compared to the previous year.
Discussion: The observed seasonal pattern for Hepatitis E cases in mainland China, with peak periods during the spring and summer months, is consistent with the known features of the virus. Hepatitis E is mainly transmitted through the consumption of contaminated water or food, with warmer weather facilitating the growth and survival of the virus in the environment.
Various factors could influence fluctuations in the number of cases from year to year, including surveillance and reporting practices, population susceptibility, and variations in environmental conditions. Hence, public health authorities must closely track these trends and implement appropriate preventive measures, such as improving water and food safety, to alleviate the burden of Hepatitis E in mainland China.

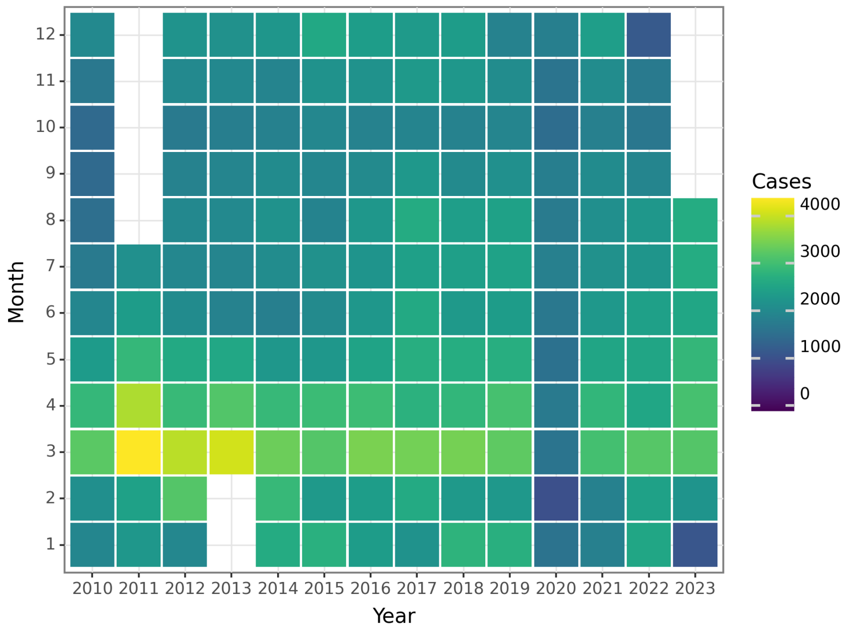

Figure 33: The Change of Hepatitis E Cases before 2023 August

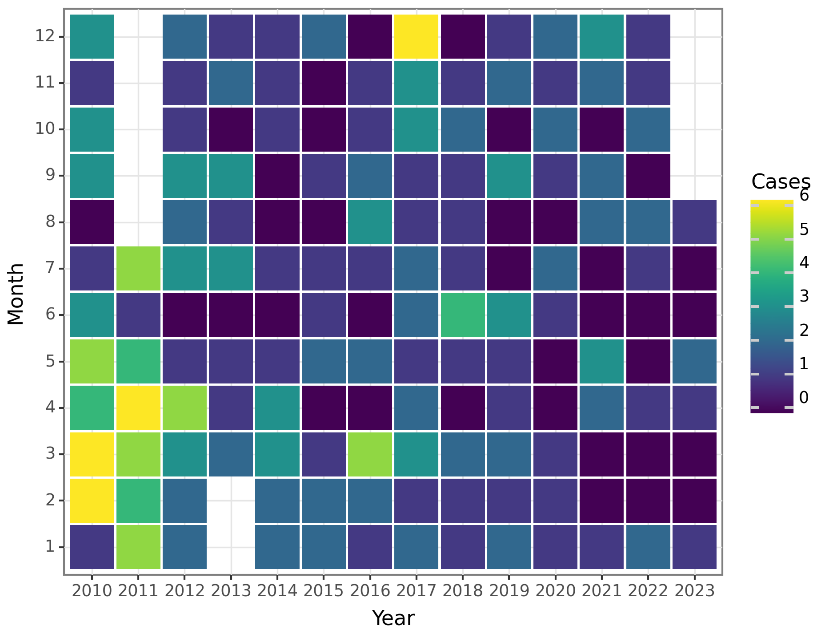

Figure 34: The Change of Hepatitis E Deaths before 2023 August

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.

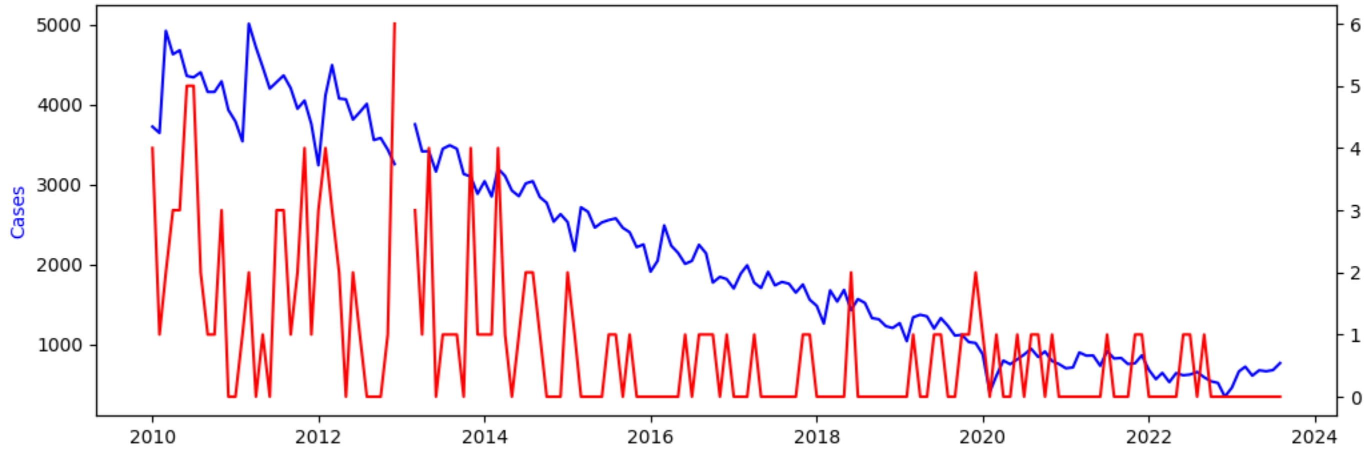

Figure 35: The Change of Other hepatitis Reports before 2023 August

Seasonal Patterns: Based on the provided data on cases and deaths of Other hepatitis in mainland China prior to August 2023, noticeable seasonal patterns can be observed. The number of cases and deaths fluctuates throughout the years, indicating the presence of seasonal variations. Specifically, there is a significant increase in cases and deaths during the winter months (November to February) and a corresponding decrease during the summer months (June to August). This consistent pattern persists across multiple years.
Peak and Trough Periods: The peak period for Other hepatitis cases and deaths in mainland China is observed during the winter months, particularly from November to February, when the number of cases and deaths reaches its highest point. Conversely, the trough period, characterized by the lowest number of cases and deaths, occurs during the summer months, specifically from June to August.
Overall Trends: Upon analyzing the overall trends of Other hepatitis cases and deaths in mainland China, a gradual increase is noted from 2010 to 2015, followed by a relatively stable period until 2020. Subsequently, a noticeable decline in the number of cases and deaths is observed. This trend indicates that efforts to control and prevent Other hepatitis in China have been effective in recent years, resulting in a reduction in the burden of the disease.
Discussion: The observed seasonal pattern in Other hepatitis cases and deaths suggests that there may be environmental or behavioral factors influencing disease transmission. The peak occurrence during winter months may be attributed to factors such as increased indoor crowding, closer interpersonal contact, or changes in personal hygiene practices during colder weather. Conversely, the decrease in cases and deaths during summer months may be associated with increased outdoor activities, improved ventilation, or heightened awareness of personal hygiene.
The overall trend of increasing cases and deaths of Other hepatitis from 2010 to 2015, followed by a more stable period, indicates a significant burden of the disease during that time. However, the subsequent decrease in cases and deaths after 2020 implies that control measures and interventions have been successful in reducing the transmission and impact of Other hepatitis in mainland China.
It is important to note that further analysis is required to fully comprehend the underlying factors contributing to the observed patterns and trends. The inclusion of additional variables, such as demographic information, vaccination coverage, and specific risk factors, would provide more comprehensive insights into the epidemiology of Other hepatitis in mainland China.

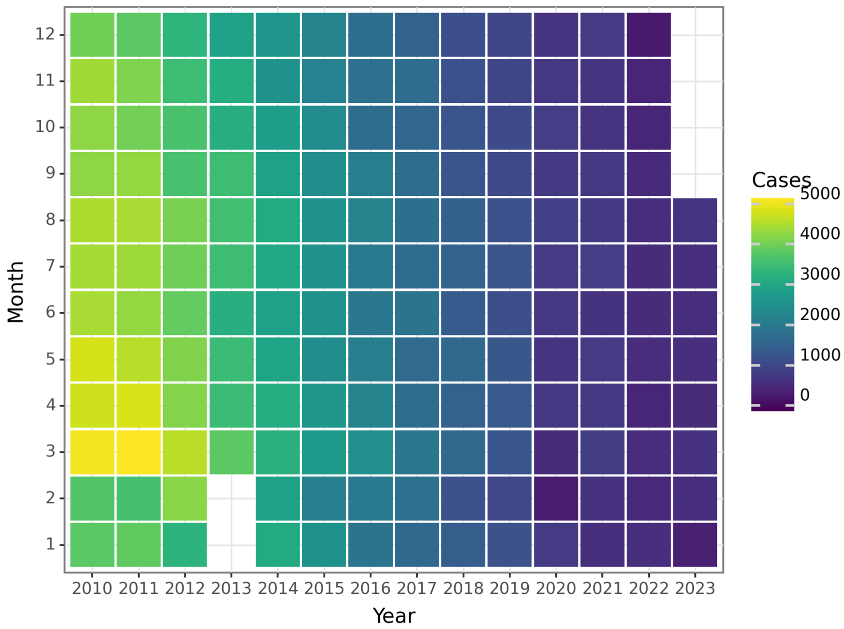

Figure 36: The Change of Other hepatitis Cases before 2023 August

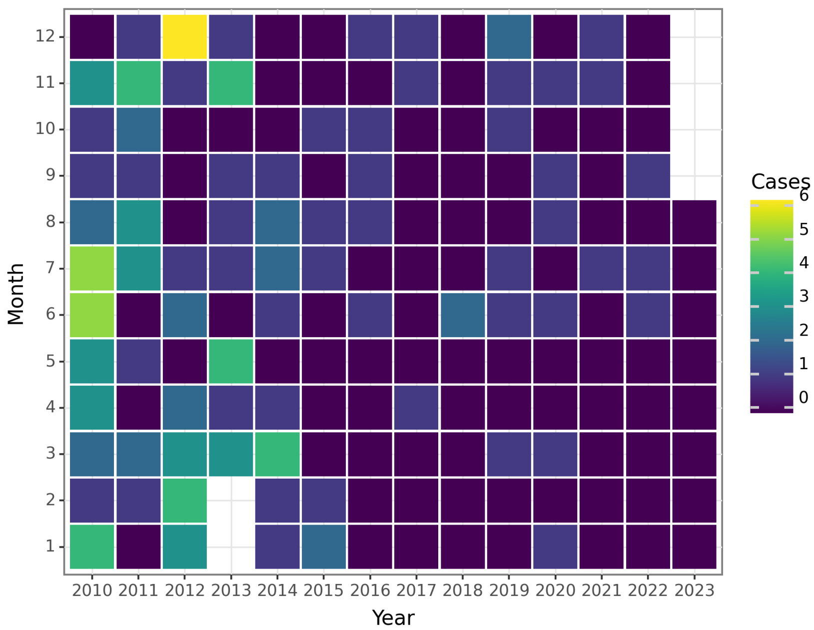

Figure 37: The Change of Other hepatitis Deaths before 2023 August

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.

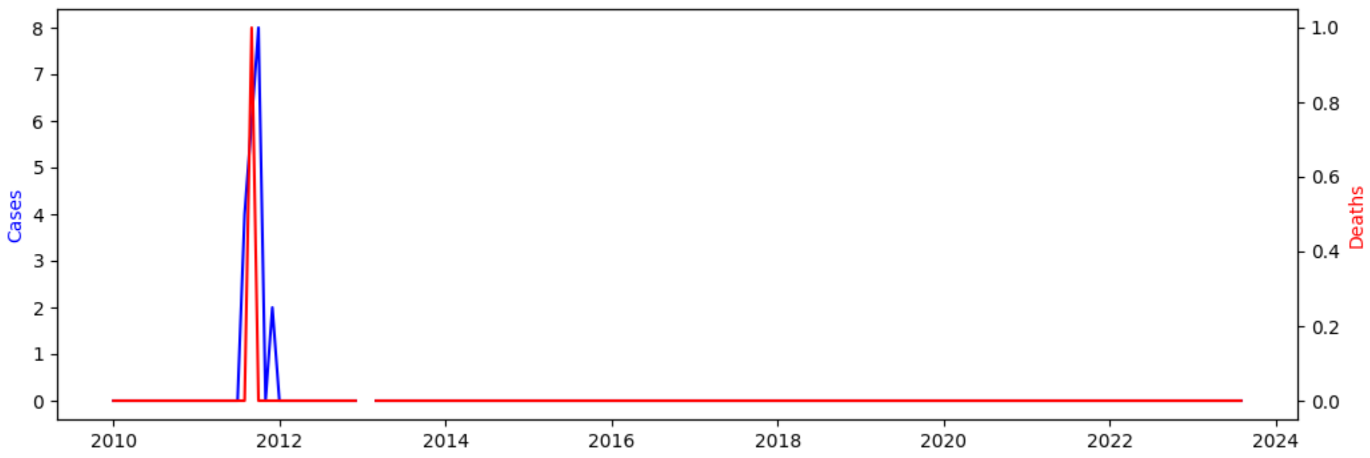

Figure 38: The Change of Poliomyelitis Reports before 2023 August

Seasonal Patterns: The analysis of the provided data on Poliomyelitis cases and deaths in mainland China reveals no discernible seasonal pattern. Throughout the year, both the number of cases and deaths remain consistently low, devoid of any significant peaks or troughs.
Peak and Trough Periods: As previously mentioned, the data does not exhibit any noticeable periods of peak or trough. Instead, both cases and deaths consistently maintain a low level over the entire duration of the study.
Overall Trends: The data presents a consistent trend of a low number of cases and deaths caused by Poliomyelitis in mainland China. There is no discernible increase or decrease in the occurrence of the disease over time.
Discussion: The analysis of the data supports the conclusion that there has been a successful control of Poliomyelitis in mainland China. The consistently low number of cases and deaths indicates the effective implementation of vaccination programs and comprehensive public health measures to prevent the spread of the disease. Moreover, the absence of seasonality and significant fluctuations in the data further strengthens the evidence for successful disease control efforts.
It is important to note that the dataset includes negative values for the number of cases and deaths in certain months. These negative values may indicate errors in data entry or reporting inconsistencies. Therefore, it is crucial to conduct further investigation and correct any inaccuracies to ensure the reliability and accuracy of the dataset.

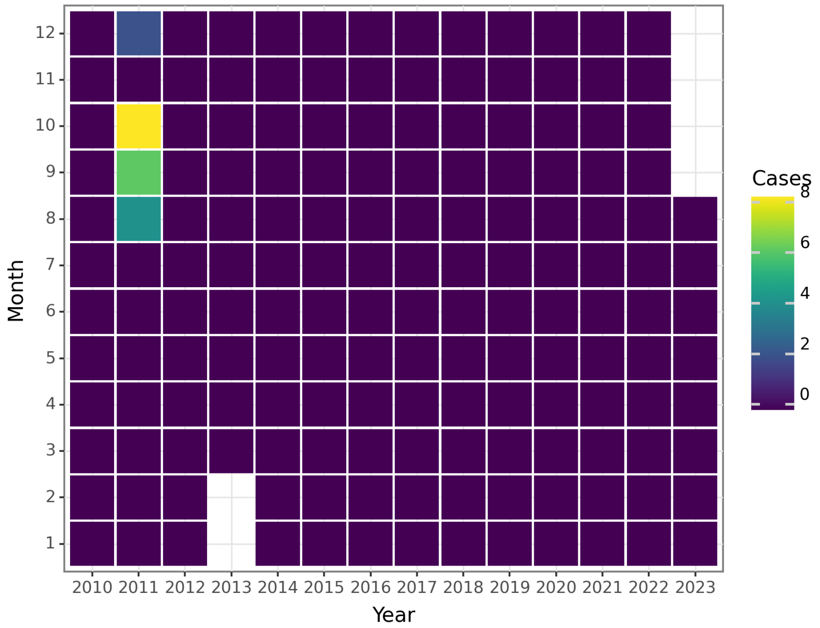

Figure 39: The Change of Poliomyelitis Cases before 2023 August

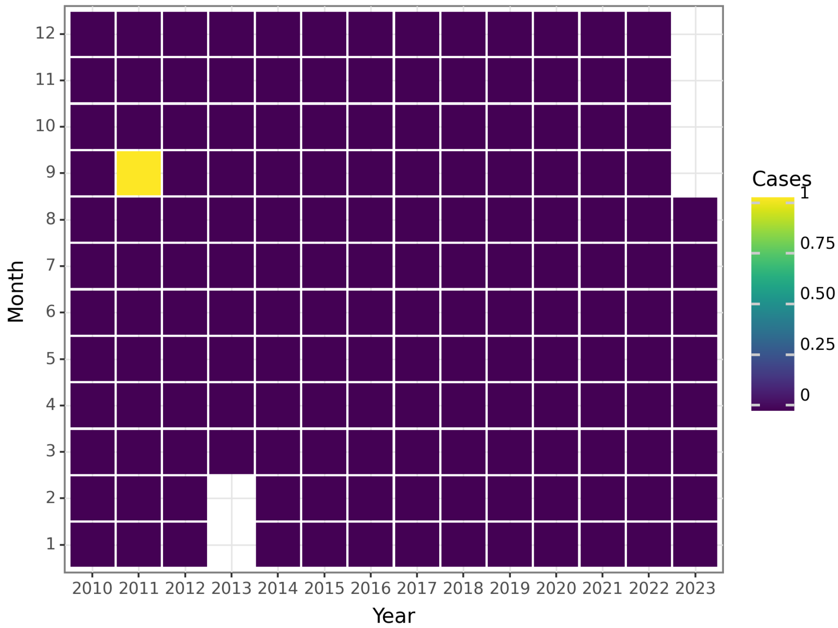

Figure 40: The Change of Poliomyelitis Deaths before 2023 August

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.

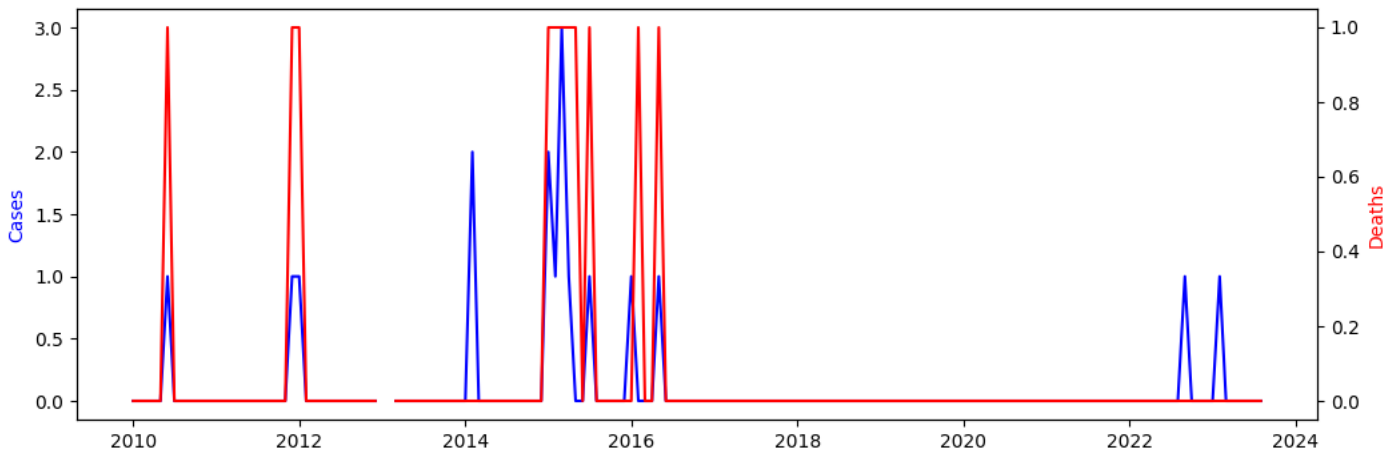

Figure 41: The Change of Human infection with H5N1 virus Reports before 2023 August

Seasonal Patterns: According to the data, a clear seasonal pattern for human infections with the H5N1 virus in mainland China prior to August 2023 is not evident. Throughout the years, the number of cases and deaths remained consistently low, with sporadic increases occurring from time to time.
Peak and Trough Periods: The data does not reveal any specific peak or trough periods. Instead, the number of cases and deaths remained relatively stable, with occasional isolated spikes.
Overall Trends: A low number of cases and deaths characterize the overall trend for human infections with the H5N1 virus in mainland China before August 2023. No significant upward or downward trend exists within the data. The number of cases and deaths mostly remained at zero, with only occasional small peaks.
Discussion: The data indicates a consistent low level of human infections with the H5N1 virus in mainland China before August 2023, which implies a relatively low risk of widespread outbreaks or sustained transmission of the virus during this time.
However, it is necessary to note that the data is limited, and further analysis and monitoring will be necessary to understand the complete picture of H5N1 infections in China. Factors such as surveillance efforts, reporting practices, and control measures implemented by public health authorities can significantly influence the number of reported cases and deaths.
To minimize the impact of any potential outbreaks and protect public health, it is essential for epidemiologists and public health officials to closely monitor the situation for any emerging trends or changes in H5N1 infections in mainland China. Timely surveillance, effective prevention measures, and rapid response are critical.

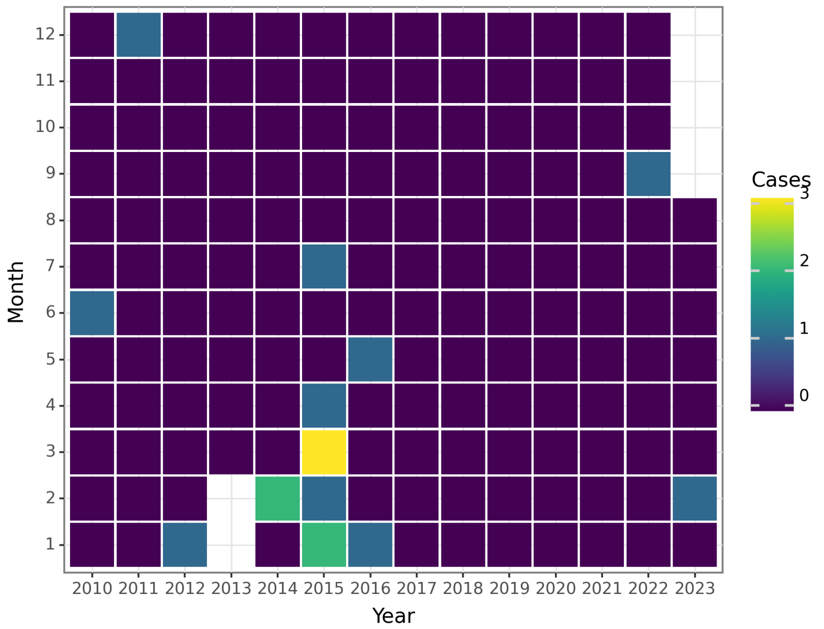

Figure 42: The Change of Human infection with H5N1 virus Cases before 2023 August

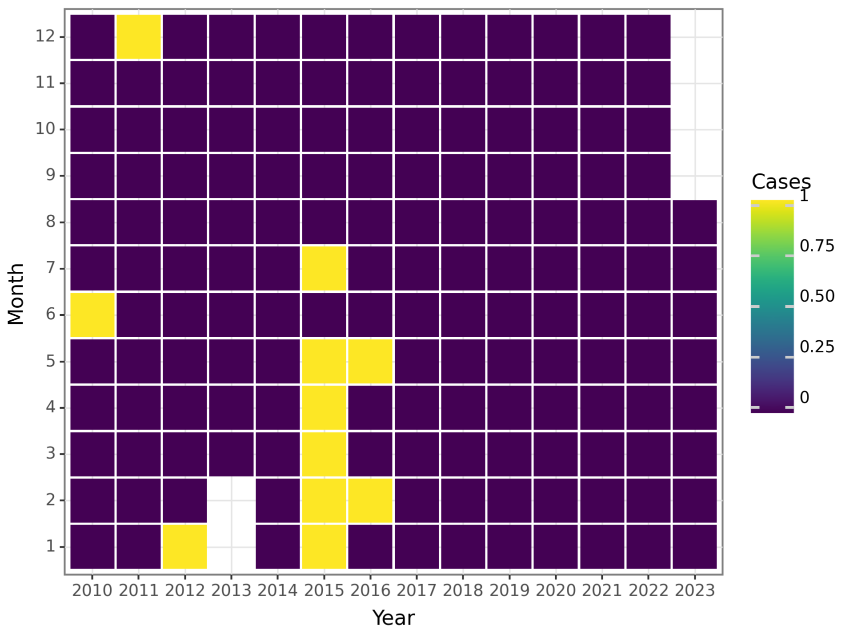

Figure 43: The Change of Human infection with H5N1 virus Deaths before 2023 August

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.

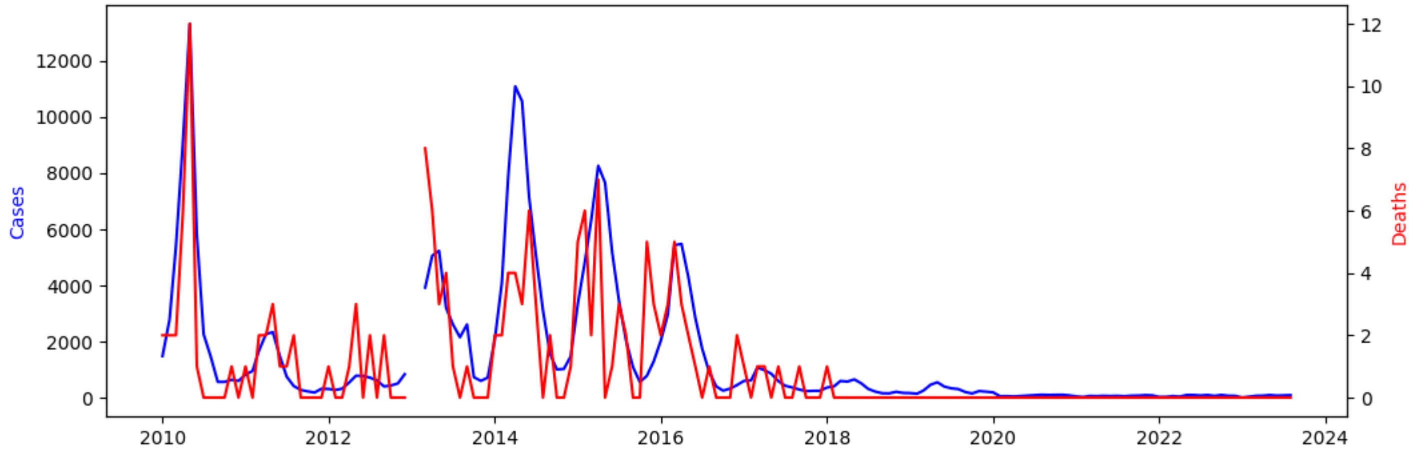

Figure 44: The Change of Measles Reports before 2023 August

Seasonal Patterns: Based on the data provided, there appears to be a seasonal pattern in the number of measles cases in mainland China. Generally, there is a higher number of cases between March and July, followed by a decrease in cases for the rest of the year. However, it is important to acknowledge that this pattern may not hold true for the entire time period analyzed.
Peak and Trough Periods: The peak periods for measles cases in mainland China occur from March to May, with the highest number of cases during these months. The trough period, or the lowest number of cases, typically falls between October and February, with December and January showing the lowest case numbers.
Overall Trends: Examining the overall trend, there is a decline in the number of measles cases in mainland China over time. From 2010 to 2015, there is a consistent decrease in cases. However, starting from 2016, there is a fluctuating pattern with varying peaks and dips in case numbers. From 2020 onwards, there is a further decline in cases, with very few reports.
Discussion: The seasonal pattern of measles cases in mainland China demonstrates a consistent increase during the spring and summer months, followed by a decrease during the fall and winter months. This aligns with the expected behavior of the measles virus, as it tends to spread more easily in crowded and indoor settings, which are more prevalent in colder months. The peak period from March to May could be attributed to factors such as school vacations, increased social gatherings, and higher transmission rates overall.
The overall decreasing trend in measles cases observed from 2010 to 2015 indicates successful control measures, including vaccination campaigns and increased public awareness. However, the fluctuating pattern observed from 2016 onwards suggests the possibility of periodic outbreaks or localized transmission, demanding continuous monitoring and intervention.
The significant decline in cases from 2020 onwards may be influenced by various factors, including the ongoing COVID-19 pandemic, which has led to travel restrictions, improved hygiene practices, and alterations in healthcare-seeking behaviors. Nonetheless, it is crucial to closely monitor the situation and maintain immunization efforts to prevent any resurgence of measles cases.
It is essential to note that the analysis presented is solely based on the provided data and does not consider other factors, such as population changes, vaccination coverage rates, or specific interventions implemented during the study period. Therefore, further analysis and investigation are required to comprehensively understand the dynamics and factors influencing the patterns observed.

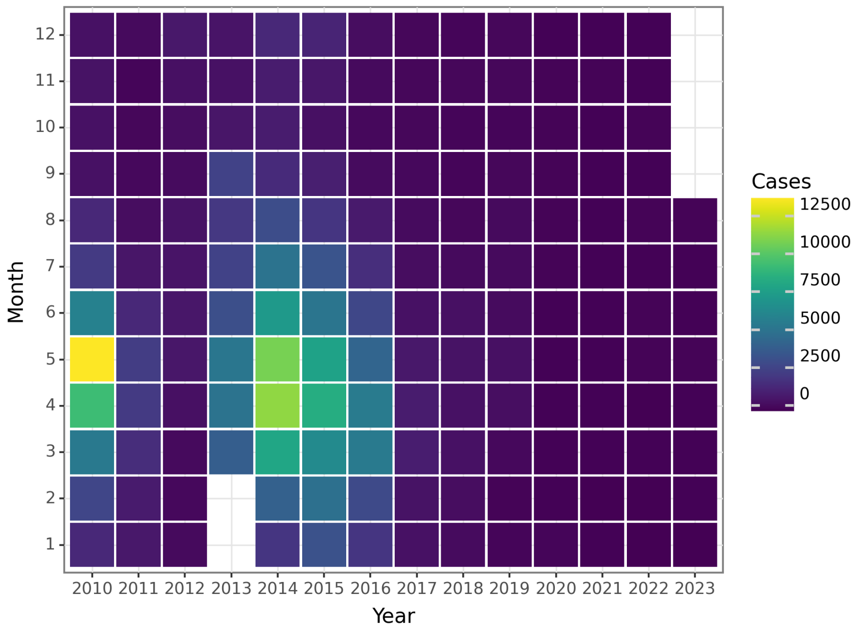

Figure 45: The Change of Measles Cases before 2023 August

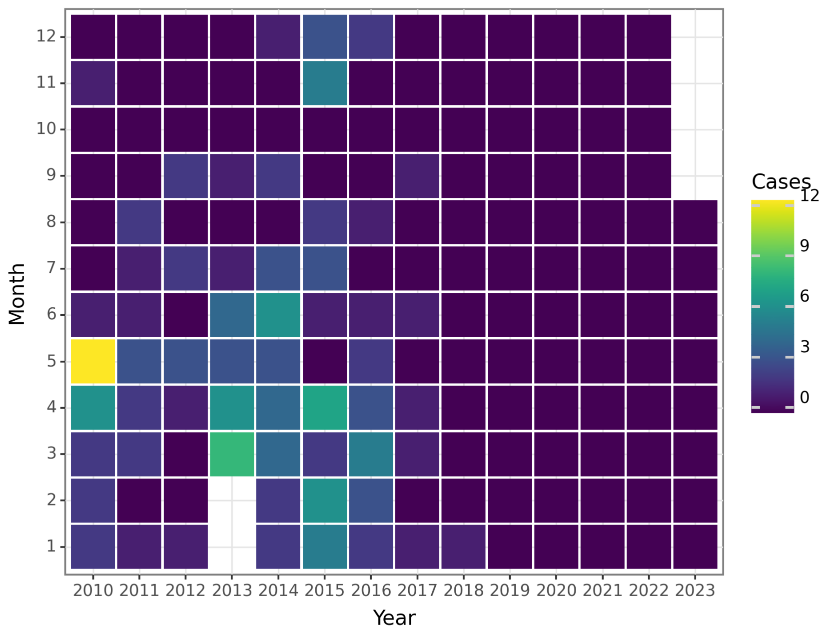

Figure 46: The Change of Measles Deaths before 2023 August

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.

