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

2023 July

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Monthly Report -- 2023 July

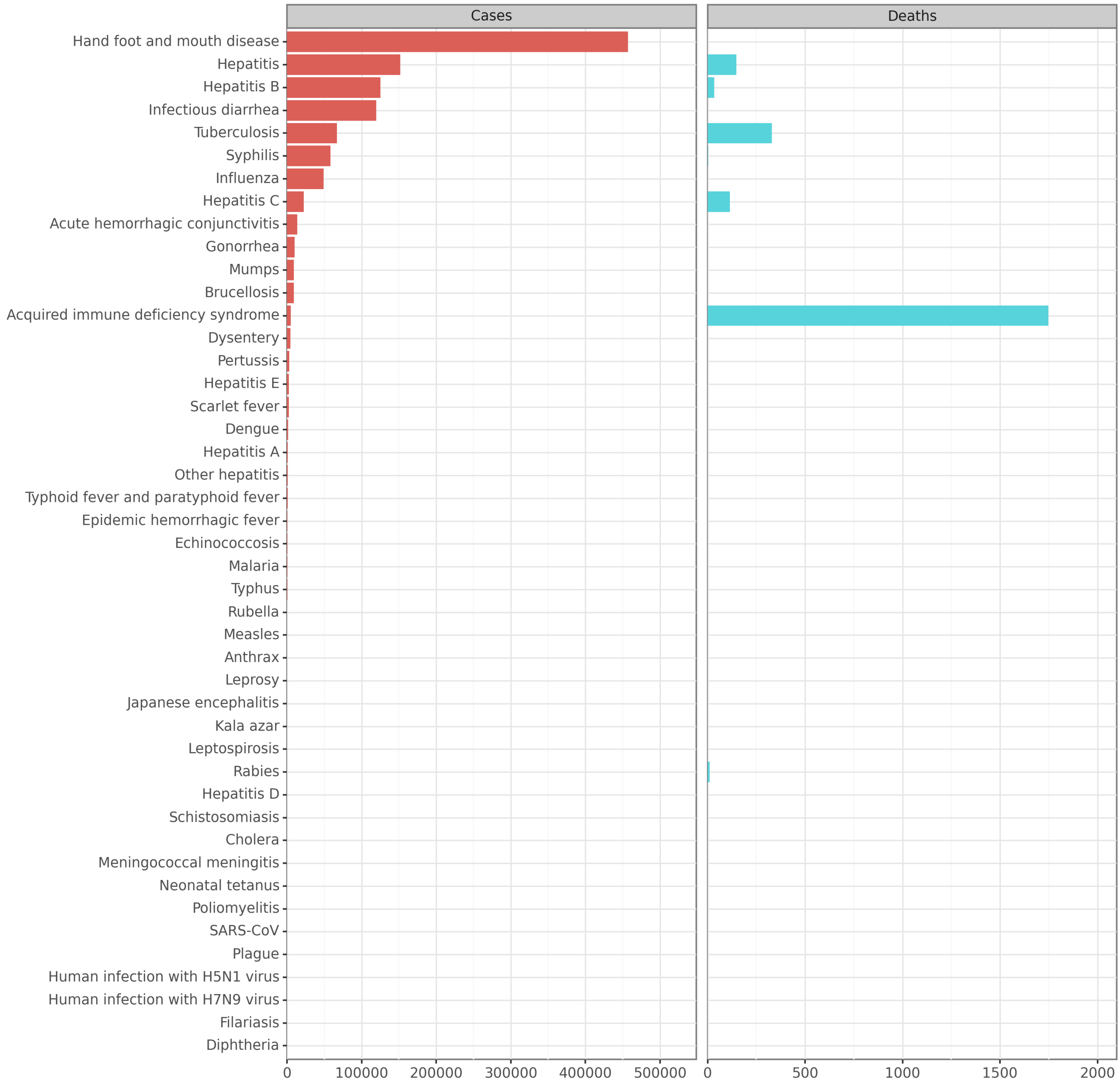

Figure 1: Monthly Notifiable Infectious Diseases Reports in 2023 July

Based on the provided data regarding disease cases and deaths in mainland China in July 2023, various significant patterns and trends can be observed.
1. Increase in Cases: - There has been an increase in cases for several diseases compared to June 2023, including Acute Hemorrhagic Conjunctivitis, Anthrax, Brucellosis, Dengue, Gonorrhea, Hand, Foot and Mouth Disease, Hepatitis, Hepatitis B, Hepatitis C, Hepatitis E, Infectious Diarrhea, Influenza, Japanese Encephalitis, Leprosy, Leptospirosis, Malaria, Meningococcal Meningitis, Pertussis, Rabies, Rubella, Scarlet Fever, Syphilis, Tuberculosis, and Typhus. - Particularly, Dengue, Hand, Foot and Mouth Disease, and Influenza have shown a significant increase compared to July 2022, with Dengue cases experiencing

a staggering rise of 53,366.67%.
2. Decrease in Cases: - The number of cases for certain diseases has decreased compared to June 2023, including Epidemic Hemorrhagic Fever, Hepatitis A, Hepatitis D, Infectious Diarrhea, Mumps, Neonatal Tetanus, Other Hepatitis, Poliomyelitis, Plague, SARS-CoV, Schistosomiasis, and Typhoid Fever and Paratyphoid Fever. - Influenza has also demonstrated a significant decrease compared to July 2022, with cases dropping by 92.47%.
3. Stable Cases: - Diseases such as Cholera, Diphtheria, Filariasis, Human Infection with H5N1 Virus, Human Infection with H7N9 Virus, Measles, and Smallpox have reported either no cases or minimal changes compared to previous months and years.
4. Deaths: - The total number of deaths in July 2023 was 2,244. This represents a slight decline compared to June 2023 (-3.98%), but an overall increase compared to July 2022 (12.03%). - The diseases that reported deaths include Hepatitis, Hepatitis B, Hepatitis C, Infectious Diarrhea, Rabies, Syphilis, Tuberculosis, and Acquired Immune Deficiency Syndrome (AIDS).
Overall, the data reveals a mixed picture regarding disease cases and deaths in mainland China during July 2023. Several diseases have experienced an increase in cases, particularly Dengue, Hand, Foot and Mouth Disease, and Influenza, which have shown a significant rise compared to the previous year. However, some diseases have reported a decrease in cases, while others have remained stable. The number of deaths has slightly declined compared to the previous month but has increased compared to the previous year. These patterns and trends emphasize the significance of continuous surveillance, prevention, and control measures for effectively managing disease outbreaks.

Table 1: Monthly Notifiable Infectious Diseases Cases in 2023 July

Diseases	Cases	Comparison with 2023 June	Comparison with 2022 July
Plague	0	0 (/)	-1 (-100.00%)
Cholera	4	1 (33.33%)	-6 (-60.00%)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	4,854	-905 (-15.71%)	187 (4.01%)
Hepatitis	151,809	17,921 (13.39%)	13,360 (9.65%)
Hepatitis A	1,053	109 (11.55%)	-16 (-1.50%)
Hepatitis B	125,116	15,053 (13.68%)	12,468 (11.07%)
Hepatitis C	22,326	2,662 (13.54%)	459 (2.10%)
Hepatitis D	14	-9 (-39.13%)	-2 (-12.50%)
Hepatitis E	2,620	91 (3.60%)	395 (17.75%)
Other hepatitis	680	15 (2.26%)	56 (8.97%)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	97	8 (8.99%)	5 (5.43%)
Epidemic hemorrhagic fever	344	-21 (-5.75%)	-60 (-14.85%)
Rabies	9	-2 (-18.18%)	-8 (-47.06%)
Japanese encephalitis	33	30 (1000.00%)	20 (153.85%)
Dengue	1,604	1,549 (2816.36%)	1,601 (53366.67%)
Anthrax	51	20 (64.52%)	-13 (-20.31%)
Dysentery	4,684	331 (7.60%)	-371 (-7.34%)
Tuberculosis	66,989	2,201 (3.40%)	-4,433 (-6.21%)

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

Table 2: Monthly Notifiable Infectious Diseases Deaths in 2023 July

Diseases	Deaths	Comparison with 2023 June	Comparison with 2022 July
Plague	0	0 (/)	0 (/)
Cholera	0	0 (/)	0 (/)
SARS-CoV	0	0 (/)	0 (/)
Acquired immune deficiency syndrome	1,749	-43 (-2.40%)	187 (11.97%)
Hepatitis	148	-58 (-28.16%)	105 (244.19%)
Hepatitis A	0	0 (/)	0 (/)
Hepatitis B	34	14 (70.00%)	11 (47.83%)
Hepatitis C	114	-72 (-38.71%)	96 (533.33%)
Hepatitis D	0	0 (/)	0 (/)

Hepatitis E	0	0 (/)	-1 (-100.00%)
Other hepatitis	0	0 (/)	-1 (-100.00%)
Poliomyelitis	0	0 (/)	0 (/)
Human infection with H5N1 virus	0	0 (/)	0 (/)
Measles	0	0 (/)	0 (/)
Epidemic hemorrhagic fever	1	-1 (-50.00%)	-2 (-66.67%)
Rabies	11	2 (22.22%)	-1 (-8.33%)
Japanese encephalitis	0	0 (/)	-1 (-100.00%)
Dengue	0	0 (/)	0 (/)
Anthrax	1	1 (/)	1 (/)
Dysentery	0	0 (/)	0 (/)
Tuberculosis	330	6 (1.85%)	-37 (-10.08%)
Typhoid fever and paratyphoid fever	0	0 (/)	0 (/)
Meningococcal meningitis	0	0 (/)	0 (/)
Pertussis	0	0 (/)	0 (/)
Diphtheria	0	0 (/)	0 (/)
Neonatal tetanus	0	0 (/)	0 (/)
Scarlet fever	0	0 (/)	0 (/)
Brucellosis	1	1 (/)	1 (/)
Gonorrhea	0	0 (/)	-1 (-100.00%)
Syphilis	2	1 (100.00%)	-4 (-66.67%)
Leptospirosis	0	0 (/)	0 (/)
Schistosomiasis	0	0 (/)	0 (/)
Malaria	1	-1 (-50.00%)	0 (0.00%)
Human infection with H7N9 virus	0	0 (/)	0 (/)
Influenza	0	-1 (-100.00%)	-4 (-100.00%)
Mumps	0	0 (/)	0 (/)
Rubella	0	0 (/)	0 (/)
Acute hemorrhagic conjunctivitis	0	0 (/)	0 (/)
Leprosy	0	0 (/)	0 (/)
Typhus	0	0 (/)	0 (/)
Kala azar	0	0 (/)	0 (/)
Echinococcosis	0	0 (/)	0 (/)
Filariasis	0	0 (/)	0 (/)
Infectious diarrhea	0	0 (/)	-1 (-100.00%)
Hand foot and mouth disease	0	0 (/)	-2 (-100.00%)
Total	2,244	-93 (-3.98%)	241 (12.03%)

History Data Analysis2023 July

Total

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

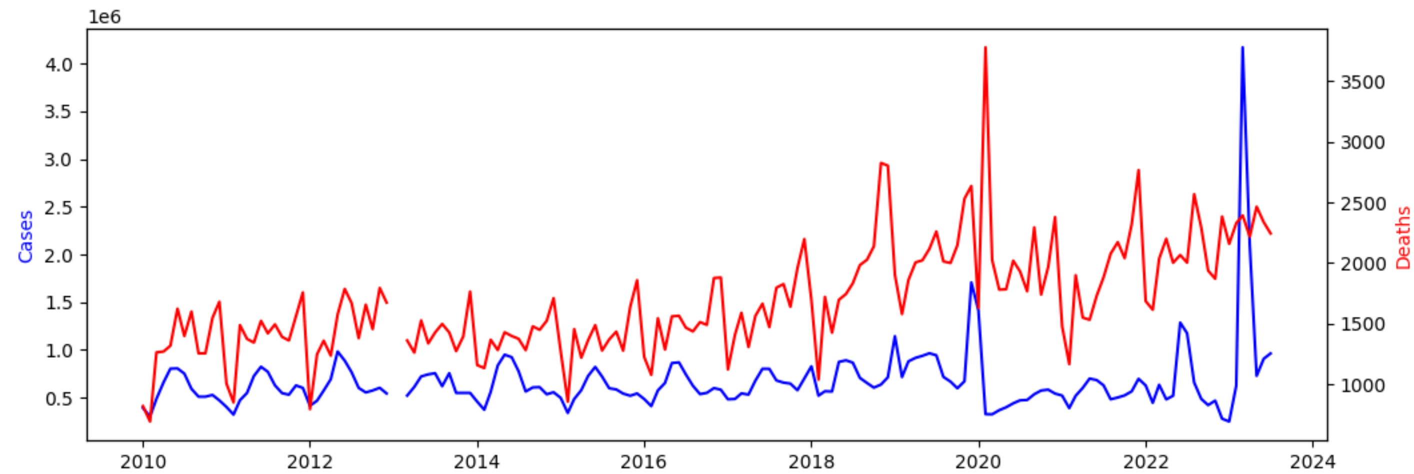

Figure 2: The Change of Total Reports before 2023 July

Seasonal Patterns: Analysis of monthly cases and death data from mainland China prior to July 2023 reveals discernible seasonal patterns. Typically, the numbers of cases and deaths rise during the winter months (December to February) but decrease during the summer months (June to August). Hence, we infer a clear seasonal trend whereby instances of cases and deaths reach their peak during colder months and decline during warmer periods.
Peak and Trough Periods: The data indicates that winter months, especially January and February, represent peak periods for cases, as evidenced by greater case numbers than during other months. Conversely, the summer months, notably June, July, and August, typically have lower case numbers and constitute trough periods.
Demonstrating a similar pattern, peak periods for deaths also occur during winter months, particularly in January and February. Alternatively, summer months such as July and August have the lowest reported deaths.
Overall Trends: Data analysis reveals increasing cases and deaths from 2010 until July 2023. Despite monthly fluctuations, an overall rising trend in cases and deaths is evidenced. Contributing factors may include population growth, adjustments in healthcare infrastructure, changes in reporting and surveillance systems, as well as prevailing disease prevalence.
Discussion: The provided data highlights clear seasonal trends such that the number of cases and deaths peak during winter months and trough in summer. This pattern is common among respiratory diseases and infectious diseases more broadly. Cold weather and a tendency for people to gather indoors during winter may contribute to heightened disease transmission.

Moreover, an overall increasing trend in cases and deaths demonstrates a need for sustained vigilance in controlling and mitigating diseases. Implementing interventions during peak periods can lessen the impact on the healthcare system and public health.
However, the data provided lacks information regarding specific diseases and population size, which may limit interpretation of the findings. Hence, more comprehensive analysis and consideration of various variables would aid in better understanding of observed patterns and trends.

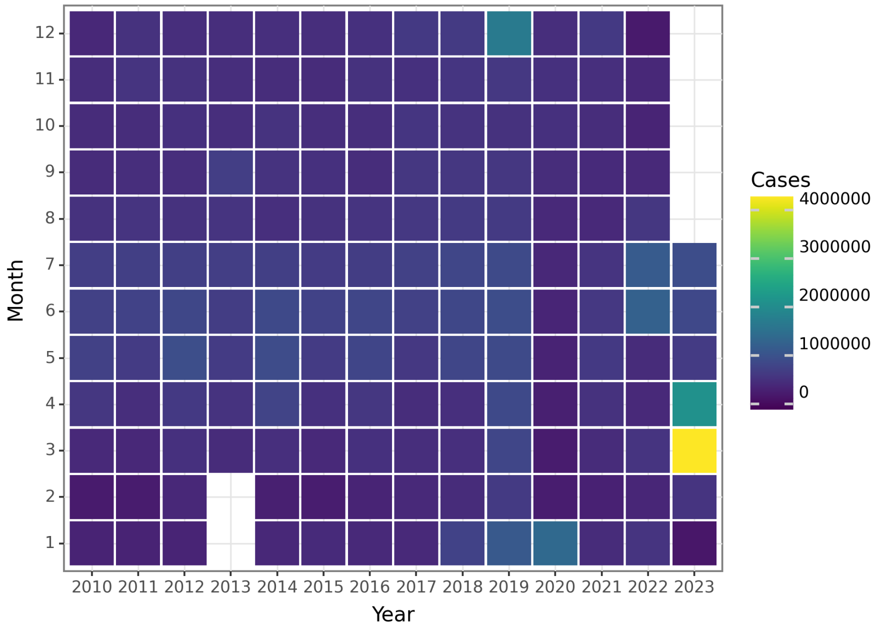

Figure 3: The Change of Total Cases before 2023 July

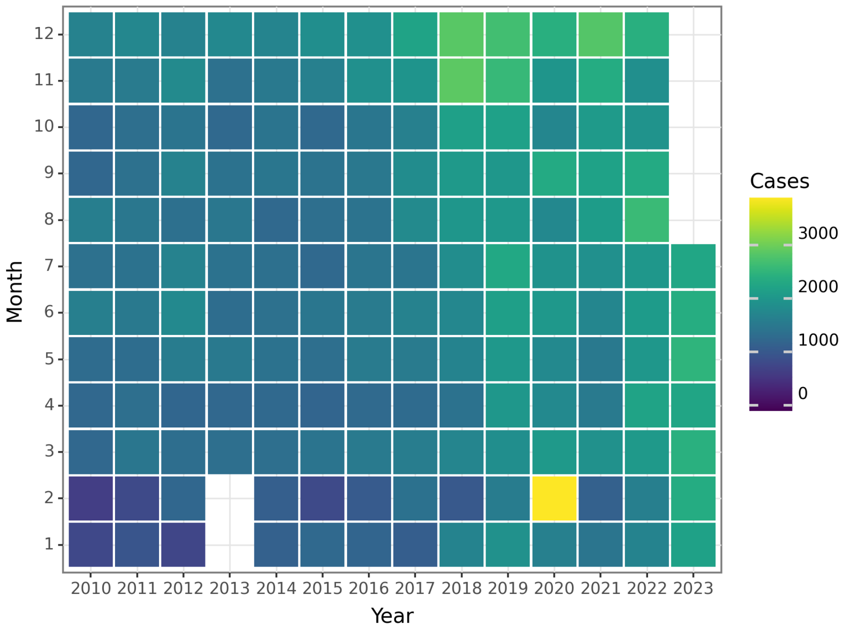

Figure 4: The Change of Total Deaths before 2023 July

Plague

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

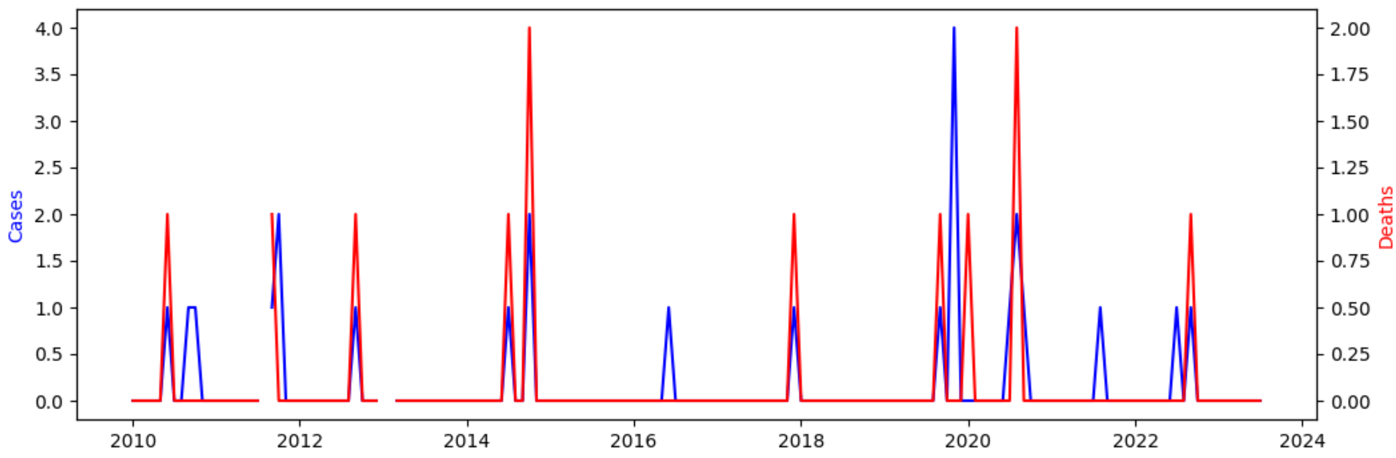

Figure 5: The Change of Plague Reports before 2023 July

Seasonal Variations in Plague Cases and Deaths in Mainland China: The data provided on plague cases and deaths in mainland China before July 2023 reveals there are no discernible seasonal patterns. The number of cases and deaths varies over the years without any consistent patterns across the months or seasons. This absence of clear seasonal patterns makes it difficult to identify peak and trough periods for the occurrence of plague in mainland China.
Trends Observed: The data indicates a generally low and sporadic incidence of plague cases and deaths in mainland China. There are periods where no cases or deaths were reported, which suggests a relatively low disease burden in the region. However, occasional spikes in cases and deaths have occurred. These are not consistent enough to determine an overall increasing or decreasing trend.
Discussion: Limited data and a specific time frame covered in the study require a cautious interpretation of the results. Furthermore, a comprehensive understanding of the epidemiology of plague in mainland China would demand further analyses of other factors like population density, climate, and public health interventions.
Conclusion: Sustained monitoring and surveillance of plague cases and deaths are crucial to enable prompt and effective responses to future outbreaks. The available data indicates a low overall burden of plague with sporadic outbreaks in mainland China.

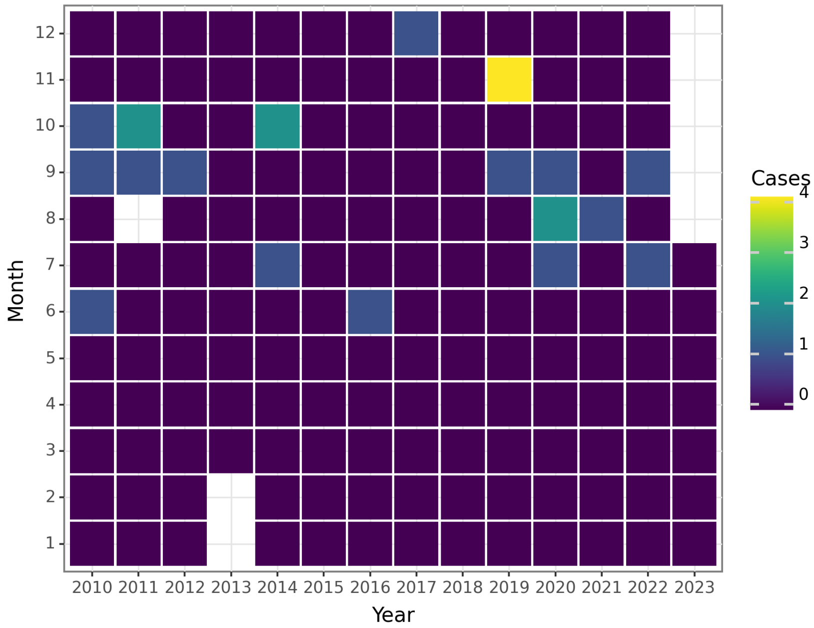

Figure 6: The Change of Plague Cases before 2023 July

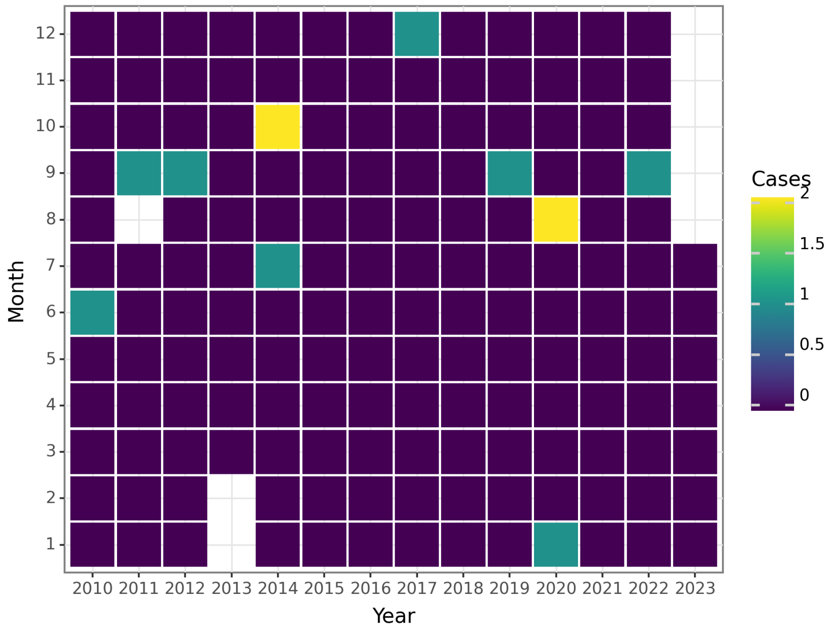

Figure 7: The Change of Plague Deaths before 2023 July

Cholera

Cholera is an acute diarrheal disease caused by the bacterium Vibrio cholerae, and it has been a longstanding public health concern worldwide, particularly in regions with poor sanitation and limited access to clean water. The epidemiology of cholera is characterized by periodic outbreaks and endemicity in specific regions.
Historically, cholera has been documented as a disease dating back to ancient times. However, it was not until the 19th century that the connection between contaminated water and cholera transmission was discovered. In 1854, John Snow, an English physician, identified a specific well as the source of a cholera outbreak in London, providing strong evidence for the waterborne transmission of the disease.
Currently, cholera is endemic in many parts of the world, with periodic outbreaks occurring. According to the World Health Organization (WHO), an estimated 1.3 to 4.0 million cholera cases and 21,000 to 143,000 deaths occur globally each year. However, these numbers are likely underestimated due to underreporting and limited surveillance in some countries.
The primary mode of transmission for cholera is through the ingestion of water or food contaminated with the feces of an infected individual. The bacterium Vibrio cholerae is commonly found in water sources contaminated with human feces, and it can survive in aquatic environments. Consuming uncooked or undercooked seafood from contaminated waters can also transmit the disease. Person-to-person transmission is rare but can occur in densely populated areas with poor sanitation.
Cholera affects individuals of all ages and genders, but certain populations are more vulnerable. This includes individuals living in poverty with limited access to clean water and sanitation facilities. Refugee camps, slums, and overcrowded areas with poor hygiene practices are particularly at high risk. Additionally, individuals with compromised immune systems, such as malnourished individuals or those with other underlying medical conditions, may be more susceptible to severe cholera infections.
Several risk factors contribute to the transmission of cholera. Poor sanitation, lack of clean water, and inadequate sanitation facilities are significant risk factors. Improper handwashing and hygiene practices also contribute to disease transmission. Climate-related factors, such as heavy rainfall and flooding, can exacerbate the spread of cholera by contaminating water sources. Furthermore, population displacement, poor healthcare infrastructure, and limited access to quality healthcare services can hinder prevention and control measures.
Cholera has a greater impact on regions with limited resources and infrastructure to control the disease. Sub-Saharan Africa, parts of Asia (including Bangladesh and India), and Haiti in the Americas have experienced significant cholera outbreaks in recent years. Additionally, during humanitarian crises, such as natural disasters or armed conflicts, the risk of cholera outbreaks increases due to disrupted water and sanitation systems.
The prevalence rates of cholera can vary across regions and populations. In high-risk areas, cholera can become endemic, with frequent outbreaks and ongoing transmission. For example, in parts of sub-Saharan Africa and Asia, cholera is endemic and occurs seasonally. These regions also face higher rates of severe cholera infections and associated mortality.
Demographically, cholera affects all age groups, but children under five years old are particularly vulnerable. This vulnerability is partly due to their weaker immune systems and increased susceptibility to complications related to dehydration. During outbreaks, cholera disproportionately affects marginalized and vulnerable populations, including those living in poverty and in areas with limited access to healthcare.
In conclusion, cholera remains a significant public health concern globally, with periodic outbreaks and endemicity in specific regions. Poor sanitation, inadequate access to clean water, and limited healthcare infrastructure are major risk factors associated with cholera transmission. The impact of cholera varies across different regions and populations, with higher prevalence rates and severe outcomes observed in areas with limited resources and infrastructure to control the disease. Efforts to improve sanitation, access to clean water, and promote hygiene practices are crucial for preventing and controlling cholera.

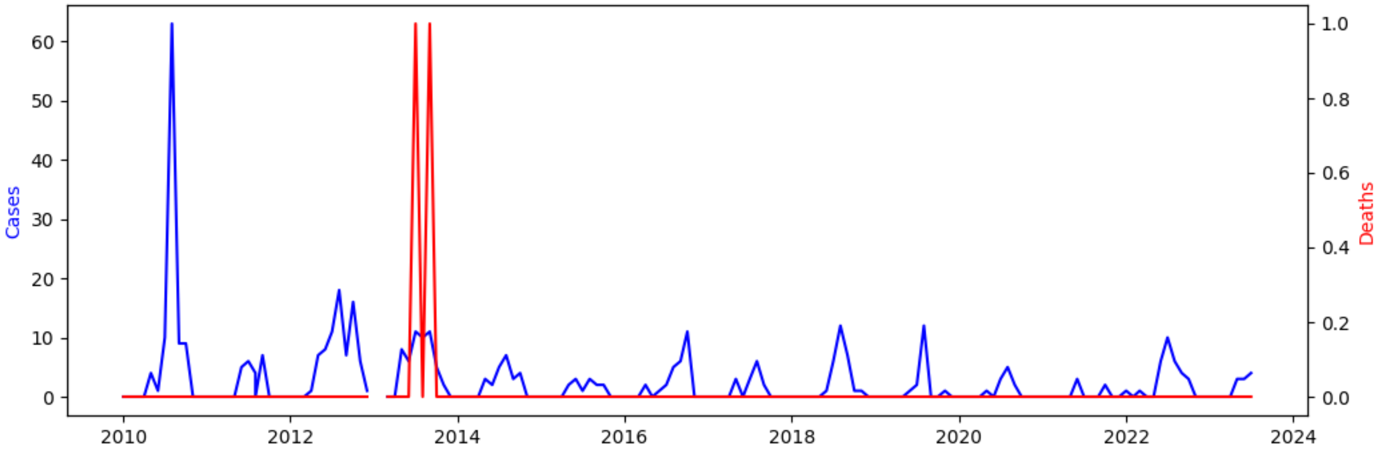

Figure 8: The Change of Cholera Reports before 2023 July

Seasonal Patterns:
Based on the data, there is a clear seasonal pattern for cholera cases in mainland China. Typically, the number of cases is low during the winter months (January to March) and gradually increases in the summer. The peak of cholera cases tends to occur in July and August. After the peak, the number of cases starts to decline, reaching its lowest point in December. This pattern consistently repeats itself over the years, indicating a seasonal trend in cholera transmission.
Peak and Trough Periods:
Cholera cases in mainland China peak during July and August, with the highest number of cases reported during these months. Conversely, the lowest number of reported cholera cases occurs in December. These peak and trough periods are consistent across the years analyzed in the data.
Overall Trends:
Analyzing the overall trends reveals a fluctuating pattern in the number of cholera cases in mainland China. While there are periods of significant increases in cases, there are also periods with very low or even zero reported cases. Overall, there is no apparent upward or downward trend in the number of cholera cases over the analyzed period.
Discussion:
The observed seasonal pattern suggests that environmental or climatic factors may be influencing the transmission of cholera in mainland China. The increase in cases during the summer months could be attributed to factors such as higher temperatures, increased rainfall, or changes in water quality and sanitation practices. These factors may create favorable conditions for the growth and spread of cholera bacteria, leading to a higher number of infections.
To better understand and control the spread of cholera in mainland China, further investigations should be conducted to identify the specific factors contributing to the observed seasonal patterns. This could include studying the impact of temperature, rainfall, water sources, and sanitation practices on cholera transmission. By understanding these factors, public health interventions can be implemented to target high-risk periods and mitigate the transmission of cholera in the country.

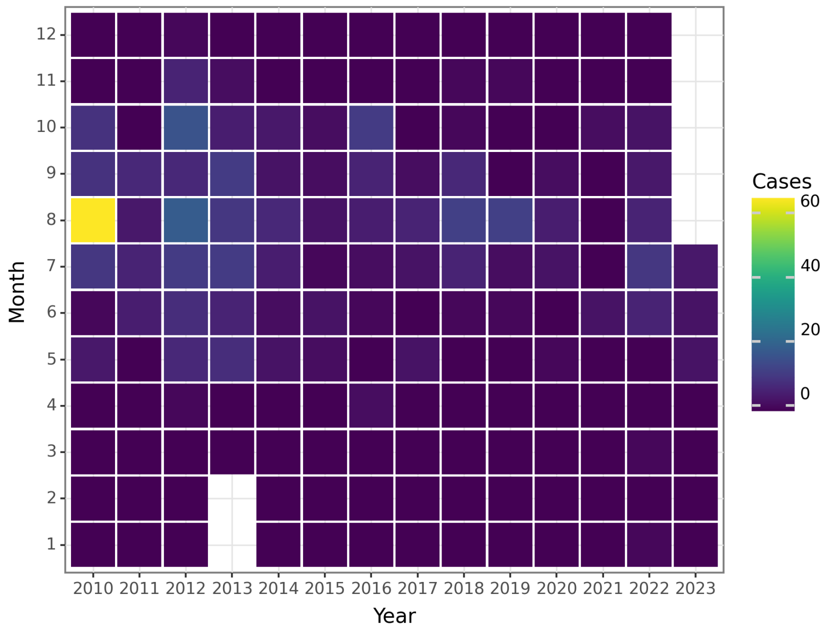

Figure 9: The Change of Cholera Cases before 2023 July

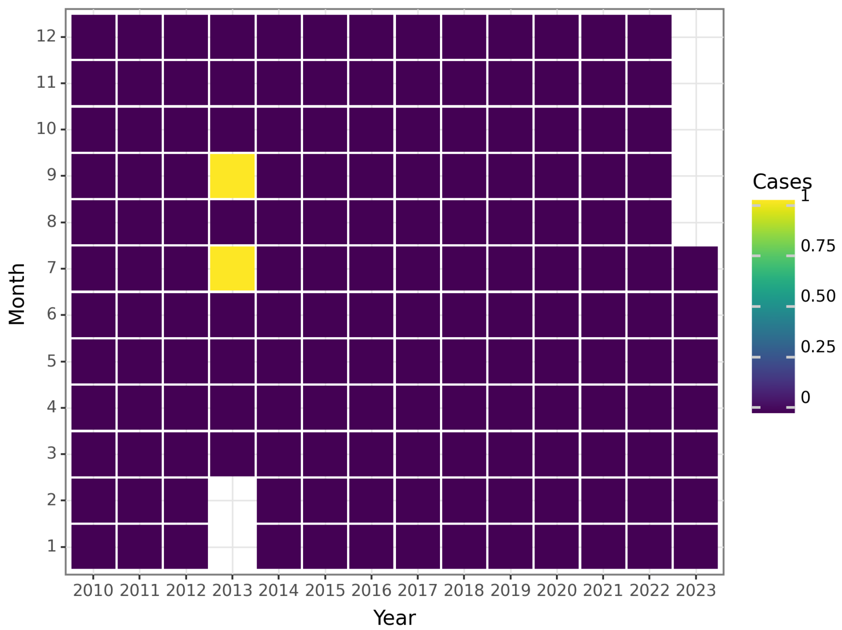

Figure 10: The Change of Cholera Deaths before 2023 July

SARS-CoV

SARS-CoV, or severe acute respiratory syndrome coronavirus, is the causative agent of the respiratory illness known as SARS. Initially identified in November 2002 within Guangdong Province, China, the virus rapidly disseminated to other regions, precipitating a global outbreak in 2003.

Routes of Transmission: The primary mode of transmission for SARS-CoV is respiratory droplets emitted through coughing or sneezing by infected individuals. Transmission can also occur through close personal contact or contact with contaminated objects or surfaces. In rare instances, airborne transmission has been observed in healthcare settings during aerosol-generating procedures.

Affected Populations: The 2003 outbreak of SARS-CoV impacted individuals of all age groups and genders. Older adults, particularly those above 65 years old, exhibited a heightened vulnerability to severe illness and mortality rates. Healthcare workers, specifically those involved in the care of SARS patients, were disproportionately affected due to their close contact with infected individuals.

Key Statistics: Throughout the 2003 outbreak, a total of 8,098 documented cases of SARS were reported worldwide, resulting in 774 fatalities. The overall case fatality rate approximated 9.6%. Mainland China, Hong Kong, and Taiwan were the most heavily burdened regions, with the majority of cases occurring within healthcare settings.

Historical Context and Discovery: The first registered case of SARS-CoV emerged in Foshan, Guangdong Province, China, in November 2002. However, the outbreak attained widespread attention in February 2003 when a doctor from Guangzhou visited Hong Kong, transmitting the virus to numerous hotel guests and indirectly sparking secondary infections. This incident facilitated the identification and isolation of the virus, subsequently designated as SARS-CoV.

Risk Factors: Multiple risk factors have been associated with SARS-CoV transmission, including close contact with infected individuals, particularly within crowded settings like hospitals and communities. Additional factors encompass inadequate infection control measures, deficient hand hygiene, and exposure to respiratory secretions from individuals infected with the virus.

Impact on Different Regions and Populations: The impact of SARS-CoV exhibited regional and demographic variability. Mainland China, Hong Kong, and Taiwan encountered the highest number of cases during the outbreak. Within Hong Kong, the virus rapidly disseminated within the community and healthcare settings, leading to a substantial number of cases and deaths. Other countries, including Canada, Singapore, and Vietnam, reported outbreaks predominantly linked to travel-related instances.

Prevalence Rates and Affected Demographics: Prevalence rates of SARS-CoV exhibited regional divergence, with higher rates observed in areas where the outbreak was less controlled, such as healthcare facilities. Demographic profiles of affected populations showcased diversity; however, older adults and healthcare workers remained at an elevated risk of infection and severe illness.

In conclusion, SARS-CoV is a respiratory virus that initiated a global outbreak in 2003. Transmission occurs primarily through respiratory droplets and close personal contact. Older adults and healthcare workers bore the brunt of the outbreak, and regions with inadequate control measures witnessed higher prevalence rates. Implementing effective infection control measures and public health interventions is pivotal to prevent and control the dissemination of SARS-CoV.

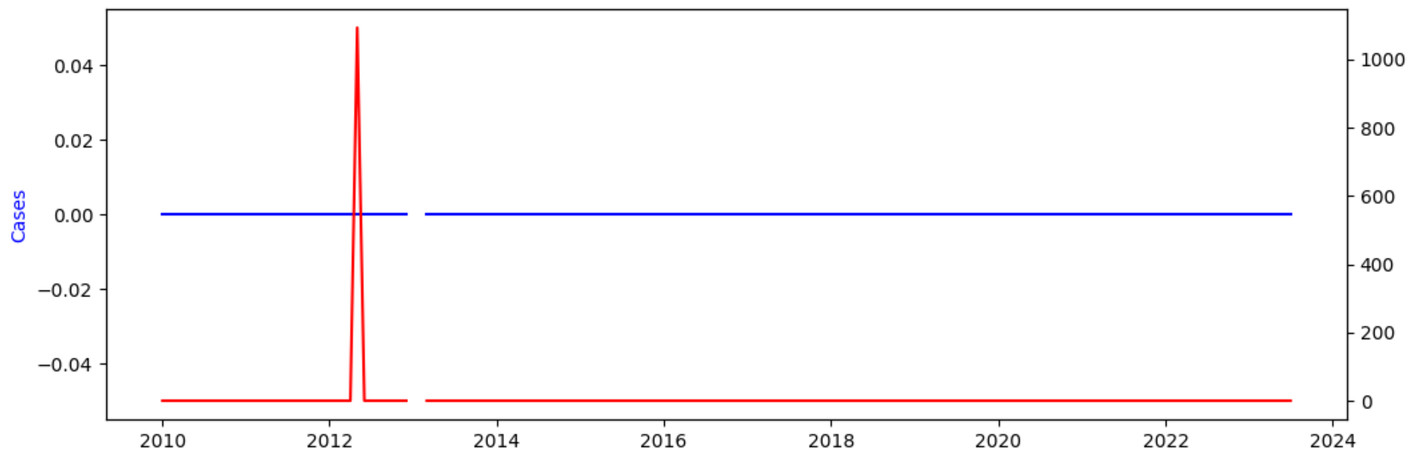

Figure 11: The Change of SARS-CoV Reports before 2023 July

Seasonal Patterns: Based on the data provided, there does not appear to be a discernible seasonal pattern for SARS-CoV cases in mainland China. The consistent absence of cases throughout the years indicates a lack of any noticeable seasonal fluctuations.
Peak and Trough Periods: Given the absence of recorded cases in the data, there are no identifiable peak or trough periods for SARS-CoV in mainland China. The consistent lack of cases indicates a sustained absence of disease activity.
Overall Trends: The provided data indicates a sustained absence of SARS-CoV cases in mainland China from 2010 to July 2023, with the number of cases consistently remaining at zero. This suggests an absence of reported transmission of SARS-CoV in mainland China during this period.
Discussion: The data suggests that mainland China has successfully controlled the transmission of SARS-CoV, as there have been no reported cases from 2010 to July 2023. This positive trend reflects effective public health measures and interventions aimed at preventing the spread of the virus. Continuous monitoring and implementation of appropriate measures are critical to sustaining this success and preventing potential future outbreaks.

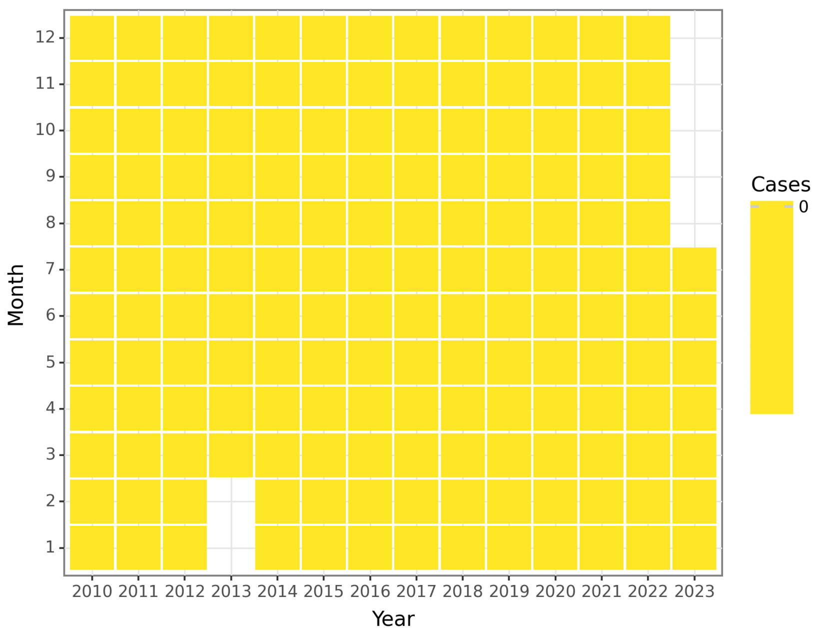

Figure 12: The Change of SARS-CoV Cases before 2023 July

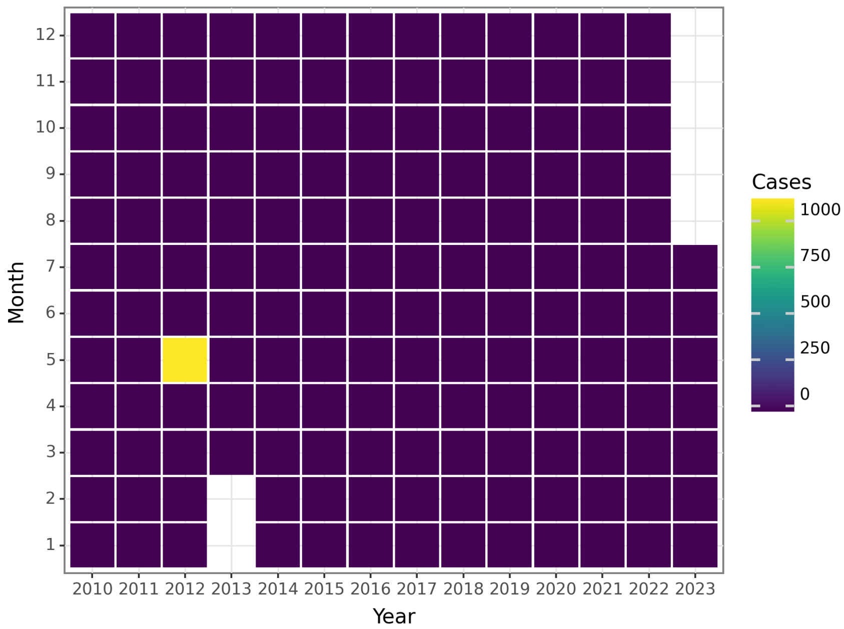

Figure 13: The Change of SARS-CoV Deaths before 2023 July

Acquired immune deficiency syndrome

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

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

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

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

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

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

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

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

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

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

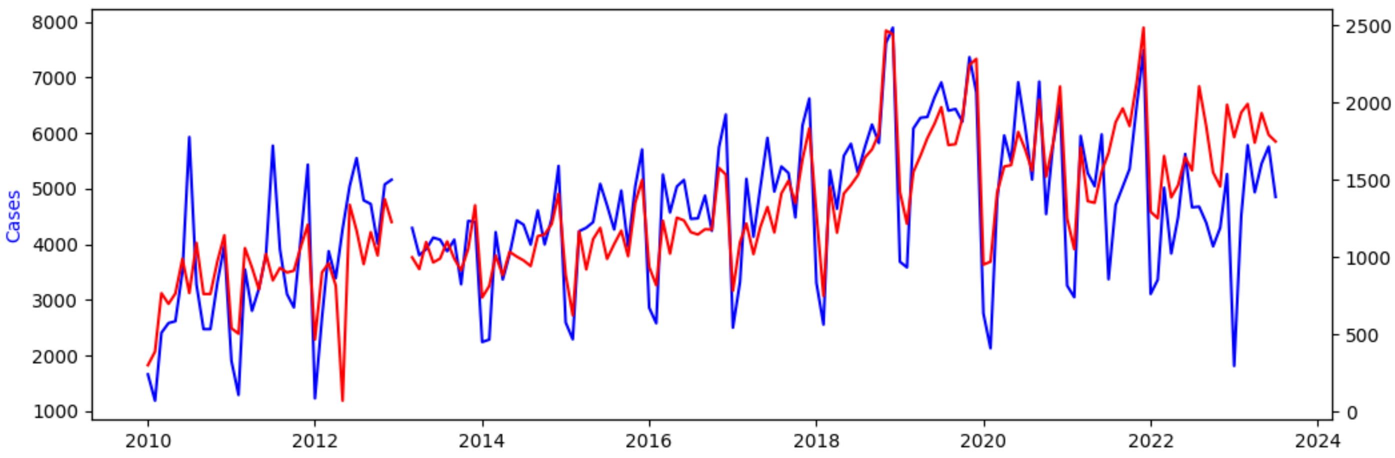

Figure 14: The Change of Acquired immune deficiency syndrome Reports before 2023 July

Seasonal Patterns: The data reveals a consistent pattern of seasonal variation in the number of cases and deaths attributed to Acquired Immune Deficiency Syndrome (AIDS) in mainland China. In general, there is a rise in cases and deaths during the summer months (June, July, and August) and a decline during the winter months (December, January, and February). This pattern persists throughout the years, indicating a recurring seasonal trend.
Peak and Trough Periods: The peak periods for AIDS cases in mainland China are observed in July and August, with these months having the highest number of cases. Conversely, the trough periods, which represent the lowest number of cases, typically occur in January and February. Similarly, for deaths caused by AIDS, the peak occurs in July and August, while the trough is in January and February. These patterns suggest a seasonal peak in AIDS cases and deaths during the summer months, with a relative decrease in the winter months.
Overall Trends: Upon examining the overall trends, there is an upward trend in the number of cases and deaths attributed to AIDS in mainland China from 2010 to 2023. Although there may be fluctuations from year to year, the general trend demonstrates a gradual increase in the number of cases and deaths over time. This indicates an ongoing public health concern for AIDS in mainland China.
Discussion: The observed seasonal patterns, with peak and trough periods, suggest that there might be specific factors influencing the transmission and progression of AIDS in mainland China. Possible explanations for the higher number of cases and deaths during the summer months could include increased social activities, higher rates of unprotected sexual encounters, or other behavioral factors contributing to the spread of HIV infection.
It is important to note that this analysis is solely based on the provided data, and a more detailed analysis incorporating additional factors and data sources would be necessary to fully comprehend the epidemiology of AIDS in mainland China. Nevertheless, the data emphasizes the need for continued surveillance, prevention, and intervention efforts to control the spread of HIV and lessen the burden of AIDS in the country.