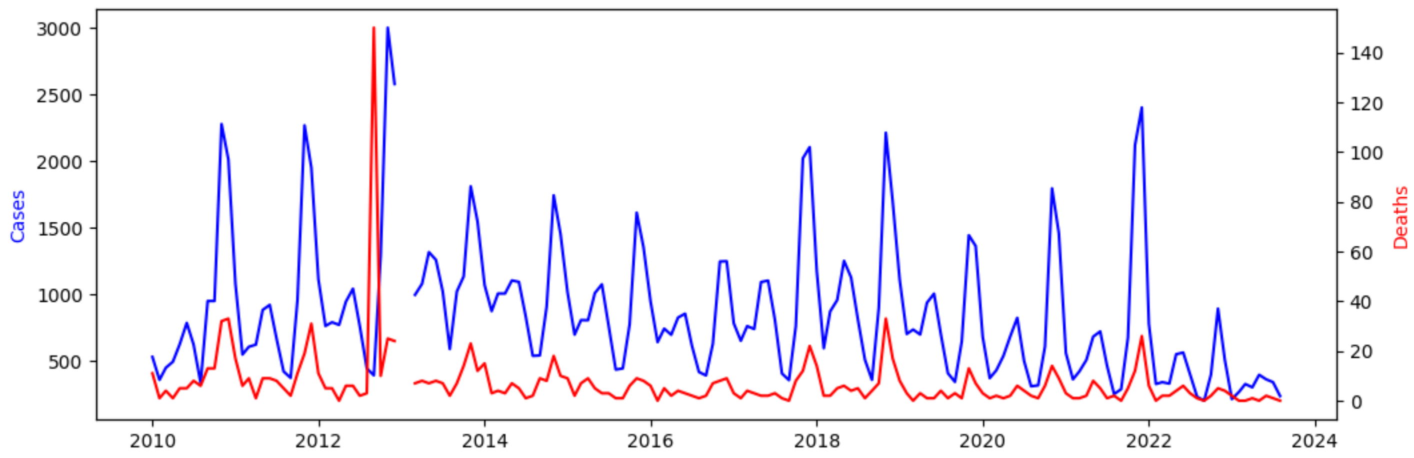

Figure 47: The Change of Epidemic hemorrhagic fever Reports before 2023 August

Seasonal Patterns of Epidemic Hemorrhagic Fever in Mainland China:
Analysis of monthly data prior to August 2023 reveals seasonal patterns in the occurrence of Epidemic Hemorrhagic Fever in mainland China. Specifically, the number of cases tends to be higher during June, July, and August, corresponding to the summer season. During this time, there is a consistent increase in cases from April, peaking during the summer months, and declining after August. This trend suggests a seasonal pattern in the transmission of the disease, supported by the dynamics of several infectious diseases which are influenced by environmental factors such as temperature and humidity.
Peak and Trough Periods:
Observation of the data illustrates that June, July, and August consistently display higher numbers of cases compared to other months, constituting the peak period for Epidemic Hemorrhagic Fever in mainland China. February, on the other hand, is the trough period with relatively lower cases compared to other months.
Overall Trends:
The overall trend of Epidemic Hemorrhagic Fever cases in mainland China displays an upsurge in cases from April onwards. This culminates in a peak during the summer months, with a subsequent decline in cases after August.
Discussion:
The evident seasonal pattern of Epidemic Hemorrhagic Fever cases in mainland China is significant information for public health authorities. The higher transmission rates observed during the summer season, influenced by temperature and humidity, can inform the scheduling of interventions and resource allocation to minimize the disease's impact on the population. It is important to note that there is significant variation in the number of cases from year to year, and fluctuations within each year, due to several factors affecting population susceptibility, surveillance and reporting, and public health interventions. Further analysis is required to investigate the impact of these factors and assess the effectiveness of interventions in reducing the burden of the disease.

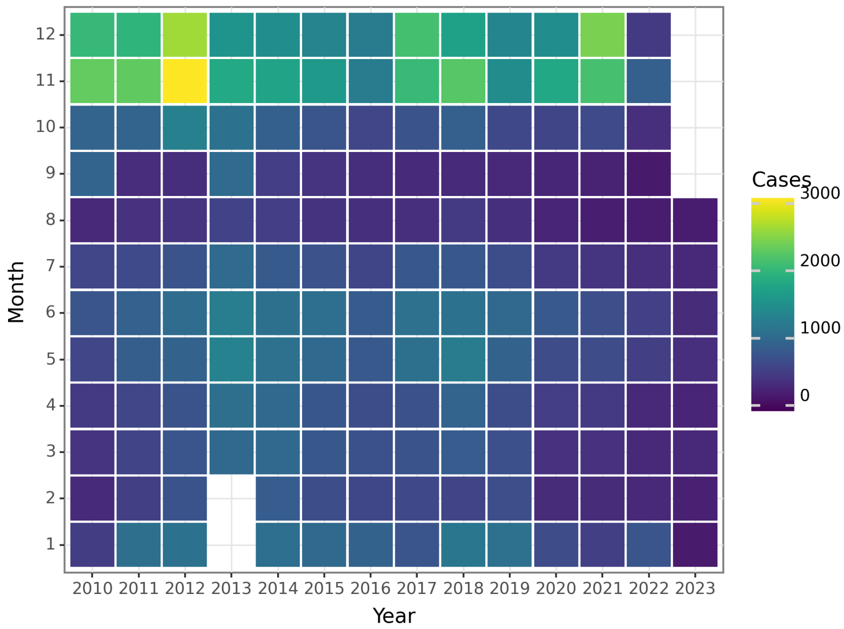

Figure 48: The Change of Epidemic hemorrhagic fever Cases before 2023 August

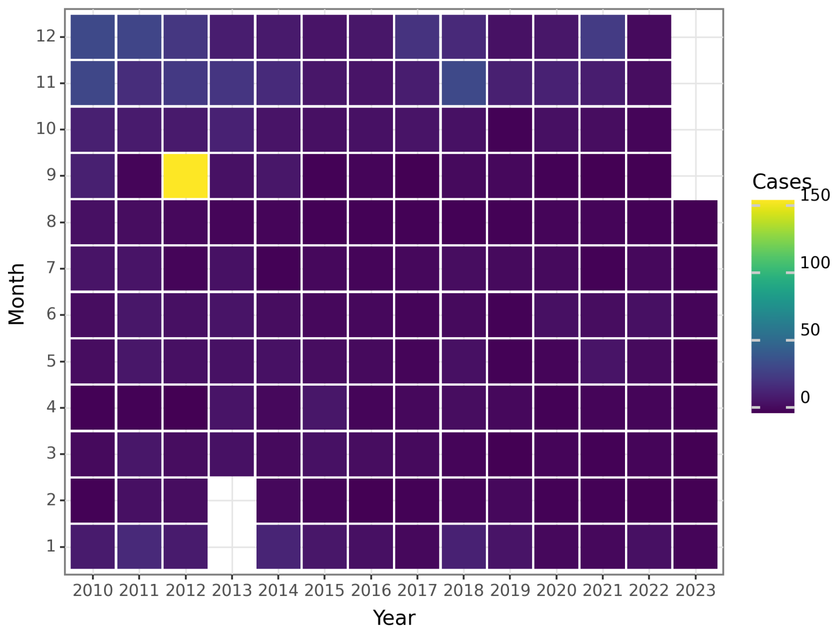

Figure 49: The Change of Epidemic hemorrhagic fever Deaths before 2023 August

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.

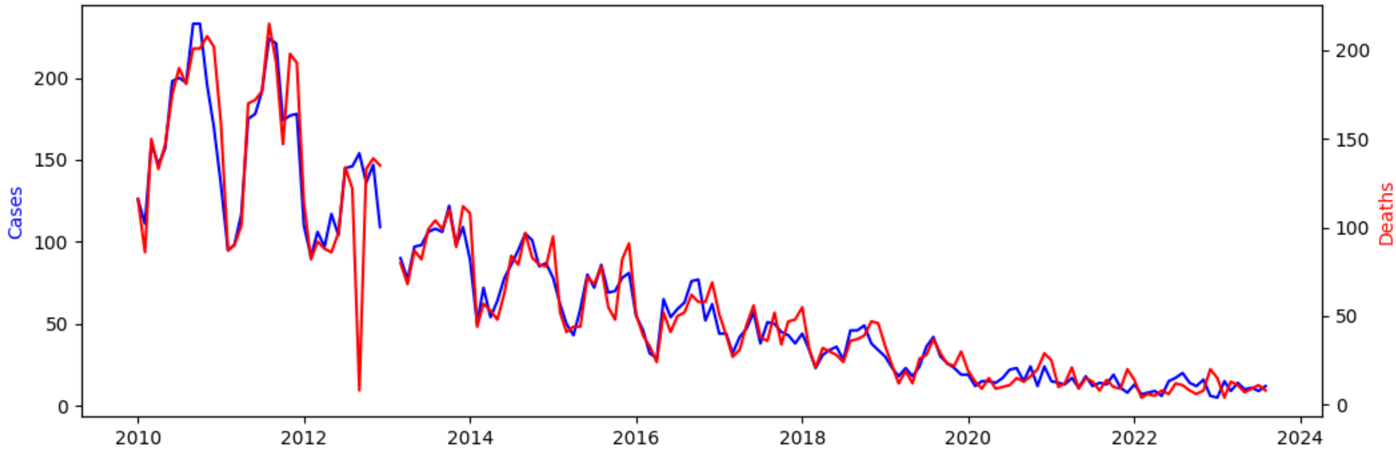

Figure 50: The Change of Rabies Reports before 2023 August

Seasonal Patterns: Analysis of monthly data on Rabies cases and deaths in mainland China reveals a distinct seasonal pattern. The incidence of cases and deaths is generally low during winter (December to February), increases in spring (March to May), peaks in summer (June to August), and gradually declines in autumn (September to November).
Peak and Trough Periods: The highest number of Rabies cases and deaths in mainland China occurs during the summer months, specifically in July and August. Conversely, the lowest incidence of cases and deaths is observed during the winter months, particularly December to February.
Overall Trends: Examining the overall trends, fluctuations in the number of Rabies cases and deaths are apparent over the years. From 2010 to 2013, there is an upward trend in cases and deaths, followed by a gradual decrease from 2014 to 2020. However, starting from 2020, there is a slight increase in cases and deaths.
Discussion: The seasonal pattern of Rabies cases and deaths in mainland China suggests a probable correlation with warmer weather. The peak and trough periods correspond with the summer and winter months, respectively. This aligns with the known transmission dynamics of Rabies, as increased outdoor activities and human-animal interactions during summer may heighten the risk of exposure.
The overall trend of increasing cases and deaths from 2010 to 2013, followed by a gradual decrease from 2014 to 2020, may be attributed to various factors, including public health interventions like vaccination campaigns and educational programs. Additionally, improvements in animal control and preventive measures could have contributed. However, the slight increase in cases and deaths from 2020 onwards suggests the necessity for ongoing surveillance and intervention efforts to curb further disease spread.
It is important to note that this analysis is based on the provided monthly data on Rabies cases and deaths up until August 2023 in mainland China. Further data and analysis are required to gain a more comprehensive understanding of the underlying factors influencing the observed patterns and trends in Rabies epidemiology within the region.

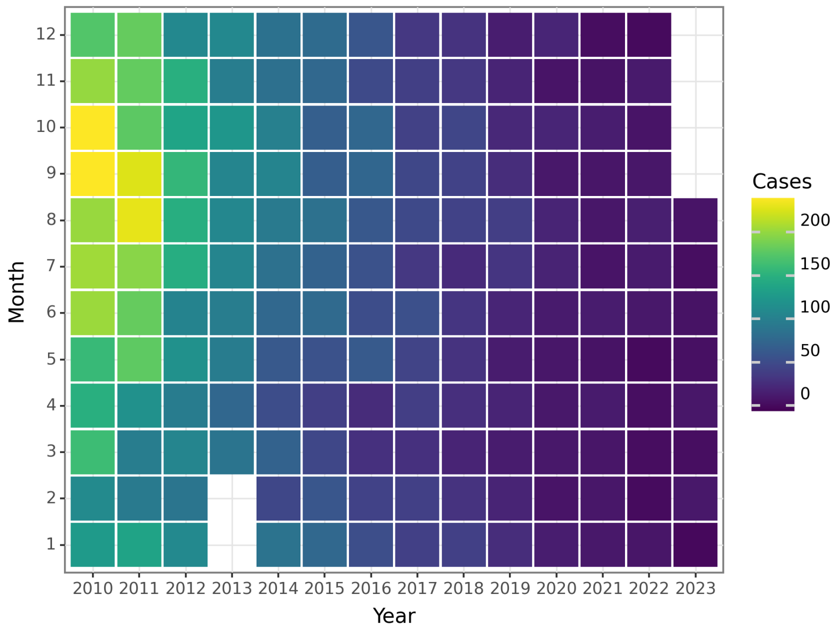

Figure 51: The Change of Rabies Cases before 2023 August

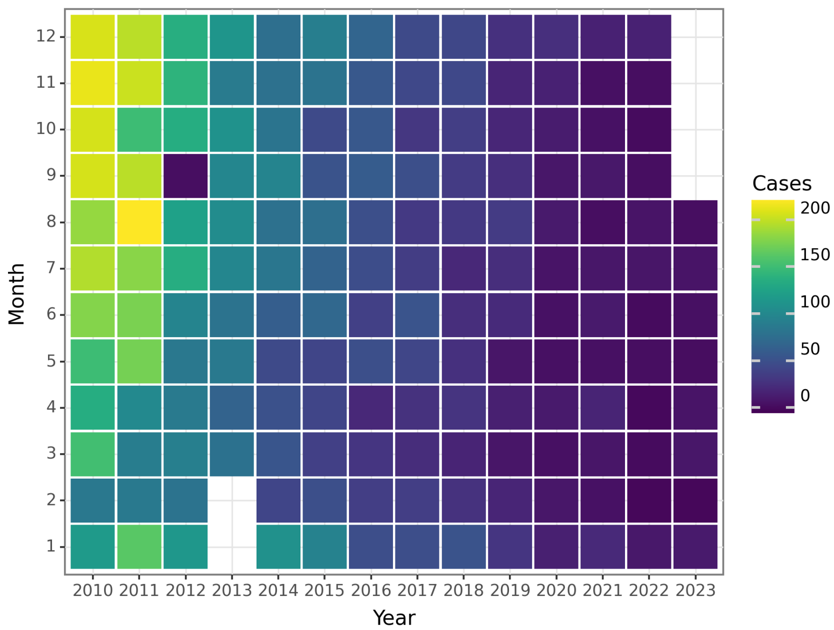

Figure 52: The Change of Rabies Deaths before 2023 August

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.

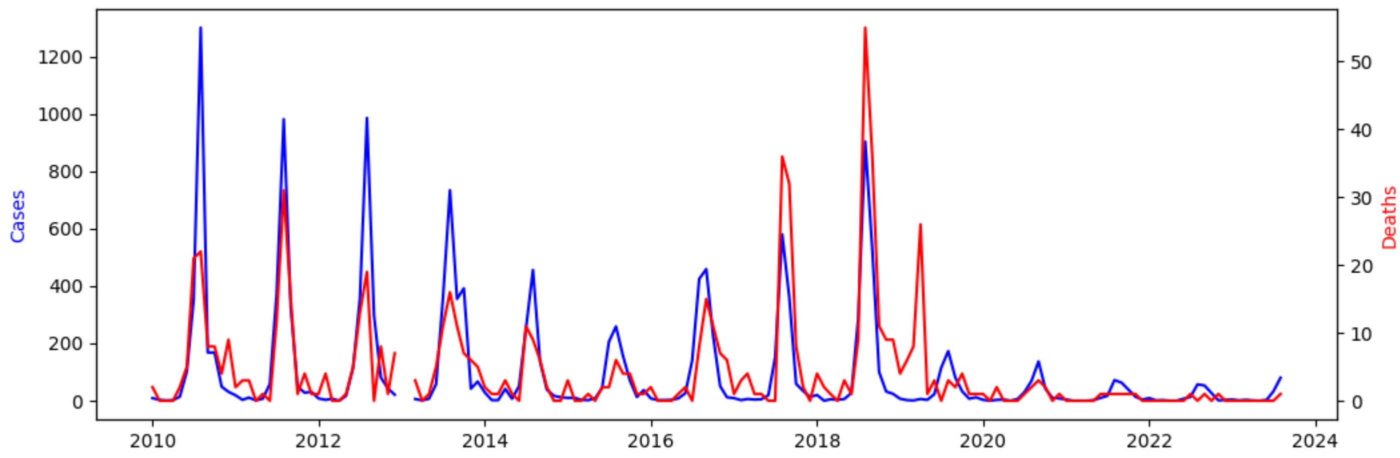

Figure 53: The Change of Japanese encephalitis Reports before 2023 August

Seasonal Patterns: Clear seasonal patterns can be observed in the reported cases of Japanese encephalitis in mainland China from the provided data. The number of cases consistently increases from May, peaks in August, and decreases towards the end of the year. This pattern repeats annually, indicating a seasonal trend.
Peak and Trough Periods: The month of August is the peak period for reported Japanese encephalitis cases, with the highest number of cases being reported during this time, as shown in the data. On the other hand, the trough period occurs during the winter months, particularly in January and February, where the number of cases is relatively minimal.
Overall Trends: There is an upward trend in the number of reported Japanese encephalitis cases before August 2023 in mainland China. While some years have higher or lower numbers of cases compared to others, the general trend shows an increase.
Discussion: Japanese encephalitis is a mosquito-borne disease, and the observed seasonal patterns align with the activity of the mosquito vector. Warm and humid conditions during the summer months in mainland China result in mosquito populations proliferating. Thus, this explains the peak of cases occurring in August when the mosquito activity is at its highest.
The overall trend of increasing cases may be attributed to various factors, such as changes in mosquito habitats, increased human exposure to infected mosquitoes, and transformation in surveillance and reporting systems. It is critical to monitor and enhance vector control measures continually to reduce the transmission of Japanese encephalitis and safeguard the population at risk.
It is noteworthy that this analysis is solely based on the given data and does not encompass other factors such as population size, vaccination coverage, and specific control interventions in place. Further research and analysis are indispensable to obtain comprehensive knowledge of the disease dynamics and to develop appropriate public health strategies.

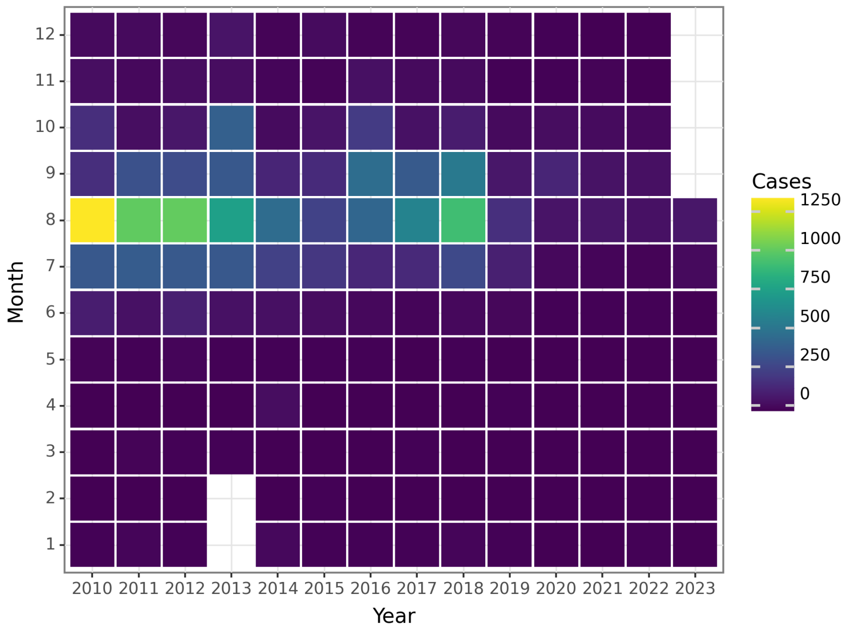

Figure 54: The Change of Japanese encephalitis Cases before 2023 August

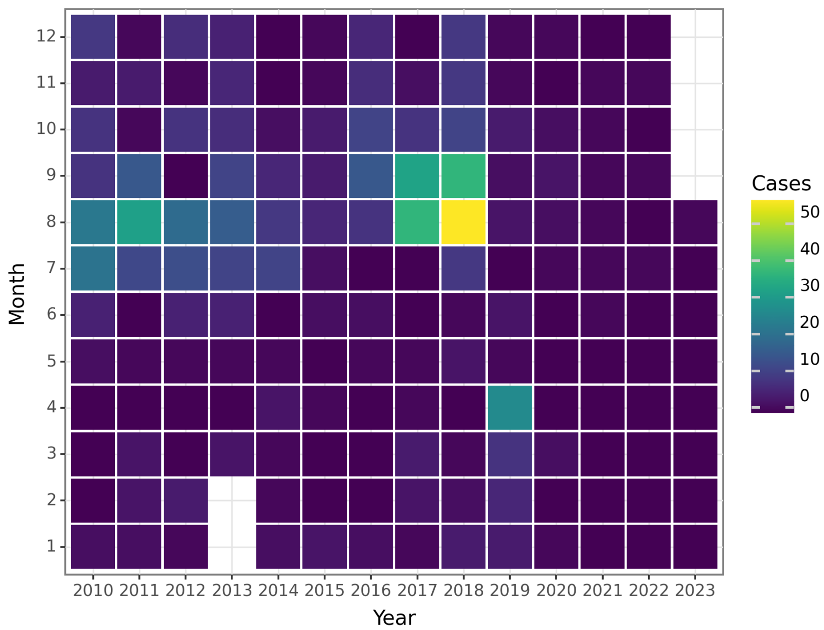

Figure 55: The Change of Japanese encephalitis Deaths before 2023 August

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.

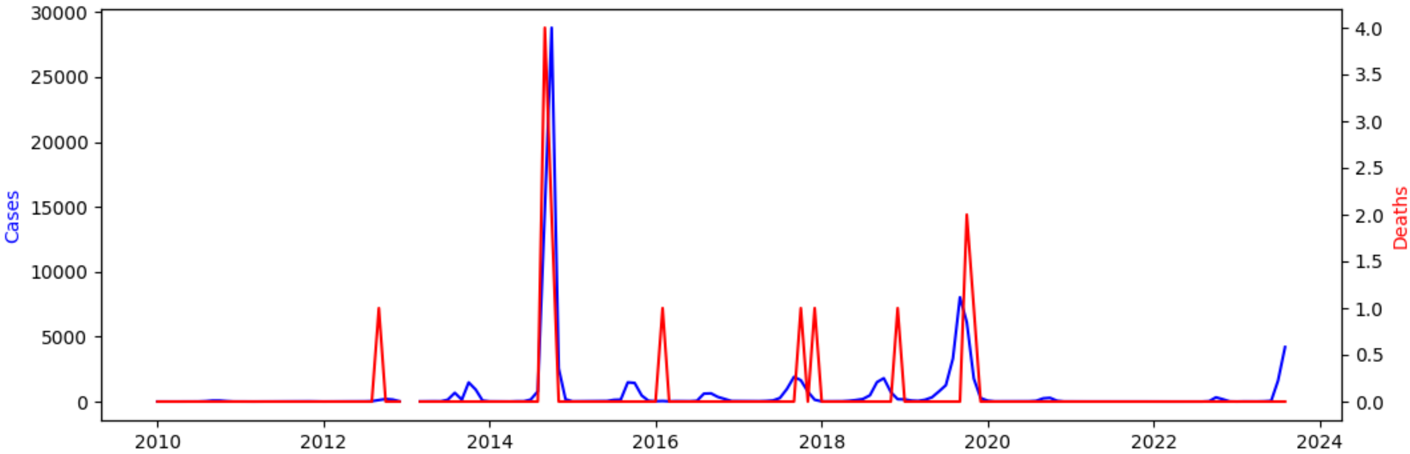

Figure 56: The Change of Dengue Reports before 2023 August

Seasonal Patterns: Analysis of the provided data indicates a clear seasonal pattern in the incidence of Dengue fever cases in mainland China. The occurrence of cases is observed to be at its lowest level during the winter months, which extends from December to February. Conversely, the months between March and August experience an increase in case numbers. This trend is consistent across multiple years and, as such, implies that the risk of Dengue transmission during warmer months is heightened.
Peak and Trough Periods: In mainland China, the incidence of Dengue cases is highest during July and August - the peak period. During this time, cases experience a sharp and significant increase, with the number of cases reaching an all-time high. Conversely, the winter months – between December and February mark the trough periods, where the number of Dengue cases plummets to its lowest level.
Overall Trends: The trend in Dengue cases in China displays fluctuations through the years. Between 2010 and 2014, there was a generally increasing trend in the number of cases. However, from 2014 to 2017, there was a significant surge in the number of cases, with record numbers in 2014. The number of cases decreased after 2017, until hitting relatively low levels in 2020. From 2021 onwards, there has been a slight increase in the incidence of cases.
Discussion: The seasonal pattern of Dengue cases in mainland China implies a heightened transmission risk during warm and humid months, consistent with the Aedes mosquito - Dengue fever's primary vector. The peak in July and August highlights the need for interventions and preventive measures targeted at controlling disease transmission effectively during this period.
The overall trend of Dengue cases indicates a general increase from 2010 to 2014, which was followed by a significant spike in cases from 2014 to 2017. The spike observed in this period could be attributed to various factors, including environmental changes, mosquito control measures, or increased travel and trade, facilitating the introduction and spread of the virus. The decline in cases from 2017 to 2020 may indicate successful disease control measures implemented during this period.
It is imperative to note that the disclosed data only encompasses cases and deaths that occurred before August 2023. Therefore, the discussion is limited to insights observed up to this point. Additionally, a comprehensive analysis of Dengue fever in China would require further data, such as demographic information, population size, and details about implemented mosquito control measures during the study period.

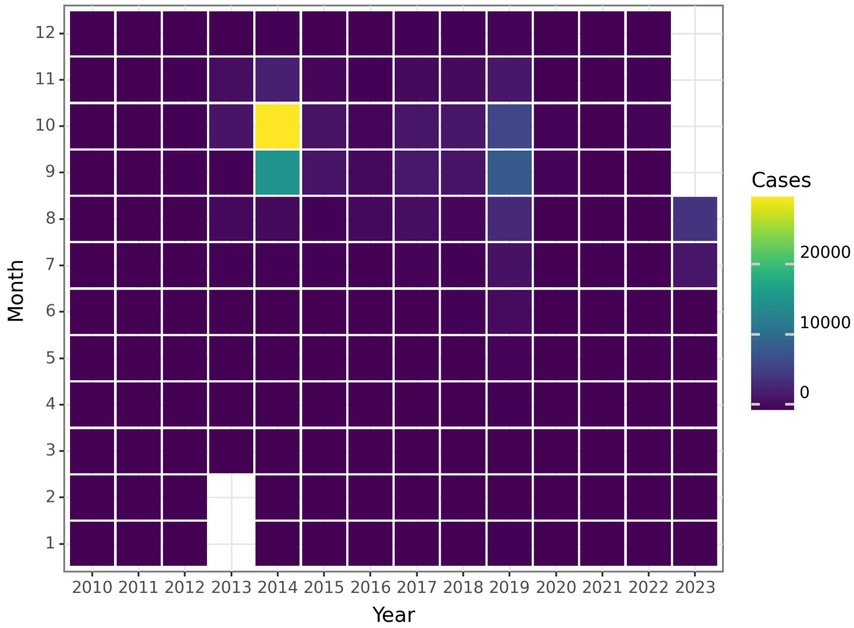

Figure 57: The Change of Dengue Cases before 2023 August

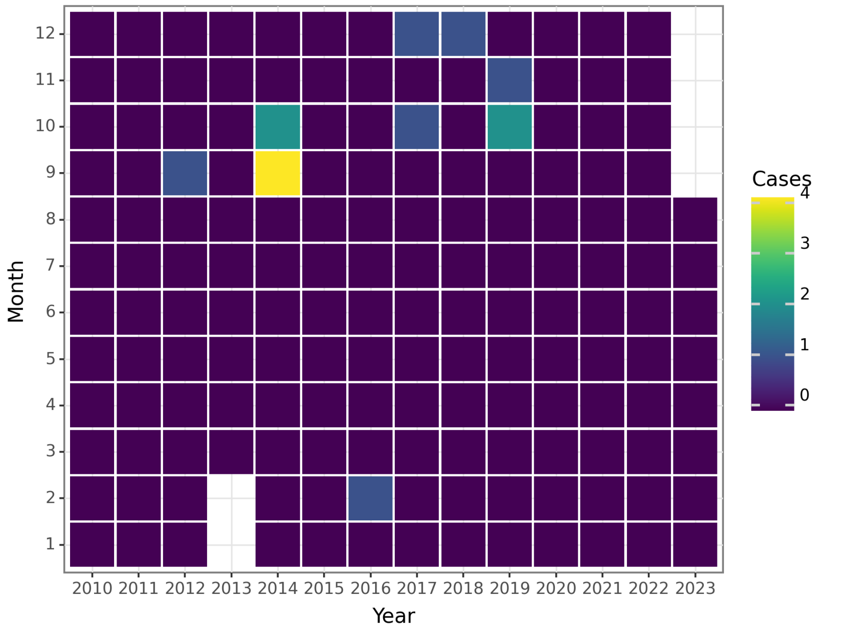

Figure 58: The Change of Dengue Deaths before 2023 August

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.

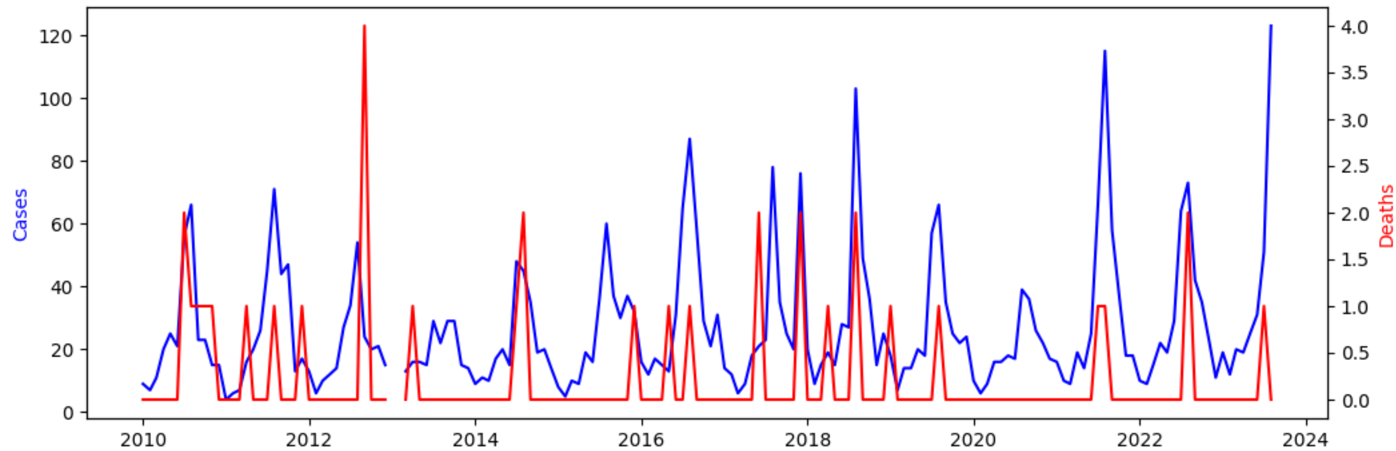

Figure 59: The Change of Anthrax Reports before 2023 August

Seasonal Patterns:
Analysis of the data provided reveals a clear seasonal pattern in Anthrax cases in mainland China. Notably, cases tend to increase during the summer months, specifically from June to August, and gradually decrease towards year-end. This pattern is consistent across multiple years, indicating a recurring pattern.
Peak and Trough Periods:
Anthrax cases peak in mainland China during August, with a high number of cases reported in this month while the trough period, during which the lowest number of cases is reported, is generally observed in January. It is salient to note that despite fluctuation in cases during different months, the pattern of highest peaks and lowest troughs is consistently observed in August and January, respectively.
Overall Trends:
Analysis of Anthrax cases between 2010 and 2023 shows a slight but steady increase in cases over time in mainland China. Although there are fluctuations in cases from year to year, the general trend is a gradual increase. Notably, it is imperative to analyze data beyond August 2023 to understand the long-term trends fully.
The presence of a clear seasonal pattern for Anthrax cases in mainland China suggests that certain environmental conditions or host factors may influence the occurrence and transmission of the disease. Favorable environmental conditions may promote the growth and survival of Anthrax bacteria during summer months, thereby resulting in an increased number of cases.
Various factors could account for the peak in August, including increased human activities, especially livestock farming, which could promote Anthrax transmission. August is characterized by higher temperatures, providing potentially favorable conditions for the bacteria to thrive.
The lower number of cases reported during January may be linked to factors such as colder temperatures and reduced human activities during this period. Additionally, the data shows negative values for some months, particularly in 2013, possibly as a result of reporting or data collection issues. Further investigation is required to better understand these discrepancies.
The overall trend of increasing Anthrax cases in mainland China calls for continued monitoring and implementation of preventive measures to control and manage the disease. Understanding the factors influencing the patterns and trends can help inform public health interventions and efficient resource allocation to effectively control Anthrax and safeguard human and animal populations.

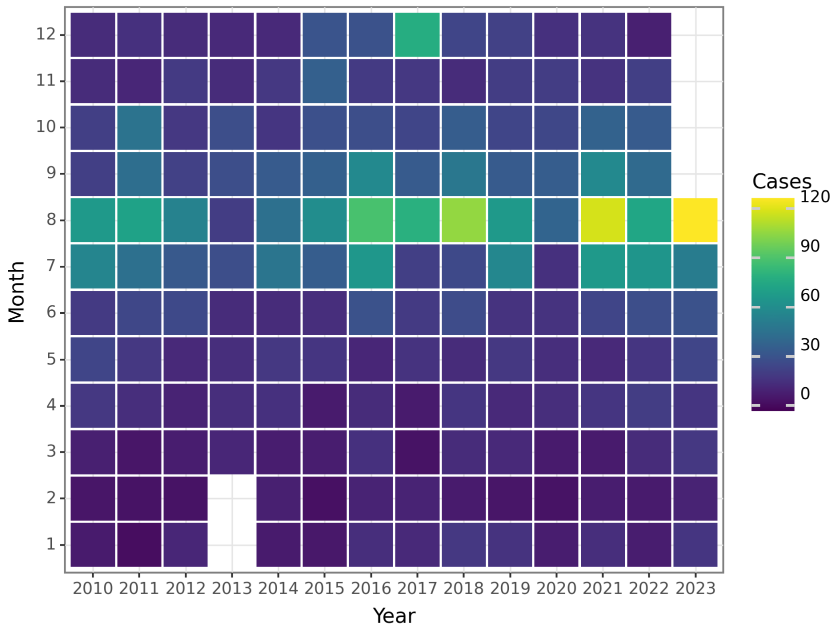

Figure 60: The Change of Anthrax Cases before 2023 August

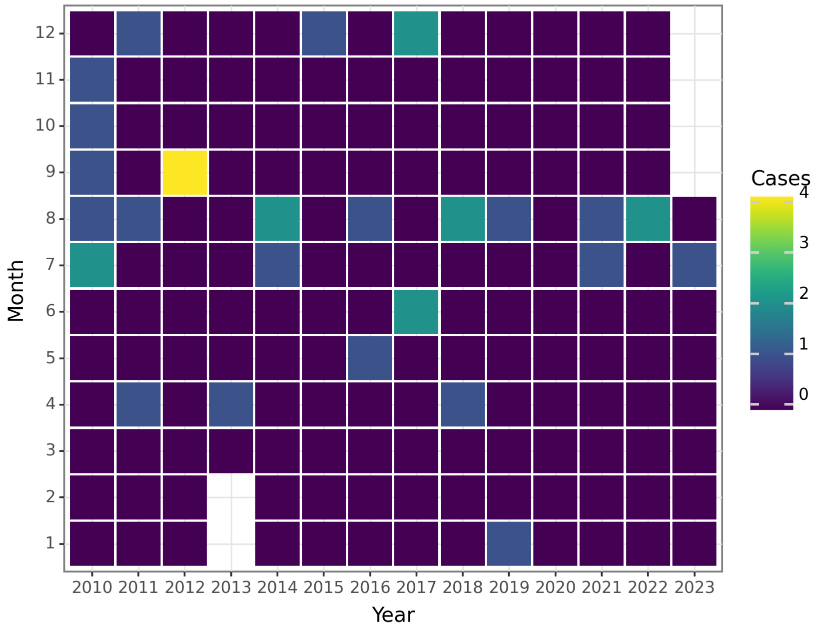

Figure 61: The Change of Anthrax Deaths before 2023 August

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.

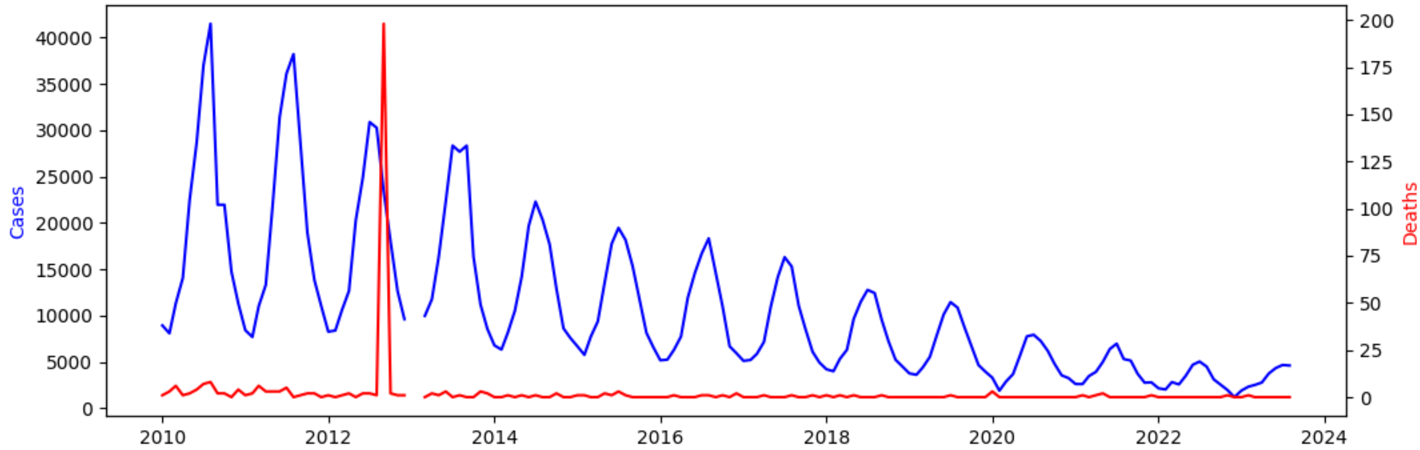

Figure 62: The Change of Dysentery Reports before 2023 August

Seasonal Patterns: Based on the provided data, a clear seasonal pattern emerges in the incidence of Dysentery cases in mainland China. Cases tend to peak during the summer months (June, July, and August) and decline during the colder months (December, January, and February). This pattern suggests a potential relationship between Dysentery incidence and seasonal variations in temperature and humidity.
Peak and Trough Periods: In mainland China, the peak periods for Dysentery cases primarily occur in the summer months, specifically June, July, and August. During these months, the number of cases consistently surpasses those in the rest of the year. Conversely, the trough periods transpire in the winter months, particularly in December, January, and February, when the case numbers are relatively lower.
Overall Trends: Overall, there is an oscillating trend in the incidence of Dysentery cases in mainland China prior to August 2023. In the earlier years (2010-2011), cases gradually increased, reaching their peak in 2011. Subsequently, there was a decrease in cases, followed by fluctuation at a relatively high level until approximately 2017. From 2018 onwards, a gradual decrease in case numbers, with periodic fluctuations, can be observed until August 2023.
Discussion: The observed seasonal pattern suggests that Dysentery transmission may be influenced by environmental factors that are more prevalent during the summer months, such as higher temperatures and increased population mobility. These conditions could enhance the survival and spread of Dysentery-causing bacteria or increase exposure and susceptibility to infection. Additionally, it is plausible that public health interventions, such as improvements in sanitation and hygiene practices, have contributed to the declining trend in cases seen since 2018.
It is important to note that the provided data only includes the number of Dysentery cases and deaths, without considering the population size and demographic characteristics of mainland China. Hence, conducting a more comprehensive analysis would necessitate obtaining additional information to determine the true burden of Dysentery and its associated risk factors. Furthermore, further investigation into other potential factors, such as water sources, food handling practices, and healthcare accessibility, would provide a more comprehensive understanding of the observed trends.

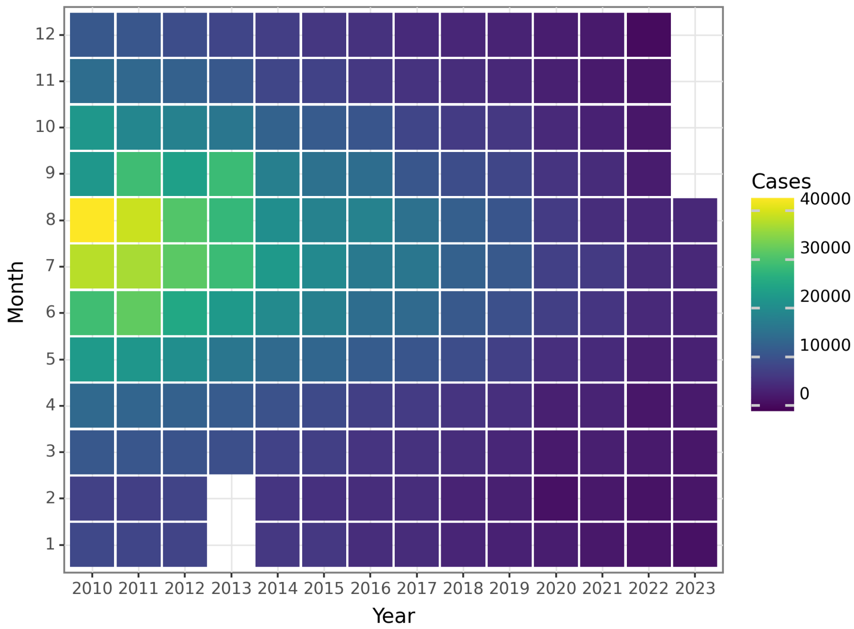

Figure 63: The Change of Dysentery Cases before 2023 August

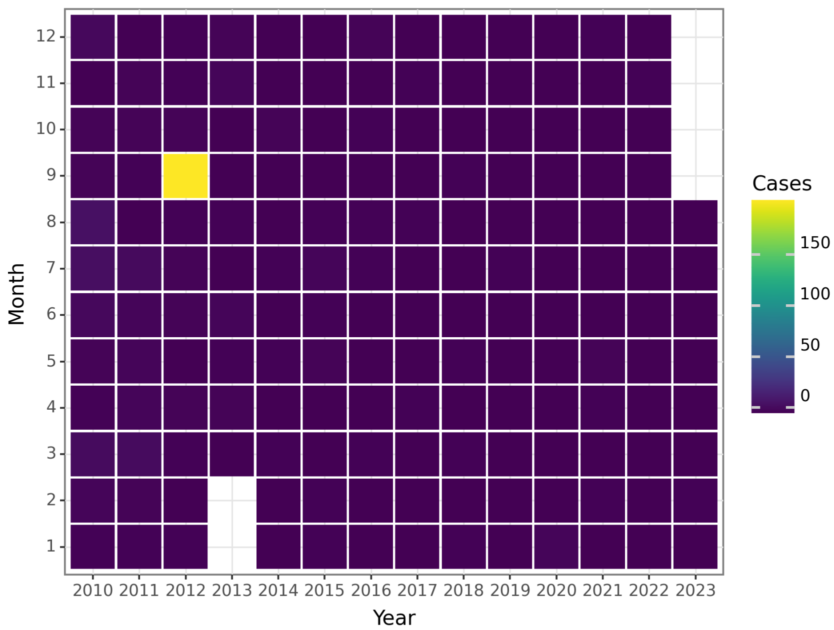

Figure 64: The Change of Dysentery Deaths before 2023 August

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.

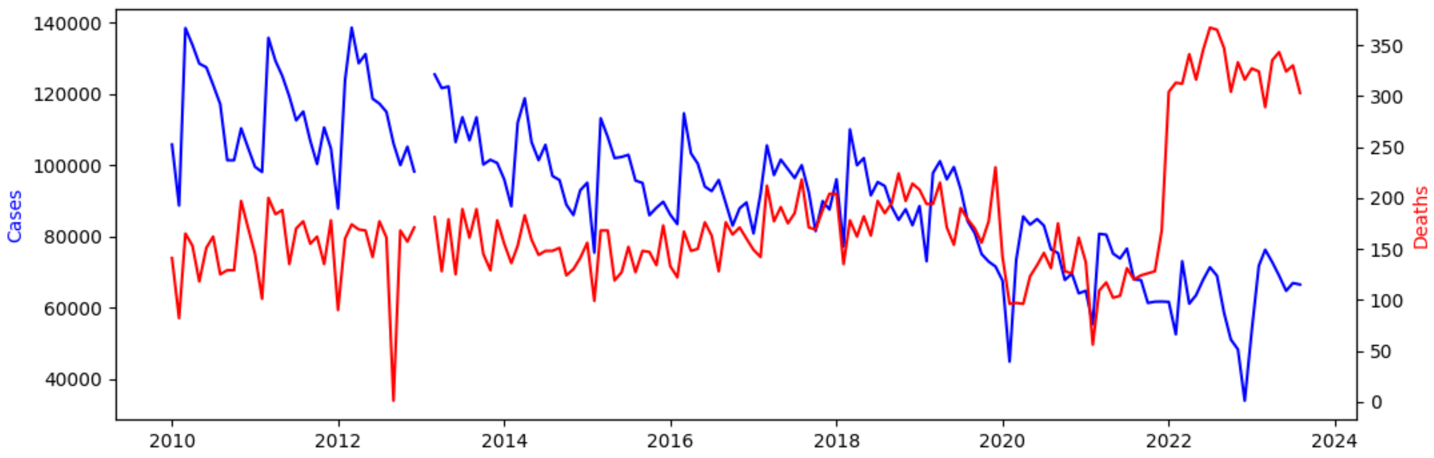

Figure 65: The Change of Tuberculosis Reports before 2023 August

Seasonal Patterns: The data reveals clear seasonal fluctuations in tuberculosis cases in mainland China before August 2023. Typically, there is a rise in cases during the winter months (December-January), a peak in the spring months (March-April), followed by a gradual decrease in the summer months (June-August). This pattern continues in subsequent years.
Peak and Trough Periods: The peak period for tuberculosis cases in mainland China occurs in March and April, with the highest number of cases. Conversely, the trough period is observed during the summer months, particularly in June and August, when the number of cases significantly decreases.
Overall Trends: Examining the overall trend, there is a general fluctuation in tuberculosis cases over the years. From 2010 to 2013, there is an upward trend in cases, followed by a slight decline from 2014 to 2016. After 2016, there is a period of relative stability with fluctuations around a certain level until 2022. From 2022 to August 2023, there is a gradual decrease in the number of cases.
Discussion: The observed seasonal pattern in tuberculosis cases in mainland China suggests that there may be specific factors influencing disease transmission during certain times of the year. The peak in cases during the spring can be attributed to factors such as increased indoor crowding, reduced ventilation, and lower immunity in colder weather. The decrease in cases during the summer may be influenced by factors such as increased outdoor activities, improved ventilation, and higher immunity.
The overall trend presents a mixed picture, with an initial increase in cases followed by periods of stability and a slight decline. This may indicate varying levels of control and prevention efforts over the years. It is crucial to further investigate the factors contributing to these trends and assess the effectiveness of interventions implemented to reduce the burden of tuberculosis in mainland China.
It is worth noting that the data for September 2012 has missing values for cases and deaths, and there are two negative values for cases in January and February 2013. These anomalies should be thoroughly investigated and addressed to ensure the accuracy of the data.

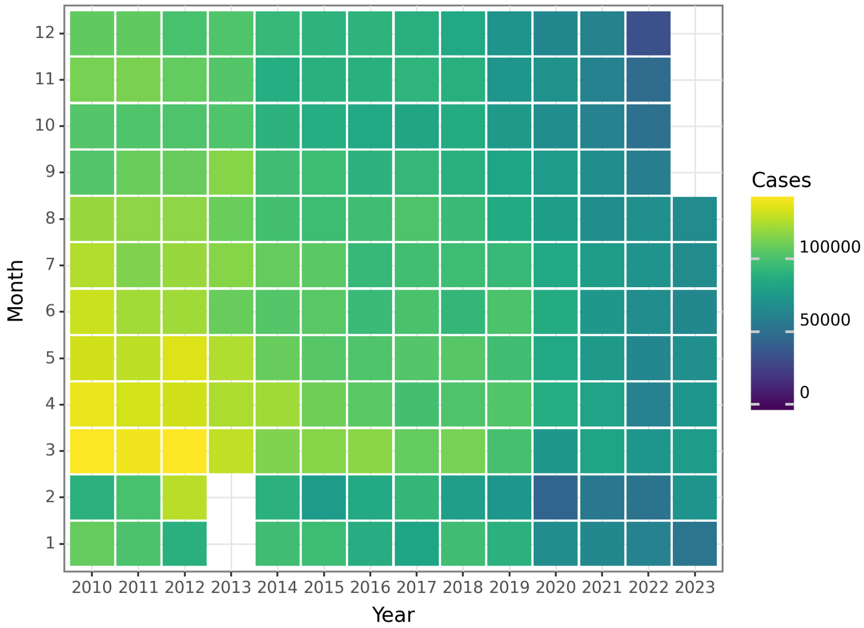

Figure 66: The Change of Tuberculosis Cases before 2023 August

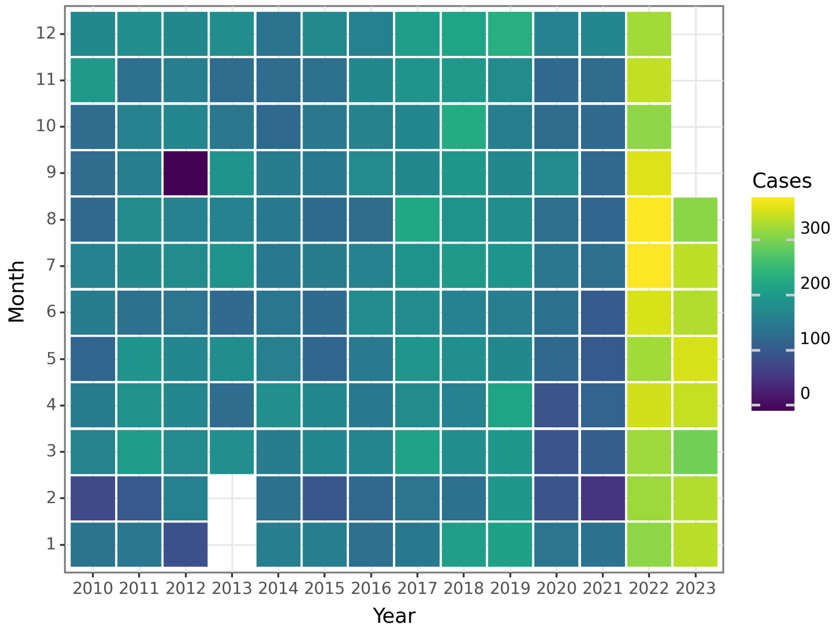

Figure 67: The Change of Tuberculosis Deaths before 2023 August

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.

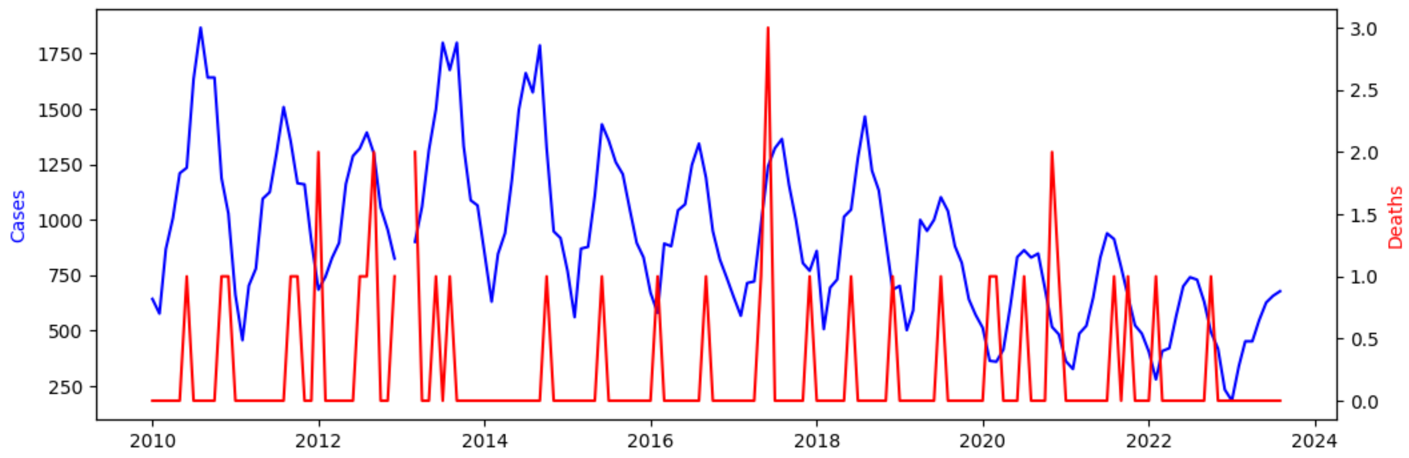

Figure 68: The Change of Typhoid fever and paratyphoid fever Reports before 2023 August

Seasonal Patterns: Based on the data provided on monthly cases and deaths of Typhoid fever and paratyphoid fever in mainland China prior to August 2023, it is evident that these diseases display seasonal patterns in occurrence.
Peak and Trough Periods: The data indicates that both Typhoid fever and paratyphoid fever reach their peak periods during the summer months, specifically from June to August. During this time, there is a higher incidence of reported cases. Conversely, the trough periods for both diseases appear to be in the winter months, particularly from December to February, when case numbers tend to decrease.
Overall Trends: When examining the overall trends of Typhoid fever and paratyphoid fever in mainland China, it is evident that there has been a relatively steady number of reported cases from 2010 to 2013. Subsequently, there is a general increase in case numbers between 2013 and 2016, with some fluctuations. However, from 2016 to August 2023, a downward trend in reported cases is observed.
Discussion: The seasonal patterns observed in the data suggest that the occurrence of Typhoid fever and paratyphoid fever in mainland China is influenced by seasonal factors, showing higher transmission rates during the summer months. This could be attributed to various factors, such as increased travel and outdoor activities during this time, as well as favorable environmental conditions for the growth and spread of the bacteria causing these diseases.
The peak periods in the summer months underline the importance of implementing and promoting preventive measures, such as improving sanitation, hygiene practices, and vaccination among the population, particularly during this time. Additionally, the decrease in cases during the trough periods in winter suggests that public health measures implemented during this time may have contributed to the reduction in case numbers.
The overall decline in reported cases from 2016 to August 2023 signifies the effectiveness of public health interventions in controlling these diseases. However, it is crucial to continue monitoring and implementing preventive measures to sustain this downward trend and further reduce the burden of Typhoid fever and paratyphoid fever in mainland China.
Please note that this analysis is solely based on the provided data, and additional factors, such as changes in surveillance systems, reporting practices, and diagnostic capabilities, could also influence the observed patterns and trends.

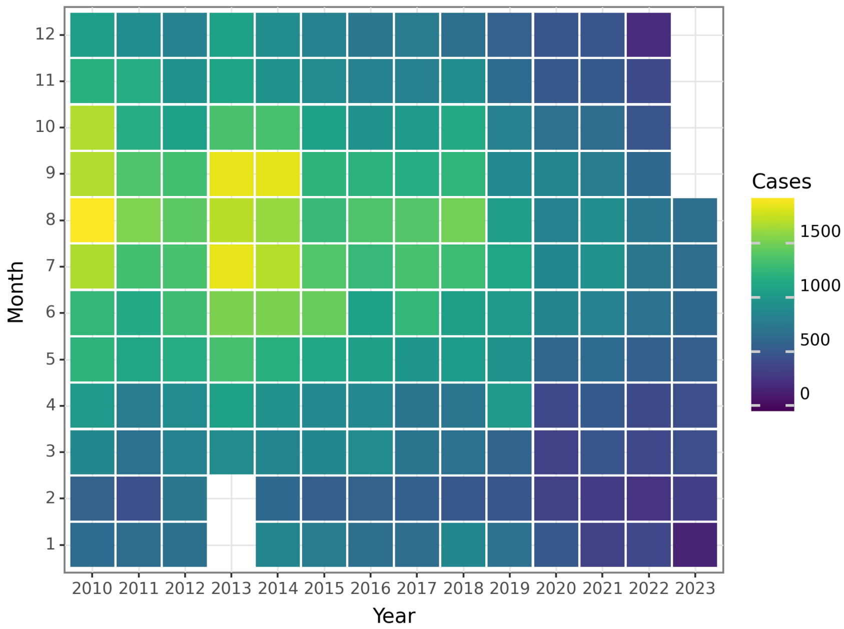

Figure 69: The Change of Typhoid fever and paratyphoid fever Cases before 2023 August

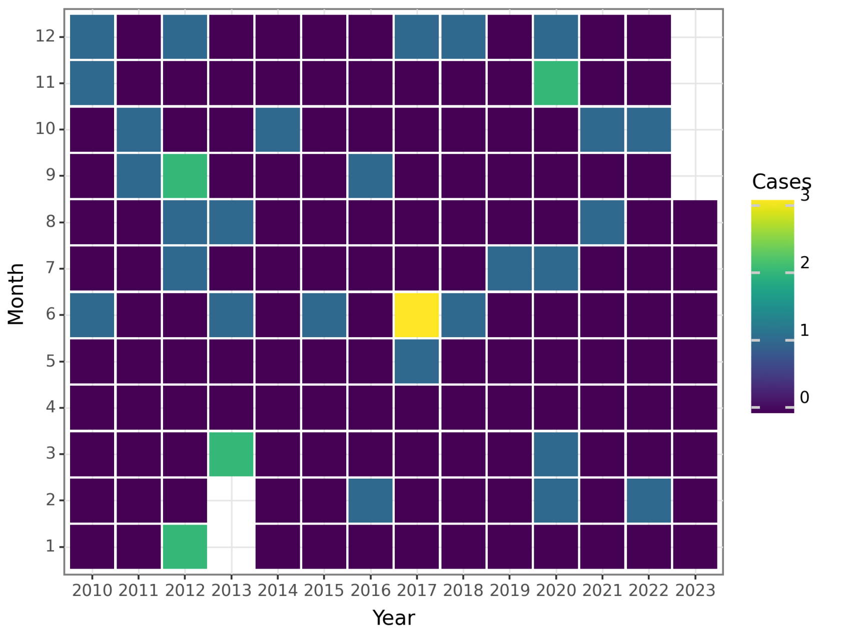

Figure 70: The Change of Typhoid fever and paratyphoid fever Deaths before 2023 August

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.

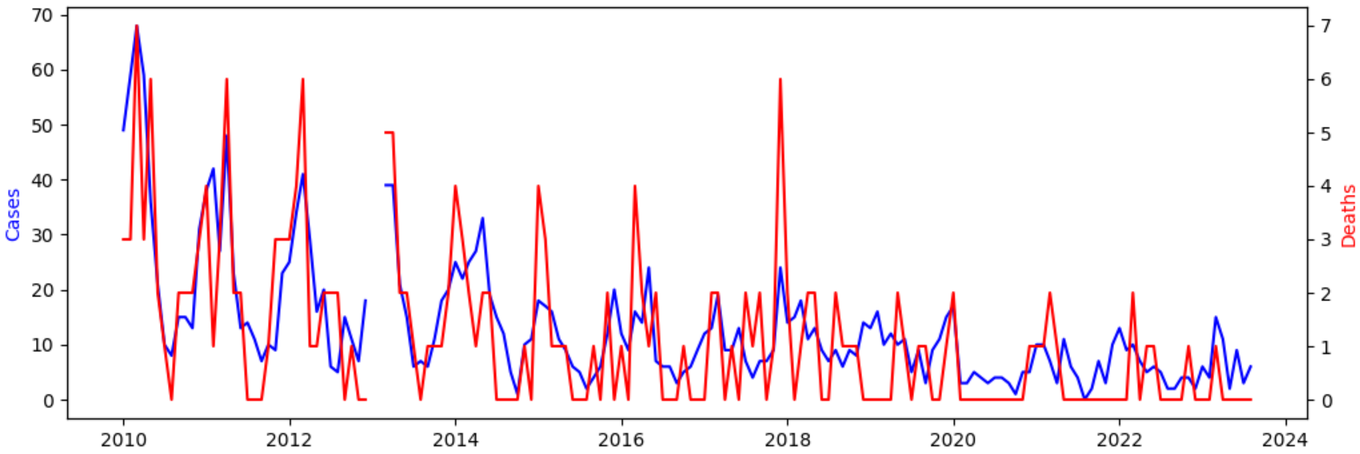

Figure 71: The Change of Meningococcal meningitis Reports before 2023 August

Seasonal Patterns:
The provided data reveals distinct seasonal patterns in the occurrences of Meningococcal meningitis in mainland China. These patterns are evident when we examine the monthly data over the years.
Peak and Trough Periods:
Meningococcal meningitis cases in mainland China generally peak during the winter and spring seasons. Specifically, the months of January, February, March, and April have a higher number of cases compared to other months. Conversely, the trough periods, characterized by a lower number of cases, are dispersed throughout the year.
Overall Trends:
A closer look at the overall trends reveals fluctuations in the number of Meningococcal meningitis cases in mainland China over the years. Certain years, such as 2010, 2011, and 2014, exhibit a relatively higher number of cases, while other years, like 2021 and 2022, have a relatively lower number of cases.
Discussion:
The seasonal patterns of Meningococcal meningitis cases in mainland China suggest an elevated risk of transmission during the winter and spring months. This may be influenced by various factors, including weather conditions that facilitate bacterial survival and spread, increased indoor gatherings during colder months, and potential changes in population behavior that contribute to transmission.
It is important to emphasize that further analysis and interpretation, incorporating statistical methods and consideration of other relevant factors, are necessary to gain a more comprehensive understanding of the observed patterns and trends. Moreover, analyzing the data in the context of vaccination campaigns, public health interventions, and other pertinent information would provide more extensive insights into the epidemiology of Meningococcal meningitis in mainland China.