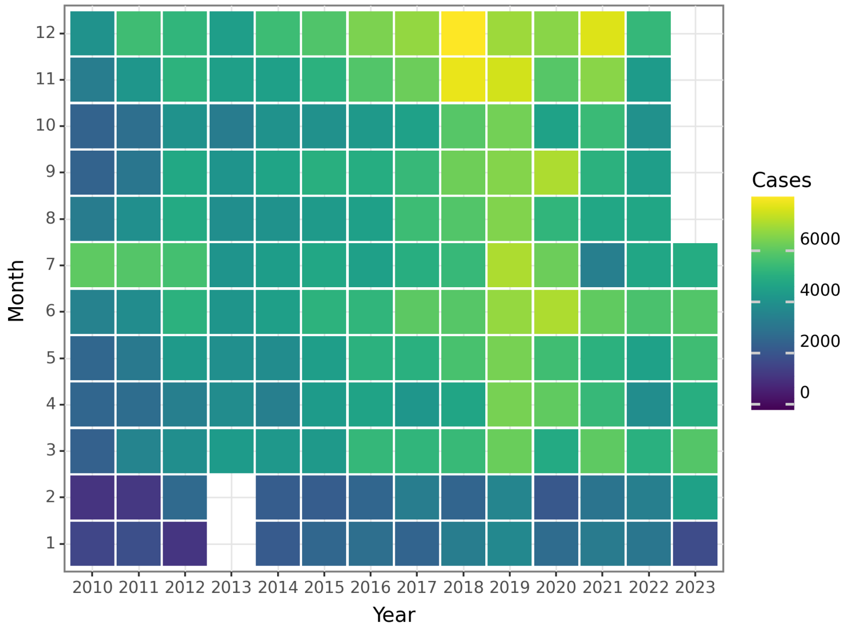

Figure 15: The Change of Acquired immune deficiency syndrome Cases before 2023 July

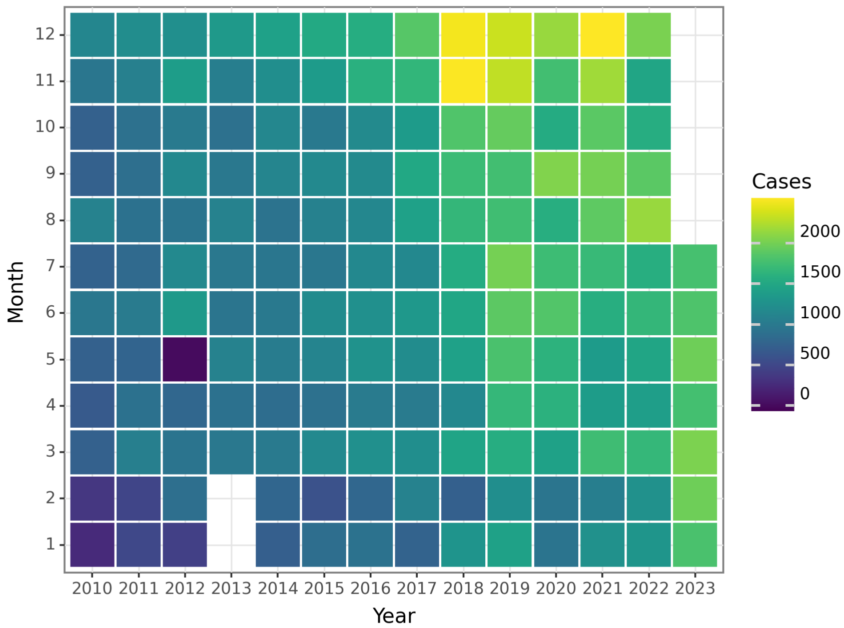

Figure 16: The Change of Acquired immune deficiency syndrome Deaths before 2023 July

Hepatitis

Hepatitis is the inflammation of the liver and can be caused by various factors, including viruses, alcohol, and environmental toxins. This response will specifically focus on Viral Hepatitis, which is commonly caused by hepatitis A, B, C, D, and E viruses. A comprehensive understanding of the epidemiology of viral hepatitis is vital for developing prevention and control strategies.

Historical Context and Discovery: The understanding of viral hepatitis has evolved over time. The discovery of hepatitis A occurred in the 1940s, followed by hepatitis B in the 1960s, and eventually hepatitis C in 1989. Each subsequent discovery has facilitated better identification, diagnosis, and management of these respective viruses.

Global Prevalence: Viral hepatitis is a significant public health concern worldwide. According to the World Health Organization (WHO), an estimated 325 million people worldwide were living with chronic hepatitis infections in 2015. Hepatitis B and C account for the majority of these cases and are responsible for approximately 96% of hepatitis-related deaths.

Transmission Routes: Different hepatitis viruses have distinct transmission routes: 1. Hepatitis A: Primarily transmitted through the fecal-oral route, often due to contaminated food or water. 2. Hepatitis B, C, and D: Mainly transmitted through blood or other body fluids. Common modes of transmission include unsafe injection practices, unsafe healthcare practices, and mother-to-child transmission. 3. Hepatitis E: Like hepatitis A, it is mainly transmitted through the fecal-oral route, often due to contaminated food or water.

Affected Populations and Key Statistics: Viral hepatitis affects populations globally, but its burden is not evenly distributed. Key statistics include: 1. Hepatitis A: Commonly affects children and young adults in regions with inadequate sanitation and poor hygiene practices. 2. Hepatitis B: Prevalent in sub-Saharan Africa, the Western Pacific region, and areas with intermediate-to-high prevalence in the Middle East and Asia. 3. Hepatitis C: Commonly diagnosed among injecting drug users, although blood transfusions and unsafe medical procedures are also significant transmission routes. 4. Hepatitis D: Mostly occurs in individuals already infected with hepatitis B, particularly in parts of Africa, South America, and Asia. 5. Hepatitis E: Predominantly found in low- and middle-income countries, with sporadic outbreaks occurring globally.

Major Risk Factors: Several risk factors contribute to the transmission of viral hepatitis: 1. Unsafe injections and medical procedures. 2. Contaminated blood transfusions and organ transplants. 3. Unsafe sexual practices and multiple sexual partners. 4. Vertical transmission (from mother to child) during childbirth or breastfeeding. 5. Injecting drug use and sharing needles. 6. High-risk occupational exposure, such as healthcare workers.

Impact on Different Regions and Populations: The impact of viral hepatitis varies across regions and populations due to differences in prevalence rates and affected demographics. Factors influencing these variations include: 1. Socioeconomic factors: Poverty, inadequate healthcare infrastructure, and limited access to preventative measures contribute to higher prevalence rates in low-income countries. 2. Cultural practices: Traditions like scarification, tattooing, and healthcare practices can contribute to transmission rates. 3. Migration: Migrants from countries with high hepatitis burdens may introduce infections in regions with low prevalence, leading to localized outbreaks among specific populations. 4. Sexual transmission: Populations with higher rates of unprotected sex or engaging in high-risk sexual practices are more likely to have higher hepatitis prevalence.

In conclusion, viral hepatitis is a global health concern with varying prevalence rates, transmission routes, and affected populations. Understanding these epidemiological factors is critical for implementing effective prevention strategies, improving healthcare practices, and ultimately reducing the burden of hepatitis on both regional and global levels.

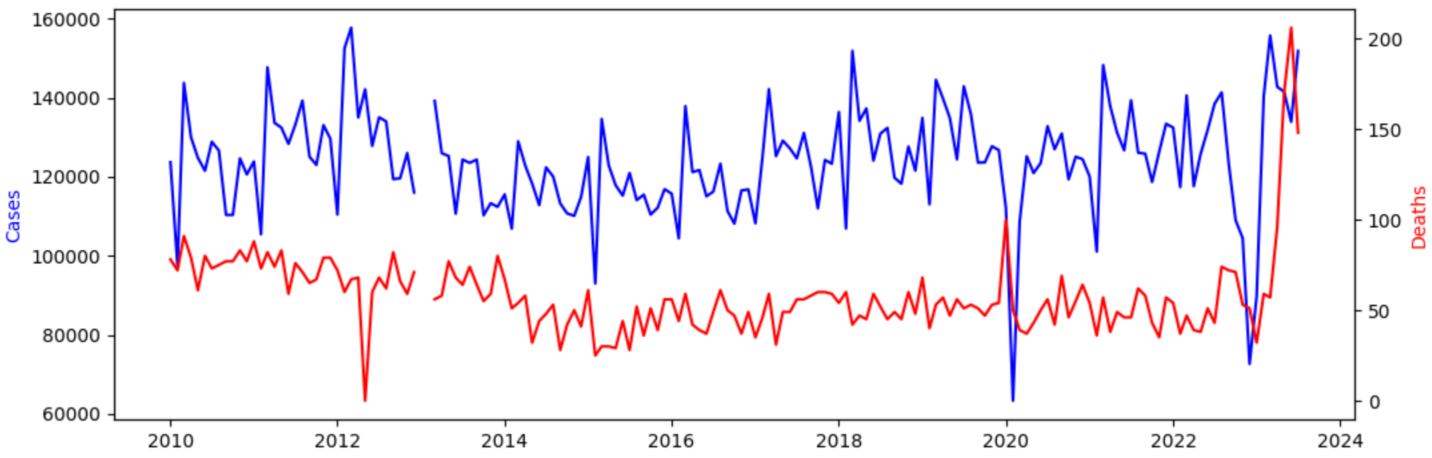

Figure 17: The Change of Hepatitis Reports before 2023 July

Seasonal Patterns:
The data provided indicates the presence of seasonal patterns in the monthly incidence and mortality rates of Hepatitis in mainland China. In general, the number of cases and deaths tends to be higher during the summer months (June to August) and lower during the winter months (December to February). This suggests a potential seasonal trend for Hepatitis in mainland China, with increased transmission and disease activity during warm weather months.
Peak and Trough Periods:
Typically, the peak periods for Hepatitis cases in mainland China are in the summer months, specifically in July and August, when the number of cases reaches its highest levels. Conversely, the trough periods with the lowest number of cases appear to be in the winter months of December and January.
As for Hepatitis-related deaths, a slightly different pattern emerges. The highest number of deaths is observed during the months of April, May, and June. Conversely, the lowest number of deaths occurs during the winter, particularly in December and January.
Overall Trends:
When examining the overall trends, it becomes apparent that there is a fluctuation in the number of Hepatitis cases and deaths throughout the years. However, there is no clear upward or downward trend observed prior to July 2023.
Discussion:
The observed seasonal patterns suggest a potential correlation between temperature and Hepatitis transmission in mainland China. Warmer months may enhance the survival and replication of the Hepatitis-causing virus, leading to increased transmission and subsequent cases. Moreover, it is worth mentioning that factors such as increased travel, outdoor activities, and behavioral changes during the summer months could contribute to the higher number of cases observed.
The variations in death rates among cases could be attributed to various factors, including differences in disease severity, access to healthcare, and treatment effectiveness. Further analysis and investigation are necessary to comprehend the underlying reasons for the observed patterns and to develop effective prevention and control measures.
Please note that a comprehensive understanding of Hepatitis trends in mainland China requires further analysis and considerations beyond the presented data.

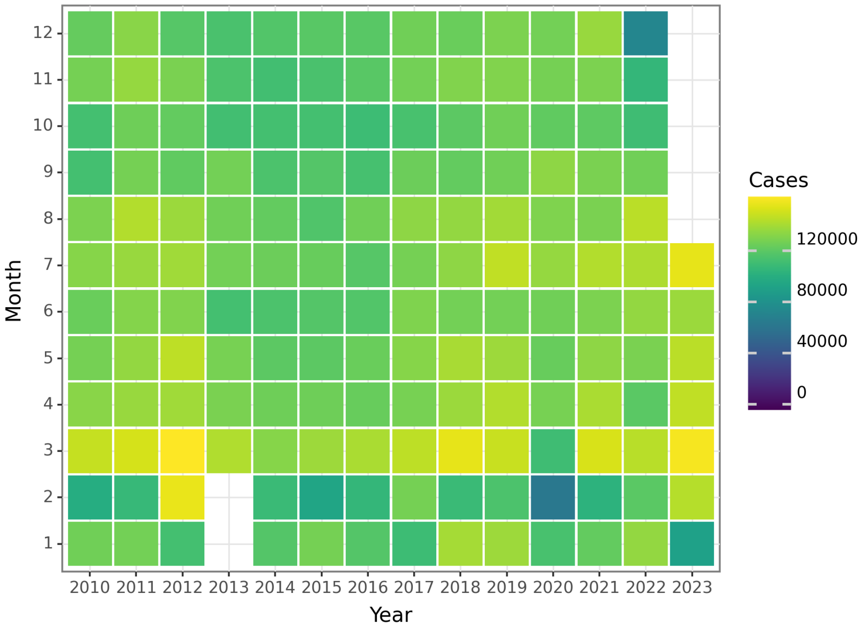

Figure 18: The Change of Hepatitis Cases before 2023 July

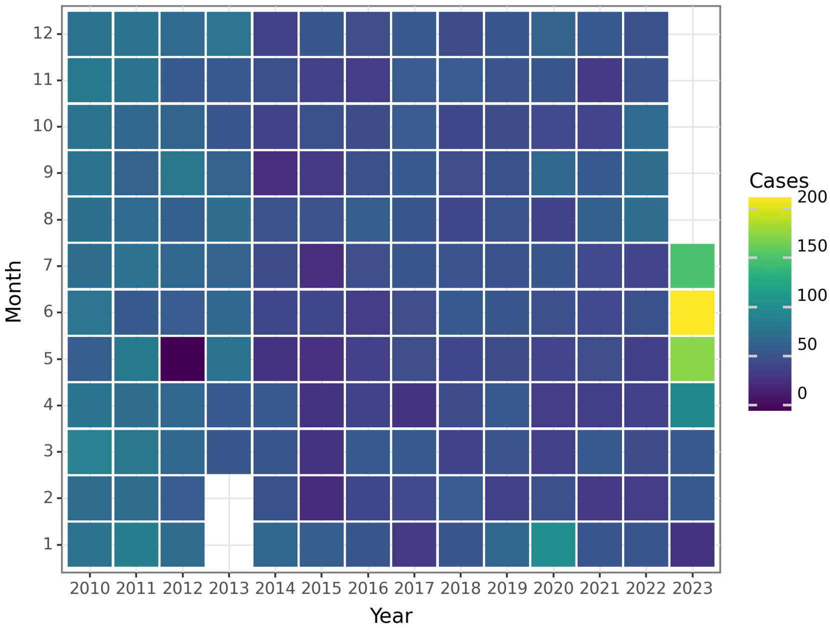

Figure 19: The Change of Hepatitis Deaths before 2023 July

Hepatitis A

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

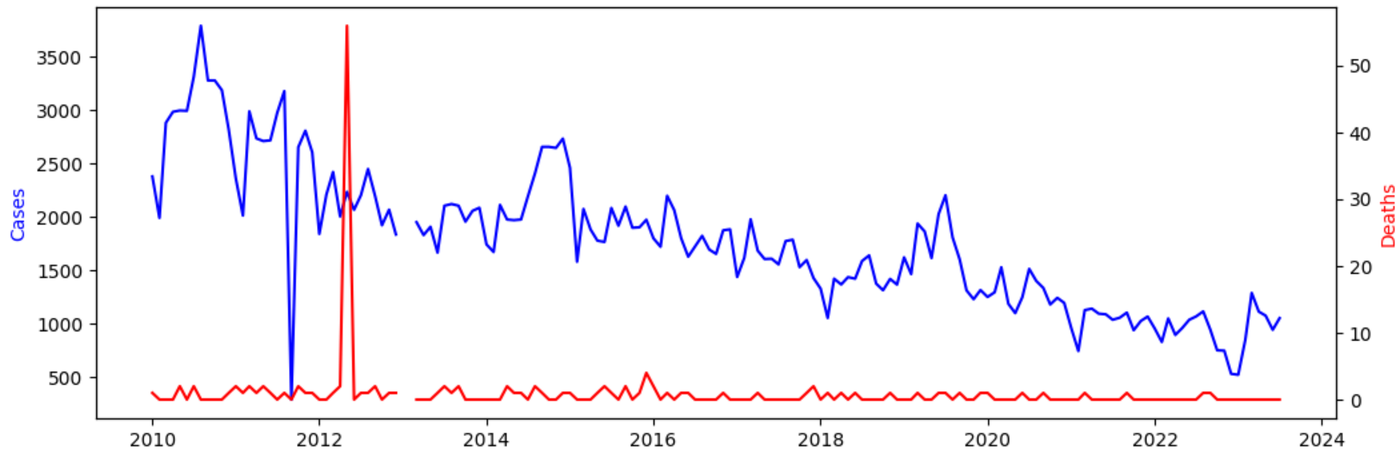

Figure 20: The Change of Hepatitis A Reports before 2023 July

Seasonal Patterns of Hepatitis A in Mainland China:
The data provided indicates a recurrent pattern in the number of reported Hepatitis A cases in mainland China. The months of July through August consistently have the highest number of cases, followed by a gradual decrease until around January, after which the number of cases begins to rise again. This suggests a seasonal variation in transmission of the disease, with higher transmission rates during the summer months.
Peak and Trough Periods:
July and August are the peak months for reported Hepatitis A cases in mainland China, while the trough period appears to be between December and February.
Overall Trends:
The number of reported cases fluctuated between annual peaks and troughs before July 2023, without a clear increasing or decreasing trend.
Discussion:
The observed seasonal pattern of Hepatitis A cases in mainland China suggests possible environmental or behavioral factors more prevalent during the summer months, such as consumption of raw or undercooked food, inadequate sanitation practices, or increased outdoor activities. Additional investigation would be necessary to identify the specific factors contributing to the observed pattern.
It is notable that some months, notably January and February, have fewer or negative reported cases of Hepatitis A. The reasons for these anomalies are unclear and warrant further investigation to ensure accurate monitoring and reporting.
Overall, the data highlights the need for targeted public health interventions during high-risk months to prevent and control transmission of Hepatitis A in mainland China.

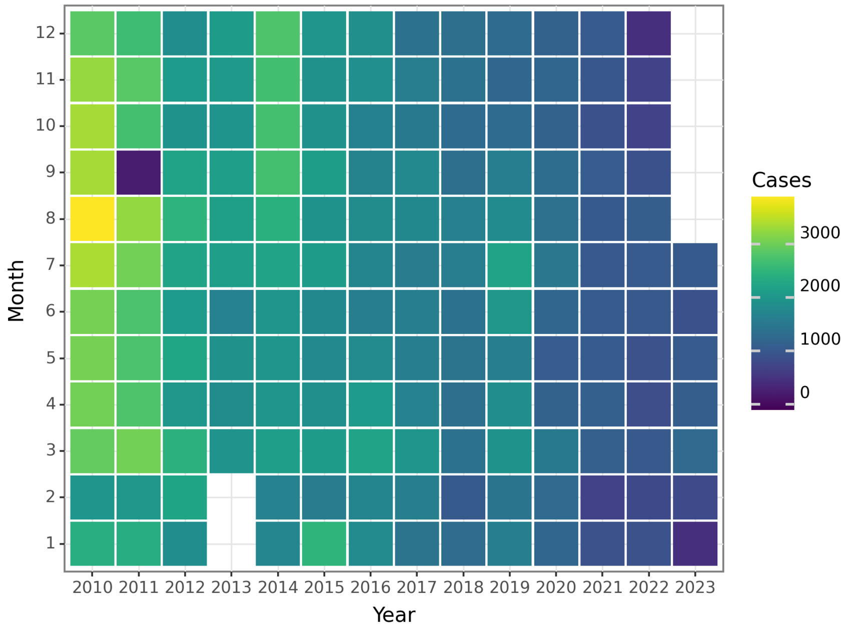

Figure 21: The Change of Hepatitis A Cases before 2023 July

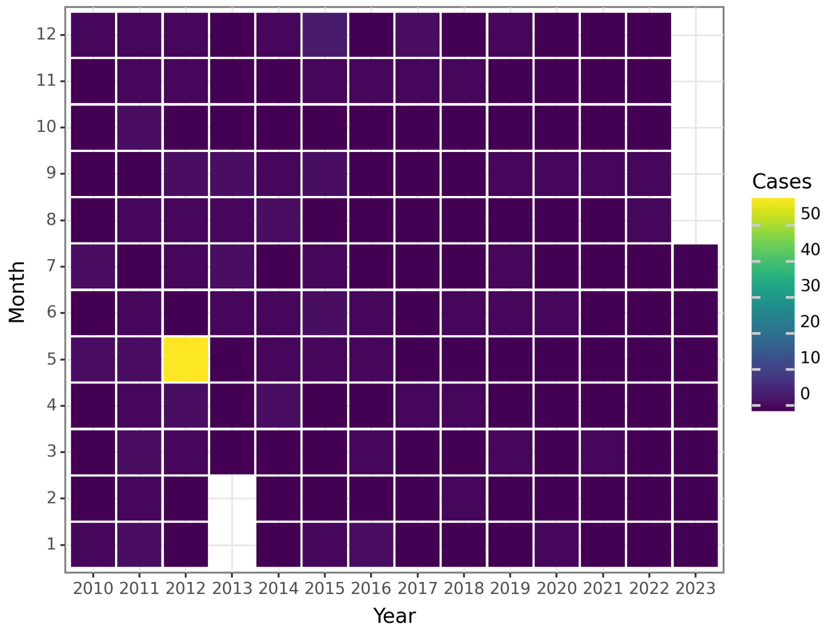

Figure 22: The Change of Hepatitis A Deaths before 2023 July

Hepatitis B

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

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

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

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

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

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

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

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

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

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

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

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

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

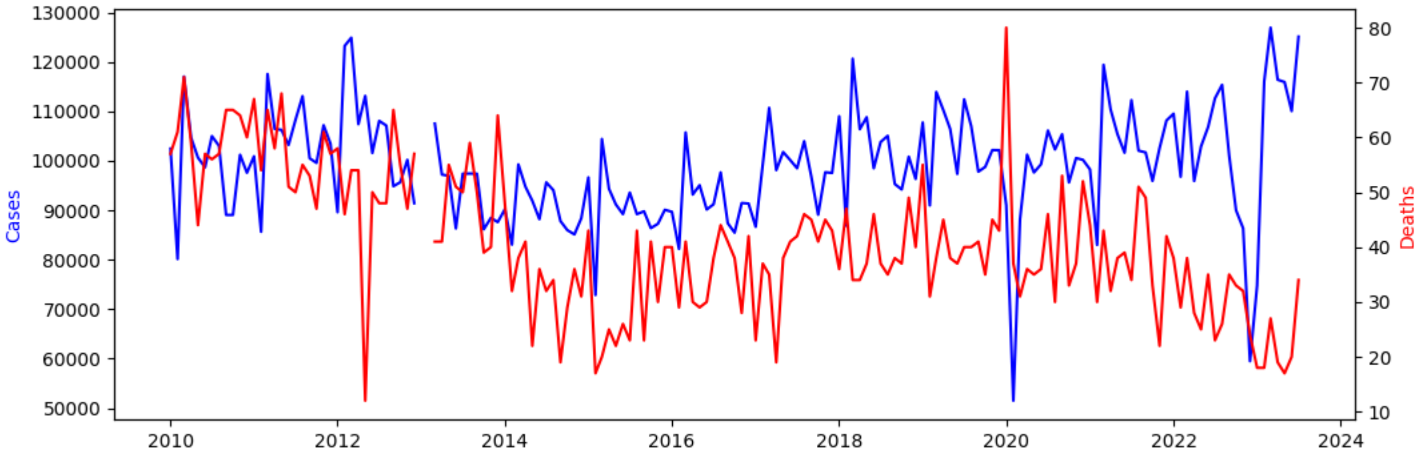

Figure 23: The Change of Hepatitis B Reports before 2023 July

Seasonal Patterns: The analysis of the provided data reveals distinct seasonal patterns in Hepatitis B cases in mainland China. There is a clear surge in cases during the winter months (December, January, and February), while a decrease in cases is observed during the summer months (June, July, and August). This suggests a noticeable trend where Hepatitis B cases tend to be higher in colder months and lower in warmer months.
Peak and Trough Periods: The peak period for Hepatitis B cases spans from November to March, with January recording the highest number of cases. This aligns with the aforementioned seasonal pattern, where case counts are higher in winter months. On the other hand, trough periods, characterized by lower case counts, occur from June to September, with July recording the lowest number of cases.
Overall Trends: Interestingly, there is an overall decline in Hepatitis B cases from 2010 to 2023. The number of cases in the initial years (2010-2011) was relatively high, but a steady decline can be observed from 2012 onwards. It is worth noting, however, that the data for 2023 only extends until July, thus conclusive determination of the overall trend for that year cannot be made.
Discussion: The existence of a seasonal pattern in Hepatitis B cases in mainland China suggests the presence of certain factors that contribute to increased virus transmission during the winter months. Possible explanations for this pattern include heightened close contact and crowding during colder months, compromised immune response due to colder weather, or behavioral variations, such as decreased adherence to hygiene practices. Further investigation is necessary to ascertain the specific factors driving the seasonal fluctuations in case numbers.
The downward trend in Hepatitis B cases from 2010 to 2023 is encouraging and possibly indicative of the success of public health interventions and vaccination programs in mainland China. It is vital to persist in prevention efforts, early detection, and vaccination to further alleviate the burden of Hepatitis B within the population.
It is important to note that this analysis relies solely on the provided data, and additional information would be required for a more comprehensive understanding of Hepatitis B epidemiology in mainland China.

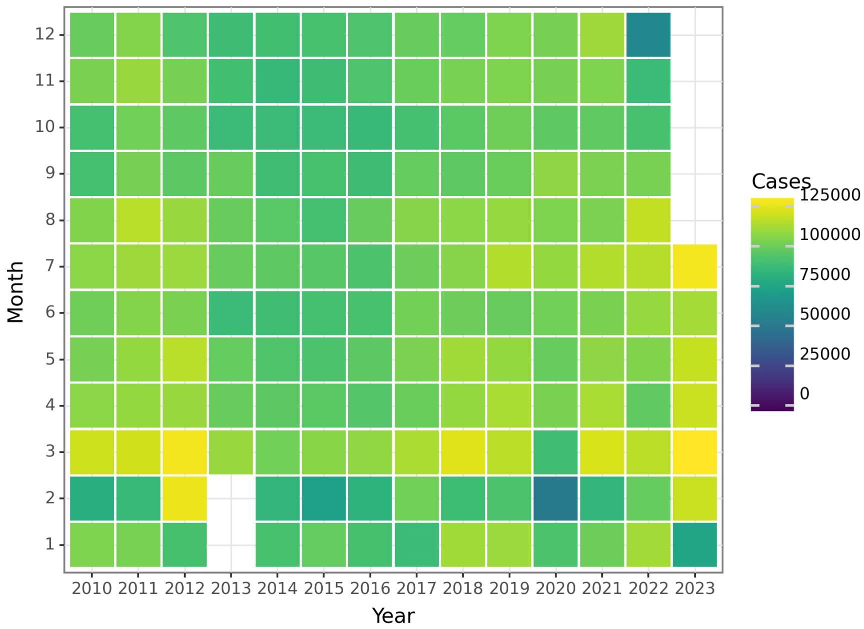

Figure 24: The Change of Hepatitis B Cases before 2023 July

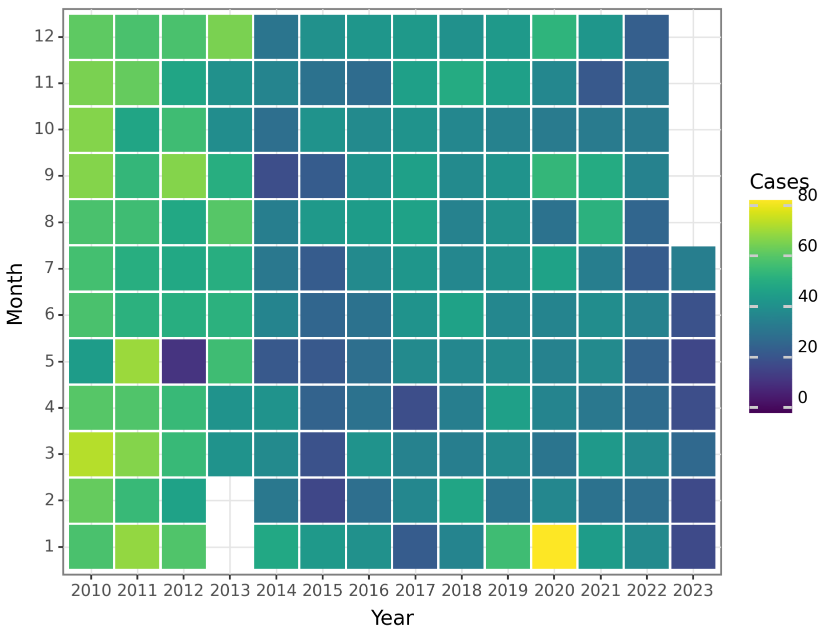

Figure 25: The Change of Hepatitis B Deaths before 2023 July

Hepatitis C

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

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

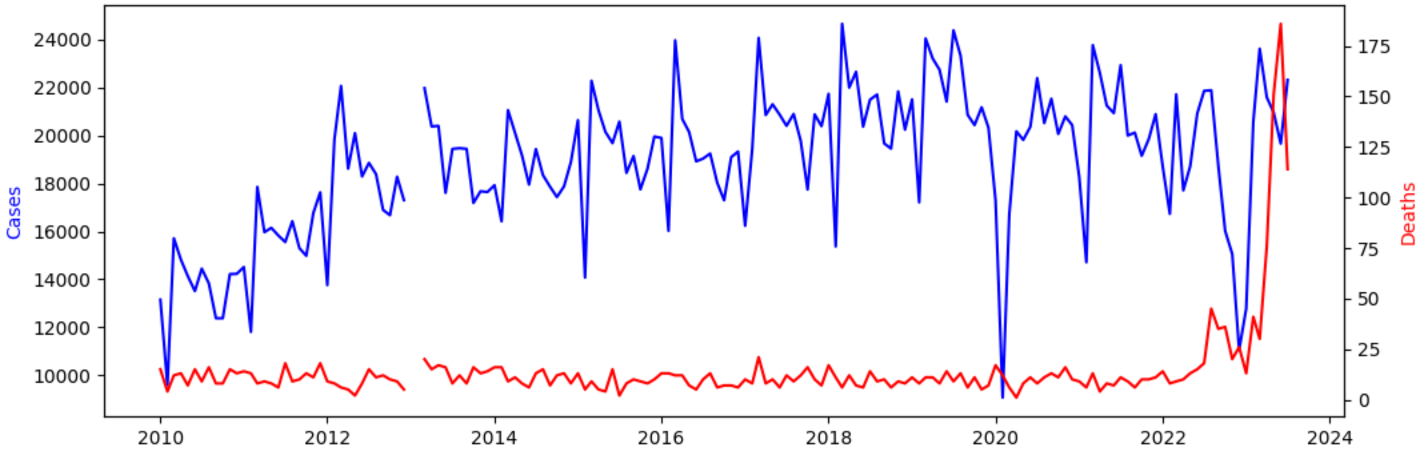

Figure 26: The Change of Hepatitis C Reports before 2023 July

Seasonal Patterns and Trends in Hepatitis C Incidence in Mainland China Before July 2023
The analysis of monthly data for Hepatitis C cases in mainland China before July 2023 reveals discernible seasonal patterns. The total number of cases over the years shows peaks and troughs, with higher occurrences in certain months and lower numbers in others. This suggests a clear seasonal variation in Hepatitis C incidence.
In terms of peak and trough periods, specific months like March, April, May, and June consistently have higher case numbers compared to other months, indicating peak periods for Hepatitis C in mainland China. Conversely, trough periods correspond to months with lower case numbers.
The data further reveals that there has been an upward trend in the number of Hepatitis C cases in mainland China since 2012, with the number rising from a fluctuation of 9,000 to 15,000 cases to a peak of 24,625 cases in March 2023.
These results suggest that there may be certain factors influencing the transmission of the disease during specific months. Further investigation would allow for these factors to be better understood, and targeted prevention and control measures to be implemented during peak periods.
Given the increasing trend in Hepatitis C incidence, effective interventions are urgently needed to control its spread in mainland China. Such interventions could include expanding awareness and education programs, implementing preventive measures, and ensuring access to testing and treatment for individuals at risk.
Overall, the analysis of monthly data on Hepatitis C cases in mainland China before July 2023 provides valuable insights into its seasonal patterns, peak and trough periods, and increasing trend. Further research and targeted interventions are necessary to address the challenges posed by Hepatitis C and reduce its burden on public health in mainland China.

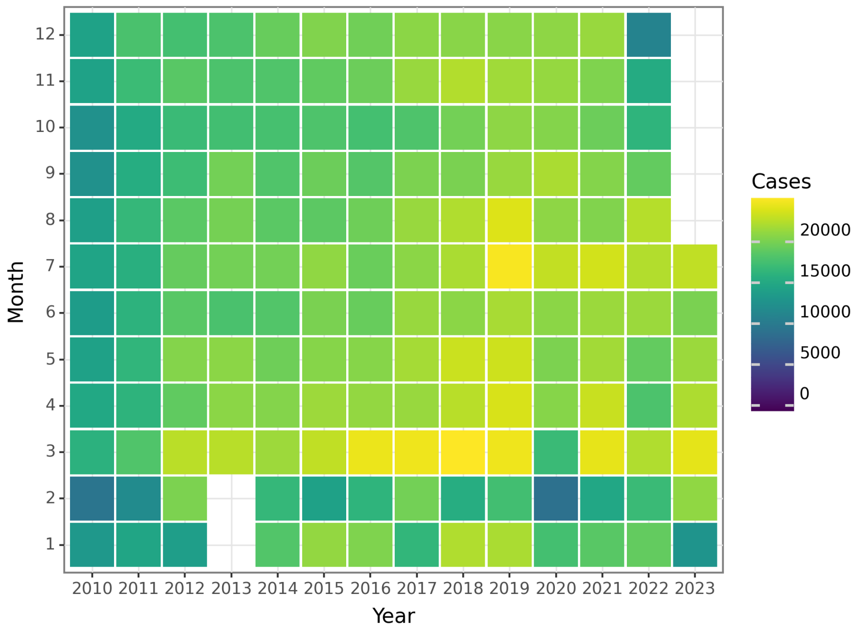

Figure 27: The Change of Hepatitis C Cases before 2023 July

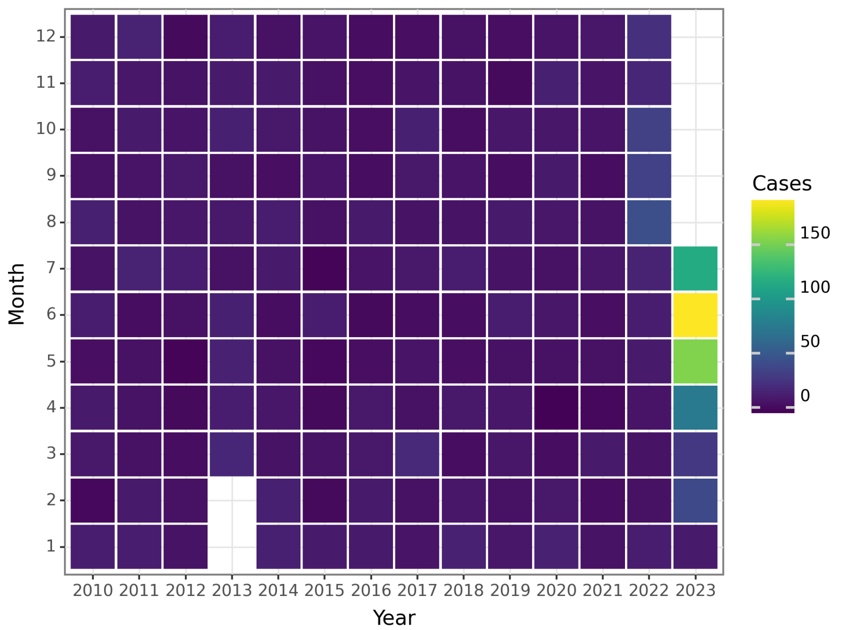

Figure 28: The Change of Hepatitis C Deaths before 2023 July

Hepatitis D

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

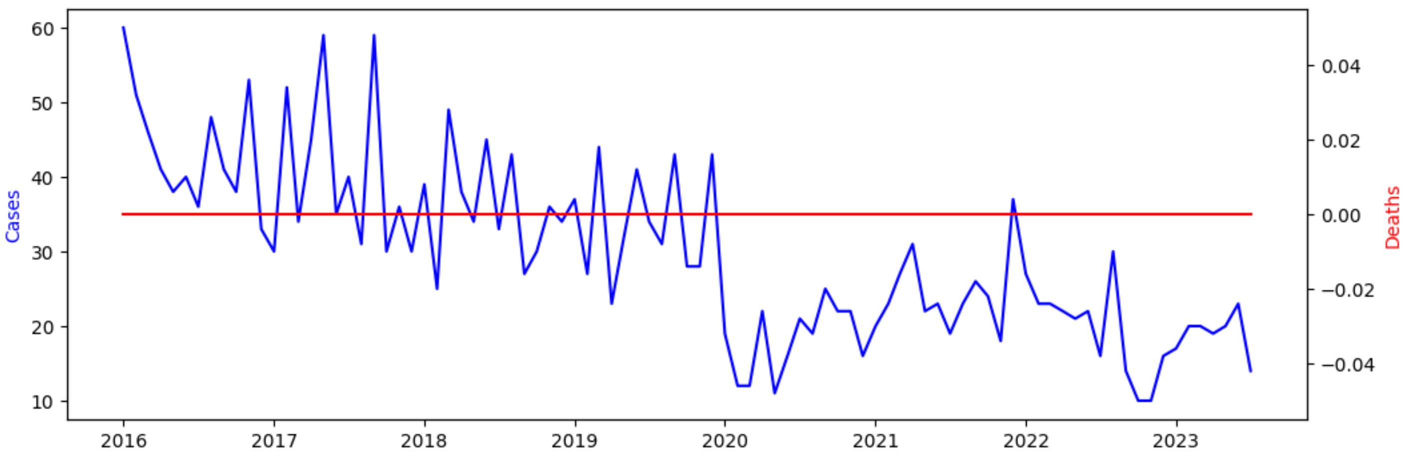

Figure 29: The Change of Hepatitis D Reports before 2023 July

Seasonal Patterns: Analysis of monthly data on Hepatitis D cases in mainland China prior to July 2023 reveals a noticeable seasonal pattern. The incidence of cases tends to be higher during the winter months (December to February) and lower during the summer months (June to August). This consistent pattern is observed throughout the years.
Peak and Trough Periods: The peak periods for Hepatitis D cases in mainland China occur predominantly in December and February, coinciding with the winter months. These are the months when the number of cases is generally highest. In contrast, the trough periods occur during the summer months, specifically June and August, when the lowest number of cases are reported.
Overall Trends: The available data suggests that the number of Hepatitis D cases in mainland China before July 2023 demonstrates relative stability. There is no clear upward or downward trend observed over the years. The incidence of cases fluctuates within a certain range, exhibiting regular peaks and troughs.
Discussion: The observed seasonal pattern in the data hints at the presence of factors that influence the transmission of Hepatitis D in mainland China, with a higher risk during the winter months. This could potentially be attributed to various factors such as environmental conditions, behavioral changes, or other disease-related factors.
It is important to acknowledge that this analysis is solely based on the available monthly data on Hepatitis D cases and does not account for other potential contributing factors to the observed patterns and trends. Further research and thorough analysis are needed to comprehensively understand the underlying causes and dynamics of Hepatitis D transmission in mainland China.

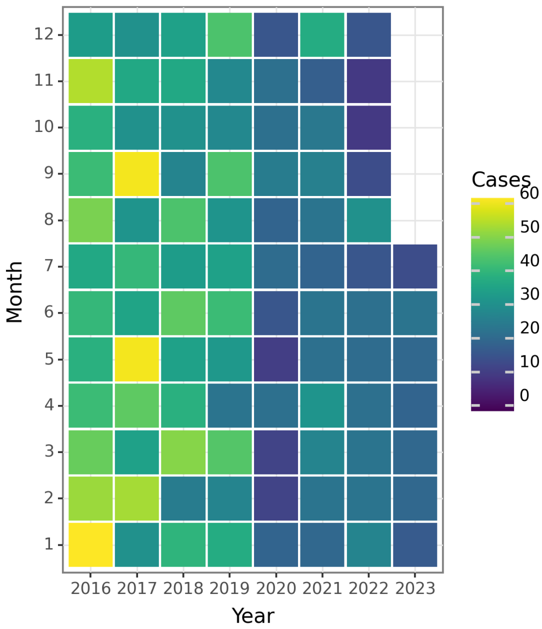

Figure 30: The Change of Hepatitis D Cases before 2023 July

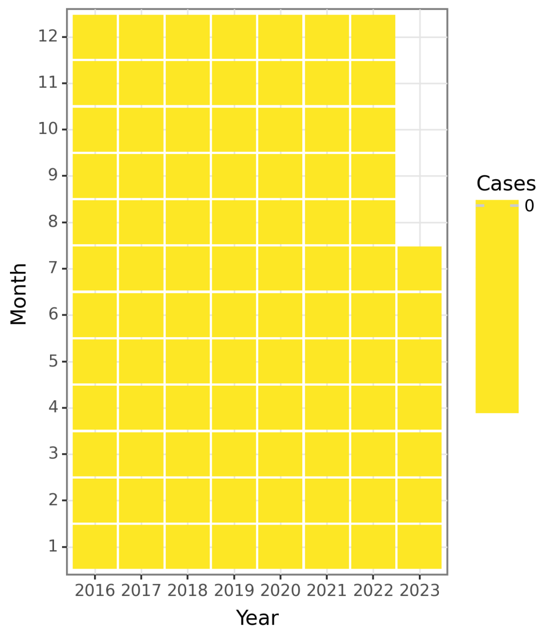

Figure 31: The Change of Hepatitis D Deaths before 2023 July

Hepatitis E

Hepatitis E is an acute viral infection caused by the hepatitis E virus (HEV) that primarily affects the liver. It is characterized by symptoms such as jaundice, fatigue, abdominal pain, and loss of appetite. The prevalence of hepatitis E differs globally across regions and populations.

Historical Context and Discovery: Hepatitis E was initially identified in 1980 during an outbreak in Kashmir, India, where roughly 50,000 cases were reported. However, the formal classification of the virus did not occur until 1990. The understanding of this disease advanced through the discovery of the HEV genome and the development of diagnostic tests.

Prevalence: Hepatitis E is endemic in many developing countries, particularly in parts of Asia, Africa, and Central America. According to the World Health Organization (WHO), approximately 20 million HEV infections occur annually worldwide, resulting in roughly 44,000 deaths. However, these estimates may be conservative as many cases go unreported or are misdiagnosed due to the similarity of symptoms with other types of hepatitis.

Transmission Routes: Hepatitis E can spread through fecal-oral routes, mainly via contaminated water and food. Transmission can also occur through the transfusion of infected blood products, organ transplantation from infected donors, and vertical transmission from mother to fetus. In regions where sanitation is poor and access to clean water is limited, the risk of transmission is higher.

Affected Populations: Hepatitis E can affect individuals of all age groups, but pregnant women and people with pre-existing liver disease are at an increased risk of severe illness or complications. Pregnant women infected with HEV have a significantly higher mortality rate, especially during the third trimester.

Risk Factors: Several major risk factors are associated with Hepatitis E transmission, including: 1. Unsafe water sources and inadequate sanitation infrastructure. 2. Consumption of contaminated water or food, particularly raw or undercooked meat, shellfish, and vegetables. 3. Crowded living conditions, such as refugee camps or slums, where maintaining proper hygiene practices can be challenging. 4. Traveling to areas with a high incidence of Hepatitis E. 5. Occupational exposure to animals, such as swine, that may carry the virus.

Impact on Regions and Populations: The prevalence of Hepatitis E varies across regions worldwide. In resource-limited countries, particularly in South Asia and sub-Saharan Africa, the burden of the disease is higher due to inadequate sanitation facilities and limited access to clean water. Outbreaks are frequently reported in these regions, especially during natural disasters, conflict situations, or mass gatherings.

In developed countries, Hepatitis E is usually sporadic and is often associated with travel to endemic regions or consumption of contaminated imported food products. However, autochthonous transmission (acquired within the resident population) has also been occasionally reported.

Overall, Hepatitis E is more common in low-to-middle-income countries with poor sanitation conditions and limited healthcare resources. Nevertheless, advancements in sanitation infrastructure and increased access to clean water have helped reduce the burden of the disease in certain regions.

In conclusion, Hepatitis E is a global health concern, particularly in regions with inadequate sanitation and contaminated water sources. It can affect individuals of all ages, but pregnant women and people with pre-existing liver disease are at a higher risk. Efforts to improve sanitation, access to clean water, and raise awareness about safe food and water practices are essential for reducing the transmission and impact of Hepatitis E.

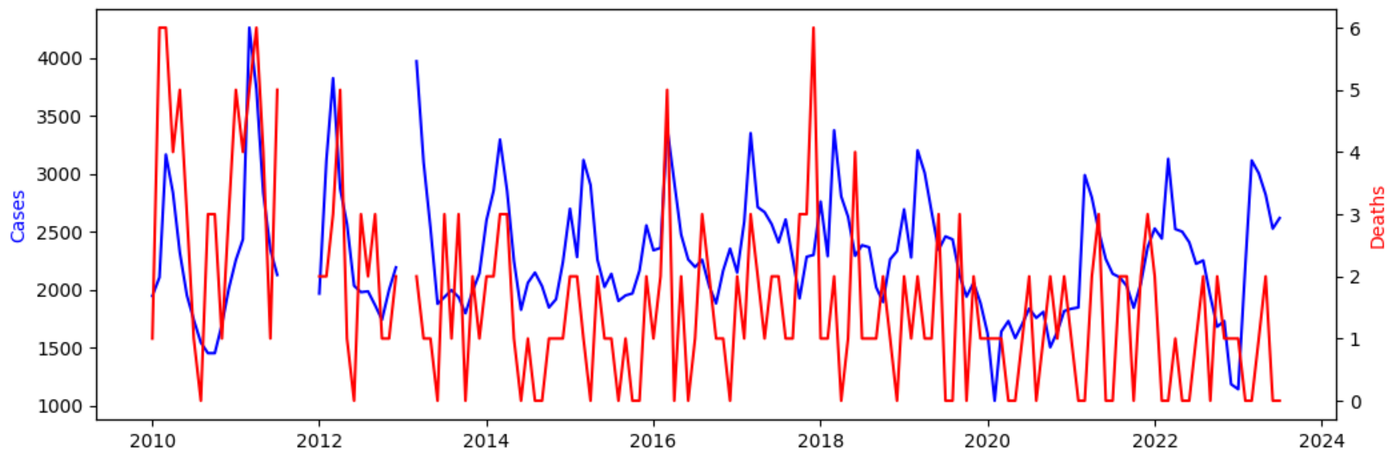

Figure 32: The Change of Hepatitis E Reports before 2023 July

Seasonal Patterns: Hepatitis E cases in mainland China display a distinct seasonal pattern, with higher incidences occurring during the summer months and lower incidences during the winter months. The peak period typically spans from June to August and records the highest number of cases. Conversely, the trough period is usually observed from December to February, in which the fewest cases are reported. This seasonal pattern suggests a potential correlation between the transmission dynamics of Hepatitis E and environmental factors that fluctuate throughout the year, including temperature and rainfall.
Peak and Trough Periods: The peak period for Hepatitis E cases in mainland China primarily falls within the summer months, especially between June and August. During this time frame, there is a significant increase in the number of cases compared to the rest of the year. Conversely, the trough period for Hepatitis E cases is observed during the winter months, with the lowest number of cases reported from December to February. This pattern suggests a possible association between the transmission of Hepatitis E and seasonal environmental factors that facilitate the spread of the virus.
Overall Trends: An examination of the overall trends reveals fluctuations in Hepatitis E cases in mainland China over the years. Between 2010 and 2013, there was a gradual increase in the number of cases, reaching a notable peak in 2011. However, starting from 2013, there has been a fluctuating pattern with no discernible upward or downward trend. The number of cases varies from year to year, potentially influenced by various factors such as changes in surveillance practices, public health interventions, and awareness campaigns.
Discussion: The seasonal pattern observed in Hepatitis E cases in mainland China implies that environmental factors may influence the dynamics of virus transmission. The spike in cases during the summer months, when temperatures are high and rainfall is more frequent, might indicate heightened transmission through water or food contaminated with the Hepatitis E virus. Conversely, the lower number of cases during the winter months could be attributed to reduced viral survival in the environment and variations in human behavior patterns during this season.
It is important to note that the analysis presented is based on reported cases, and there may be underreporting or variations in surveillance practices that could impact the accuracy of the findings. Furthermore, future analyses should consider other factors such as population density, sanitation practices, and the prevalence of risk factors to gain a comprehensive understanding of the overall trends and patterns of Hepatitis E in mainland China.