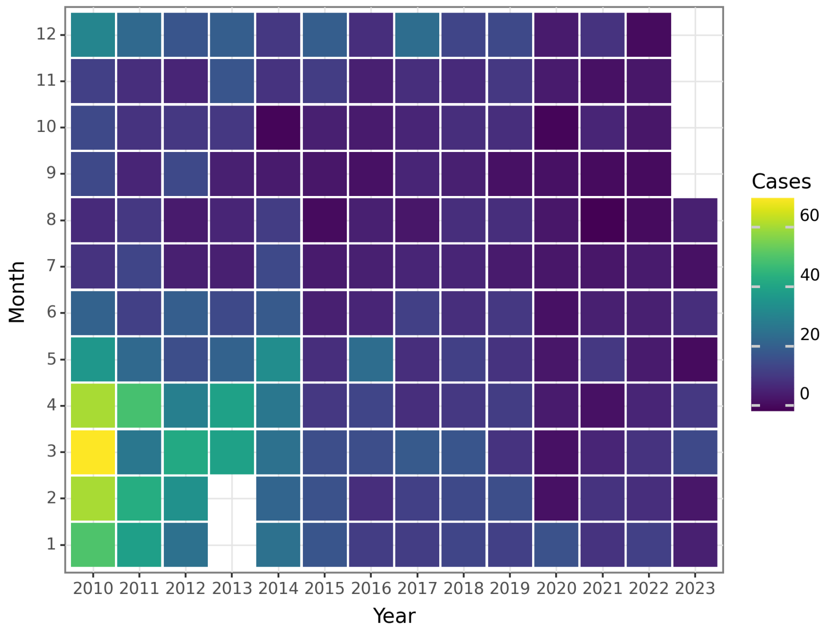

Figure 72: The Change of Meningococcal meningitis Cases before 2023 August

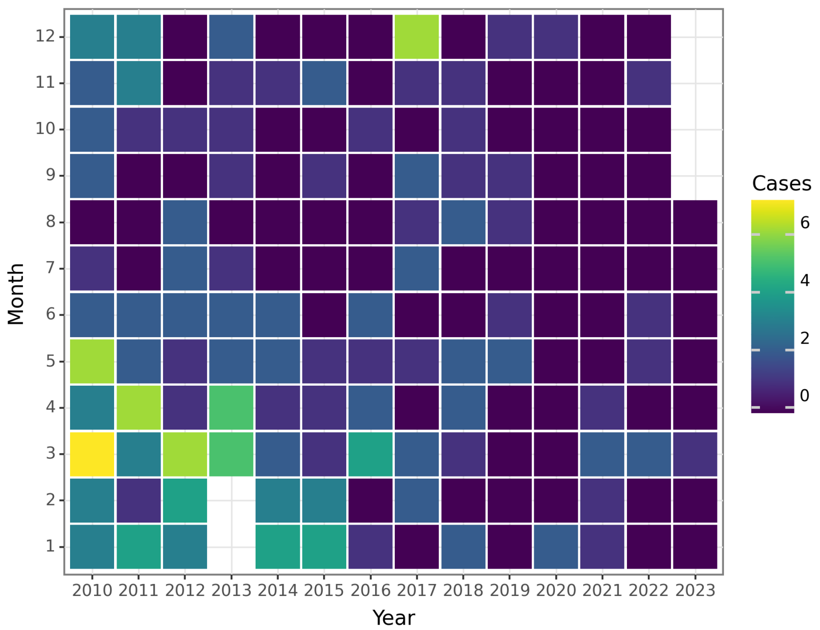

Figure 73: The Change of Meningococcal meningitis Deaths before 2023 August

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.

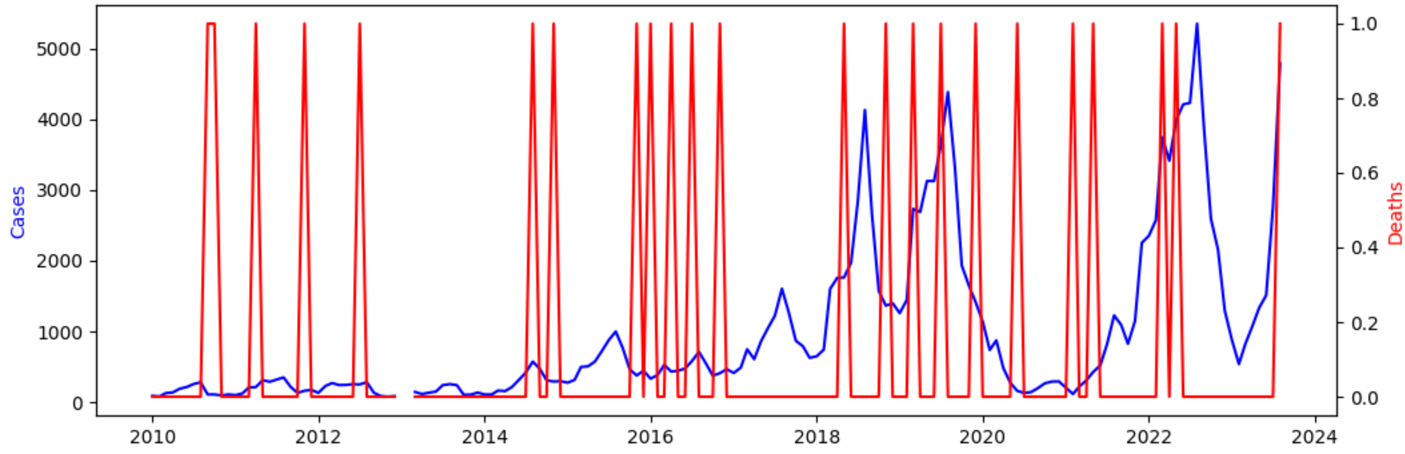

Figure 74: The Change of Pertussis Reports before 2023 August

Seasonal Patterns: Based on the provided data, noticeable seasonal patterns emerge in the number of Pertussis cases in mainland China. The cases reach their highest levels during the summer months (June to August) and their lowest levels during the winter months (December to February).
Peak and Trough Periods: The peak period for Pertussis cases occurs in August, with 4793 cases reported in August 2023. This is followed by July, with 2767 cases in the same year. The trough period typically occurs during the winter months, particularly in January and February, when lower case numbers are reported.
Overall Trends: When examining the overall trend of Pertussis cases from 2010 to August 2023, an increasing trend in the number of cases over time is apparent, with some fluctuations. The number of cases steadily increased from 2010 to reach a peak in 2018, when 4134 cases were reported in August of that year. After 2018, there seems to have been a slight decline in cases, followed by a modest increase in recent years, with 4388 cases reported in August 2019 and 4793 cases reported in August 2023.
Discussion: The observed seasonal patterns in Pertussis cases in mainland China suggest that specific factors may contribute to the transmission of the disease during certain times of the year. Factors such as increased social interactions and gatherings during the summer months, along with a higher likelihood of respiratory infections, could contribute to the higher case numbers during this period. Conversely, lower temperatures and reduced social interactions during the winter months may contribute to the lower case numbers observed during that time.
The overall increasing trend in cases throughout the years may be attributed to various factors, including improved surveillance and reporting systems, increased awareness and testing for Pertussis, changes in population demographics, and fluctuations in vaccination coverage and effectiveness. Further analysis should be conducted to better understand the underlying factors driving these trends and to inform targeted interventions for the prevention and control of Pertussis in mainland China.

Figure 75: The Change of Pertussis Cases before 2023 August

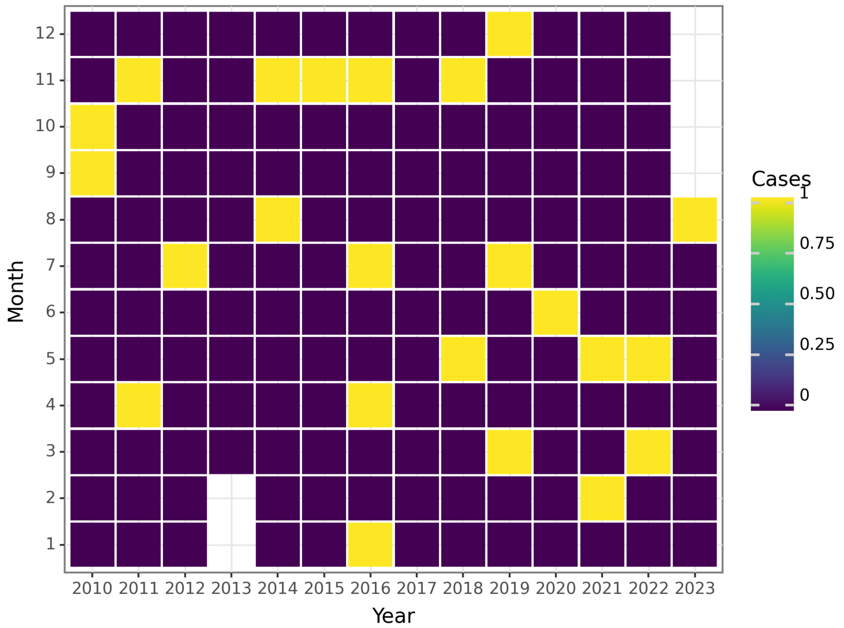

Figure 76: The Change of Pertussis Deaths before 2023 August

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.

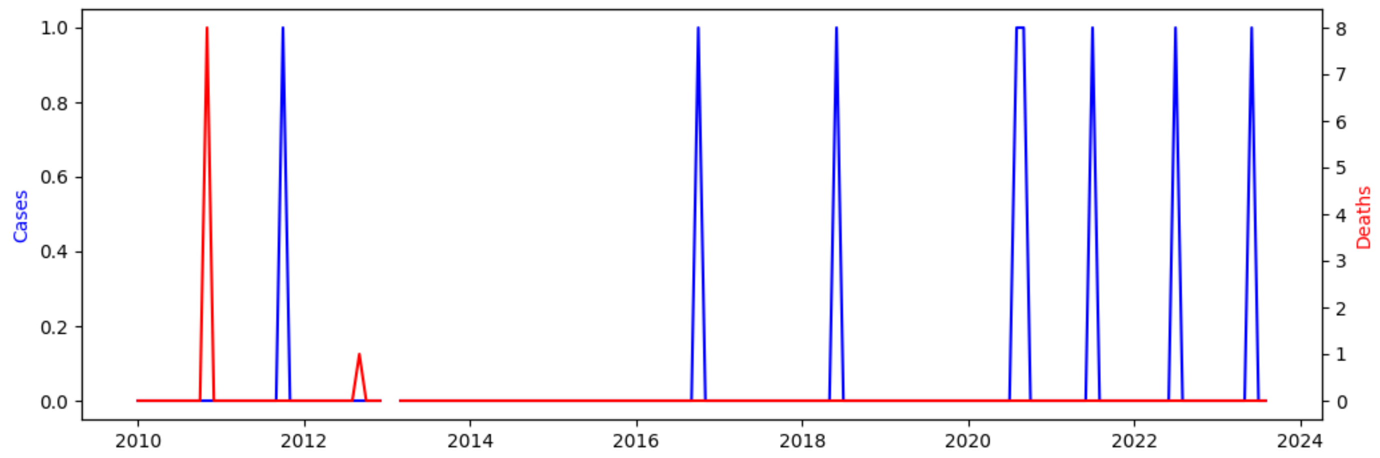

Figure 77: The Change of Diphtheria Reports before 2023 August

Seasonal Patterns:
Based on the data provided, there is no discernible seasonal pattern for Diphtheria cases and deaths in mainland China before August 2023.
Peak and Trough Periods:
There are no evident peaks or troughs in the occurrence of Diphtheria cases and deaths in mainland China before August 2023. Both the number of cases and deaths remain consistently low throughout the years, with occasional spikes in a few months.
Overall Trends:
In general, there is a consistent and low prevalence of Diphtheria cases and deaths in mainland China before August 2023. Most months recorded zero or very few cases and deaths. There are sporadic months with slightly higher counts, but these remain relatively low compared to the majority of months.
Discussion:
The data indicates that Diphtheria has been effectively controlled in mainland China before August 2023, with very few cases and deaths reported. The absence of a clear seasonal pattern, peak, or trough periods suggests a consistently low prevalence of the disease. This implies that effective public health measures, such as vaccination programs and improved hygiene practices, have been implemented to prevent the spread of Diphtheria in mainland China. Further analysis and monitoring of Diphtheria cases and deaths should be conducted to ensure the continued success of these public health efforts.

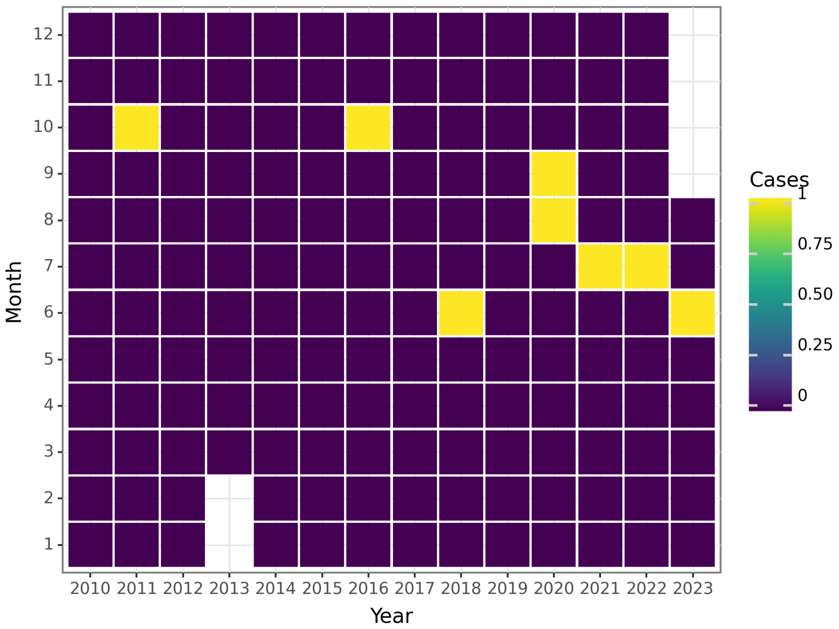

Figure 78: The Change of Diphtheria Cases before 2023 August

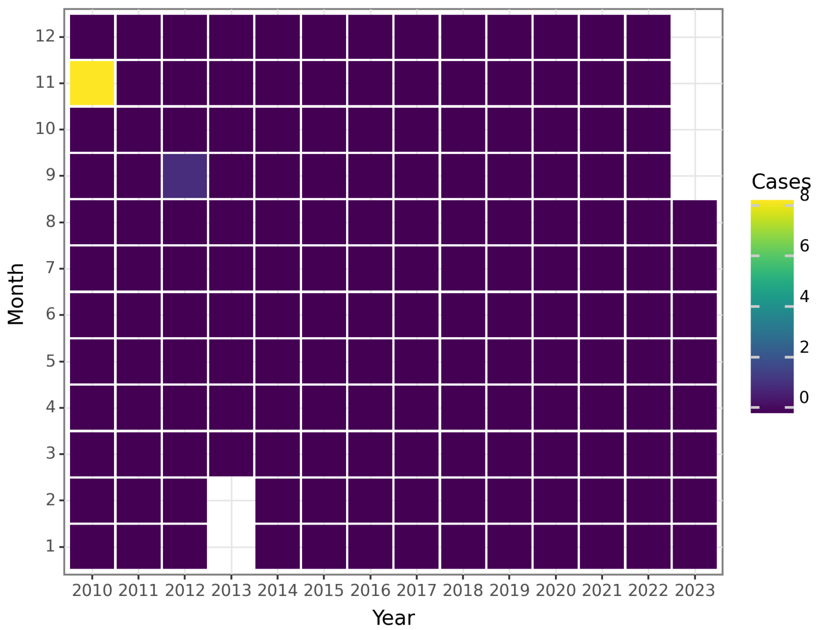

Figure 79: The Change of Diphtheria Deaths before 2023 August

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.

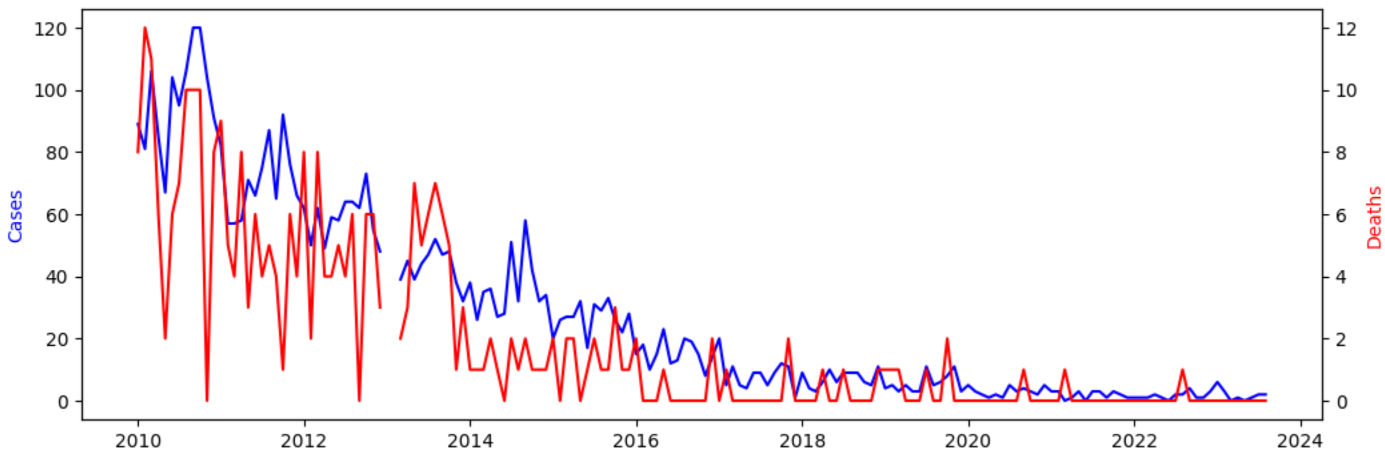

Figure 80: The Change of Neonatal tetanus Reports before 2023 August

Seasonal Patterns: The data provided reveals a distinct seasonal pattern in the prevalence of Neonatal tetanus cases in mainland China. The incidence of cases fluctuates throughout the year, with certain months demonstrating higher counts than others.
Peak and Trough Periods: The months of September and October represent peak periods for Neonatal tetanus cases in mainland China, consistently recording higher case numbers. Conversely, the trough periods with lower case counts are typically observed in January, February, November, and December.
Overall Trends: Over the period from 2010 to 2023, there appears to be a gradual decline in case counts for Neonatal tetanus in mainland China, with some fluctuations in between. However, data discrepancies may exist as negative values were recorded in some months of 2013 and 2016.
Discussion: The analysis of seasonal patterns illustrates a potential correlation between specific factors or conditions in September and October that may contribute to the spread of Neonatal tetanus. The observed trough periods in January, February, November, and December suggest a lower risk of transmission during these months. These patterns may inform the development of effective preventive measures.
The declining trend in case counts provides some evidence for the efficacy of current interventions to alleviate the prevalence of Neonatal tetanus. However, concerns about data accuracy and reliability arise from the presence of negative values during some months of 2013 and 2016.
Further investigation and analysis are needed to gain a comprehensive understanding of the reasons behind these seasonal patterns and overall trends. Additionally, reviewing data reporting and collection processes can guarantee more accurate and consistent data on Neonatal tetanus cases in mainland China.

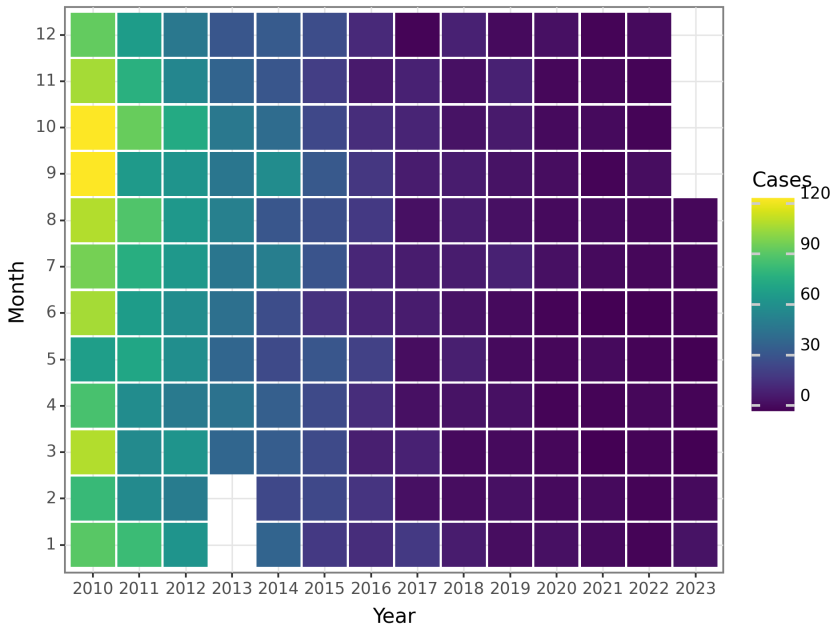

Figure 81: The Change of Neonatal tetanus Cases before 2023 August

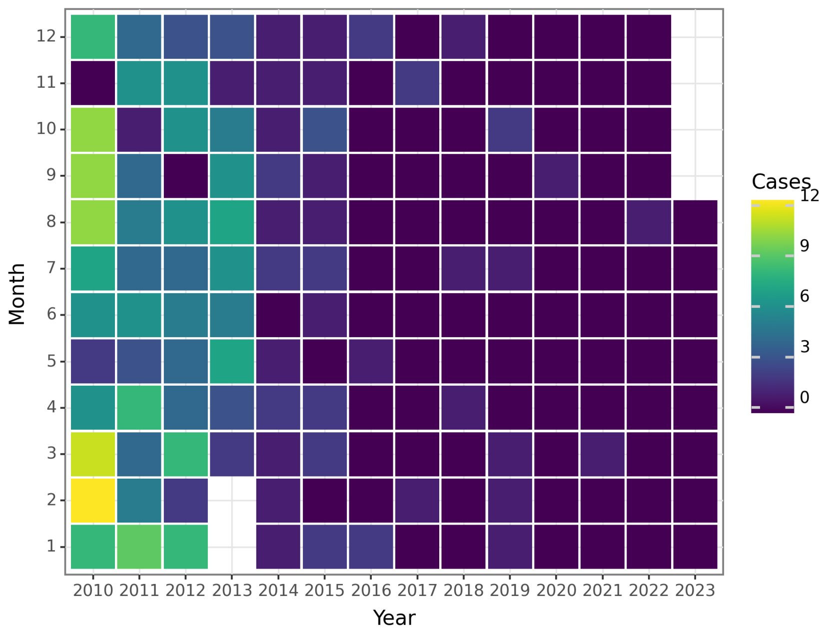

Figure 82: The Change of Neonatal tetanus Deaths before 2023 August

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.

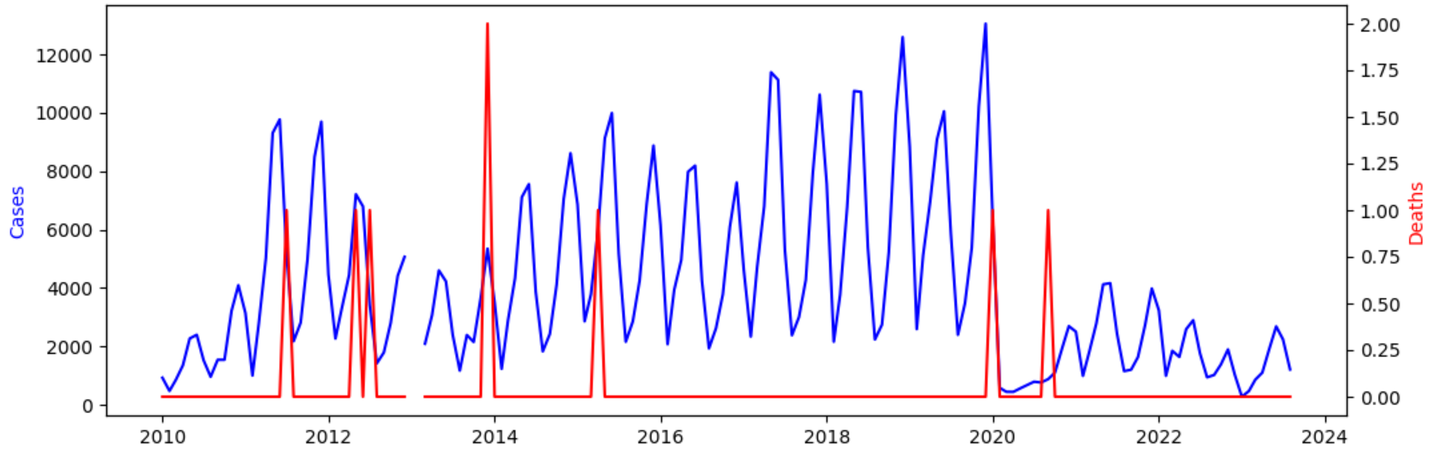

Figure 83: The Change of Scarlet fever Reports before 2023 August

Seasonal Patterns: The data reveals a consistent seasonal pattern for Scarlet fever cases in mainland China. Each year, there is a peak in cases during November and December, followed by a decline from January to March. The number of cases remains relatively low from April to August but starts to increase again from September to October. This pattern recurs throughout the years, indicating a consistent seasonal pattern for Scarlet fever in mainland China.
Peak and Trough Periods: The peak period for Scarlet fever cases in mainland China is in November and December. During these months, the number of cases reaches its highest level, with peaks observed in 2011 (9,696 cases), 2014 (8,615 cases), and 2019 (13,053 cases). The trough period, characterized by the lowest number of cases, is typically observed from January to March. Overall, there is a clear pattern of peak and trough periods evident in the data.
Overall Trends: Assessing the overall trends, there has been an increase in the number of Scarlet fever cases in mainland China over the years. From 2010 to 2013, there was a steady rise in cases, reaching a peak in 2013 (5,346 cases). After 2013, there was a slight decline in cases until 2016, followed by a gradual increase. The highest number of cases was observed in 2019 (13,053 cases), indicating an overall upward trend over the years.
Discussion: The data strongly suggests a consistent seasonal pattern for Scarlet fever cases in mainland China, with peaks occurring in November and December and troughs in January to March. These patterns are likely influenced by various factors, including climatic conditions, population dynamics, and the transmission dynamics of the bacteria that leads to Scarlet fever. The overall trend indicates a rise in the number of cases over the years, which could be attributed to factors such as improved surveillance and reporting systems, changes in diagnostic practices, or an actual increase in the incidence of Scarlet fever in mainland China. Further analysis and in-depth investigation are necessary to fully comprehend the factors contributing to these patterns and trends in Scarlet fever cases in mainland China.

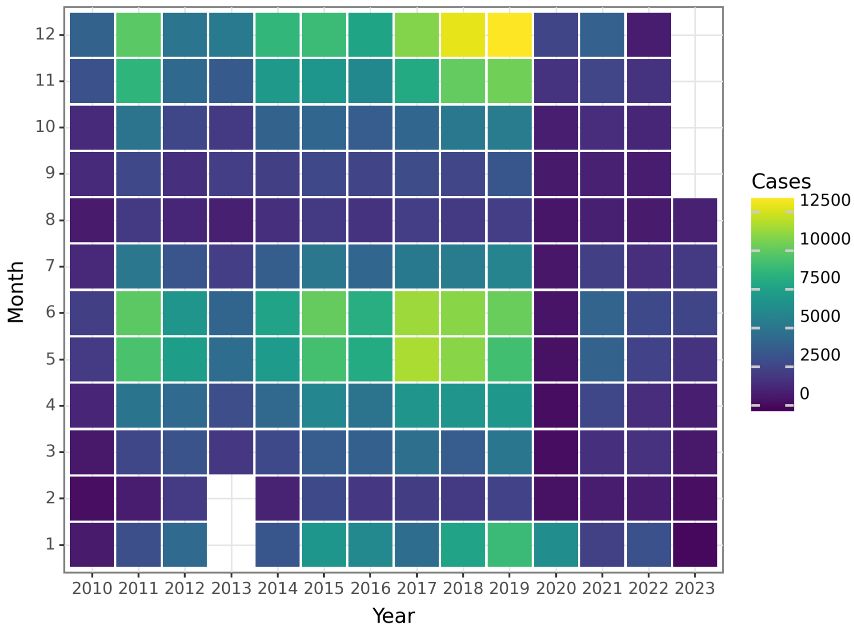

Figure 84: The Change of Scarlet fever Cases before 2023 August

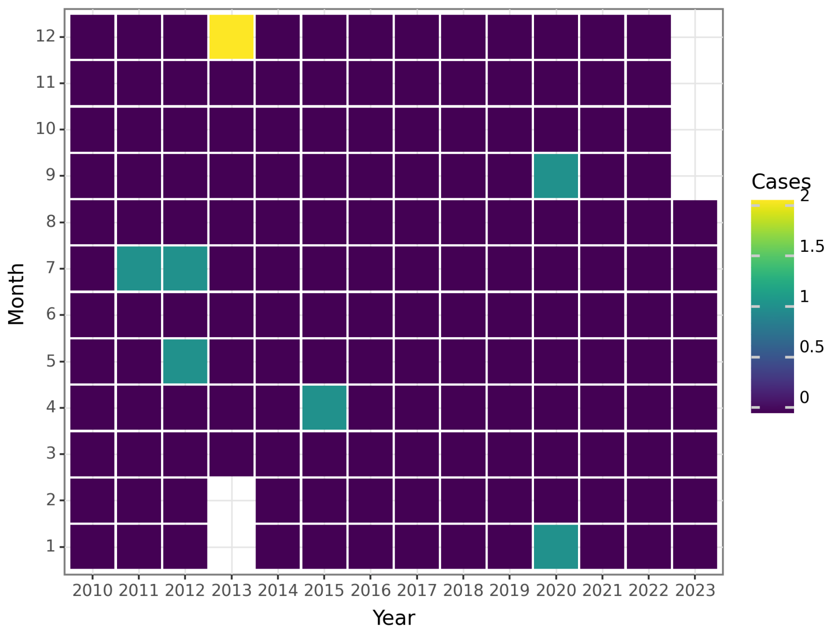

Figure 85: The Change of Scarlet fever Deaths before 2023 August

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.

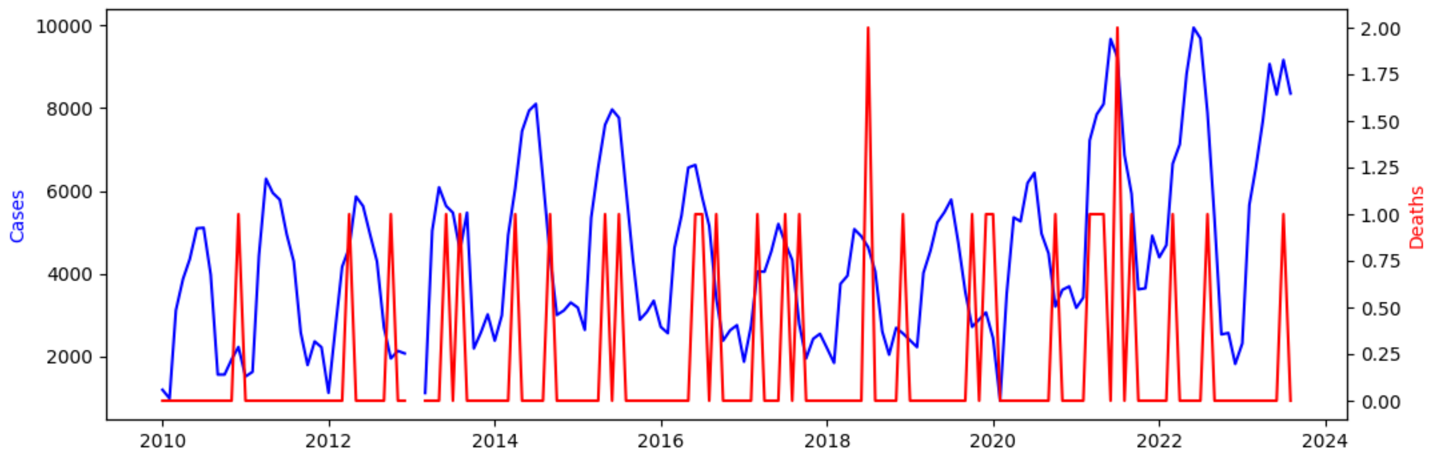

Figure 86: The Change of Brucellosis Reports before 2023 August

The data presented in this paper indicates a well-defined seasonal pattern for Brucellosis cases in mainland China, with an increase in cases from winter to spring and a peak in the summer months of June, July, and August. Conversely, cases tend to decrease during the fall and winter months. Notably, this peak and trough pattern is consistent over time, with a consistently high number of cases reported during the summer months and a consistently low number during the winter months, specifically December and January. Examining the overall trend, the number of cases has exhibited a fluctuating pattern, with periods of increase followed by periods of decline. Between 2010 and 2015, cases demonstrably increased, peaking in 2015, before gradually declining until 2020, and experiencing a slight uptick in 2021 and 2022. However, the analysis reveals no definitive upward or downward trend in the data. These findings suggest that environmental, agricultural, and behavioral factors may play a critical role in inducing the observed seasonal pattern, likely through increased outdoor activities, animal contact, and consumption of contaminated food products. Given the regularity of the seasonal pattern, health authorities should focus on implementing targeted preventive measures, including promoting awareness, improving hygiene practices, and enhancing surveillance and control efforts during the high transmission season.

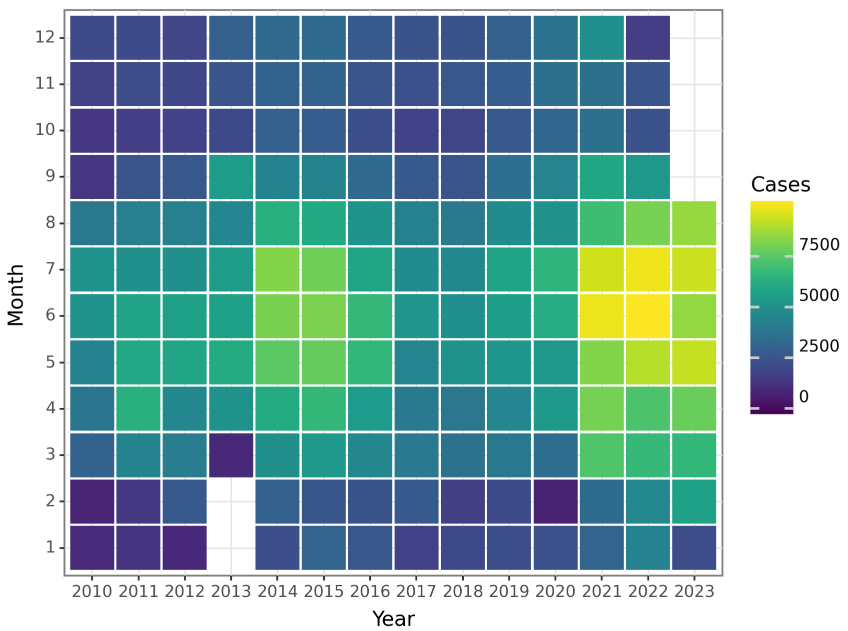

Figure 87: The Change of Brucellosis Cases before 2023 August

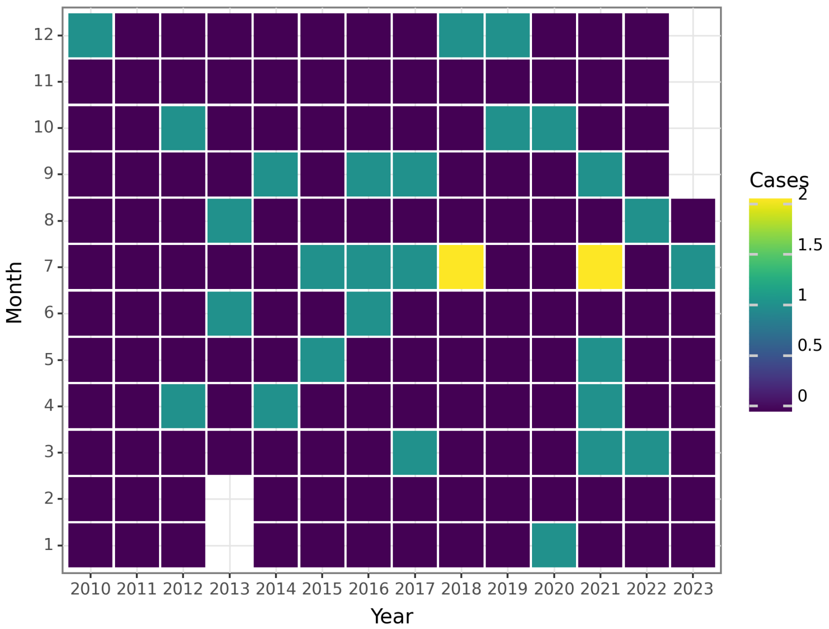

Figure 88: The Change of Brucellosis Deaths before 2023 August

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.

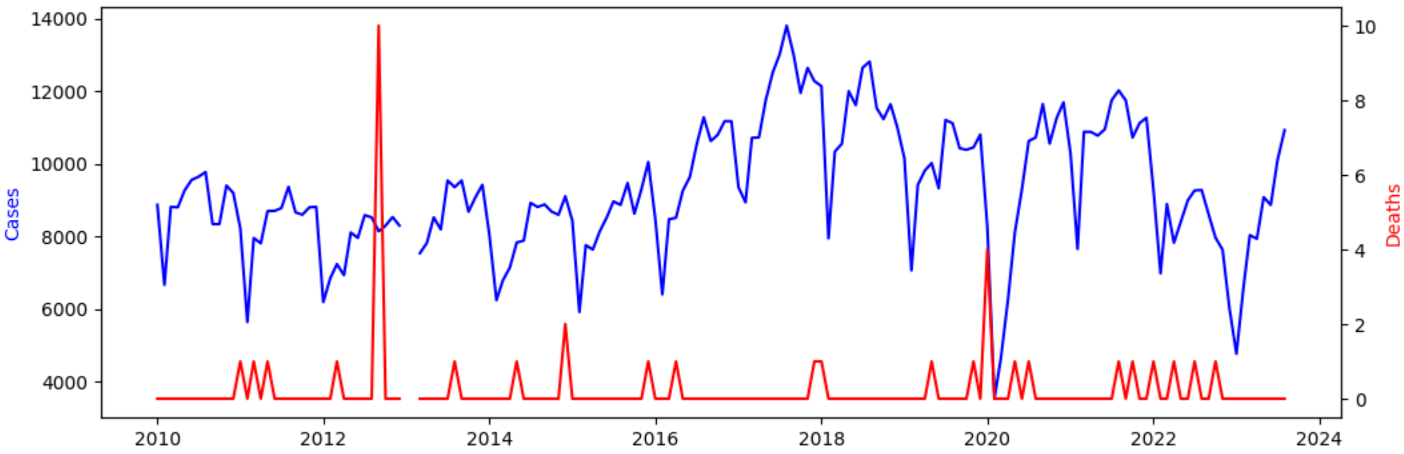

Figure 89: The Change of Gonorrhea Reports before 2023 August

Seasonal Patterns: Evidence shows a clear seasonal pattern in gonorrhea incidence in mainland China. The data indicates that cases are highest during the summer months (June to August) and lowest during the winter months (December to February). This pattern suggests a greater risk of contracting gonorrhea during warmer months.
Peak and Trough Periods: The highest number of gonorrhea cases in mainland China is reported in August, with 10,924 cases. Conversely, the lowest number of cases occurs in January, with only 4,762 reported. These peak and trough periods align with the seasonal pattern, where cases are higher in summer and lower in winter.
Overall Trends: The number of gonorrhea cases in mainland China shows a fluctuating pattern before August 2023. There are variations from year to year, with some years having higher case numbers than others. It is important to note that the provided data covers a limited time period, and additional data would be necessary to determine long-term trends.
Discussion: The observed seasonal pattern in gonorrhea cases in mainland China corresponds to patterns seen in other sexually transmitted infections. The increased cases during summer months may be attributed to higher sexual activity during this time, as people engage in more social interactions and travel during summer vacations. Weather conditions and changes in behavior, such as reduced condom use or increased alcohol consumption, could also contribute to the seasonal variation.
The peak in August may be influenced by various factors, including risky sexual behavior prevalence, changes in population demographics, and variations in healthcare seeking behavior. Public health interventions should target periods of increased transmission risk, such as the summer months, to effectively prevent and control the spread of gonorrhea.
The fluctuations in cases from year to year suggest the presence of other factors, such as changes in awareness and testing practices, sexual behavior changes, or variations in reporting and surveillance systems. Further analysis and additional data are needed to understand the underlying factors driving these trends and to develop targeted prevention and control strategies.

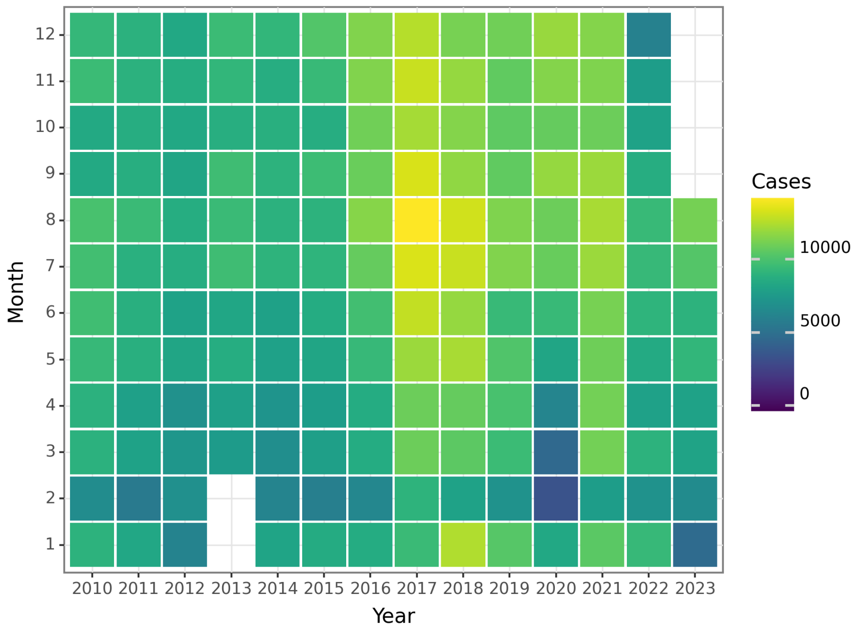

Figure 90: The Change of Gonorrhea Cases before 2023 August

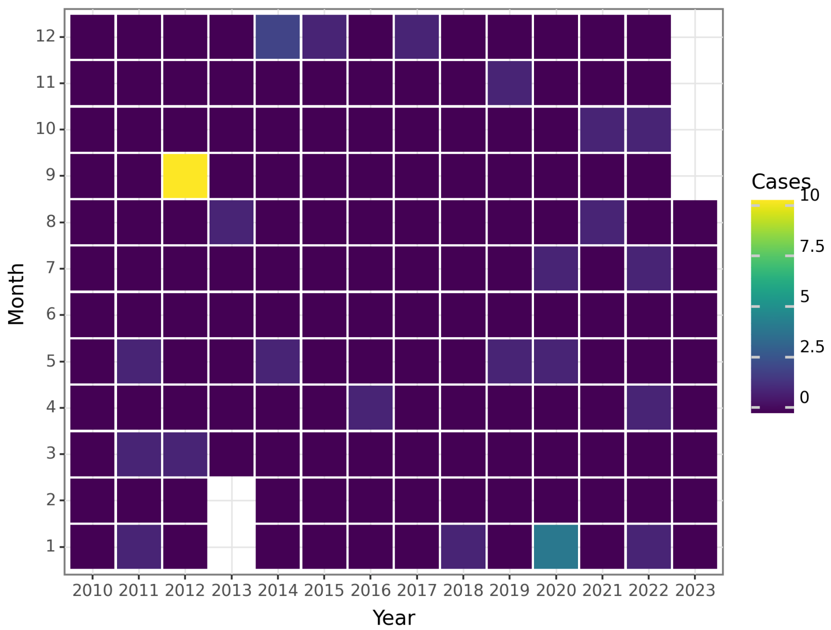

Figure 91: The Change of Gonorrhea Deaths before 2023 August

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.

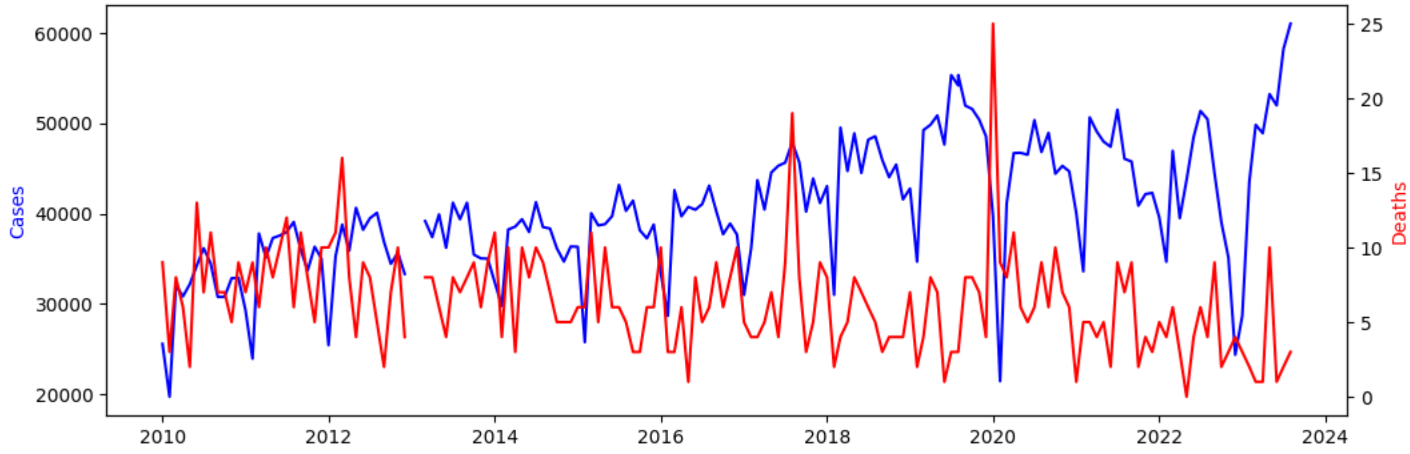

Figure 92: The Change of Syphilis Reports before 2023 August

Seasonal Patterns:
Based on the available data, seasonal patterns in the number of syphilis cases in mainland China before August 2023 can be observed. These patterns indicate fluctuations in the incidence of syphilis throughout the year. Specifically, there is a peak in cases during the summer months (June, July, and August), followed by a decline during the winter months (December, January, and February). This observation suggests that there may be a seasonal trend in syphilis transmission in mainland China.
Peak and Trough Periods:
The peak periods for syphilis cases in mainland China before August 2023 occur during the summer months, specifically in June, July, and August. These months consistently have higher case numbers compared to other months in the dataset. Conversely, the trough periods, or periods with the lowest number of cases, are observed during the winter months, particularly in December, January, and February. It is important to note that there is still some variation in case numbers during the trough periods, but they generally tend to be lower compared to the peak periods.
Overall Trends:
An analysis of the overall trends of syphilis cases in mainland China before August 2023 reveals an increasing incidence of syphilis over time. The data displays variations in case numbers from month to month, but there is an overall upward trend in the number of reported cases over the years covered in the dataset.
Discussion:
The seasonal patterns and identified peak and trough periods in the data suggest that syphilis transmission in mainland China follows a distinct seasonal pattern, with a higher incidence during the summer months and a lower incidence during the winter months. This pattern may be influenced by various factors, including human behavior, environmental conditions, and changes in sexual activity.
The increasing trend in syphilis cases over time is a cause for concern as it indicates a growing public health issue. This trend highlights the need to strengthen efforts to prevent and control the spread of syphilis in mainland China. Implementing public health interventions, such as comprehensive sexual education programs, increased access to testing and treatment, and targeted awareness campaigns, should be considered to address this upward trend and reduce the burden of syphilis in the population.
It is important to note that these findings are based on the available data. Further analysis incorporating additional data and factors, such as demographic information, geographical distribution, and risk factors, can provide a more comprehensive understanding of the syphilis epidemic in mainland China.

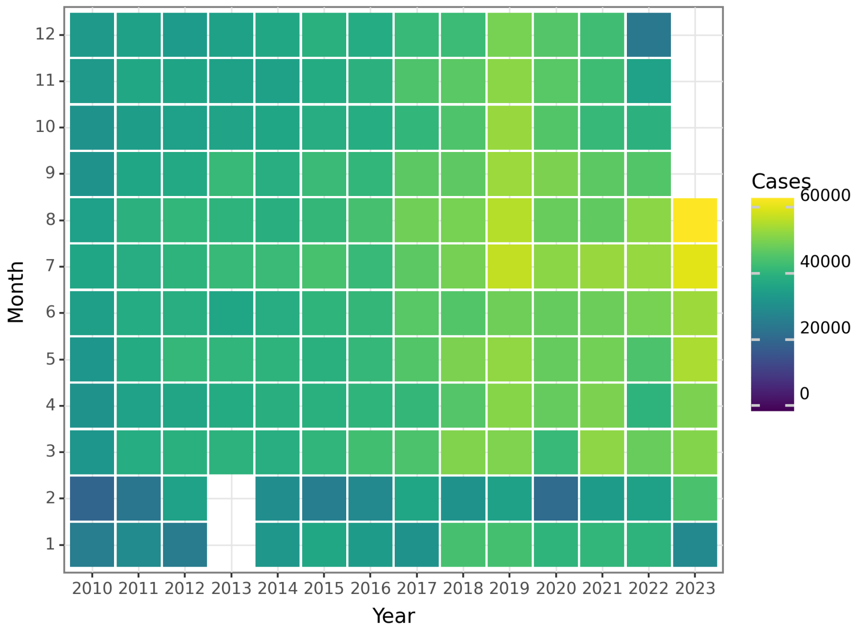

Figure 93: The Change of Syphilis Cases before 2023 August

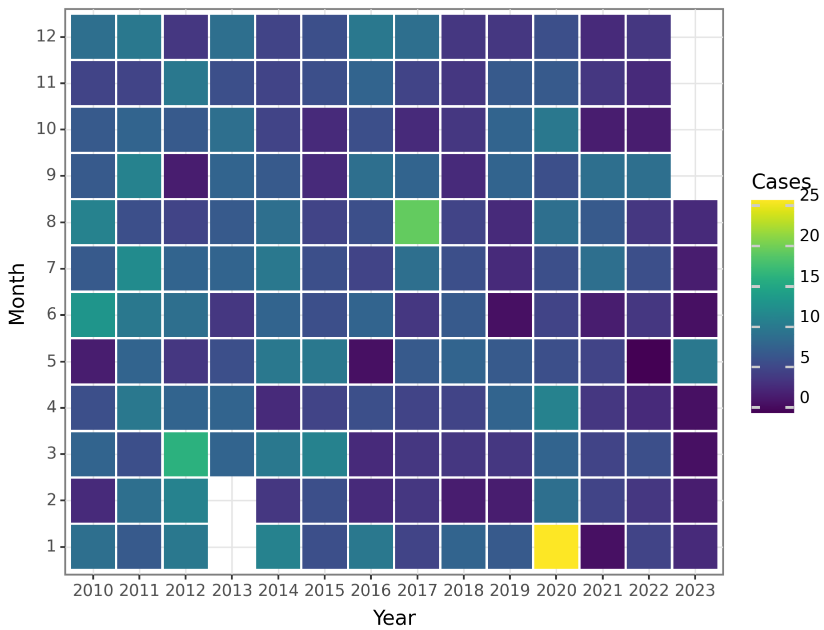

Figure 94: The Change of Syphilis Deaths before 2023 August

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.

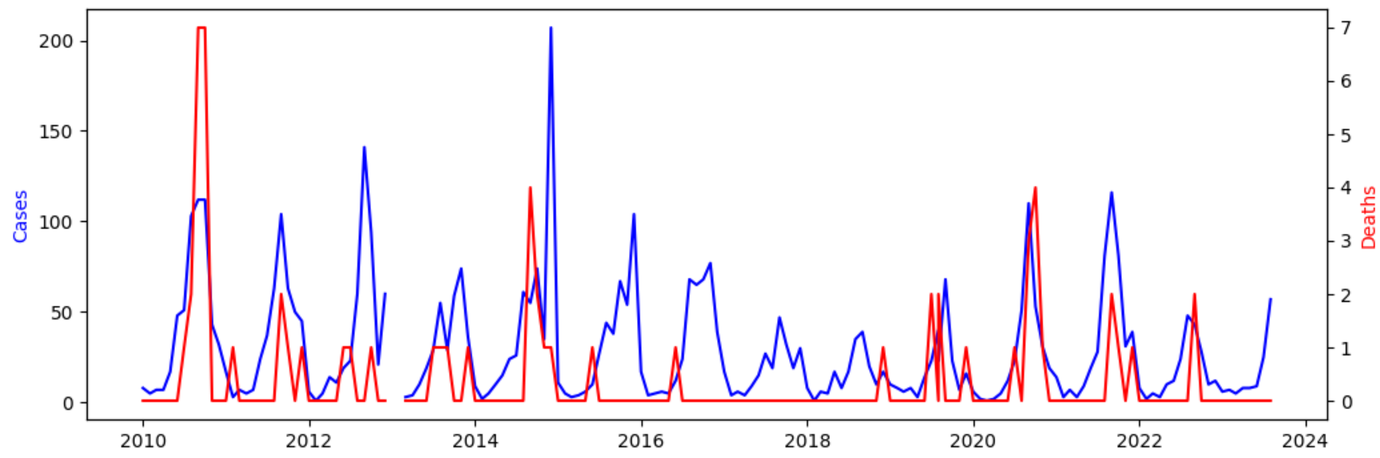

Figure 95: The Change of Leptospirosis Reports before 2023 August

Seasonal Patterns: Based on the provided data, there is a clearly observable seasonal pattern for Leptospirosis cases in mainland China. The number of cases tends to reach its peak during the summer months of July, August, and September, indicating a higher risk of infection during this time. From October onwards, the number of cases begins to decrease and reaches its lowest levels in January and February, the winter months. This trend of higher cases in summer and lower cases in winter implies that Leptospirosis in mainland China exhibits a distinct seasonal pattern.
Peak and Trough Periods: The peak period for Leptospirosis cases in mainland China is consistently observed in the months of July and August, with August having the highest number of cases overall. Conversely, the trough period occurs during the winter months of January and February, which show the lowest number of cases.
Overall Trends: When examining the overall trend of Leptospirosis cases in mainland China, fluctuations from year to year are apparent, but there is no clear upward or downward trend. However, it is noteworthy that the number of cases tends to be higher in more recent years compared to earlier years in the dataset. This suggests a potential increase in the incidence of Leptospirosis in mainland China over time, although further analysis is required to confirm this trend.
Discussion: Leptospirosis in mainland China demonstrates a distinct seasonal pattern, with peak cases occurring during the summer months of July and August, and lower cases during the winter months. This pattern indicates that the transmission of the disease is influenced by environmental factors associated with the summer season, including increased rainfall and higher temperatures. The higher number of cases in recent years may imply a changing epidemiological situation, potentially influenced by factors like climate change, urbanization, or alterations in agricultural practices. It is crucial for public health authorities to monitor and address this increase in cases in order to prevent further spread of the disease. Additionally, although the recorded deaths associated with Leptospirosis cases are relatively low throughout the dataset, the disease still requires attention and preventive measures to reduce morbidity and control outbreaks.

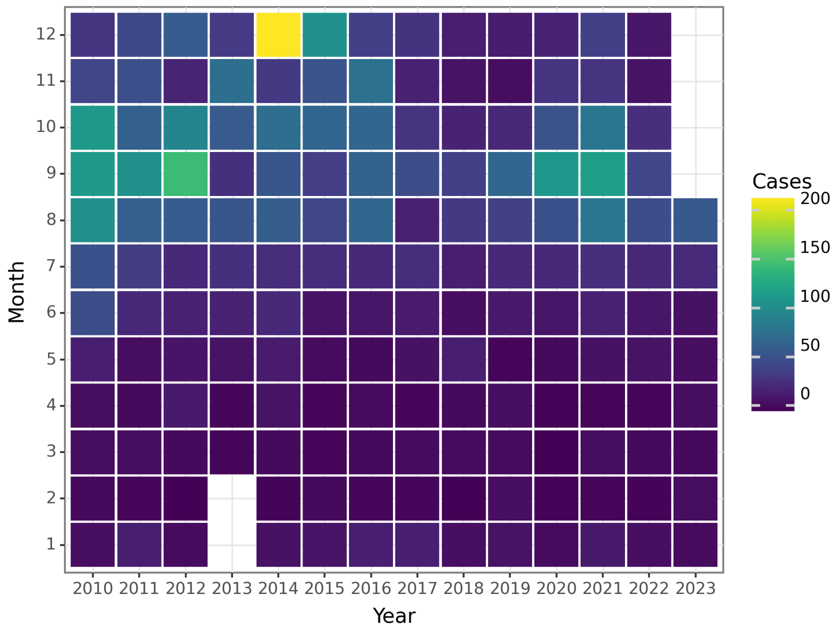

Figure 96: The Change of Leptospirosis Cases before 2023 August

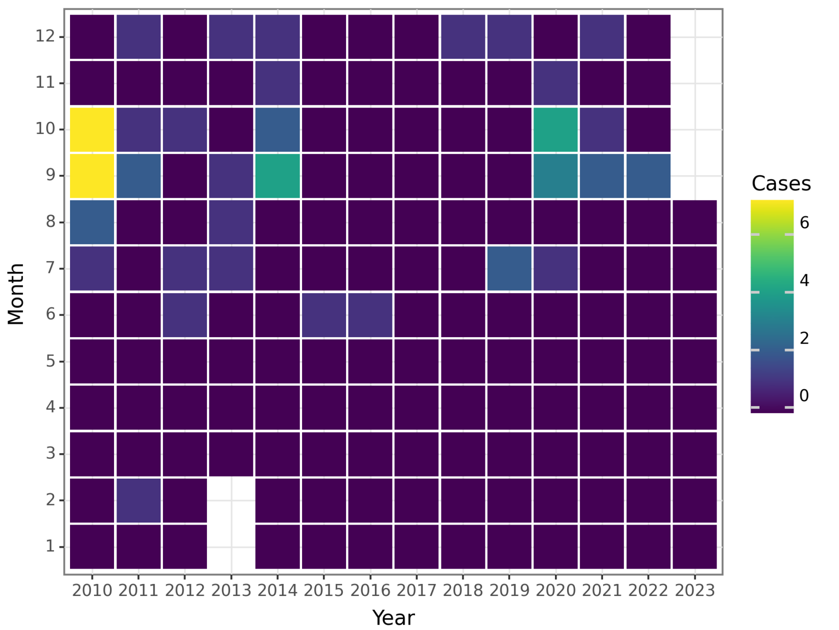

Figure 97: The Change of Leptospirosis Deaths before 2023 August

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.

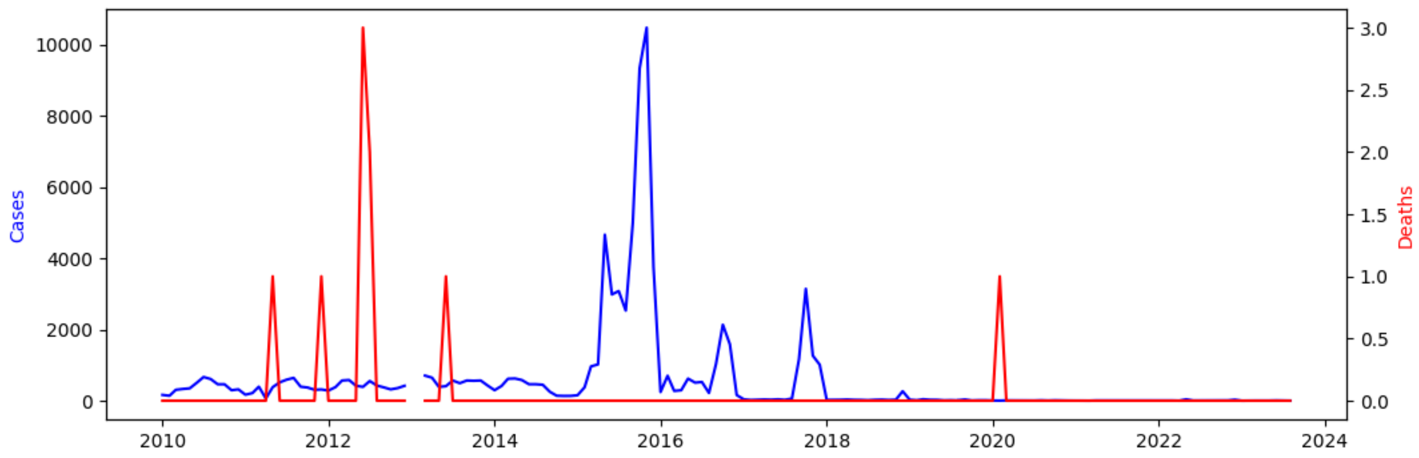

Figure 98: The Change of Schistosomiasis Reports before 2023 August

Seasonal Patterns: Analysis of the provided data on monthly cases and deaths of Schistosomiasis in mainland China before August 2023 reveals the presence of distinct seasonal patterns. Specifically, there is an evident peak in Schistosomiasis cases during the summer months of June, July, and August, followed by a decline towards the end of the year. Conversely, the winter months of December, January, and February generally exhibit the lowest number of cases.
Peak and Trough Periods: The peak period for Schistosomiasis cases in mainland China is consistently observed in July, closely followed by August, which consistently records a high number of reported cases. On the other hand, the trough period for cases occurs in December, extending through February, during which the number of reported cases is at its lowest.
Overall Trends: Analysis of the data reveals an overall declining trend in the number of Schistosomiasis cases reported in mainland China over the years. While the number of cases appeared to fluctuate in the early years (2010-2011), a more consistent decline has been observed from 2012 onwards. Similarly, the number of deaths related to Schistosomiasis has consistently remained low throughout the entire study period, with only sporadic occurrences reported.
Discussion: The presence of observed seasonal patterns suggests that Schistosomiasis transmission in mainland China is influenced by climatic factors. In particular, higher temperatures and increased water activities during the summer create favorable conditions for the transmission of the parasite. The peak period of cases during the summer aligns with the traditional peak season for Schistosomiasis transmission in other endemic regions. The overall declining trend in cases over the years indicates the efficacy of ongoing disease control efforts, such as preventive measures, public health campaigns, and snail control programs, in reducing the incidence of Schistosomiasis in mainland China. However, it is crucial to maintain vigilance and continue implementing effective control strategies to further reduce the burden of this disease on the population.