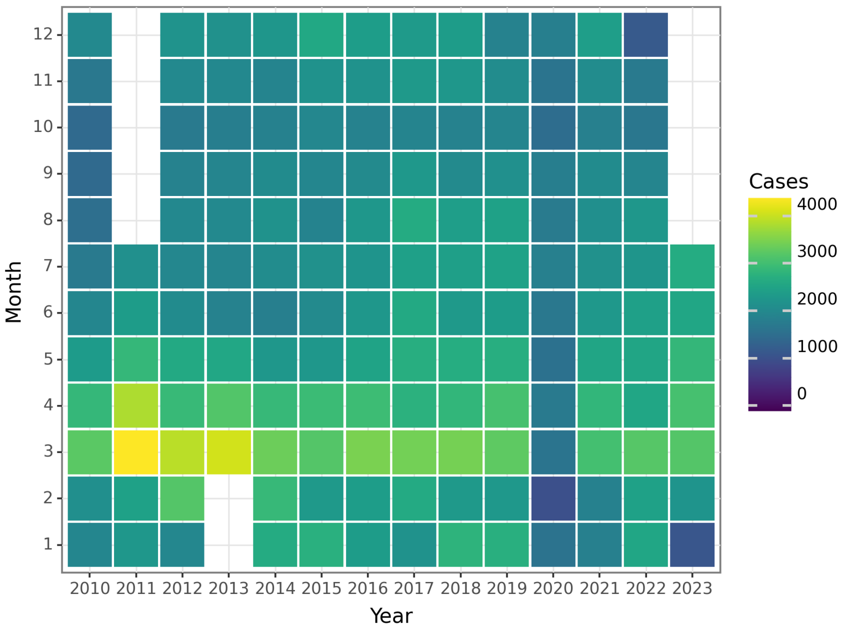

Figure 33: The Change of Hepatitis E Cases before 2023 July

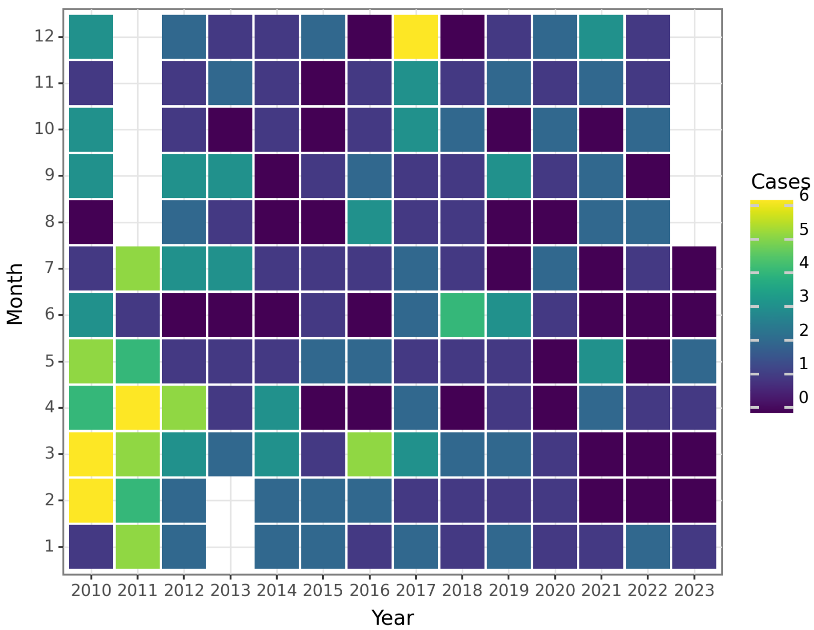

Figure 34: The Change of Hepatitis E Deaths before 2023 July

Other hepatitis

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

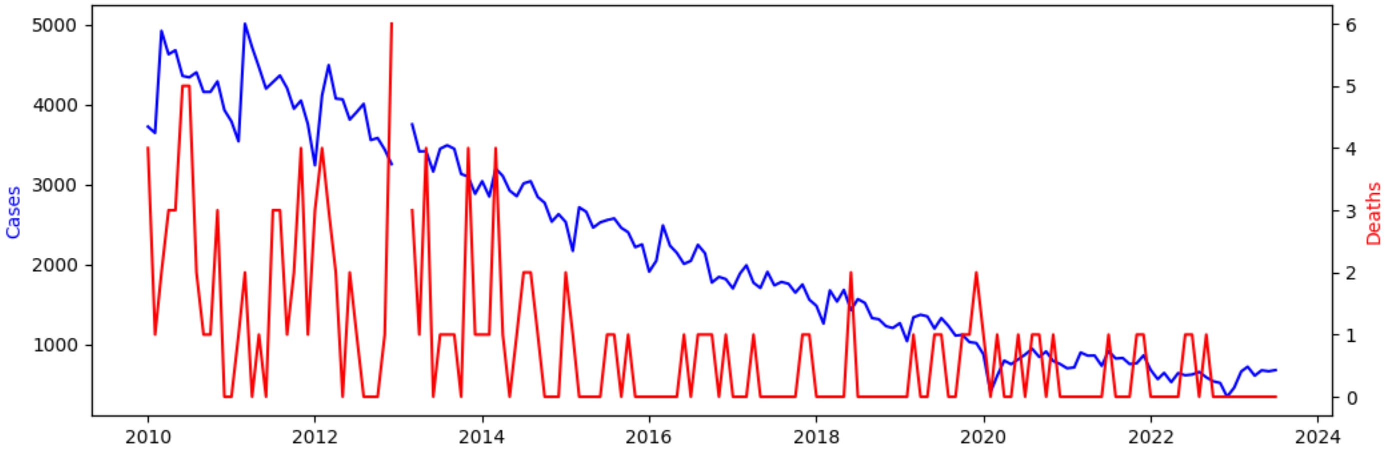

Figure 35: The Change of Other hepatitis Reports before 2023 July

Seasonal Patterns: The data from January 2010 to July 2023 on the cases and deaths of Other hepatitis in mainland China reveals recurring patterns. There is a seasonal pattern with an increase in cases during the winter months, particularly from November to February, and a decrease during the summer months. However, it is important to note that the data does not include information on specific reasons for the seasonality; further analysis is needed to determine the underlying factors contributing to these patterns.
Peak and Trough Periods: Upon examining the data, the peak periods for reported cases of Other hepatitis typically occur between November and March, with the highest number of cases observed in January and February. On the other hand, trough periods are seen in the summer months, specifically in June, July, and August, when the number of reported cases tends to be lower.
Overall Trends: Overall, there appears to be a gradual increase in reported cases of Other hepatitis over the years, with fluctuations observed from year to year. From 2010 to 2014, there is a general upward trend in cases, followed by a period of relatively stable numbers from 2015 to 2018. After that, there seems to be a slight decline in reported cases from 2019 to 2021. However, it is important to note that the data for 2023 is only available up to July, so the overall trend for the year may not be fully captured.
Discussion: The seasonal patterns observed in the data suggest that there may be certain environmental or behavioral factors that contribute to the spread of Other hepatitis in mainland China. Factors such as changes in temperature, humidity, or social behaviors during different seasons may play a role in the number of reported cases. Further investigation and analysis would be necessary to understand the underlying causes of the observed patterns and to determine any potential interventions or preventive measures that could help reduce the occurrence of Other hepatitis.
It is also worth noting that the number of reported deaths due to Other hepatitis is generally low and demonstrates fluctuations throughout the years. While the data does not provide specific information on the causes of death or the severity of the cases, it is an important aspect to consider in the overall analysis of the disease burden.
Please note that without a graphical representation of the data, it is challenging to provide a comprehensive analysis. To obtain a more detailed and accurate assessment, it is recommended to generate graphs or charts that visually present the data.

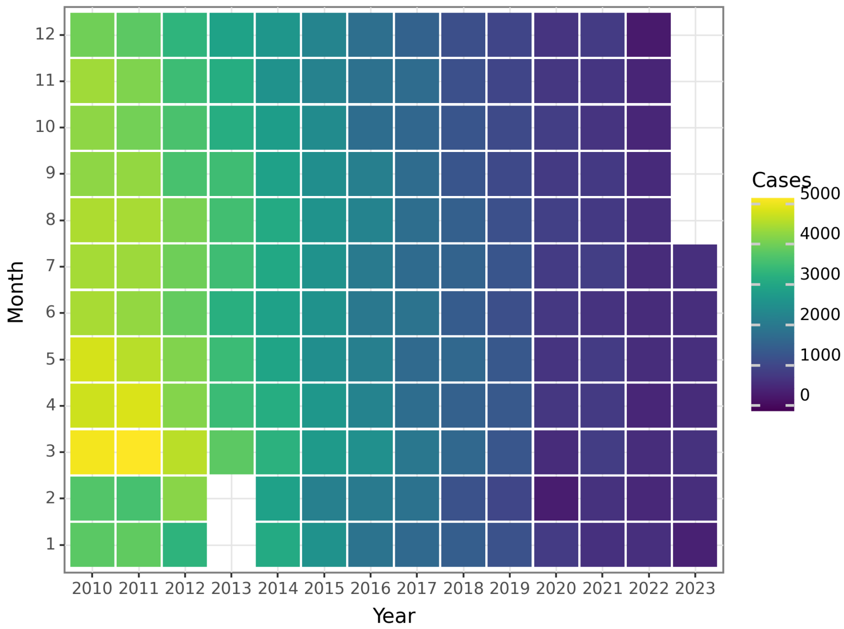

Figure 36: The Change of Other hepatitis Cases before 2023 July

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

Poliomyelitis

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

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

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

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

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

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

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

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

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

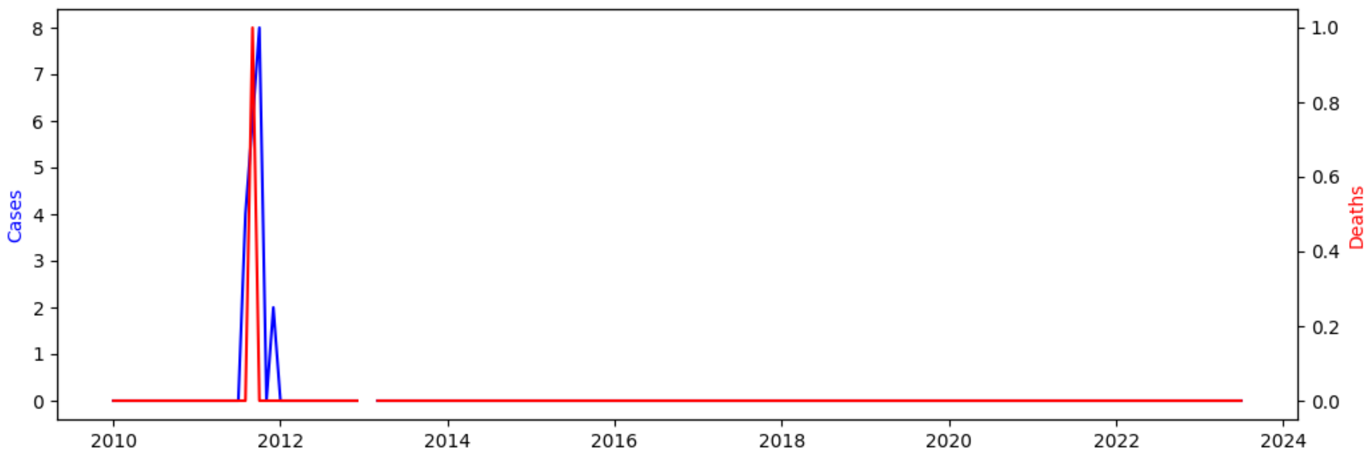

Figure 38: The Change of Poliomyelitis Reports before 2023 July

Seasonal Patterns: There is no evidence of seasonal patterns for cases and deaths of Poliomyelitis in mainland China up to July 2023, based on the provided data. Throughout the recorded period, the number of cases and deaths remained consistently at zero.
Peak and Trough Periods: Without any recorded cases or deaths, there are no identifiable peak or trough periods for Poliomyelitis in mainland China before July 2023.
Overall Trends: Cases and deaths of Poliomyelitis in mainland China before July 2023 have remained consistently stable, with zero reported cases or deaths during the recorded period.
Discussion: The absence of Poliomyelitis cases and deaths in mainland China before July 2023 aligns with the efforts of the Chinese government and international health organizations to eradicate and control this disease. This could be attributed to the robust implementation of vaccination programs and public health measures. However, it is important to acknowledge that the dataset provided only includes monthly data for Poliomyelitis in mainland China, and a more comprehensive analysis considering other factors such as vaccination coverage and surveillance systems would provide a more holistic understanding of the disease trends.

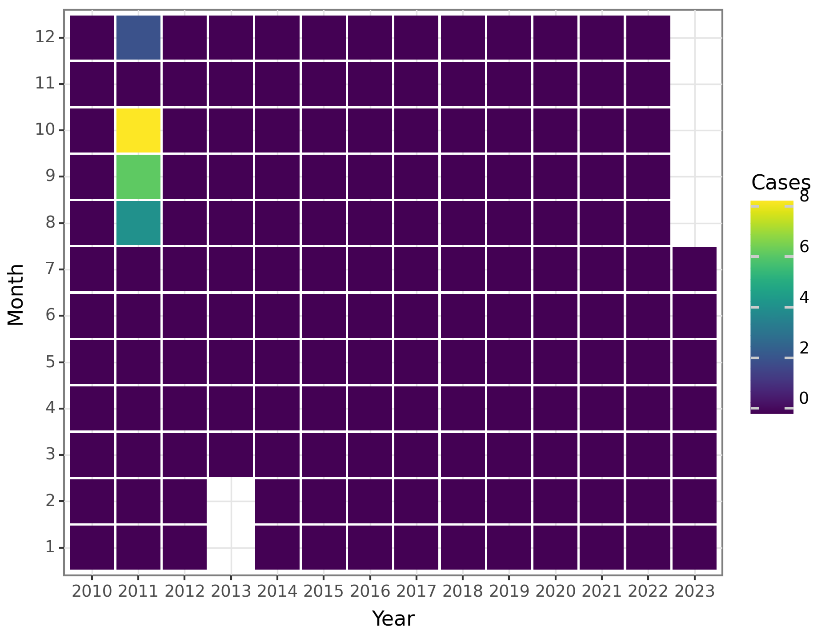

Figure 39: The Change of Poliomyelitis Cases before 2023 July

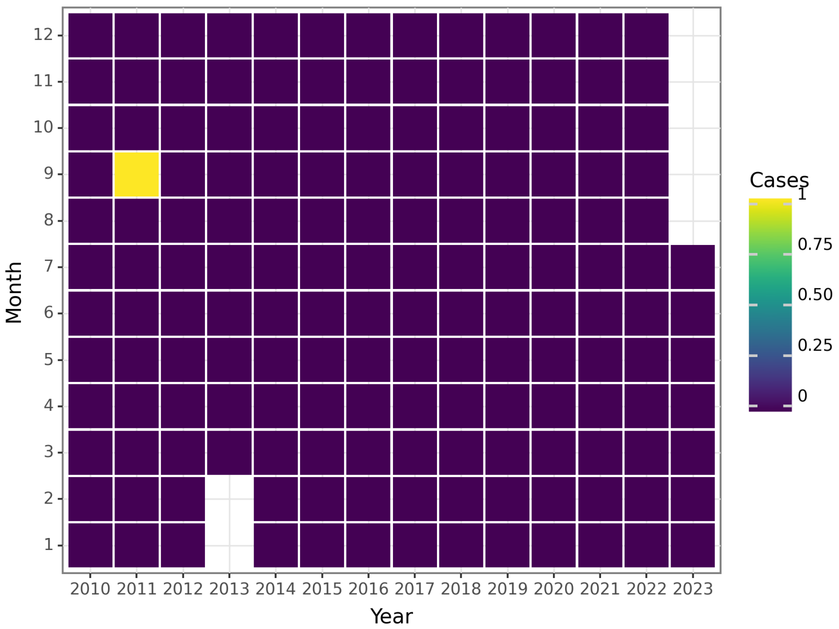

Figure 40: The Change of Poliomyelitis Deaths before 2023 July

Human infection with H5N1 virus

Human infection with the H5N1 virus, commonly known as avian influenza or bird flu, is a highly pathogenic viral disease that emerged in 1997. While the primary hosts of the H5N1 virus are birds, particularly poultry like chickens and ducks, it can also infect humans and other mammals. Understanding the epidemiology of this virus is crucial for implementing public health interventions and preparedness measures.
Historical Context and Discovery: The first documented cases of H5N1 infection in humans were reported in Hong Kong in 1997. The virus had crossed the species barrier from birds to humans, resulting in severe respiratory illness and death. To control the virus, millions of poultry were culled during the outbreak. Since then, sporadic cases and outbreaks have occurred in various parts of the world.
Prevalence and Distribution: H5N1 primarily affects birds and periodic outbreaks have been reported among poultry populations in many countries worldwide. Birds in Asia, Europe, Africa, and the Middle East have tested positive for the virus. However, human cases have been reported in fewer regions, mainly in Asia, with China, Vietnam, Indonesia, Thailand, and Egypt being the most affected countries.
Transmission Routes: The primary mode of H5N1 transmission to humans is through direct or indirect contact with infected birds or their bodily fluids, such as respiratory secretions, feces, or blood. Those who are in close and prolonged contact with infected poultry, such as during the slaughtering, preparing, or handling of infected birds, are at higher risk of transmission. Limited human-to-human transmission has occurred, but it is rare and inefficient, mainly through close and unprotected contact with infected individuals.
Affected Populations: H5N1 infections in humans have occurred across different age groups, genders, and occupations. Cases have been reported in both children and adults, with a majority of cases being individuals under the age of 40. Farmworkers, poultry handlers, and those with close contact with infected birds are at a higher risk. The virus does not show a particular preference for gender.
Key Statistics: Since 2003, when the reporting of H5N1 cases became mandatory, a total of 862 laboratory-confirmed cases have been reported to the World Health Organization (WHO) as of September 2021, with a case fatality rate of approximately 53%. However, these figures likely underestimate the true number of cases due to limited surveillance and unreported instances of asymptomatic or mild cases.
Risk Factors: Several factors contribute to the transmission of H5N1 from birds to humans. These include proximity to infected birds or live poultry markets, poor hygiene practices, lack of biosecurity measures in poultry farms and markets, and exposure to contaminated environments. In some cases, consumption of undercooked or raw contaminated poultry products has also been associated with human infection.
Impact on Different Regions and Populations: The impact of H5N1 varies among different regions and populations. In countries like Indonesia, Vietnam, and Egypt, the virus has caused significant outbreaks in both birds and humans, leading to substantial economic losses and public health burden. These regions often have high rates of poultry farming and limited resources to effectively implement control measures. Other countries have managed to contain sporadic human cases through aggressive surveillance, culling of infected birds, and public health interventions.
In conclusion, human infection with the H5N1 virus remains a persistent public health concern, especially in countries with frequent outbreaks among poultry. Close monitoring of the epidemiology, early detection, prompt response, and effective communication of risks to the public and healthcare professionals are essential in mitigating the impact of H5N1 on both human and animal health.

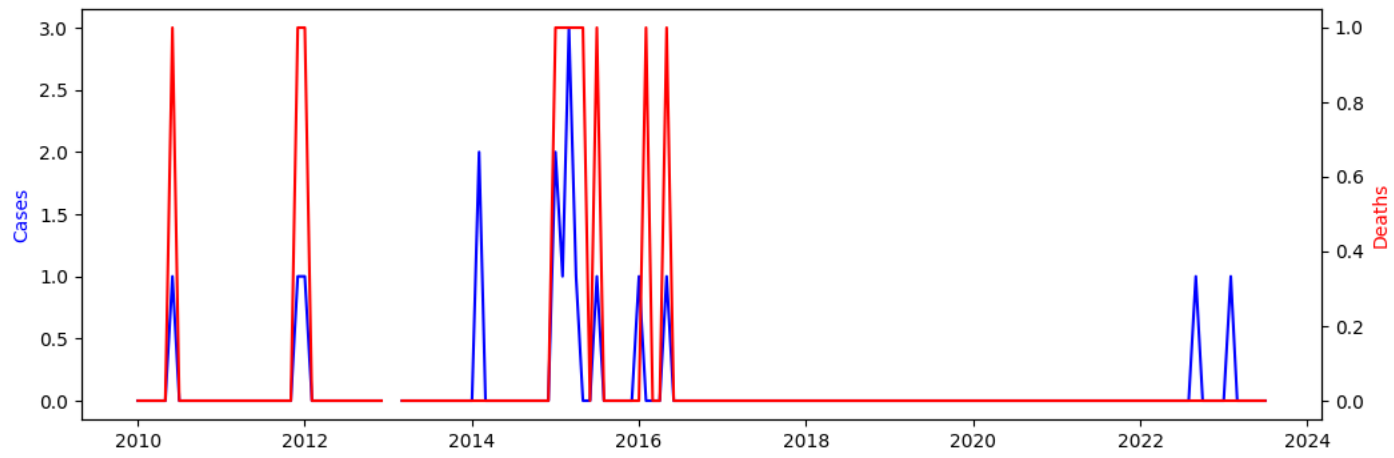

Figure 41: The Change of Human infection with H5N1 virus Reports before 2023 July

Seasonal Patterns:
Based on the data provided for human infection with the H5N1 virus in mainland China, there is no consistent seasonal pattern observed. The number of cases and deaths fluctuates throughout the years, with certain periods showing no cases or deaths occurring.
Peak and Trough Periods:
No clear peak or trough periods are observed in the data. The number of cases and deaths varies from month to month and year to year, without any distinct periods of consistently high or low values.
Overall Trends:
Examining the overall trend reveals that the number of cases and deaths has generally remained low throughout the given time period. There are sporadic peaks where a few cases and deaths occur, but overall, the occurrences are low.
Discussion:
The data provided for human infection with the H5N1 virus in mainland China before July 2023 does not show any specific seasonal patterns, peak or trough periods, or clear overall trends. The number of cases and deaths fluctuates and remains generally low. It is crucial to continue monitoring the situation and gathering more data to assess any patterns or trends that may emerge over a longer time period. This information is essential for understanding and implementing appropriate public health measures to control and prevent the spread of the H5N1 virus.

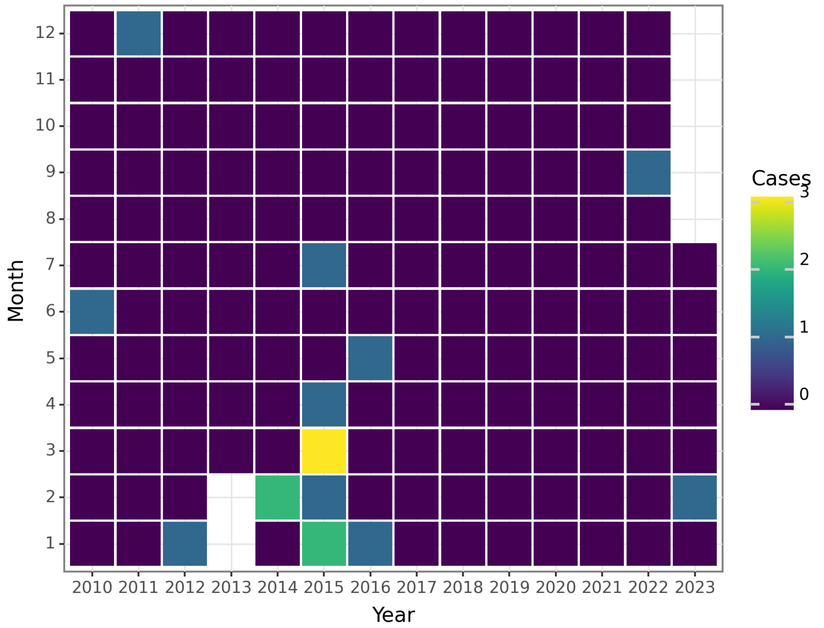

Figure 42: The Change of Human infection with H5N1 virus Cases before 2023 July

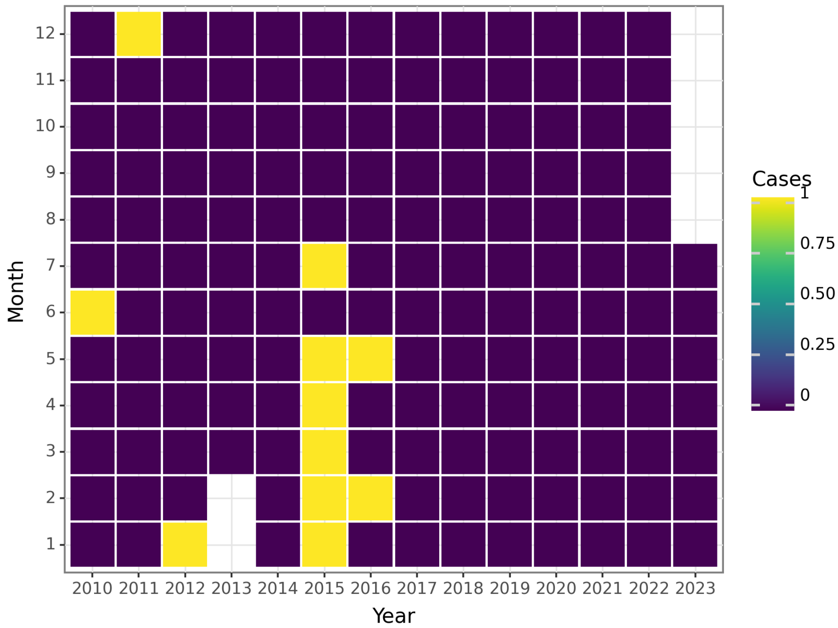

Figure 43: The Change of Human infection with H5N1 virus Deaths before 2023 July

Measles

Measles, also known as rubeola, is a contagious viral infection primarily affecting children. It is caused by the measles virus, a member of the Paramyxoviridae family. Measles spreads through respiratory droplets and typically presents with symptoms including fever, cough, runny nose, red eyes, and a distinctive rash. Despite being preventable through vaccination, measles continues to be a significant global public health concern.

Epidemiology:

Global Prevalence: Measles is found worldwide, but its prevalence varies geographically. Before widespread vaccination, measles was nearly universal in childhood. Since the introduction of the vaccine in the 1960s, significant progress has been made in reducing measles cases and deaths. However, measles remains endemic in many parts of the world, especially in developing countries with limited access to vaccination programs.

Transmission Routes: Measles primarily spreads through respiratory droplets. Infected individuals can transmit the virus to others through coughing, sneezing, or direct contact with nasal or throat secretions. The virus can survive in the air or on surfaces for up to two hours, making it highly contagious.

Affected Populations: Measles primarily affects children, particularly those who have not received the vaccine. However, individuals of any age, including adults, can contract measles if they have not been immunized or have not previously had the infection. Infants who are too young to receive the vaccine and individuals with weakened immune systems are particularly vulnerable.

Key Statistics: Prior to widespread vaccination, measles caused approximately 2-3 million deaths annually. However, thanks to global immunization efforts, this number has significantly decreased over the years. In 2019, the World Health Organization (WHO) estimated approximately 207,500 measles deaths worldwide, equivalent to approximately 567 deaths per day or 24 deaths per hour.

Historical Context and Discovery: Measles has been known for centuries. Ancient Chinese, Persian, and Arabian texts described the symptoms of measles as early as the 9th century. However, the first formal description of the disease was made by the Persian physician Rhazes in the 10th century. The virus responsible for measles was not discovered until 1954 by American physician Thomas Huckle Weller and colleagues.

Major Risk Factors:

1. Lack of Vaccination: The primary risk factor for contracting measles is the absence of vaccination. Unvaccinated individuals who come into contact with the virus are highly susceptible to infection.
2. Travel to Endemic Areas: Traveling to regions with active measles transmission increases the risk of contracting the disease. Unvaccinated individuals traveling to countries with low immunization rates or ongoing outbreaks are particularly vulnerable.
3. Lack of Healthcare Infrastructure: Limited access to healthcare services, particularly in developing countries, contributes to low immunization rates and increases the risk of measles outbreaks.

Impact on Regions and Populations:

Prevalence Rates: The prevalence of measles varies globally. Regions such as Africa, Southeast Asia, and the Western Pacific have higher incidence rates compared to countries with robust vaccination programs. In contrast, regions like the Americas, Europe, and the Eastern Mediterranean have achieved significant reductions in measles cases, primarily due to vaccination efforts.

Affected Demographics: Measles can affect individuals of any age and demographic; however, outbreaks often occur in populations with lower vaccine coverage. These include communities with vaccine hesitancy, marginalized populations, and areas with weak healthcare infrastructure. Additionally, overcrowded settings such as refugee camps and schools can facilitate rapid measles transmission.

In conclusion, measles is a highly contagious viral infection that remains a significant global public health concern. Although vaccination has dramatically reduced measles cases and deaths, outbreaks still occur, particularly in regions with limited access to immunization programs. Lack of vaccination, travel to endemic areas, and limited healthcare infrastructure are the primary risk factors for measles transmission. Efforts to increase vaccination coverage and strengthen healthcare systems are essential to further control and prevent the spread of measles.

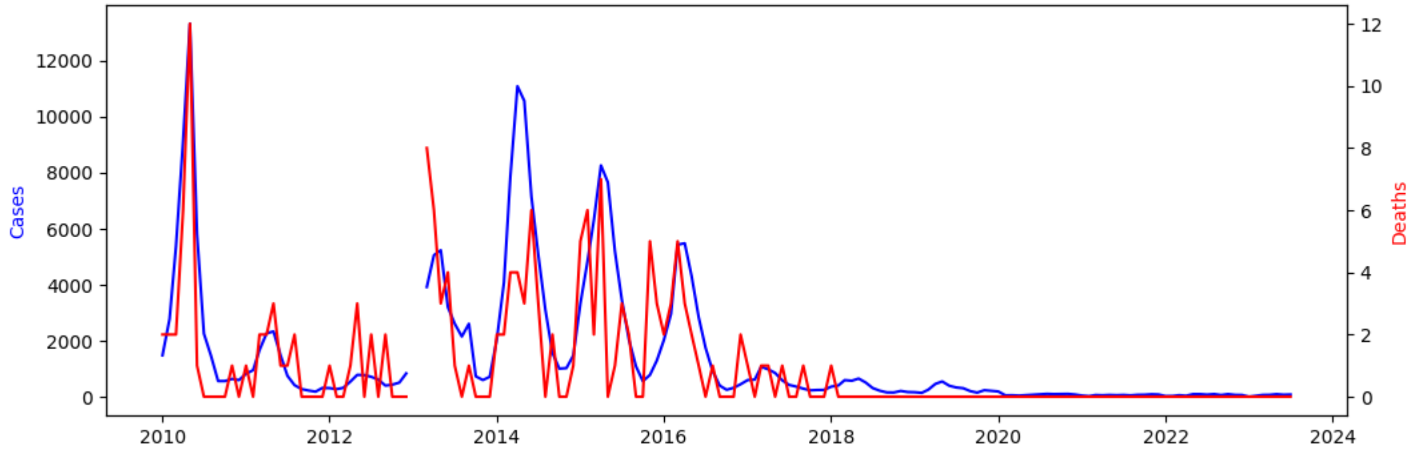

Figure 44: The Change of Measles Reports before 2023 July

Seasonal Patterns: The data reveals a distinct seasonal pattern in the incidence of measles cases in mainland China. Generally, there is an increase in cases during the winter and spring months (December to April), followed by a decrease during the summer and fall months (May to November).
Peak and Trough Periods: The highest number of measles cases, considered as the peak period, is observed from February to April. Conversely, the lowest number of cases, referred to as the trough period, is recorded from June to September.
Overall Trends: A declining trend in the number of measles cases is evident from 2010 to 2023. In the earlier years, there were relatively high numbers of cases, with peaks occurring in 2013 and 2014. However, the incidence of cases has steadily decreased since then, with lower peaks observed in subsequent years. These findings suggest that control measures and vaccination efforts have been effective in reducing the burden of measles in mainland China.
Discussion: The observed seasonal pattern in measles cases aligns with typical patterns observed in many other countries, where cases tend to be higher during the colder months. This may be attributed to factors such as increased indoor crowding and closer contact among individuals during winter, which facilitate the transmission of the measles virus.
The declining trend in measles cases over the years is a positive indication, indicating successful efforts to control and prevent measles. Vaccination campaigns, improved healthcare infrastructure, and public health interventions likely played a crucial role in reducing the number of cases. However, it is crucial to remain vigilant and continue efforts to maintain high vaccination coverage to prevent any potential resurgence of the disease.
It is important to note that while this analysis focuses on the number of measles cases, monitoring and addressing measles-related deaths are equally important. The data demonstrates that the number of deaths due to measles is generally low, with sporadic occurrences throughout the years. This is likely due to timely and effective medical interventions and treatments.
In conclusion, the data shows a seasonal pattern in measles cases in mainland China, with peak periods during winter and spring, a declining trend in the number of cases over the years, and relatively low numbers of measles-related deaths. Continued surveillance and proactive measures should be sustained to ensure ongoing control and prevention of measles in the future.

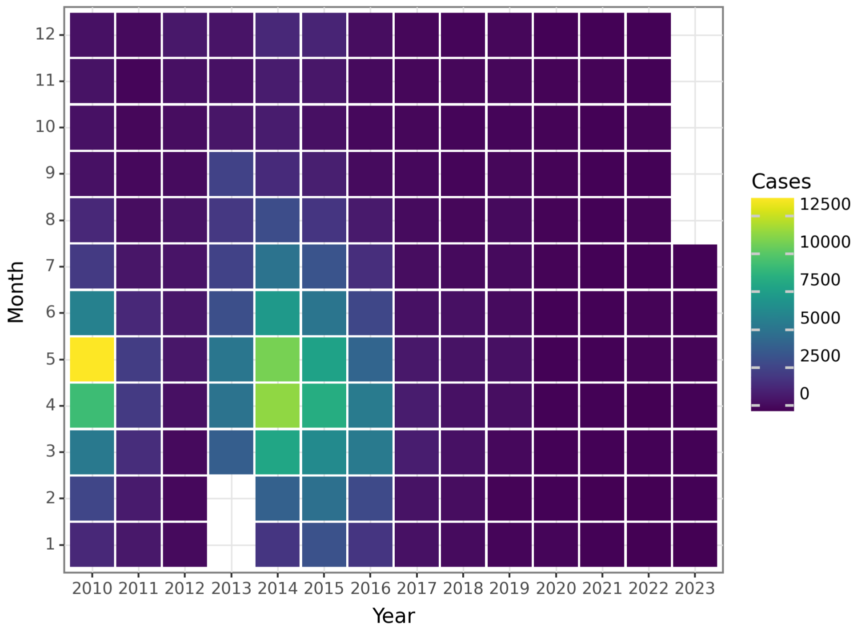

Figure 45: The Change of Measles Cases before 2023 July

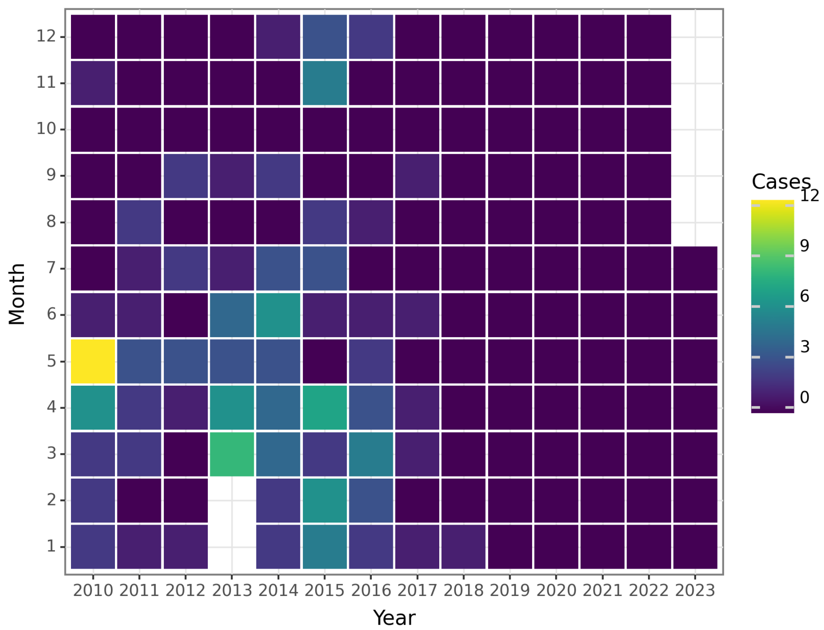

Figure 46: The Change of Measles Deaths before 2023 July

Epidemic hemorrhagic fever

Epidemic hemorrhagic fever (EHF) is a viral disease characterized by fever, bleeding tendencies, and organ damage. It belongs to a group of viral hemorrhagic fevers, which also include diseases such as Ebola and Lassa fever. EHF is caused by several different viruses, including the Ebola virus, Marburg virus, and Crimean-Congo hemorrhagic fever virus. Each of these viruses has unique epidemiological characteristics, but collectively they contribute to the overall burden of EHF.

Historical Context and Discovery: Epidemic hemorrhagic fever has been recognized for many years, although the specific viruses causing the disease were not identified until later. The first recorded outbreak of EHF occurred in 1967 in Marburg, Germany, where laboratory workers were infected with the Marburg virus after handling infected monkeys from Uganda. This event led to the discovery of the Marburg virus and recognition of EHF as a distinct disease. Subsequently, other viruses such as Ebola and Crimean-Congo hemorrhagic fever virus were identified as causes of EHF.

Global Prevalence: EHF has a global presence, although the specific viruses causing the disease are geographically constrained. Ebola virus outbreaks have primarily occurred in Central and West Africa, with notable outbreaks in countries like the Democratic Republic of Congo, Guinea, Sierra Leone, and Liberia. Marburg virus outbreaks have predominantly occurred in Africa, with outbreaks reported in Uganda, Angola, and the Democratic Republic of Congo. Crimean-Congo hemorrhagic fever virus is found in parts of Africa, Europe, Asia, and the Middle East, with outbreaks reported in countries such as Pakistan, Turkey, and Iran.

Transmission Routes: EHF viruses are zoonotic, originating in animals and transmissible to humans. The exact reservoir hosts for each virus may vary, but common animals include bats, primates, and rodents. Humans can acquire the virus through direct contact with infected animals or their bodily fluids, such as blood or secretions. Additionally, human-to-human transmission can occur through contact with infected bodily fluids, including direct contact, sexual transmission, and contact with contaminated surfaces or objects. Healthcare workers are particularly at risk due to their close contact with infected individuals.

Affected Populations: EHF can affect individuals of any age, gender, or socioeconomic status. However, certain populations may be at higher risk due to occupational exposure or living conditions. For example, individuals involved in hunting, animal husbandry, or healthcare are at increased risk of exposure to infected animals or patients. Lack of access to healthcare facilities or resources, poor infection control practices, and crowded living conditions can also contribute to the spread of EHF among vulnerable populations.

Key Statistics: EHF outbreaks can vary in severity and impact. The fatality rates associated with different EHF viruses can range from 25% to over 90%. For example, the case fatality rate of the Ebola virus can exceed 70% in some outbreaks. The number of cases during an outbreak can also vary, with smaller localized outbreaks to larger epidemics impacting thousands of individuals. The overall burden of EHF on a global scale is relatively low compared to other infectious diseases, but outbreaks can have a profound impact on affected communities and healthcare systems.

Risk Factors: Several risk factors are associated with the transmission of EHF. These can include proximity to specific animal reservoirs, such as bat caves, primate habitats, or rodent-infested areas. Engaging in activities that involve contact with animals or their products, such as hunting or butchering, can increase the risk of exposure. Additionally, inadequate infection control practices, including improper handling of biological samples or limited access to personal protective equipment, can contribute to the spread of EHF. Lack of public health infrastructure and resources to respond to outbreaks also exacerbates the risk.

Impact on Different Regions and Populations: EHF outbreaks have had significant impacts on different regions and populations. In areas where healthcare infrastructure is weak, outbreaks can quickly overwhelm healthcare systems and lead to high mortality rates. These outbreaks also have wider socio-economic consequences, including disruption of trade, travel restrictions, and negative impacts on education and employment. EHF outbreaks also disproportionately affect marginalized populations, particularly those living in poverty or in areas with limited access to healthcare services. Women and children may also experience unique vulnerabilities during outbreaks, such as increased risks during pregnancy or challenges accessing healthcare.

Overall, EHF is an important public health concern with the potential for severe outbreaks and high mortality rates. Continued efforts in surveillance, prevention, and outbreak response are essential to minimize the impact of EHF on affected populations and prevent future outbreaks.

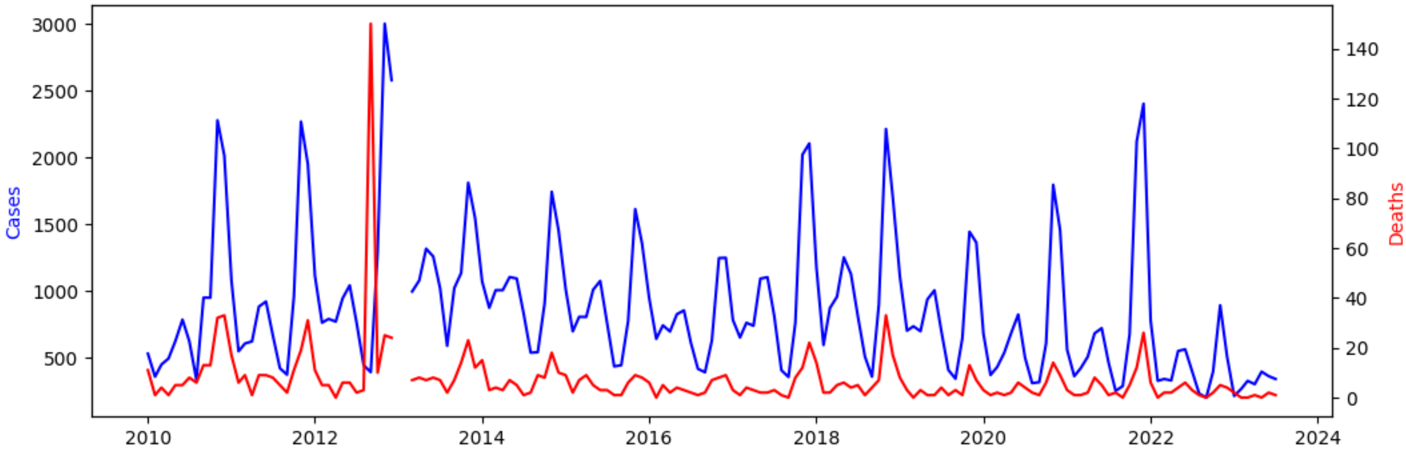

Figure 47: The Change of Epidemic hemorrhagic fever Reports before 2023 July

Seasonal Patterns: The data show a clear seasonal pattern for Epidemic Hemorrhagic Fever (EHF) in mainland China. The number of cases tends to be higher in the warmer months (April to September) and lower in the colder months (October to March). This suggests a cyclic pattern of the disease with increased transmission during the warmer seasons.
Peak and Trough Periods: EHF in mainland China reaches its peak in November, with the highest number of reported cases in multiple years, such as 3,000 cases in November 2012 and 2,120 cases in November 2021. Conversely, the trough period occurs in February, with the lowest number of reported cases in some years, for example, 330 cases in February 2023. These peak and trough periods indicate fluctuations in disease transmission and prevalence throughout the year.
Overall Trends: Overall, there is an increasing trend in the number of EHF cases in mainland China from 2010 to 2013, followed by fluctuations in subsequent years. However, from 2017 to 2023 (until July), there is a significant upward trend, reaching its highest peak in 2021 with 2,402 cases in December. These trends suggest a concerning rise in EHF incidence in recent years.
Discussion: The observed seasonal patterns underscore the importance of considering environmental factors and climate variations in EHF transmission. Warmer temperatures, higher rainfall, and increased vector activity during the summer months may contribute to the disease's higher transmission rates. The peak and trough periods signify potential periods of increased risk and lower transmission. Understanding these patterns can inform the development and implementation of effective prevention and control measures, such as targeted interventions during peak periods.
The overall increasing trend in EHF cases in mainland China is alarming and may indicate various contributing factors in its transmission, such as changes in population susceptibility, vectors or reservoirs, social and behavioral factors, and healthcare access. Further investigation and analysis are necessary to identify the underlying reasons for this trend and to inform strategies for disease prevention, surveillance, and response.
Note: The analysis is based solely on the provided data and should be interpreted cautiously as other factors and information may influence the patterns and trends of EHF in mainland China.