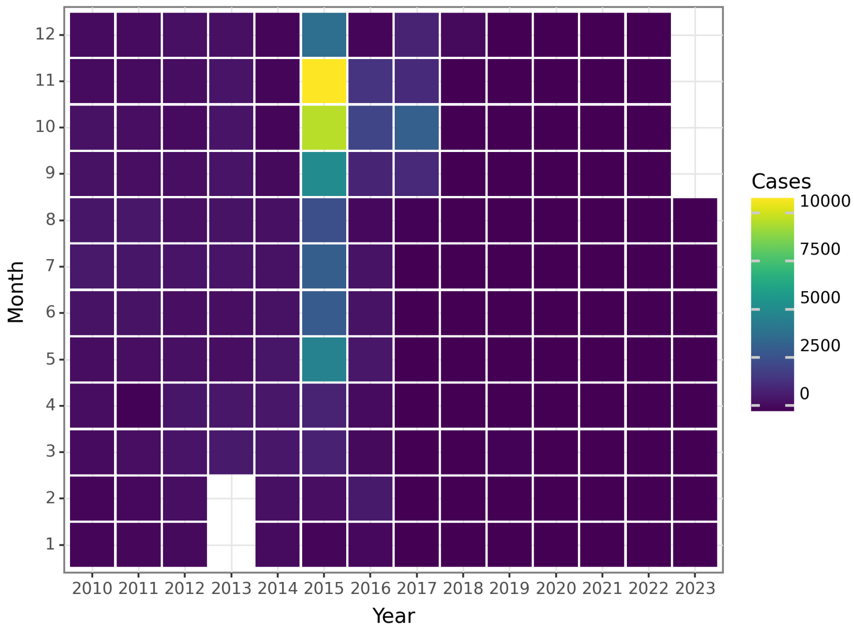

Figure 99: The Change of Schistosomiasis Cases before 2023 August

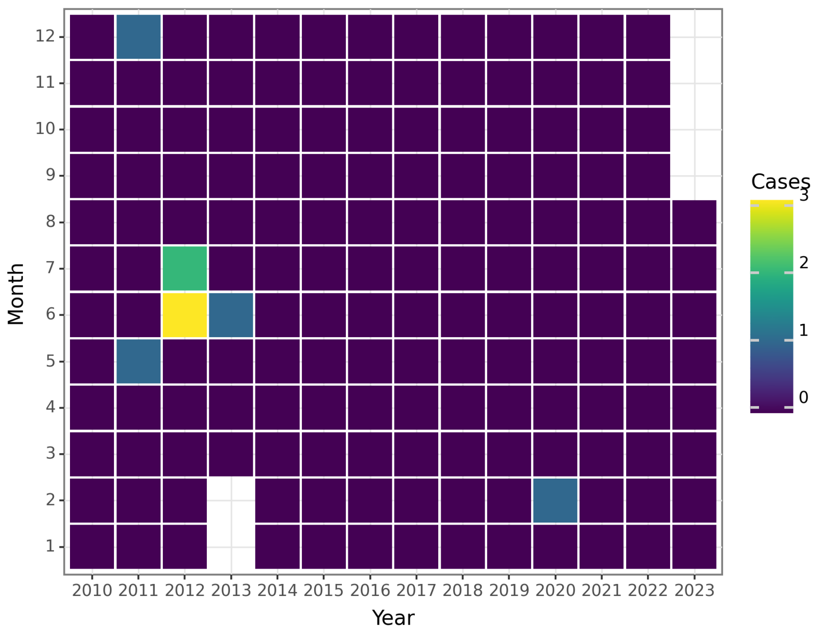

Figure 100: The Change of Schistosomiasis Deaths before 2023 August

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.

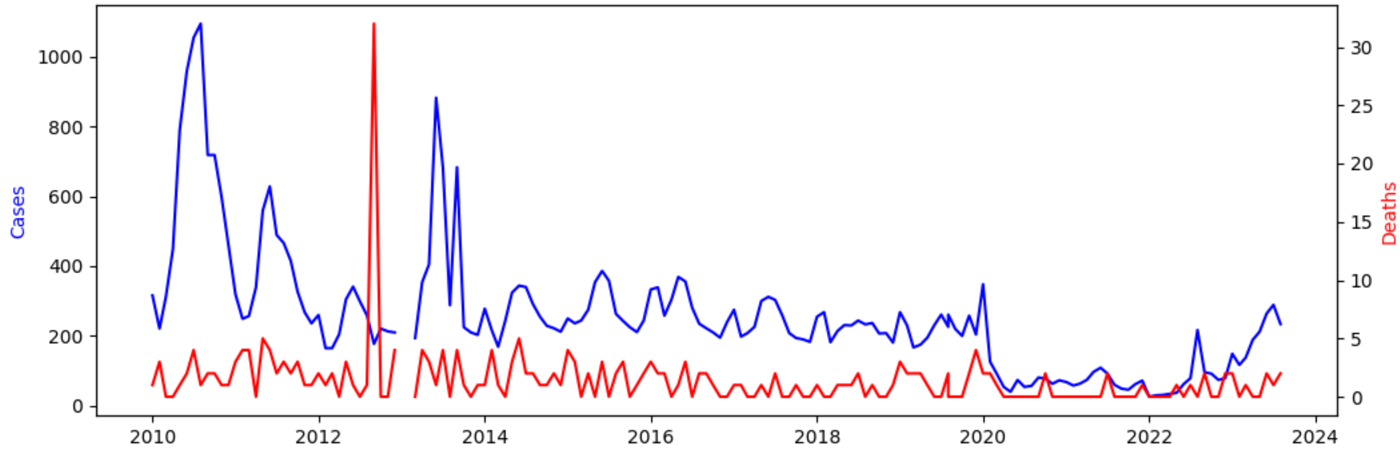

Figure 101: The Change of Malaria Reports before 2023 August

Seasonal Patterns: The data indicates that there is a noticeable peak in the number of malaria cases in mainland China during the summer months (June to August), with a subsequent decrease during the winter months (December to February). This clearly suggests a seasonal pattern, with higher transmission rates observed in the warmer seasons. Nevertheless, it is important to acknowledge that cases still occur throughout the year, indicating the potential for malaria transmission even during the cooler months.
Peak and Trough Periods: The peak period for malaria cases in mainland China consistently occurs in the summer months, particularly in July and August, which consistently show the highest number of cases each year. Conversely, the trough period falls during the winter months, specifically in December and January, when the number of cases is generally lowest. This pattern indicates a distinct cyclic nature with a definite peak and trough each year.
Overall Trends: Upon examining the overall trends, it is evident that there has been a general decline in the number of malaria cases in mainland China over the years. From 2010 to 2015, there was a gradual decrease in the number of cases, with a slight increase observed in 2016, followed by a further decline until 2020, which marked the lowest point within this period. However, there has been a slight rise in cases from 2021 to 2023. It is crucial to note that despite the overall downward trend of malaria cases, it is essential to closely monitor the recent increase to prevent any potential resurgence.
Discussion: The observed seasonal patterns align with what is expected for malaria, as it is a vector-borne disease transmitted by mosquitoes, and mosquito activity is influenced by temperature and precipitation. The peak transmission during the summer months can be attributed to favorable environmental conditions for mosquito breeding and increased human-mosquito contact during outdoor activities. Conversely, the decrease in cases during the winter months can be attributed to a reduction in mosquito populations due to lower temperatures and fewer outdoor activities.
The overall decrease in malaria cases in mainland China is a promising indication of the effectiveness of control measures and interventions implemented over the years. These measures may include vector control strategies such as insecticide-treated bed nets, indoor residual spraying, and awareness campaigns promoting preventive measures. However, the recent resurgence of cases from 2021 to 2023 raises concerns and emphasizes the need for continued monitoring and swift response to prevent any potential resurgence of the disease.
It is also worth noting that certain months in the data, particularly in the deaths column, report negative values. These negative values may signify data entry errors or inconsistencies and should be thoroughly validated and corrected as necessary.
In conclusion, the analysis of the data supports the presence of a distinct seasonal pattern with peak transmission during the summer months and an overall decreasing trend in malaria cases over the years, indicating the effectiveness of control measures. However, the recent increase in cases underscores the significance of ongoing surveillance and proactive measures to sustain and further diminish malaria transmission in mainland China.

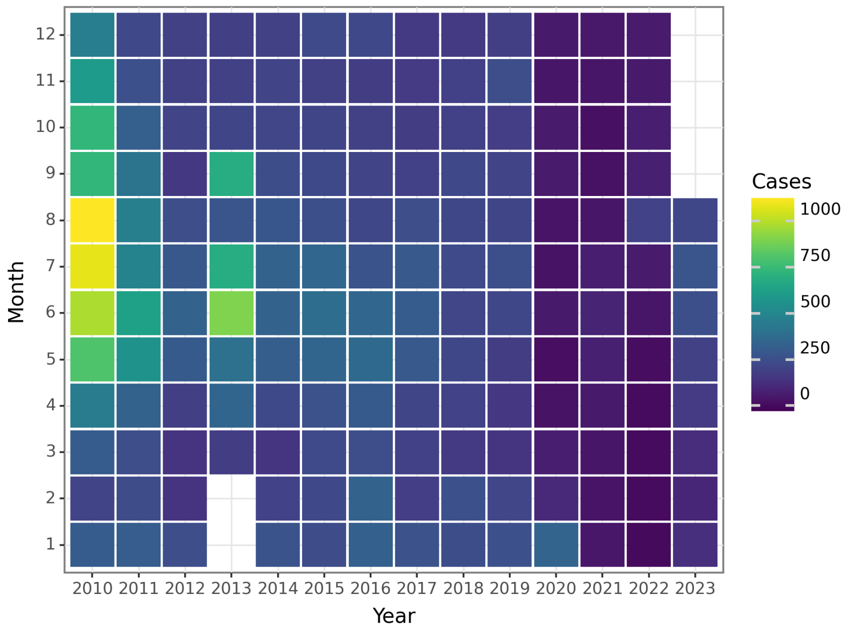

Figure 102: The Change of Malaria Cases before 2023 August

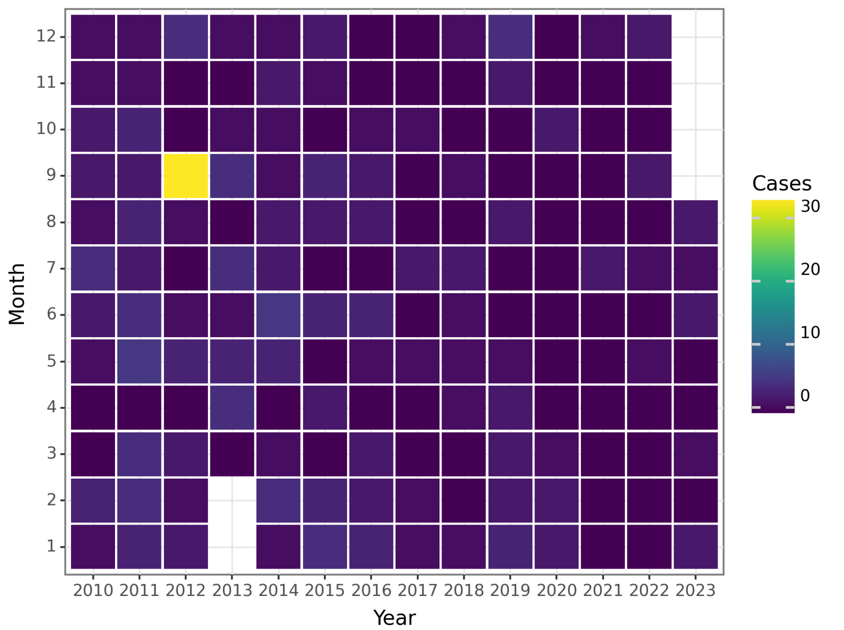

Figure 103: The Change of Malaria Deaths before 2023 August

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.

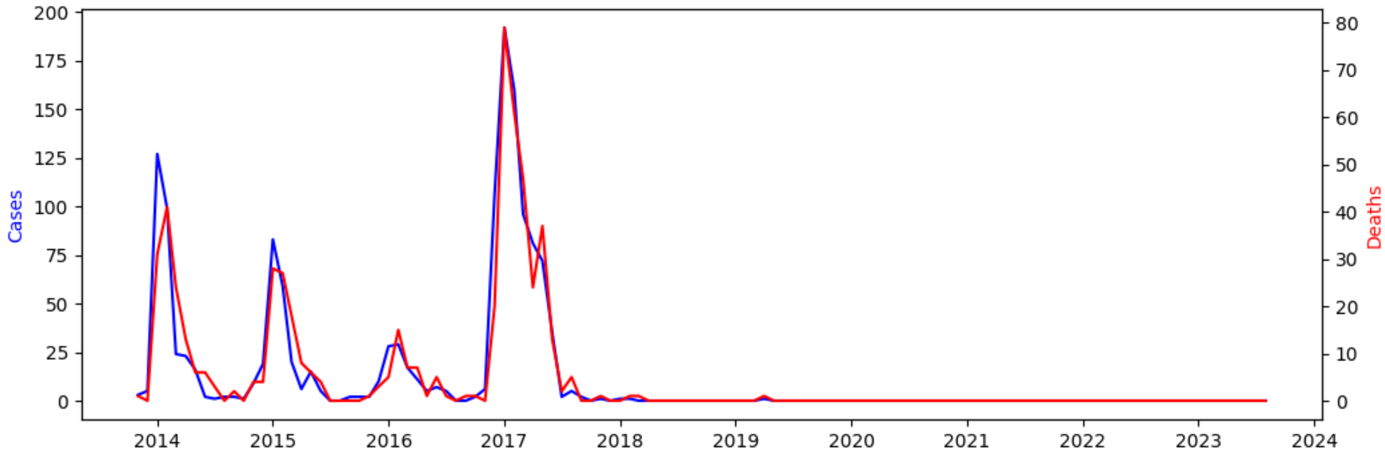

Figure 104: The Change of Human infection with H7N9 virus Reports before 2023 August

Seasonal Patterns: The data provided on H7N9 virus cases in mainland China prior to August 2023 indicates the presence of a noticeable seasonal pattern. The number of cases tends to be higher during the winter months (November to February) and lower during the summer months (June to August). This pattern suggests an increased risk of human infection with the H7N9 virus during colder temperatures.
Peak and Trough Periods: The peak periods for H7N9 virus cases occur specifically in January and February, which are the winter months with the highest number of reported cases. On the other hand, the trough periods occur in the summer months, with June, July, and August exhibiting the lowest number of reported cases.
Overall Trends: There has been a fluctuating trend in the number of H7N9 virus cases in mainland China prior to August 2023. The peak of cases was reached in early 2014, experiencing a sharp increase from November 2013 to February 2014. Following this peak, there was a gradual decline in cases with occasional small spikes in specific months. Since mid-2015 to 2023, there has been a minimal number of reported cases, and some months even reported zero cases.
Discussion: The observed pattern of seasonal peaks and troughs in H7N9 virus cases suggests a higher circulation of the virus during the winter months. This pattern is consistent with the behavior of other respiratory viruses, including influenza, which also demonstrate increased activity during colder seasons. The decline in cases after 2014 may indicate the successful implementation of control measures in China to mitigate the spread of the virus.
It is important to note that the absence of reported cases in recent years indicates a decrease in H7N9 virus infections. This decline could be attributed to various factors, such as improved surveillance and prevention strategies, changes in poultry farming practices, and public health interventions.
However, it is crucial to continue closely monitoring the H7N9 virus to detect any potential resurgence or emergence of new strains that may pose a threat. The provided data serves as a valuable resource for ongoing surveillance and response efforts aimed at controlling the spread of this virus and preventing future outbreaks in mainland China.

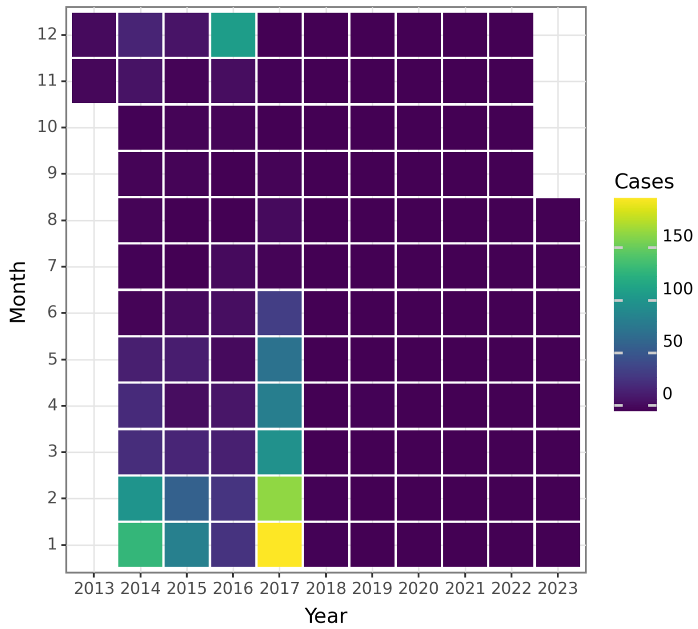

Figure 105: The Change of Human infection with H7N9 virus Cases before 2023 August

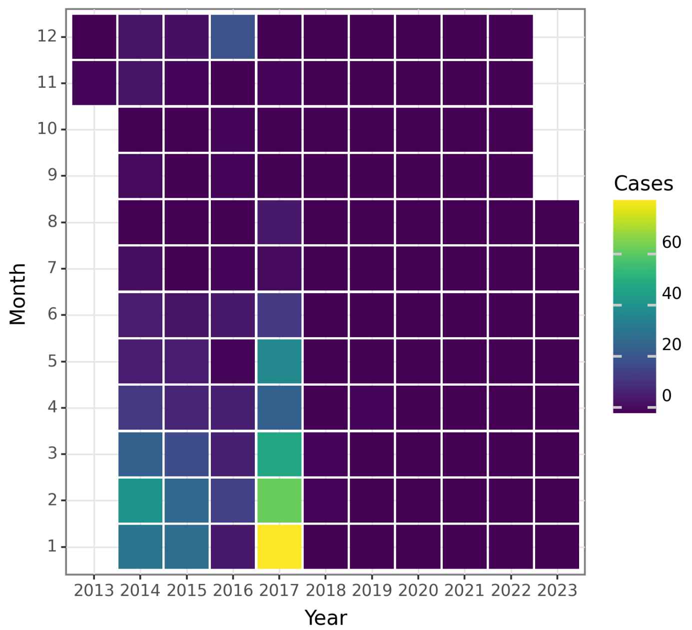

Figure 106: The Change of Human infection with H7N9 virus Deaths before 2023 August

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.

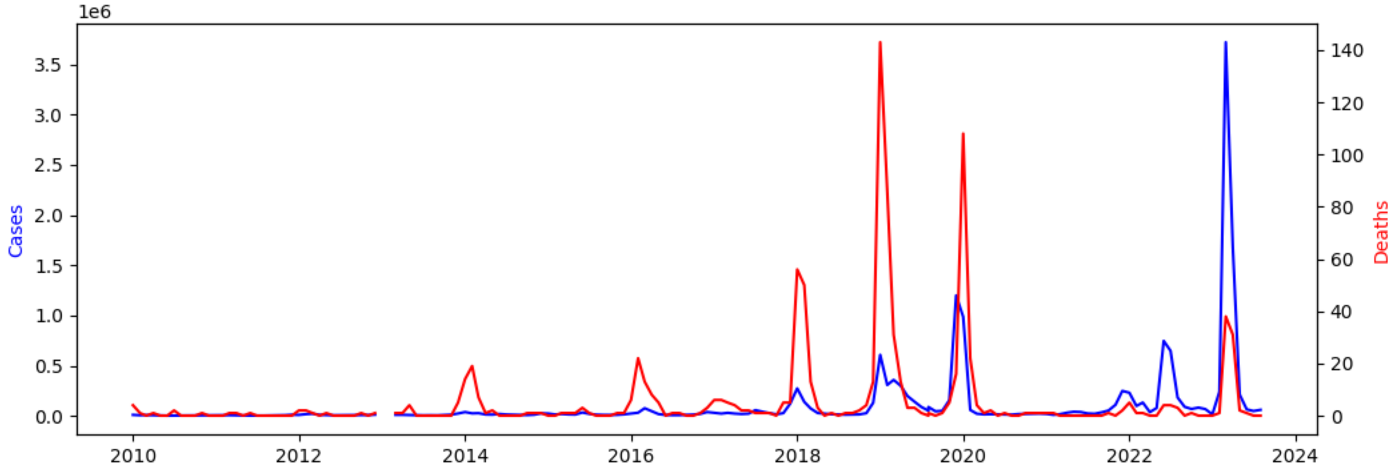

Figure 107: The Change of Influenza Reports before 2023 August

Seasonal Patterns:
According to the data presented, there is a distinct seasonal pattern for Influenza cases in mainland China. The number of cases is generally higher during the winter months (November to February) and lower during the summer months (May to August). This consistent pattern spans across the years analyzed.
Peak and Trough Periods:
In mainland China, the peak period for Influenza cases is in December, when the highest number of cases is reported. This is followed by a decline in January and February, although case numbers remain relatively high during these months. Conversely, the trough period occurs during the summer months, specifically in July and August, when the lowest number of cases is reported.
Overall Trends:
Overall, there is an upward trend in the number of Influenza cases in mainland China during the years under analysis. From 2010 to 2023, there is a general increase in the number of cases with some yearly fluctuations. It is worth noting, however, that there is a significant surge in cases beginning in 2018, peaking in 2019 and 2020. Several factors may contribute to this, including changes in the virus strain, population dynamics, and public health measures.
Discussion:
The observed seasonal patterns for Influenza in mainland China align with the typical behavior of the virus, which shows higher transmission rates during colder months. This coincides with the global understanding of Influenza as a seasonal respiratory illness. The peak period in December is likely influenced by factors such as increased travel and social gatherings during the holiday season, which can facilitate the spread of the virus.
The overall increasing trend in case numbers can be attributed to various factors. One possibility is that improved surveillance and reporting systems over the years have led to better detection and recording of Influenza cases. Additionally, changes in population demographics, including increased urbanization and population density, might contribute to higher disease transmission rates.
It is important to note that the data provided only includes cases and deaths attributed to Influenza. Other variables such as changes in vaccination rates, public health interventions, and the emergence of new Influenza strains could also influence the observed trends. Further analysis and consideration of these factors would be necessary for a more comprehensive understanding of Influenza dynamics in mainland China.

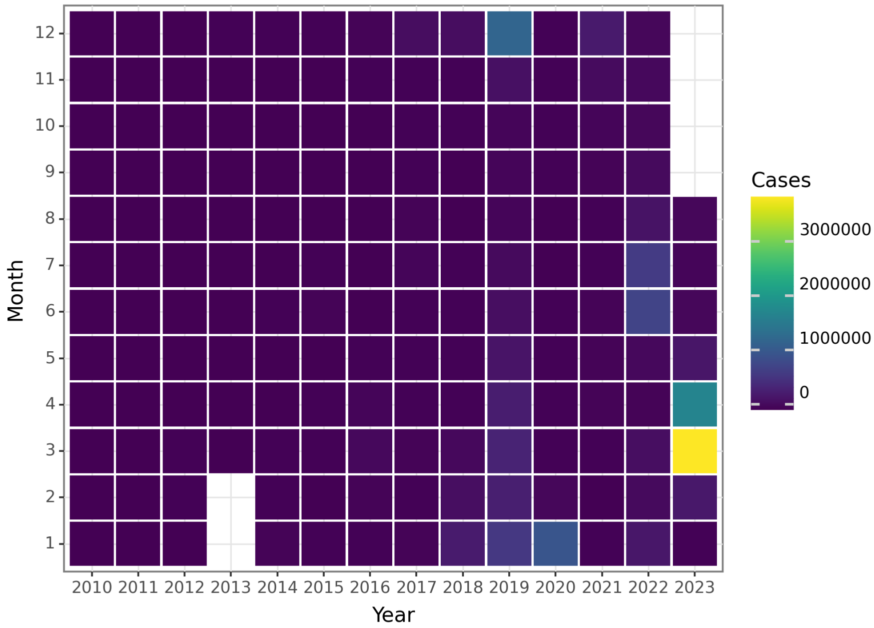

Figure 108: The Change of Influenza Cases before 2023 August

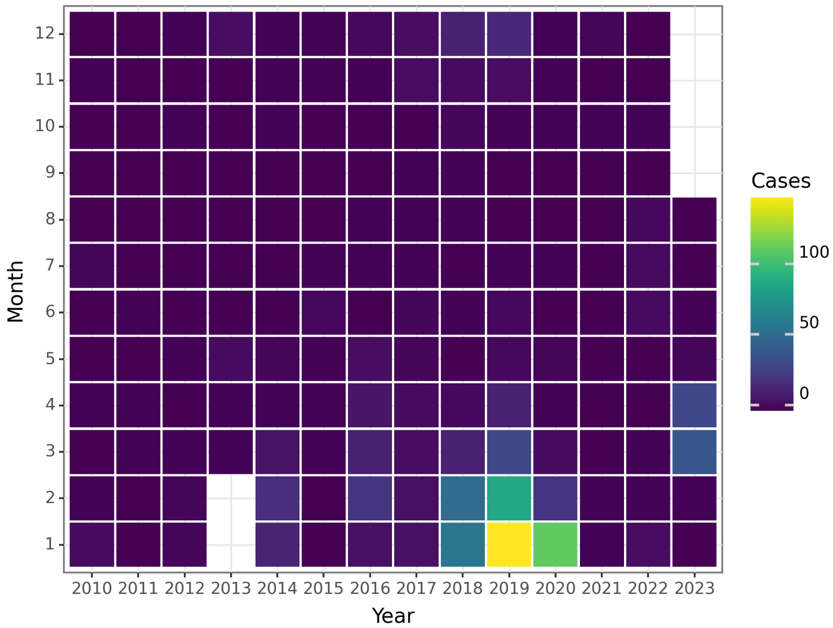

Figure 109: The Change of Influenza Deaths before 2023 August

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.

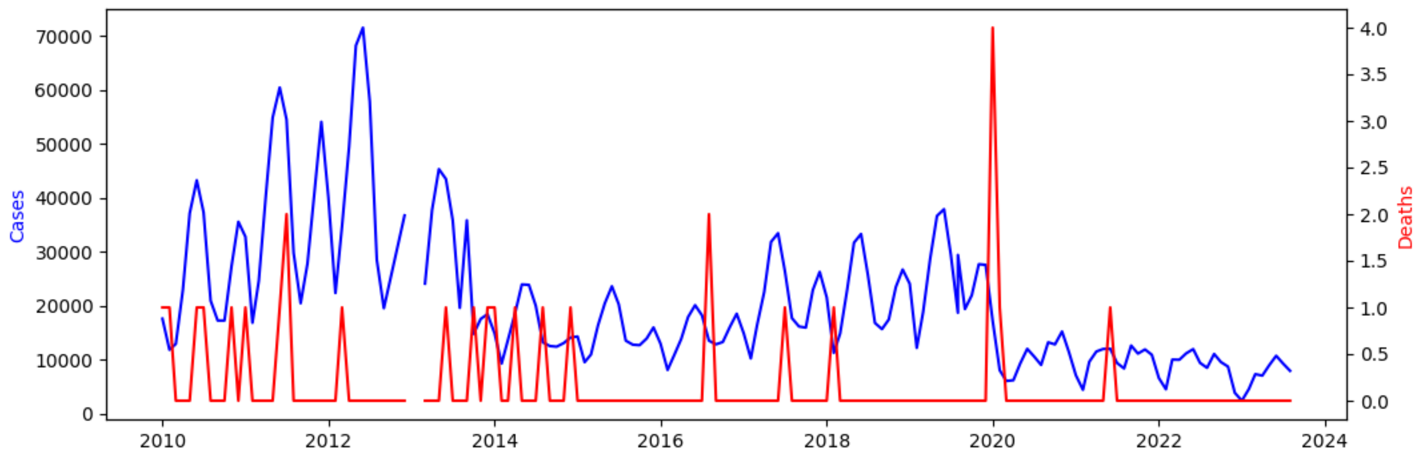

Figure 110: The Change of Mumps Reports before 2023 August

Seasonal Patterns:
A clear seasonal pattern in the number of Mumps cases in mainland China can be observed based on the monthly data. The cases tend to increase during the winter and spring months (December to April) and decrease during the summer and fall months (May to November). This pattern can be attributed to various factors such as changes in population behavior, environmental conditions, and viral transmission dynamics.
Peak and Trough Periods:
Peak periods of Mumps cases occur specifically from December to April, during the winter and spring months. These months witness the highest levels of Mumps cases. Trough periods refer to the months with the lowest number of Mumps cases, which typically fall between May and November.
Overall Trends:
Analyzing the overall trends of Mumps cases in mainland China reveals a general fluctuation in the number of cases over the years. From 2010 to 2012, there is a steady increase in the number of cases, reaching its peak in 2012. After that, the number of cases fluctuates but generally decreases from 2013 to 2016. From 2017 to 2018, there is another increase in cases followed by a decrease in 2019 and 2020. However, it is important to note that the data for the period from 2021 to August 2023 is incomplete and does not illustrate a clear trend.
Discussion:
The seasonal patterns and peak/trough periods of Mumps cases suggest the presence of a cyclic pattern of Mumps incidence in mainland China. The increase in cases during the winter and spring months indicates a higher risk of Mumps transmission during these periods, possibly due to closer contact between individuals in indoor spaces, reduced ventilation, and lower humidity. The decrease in cases during the summer and fall months could be attributed to factors such as warmer weather, improved personal hygiene practices, and increased population immunity.
The overall trend of Mumps cases in mainland China demonstrates fluctuations but generally indicates varying levels of Mumps activity over the years. Factors contributing to these fluctuating trends may include changes in population immunity, vaccination coverage, and variations in virus circulation. However, further analysis and additional data are necessary to comprehend the specific factors influencing these trends.
It is crucial to continue monitoring Mumps cases and implementing preventive measures, including vaccination campaigns, public education on hygiene practices, and surveillance systems to detect outbreaks and prevent further transmission.

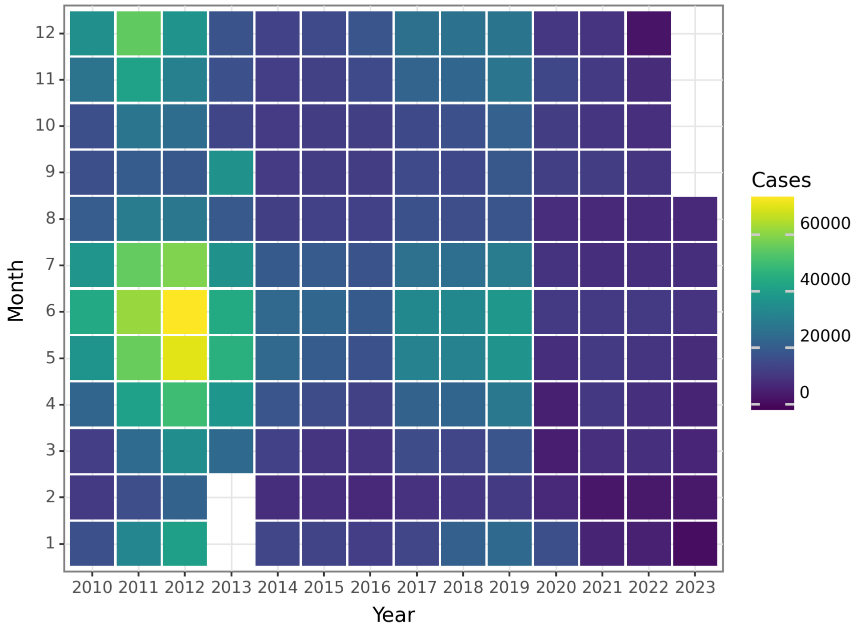

Figure 111: The Change of Mumps Cases before 2023 August

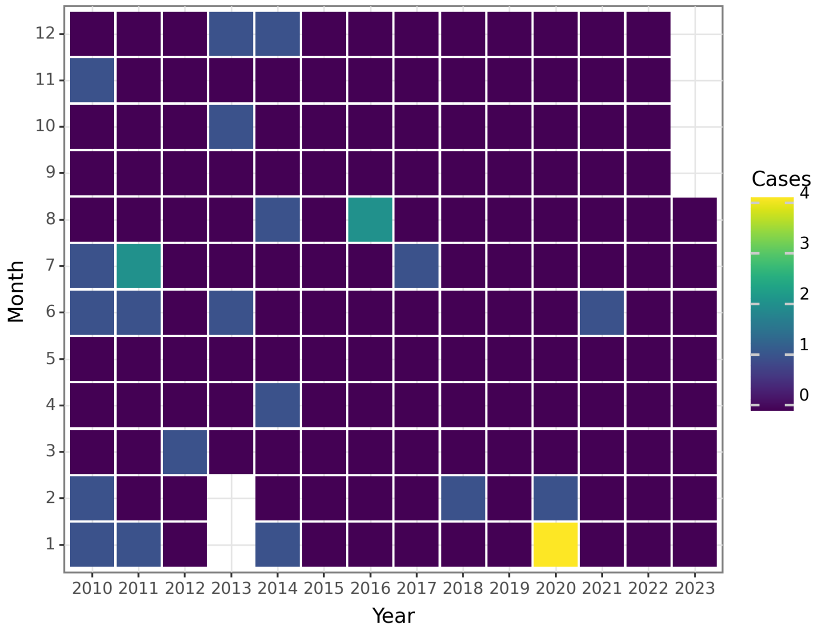

Figure 112: The Change of Mumps Deaths before 2023 August

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.