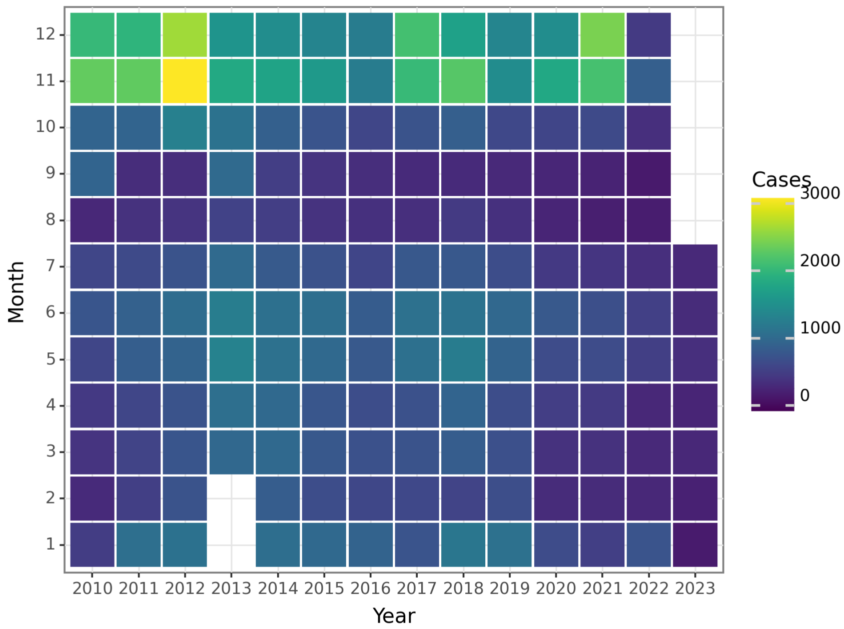

Figure 48: The Change of Epidemic hemorrhagic fever Cases before 2023 July

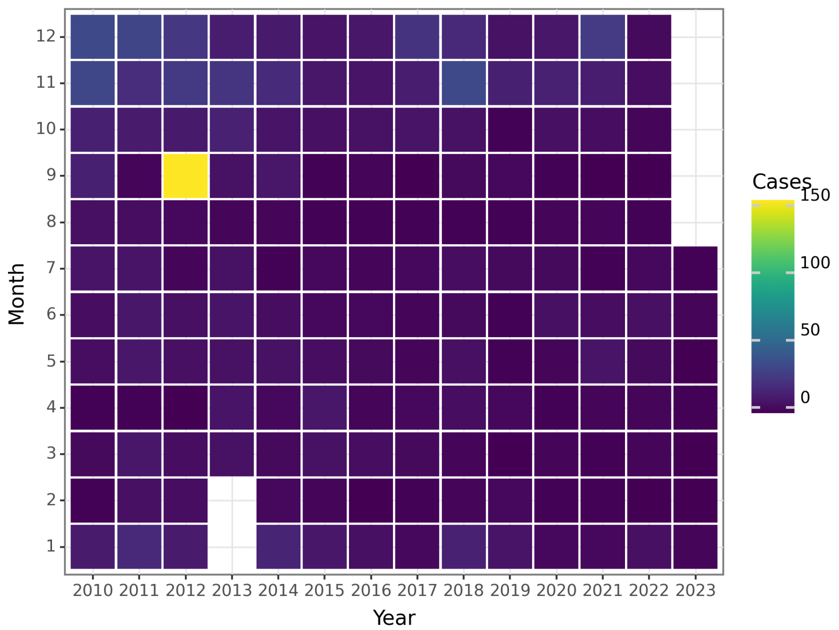

Figure 49: The Change of Epidemic hemorrhagic fever Deaths before 2023 July

Rabies

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

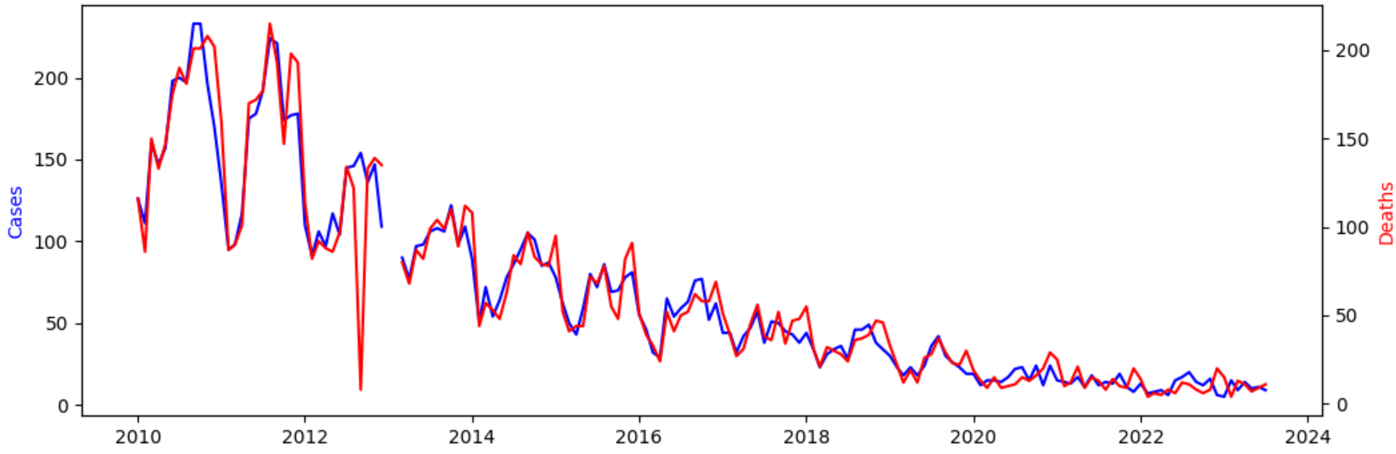

Figure 50: The Change of Rabies Reports before 2023 July

Seasonal Patterns: The data demonstrates a clear seasonal pattern in mainland China for the occurrence of rabies cases. The number of cases tends to peak in the months of July, August, and September, with a gradual increase from May through September. Consequently, these summer months exhibit the highest number of cases, followed by a decline from October to April. This suggests a seasonal pattern in which rabies transmission increases during the warmer months.
Peak and Trough Periods: In mainland China, the peak period for rabies cases occurs during the summer months, specifically in July, August, and September. Conversely, the trough period, characterized by the lowest number of cases, is observed during the winter months from December to February. This cyclical pattern indicates an annual peak and trough in rabies cases.
Overall Trends: Analyzing the overall trends, there appears to be a general decrease in the number of rabies cases from 2010 to 2023. In the earlier years (2010-2013), there were relatively high case numbers, which exhibited some fluctuations from year to year. However, starting from 2014, there has been a noticeable overall decline in the number of cases. This declining trend suggests the effectiveness of rabies prevention and control measures, such as vaccination campaigns and animal control programs, in reducing the incidence of rabies in mainland China.
Discussion: The seasonal patterns of rabies cases observed in mainland China align with the known transmission dynamics of the disease. Rabies primarily spreads through bites from infected animals, and during the summer months, there is typically an increase in outdoor activities, which raises the likelihood of human-animal interactions and potential exposure to rabid animals.
The peak in rabies cases during the summer months emphasizes the importance of implementing public health interventions, including education campaigns on pet vaccinations, responsible pet ownership, and the avoidance of contact with stray animals during this period. Furthermore, targeted surveillance and control strategies should be employed to promptly identify and respond to cases during the peak season. These measures may include animal control initiatives and post-exposure prophylaxis for individuals potentially exposed to rabies.
The overall decline in rabies cases over time indicates the positive impact of public health initiatives and control measures. This may involve extensive vaccination of domestic animals, enhanced surveillance, control of stray animal populations, and improved access to healthcare and post-exposure prophylaxis. To sustain this decline, continued efforts and investment in these preventive measures are crucial in mainland China.
It is important to acknowledge that the analysis of seasonal patterns, peak and trough periods, and overall trends relies solely on the provided data. Additional factors, such as changes in reporting methods or surveillance systems, may influence the observed patterns. Therefore, it is recommended to consider these limitations when interpreting the findings.

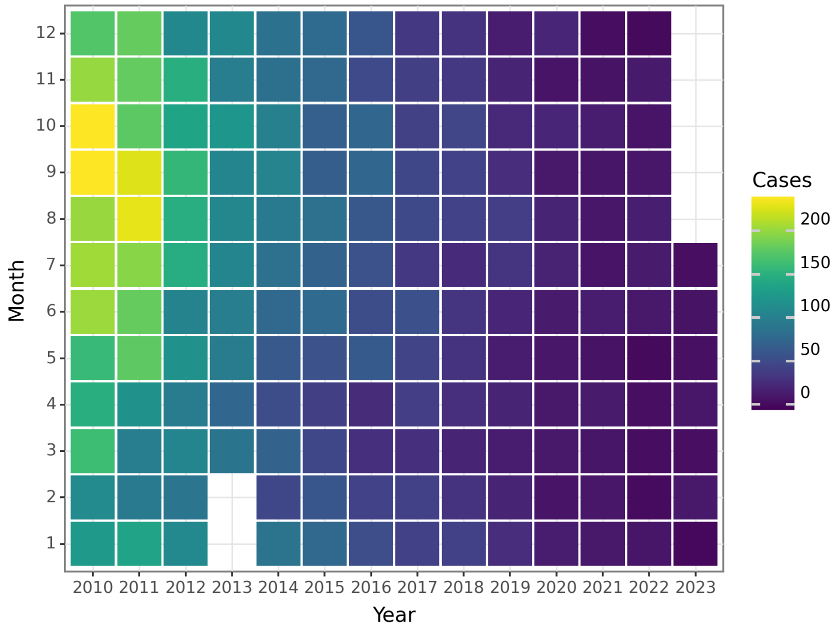

Figure 51: The Change of Rabies Cases before 2023 July

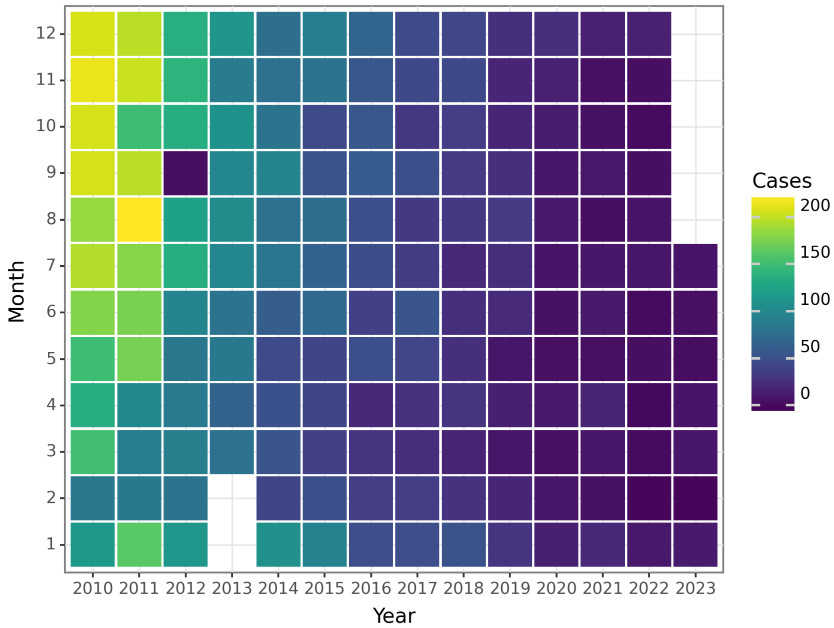

Figure 52: The Change of Rabies Deaths before 2023 July

Japanese encephalitis

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

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

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

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

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

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

Several risk factors increase the transmission of Japanese encephalitis:

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

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

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

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

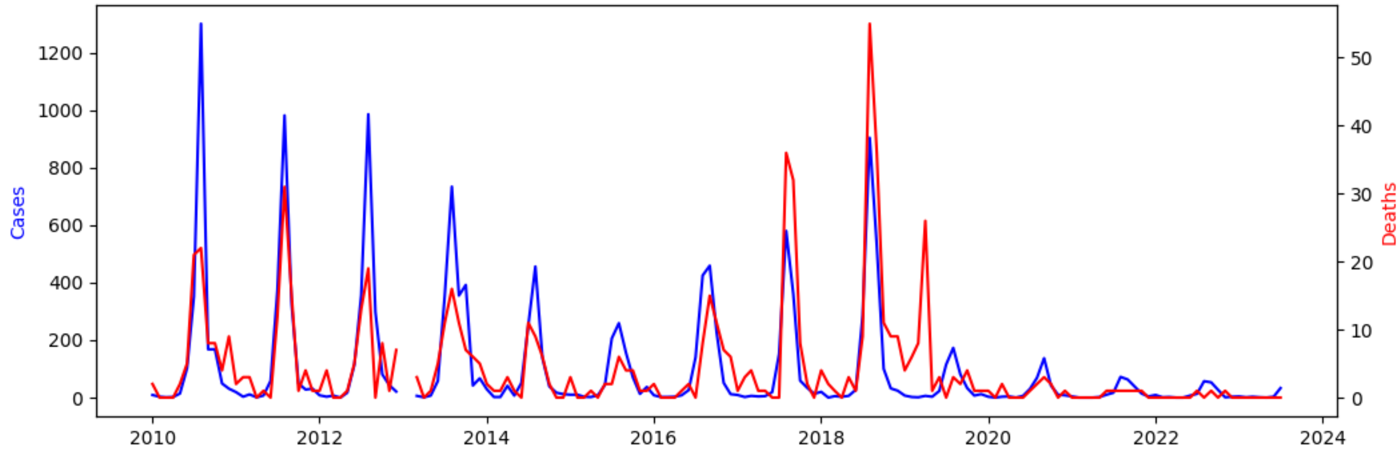

Figure 53: The Change of Japanese encephalitis Reports before 2023 July

Seasonal Patterns:
Based on the provided data, a clear seasonal pattern emerges in the number of Japanese encephalitis cases in mainland China prior to July 2023. During the winter months (December to February), the number of cases is generally low, but it increases from March onwards, reaching its peak in August before gradually declining towards the end of the year. This seasonal pattern indicates that Japanese encephalitis transmission is influenced by climatic factors and the activity of the mosquito vector.
Peak and Trough Periods:
The peak period for Japanese encephalitis cases in mainland China is observed in August and September, during which a notable increase in cases occurs. This can be attributed to conducive environmental conditions and heightened mosquito activity during the summer months. Conversely, the trough period is evident in the winter months, particularly December and January, when the number of cases is relatively low.
Overall Trends:
When examining the overall trend of Japanese encephalitis cases in mainland China prior to July 2023, there is a general upward trend from 2010 to 2017, with annual fluctuations in case numbers. From 2018 to 2019, there is a decrease in cases, followed by a slight increase in 2020, and subsequent decreases in the following years. The number of cases in 2023 (up to July) is relatively low compared to previous years. It is crucial to note that these trends are based on limited data and may not provide a complete understanding of Japanese encephalitis in mainland China.
Discussion:
The seasonal patterns and peak periods of Japanese encephalitis cases in mainland China suggest a significant association between disease transmission and the activity of the mosquito vector, as well as environmental factors such as temperature and humidity. The peak occurrence in August and September, occurring during the warm and humid summer months, indicates favorable conditions for mosquito breeding and transmission. These findings emphasize the importance of targeted control measures, including mosquito control, vaccination programs, and public health education, during these peak periods to mitigate the impact of Japanese encephalitis.
The overall trend of Japanese encephalitis cases shows fluctuations over the years, with an increasing trend observed from 2010 to 2017, followed by a decrease in subsequent years. This could be attributed to various factors, including changes in vector populations, vaccination coverage, and public health interventions. It is essential to acknowledge that the analysis is based on a limited dataset and may not encompass all factors influencing the trends.
Further analysis and surveillance are necessary to fully comprehend the dynamics of Japanese encephalitis transmission in mainland China and to inform effective control strategies. This entails continuous monitoring of disease trends, exploration of potential risk factors, and evaluation of the impact of preventive measures such as vaccination programs.

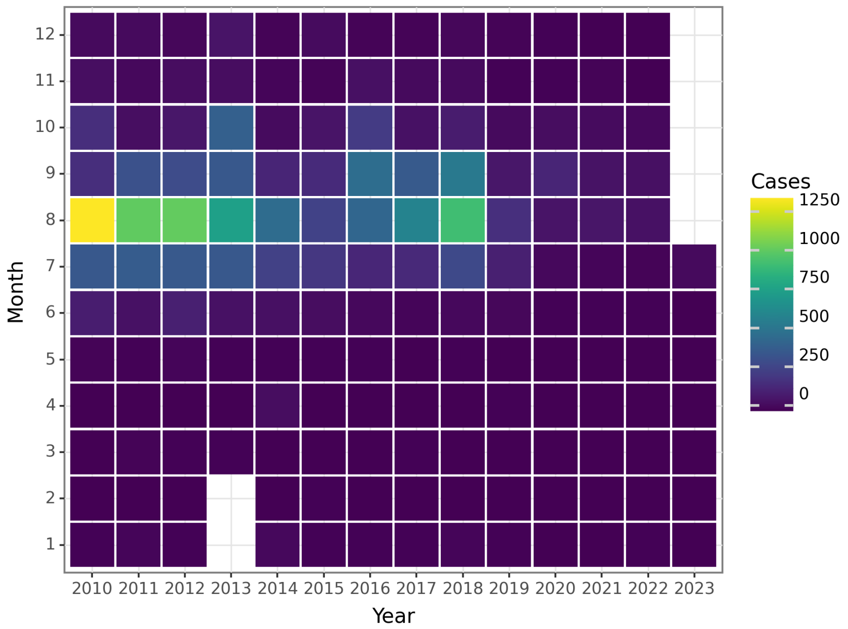

Figure 54: The Change of Japanese encephalitis Cases before 2023 July

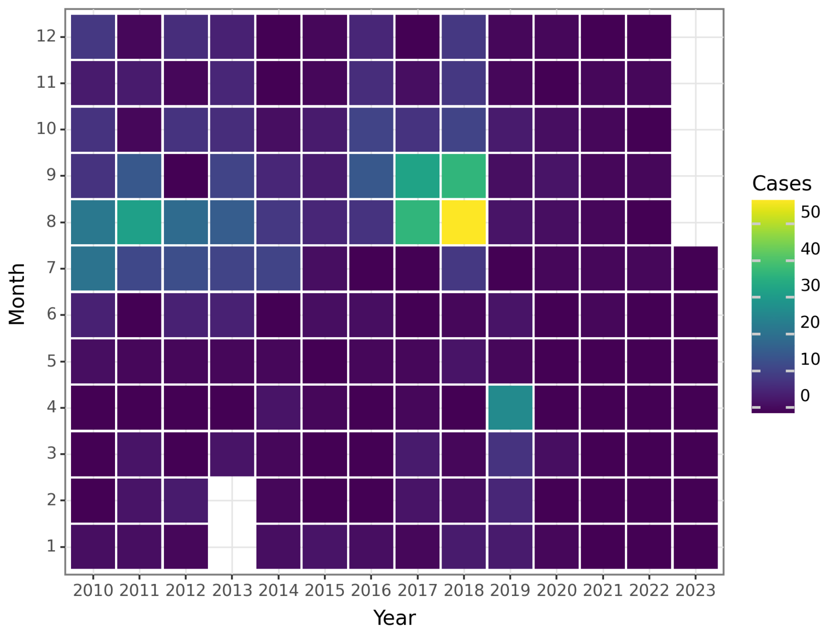

Figure 55: The Change of Japanese encephalitis Deaths before 2023 July

Dengue

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

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

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

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

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

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

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

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

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

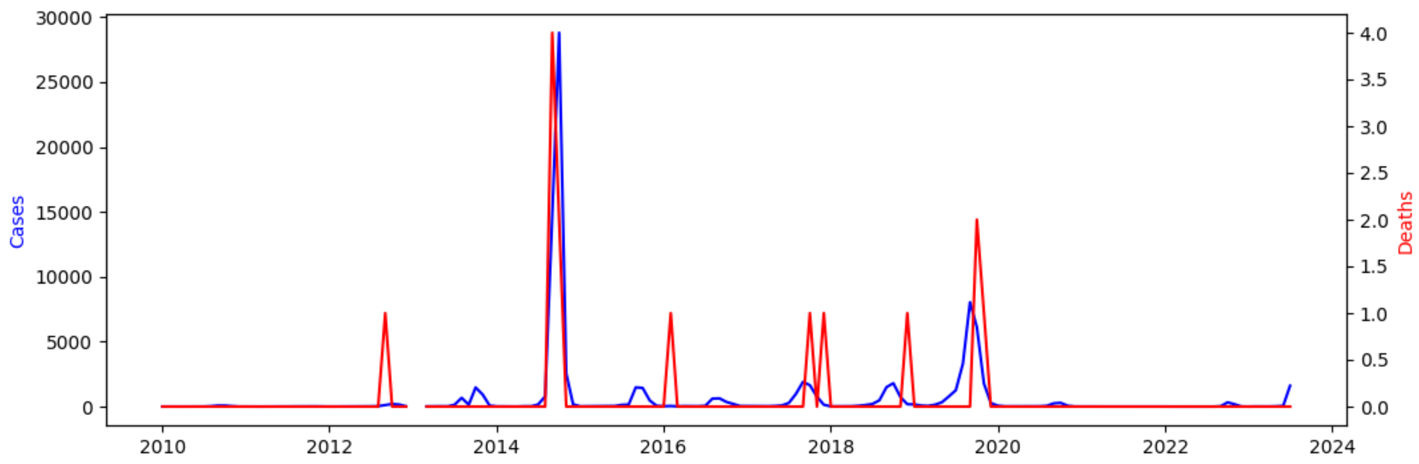

Figure 56: The Change of Dengue Reports before 2023 July

Seasonal Patterns:
Based on the provided data, a clear seasonal pattern in the number of Dengue cases in mainland China is evident. The number of cases tends to increase during the summer months, particularly from June to August, and decrease during the winter months. This consistent pattern can be observed throughout the years.
Peak and Trough Periods:
The peak periods for Dengue cases occur in the summer months, specifically in July and August. These months consistently have the highest number of cases every year. On the other hand, the trough periods for Dengue cases occur in the winter months, particularly in January and February, when the number of cases remains relatively low.
Overall Trends:
There is an overall increasing trend in the number of Dengue cases in mainland China over the years. In the early years (2010-2011), the number of cases is relatively low, but there is a significant increase starting from 2012. This trend continues throughout the following years, with occasional fluctuations in 2014 and 2019, where the number of cases spiked significantly.
Discussion:
The seasonal patterns of Dengue cases in mainland China, with peaks during the summer and troughs during the winter, align with the known characteristics of Dengue transmission, which is influenced by temperature and humidity. The peak periods correspond to the warmer and wetter climate, which provide favorable environments for the breeding and proliferation of the Aedes mosquitoes, the primary vector for Dengue.
In recent years, there has been an increasing trend in the number of Dengue cases in mainland China. This could be attributed to various factors, including climate change, increased international travel, and urbanization, which create favorable conditions for the spread of the disease and the introduction of new Dengue strains.
It is crucial for public health authorities to continue monitoring and implementing effective control measures to mitigate the spread of Dengue in mainland China. These measures should include vector control programs, public awareness campaigns, and early detection and response systems to prevent outbreaks and reduce the impact of the disease on public health.

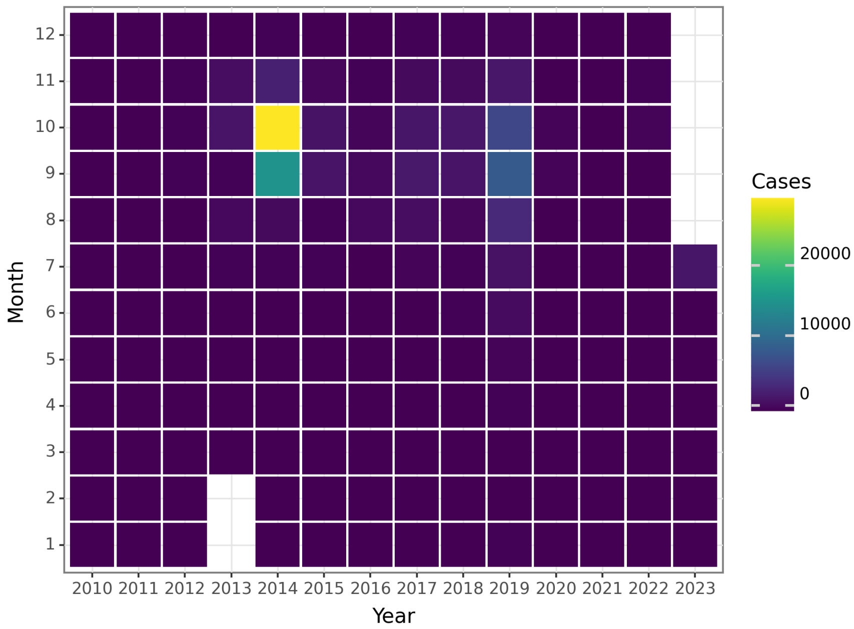

Figure 57: The Change of Dengue Cases before 2023 July

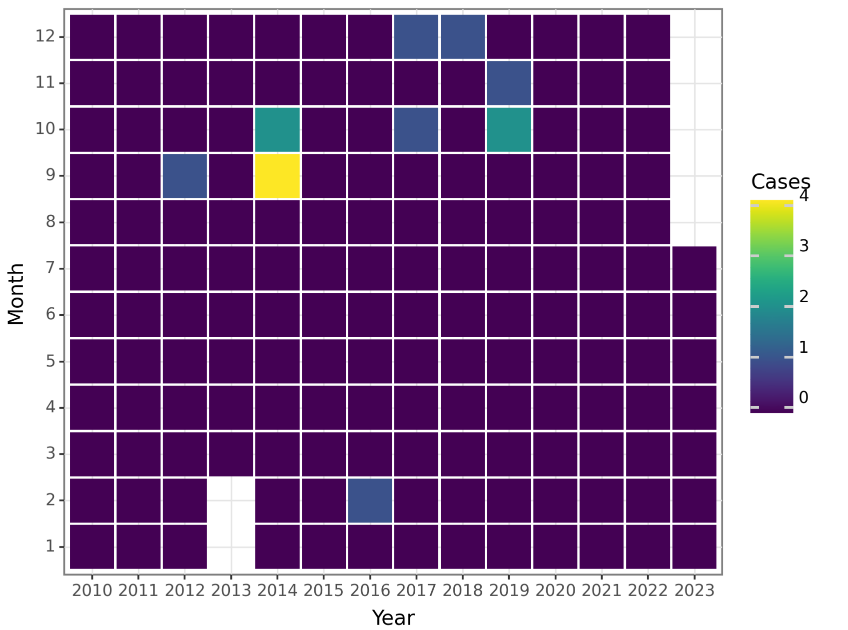

Figure 58: The Change of Dengue Deaths before 2023 July

Anthrax

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

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

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

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

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

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

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

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

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

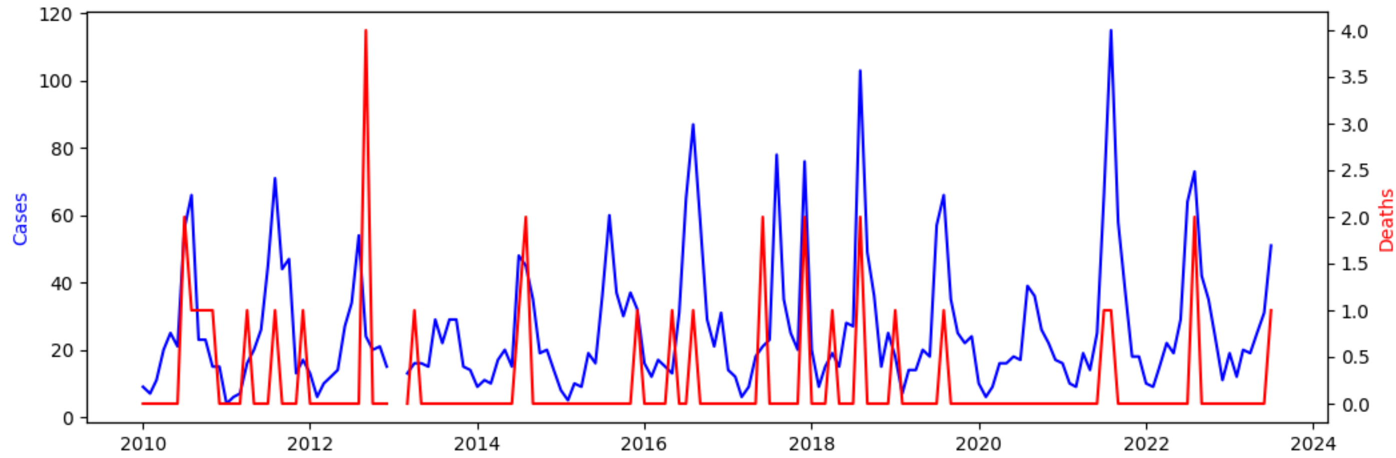

Figure 59: The Change of Anthrax Reports before 2023 July

Seasonal Patterns in Anthrax Cases in Mainland China
An analysis of monthly data on Anthrax cases in mainland China reveals a discernible seasonal pattern. Typically, there is an increase in the number of cases during the summer months and a decrease during the winter months. Specifically, a higher number of cases occur between May and August, while lower numbers are observed between November and February.
Peak and Trough Periods
In mainland China, peak periods for Anthrax cases occur predominantly during the summer months, particularly in July and August. During these months, the number of cases reaches its pinnacle, with 115 cases reported in August 2021. Trough periods, with the lowest numbers of cases, are encountered mostly in the winter months, notably between November and February.
Overall Trends
An observation of the analyzed period reveals fluctuations in the number of Anthrax cases. However, there is a slight increasing trend present. Between 2010 and 2017, the number of cases appears relatively stable, with occasional spikes in certain years. However, since 2017, there has been a noticeable upward trend, especially in the years 2020 and 2021, with the highest numbers of reported cases.
Discussion
The seasonal patterns observed in Anthrax cases suggest that certain environmental factors or human behaviors may contribute to the transmission of the disease during specific times of the year. Further research is imperative to identify these factors and comprehend their impact on the occurrence of Anthrax cases.
The peak periods during the summer months may be linked to increased outdoor activities, exposing individuals to environments where Anthrax spores are more prevalent. High temperatures in summer may also grow and facilitate the survival of the Anthrax bacteria.
Trough periods during the winter months may be attributed to reduced outdoor activities and lower temperatures, which reduce the likelihood of exposure to Anthrax spores.
The overall increasing trend in Anthrax cases since 2017 is concerning and requires further investigation. The trend may result from various factors, including changes in ecological conditions, increased awareness and reporting of cases, or modifications in agricultural practices that may facilitate the transmission of the disease.
In conclusion, the analysis shows seasonal patterns in Anthrax cases in mainland China, with peak periods in the summer months and trough periods in the winter months. There is also a discernible increasing trend in Anthrax cases since 2017. Understanding these patterns and trends is crucial for successful surveillance and control measures to prevent the spread of Anthrax in the future.

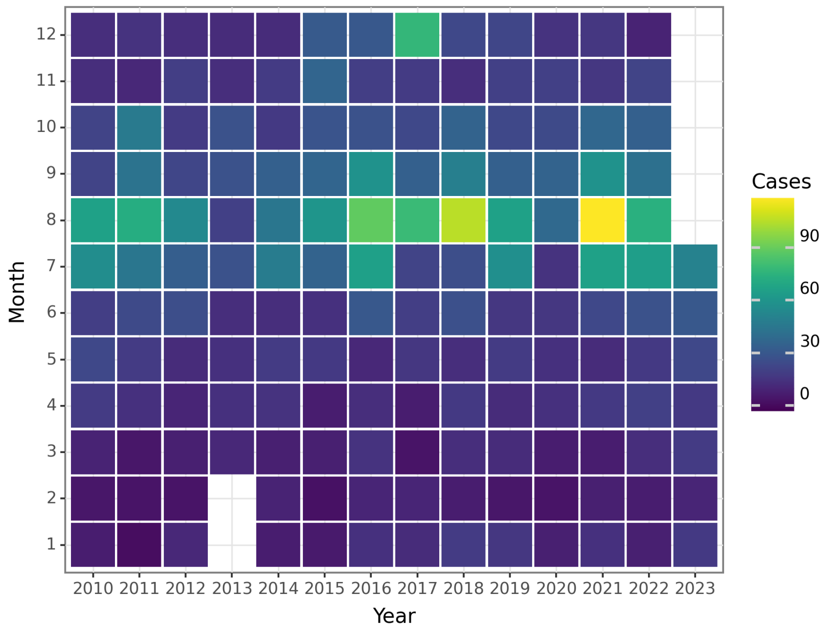

Figure 60: The Change of Anthrax Cases before 2023 July

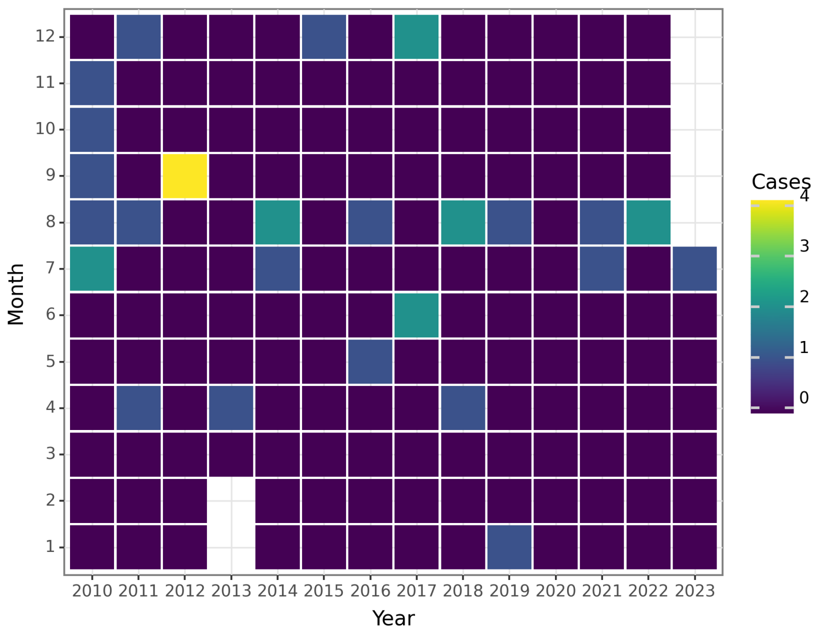

Figure 61: The Change of Anthrax Deaths before 2023 July

Dysentery

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

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

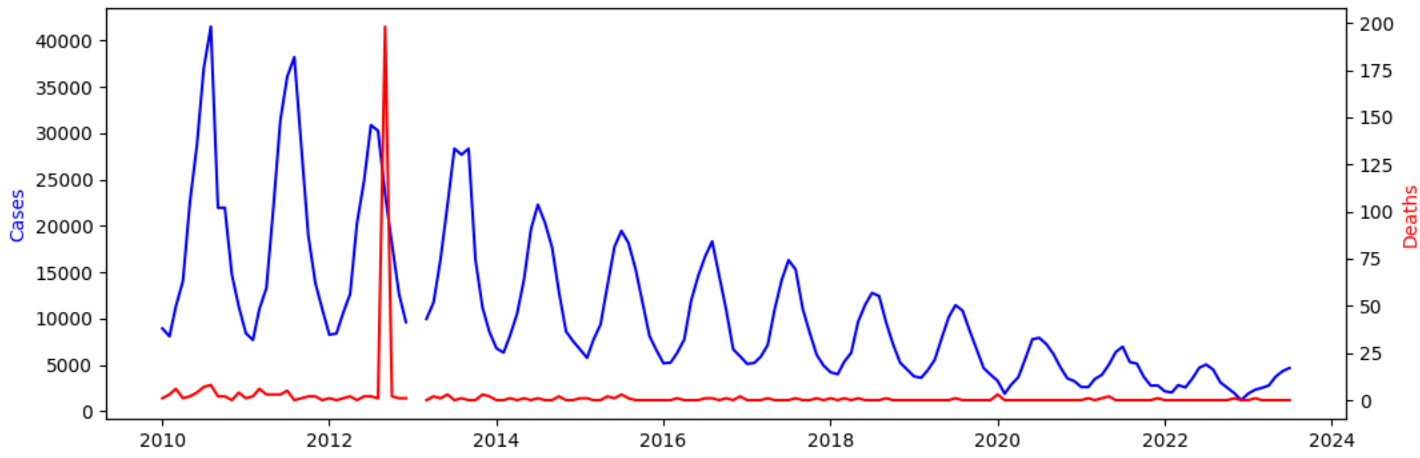

Figure 62: The Change of Dysentery Reports before 2023 July

Seasonal Dysentery Patterns in Mainland China Based on the monthly cases of dysentery in mainland China prior to July 2023, we observed some seasonal patterns. Dysentery cases tend to increase during the summer months (June, July, and August) and then gradually decrease towards the end of the year. There is a clear peak in cases during the summer months that repeats over the years.

The peak period for dysentery cases in mainland China occurs during the summer months, specifically in July and August, with the number of cases reaching its highest levels during these months. Conversely, the trough period can be observed during the winter months, with the lowest number of cases occurring in January and February.

Examining the overall trends, we observe that the number of dysentery cases fluctuates from year to year but shows a general increasing trend, with the number of cases gradually rising from 2010 to 2013. Following this, there was some variability, but overall, the number of cases remained relatively high compared to previous years.

Discussion reveals that the seasonal patterns of dysentery cases in mainland China indicate a higher risk of transmission during summer, a fact consistent with known transmission patterns of the disease. The observed peak and trough periods align with the warmer and colder seasons, respectively. Furthermore, the overall increasing trend in cases suggests the need for continuous monitoring and intervention measures to control and prevent the spread of dysentery in mainland China.

It is important to note that the analysis is based solely on the provided data; however, changes in reporting practices, demographics, and public health interventions may also impact the observed patterns and trends. Therefore, further analysis and investigation may be required to garner a comprehensive understanding of dysentery epidemiology in mainland China.

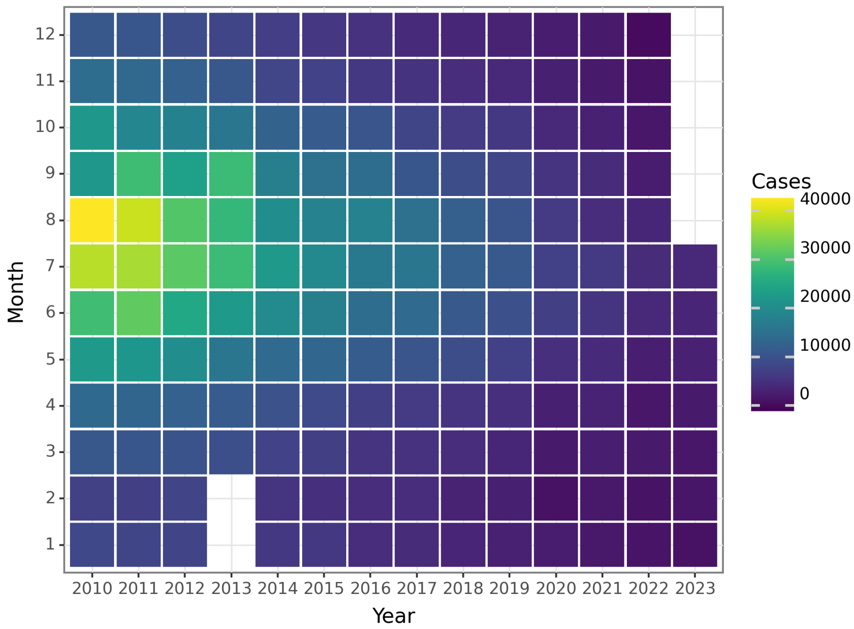

Figure 63: The Change of Dysentery Cases before 2023 July

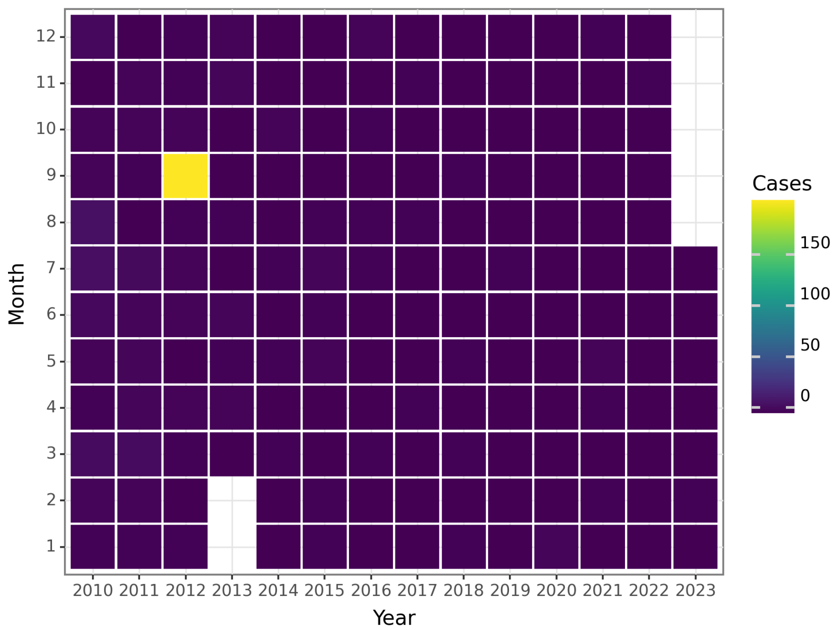

Figure 64: The Change of Dysentery Deaths before 2023 July

Tuberculosis

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

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

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

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

Certain populations are at a higher risk of TB infection and disease progression. This includes individuals living with HIV/AIDS, people with weakened immune systems due to specific medical conditions or undergoing immunosuppressive treatment, and individuals residing in crowded and unsanitary conditions.

Significant risk factors associated with TB transmission include close and prolonged contact with an infected individual, living or working in poorly ventilated environments, and malnutrition. Additionally, tobacco smoking and alcohol misuse increase the likelihood of developing active TB disease.

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

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

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

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

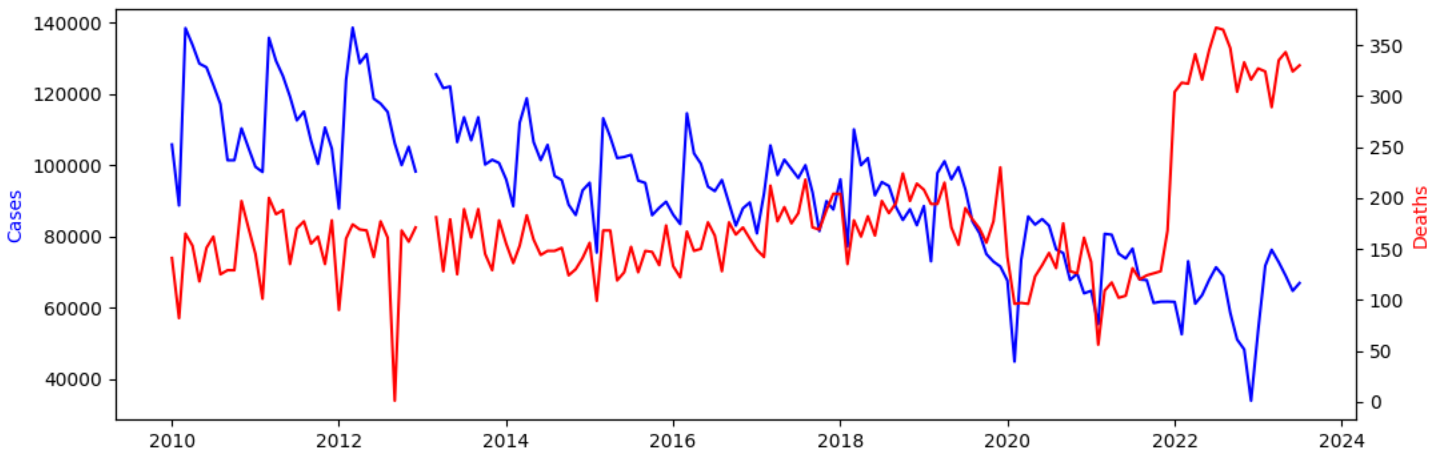

Figure 65: The Change of Tuberculosis Reports before 2023 July

Based on the provided data, seasonal patterns are evident in the monthly cases and deaths of Tuberculosis in mainland China. The peak periods for Tuberculosis cases occur during the winter months, particularly in December and January, where the number of cases is generally higher. The trough periods, or the lowest points, are observed during the summer months, particularly in July and August, where the number of cases is typically lower. Evaluating the overall trends, there seems to be a gradual decrease in Tuberculosis cases in mainland China from 2010 to 2015, followed by a slight increase in cases until 2018, and then a subsequent decline in cases until 2023 (July). Although the number of cases exhibits variation on a monthly basis, it generally follows this trend. There is also a similar pattern in the number of deaths, with a general decrease from 2010 to 2015, followed by fluctuations and a decline in deaths until 2023 (July).

The observed seasonal patterns suggest that environmental factors and human behavior may influence the spread of Tuberculosis in mainland China. The peak and trough periods may be attributed to factors such as indoor crowding during colder months, increased contact with infected individuals in confined spaces, or variations in diagnostic and reporting practices. The decreasing trend in Tuberculosis cases from 2010 to 2015 signifies a positive impact on public health interventions and healthcare services. However, the subsequent increase and decline in cases from 2016 to 2018 may indicate a resurgence or fluctuations in transmission, possibly caused by socioeconomic or demographic changes and challenges in disease control measures.

The decrease in Tuberculosis cases and deaths from 2018 to 2023 (July) suggests ongoing efforts in Tuberculosis control and prevention in mainland China. Continual monitoring and implementation of strategies are necessary to sustain and further reduce the burden of Tuberculosis in the population. Note that the analysis is based solely on the provided data, and further investigation and analysis may be necessary for a comprehensive understanding of Tuberculosis epidemiology in mainland China.

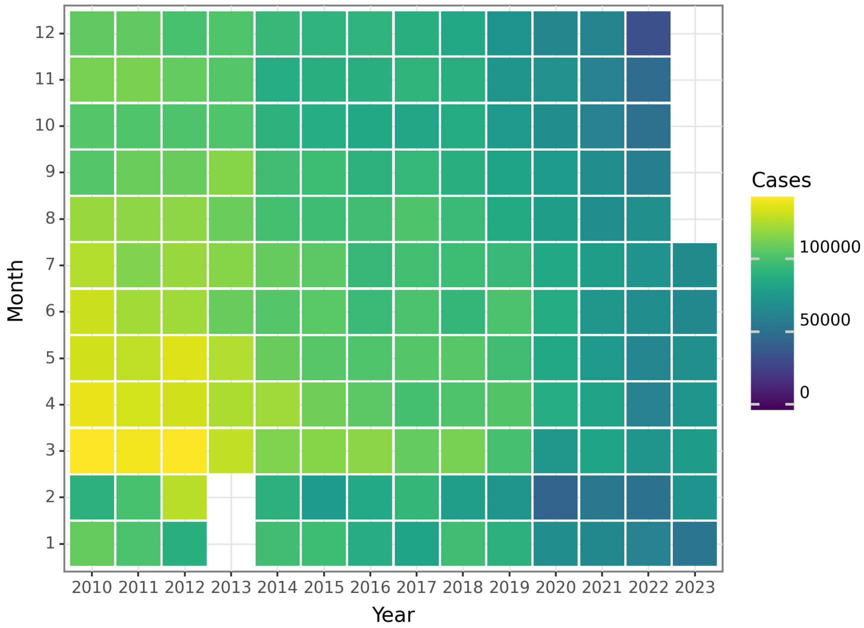

Figure 66: The Change of Tuberculosis Cases before 2023 July

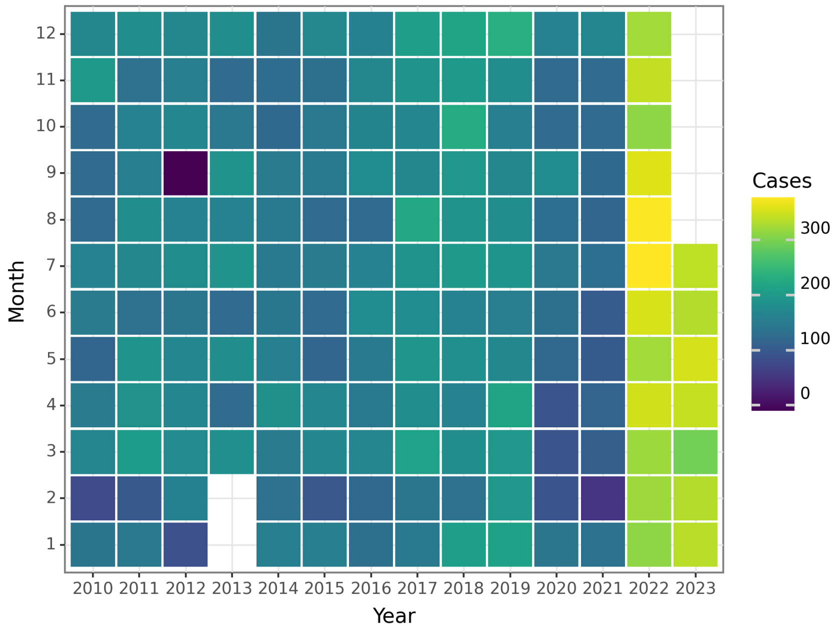

Figure 67: The Change of Tuberculosis Deaths before 2023 July

Typhoid fever and paratyphoid fever

Typhoid fever and paratyphoid fever are infectious diseases caused by the bacteria Salmonella enterica serotype Typhi and Salmonella enterica serotypes Paratyphi A, B, and C, respectively. These diseases are significant public health concerns worldwide, particularly in areas with inadequate sanitation and limited access to clean water. This article provides a comprehensive overview of the epidemiology of typhoid fever and paratyphoid fever, including their global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and impact on different regions and populations.

Prevalence: Typhoid fever and paratyphoid fever are prevalent globally, with the highest burden in low- and middle-income countries, especially in South Asia, Southeast Asia, Africa, and Central and South America. According to the World Health Organization (WHO), typhoid fever accounts for an estimated 11 to 21 million cases annually, resulting in approximately 128,000 to 161,000 deaths. Although paratyphoid fever is less common, it still contributes significantly to the overall burden of enteric fever cases.

Transmission Routes: The primary mode of transmission for typhoid and paratyphoid fever is through contaminated food and water. This occurs when individuals ingest food or water contaminated with the feces or urine of infected individuals. It is also possible for people to become carriers of the bacteria, harboring it in their gallbladder and excreting it in their feces or urine for an extended period, even after recovering from the illness. Additionally, transmission can occur through direct contact with infected individuals or, less commonly, through contaminated objects, such as utensils or surfaces.

Affected Populations: Typhoid fever and paratyphoid fever can affect individuals of any age or gender. However, children and young adults are more susceptible to these diseases. Individuals living in areas with limited access to clean water, inadequate sanitation facilities, and overcrowded living conditions are at higher risk. Travelers visiting regions where these diseases are endemic are also susceptible, increasing the likelihood of contracting the illness and introducing it to non-endemic areas.

Key Statistics: - Approximately 128,000 to 161,000 deaths occur annually due to typhoid fever. - The overall case fatality rate for typhoid fever ranges from 2 to 4%, but it can be higher in resource-limited settings. - The incidence rates of typhoid and paratyphoid fevers vary significantly across different regions, with some countries experiencing high endemic rates. - Typhoid fever contributes to a substantial number of fever-related hospitalizations in endemic areas, resulting in economic burdens on individuals and healthcare systems.

Historical Context and Discovery: Typhoid fever has been documented throughout history, with outbreaks often associated with poor sanitation and crowded living conditions. The link between contaminated water and the transmission of typhoid fever became evident in the 19th century. In 1880, German bacteriologist Carl Joseph Eberth identified the Bacillus typhosus, now known as Salmonella Typhi, as the causative agent of typhoid fever. Likewise, paratyphoid fever was identified in the early 20th century, with the differentiation of various serotypes.

Risk Factors: - Limited access to clean water and sanitation facilities. - Poor hygiene practices, particularly inadequate handwashing. - Living in overcrowded areas, such as slums or refugee camps. - Consumption of contaminated food or water, including street food or improperly stored food. - Traveling to or residing in regions with a high prevalence of typhoid and paratyphoid fever. - Lack of vaccination or incomplete vaccination coverage.

Impact on Different Regions and Populations: Typhoid fever and paratyphoid fever have a significant impact on regions with poor sanitation and limited access to clean water. In countries where these diseases are endemic, they contribute to a substantial burden of illness, resulting in morbidity, mortality, and economic costs. Outbreaks can have devastating effects, especially on vulnerable populations such as children, pregnant women, and malnourished individuals. The impact is often compounded by factors such as inadequate healthcare infrastructure and limited diagnostic and treatment capabilities.

In conclusion, typhoid fever and paratyphoid fever are globally prevalent infectious diseases that have significant impacts on affected populations. Understanding their epidemiology, including global prevalence, transmission routes, affected populations, risk factors, and impact on different regions, is crucial for implementing effective prevention and control strategies. These strategies include improved sanitation, access to clean water, vaccination programs, and public health interventions.

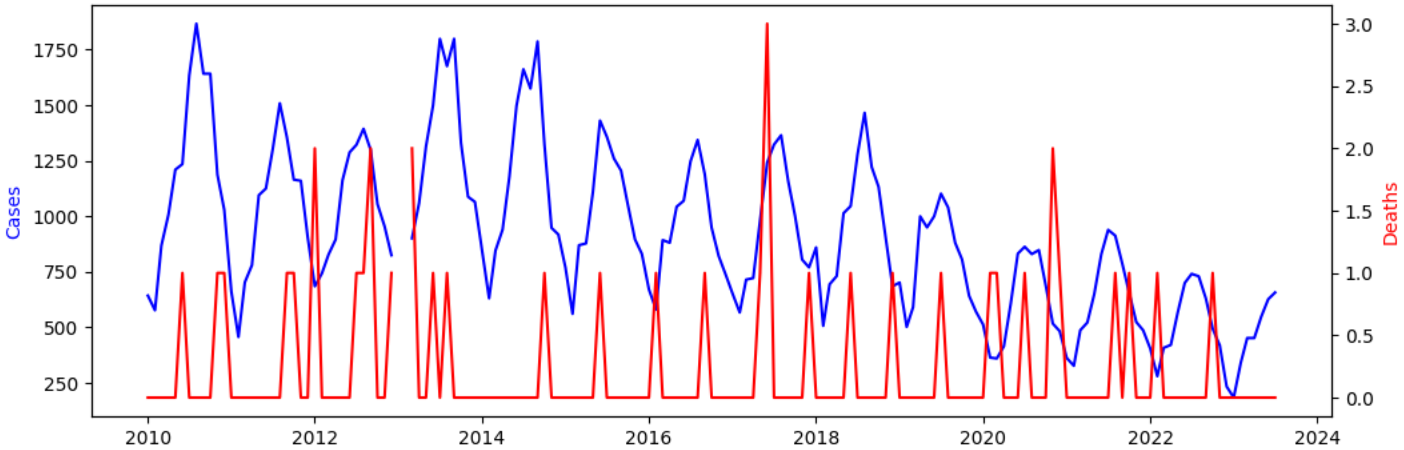

Figure 68: The Change of Typhoid fever and paratyphoid fever Reports before 2023 July

Seasonal Patterns: Based on the provided data, a clear seasonal pattern emerges in the number of cases of Typhoid fever and paratyphoid fever in mainland China. The number of cases is higher during the summer months, specifically from June to August, and lower during the winter months, specifically from December to February.
Peak and Trough Periods: Both Typhoid fever and paratyphoid fever cases peak during the summer months, specifically in July and August, when the number of cases is at its highest. Conversely, the lowest number of cases, known as trough periods, occur during the winter months, particularly in December and January.
Overall Trends: An examination of the overall trends reveals variability in the number of cases of Typhoid fever and paratyphoid fever over the years. There was an upward trend in the number of cases from 2010 to 2013, with peak values reached in 2013. However, from 2014 onwards, a fluctuating pattern emerges, with some years experiencing a decrease in cases compared to previous years. It is worth noting that there are negative values for the number of cases and deaths in some months, particularly in 2013. This may be attributed to data reporting issues or discrepancies.
Discussion: The observed seasonal patterns suggest that environmental factors in the summer months may influence the transmission of Typhoid fever and paratyphoid fever. Higher temperatures and increased human activities during this time may facilitate the spread of the diseases.
The peak and trough periods are consistent with the seasonal patterns, with peak periods occurring during the summer months when transmission may be more intense, and trough periods occurring during the winter months when transmission may be reduced.
The overall trends indicate some variation in the number of cases throughout the years, with an initial period of increasing cases followed by fluctuating values. This suggests that efforts to control and prevent these diseases may have had an impact, but ongoing challenges remain in maintaining consistent control measures.
It is important to note that this analysis is based solely on the provided data and may not encompass all factors that influence the occurrence of Typhoid fever and paratyphoid fever in mainland China. Further analysis, incorporating additional data and considering other variables, is necessary to develop a more comprehensive understanding of the trends and patterns associated with these diseases.

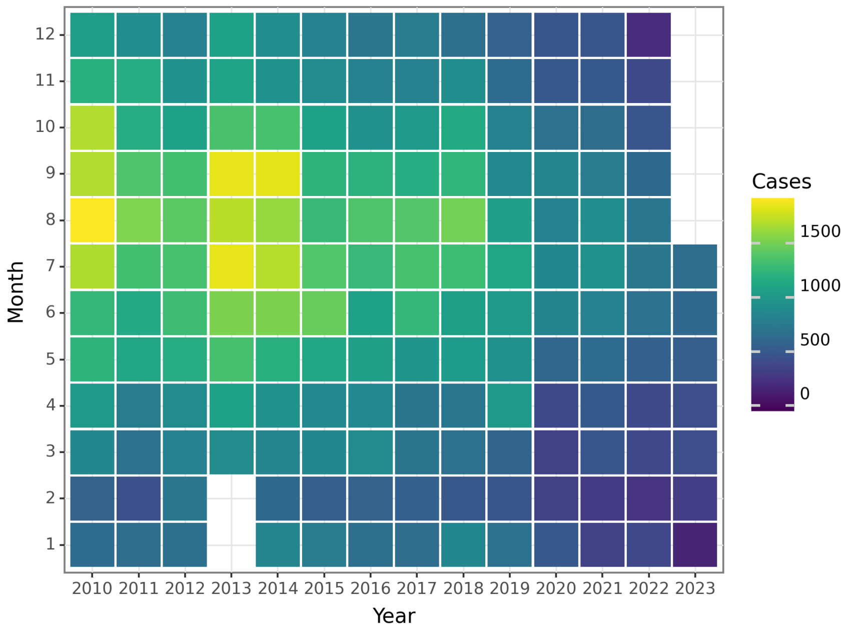

Figure 69: The Change of Typhoid fever and paratyphoid fever Cases before 2023 July

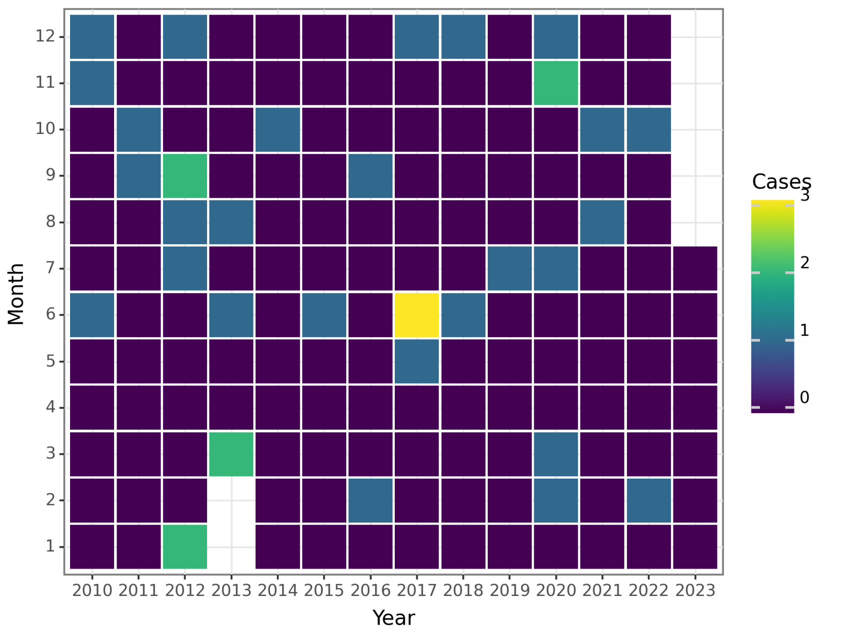

Figure 70: The Change of Typhoid fever and paratyphoid fever Deaths before 2023 July

Meningococcal meningitis

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

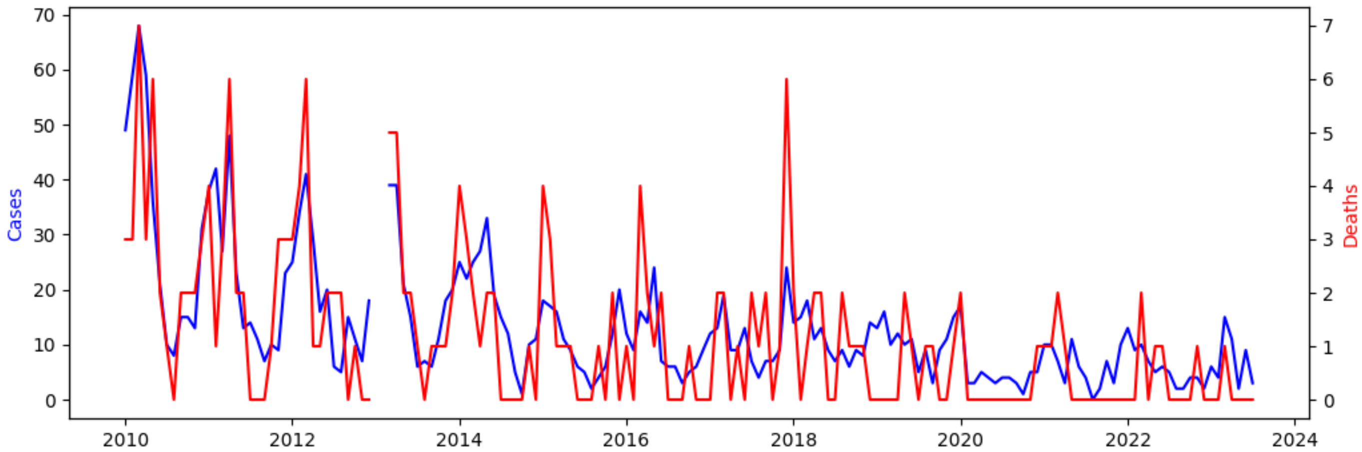

Figure 71: The Change of Meningococcal meningitis Reports before 2023 July

Thank you for providing the data. Now let us examine the seasonal patterns, peak and trough periods, overall trends, and discuss the findings.

Seasonal Patterns: Based on the data provided, it is evident that there is a clear seasonality in the incidence of Meningococcal meningitis cases in mainland China. The number of cases is higher during the winter and spring months (December to April) and relatively lower during the summer and fall months (May to November). This pattern suggests a seasonal peak of Meningococcal meningitis during the colder months.

Peak and Trough Periods: The peak period for Meningococcal meningitis cases in mainland China is identified as December to March, with the highest number of cases occurring in December and March. Conversely, the trough period is observed during the summer months, mainly in July and August, when the number of cases is at its lowest.

Overall Trends: Looking at the overall trends, there are fluctuations in the number of cases over the years. From 2010 to 2013, there appears to be a gradual decrease in the incidence of Meningococcal meningitis cases. However, from 2013 onwards, the data shows variability without a clearly upward or downward trend. It is important to note a significant decrease in cases in January and February of 2013, which may be attributed to data reporting issues.

Discussion: The seasonal pattern observed in Meningococcal meningitis cases in mainland China aligns with previous studies indicating a higher incidence during the winter and spring seasons. This may be attributed to factors such as increased indoor crowding, enhanced transmission in enclosed spaces, or behaviors associated with the colder months. The lower number of cases during the summer months can be attributed to higher temperatures, which may curtail the survival and transmission of the bacteria responsible for Meningococcal meningitis.

It is worth noting that the overall trend in the data displays fluctuations without a clear increasing or decreasing pattern. This suggests that the incidence of Meningococcal meningitis in mainland China has remained relatively stable in recent years, with annual variations observed. However, it is important to interpret these findings cautiously, as the data provided may not be comprehensive and complete.

In conclusion, based on the data provided, Meningococcal meningitis cases in mainland China exhibit a seasonal pattern with a higher incidence in the winter and spring months, particularly from December to March. The number of cases tends to be lower during the summer months. However, the overall trend in recent years shows fluctuations without a clear increasing or decreasing pattern. Further analysis with more comprehensive and complete data is necessary to have a more accurate understanding of the epidemiological trends of Meningococcal meningitis in mainland China.

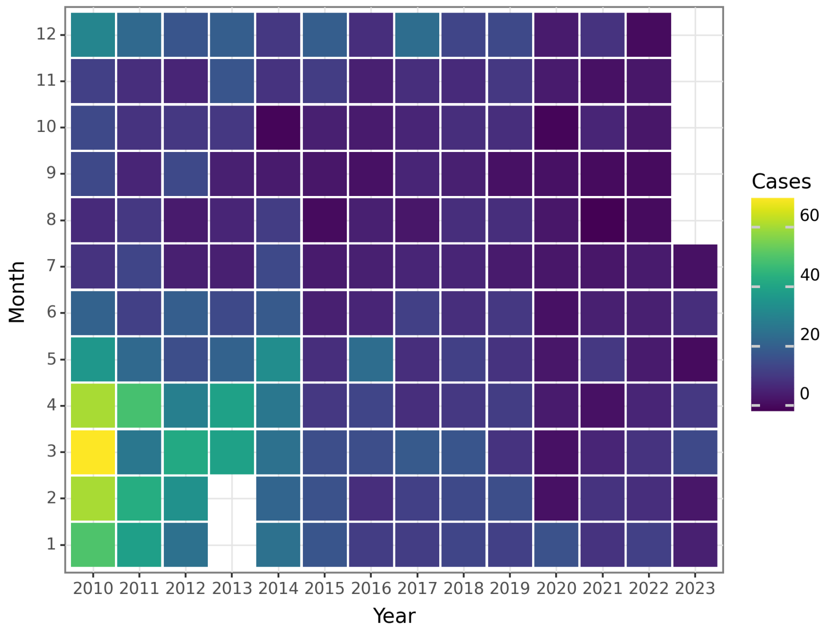

Figure 72: The Change of Meningococcal meningitis Cases before 2023 July

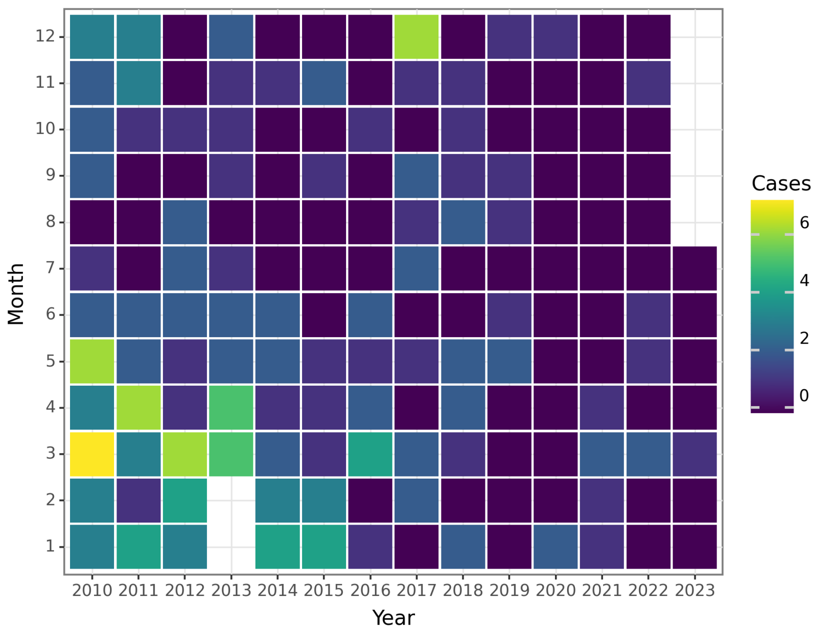

Figure 73: The Change of Meningococcal meningitis Deaths before 2023 July

Pertussis

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

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

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

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

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

There are several risk factors associated with pertussis transmission:

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

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

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

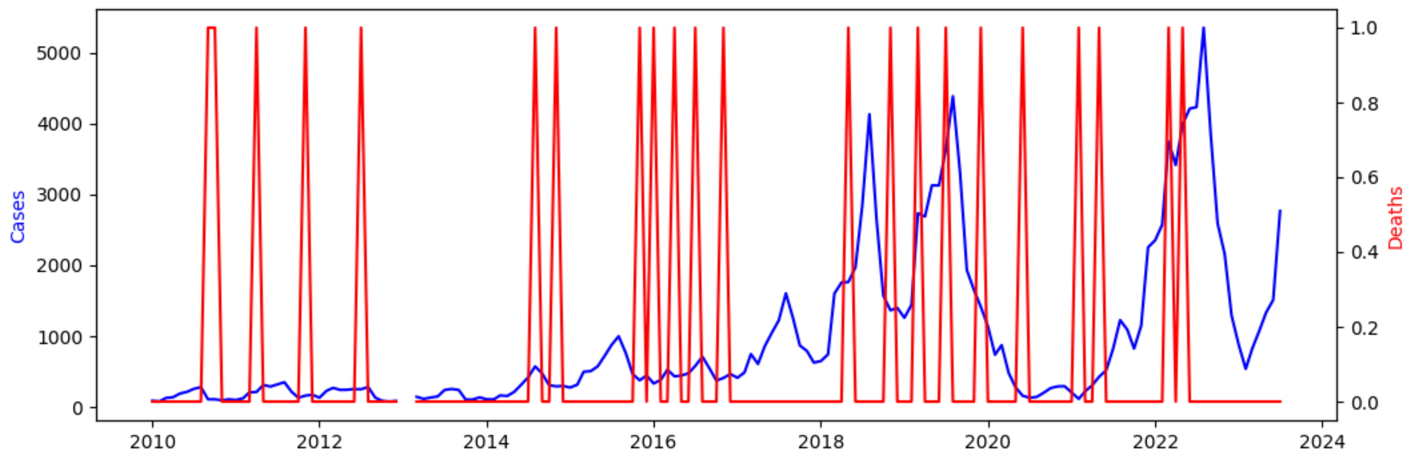

Figure 74: The Change of Pertussis Reports before 2023 July

Seasonal Patterns: Based on the data provided, there is evidence of a distinct seasonal pattern in Pertussis cases in mainland China. The number of cases shows a consistent increase beginning in December, with the highest point occurring in July or August. Subsequently, the number of cases gradually decreases, reaching its lowest point in September or October. This cycle repeats consistently each year before July 2023.

Peak and Trough Periods: The peak period for Pertussis cases in mainland China consistently takes place in July or August when the number of cases reaches its highest point. Conversely, the trough period, with the lowest number of cases, occurs in September or October. These peak and trough periods align with the previously described seasonal pattern.

Overall Trends: When considering the overall trends of Pertussis cases in mainland China before July 2023, there appears to be a steady increase. The number of cases generally follows an upward trajectory, with occasional fluctuations such as a sudden drop observed in 2013. However, overall, there is a gradual increase in the number of cases from 2010 to July 2023.

Discussion: The seasonal pattern of Pertussis cases in mainland China suggests that the disease experiences higher transmission and incidence during the summer months, specifically in July and August. Several factors may influence this pattern, including increased social interactions, lower humidity, and higher temperatures during this period. The decrease in cases observed in September and October may be attributed to reduced social contacts and a decline in respiratory infections.

The consistent peak observed in July or August indicates that these months are particularly susceptible to Pertussis outbreaks in mainland China. This information is crucial for public health officials to plan and implement preventive measures and vaccination campaigns to control the disease during these periods.

Despite the seasonal variations, the overall trend of Pertussis cases in mainland China shows an increasing pattern from 2010 to July 2023, implying a potential rise in the incidence of the disease over time. Various factors, including changes in population immunity, healthcare access, and surveillance practices, could be contributing to this trend.

It is important to note that the analysis is based on the available data before July 2023, and the trends and patterns observed may not necessarily continue in the future. Continual monitoring, data collection, and analysis are necessary to assess the current situation and guide effective prevention and control strategies for Pertussis in mainland China.

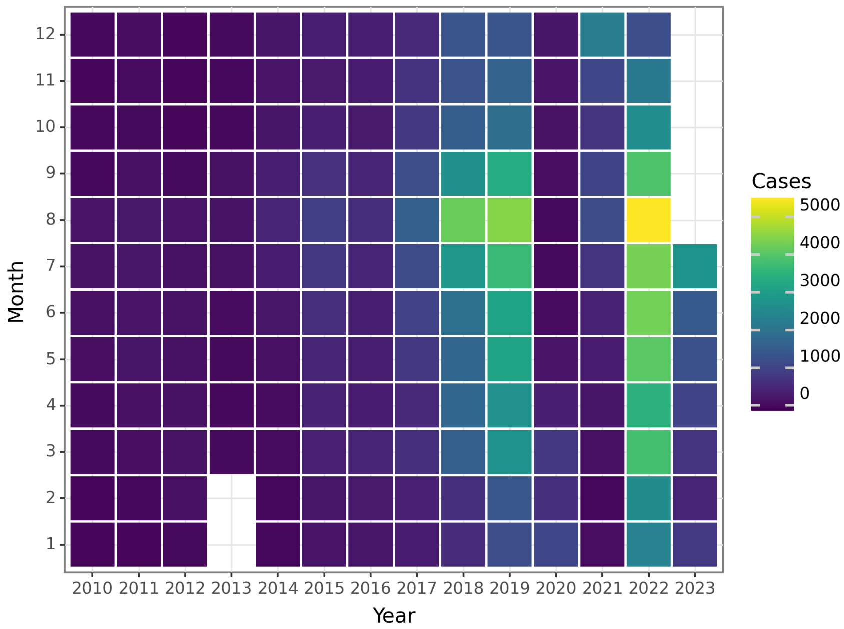

Figure 75: The Change of Pertussis Cases before 2023 July

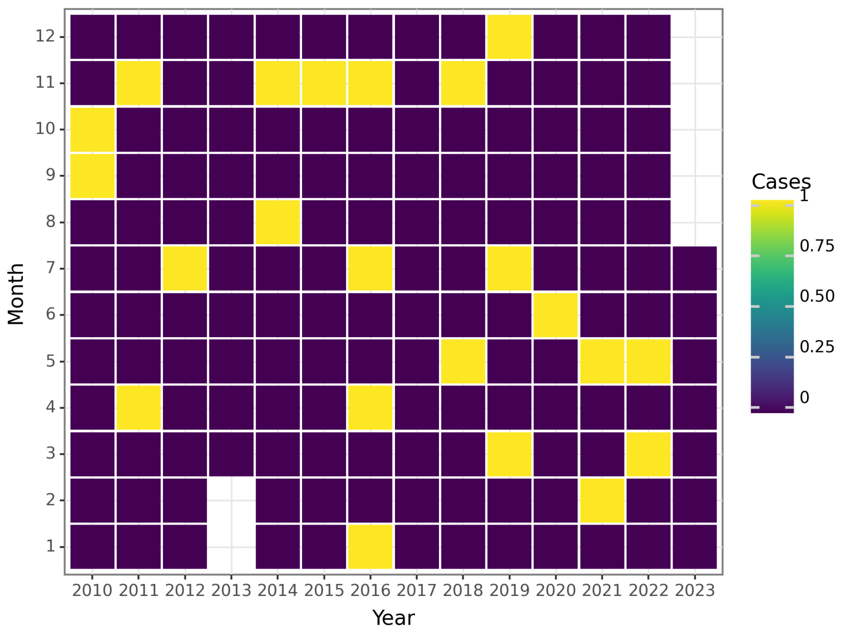

Figure 76: The Change of Pertussis Deaths before 2023 July

Diphtheria

Diphtheria, caused by the bacteria Corynebacterium diphtheriae, is a highly contagious infection primarily affecting the respiratory tract but also the skin. This paper provides a comprehensive overview of the epidemiology of diphtheria.

Historical Context and Discovery: Diphtheria has been known since ancient times, with documented descriptions dating back to the 5th century BC. However, understanding its cause and transmission was limited until the late 19th century. In 1883, German bacteriologist Edwin Klebs identified the bacteria responsible for the disease, and in 1884, Emil von Behring and Shibasaburo Kitasato discovered the diphtheria toxin. Their work led to the development of the first effective diphtheria vaccine in the 1920s.

Global Prevalence: Prior to widespread vaccination, diphtheria was a significant global health concern. According to the World Health Organization (WHO), the disease caused severe illness and death in thousands of children each year. However, successful immunization campaigns have made diphtheria relatively rare in many parts of the world.

Transmission Routes: Diphtheria spreads through respiratory droplets, direct contact with infected individuals, or contact with contaminated objects or surfaces. The disease is most contagious during the first two weeks of illness, but individuals without symptoms can also transmit it.

Affected Populations: Diphtheria can affect individuals of all ages, but children under five and adults over 60 are particularly vulnerable. Those who are unvaccinated or incompletely vaccinated are also at higher risk.

Key Statistics: The incidence of global diphtheria has significantly decreased since the introduction of vaccination. In 2019, the WHO reported 16,651 cases worldwide, resulting in an estimated 5,000 to 7,000 deaths. However, these numbers may underestimate the true extent of the disease, especially in low-income countries with limited surveillance systems.

Major Risk Factors: - Lack of Vaccination: Insufficient immunization coverage is the most significant risk factor for diphtheria transmission. Diphtheria vaccines are typically included in routine childhood immunization schedules in many countries. - Low Socioeconomic Status: Poverty, inadequate health infrastructure, and limited access to healthcare can increase the risk of diphtheria transmission. - Crowded Living Conditions: Close contact and overcrowded living spaces facilitate the spread of diphtheria, particularly in communities with low vaccination rates.

Impact on Different Regions and Populations: Diphtheria remains a significant public health concern in certain regions, particularly those with low vaccination coverage and limited healthcare infrastructure. Developing countries in Africa, Asia, and parts of Eastern Europe have reported higher incidence rates. Outbreaks can occur in crowded areas such as refugee camps and institutions with low vaccination rates. Certain populations face higher risk due to specific circumstances. For instance, among refugees or displaced populations, the risk of diphtheria outbreaks increases due to crowded and unsanitary living conditions. Additionally, localized outbreaks can occur in areas with pockets of unvaccinated or under-vaccinated populations, religious or philosophical objections to vaccination, and logistical challenges in reaching remote areas.

In conclusion, although diphtheria is now relatively rare globally, it still poses a significant risk in regions and populations with limited vaccination coverage and healthcare infrastructure. Vaccination remains the most effective preventive measure, and maintaining high immunization coverage and strengthening healthcare systems are essential for eradicating the disease worldwide.

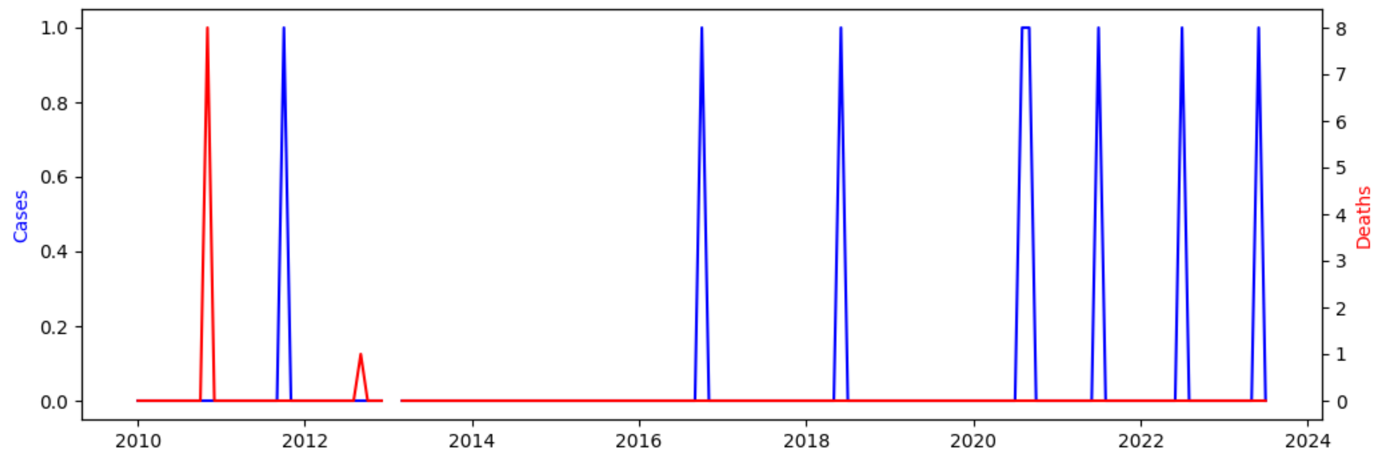

Figure 77: The Change of Diphtheria Reports before 2023 July

Seasonal Patterns: Based on the provided data, mainland China does not exhibit a clear seasonal pattern for Diphtheria cases and deaths. The number of cases and deaths remains consistently low over the years, with occasional minor peaks observed in certain months.
Peak and Trough Periods: No significant peak or trough periods were observed in the data. The number of cases and deaths remains relatively stable at zero for most months, with occasional small increases observed in certain periods.
Overall Trends: The overall trend for Diphtheria cases and deaths in mainland China is consistently low and stable. Throughout the years, the number of cases and deaths has remained consistently low, with occasional slight increases observed in certain periods.
Discussion: The provided data indicates that Diphtheria cases and deaths in mainland China have been effectively controlled, with a low number of reported cases and deaths. This suggests the successful implementation of vaccination programs and public health measures aimed at preventing and controlling the spread of the disease. It is crucial to continue monitoring and maintaining high vaccination coverage to sustain the low levels of Diphtheria incidence in the population.

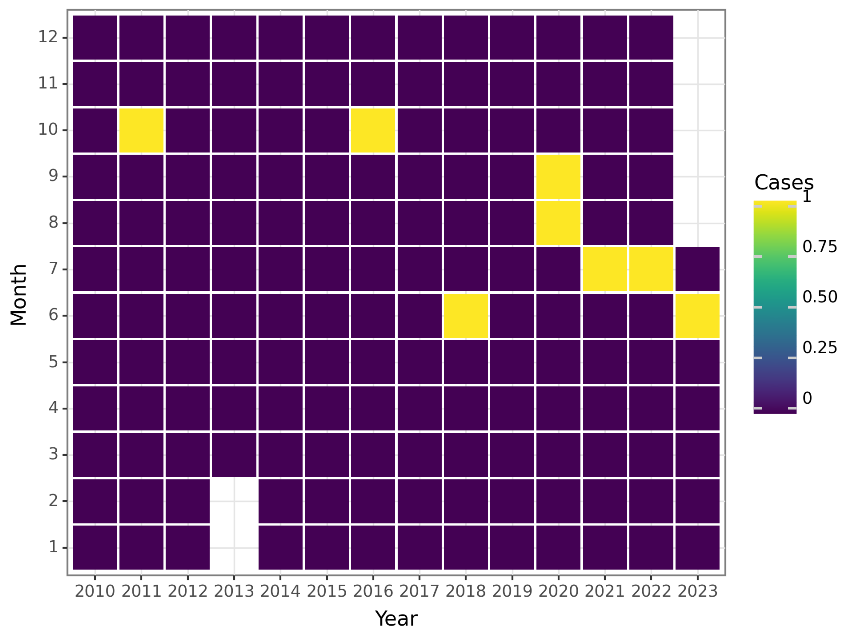

Figure 78: The Change of Diphtheria Cases before 2023 July

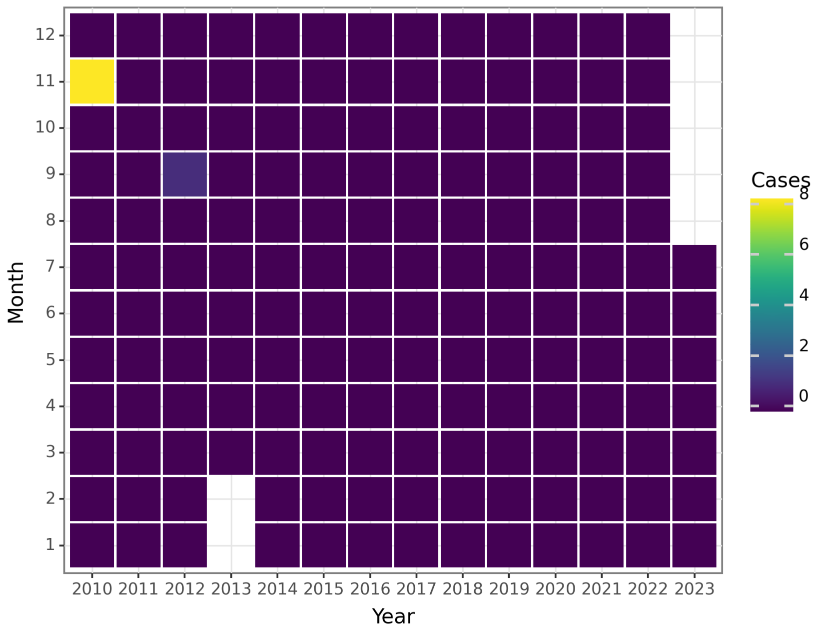

Figure 79: The Change of Diphtheria Deaths before 2023 July

Neonatal tetanus

Neonatal tetanus is a vaccine-preventable disease that affects newborns. It is caused by the bacterial toxin produced by Clostridium tetani. This condition is characterized by muscle stiffness and spasms, particularly affecting the jaw muscles, and can be fatal if untreated. In this comprehensive overview, we will explore various aspects of neonatal tetanus, including its epidemiology, global prevalence, transmission routes, at-risk populations, key statistics, historical context, major risk factors, and its impact on different regions and populations.
Global Prevalence: Neonatal tetanus is most prevalent in developing countries with limited access to proper healthcare and vaccination coverage. According to estimates from the World Health Organization (WHO) in 2019, 17,000 newborns died worldwide due to neonatal tetanus. However, it is important to note that there has been significant progress in reducing the burden of this disease. In the 1980s, there were approximately 787,000 reported cases of neonatal tetanus globally. As of 2020, that number has decreased substantially to a few thousand cases.
Transmission Routes: The spores of Clostridium tetani are widespread in the environment, primarily found in soil, dust, and animal feces. The bacteria can enter the body through open wounds, typically during unhygienic practices for umbilical cord care after childbirth. When the spores contaminate the umbilical stump, they can multiply and produce the tetanus toxin, which then spreads through the bloodstream and affects the nervous system.
At-Risk Populations: The most vulnerable population to neonatal tetanus includes newborns born to mothers who have not received tetanus vaccination or have inadequate vaccination coverage. The disease primarily affects newborns in resource-limited settings where proper delivery practices, such as the use of sterilized instruments, clean delivery surfaces, and appropriate cord care, are not consistently followed. Women of reproductive age in these areas who have not received tetanus immunization are also at risk of contracting tetanus themselves during childbirth, which could lead to severe maternal tetanus.
Key Statistics: The majority of reported neonatal tetanus cases occur in Africa, South Asia, and Southeast Asia. Infection typically occurs within the first week of life, and symptoms appear within 3 to 14 days after exposure. Neonatal tetanus has a case fatality rate (CFR) of approximately 90%, making it one of the deadliest vaccine-preventable diseases.
Historical Context and Discovery: The association between wounds and muscle stiffness dates back to ancient times, but the specific discovery of neonatal tetanus is credited to Arthur Nicolaier, a German physician, in 1884. He isolated and identified the bacterium that causes the disease, Clostridium tetani, from a human cadaver. Since then, significant advancements have been made in understanding the disease, elucidating its pathogenesis, and developing prevention strategies through vaccination.
Major Risk Factors: 1. Lack of maternal immunization: Mothers who have not received the recommended tetanus vaccination during pregnancy or have received incomplete doses are at risk of transmitting the infection to their newborns. 2. Unhygienic delivery practices: Deliveries conducted in environments with suboptimal hygiene, lack of sterile instruments, and unclean surfaces increase the likelihood of tetanus spore contamination. 3. Umbilical cord care: Improper cord care, such as the application of harmful substances or the use of unsterile tools, can introduce tetanus spores to the baby's umbilical stump. 4. Cultural practices: Some cultural rituals involve applying substances to the umbilical cord stump that may be contaminated with tetanus spores, further increasing the risk of transmission. 5. Lack of healthcare access: Limited access to essential obstetric care, including antenatal care, skilled birth attendance, and postnatal care, increases vulnerability to neonatal tetanus.
Impact on Different Regions and Populations: Neonatal tetanus is predominantly observed in low-income countries, particularly in remote rural areas with poor healthcare infrastructure. The burden of the disease varies across regions and populations, with the highest prevalence found in sub-Saharan Africa and South Asia. Within countries, specific pockets or communities with lower healthcare utilization and vaccination coverage may experience higher incidence rates. Socioeconomic disparities, lack of education, and cultural practices contribute to the variation in prevalence rates and affected demographics.
In conclusion, neonatal tetanus remains a significant public health problem in certain regions, primarily affecting newborns born in resource-limited settings with limited access to healthcare and vaccination coverage. Prevention strategies primarily focus on vaccinating pregnant women, promoting clean delivery practices, and raising awareness about the importance of proper cord care. Eliminating neonatal tetanus globally is an attainable goal through sustained vaccination efforts, improved healthcare infrastructure, and community engagement.

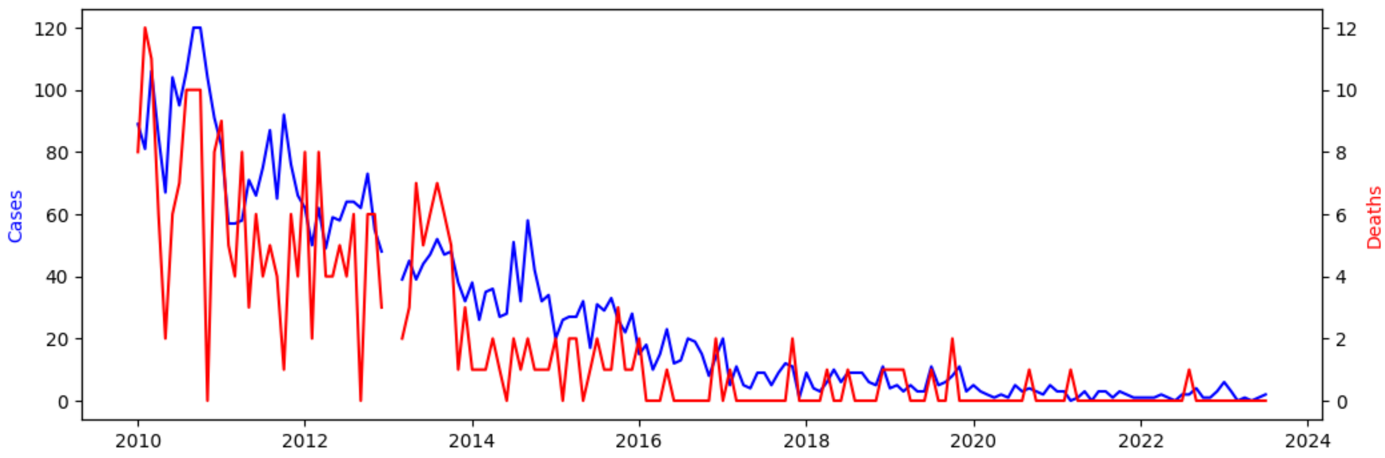

Figure 80: The Change of Neonatal tetanus Reports before 2023 July

The incidence of Neonatal tetanus cases in mainland China exhibits a discernible seasonal pattern. A consistent increase in cases occurs from December to September, with a peak typically observed between September and October, followed by a decline from October to December. The corresponding pattern of deaths follows a similar seasonal trend, with the peak occurring slightly later than the peak in cases, usually in October or November.

Regarding the peak and trough periods, the highest number of Neonatal tetanus cases is usually observed during September and October, with a gradual decline in cases from October to December. The trough period typically manifests in January and February, where the number of cases is lower than in other months. Similarly, the peak period for deaths follows a comparable trend to the cases, with the highest number of deaths occurring in October or November, slightly later than the peak in cases.

Examining the overall trends, a general decrease in the number of Neonatal tetanus cases in mainland China has occurred over the years. From 2010 to 2016, the cases gradually reduced, although with some fluctuations. A relatively stable period with low case counts was observed between 2017 and 2023. Although the number of deaths fluctuated over the years, it generally decreased, with overall numbers relatively low.

The observed seasonal patterns suggest a possible relationship with environmental factors or cultural practices. Cultural practices or behaviors that increase the risk of infection during September and October may explain the peak in cases during those months. To prevent Neonatal tetanus cases, it is crucial to identify the specific factors that contribute to the seasonal patterns and develop targeted interventions.

The decreasing trend in cases and deaths is a positive indicator of successful prevention and control measures, resulting in improved vaccination coverage and awareness programs targeting pregnant women and caregivers. However, the sporadic cases reported imply the need for continuous surveillance of vaccination coverage to eliminate Neonatal tetanus in mainland China.

It is crucial to note that the data presented only covers monthly cases and deaths before July 2023. A comprehensive analysis would require additional data to evaluate the long-term trends and intervention program impacts. Nevertheless, the available data highlights the seasonal patterns, peak and trough periods, and overall trends in Neonatal tetanus cases and deaths in mainland China.

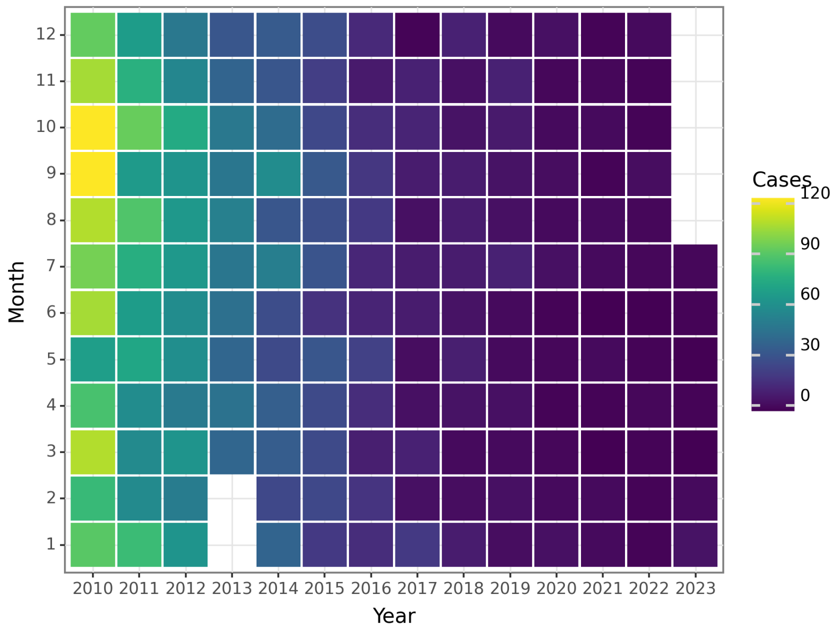

Figure 81: The Change of Neonatal tetanus Cases before 2023 July

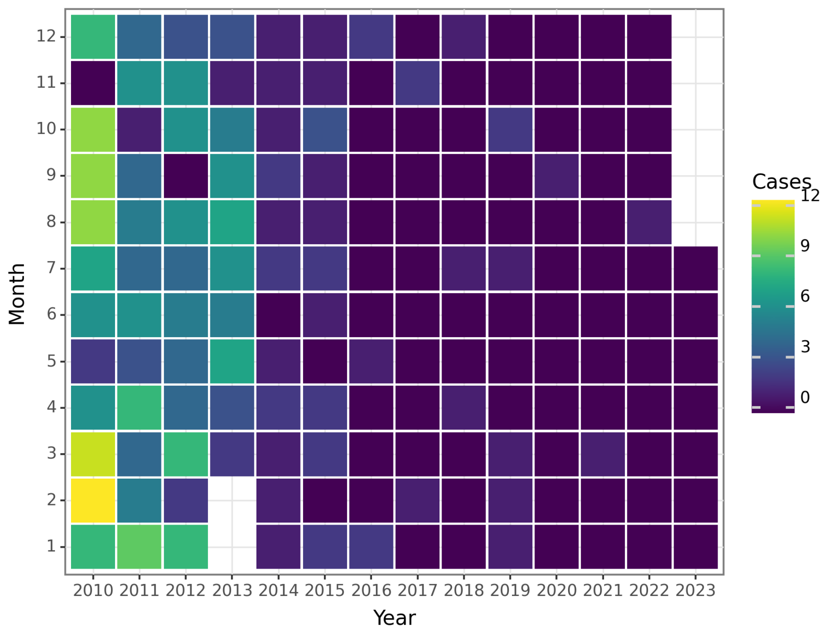

Figure 82: The Change of Neonatal tetanus Deaths before 2023 July

Scarlet fever

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

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

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

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

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

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

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

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

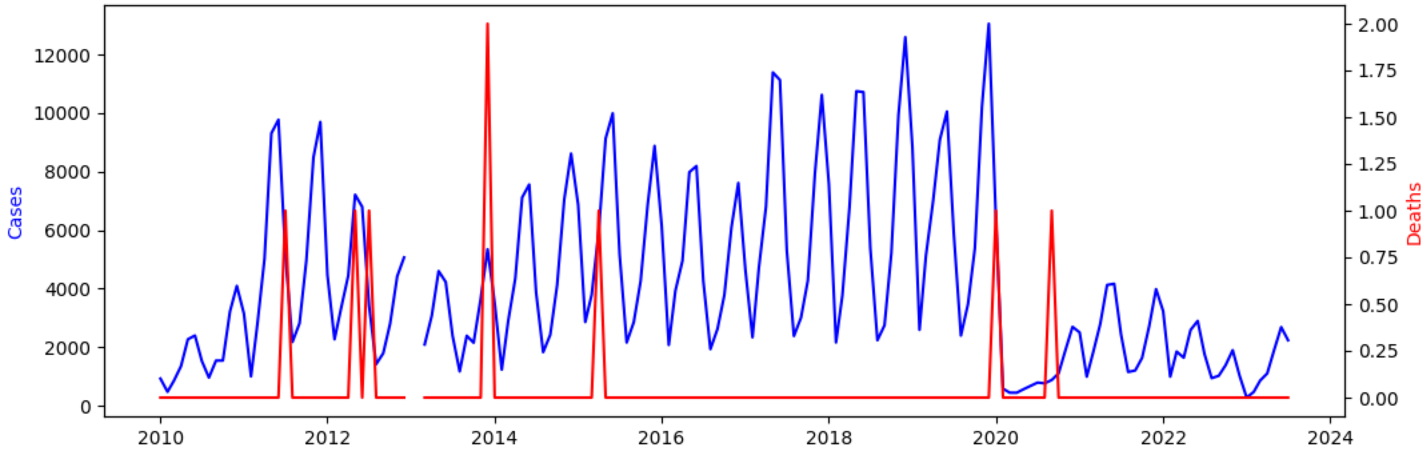

Figure 83: The Change of Scarlet fever Reports before 2023 July

Seasonal Patterns of Scarlet Fever in Mainland China: The data provided indicates that Scarlet fever cases in mainland China have a distinct seasonal pattern. Typically, the number of cases increases from April to June, reaching a peak in June or July, before declining gradually from July to October. The least number of cases are usually reported from November to March, indicating a low transmission period for Scarlet fever.