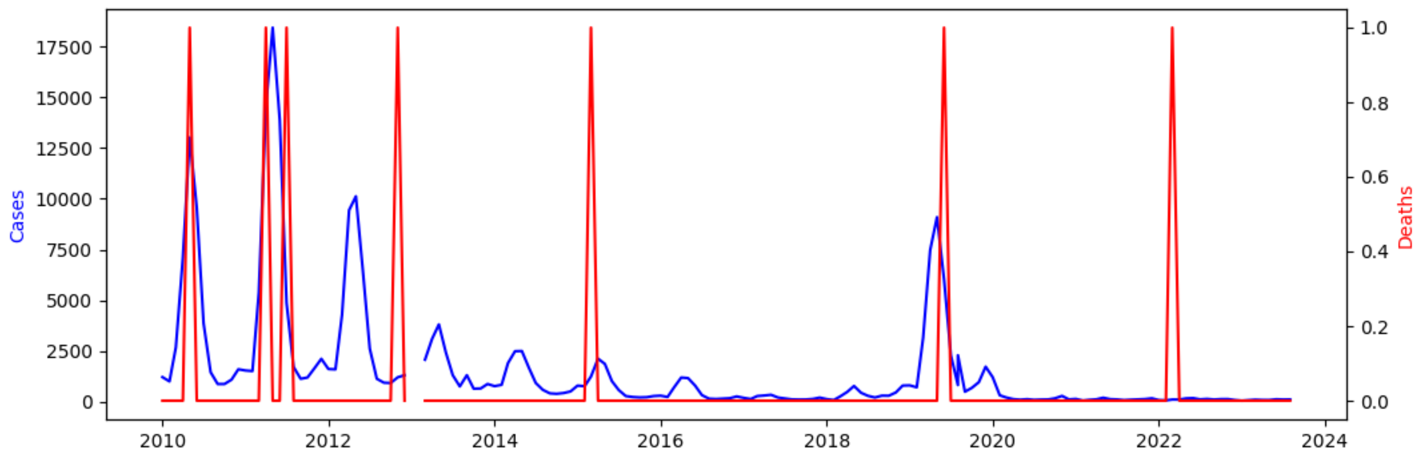

Figure 113: The Change of Rubella Reports before 2023 August

Seasonal Patterns: The data provided indicate a clear seasonal pattern regarding rubella cases in mainland China, demonstrating a peak in the spring and summer months, specifically from April to August, followed by a gradual decline in the fall and winter months.
Peak and Trough Periods: Rubella cases typically peak between April and August in mainland China, with the highest number of cases occurring in May. This period is characterized by a sharp increase in cases, reaching its apex during this season. In contrast, the lowest number of cases occur in winter, particularly in December and January.
Overall Trends: Although there is some variation from year to year, observing the overall trend of rubella cases in mainland China shows a decreasing trend since 2014. This decrease is also reflected in the low number of deaths reported each year.
Discussion: The observed seasonal trend in the spread of rubella is consistent with known transmission dynamics, showing a higher rate of transmission during spring and summer seasons when social interactions increase, and respiratory droplets can easily transmit the virus.
The peak in rubella cases during April to August highlights the importance of preventive measures such as vaccination campaigns, targeted surveillance, and public health education to control the spread of the disease. The decline in cases since 2014 likely reflects successful vaccination programs and improved healthcare infrastructure.
However, despite the decreasing trend, continued monitoring and vaccination coverage are mandatory to prevent potential outbreaks or resurgence. Further studies and analysis are required to investigate underlying factors contributing to the observed seasonal patterns and overall trends of rubella cases in mainland China.

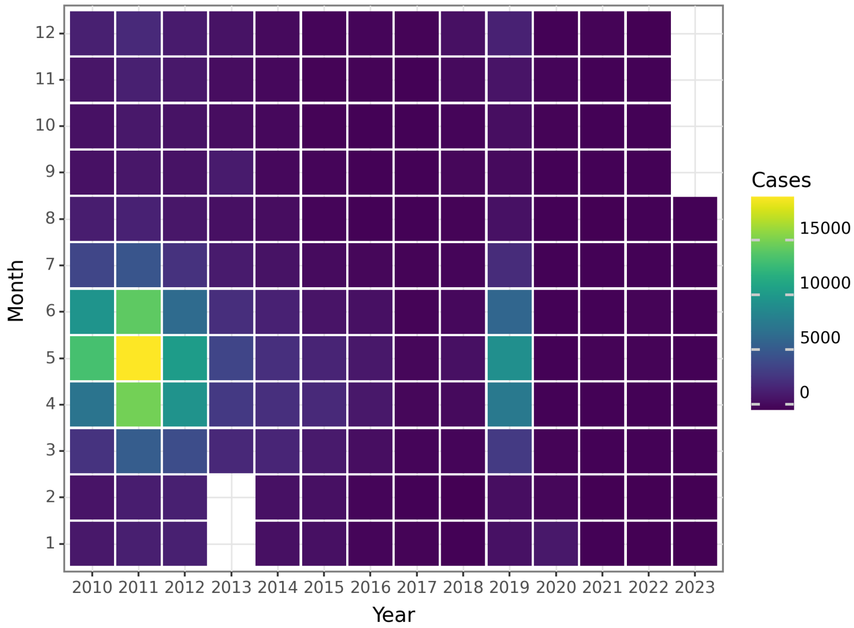

Figure 114: The Change of Rubella Cases before 2023 August

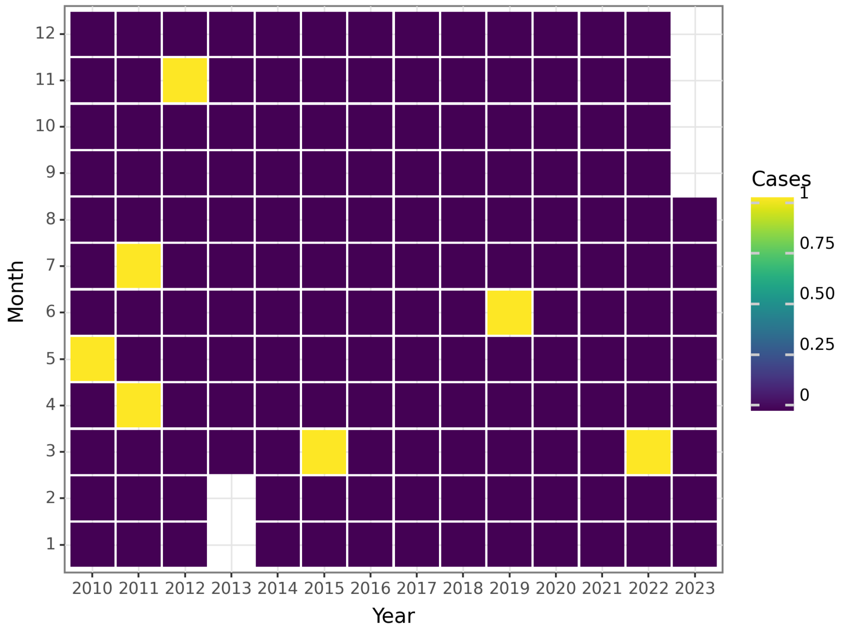

Figure 115: The Change of Rubella Deaths before 2023 August

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.

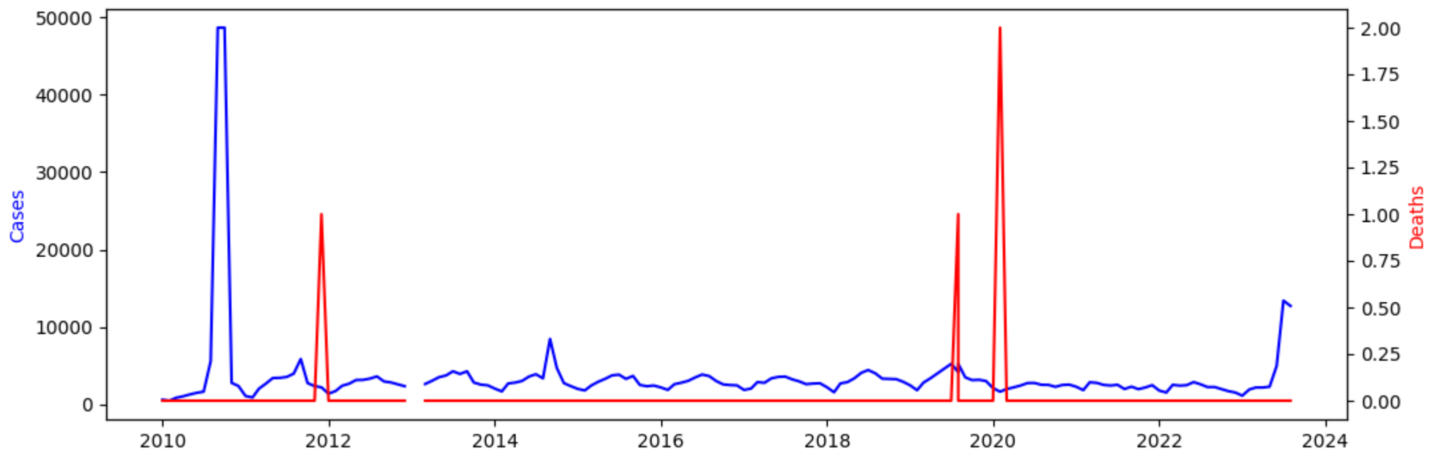

Figure 116: The Change of Acute hemorrhagic conjunctivitis Reports before 2023 August

Seasonal Patterns: Analysis of the available data reveals the existence of a seasonal pattern in the occurrence of Acute Hemorrhagic Conjunctivitis (AHC) cases in mainland China. The number of cases demonstrates an upward trend commencing in January or February, reaching its zenith in August, and subsequently declining towards the end of the year. This pattern recurs in successive years.
Peak and Trough Periods: Consistently, the month of August represents the peak period for AHC cases in mainland China, as indicated by the data. This time frame witnesses the highest number of reported cases. Conversely, the trough period, characterized by the lowest number of cases, varies across different years. In some instances, it transpires in January and February, while in other years, it occurs in December.
Overall Trends: The overall trend concerning AHC cases in mainland China demonstrates a progressive increase over the years. The data suggests that the number of cases remains relatively stable from 2010 to 2012, albeit with some fluctuations. However, a significant surge in the number of cases is observed from 2012 to 2014. Subsequently, a slight decrease is observed in 2015, followed by a gradual increase until 2019. After 2019, the number of cases displays greater fluctuation but generally remains high.
Discussion: The provided data strongly supports the notion of a seasonal pattern in AHC cases in mainland China, with peak periods occurring in August and trough periods observed in January or December. Moreover, the overall trend indicates a consistent increase in the number of cases over time, with a notable surge between 2012 and 2014. Further analysis and investigation are necessary to elucidate the underlying factors contributing to these patterns and trends, including changes in environmental conditions, population dynamics, and preventive measures. Furthermore, it is crucial to consider the influence of public health interventions implemented during specific time periods, as they may have affected the reported number of cases.

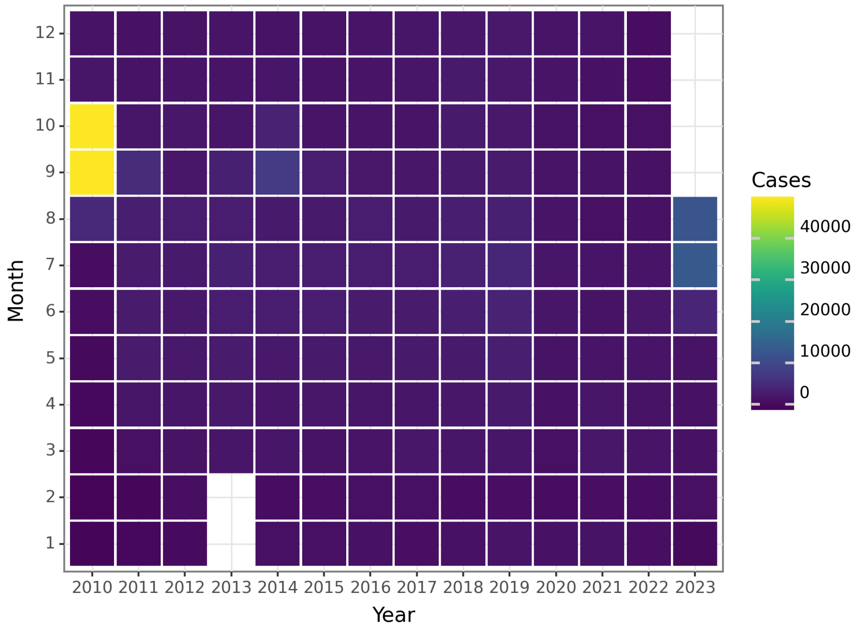

Figure 117: The Change of Acute hemorrhagic conjunctivitis Cases before 2023 August

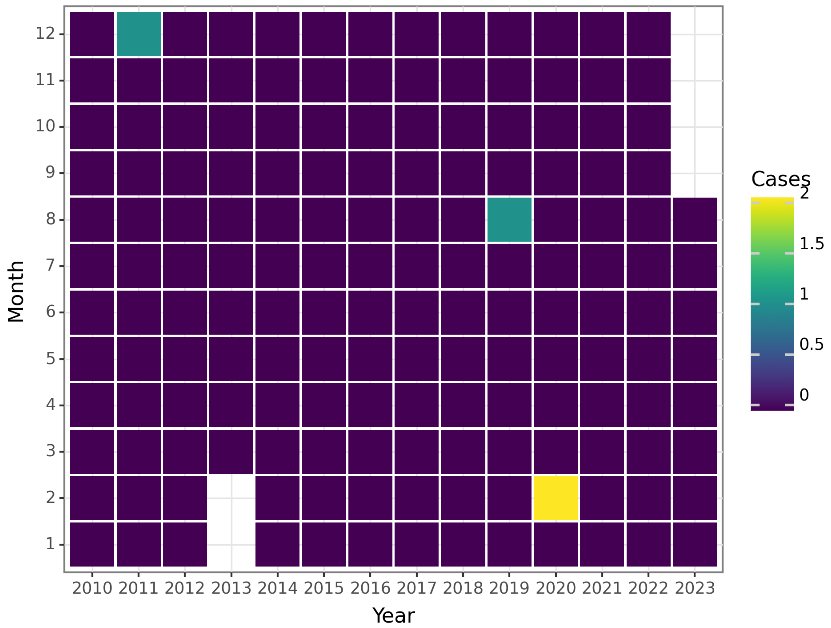

Figure 118: The Change of Acute hemorrhagic conjunctivitis Deaths before 2023 August

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.

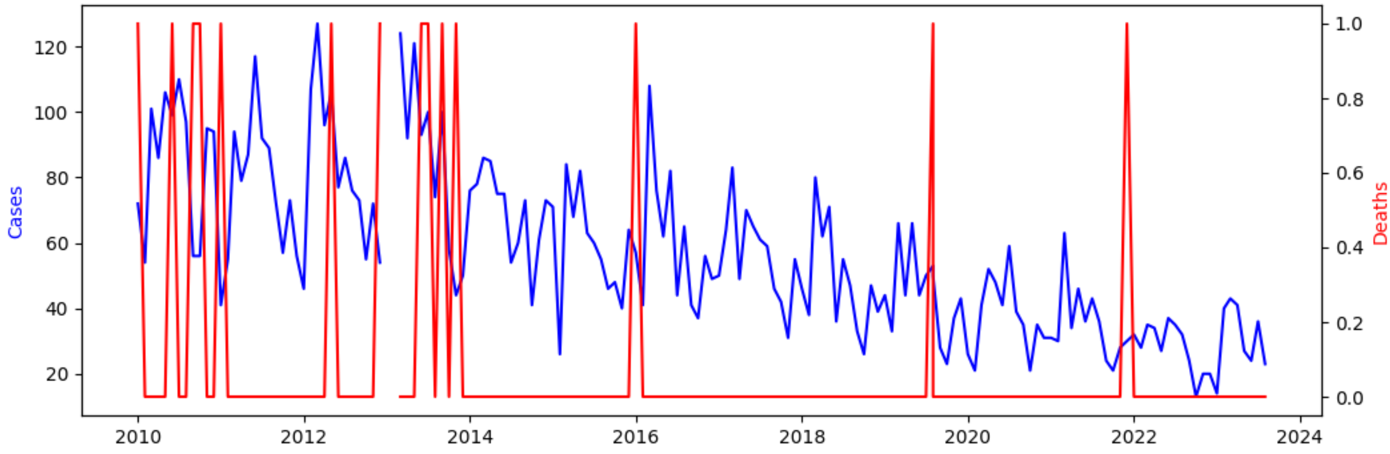

Figure 119: The Change of Leprosy Reports before 2023 August

Seasonal Patterns:
The data provided shows no discernible seasonal pattern in the occurrence of leprosy cases in mainland China. Instead, the number of cases varies from month to month, with no consistent or noticeable seasonal trend.
Peak and Trough Periods:
The peak and trough periods for leprosy cases in mainland China are identifiable by referring to the highest and lowest number of cases recorded in the data. In June of both 2011 and 2012, the highest number of cases was recorded, with 117 and 127 cases, respectively. Conversely, several months, including January and February 2013, reported -10 cases (potentially due to an error or data issue). Additionally, several months from 2020 to 2023 reported 0 cases.
Overall Trends:
A relative stability characterizes the trend in leprosy cases in mainland China based on the data available. While there are fluctuations in the number of cases on a monthly basis, there is no clear upward or downward trend over time. Though there are variances in the number of cases, there is no observable spike or decline in incidence.
Discussion:
The available data suggests that the incidence of leprosy is not strongly influenced by seasonal factors in mainland China. The absence of a clear seasonal pattern indicates this inference.
While leprosy incidence reveals peak periods in June 2011 and June 2012, other factors such as reporting practices or variations in sample collection may be responsible for this trend. Thus, these findings should be interpreted with caution.
Relatively stable incidence rates over time indicate that leprosy cases have remained constant over the period covered by the data. However, it is essential to continue monitoring such rates to identify any emerging trends or changes in incidence. Furthermore, closer analysis and research beyond the provided data are necessary to gain a comprehensive understanding of leprosy epidemiology in mainland China.

Figure 120: The Change of Leprosy Cases before 2023 August

Figure 121: The Change of Leprosy Deaths before 2023 August

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.

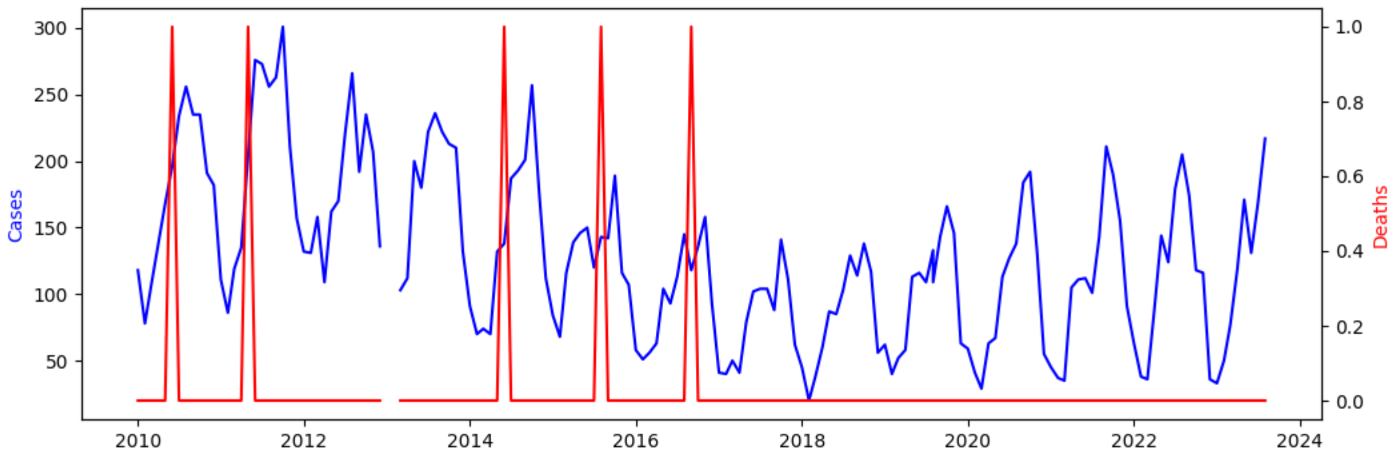

Figure 122: The Change of Typhus Reports before 2023 August

Seasonal Patterns:
Based on the provided data, it is evident that seasonal patterns exist in the occurrence of Typhus in mainland China. The number of reported cases consistently increases during the summer months, with the highest values observed in June, July, and August. This suggests that Typhus transmission is influenced by seasonal factors, such as warmer temperatures and increased outdoor activities during the summer season.
Peak and Trough Periods:
The peak periods for Typhus cases in mainland China are observed during the months of June, July, and August. These months consistently demonstrate the highest number of reported cases throughout the analyzed years. Conversely, the trough periods, characterized by relatively fewer cases, occur during the winter months, specifically in January and February.
Overall Trends:
Analyzing the overall trend of Typhus cases in mainland China reveals a cyclical pattern. The number of cases tends to increase during the summer months, reach a peak, and subsequently decrease during the winter months. However, the data does not exhibit a clear upward or downward trend in Typhus cases over the analyzed years.
Discussion:
The observed seasonal patterns in Typhus cases in mainland China align with the known transmission dynamics of the disease. Typhus is primarily transmitted by fleas present on rodents and other animals, and the conditions during the summer months are more conducive to the thriving of flea populations. Moreover, increased human interaction with outdoor environments during the summer may contribute to higher transmission rates.
The peak periods in June, July, and August likely coincide with heightened flea activity and human exposure to infected fleas. It is noteworthy that the number of reported cases may be influenced by various factors, including surveillance systems, reporting practices, and changes in healthcare-seeking behavior.
Comprehending the seasonal patterns and peak periods of Typhus cases can assist in the development of targeted prevention and control measures. Public health interventions, such as community education on personal hygiene and sanitation, vector control programs, and promotion of rodent control, may be particularly effective during the peak months in reducing the risk of Typhus transmission.
Continued monitoring of Typhus cases in mainland China is crucial to identify any emerging trends or deviations from the observed patterns. This information can guide public health efforts and aid in early detection and response to outbreaks.

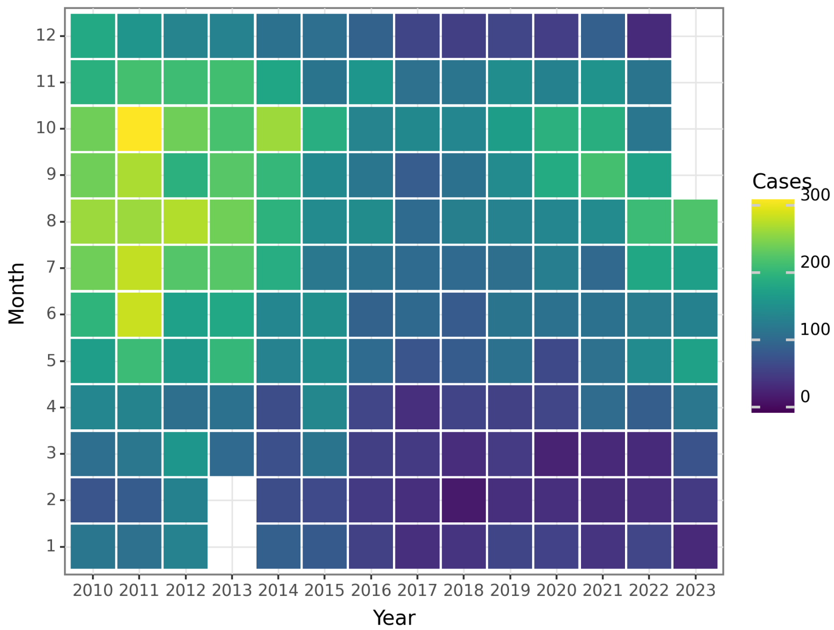

Figure 123: The Change of Typhus Cases before 2023 August

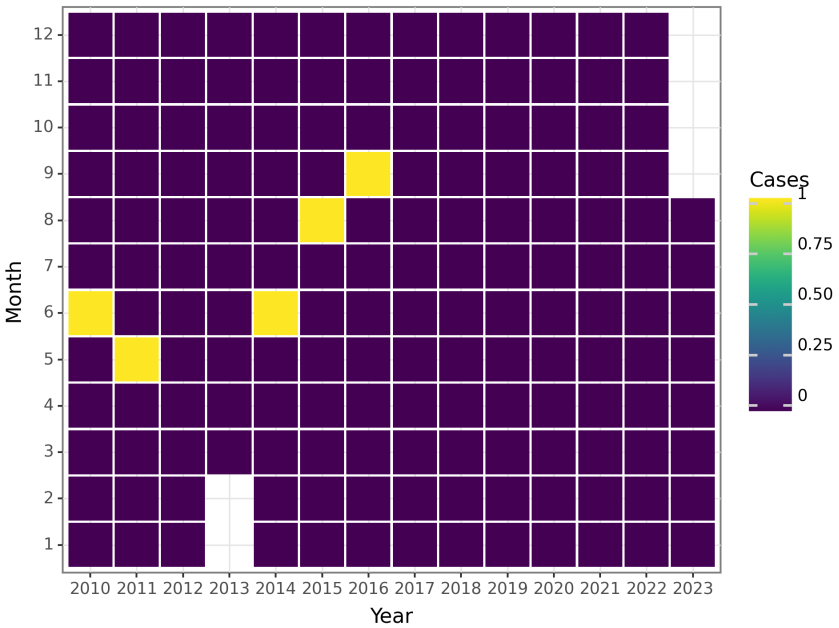

Figure 124: The Change of Typhus Deaths before 2023 August

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.

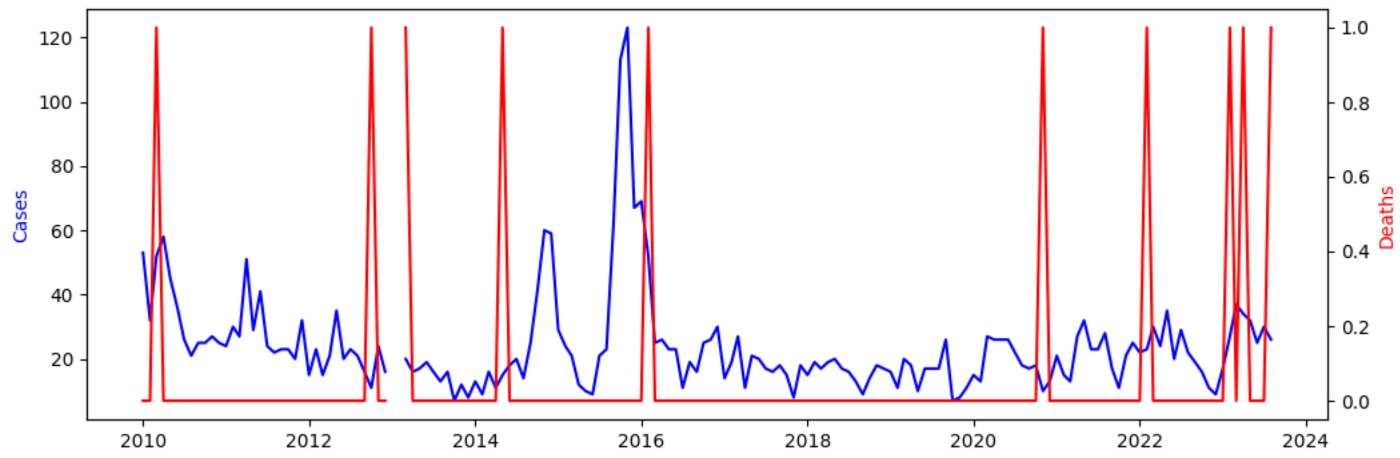

Figure 125: The Change of Kala azar Reports before 2023 August

Seasonal Patterns: The data provided reveals clear seasonal patterns in Kala azar cases in mainland China. There is a significant increase in cases during the summer months, particularly in July and August. From August to September, the number of cases tends to decrease, remaining relatively low during the winter months from December to February. In the spring months, from March to May, there is a slight increase in cases before reaching the peak in the summer.
Peak and Trough Periods: The peak period for Kala azar cases in mainland China consistently occurs during the summer months, specifically in July and August. During this time, the number of cases is at its highest. Conversely, the trough period, characterized by the lowest number of cases, typically falls in the winter months, from December to February.
Overall Trends: The overall trend for Kala azar cases in mainland China demonstrates a clear seasonal pattern, with peaks occurring in the summer months and troughs in the winter months. From March onwards, there is a gradual increase in cases, reaching its peak in July/August, followed by a decline from September onwards. Although there is some variation in the number of cases over the years, certain years have shown higher peaks compared to others.
Discussion: The observed seasonal patterns in Kala azar cases in mainland China can be attributed to various factors, including climatic conditions, vector abundance, and human activities. The summer months provide ideal conditions for the sandflies, which are responsible for transmitting the disease. These months are characterized by higher temperatures and increased humidity, known to support the survival and reproduction of sandflies. Furthermore, factors such as agricultural activities and migration patterns may also contribute to the higher number of cases during the summer months. It is crucial to implement public health interventions during the peak months to control the spread of the disease and reduce the burden of Kala azar in mainland China.