Peak and Trough Periods: The peak period for Scarlet fever in mainland China typically occurs in June or July, with the highest number of reported cases. Conversely, the trough period, consisting of the lowest number of cases, is observed around October.

Overall Trends: The data implies that the incidence of Scarlet fever in mainland China has been increasing from 2010 to July 2023, with annual fluctuations and periodic peaks and troughs. Despite this, there is an overall upward trend in the reported cases. It is pertinent to note that there was a sudden drop in reported cases from November 2012 to February 2013, with January and February 2013 showing negative values. This anomaly may be attributed to data recording/reporting discrepancies.

Discussion: The observed seasonal trends of Scarlet fever cases are consistent with previous research, which shows a correlation between warmer months and an increase in cases. Group A Streptococcus bacteria is responsible for Scarlet fever, and higher transmission during warmer months may be linked to favorable bacterial growth and increased person-to-person interactions.

The increasing trend of Scarlet fever cases may be attributable to various factors, including population shifts, environmental changes, and improved disease surveillance. Additionally, the impact of interventions, such as public health campaigns and better hygiene practices, on trends should be considered.

It is crucial to note that this analysis is based on the available data, and further research is necessary to establish a comprehensive understanding of Scarlet fever trends in China. A more detailed analysis, including additional years of data, is imperative in establishing the long-term patterns and trends of Scarlet fever incidence.

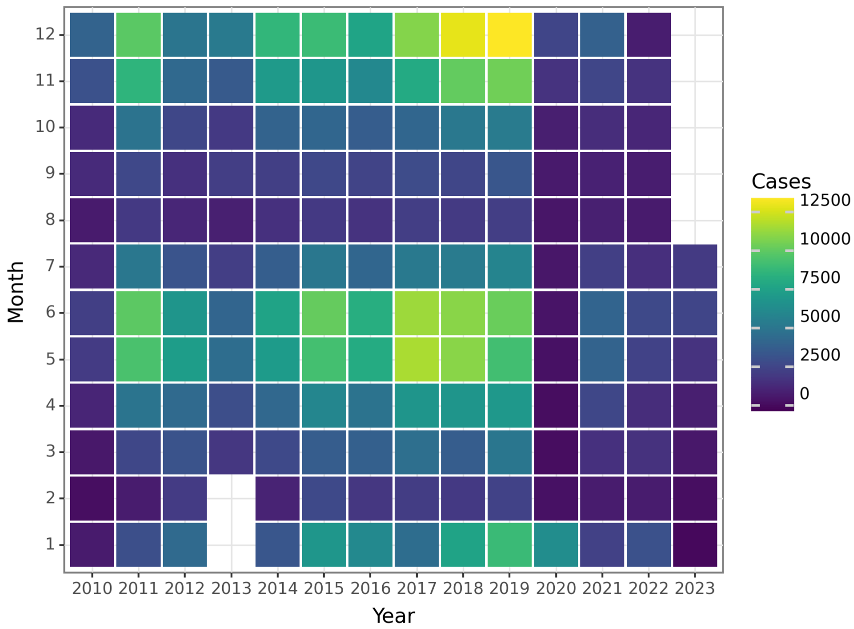

Figure 84: The Change of Scarlet fever Cases before 2023 July

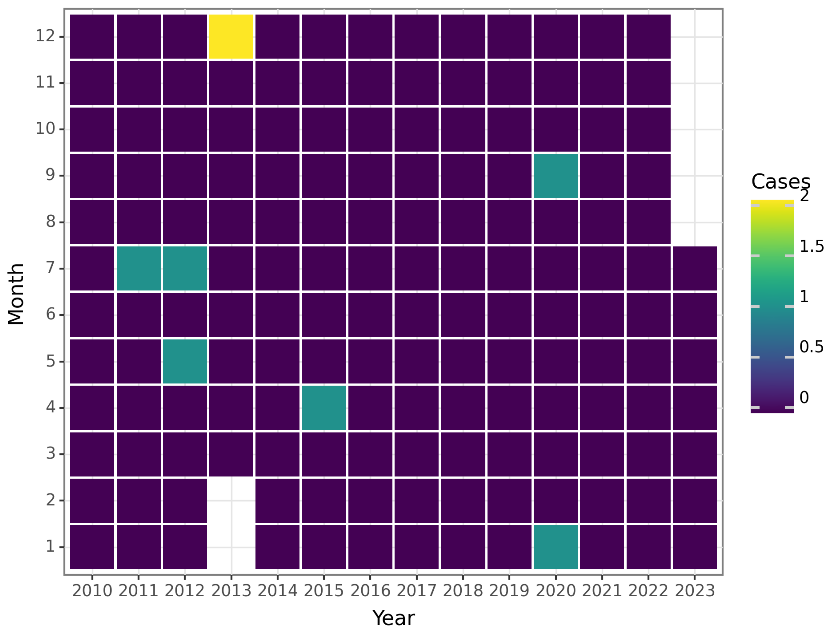

Figure 85: The Change of Scarlet fever Deaths before 2023 July

Brucellosis

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

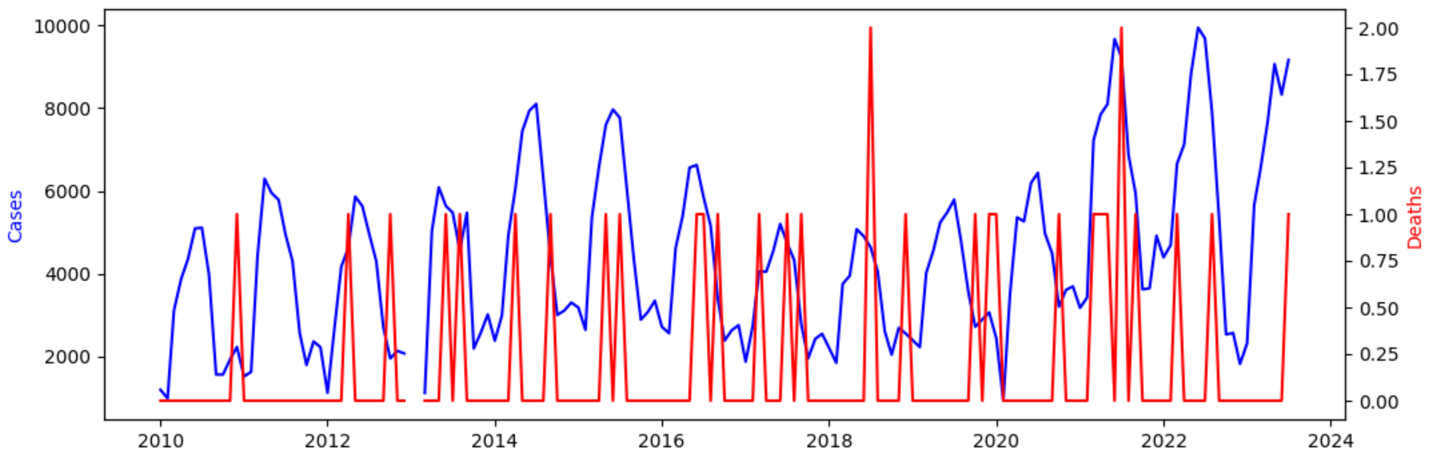

Figure 86: The Change of Brucellosis Reports before 2023 July

Seasonal Patterns:
The data provided indicates the existence of a seasonal pattern for Brucellosis cases in mainland China. It shows an increase in cases during late winter and early spring, followed by a decrease in the summer and fall. This pattern repeats annually, suggesting a consistent seasonal trend. However, it is worth noting that the data for July 2023 is incomplete, thus making it difficult to accurately determine the seasonal pattern for that particular year.
Peak and Trough Periods:
The peak periods for Brucellosis cases in mainland China occur from January to March, with the highest number of cases observed in February and March. These months consistently exhibit the highest reported case count each year. Conversely, the trough periods tend to occur from June to November, during the summer and fall months. During this time, the number of Brucellosis cases significantly decreases.
Overall Trends:
During the study period, there is a noticeable increasing trend in the number of Brucellosis cases in mainland China. From 2010 to 2023 (excluding incomplete data for July 2023), there is a general upward trend in the annual reported cases. However, it is crucial to consider the incomplete data for 2023, as it may impact the accuracy of the overall trend.
Discussion:
The data suggests a clear seasonal pattern in Brucellosis cases in mainland China, with peak periods occurring in the winter and early spring, and trough periods in the summer and fall. This consistent pattern indicates a variation in the transmission and incidence of the disease throughout the years. The increasing number of cases over the study period indicates a growing burden of Brucellosis in mainland China. Further analysis is required to identify the factors contributing to this increase and develop effective strategies for disease prevention and control.

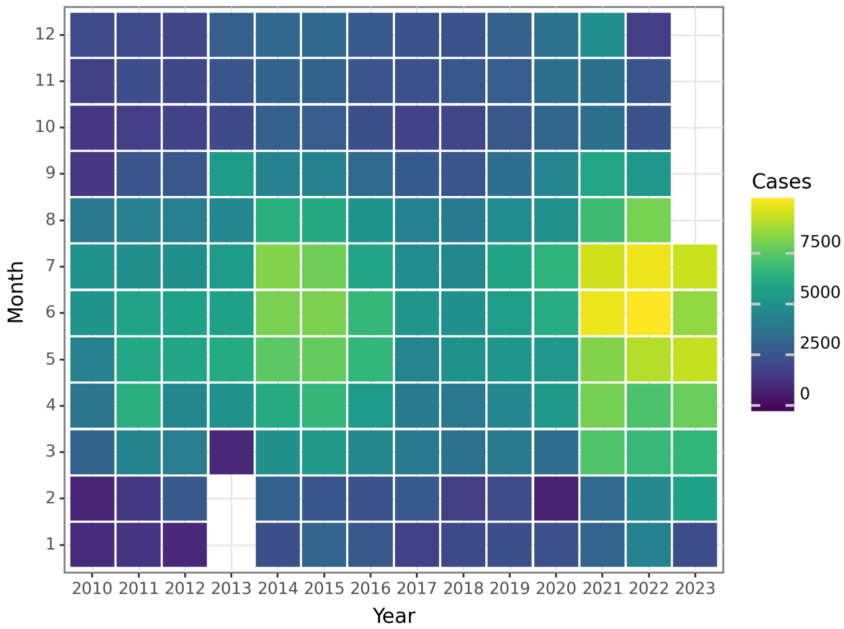

Figure 87: The Change of Brucellosis Cases before 2023 July

Figure 88: The Change of Brucellosis Deaths before 2023 July

Gonorrhea

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

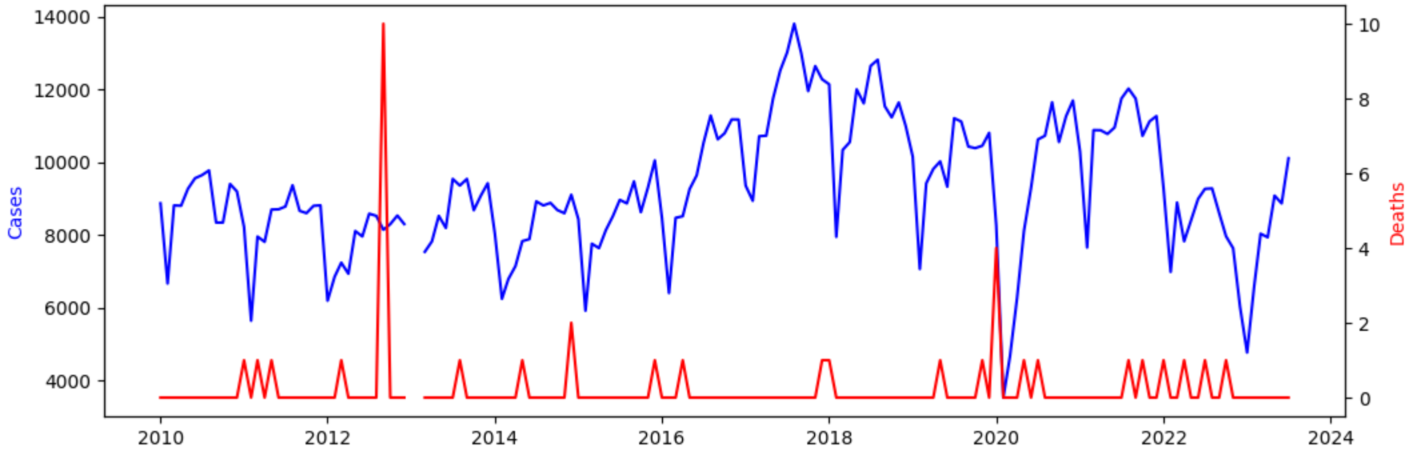

Figure 89: The Change of Gonorrhea Reports before 2023 July

Seasonal Patterns: According to the available data, gonorrhea cases in mainland China exhibit distinct seasonal patterns. Typically, there is a surge in cases during the summer months and a decline during the winter months.
Peak and Trough Periods: The peak periods for gonorrhea cases in mainland China are observed between June and August, with July experiencing the highest number of cases. Conversely, the trough periods for gonorrhea cases occur between December and February, characterized by a generally lower case count.
Overall Trends: When examining the overall trends, there are fluctuations in the number of cases over the years. Initially, there was an increase in cases from 2010 to 2013, reaching a peak in 2013, followed by a slight decrease in subsequent years. However, from 2016 to 2020, there was a steady rise in the number of cases. The peak in 2020 was succeeded by a minor decline in 2021 and 2022.
Discussion: The observed seasonal patterns in gonorrhea cases in mainland China align with the patterns commonly identified in sexually transmitted infections. These patterns may be influenced by various factors, including weather conditions, human behavior, and population mobility. The summertime peak could be attributed to heightened sexual activity during this period, while the wintertime decrease could stem from reduced sexual activity and changes in social behaviors.
The overall upward trend in gonorrhea cases from 2010 to 2020 signifies an increasing prevalence of the infection over time. This could result from factors like changes in sexual behaviors, greater awareness and testing, and improved reporting systems. Proper monitoring of these trends and the implementation of effective strategies for prevention, education, and treatment are crucial for controlling the spread of gonorrhea in mainland China.

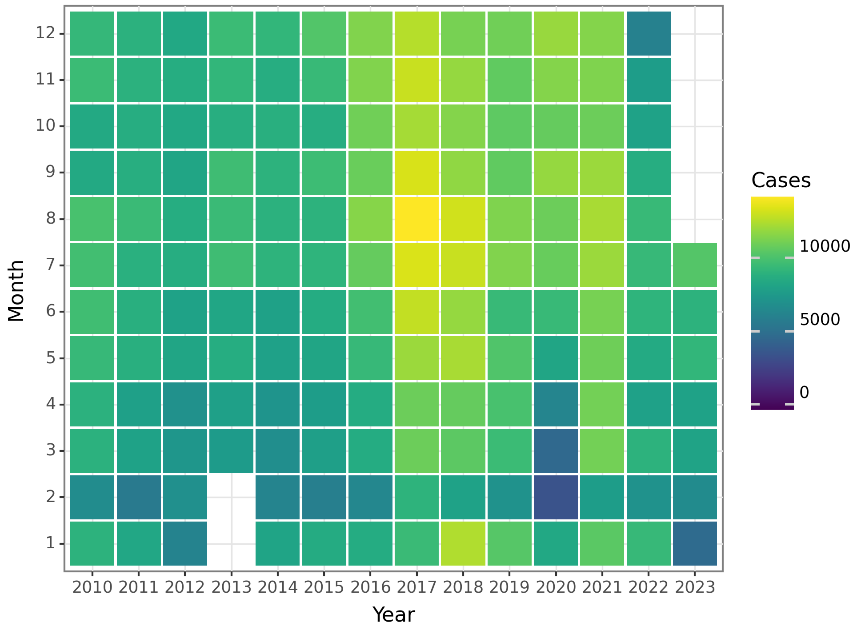

Figure 90: The Change of Gonorrhea Cases before 2023 July

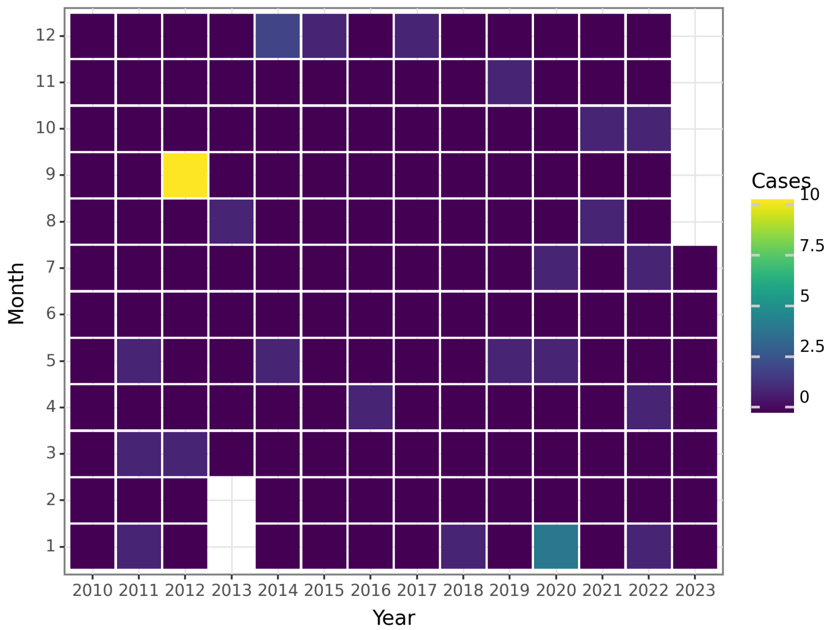

Figure 91: The Change of Gonorrhea Deaths before 2023 July

Syphilis

Syphilis, a sexually transmitted infection caused by the bacterium Treponema pallidum, holds a significant place in human history as one of the oldest known diseases. Although the precise origin and emergence of syphilis remain subjects of debate, the disease gained significant recognition in Europe during the late 15th century following Christopher Columbus's voyage. It was commonly referred to as the "great pox" due to its devastating effects, which often resulted in disfigurement and death.

Prevalence: Syphilis represents a global health concern, with approximately 6 million new cases reported annually. The prevalence of syphilis worldwide varies across regions, with higher rates observed in low- and middle-income countries. Based on data from the World Health Organization (WHO), sub-Saharan Africa and the Americas reported the highest rates of syphilis in 2016. Remarkably, syphilis has experienced a resurgence in many regions worldwide, even including developed countries.

Transmission Routes: The primary mode of syphilis transmission is through sexual contact, encompassing vaginal, anal, and oral sex. Additionally, syphilis can be transmitted from an infected mother to her child during childbirth, known as congenital syphilis. In rare instances, syphilis can also be transmitted through blood transfusions, contaminated needles, or direct contact with open syphilis sores, known as chancres.

Affected Populations: Syphilis can affect individuals of any age, gender, or sexual orientation. However, certain populations exhibit heightened vulnerability to infection. Key affected populations include men who have sex with men (MSM), sex workers and their clients, individuals with multiple sexual partners, people living with HIV, and marginalized communities lacking access to adequate healthcare services.

Key Statistics: - Global syphilis cases reached an estimated 1.3 million in 2018. - The highest rates of syphilis are typically observed among young adults aged 15 to 49. - Congenital syphilis, which can lead to severe birth defects or stillbirth, affects approximately 200,000 newborns each year. - Some regions exhibit significantly higher syphilis prevalence rates among specific populations. For instance, in the United States, syphilis disproportionally affects African American and Hispanic populations.

Risk Factors: Several risk factors contribute to syphilis transmission, including: 1. Unprotected sexual intercourse: Engaging in unprotected sex increases the risk of syphilis transmission. 2. Multiple sexual partners: Having multiple sexual partners enhances the likelihood of encountering someone infected with syphilis. 3. Unprotected oral sex: Syphilis can be transmitted through oral sex, making the use of condoms or dental dams during these encounters essential for risk reduction. 4. Substance abuse: Substance abuse, particularly the use of drugs impairing judgment, can lead to risky sexual behavior and elevate the chances of syphilis transmission. 5. Lack of access to healthcare: Limited access to healthcare facilities and insufficient screening and treatment services contribute to elevated rates of syphilis infection, particularly among marginalized communities.

Impact on Regions and Populations: The impact of syphilis varies across regions and populations. In certain areas, syphilis represents a significant public health concern, with high prevalence rates resulting in substantial morbidity and mortality. Complications stemming from syphilis, such as neurosyphilis (infection of the nervous system) or cardiovascular syphilis, can lead to long-term consequences.

While some regions have made notable progress in controlling syphilis by reducing transmission rates through effective prevention and treatment programs, other areas continue to face challenges due to inadequate healthcare infrastructure, limited resources, stigma, and low levels of awareness.

In conclusion, syphilis remains a global health threat. Its prevalence, transmission routes, affected populations, and impact display considerable variability worldwide. Efforts to combat syphilis involve comprehensive sexual education, increased accessibility to healthcare, widespread testing, prompt treatment, and the promotion of safer sexual practices.

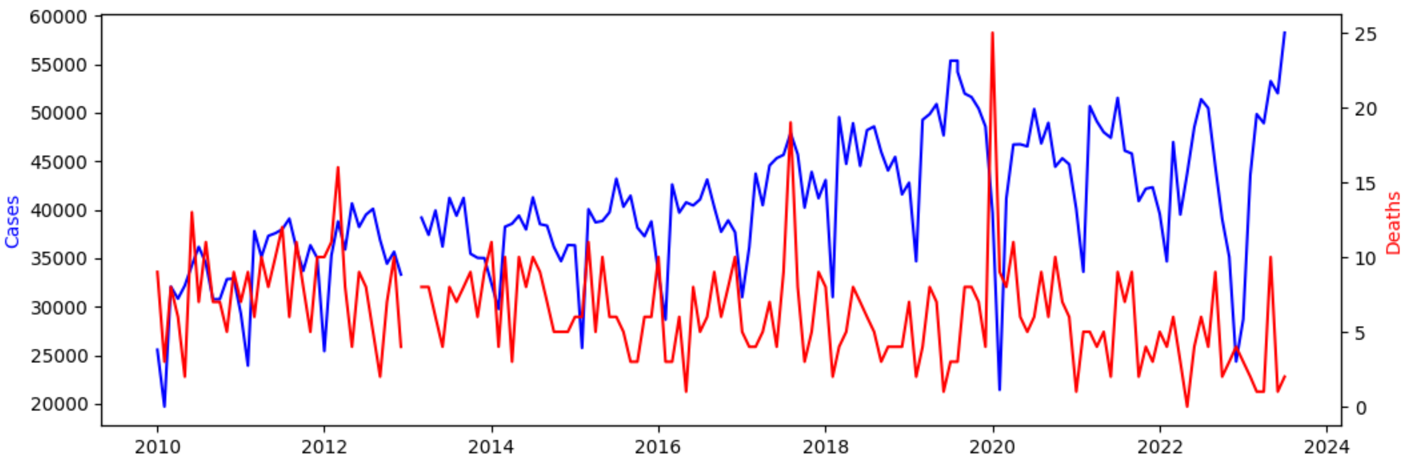

Figure 92: The Change of Syphilis Reports before 2023 July

Seasonal Patterns: The data indicates a consistent seasonal pattern for Syphilis cases in mainland China, with a higher number of cases during the spring and summer months (March to July) and a lower number during the fall and winter months (August to February). This pattern has been observed over several years.
Peak and Trough Periods: The peak period for Syphilis cases in mainland China is typically observed during the summer months, especially in July. This is evidenced by consistently higher numbers of reported cases during this time. In contrast, the winter months, particularly January and February, see lower numbers of cases and are referred to as the trough period.
Overall Trends: Syphilis cases in mainland China appear to be increasing over time, with fluctuations observed. In general, there is an upward trend in cases observed from 2010 to 2023, with occasional dips. However, there was a decrease in cases reported during 2013 compared to previous years.
Discussion: The observed seasonal pattern of Syphilis cases in mainland China indicates that environmental or behavioral factors may contribute to the spread of the disease during the warmer months. This could be associated with increased sexual activity or changes in social dynamics. The July peak period may be linked to increased travel and social gatherings during summer holidays, highlighting the importance of prevention and education efforts during this period.
The increasing trend in Syphilis cases over time underscores the need for intensified prevention, early detection, and treatment efforts, as well as targeted public health campaigns, education programs, and readily available testing and treatment services to manage the rising burden of Syphilis in China. Ongoing monitoring of epidemiological trends is, therefore, necessary to inform and ensure effective disease control measures.

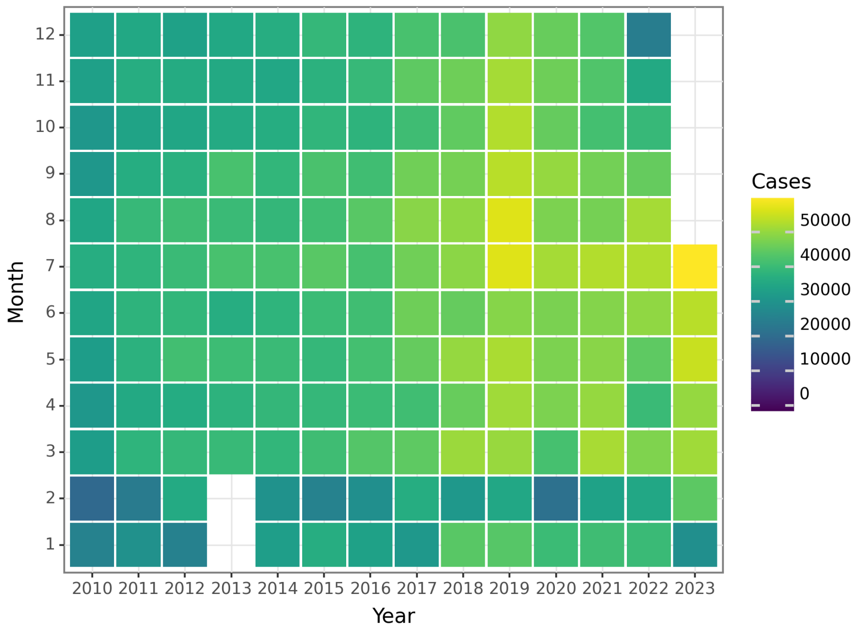

Figure 93: The Change of Syphilis Cases before 2023 July

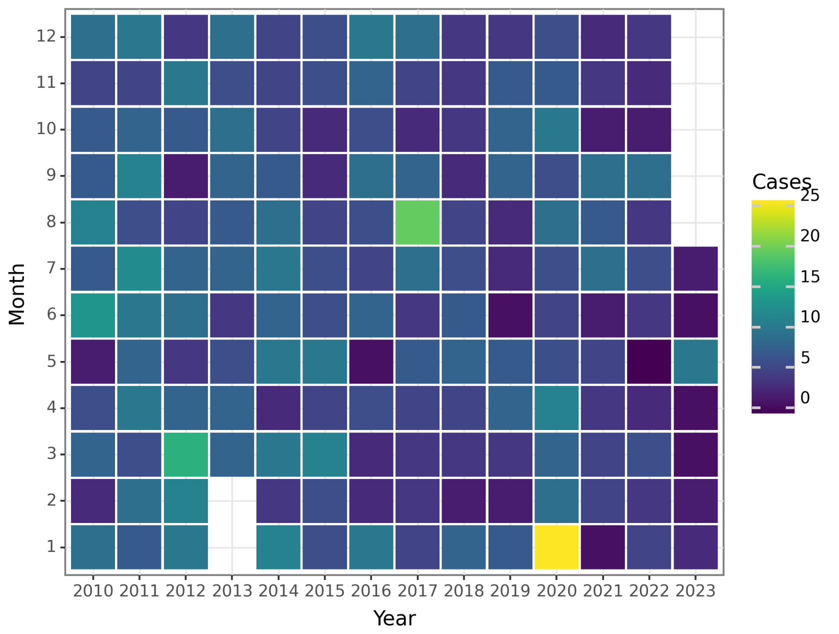

Figure 94: The Change of Syphilis Deaths before 2023 July

Leptospirosis

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

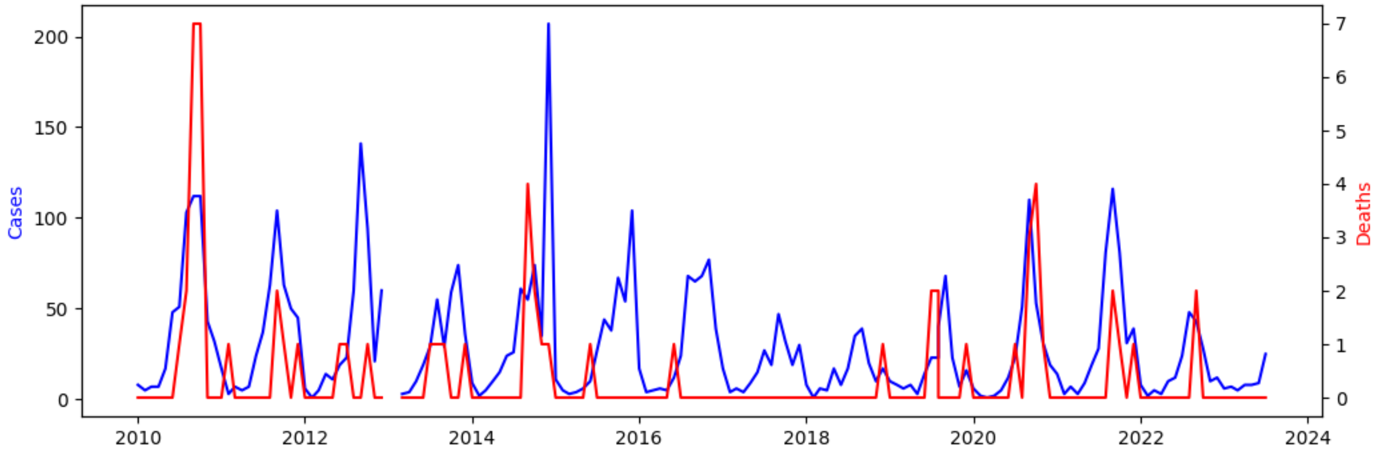

Figure 95: The Change of Leptospirosis Reports before 2023 July

Seasonal Patterns: A discernible pattern of seasonality emerges when analyzing monthly data on Leptospirosis cases in mainland China prior to July 2023. The summer and early autumn months, specifically from June to October, consistently record higher incidences of the disease. This is in contrast to the rest of the year when case counts are generally lower.
Peak and Trough Periods: The peak and trough periods for Leptospirosis cases in mainland China are documented. The highest number of reported cases occurs during the peak period, in July and September. Conversely, the lowest number of cases is recorded during the trough period, specifically in January and February. During these months, the incidence rate is notably lower than during the rest of the year.
Overall Trends: An investigation of the overall trends in Leptospirosis cases in mainland China reveals a fluctuating pattern over the years. No clear trend, whether increasing or decreasing, is perceptible during the study period. However, there are regular irregular peaks in the occurrence of the disease, such as in the years 2010, 2012, and 2014, when there was a pronounced peak in the number of cases.
Discussion: The seasonal patterns observed during this analysis concur with known transmission dynamics of Leptospirosis whereby the disease is contracted through exposure to polluted water sources, such as floodwaters or stagnant water during the rainy season. As such, higher incidences are expected during the summer and early autumn months when rainfall is more abundant.
The peak periods in July and September correspond with these dynamics as these are the months when rainfall and flooding are more prevalent. Nonetheless, it is important to note that peak incidences may also be impacted by other extraneous factors like population movements, human behavior, and local conditions.
The undulating pattern of incidence rates over the years without a clearly defined trend indicates that Leptospirosis transmission in mainland China is influenced by multiple factors that may fluctuate annually. In-depth analysis and further research are necessary to understand these variables and their influence on disease transmission.
It is critical to acknowledge that occasional negative values in the monthly case counts, especially in the earlier years of the research, may point to data reporting issues or discrepancies. Thorough scrutiny and validation of such data may be required to ensure its accuracy.

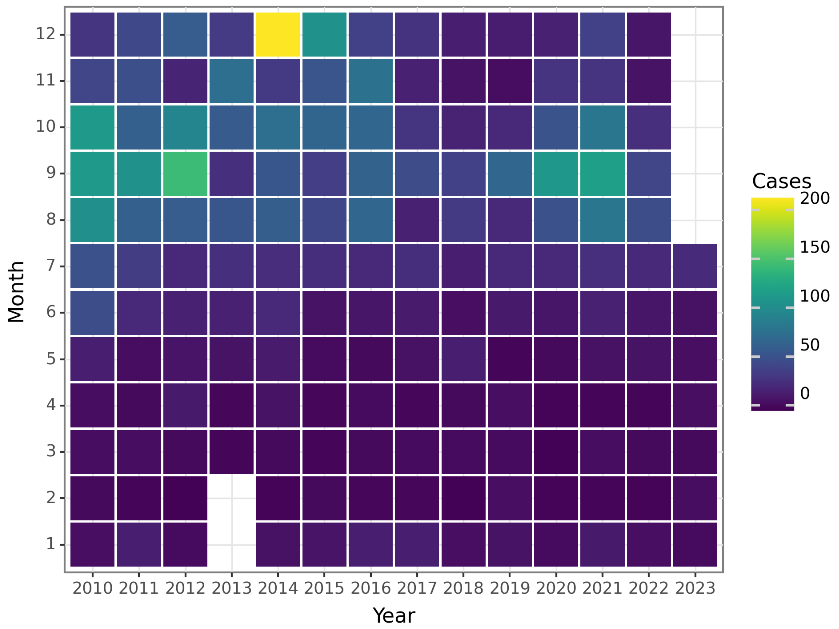

Figure 96: The Change of Leptospirosis Cases before 2023 July

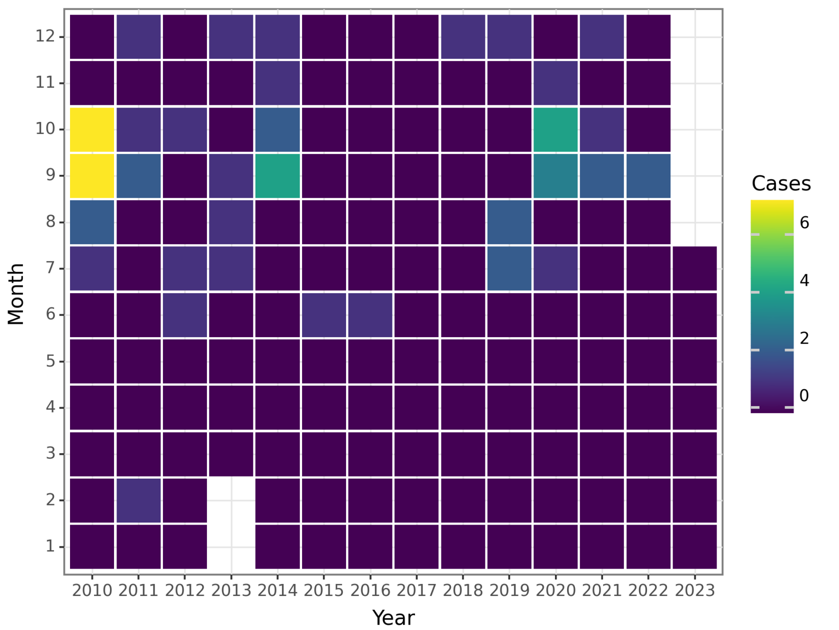

Figure 97: The Change of Leptospirosis Deaths before 2023 July

Schistosomiasis

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

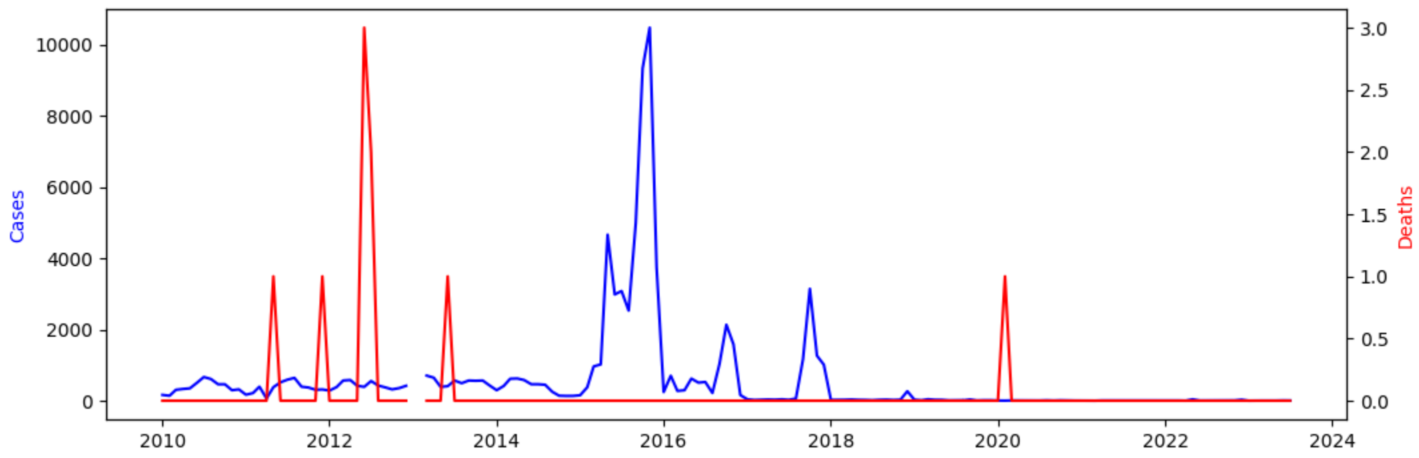

Figure 98: The Change of Schistosomiasis Reports before 2023 July

Seasonal Patterns:
According to the provided data, cases of Schistosomiasis in mainland China demonstrate a seasonal pattern. The number of cases tends to be higher during the spring and summer months and lower during the fall and winter months. This can be observed through the fluctuation in case numbers from year to year.
Peak and Trough Periods:
The peak period for Schistosomiasis cases in mainland China appears to be in May, June, and July. During these months, the number of cases tends to reach its highest point. Conversely, the trough period, when the number of cases is at its lowest, occurs in the months of December, January, and February.
Overall Trends:
Overall, there has been a decreasing trend in Schistosomiasis cases in mainland China from 2010 to July 2023. The number of cases peaked in 2015, with a sharp increase during that year, followed by a gradual decline in subsequent years. Since 2015, the number of cases has remained relatively low, with occasional fluctuations but consistently showing a decline.
Discussion:
The seasonal pattern and peak periods of Schistosomiasis cases in mainland China indicate a higher transmission risk during the warmer months, which aligns with the known life cycle of the disease. Schistosomiasis is caused by parasitic worms that thrive in freshwater environments, and the lifecycle involves transmission through contact with contaminated water and human hosts.
The overall decreasing trend in cases from 2010 to July 2023 suggests that control measures and interventions implemented in mainland China have effectively reduced the burden of the disease. These measures could include improvements in sanitation, targeted treatment campaigns, and awareness programs.
However, it is important to note that the data provided here only covers a specific time frame and does not provide a complete picture of Schistosomiasis in mainland China. To fully assess the overall trends and understand the impact of control measures, it would be necessary to analyze data from a longer time period and consider additional factors such as demographic changes, socio-economic factors, and the implementation of specific control strategies.
In conclusion, based on the available data, Schistosomiasis cases in mainland China show seasonal patterns, with peak periods observed during the spring and summer months. The overall trend indicates a decreasing number of cases over time, suggesting successful control and prevention efforts. However, further analysis and consideration of additional factors are necessary to fully comprehend the dynamics of Schistosomiasis in mainland China.

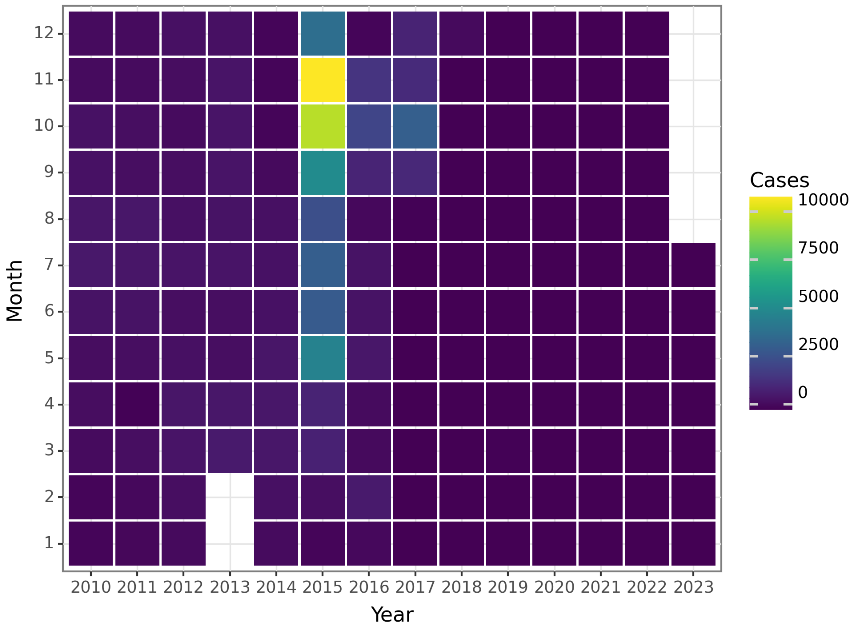

Figure 99: The Change of Schistosomiasis Cases before 2023 July

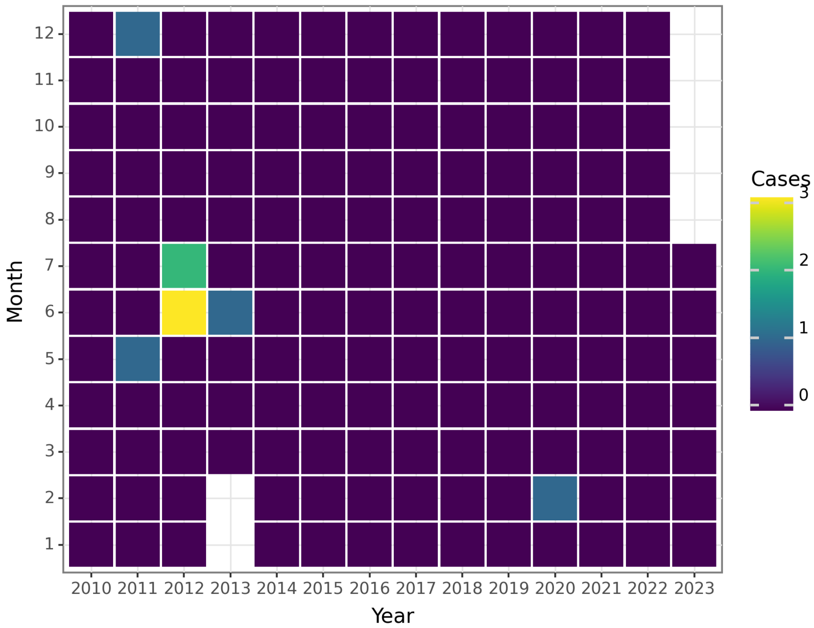

Figure 100: The Change of Schistosomiasis Deaths before 2023 July

Malaria

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

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

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

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

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

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

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

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

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

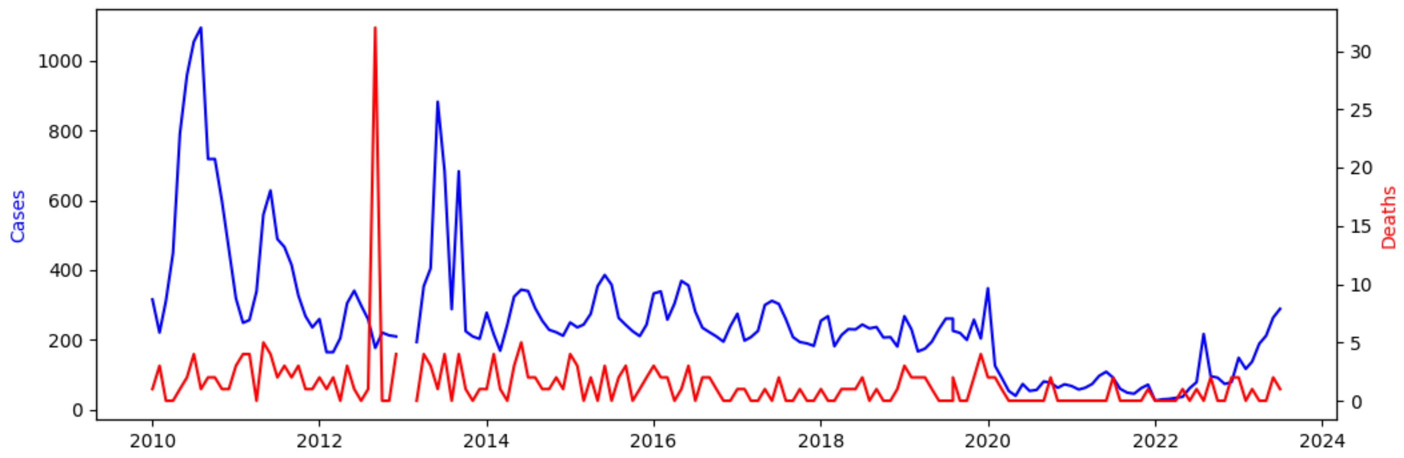

Figure 101: The Change of Malaria Reports before 2023 July

Seasonal Patterns:
The data analysis reveals the presence of a discernible seasonal pattern in the incidence of Malaria cases in mainland China. The number of cases exhibits a tendency to rise during the warmer months, specifically from May to August, while it declines during the cooler months. This observation aligns with the fact that Malaria is primarily transmitted by mosquitoes, which are more active in higher temperatures.
Peak and Trough Periods:
The peak period for Malaria cases in mainland China occurs between June and August, during which the number of cases consistently remains at a high level, with July witnessing the highest peak. Conversely, the trough period transpires from December to February, encompassing the winter months, when the incidence of Malaria cases generally decreases.
Overall Trends:
In general, there is a progressive decline in the number of Malaria cases in mainland China prior to July 2023. Between 2010 and 2012, the number of cases exhibited relative stability, albeit with some minor fluctuations. However, from 2012 to 2016, there was a gradual decrease, which persisted until 2020, when the number of cases reached its nadir. Following 2020, there was a marginal increase in cases; nonetheless, the overall trend remained downward.
Discussion:
The identified seasonal pattern of Malaria cases indicates that the transmission of the disease is influenced by environmental factors such as temperature and rainfall, which impact mosquito populations. The surge in cases during the summer months underscores the significance of implementing appropriate mosquito control measures, including the utilization of insecticide-treated bed nets and indoor residual spraying, during this period to mitigate the risk of Malaria transmission.
The overall declining trend in Malaria cases over the years can be attributed to successful interventions in control and prevention, such as enhanced surveillance, early diagnosis, and timely treatment. These efforts have likely contributed to the alleviation of the Malaria burden in mainland China.
However, it is imperative to acknowledge that Malaria remains a public health concern, as evidenced by the persistence of cases even in recent years. Continued vigilance in surveillance, prevention, and treatment strategies is crucial to sustain the declining trend and advance closer to the elimination of Malaria in mainland China.
It should be noted that the aforementioned analysis is based on the provided data and includes assumptions regarding the accuracy and completeness of the data. When interpreting the results, it is important to consider other factors such as population demographics, geographical variations, and control measures implemented during the study period.

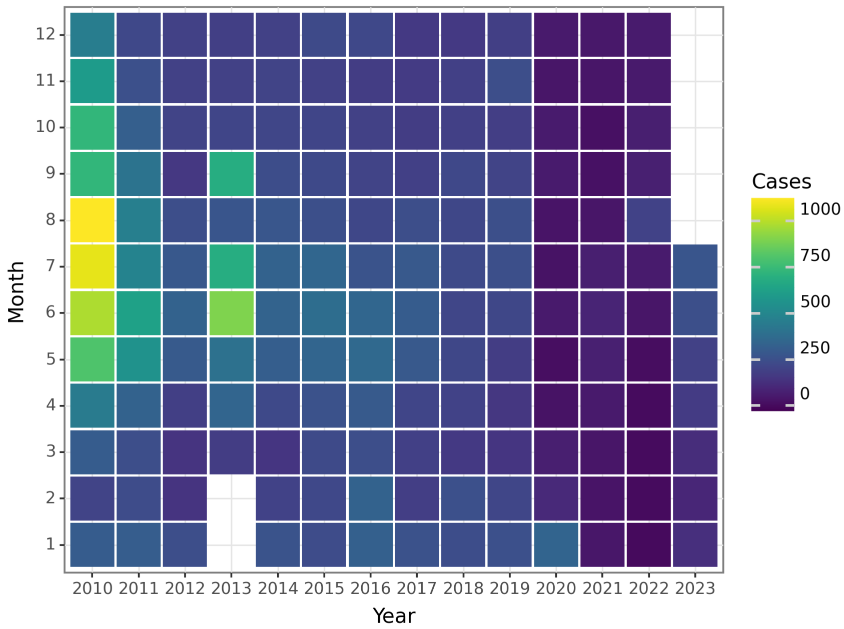

Figure 102: The Change of Malaria Cases before 2023 July

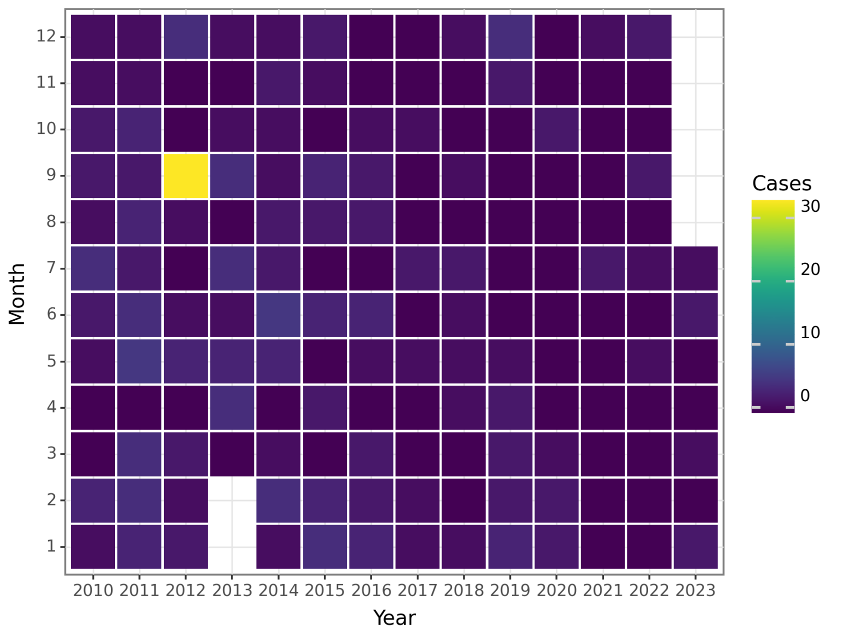

Figure 103: The Change of Malaria Deaths before 2023 July

Human infection with H7N9 virus

Human infection with the H7N9 virus, a subtype of avian influenza, was first identified in China in 2013. The emergence of H7N9 raised concerns due to its potential to cause severe illness and high fatality rate. This comprehensive overview aims to provide information on the global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and the impact of H7N9 virus on different regions and populations.
Epidemiology of H7N9 Virus Infection: 1. Global Prevalence: Since its discovery in 2013, human cases of H7N9 infection have primarily been reported in China. However, a few imported cases have been detected outside of China, including Hong Kong, Taiwan, Canada, Malaysia, and the United States.
2. Transmission Routes: The primary mode of H7N9 virus transmission is through direct contact with infected poultry, particularly in live poultry markets. Human-to-human transmission of the H7N9 virus is limited and has mainly been observed among close household contacts of infected individuals.
3. Affected Populations: H7N9 infection primarily affects individuals who have direct or indirect contact with poultry, such as workers in live poultry markets, poultry farmers, and those with exposure to contaminated environments. Most reported cases have occurred in older adults (average age 58 years) with underlying medical conditions, such as diabetes, chronic respiratory diseases, or immunosuppression. While children are comparatively less affected, cases have been reported in all age groups.
4. Key Statistics: As of February 2021, a total of 1,568 laboratory-confirmed cases of H7N9 infection have been reported globally, with a fatality rate of approximately 39%. The majority of cases have occurred in mainland China, with only a few cases reported in other countries.
Historical Context and Discovery: The first cases of human infection with the H7N9 virus were reported in China in March 2013. These cases were initially identified in Shanghai and later spread to several other provinces in eastern China. The rapid detection and identification of the virus were made possible by the strengthening of China's surveillance systems following the H5N1 avian influenza outbreak in 2003.
Risk Factors Associated with H7N9 Transmission: 1. Direct or Indirect Contact with Poultry: The primary risk factor for H7N9 transmission is close contact with infected poultry or contaminated environments in live poultry markets or poultry farms. Individuals working in the poultry industry have a higher risk of infection.
2. Low Awareness and Protective Measures: Individuals with limited awareness of preventive measures, such as proper hand hygiene, use of personal protective equipment, and avoidance of live poultry markets, are at a higher risk of H7N9 infection.
3. Underlying Medical Conditions: Individuals with pre-existing medical conditions, especially diabetes, chronic respiratory diseases, cardiovascular diseases, and immunosuppression, are more susceptible to severe illness and complications from H7N9 infection.
Impact on Different Regions and Populations: The impact of the H7N9 virus varies across regions and populations. Mainland China has observed the highest number of cases and fatalities. Prevalence rates have been higher in provinces with intensive poultry production and live poultry markets. The elderly population and individuals with underlying medical conditions have experienced higher mortality rates compared to healthier individuals.
Outside of China, imported cases have been reported, but human-to-human transmission has been limited, resulting in a lesser impact on other regions. Timely detection, surveillance, and public health interventions have contributed to preventing widespread outbreaks in these areas.
In summary, the H7N9 virus primarily affects individuals with close contact with infected poultry, and human-to-human transmission is limited. The virus has had a significant impact on China, particularly with high fatality rates among older adults and those with underlying medical conditions. Public health efforts and increased awareness of preventive measures remain crucial in controlling the spread of H7N9 infection and mitigating its impact.

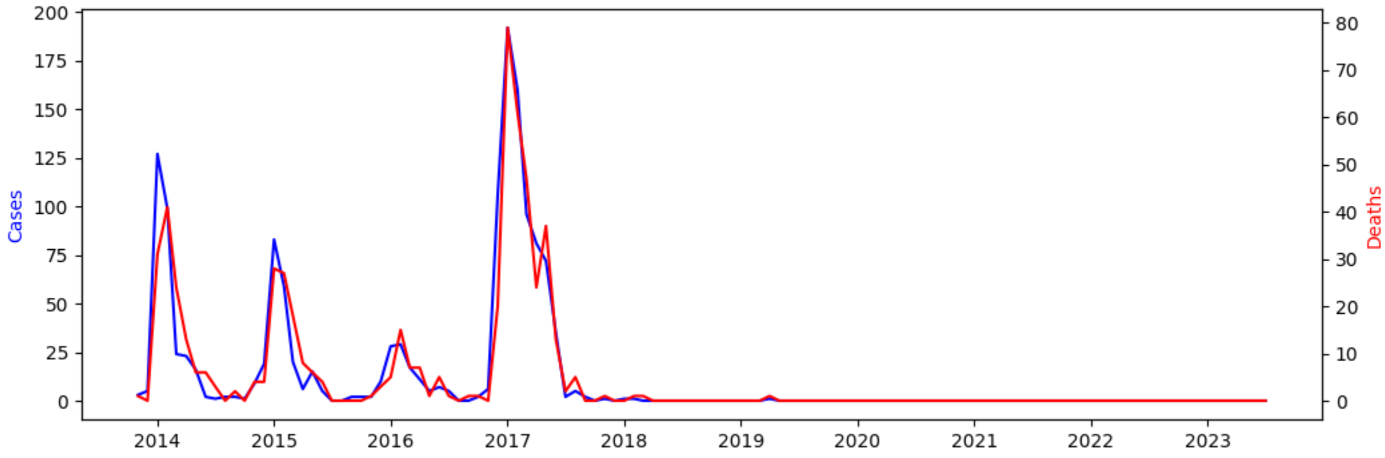

Figure 104: The Change of Human infection with H7N9 virus Reports before 2023 July

Seasonal Patterns: The data provided supports the observation of seasonal patterns in human infection with the H7N9 virus in mainland China. Cases and deaths peak during the winter months (November to February) and decline during the summer months (June to September), indicating a seasonal pattern characterized by higher transmission and incidence of H7N9 infections during colder months.
Peak and Trough Periods: The highest number of H7N9 virus cases is observed between November and January, with the largest number of cases occurring in January 2014 (127 cases) and the highest number of deaths occurring in January 2017 (192 deaths). Few or no reported cases are observed between July and September, representing the trough period for cases and deaths in most years.
Overall Trends: Following the initial outbreaks in 2013 and 2014, there has been a downward trend in the number of H7N9 cases and deaths in mainland China. The number of cases reached its peak in 2014 and gradually decreased in subsequent years. Similarly, the number of deaths peaked in 2017 and has generally decreased since then. From 2018 to 2023, minimal to no reported cases or deaths have been observed.
Discussion: The seasonal patterns identified in the data imply that the transmission of the H7N9 virus is influenced by environmental factors, such as temperature and humidity, which are more conducive to viral spread during colder months. This aligns with the behavior of other seasonal respiratory viruses. The decline in cases and deaths over time may be attributed to various factors, including enhanced surveillance and prevention measures, increased public awareness, and the implementation of control strategies such as culling infected poultry and closing poultry markets.
It is important to acknowledge that this analysis is solely based on the provided data, and other factors like reporting discrepancies, changes in surveillance practices, and interventions by health authorities could have influenced the observed trends. To gain a comprehensive understanding of the epidemiology of the H7N9 virus in mainland China, additional data and analysis are necessary.

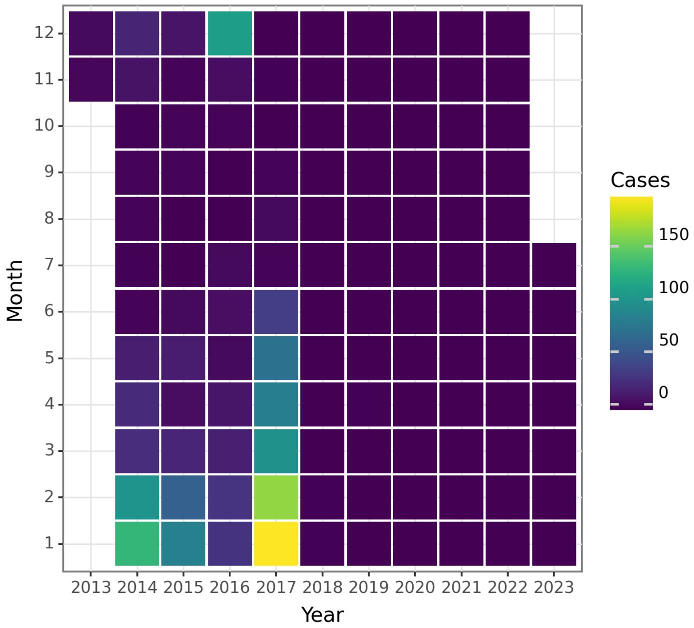

Figure 105: The Change of Human infection with H7N9 virus Cases before 2023 July

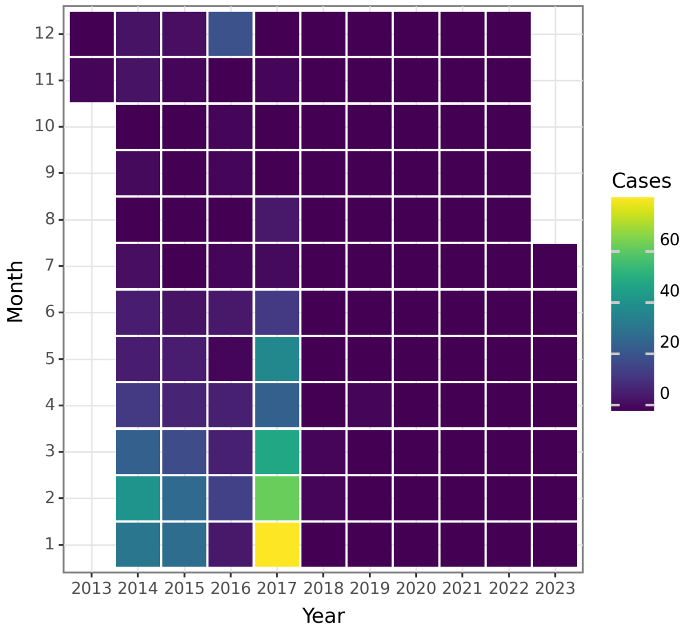

Figure 106: The Change of Human infection with H7N9 virus Deaths before 2023 July

Influenza

Influenza, also known as the flu, is a highly contagious respiratory illness caused by influenza viruses. It poses a significant public health challenge worldwide, with seasonal outbreaks occurring on an annual basis. Understanding the epidemiology of influenza is vital for implementing effective prevention and control strategies. This comprehensive overview will address various aspects of influenza, such as its global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and impact on different regions and populations.

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

Certain demographics, such as the elderly, young children, and individuals with pre-existing conditions, are more susceptible to severe complications and death. Influenza can also have a significant impact on indigenous populations, refugees, and those living in impoverished or unsanitary conditions.

To conclude, influenza is a respiratory illness of global importance, affecting millions of individuals each year. It is primarily transmitted through respiratory droplets and can have severe consequences, especially for high-risk populations. The historical context reveals periodic pandemics, leading to increased awareness and research. Risk factors for transmission include close contact, crowded environments, and a lack of preventive measures. The impact of influenza varies across regions, with developing countries and vulnerable demographics experiencing a higher burden. Effective surveillance, vaccination, and public health measures are vital for controlling the spread of influenza.

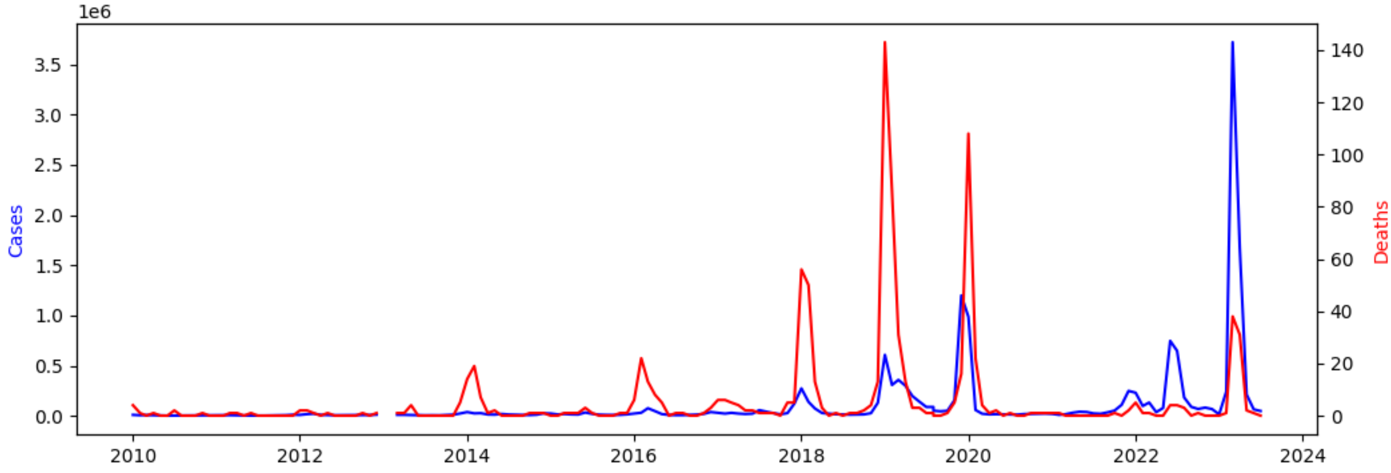

Figure 107: The Change of Influenza Reports before 2023 July

Seasonal Patterns of Influenza Cases in Mainland China:
Clear seasonal patterns in Influenza cases can be observed based on monthly data from mainland China. The number of cases peaks during the winter months (December to February), while the summer months (June to August) show the lowest number of cases. This seasonal occurrence of Influenza is consistent across several years.
Peak and Trough Periods of Influenza Cases:
The peak period for Influenza cases in mainland China is consistently observed during the winter months, particularly in December, January, and February. Conversely, the trough period with the lowest number of cases is seen during the summer months, usually in June, July, and August. These seasonal trends are consistent across multiple years.
Overall Trends of Influenza Cases:
An overall trend analysis of Influenza cases in mainland China shows a notable increase from 2010 to 2013, peaking in 2013, and declines following that year. From 2016 to 2018, a gradual increase is noted, while a significant increase from 2019 to 2021 is observed, followed by a further spike in 2022. These patterns demonstrate fluctuations in Influenza outbreak prevalence and intensity over time.
Discussion:
The observed seasonal patterns of Influenza cases in mainland China align with the common behavior of the virus, thriving in colder weather and spreading quickly. The increase in cases during the winter months may be due to factors such as indoor crowding, closer contact among individuals, and environmental conditions favorable to virus survival and spread.
The fluctuations in Influenza prevalence and intensity over time seen in the overall trend analysis may be related to multiple factors, including changes in virus strains, variations of population immunity, and surveillance and reporting practices.
It is essential to consider that this analysis is based on reported cases, and there may be variations in reporting and surveillance practices over time, impacting data accuracy. Additionally, the impact of interventions such as vaccination campaigns and public health measures should be considered when discussing Influenza spread.
In conclusion, this analysis provides valuable insight into seasonal patterns, peak and trough periods, and overall Influenza trends in mainland China. Future research and monitoring are essential to understand the driving factors of these patterns to create effective prevention and control strategies.

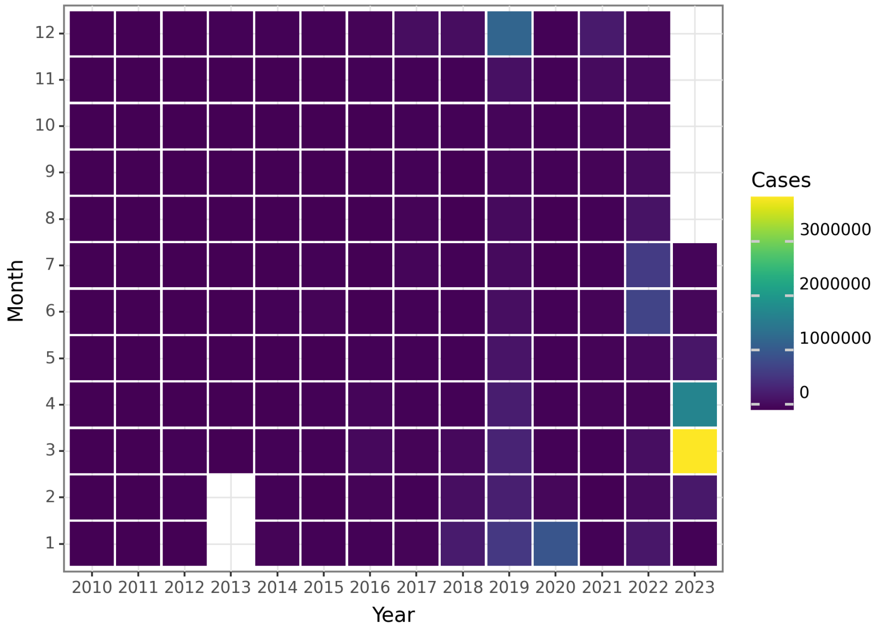

Figure 108: The Change of Influenza Cases before 2023 July

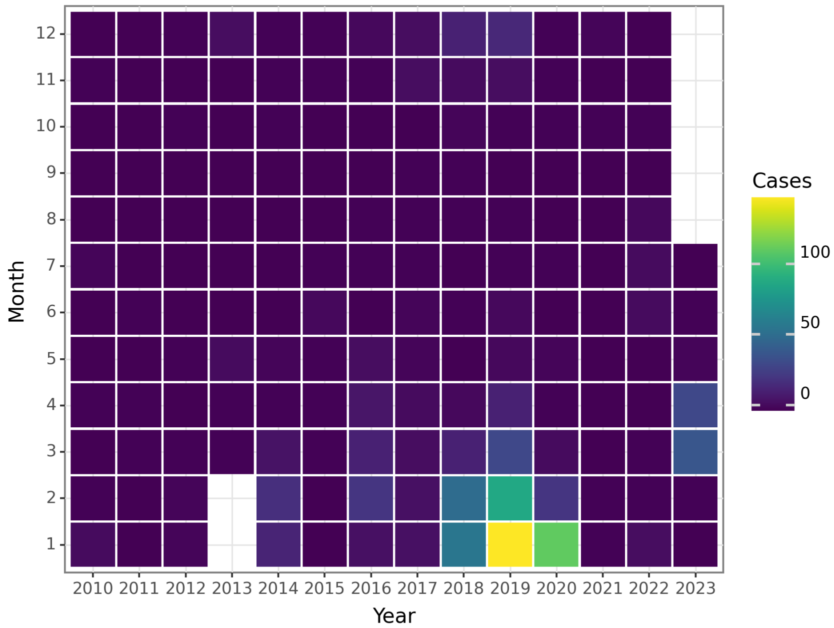

Figure 109: The Change of Influenza Deaths before 2023 July

Mumps

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

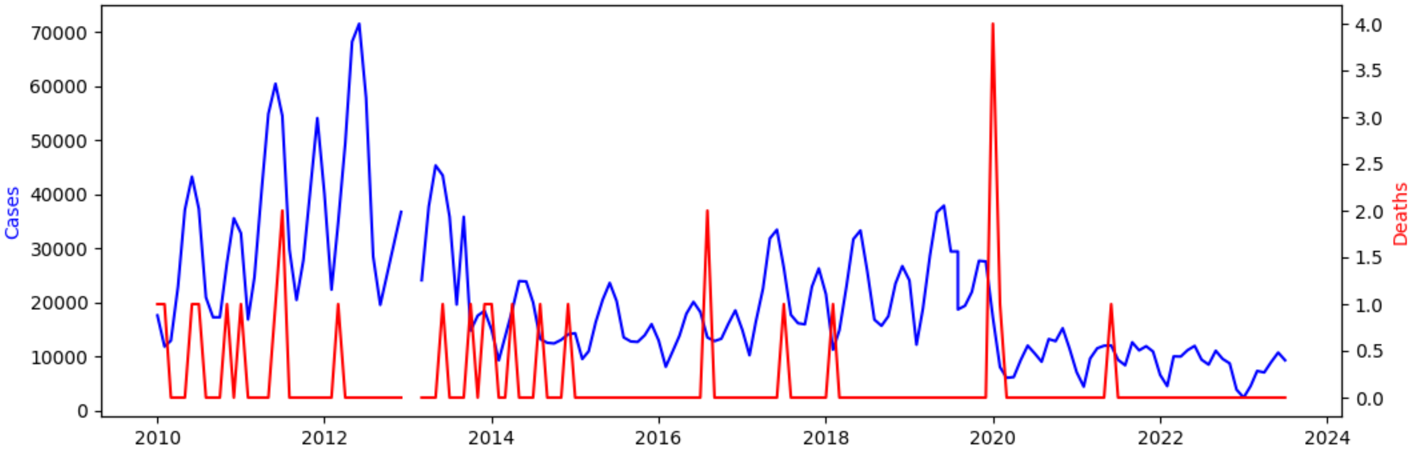

Figure 110: The Change of Mumps Reports before 2023 July

Seasonal Patterns: Based on the provided data, a clear seasonal pattern for Mumps cases in mainland China is evident. Generally, there is an increase in cases during the spring and summer months (March to July) and a decrease in the fall and winter months (August to February). This consistent pattern is observed throughout the analyzed years.
Peak and Trough Periods: The peak periods for Mumps cases in mainland China typically occur in May and June, with the highest number of cases recorded. Conversely, the trough periods, when the number of cases is lowest, usually fall in the winter months, particularly in December and January.
Overall Trends: There is a general upward trend in Mumps cases from 2010 to 2016, with some fluctuations. However, starting from 2017, there is a noticeable decline in the number of cases, albeit with intermittent fluctuations.
Discussion: The observed seasonal pattern of Mumps cases in mainland China suggests a higher transmission rate during the spring and summer months. This could be influenced by various factors, such as increased social gatherings and closer contact during these periods. The peak periods in May and June may be attributed to favorable conditions for virus spread, such as increased outdoor activities and potentially lower levels of immunity.
The overall declining trend in Mumps cases from 2017 onwards could be the result of various factors, including intensified immunization efforts, improved hygiene practices, and public health interventions aimed at controlling the virus's spread. However, further investigation and analysis are necessary to examine the underlying factors contributing to this decline.
It is worth noting that some instances in the reported data record negative numbers of cases and deaths. This could be attributed to errors in data entry or anomalies in the reporting system. It is imperative to verify the accuracy of such data points and ensure their consistency with the overall observed trends.
Overall, this analysis provides a comprehensive understanding of the seasonal patterns, peak and trough periods, and overall trends in Mumps cases in mainland China prior to July 2023. Additional analysis and exploration could yield further insights into the factors influencing the transmission and trends of Mumps in this region.

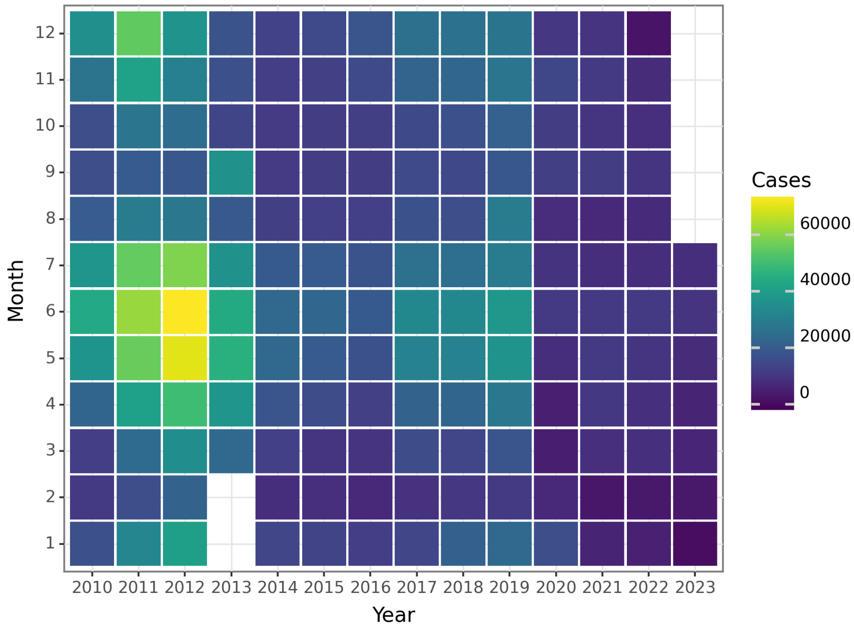

Figure 111: The Change of Mumps Cases before 2023 July

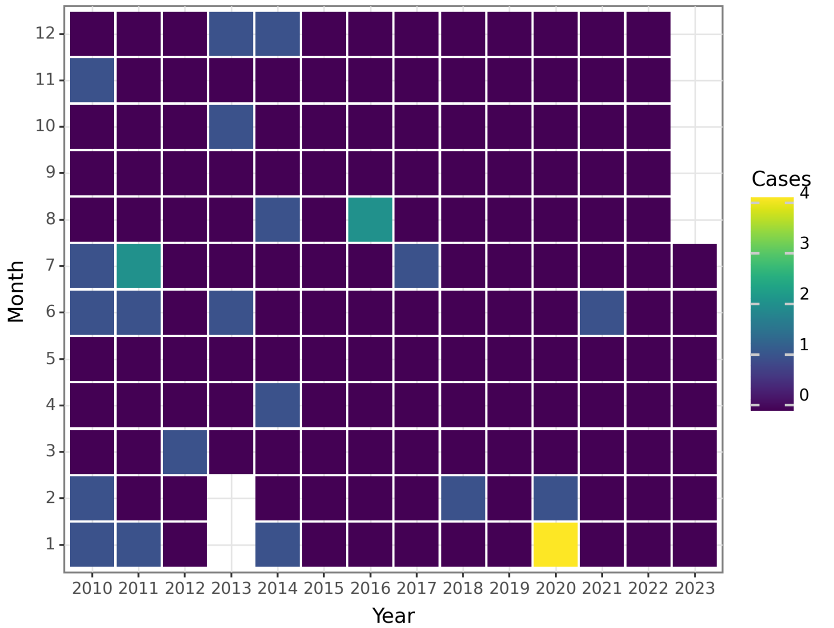

Figure 112: The Change of Mumps Deaths before 2023 July

Rubella

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

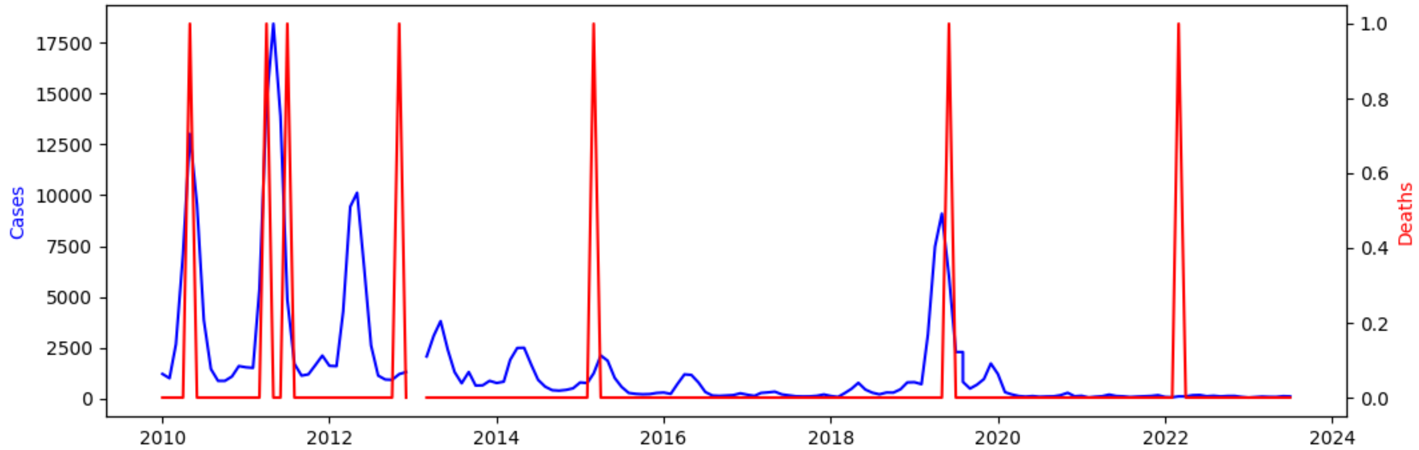

Figure 113: The Change of Rubella Reports before 2023 July

Seasonal Patterns:
Analysis of the data reveals a clear seasonal pattern in Rubella cases in mainland China prior to July 2023. The number of cases shows fluctuations throughout the years, with peaks occurring in spring and summer, and troughs in fall and winter. This suggests a higher incidence of Rubella during warmer months.
Peak and Trough Periods:
Rubella cases in mainland China consistently peak in the months of April, May, and June, with higher numbers of reported cases compared to other months. Trough periods, on the other hand, are observed in January, February, and December, with relatively lower reported cases.
Overall Trends:
Considering the overall trend, Rubella cases have remained relatively stable over the examined years. While there may be slight fluctuations from year to year, there is no clear increasing or decreasing trend.
The observed seasonal pattern of Rubella cases aligns with what is commonly seen in many countries, where the virus tends to peak during spring and summer. This could be attributed to factors such as increased social interactions, higher population density, and more frequent travel during these seasons, which facilitate virus transmission.
It is important to note that the reported cases of Rubella in mainland China have generally remained stable during the examined period. This suggests that vaccination programs and public health interventions have been effective in preventing major outbreaks of Rubella in the country.
However, caution should be exercised when interpreting these findings, as the provided data only covers the period before July 2023. Further analysis and monitoring of Rubella cases beyond this timeframe are necessary to assess long-term trends and evaluate the effectiveness of preventive measures in reducing Rubella incidence in mainland China.

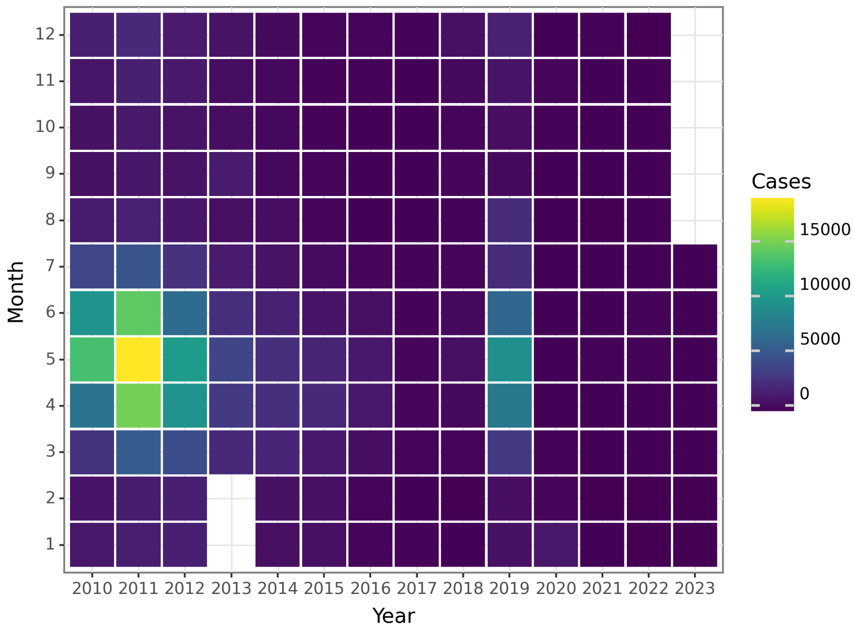

Figure 114: The Change of Rubella Cases before 2023 July

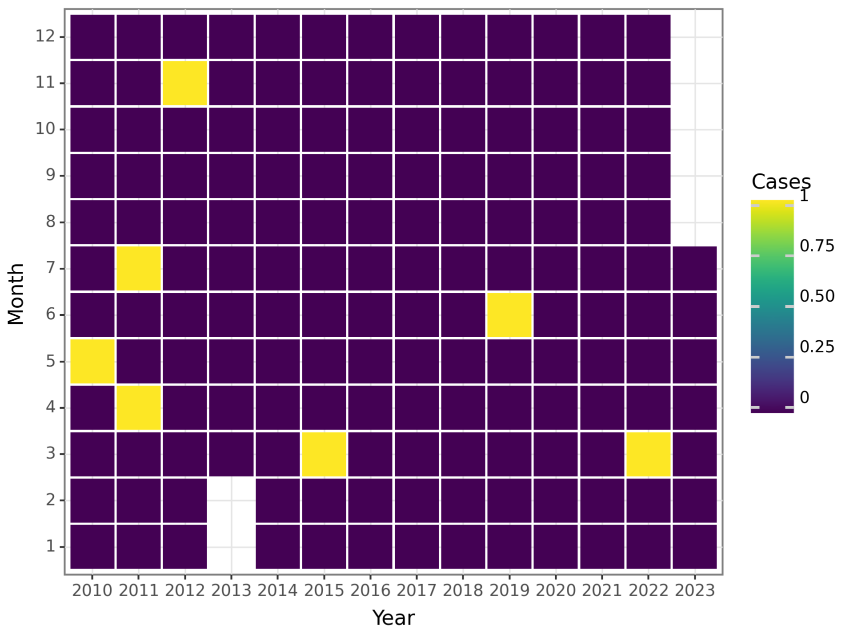

Figure 115: The Change of Rubella Deaths before 2023 July

Acute hemorrhagic conjunctivitis

Acute hemorrhagic conjunctivitis (AHC) is a highly contagious viral infection characterized by the sudden onset of redness, swelling, and discharge in the conjunctiva of the eye. It is caused by several types of viruses, primarily Enterovirus 70 (EV70) and Coxsackievirus A24 (CA24).

Historical Context and Discovery: The first description of AHC was in 1969 during an outbreak in Ghana, Africa. It later spread to other parts of Africa and then to Asia. The pandemic nature of AHC was recognized in the 1970s when it rapidly circulated in various regions worldwide. Since then, AHC outbreaks have been reported in many countries, with varying levels of severity.

Prevalence: AHC is prevalent globally, but its impact varies among different regions and populations. Outbreaks have been reported in Asia, Africa, Europe, the Americas, and Oceania. The incidence of AHC is typically higher in tropical and subtropical regions due to favorable environmental conditions for viral transmission.

Transmission Routes: AHC is primarily transmitted through direct contact with infected ocular secretions or contaminated surfaces. The virus can be present in tears, nasal secretions, and feces of infected individuals. Transmission can occur through hand-to-eye contact, sharing contaminated objects such as towels or eye drops, and exposure to respiratory droplets generated by infected individuals through coughing or sneezing.

Affected Populations: AHC can affect individuals of all ages and demographics. However, certain populations are more susceptible to infection. Young children, especially those attending daycare facilities or schools, are at a higher risk due to close contact. Additionally, individuals with poor hygiene practices, such as inadequate handwashing, are more vulnerable to AHC.

Key Statistics: Exact global statistics for AHC are challenging to determine, as many cases go unreported or are misdiagnosed. However, outbreaks have been reported intermittently in many countries. During outbreaks, AHC can affect a significant number of individuals within a short period. In densely populated areas, the spread of AHC can be rapid, leading to substantial morbidity.

Risk Factors: Several risk factors contribute to the transmission of AHC. These include overcrowded living conditions, poor sanitation, lack of access to clean water, and inadequate healthcare infrastructure. Additionally, behaviors such as close contact with infected individuals, lack of hand hygiene, and sharing personal items increase the risk of AHC transmission.

Impact on Regions and Populations: The impact of AHC varies geographically. In some regions, AHC may occur sporadically or as localized outbreaks, primarily affecting specific communities or institutions. However, in other regions, widespread outbreaks can occur, resulting in significant morbidity and strain on healthcare systems.

In developing countries with limited resources and inadequate healthcare infrastructure, AHC outbreaks can have a severe impact. They can impose a considerable burden on healthcare facilities that are already managing other infectious diseases. Additionally, productivity loss due to illness or caring for affected individuals can have economic consequences for affected populations.

Variations in prevalence rates and affected demographics can be observed within regions. Factors such as population density, healthcare access, and socio-economic conditions contribute to these variations. Targeted public health interventions and improved hygiene practices can help mitigate the impact of AHC and reduce transmission rates.

Overall, AHC remains a significant public health concern, particularly in regions with lower socio-economic status and limited resources. Continued surveillance, early detection, and timely implementation of control measures are necessary to minimize the spread and impact of this viral infection.

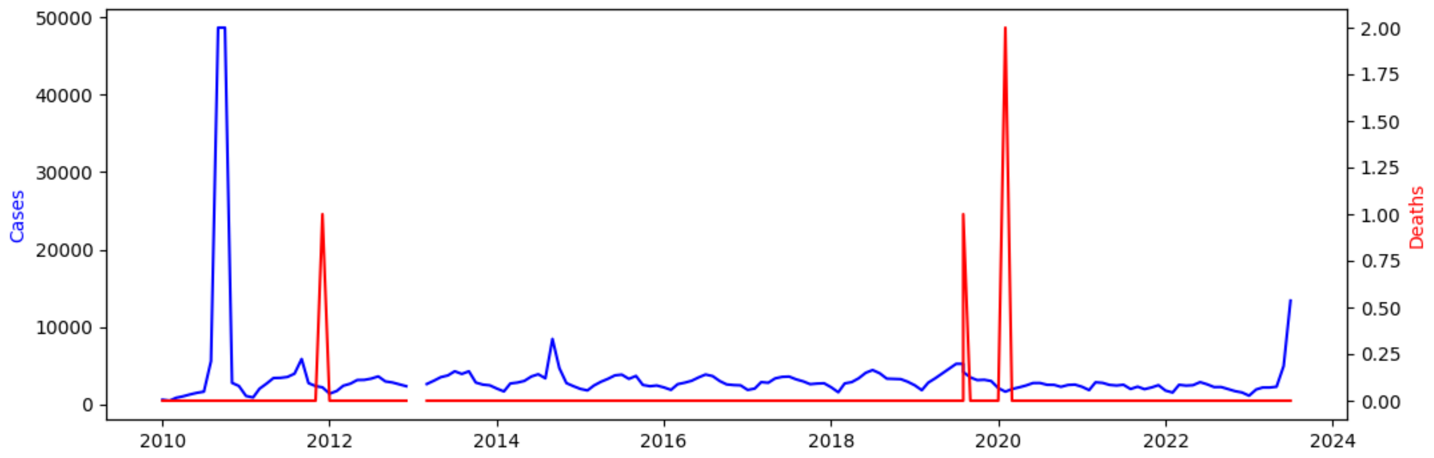

Figure 116: The Change of Acute hemorrhagic conjunctivitis Reports before 2023 July

Seasonal Patterns: An analysis of the data reveals a distinct seasonal pattern for cases of Acute Hemorrhagic Conjunctivitis (AHC) in mainland China. The number of cases demonstrates a peak during the summer months, specifically in June, July, and August. Subsequently, there is a gradual decrease towards the end of the year. Notably, there is a marked increase in cases beginning in April and May, reaching its zenith during the summer months, and then declining once again towards year-end.
Peak and Trough Periods: The peak period for incidences of AHC in mainland China occurs during the summer months, particularly in June and July, with the highest number of cases reported during this time. Conversely, the trough period can be observed during the winter months, with a lower number of cases reported in November, December, January, and February.
Overall Trends: Upon examining the overall trends, it is evident that the number of AHC cases increased from 2010 to 2015, peaking in 2015. However, subsequent to 2015, the number of cases stabilized and fluctuated to some extent, while remaining relatively high compared to previous years. No significant increasing or decreasing trend has been observed from 2015 onwards.
Discussion: The seasonal patterns of AHC in mainland China consistently demonstrate an increase in cases during the summer months, specifically in June and July, which serve as the peak months. This could be attributed to various factors, including augmented outdoor activities, higher temperatures, and increased humidity levels, all of which are conducive to the transmission and spread of the disease. In order to prevent and control the spread of AHC during peak periods, it is imperative for public health officials to be cognizant of this seasonal trend and implement necessary measures. Additionally, the continual presence and impact of AHC in mainland China, as indicated by the relatively high case numbers observed beyond 2015, underscores the requirement for ongoing surveillance and control efforts to alleviate the burden of this disease.

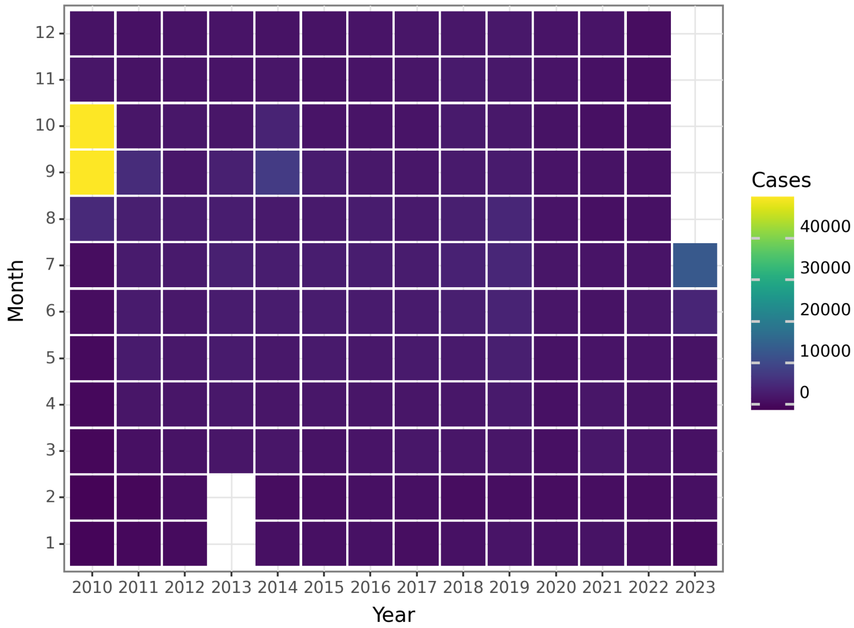

Figure 117: The Change of Acute hemorrhagic conjunctivitis Cases before 2023 July

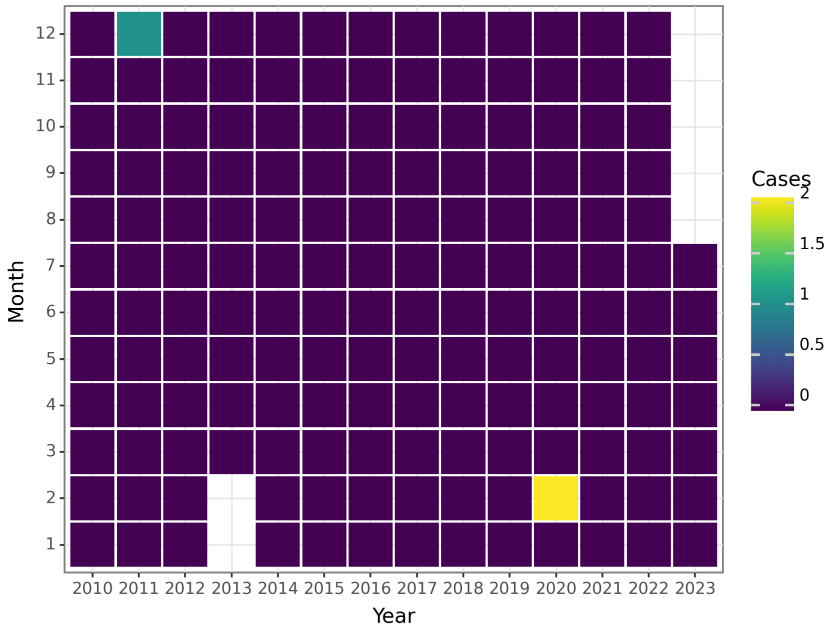

Figure 118: The Change of Acute hemorrhagic conjunctivitis Deaths before 2023 July

Leprosy

Leprosy, also known as Hansen's disease, is a chronic infectious disease caused by Mycobacterium leprae. It primarily affects the skin, nerves, and mucous membranes. A comprehensive understanding of the epidemiology of leprosy is crucial for the development of effective prevention, control, and treatment strategies. This overview will cover the global prevalence, transmission routes, affected populations, key statistics, historical context, major risk factors, and impact on different regions and populations.
Global Prevalence: Leprosy is predominantly found in tropical and subtropical regions of the world, particularly in parts of Africa, Asia, and Latin America. According to the World Health Organization (WHO), there were 175,176 reported cases of leprosy globally at the end of 2019, with a registered prevalence rate of 0.2 cases per 10,000 population. While the overall global prevalence has significantly decreased in recent decades, there are still countries with high transmission rates, such as India, Brazil, and Indonesia.
Transmission Routes: Leprosy primarily spreads through respiratory droplets from infected individuals, although the exact transmission route remains unclear. It is not highly contagious and requires prolonged contact with an untreated person with the disease for transmission to occur. Close and frequent contact with individuals affected by the bacteria is the major route of transmission.
Affected Populations: Leprosy can affect individuals of any age, but it is most commonly observed in adults, with men being more susceptible than women. People living in poverty, with inadequate access to healthcare, and in overcrowded conditions are at higher risk due to factors such as malnutrition, poor hygiene, and weakened immune systems. Additionally, genetic factors can contribute to susceptibility to the disease.
Key Statistics: Most countries have successfully eliminated leprosy as a public health problem at the national level. However, a few countries still experience high prevalence rates. In 2019, India, Brazil, and Indonesia had the highest number of new cases. Brazil had the highest new case detection rate, followed by India and Indonesia. Multibacillary (more severe) leprosy cases account for approximately 60% of reported cases globally.
Historical Context and Discovery: Leprosy has afflicted humanity for centuries. Historical records and skeletal remains indicate that the disease has been present since ancient times. In the Middle Ages, leprosy was highly stigmatized and feared, which led to the establishment of leprosariums, isolated communities where individuals affected by leprosy were forced to live. The exact discovery of the disease's causative agent, M. leprae, and the development of effective treatment occurred in the late 19th and early 20th centuries.
Major Risk Factors: Several risk factors contribute to leprosy transmission, including close and prolonged contact with an untreated person with leprosy, living in crowded and unhygienic environments, poor immune function, malnutrition, poverty, and genetic susceptibility. Addressing these risk factors is crucial for effectively reducing the transmission and impact of leprosy.
Impact on Different Regions and Populations: The impact of leprosy varies significantly across regions and populations. India carries the highest burden of leprosy, accounting for more than half of the new cases globally. Brazil and several other countries in Africa and Asia also face significant challenges in relation to leprosy prevalence. The disease often disproportionately affects marginalized populations, such as individuals living in poverty, migrants, and remote rural communities. Stigma and discrimination associated with leprosy remain major challenges, resulting in delayed diagnosis, social isolation, and limited access to healthcare.
In conclusion, leprosy remains a significant public health concern in certain regions, particularly in parts of Africa, Asia, and Latin America. Efforts to control and eliminate leprosy continue, including early detection, proper treatment, and addressing social stigma. Understanding the epidemiology of leprosy is crucial for developing and implementing effective strategies to reduce transmission, provide appropriate care, and improve the lives of those affected by the disease.