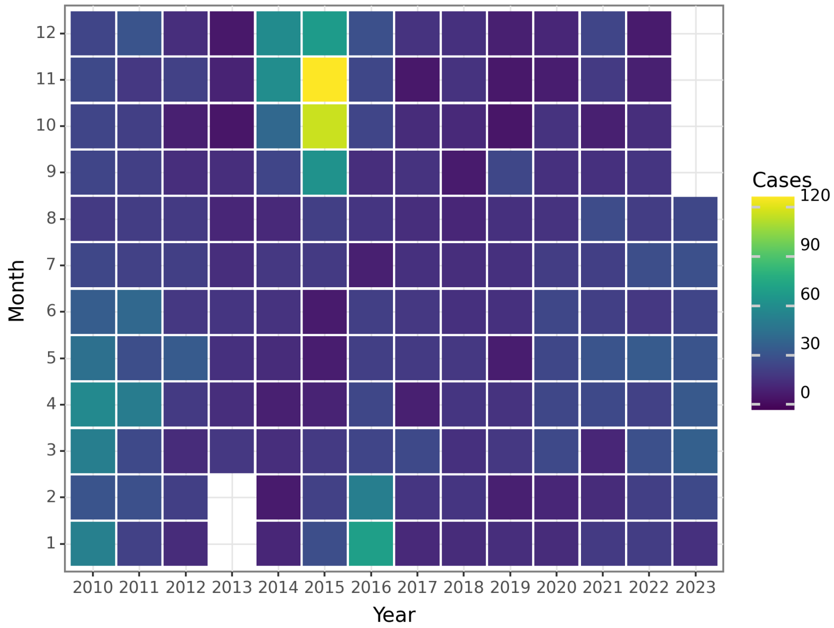

Figure 126: The Change of Kala azar Cases before 2023 August

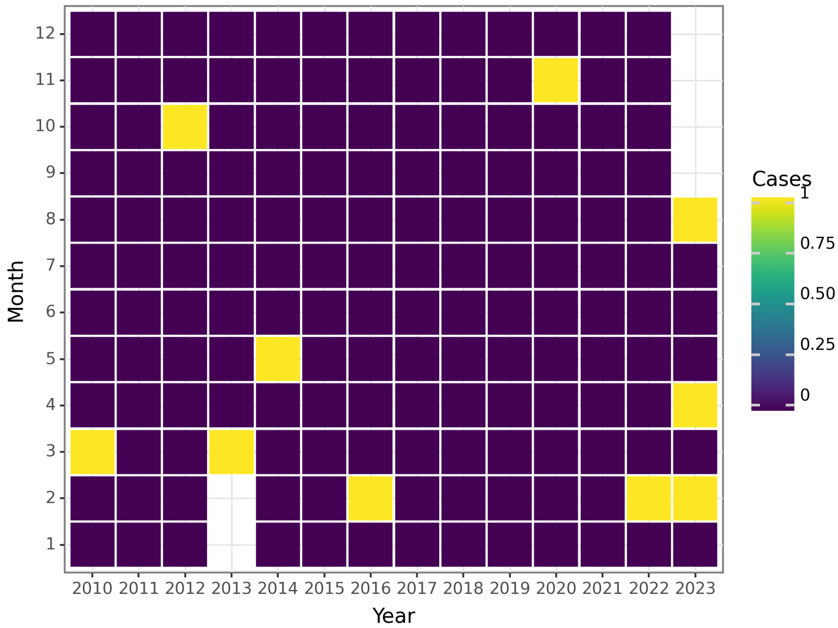

Figure 127: The Change of Kala azar Deaths before 2023 August

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.

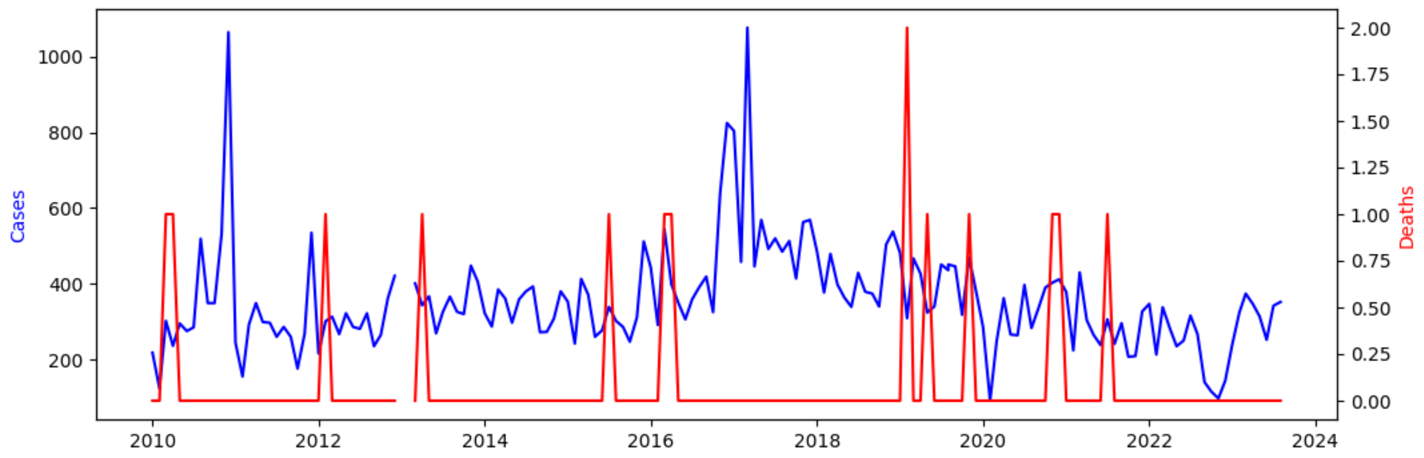

Figure 128: The Change of Echinococcosis Reports before 2023 August

Seasonal Patterns:
The data provided indicates a noticeable seasonal pattern in the prevalence of Echinococcosis cases in mainland China. These cases tend to be most prevalent from November to March, during the winter months, and least prevalent from May to September, during the summer months.
Peak and Trough Periods:
Typically, the peak period for Echinococcosis cases in mainland China is observed between November and December, with the highest number of cases occurring during these months. Conversely, the trough period is seen from May to September, during which the lowest number of cases are reported.
Overall Trends:
Overall, there is a general upward trend in Echinococcosis cases in mainland China from 2010 to 2023, with a few fluctuations in between. The number of cases initially increased from 2010 to 2011, followed by a slight decrease from 2011 to 2014. After 2014, the number of cases began to rise again and continued to increase until 2023.
Discussion:
The observed seasonal patterns in the data suggest that various factors influence the transmission of Echinococcosis in mainland China. The higher number of cases during the winter months may be attributed to environmental factors, such as lower temperatures and increased indoor activities, which increase the risk of transmission. Conversely, the lower number of cases during the summer months may be influenced by factors such as increased outdoor activities and reduced transmission opportunities.
The peak period for Echinococcosis cases in November to December could be linked to multiple factors, including increased contact with infected animals during the hunting and breeding season. Additionally, the trough period from May to September may be associated with decreased interactions with intermediate hosts and improved public health measures during the summer months.
The overall increasing trend in Echinococcosis cases indicates that the disease remains a significant public health concern in mainland China. Efforts should be focused on implementing and strengthening preventive measures, such as health education, improved sanitation, and enhanced surveillance and control measures. This data analysis provides valuable information for policymakers and healthcare professionals to develop and implement effective strategies to reduce the burden of Echinococcosis in mainland China.

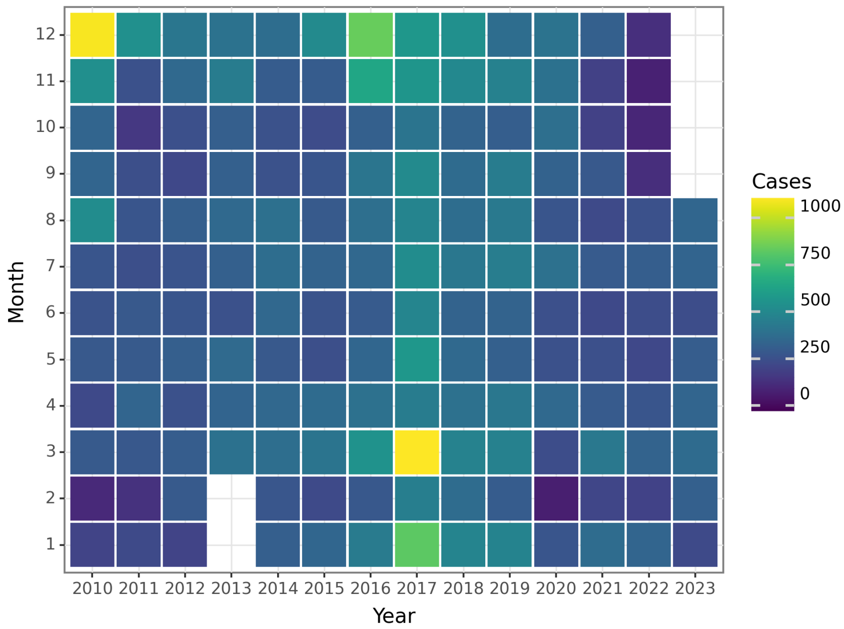

Figure 129: The Change of Echinococcosis Cases before 2023 August

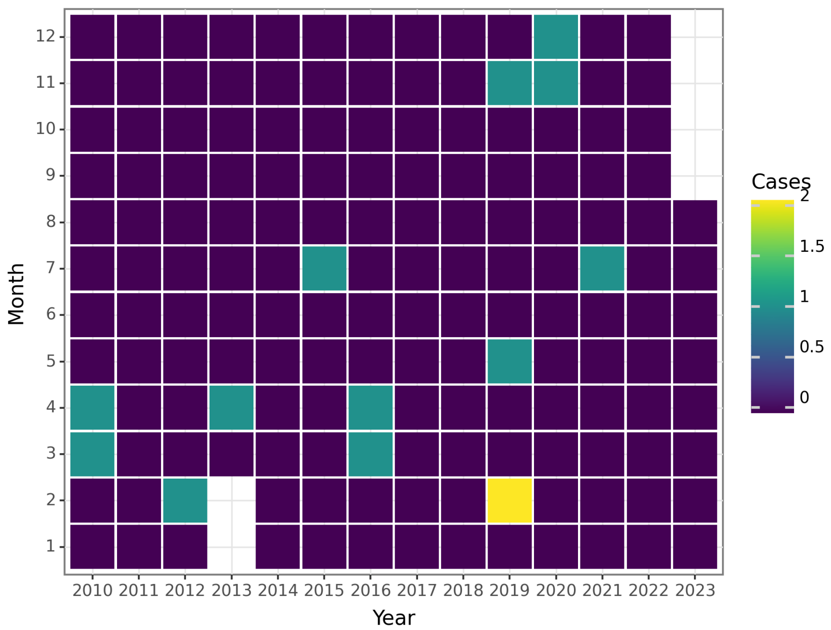

Figure 130: The Change of Echinococcosis Deaths before 2023 August

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.

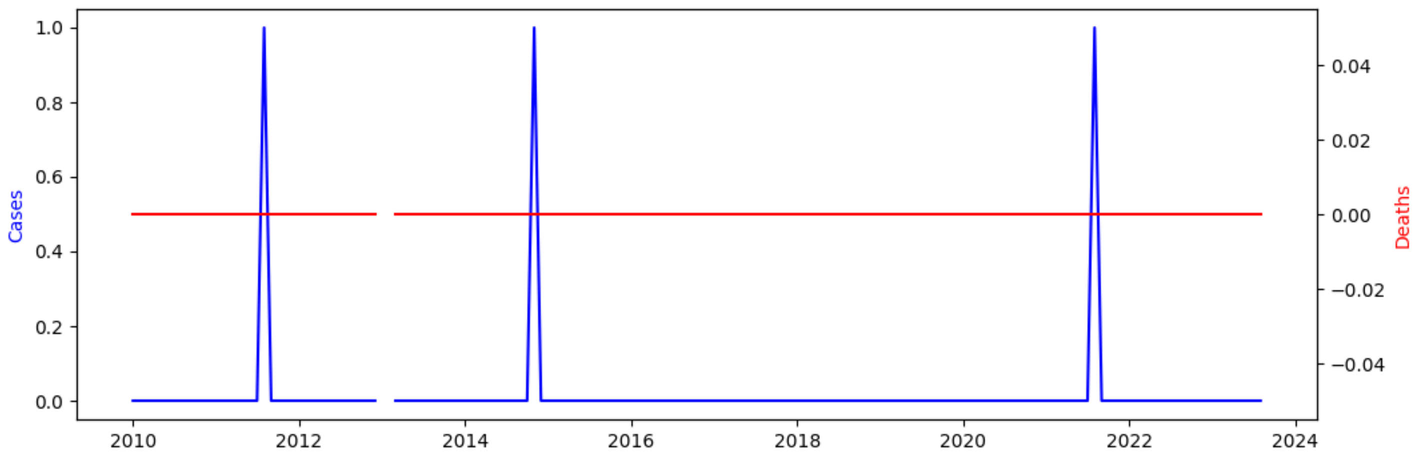

Figure 131: The Change of Filariasis Reports before 2023 August

Seasonal Patterns:
The data provided does not indicate any clear seasonal trends in Filariasis cases and deaths prior to August 2023 in mainland China. The number of cases and deaths remained consistently low throughout the months and years, with occasional, sporadic increases.
Peak and Trough Periods:
Before August 2023, there were no noticeable peak or trough periods in the incidence of Filariasis cases and deaths in mainland China. The data reflects consistently low numbers without any discernible spikes or dips.
Overall Trends:
There is a flat line in the overall trend for Filariasis cases and deaths in mainland China prior to August 2023, with no significant increases or decreases in numbers over time.
Discussion:
Filariasis, a neglected tropical disease caused by parasite infection transmitted through mosquito vectors, has been seemingly well-controlled and contained in mainland China, as evidenced by the consistent low incidence of cases and deaths. However, it is important to note that a lack of reported cases and deaths does not necessarily guarantee an absence of the disease. Unreported or misdiagnosed cases could potentially exist, and continuous surveillance is necessary to gain a comprehensive understanding of the scope of the disease burden in mainland China. Furthermore, efforts need to be sustained and enhanced to bolster existing control measures to prevent potential resurgences of the disease in the future.

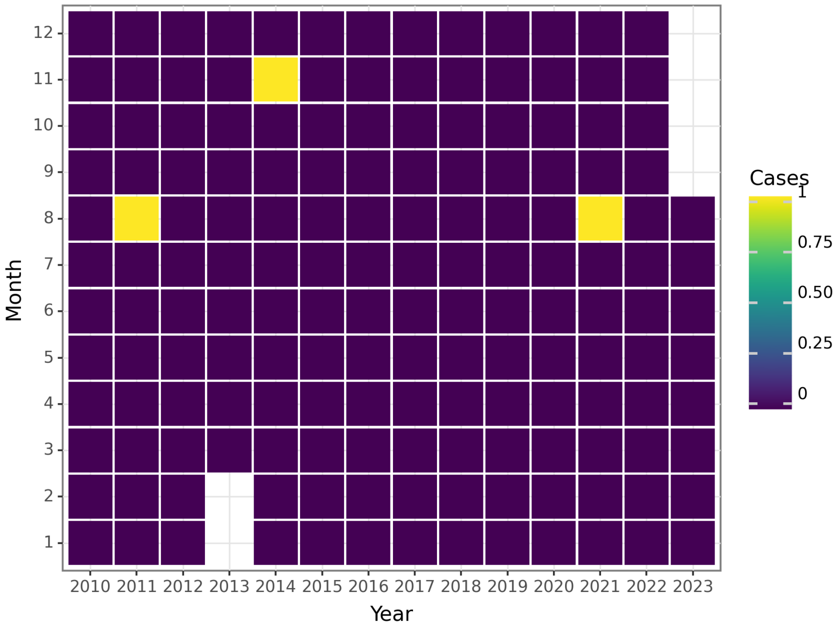

Figure 132: The Change of Filariasis Cases before 2023 August

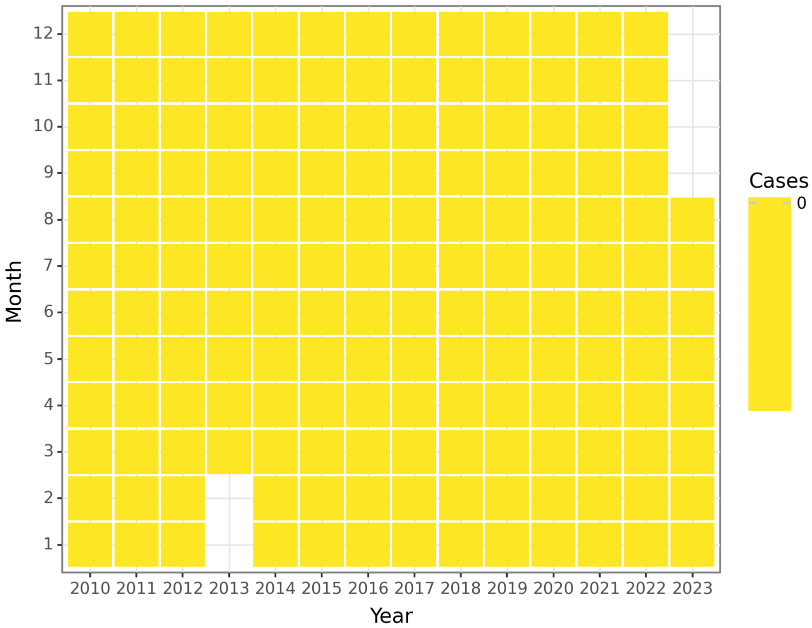

Figure 133: The Change of Filariasis Deaths before 2023 August

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.

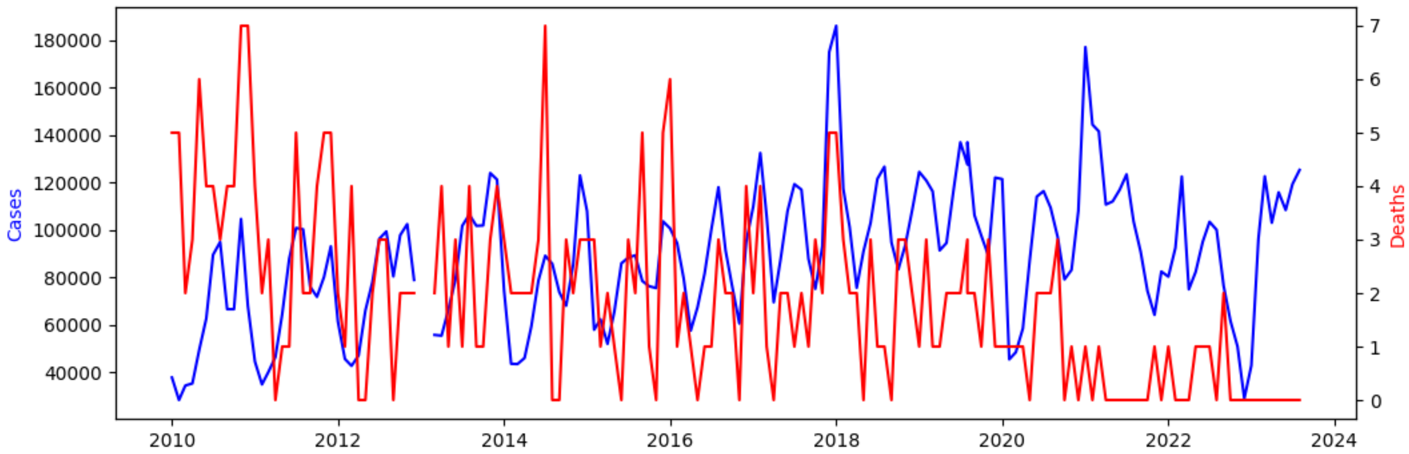

Figure 134: The Change of Infectious diarrhea Reports before 2023 August

Seasonal Patterns:
Based on the provided data, infectious diarrhea in mainland China exhibits a distinct seasonal pattern. Generally, there is an increase in the number of cases during the summer months (June, July, and August), followed by a decline in the fall and winter months. This pattern is evident throughout the years, although there may be some variations in the magnitude of the peaks and troughs.
Peak and Trough Periods:
The peak periods of infectious diarrhea cases in mainland China occur during the summer months, specifically July and August. These months consistently have the highest number of reported cases throughout the years. On the other hand, the trough periods, with the lowest number of cases, are typically observed during the fall and winter months, particularly from November to February.
Overall Trends:
The overall trend of infectious diarrhea in mainland China appears to demonstrate fluctuations over time. There are periods of increasing cases followed by periods of decreasing cases, indicating a cyclic pattern. From 2010 to 2013, the number of cases gradually increased, with some fluctuations within each year. From 2013 to 2016, there was a gradual decline in cases, with occasional fluctuations. Starting from 2017, there has been a combination of increasing and decreasing trends, with some years showing higher numbers of cases compared to previous years.
Discussion:
The seasonal patterns of infectious diarrhea in mainland China are likely influenced by various factors, including climatic conditions, changes in human behavior, and potential shifts in the prevalence of the causative infectious agents. The peak during the summer months could be attributed to factors such as increased outdoor activities, inadequate sanitation practices, and higher temperatures favoring bacterial and viral growth. On the other hand, the decrease in cases during the fall and winter could be due to lower temperatures, reduced outdoor activities, and improved hygiene practices.
It is essential to closely monitor the seasonal patterns and overall trends of infectious diarrhea in mainland China to develop effective prevention and control strategies. These strategies may include promoting proper hygiene practices, improving sanitation facilities, enhancing surveillance systems, and targeting

interventions during peak periods to reduce the burden of the disease. Additionally, further investigation is warranted to understand the specific factors driving the observed trends and to identify potential risk factors that could be addressed to reduce the incidence of infectious diarrhea.

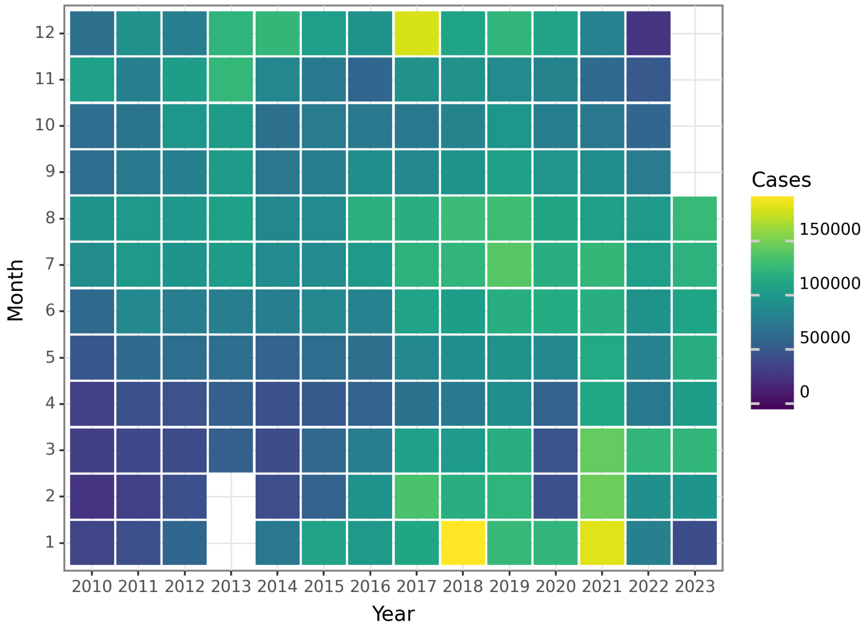

Figure 135: The Change of Infectious diarrhea Cases before 2023 August

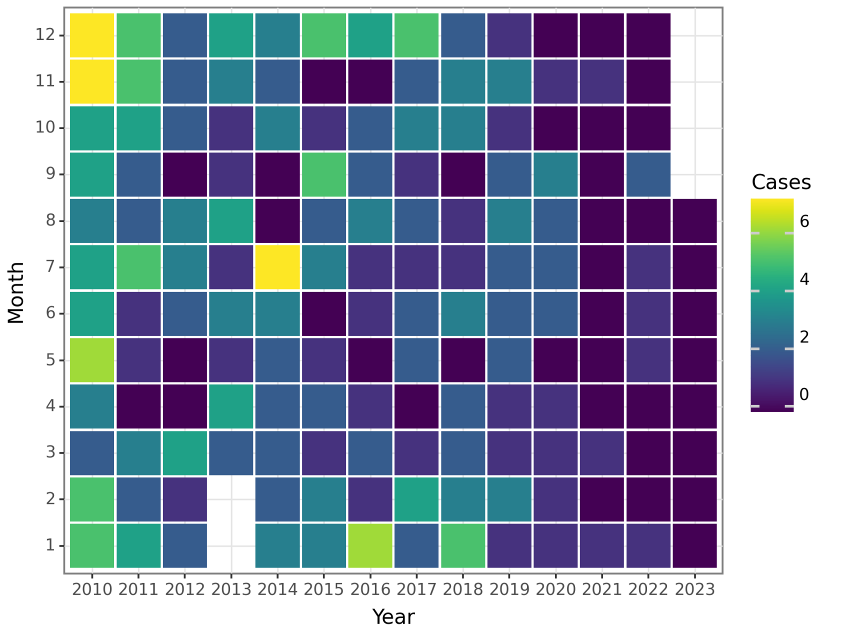

Figure 136: The Change of Infectious diarrhea Deaths before 2023 August

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.

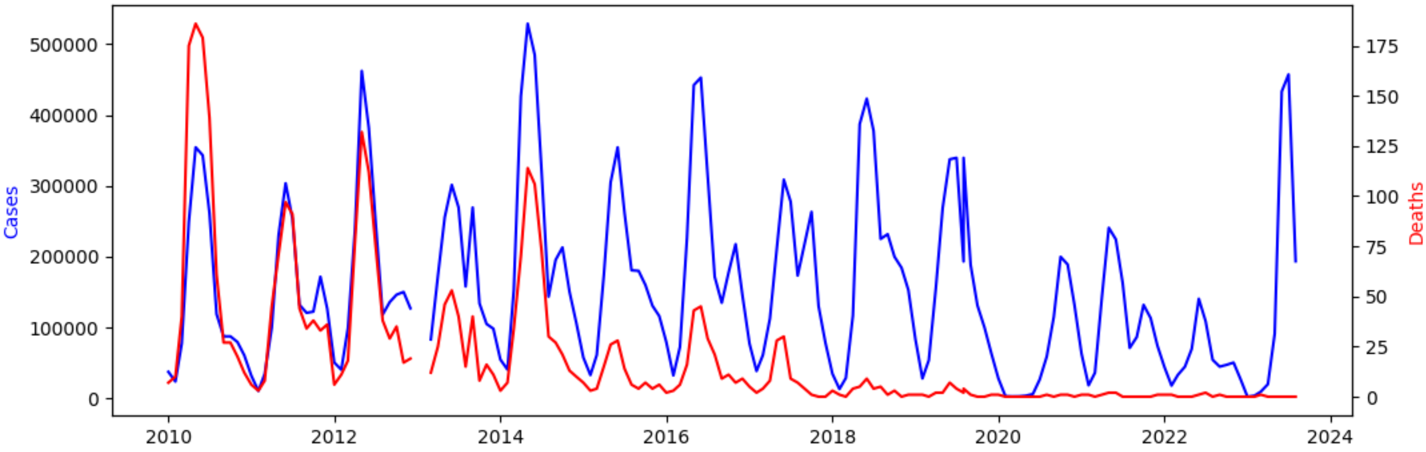

Figure 137: The Change of Hand foot and mouth disease Reports before 2023 August

Seasonal Patterns: Based on the available data, it is evident that Hand, Foot, and Mouth Disease (HFMD) in mainland China exhibits a distinct seasonal pattern. The incidence of cases tends to rise during the spring and summer months and decline during the fall and winter months. This pattern remains consistent throughout the years examined.
Peak and Trough Periods: The peak periods for HFMD cases in mainland China are typically observed from May to August, with the highest number of cases occurring during these months. The trough periods, characterized by the lowest number of cases, are usually seen from December to February.
Overall Trends: Analyzing the overall trends, there is an upward trend in the number of HFMD cases from 2010 to 2015, with a significant surge in cases during this period. However, after 2015, the number of cases appears to stabilize and fluctuate at a relatively high level. The data from 2020 onwards demonstrates a significant decrease in cases, likely attributable to the impact of the COVID-19 pandemic and the associated preventive measures.
Discussion: The seasonal pattern of HFMD in mainland China aligns with the recognized characteristics of the disease. It tends to peak during warmer months when conditions are more conducive to the transmission of enteroviruses that cause the disease. The higher incidence during the summer months can be attributed to increased social interactions, particularly in schools and daycare centers, where the disease is more easily transmitted among young children.
The increasing trend in HFMD cases observed from 2010 to 2015 may be attributable to various factors. These include changes in reporting and surveillance systems, heightened awareness and diagnosis, as well as potential shifts in the dominant circulating strains of enteroviruses during that period.
The decline in cases since 2020 can be largely attributed to the COVID-19 pandemic, which prompted the implementation of stringent public health measures, encompassing social distancing, hand hygiene, and school closures. These measures also helped reduce the transmission of HFMD. It is crucial to monitor future trends and continue implementing preventive measures to further alleviate the burden of HFMD in mainland China.

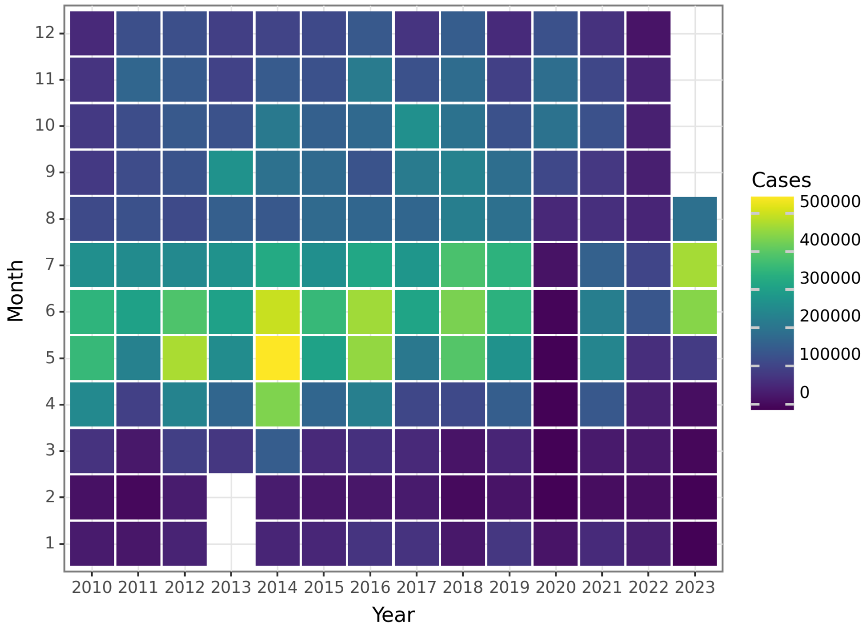

Figure 138: The Change of Hand foot and mouth disease Cases before 2023 August

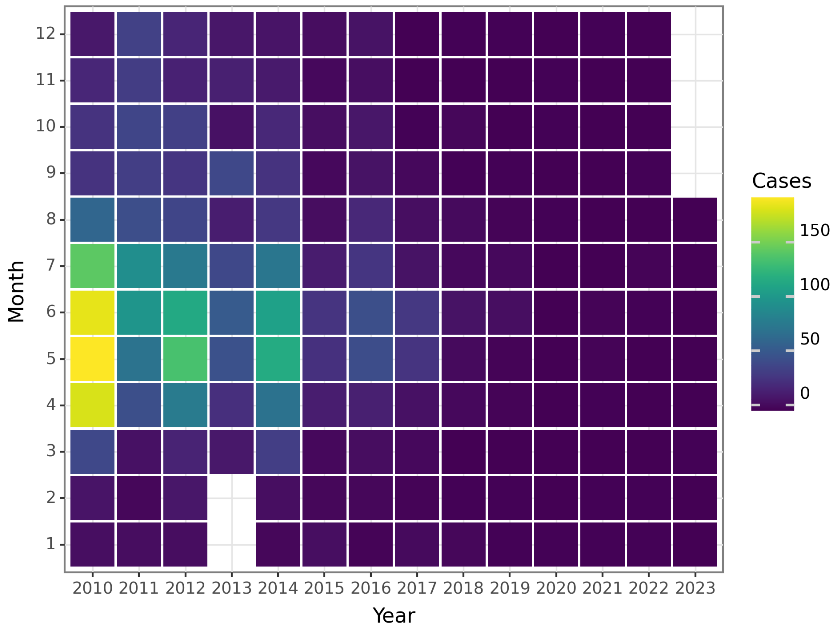

Figure 139: The Change of Hand foot and mouth disease Deaths before 2023 August