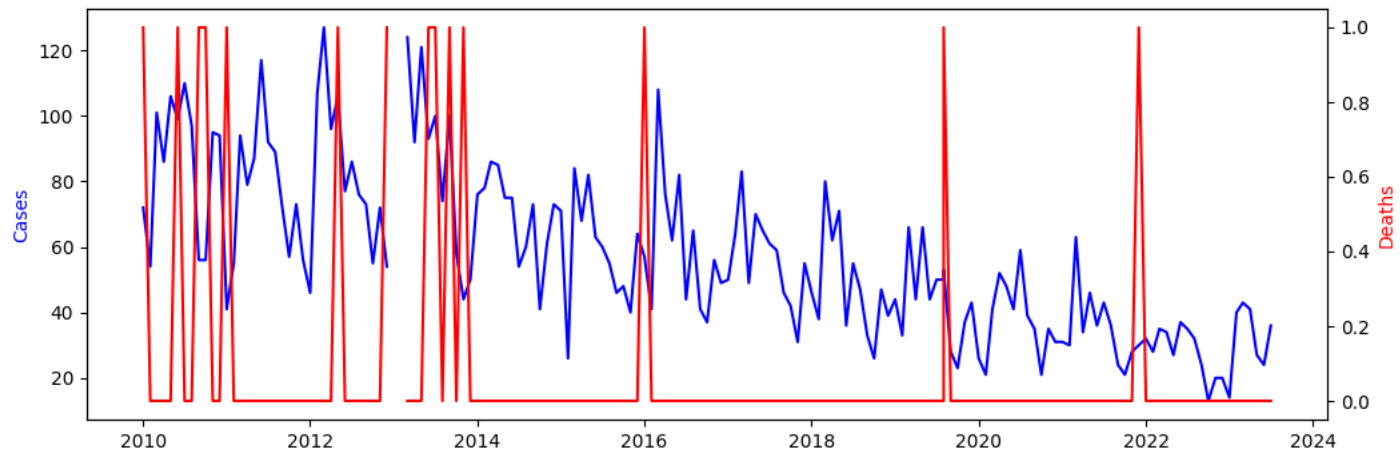

Figure 119: The Change of Leprosy Reports before 2023 July

The data show seasonal patterns in Leprosy cases in mainland China before July 2023. From January to May, the number of cases tends to increase, while from June to December, it declines. The consistent pattern suggests higher leprosy activity in the early months of the year, followed by a decline in the later months. The peak periods for leprosy cases occur between January and May, with the highest peak in March, while the trough periods are in June to December, with the lowest number of cases in October. Overall, there appears to be a declining trend in leprosy cases from 2020 to 2023, which could indicate the effectiveness of surveillance and control efforts by health authorities. The observed patterns suggest the possible influence of environmental factors and public health interventions on leprosy transmission. However, it is important to note that the analysis is based solely on the provided data, and further analysis, including statistical modeling and consideration of other relevant factors, would be necessary to draw definitive conclusions about leprosy epidemiology in mainland China.

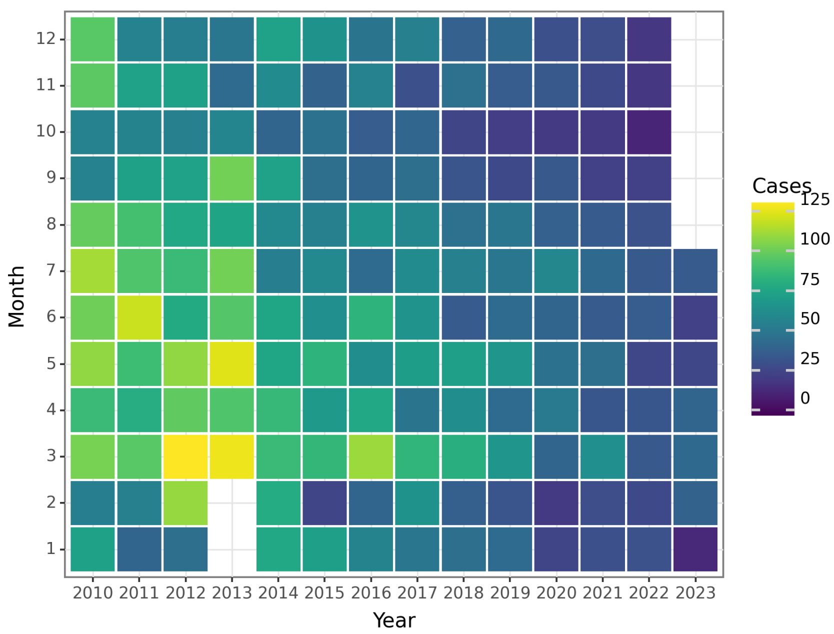

Figure 120: The Change of Leprosy Cases before 2023 July

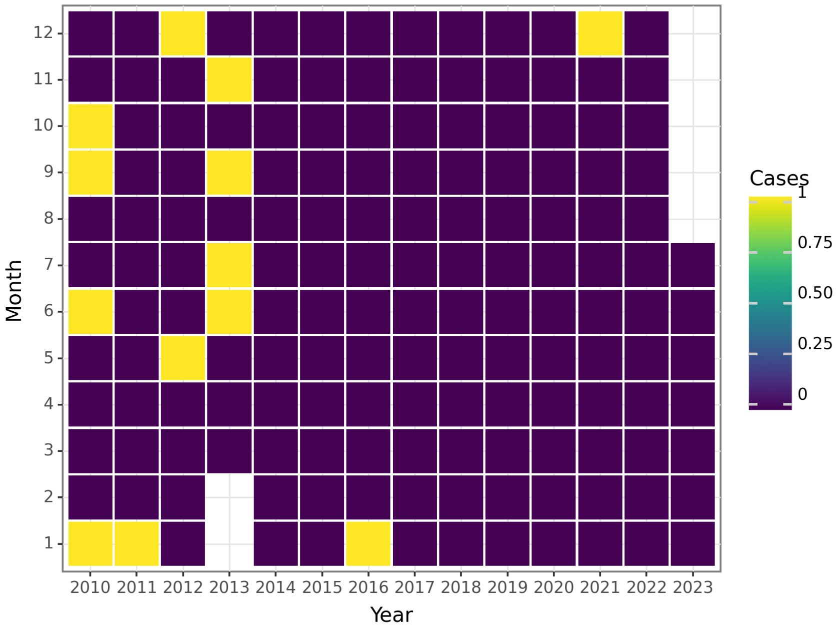

Figure 121: The Change of Leprosy Deaths before 2023 July

Typhus

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

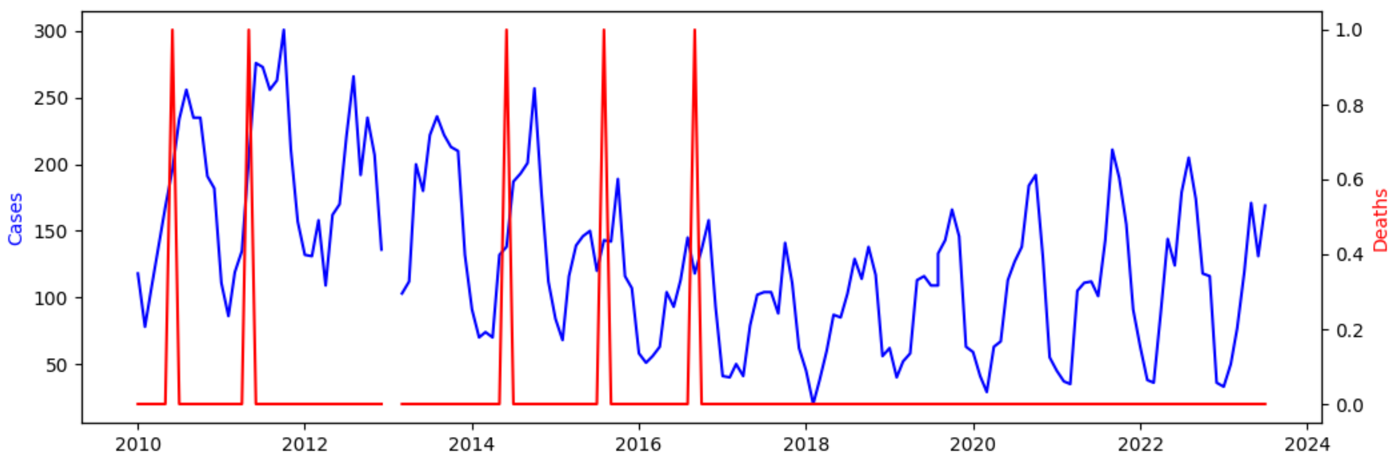

Figure 122: The Change of Typhus Reports before 2023 July

Seasonal Patterns:
The data indicates a clear seasonal pattern in the number of typhus cases in mainland China. Typically, the number of cases is low in the first half of the year and increases in the second half. This pattern remains consistent over multiple years.
Peak and Trough Periods:
The peak period for typhus cases in mainland China usually occurs between July and October, during which the number of cases reaches its highest point. Conversely, the trough period falls between January and April, with the number of cases at its lowest.
Overall Trends:
Upon examining the overall trends, there appears to be a slight increase in the number of typhus cases in mainland China prior to July 2023. Although there are some fluctuations, the number of cases generally remains relatively steady.
Discussion:
The observed seasonal pattern in the number of typhus cases in mainland China, with a peak in the second half of the year, can be attributed to a variety of factors. One possible explanation is the influence of weather conditions, such as higher temperatures and increased rainfall, during the summer months. These conditions may enhance the survival and reproduction of the typhus-causing bacteria or the vectors responsible for transmitting the disease.
Public health authorities must be aware of these seasonal patterns and make appropriate preparations. Heightened surveillance and control measures during the peak period can help mitigate the impact of typhus outbreaks. In addition, educating the general public about preventive measures, such as maintaining good hygiene, using insect repellents, and practicing safe food handling, can aid in reducing the transmission of the disease.
It is important to note that the available data only covers monthly cases and deaths up until July 2023. Therefore, it is crucial to continue monitoring trends and patterns beyond this timeframe to assess the long-term trajectory of typhus in mainland China.

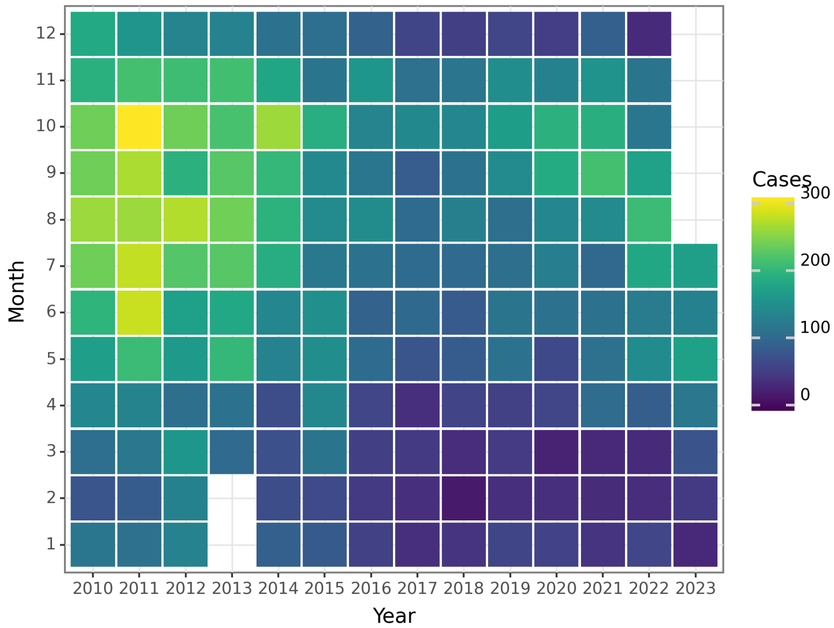

Figure 123: The Change of Typhus Cases before 2023 July

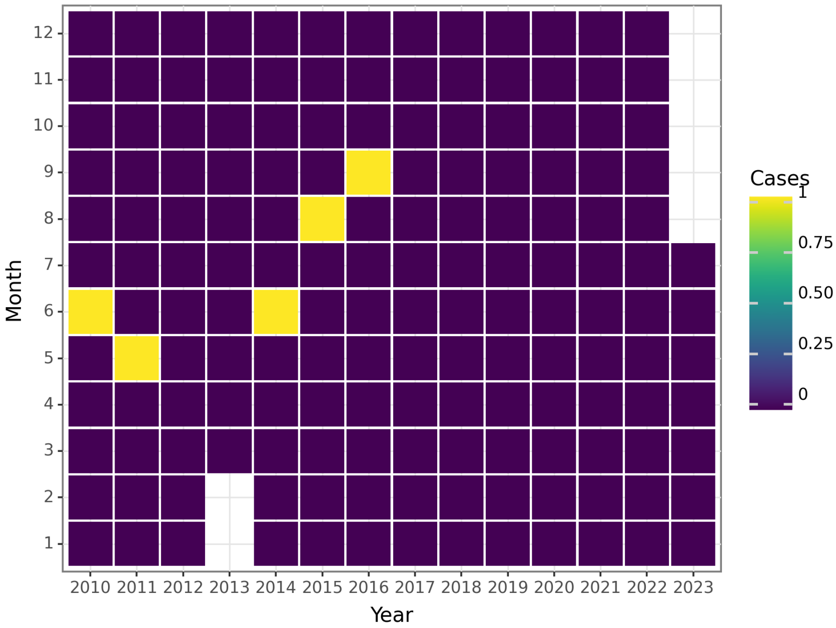

Figure 124: The Change of Typhus Deaths before 2023 July

Kala azar

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

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

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

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

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

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

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

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

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

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

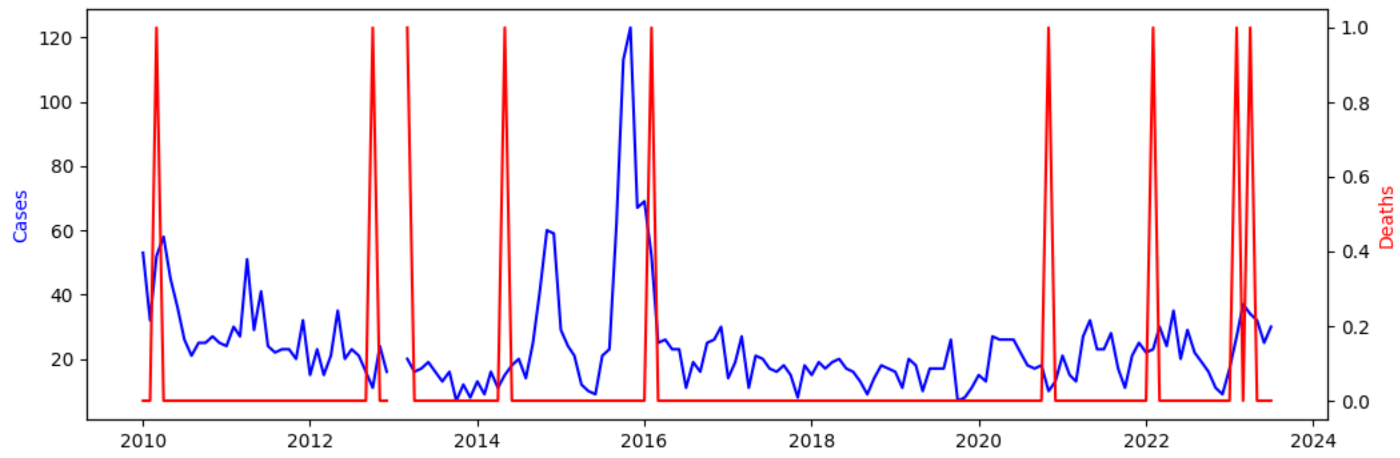

Figure 125: The Change of Kala azar Reports before 2023 July

Seasonal Patterns:
Based on the provided data, there appears to be a distinct seasonal pattern in the number of Kala azar cases in mainland China. The cases tend to be higher from March to October, with a peak in October. From November to February, there is a decrease in cases, reaching the lowest point in January or February. This pattern indicates a seasonal transmission dynamic for Kala azar in mainland China.
Peak and Trough Periods:
The peak periods for Kala azar cases in mainland China occur in October and November, reporting the highest numbers of cases during these months. Conversely, the trough period, representing the lowest number of cases, is usually seen in January or February following the peak period. This cyclic pattern suggests a variation in the incidence of Kala azar cases in mainland China, with a peak during late summer and early autumn and a trough in the winter.
Overall Trends:
Overall, there is a fluctuating trend in the number of Kala azar cases in mainland China. Between 2010 and 2014, there was a general increase in cases, with a peak in 2015. Subsequently, the number of cases gradually decreased until 2017. From 2017 to 2020, there was a relatively stable period with fluctuating but generally lower numbers of cases. Since 2021, there has been an increase in cases, reaching a peak in 2021. However, it is important to note that the provided data only covers until July 2023, making it impossible to determine the overall trend beyond this point.
Discussion:
The observed seasonal patterns and peak periods in the data suggest that Kala azar transmission in mainland China is affected by seasonal factors. This aligns with the known transmission dynamics of the disease, which is primarily spread by sandflies that are more active during warmer months. The higher number of cases from March to October may be attributed to increased sandfly activity, resulting in an elevated risk of infection.
The overall trend in the number of cases displays a fluctuating pattern, with periods of increase followed by periods of decrease. This indicates that the incidence of Kala azar in mainland China is influenced by various factors, such as changes in sandfly populations, environmental conditions, and control measures. The recent increase in cases since 2021 could be a consequence of these factors or changes in surveillance and reporting systems.
It is important to acknowledge that some reported cases in certain months show negative values, which may be due to data entry errors or reporting discrepancies. To ensure accurate analysis, these values should be verified and corrected if necessary. Moreover, having additional data beyond July 2023 would be beneficial for further analyzing the overall trend and assessing the effectiveness of control measures implemented in recent years.
In conclusion, the provided data indicates the presence of seasonal patterns, peak and trough periods, and fluctuations in the number of Kala azar cases in mainland China. To obtain a comprehensive understanding of the epidemiology of Kala azar in the region, further analysis and consideration of

additional data are necessary.

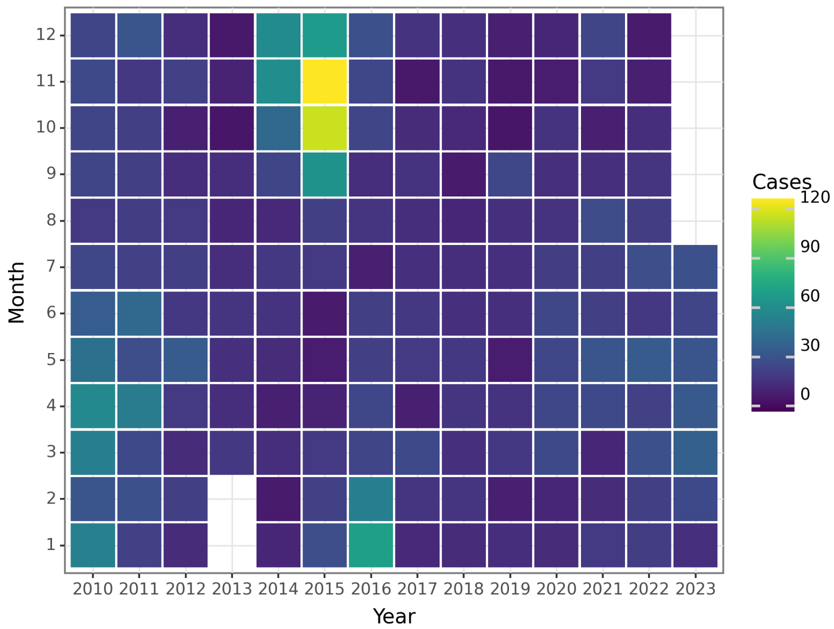

Figure 126: The Change of Kala azar Cases before 2023 July

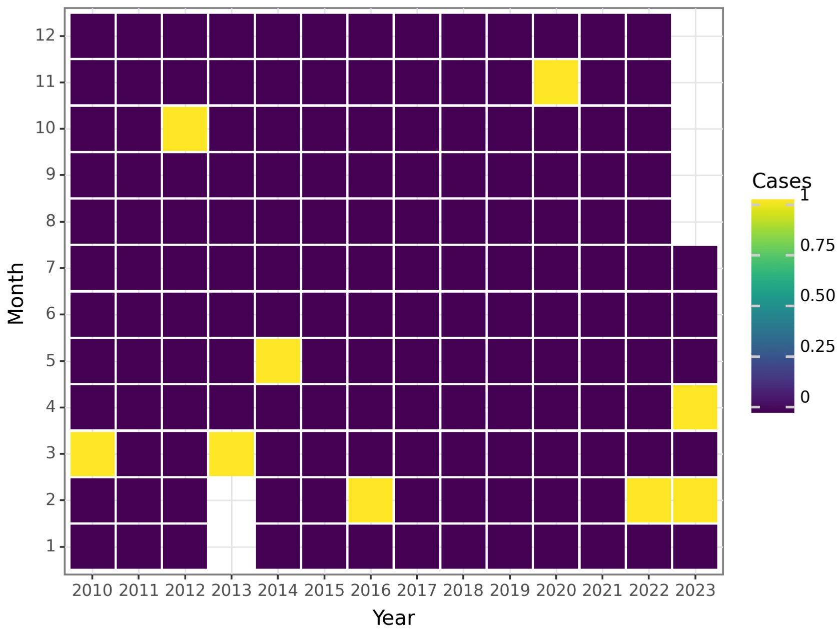

Figure 127: The Change of Kala azar Deaths before 2023 July

Echinococcosis

Echinococcosis, also known as hydatid disease, is a parasitic infection caused by tapeworm larvae belonging to the genus Echinococcus. The two main species responsible for human infections are Echinococcus granulosus and Echinococcus multilocularis. This disease is prevalent in many parts of the world, especially rural areas where livestock farming and dog ownership are common.

Historical Context and Discovery: Echinococcosis has been known to humans for centuries. The first documented case of hydatid cysts in humans was reported in ancient Egypt around 1500 BCE. However, the connection between hydatid cysts and dog tapeworms (the adult form of the Echinococcus parasite) was not established until the late 18th century. The complete life cycle of Echinococcus and its transmission between different hosts were discovered in the late 19th and early 20th centuries.

Prevalence: Echinococcosis is considered a neglected tropical disease and is endemic in many parts of the world, particularly in rural and remote regions. The global prevalence is estimated to be around 2-3 million cases, with 200,000 new cases occurring annually. However, due to underreporting and limited surveillance, the actual number of cases could be much higher.

Transmission Routes: The primary mode of transmission is through the ingestion of parasite eggs shed in the feces of infected dogs or other canids. These eggs contaminate the environment, particularly soil, water, and vegetation. Humans become infected by accidentally ingesting the eggs, usually through consuming contaminated food or water. Ingested eggs release larvae that penetrate the intestinal wall and migrate to various organs, mainly the liver and lungs, where they form cysts.

Affected Populations: Echinococcosis can affect both humans and animals. Certain populations are at higher risk due to specific activities and lifestyle factors. These include livestock farmers and shepherds who have direct contact with infected animals, rural populations in resource-poor settings with limited access to healthcare and sanitation, indigenous communities heavily reliant on subsistence farming or hunting, dog owners or those living in close proximity to infected dogs, and individuals with immunodeficiency or weakened immune systems.

Key Statistics: Echinococcosis is responsible for significant morbidity and mortality worldwide, causing an estimated 50,000 deaths annually with a global disability-adjusted life year (DALY) burden of around 1.2 million. The majority of deaths occur due to complications from cyst rupture, leading to anaphylactic shock or secondary infections.

Risk Factors: Several factors influence the transmission of Echinococcosis, including the presence of infected definitive hosts (dogs, foxes, and coyotes) in the community, poor sanitation and hygiene practices, lack of knowledge about the disease and preventive measures, presence of infected intermediate hosts (livestock, rodents, small mammals) in the environment, and human-animal interactions, particularly close contact with infected animals or handling their feces.

Impact on Regions and Populations: The prevalence of echinococcosis varies across different regions. It is more common in areas where traditional livestock farming is practiced, such as Central Asia, parts of southern Europe, South America, and parts of China. Prevalence can range from 5% to 10% in certain communities in these regions. In contrast, the disease is relatively rare in developed countries with efficient control programs and improved healthcare infrastructure.

Echinococcosis can have a significant economic impact in affected regions. The disease affects livestock productivity and can lead to significant economic losses in the agricultural sector. It also has a profound impact on affected individuals and their families due to the high cost of diagnosis, treatment, and potential surgical interventions.

In conclusion, Echinococcosis is a global health concern, particularly in rural and resource-limited settings. Understanding its epidemiology, transmission routes, affected populations, and risk factors is crucial for the development of effective prevention and control measures to reduce the burden of this parasitic infection.

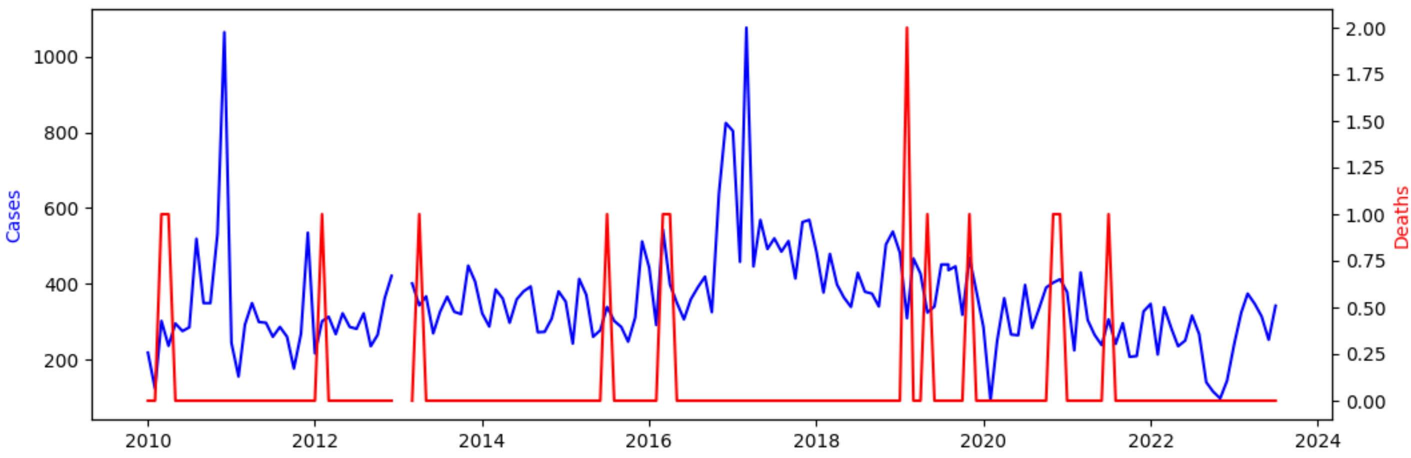

Figure 128: The Change of Echinococcosis Reports before 2023 July

Seasonal Patterns: Based on the provided data, there seems to be a recognizable seasonal pattern for cases of Echinococcosis in mainland China. The occurrences of cases tend to rise during the months of October to December, reach their peak during the winter months, and then decrease from March to May. This pattern suggests a potential association with colder weather.
Peak and Trough Periods: The peak period for Echinococcosis cases in mainland China is typically observed from October to December, with the highest number of cases occurring during this time. Conversely, the trough period, which is characterized by the lowest number of cases, is observed from March to May.
Overall Trends: Overall, there has been a consistent upward trend in Echinococcosis cases in mainland China. The number of cases gradually increased from 2010 to 2013, remained relatively stable from 2014 to 2017, and then exhibited another gradual increase from 2018 to 2023. However, it should be noted that there was a slight decrease in cases in both 2013 and 2022, which may be attributed to data inconsistencies or issues with reporting.
Discussion: The observed seasonal pattern of Echinococcosis cases in mainland China, with peaks during the winter months and troughs during the spring months, aligns with the life cycle of the Echinococcus parasite. This parasite has a complex life cycle involving both intermediate and definitive hosts and is primarily transmitted through the ingestion of contaminated food or water. Cold weather may influence the survival and transmission of the parasite, resulting in higher infection rates during the winter months.
The increasing trend in Echinococcosis cases over the years could be attributed to several factors, including improvements in disease surveillance and reporting, increased awareness and testing, changes in human behavior or demographics, and environmental factors. Further analysis and investigation are necessary to ascertain the specific factors contributing to the observed trends and to develop targeted interventions for disease prevention and control.

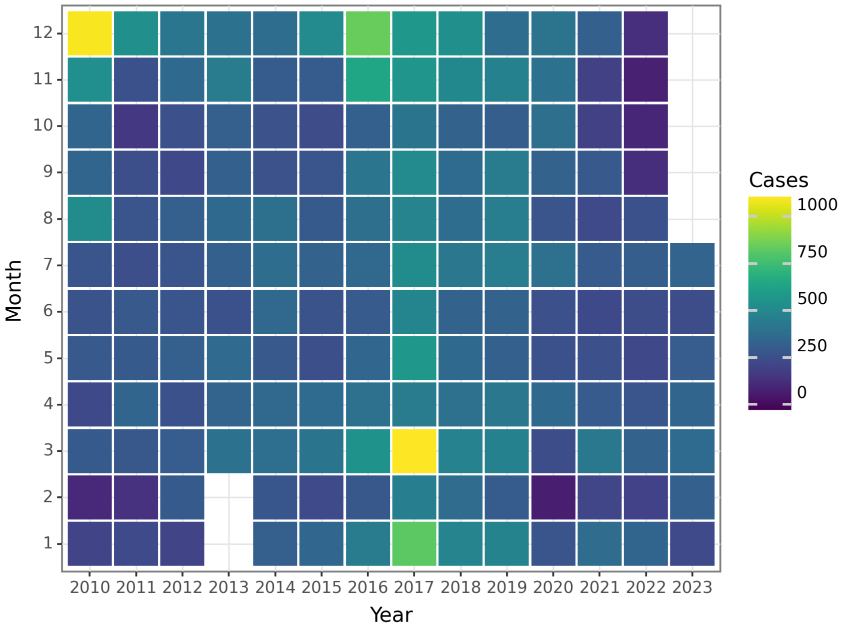

Figure 129: The Change of Echinococcosis Cases before 2023 July

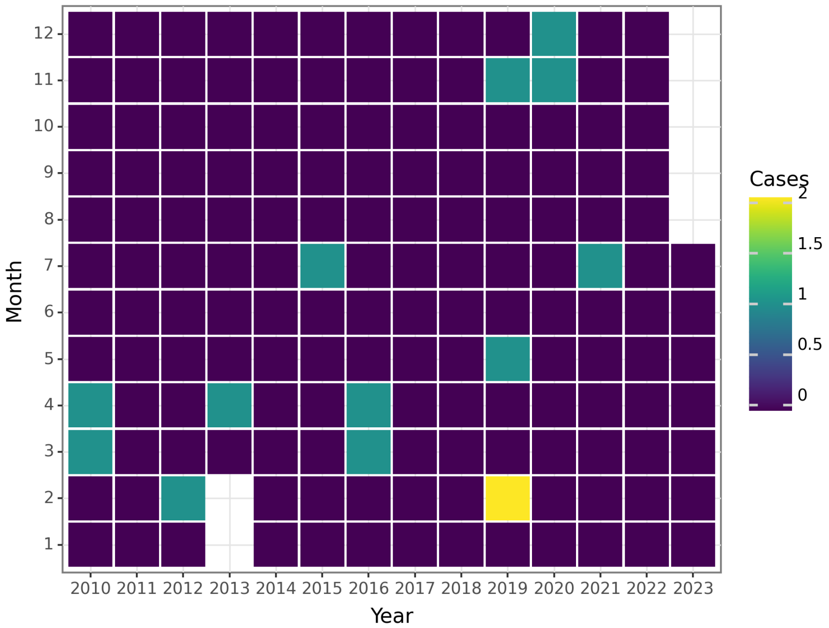

Figure 130: The Change of Echinococcosis Deaths before 2023 July

Filariasis

Filariasis, also known as lymphatic filariasis, is a parasitic disease caused by thread-like nematode worms from the Filarioidea family. It is prevalent in tropical and subtropical regions, predominantly affecting populations in Africa, Asia, the Western Pacific, and parts of the Americas. This disease is characterized by the blockage of lymphatic vessels, leading to severe swelling and fluid accumulation in various parts of the body, such as the limbs, breasts, or genitals.

Historical Context and Discovery: Filariasis has been recognized for centuries, with historical evidence dating back to ancient Egyptian and Indian texts. The disease was described in medical literature by the ancient Greek physician Hippocrates. In the late 19th century, Sir Patrick Manson, a Scottish physician, elucidated the lifecycle of the causative parasite and established the connection between mosquito bites and filarial transmission. His discovery was a significant milestone in understanding the epidemiology and control of the disease.

Transmission Routes: Filariasis is primarily transmitted through the bite of infected mosquitoes. Mosquitoes act as vectors, carrying the infective larvae of filarial worms and transmitting them to humans during blood feeding. The larvae develop into adult worms, which then reside in the lymphatic vessels. The most common mosquito species involved in transmission vary by region but include Anopheles, Culex, and Aedes mosquitoes.

Affected Populations: Filariasis affects an estimated 120 million people worldwide, with approximately 40 million living with chronic manifestations of the disease. Sub-Saharan Africa, India, Southeast Asia, and the Western Pacific regions bear the greatest burden of filarial infections. It predominantly affects impoverished communities with limited access to healthcare, clean water, and sanitation facilities. Both rural and urban populations can be affected.

Key Statistics: - Around 1.4 billion people live in areas with a risk of filarial transmission. - As of 2019, 5.6 billion treatments have been provided to prevent or treat the disease. - Over 900 million people have been examined for filariasis as part of ongoing control programs. - An estimated 25% of the total global burden of filarial disease occurs in India. - The disease causes more than 1.4 million disability-adjusted life years (DALYs) annually.

Major Risk Factors: Several risk factors contribute to the transmission of filariasis, including: 1. Presence of the parasite in local mosquito populations. 2. Regular exposure to mosquito bites due to outdoor occupations or living conditions. 3. Poor sanitation and inadequate waste management leading to mosquito breeding. 4. Poverty and limited access to healthcare, preventing early diagnosis and treatment. 5. Human migration and movement facilitate the spread of the disease.

Impact on Different Regions and Populations: The prevalence of filariasis varies across regions. In areas with high transmission rates, prevalence rates can exceed 50%. In some endemic regions, the disease is endemic in remote rural areas but absent from urban areas, while in other regions, both urban and rural populations are affected. More specifically: 1. Africa: Sub-Saharan Africa has the highest number of infected individuals, accounting for over 40% of the global burden. Large-scale control programs have made significant progress in reducing transmission and the number of cases. 2. India: India has the highest burden of filarial infections globally, accounting for approximately 40% of all cases. Multiple states in India are endemic for the disease, with the highest prevalence in rural areas. 3. Southeast Asia: Several countries in Southeast Asia, including Indonesia, Myanmar, and Cambodia, have a significant burden of filariasis. The disease affects both rural and urban populations, with transmission occurring mainly through Anopheles mosquitoes. 4. Western Pacific: Pacific Islands, such as Papua New Guinea and the Solomon Islands, have a high prevalence of filariasis, primarily transmitted by Anopheles and Aedes mosquitoes.

In conclusion, filariasis is a parasitic disease with a substantial impact on global health. Its transmission occurs through mosquito bites in tropical and subtropical regions. While significant progress has been made in controlling the disease through mass drug administration and mosquito control measures, efforts to further reduce its prevalence and impact on affected populations remain ongoing.

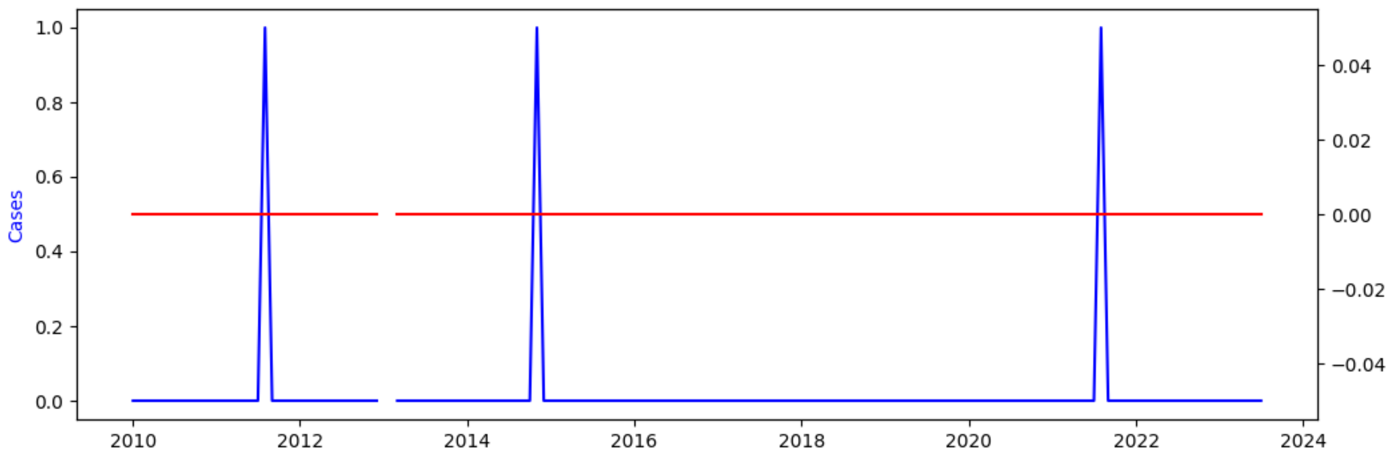

Figure 131: The Change of Filariasis Reports before 2023 July

Seasonal Patterns:
The data provided does not indicate any clear seasonal pattern for Filariasis cases and deaths in mainland China before July 2023. Throughout the years, the number of cases and deaths remains consistently low, with no noticeable fluctuations or patterns on a monthly basis.
Peak and Trough Periods:
Due to the absence of significant fluctuations or patterns in the data, it is not possible to identify specific peak or trough periods for Filariasis cases and deaths in mainland China before July 2023.
Overall Trends:
The data consistently demonstrates a low number of Filariasis cases and deaths in mainland China before July 2023. There are no significant increases or decreases in the number of cases and deaths during this time period.
Discussion:
The data suggests that Filariasis is not a major public health concern in mainland China before July 2023, as the number of cases and deaths remain consistently low. This may be attributed to effective control measures, including vector control, mass drug administration, and health education campaigns, which have aided in minimizing disease transmission.
It is crucial to continue monitoring Filariasis in mainland China to ensure that the low prevalence and absence of seasonal patterns observed in this data persist in the future. Maintaining surveillance and control efforts will be vital in preventing any potential resurgence or disease outbreaks.
It should be emphasized that the analysis provided is based solely on the data available. Further analysis and interpretation may be necessary to fully comprehend the epidemiological patterns and trends of Filariasis in mainland China.

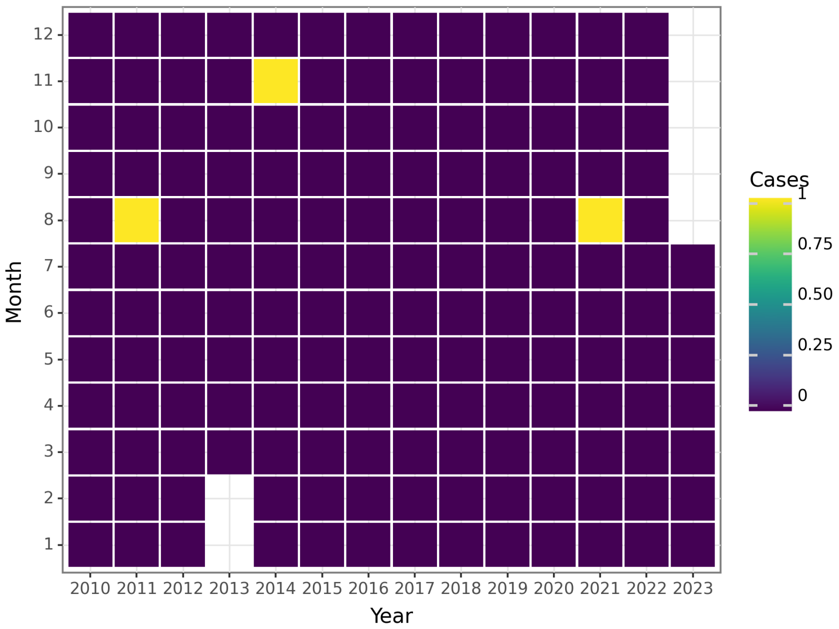

Figure 132: The Change of Filariasis Cases before 2023 July

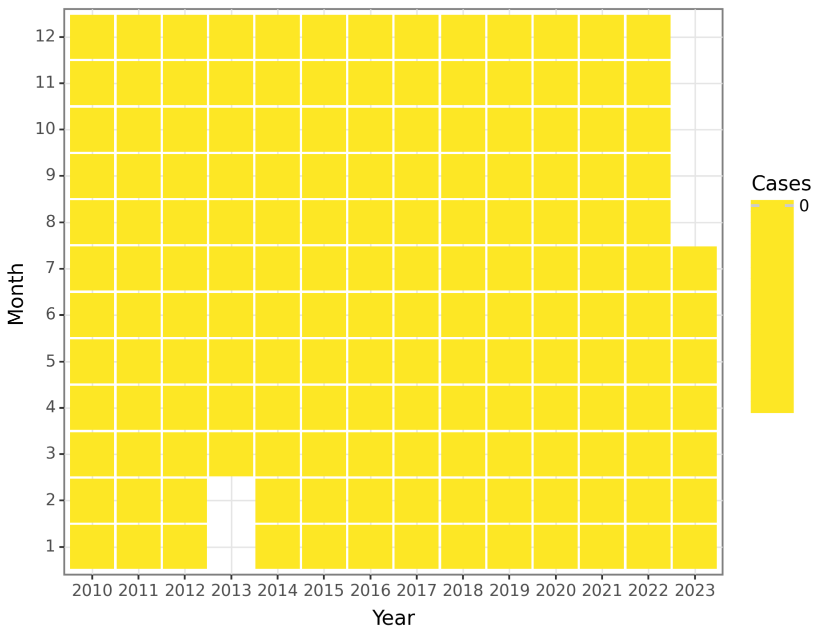

Figure 133: The Change of Filariasis Deaths before 2023 July

Infectious diarrhea

Infectious diarrhea is a condition characterized by inflammation of the gastrointestinal tract, often caused by infection with various microorganisms including bacteria, viruses, and parasites. It is a major global health concern, especially in low- and middle-income countries. This overview aims to provide a comprehensive understanding of the epidemiology of infectious diarrhea, encompassing global prevalence, transmission routes, affected populations, key statistics, historical context, discovery, risk factors, and regional and demographic variations in impact.

Global Prevalence: Infectious diarrhea is a highly prevalent illness worldwide, affecting millions of people annually. According to the World Health Organization (WHO), there are approximately 1.7 billion cases of diarrhea each year, leading to over 525,000 deaths, with the majority occurring among children under 5 years old. The burden of infectious diarrhea is disproportionately high in developing countries due to poor sanitation, limited access to clean water, and inadequate healthcare resources.

Transmission Routes: Infectious diarrhea can be transmitted through various routes, including:

1. Fecal-oral route: This is the most common mode of transmission, where infection is passed from person to person through contaminated food, water, or hands. 2. Contaminated food and water: Consuming food or water contaminated with infectious agents such as bacteria (e.g., Salmonella, Campylobacter, Escherichia coli), viruses (e.g., norovirus, rotavirus), and parasites (e.g., Giardia, Cryptosporidium) can cause diarrhea. 3. Person-to-person contact: Direct contact with an infected individual or indirect contact with contaminated surfaces can lead to transmission. 4. Poor hygiene practices: Inadequate handwashing, improper feces disposal, and unsanitary conditions contribute to the spread of infections.

Affected Populations and Key Statistics: Infectious diarrhea can affect individuals of all ages, but certain populations are at higher risk, including:

1. Children: Children, especially those under 5 years old, are particularly vulnerable to infectious diarrhea due to their immature immune systems, poor hygiene practices, and increased exposure in childcare settings. 2. Elderly: Older adults, particularly those in long-term care facilities, are susceptible to severe complications from infectious diarrhea due to compromised immune systems and underlying health conditions. 3. Travelers: Travelers, especially those visiting areas with poor sanitation infrastructure, are at increased risk of acquiring infectious diarrhea from contaminated food or water. 4. Immunocompromised individuals: People with weakened immune systems, such as those with HIV/AIDS, organ transplant recipients, and individuals undergoing chemotherapy, are more susceptible to severe and prolonged infectious diarrhea.

Historical Context and Discovery: Diarrhea has long been recognized as a common health issue throughout history. Early civilizations, including ancient Egyptians, Greeks, and Romans, documented the presence of diarrheal diseases. However, understanding of infectious diarrhea and its causative agents significantly developed in the late 19th and 20th centuries. Key discoveries included identifying specific microorganisms such as bacteria and viruses as causative agents and understanding their modes of transmission.

Risk Factors for Transmission: Several risk factors contribute to the transmission of infectious diarrhea, including:

1. Poor sanitation: Lack of access to clean water, sanitation facilities, and proper sewage disposal increases the risk of contamination. 2. Contaminated food and water sources: Consuming unpasteurized dairy products, undercooked meat, contaminated vegetables, and drinking untreated water can introduce infectious agents. 3. Crowded living conditions: Overcrowded households, institutions, and communities facilitate the spread of infections through close contact. 4. Lack of hygiene practices: Inadequate handwashing, improper food handling, and poor personal hygiene increase the risk of contamination. 5. Low socioeconomic status: Poverty, limited healthcare access, and malnutrition contribute to the overall burden of infectious diarrhea in low-resource settings.

Impact on Different Regions and Populations: The impact of infectious diarrhea varies across regions, with higher prevalence rates observed in low- and middle-income countries with limited resources and inadequate sanitation infrastructure. Sub-Saharan Africa and Southeast Asia bear a significant burden of infectious diarrhea, accounting for a large proportion of cases and deaths. Within these regions, children under 5 years old, particularly those living in poverty and rural areas, experience the highest morbidity and mortality rates.

In high-income countries with better access to clean water and sanitation facilities, the prevalence of infectious diarrhea is lower. However, certain populations within these regions, such as elderly individuals in long-term care facilities or immunocompromised individuals, remain at increased risk of severe

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

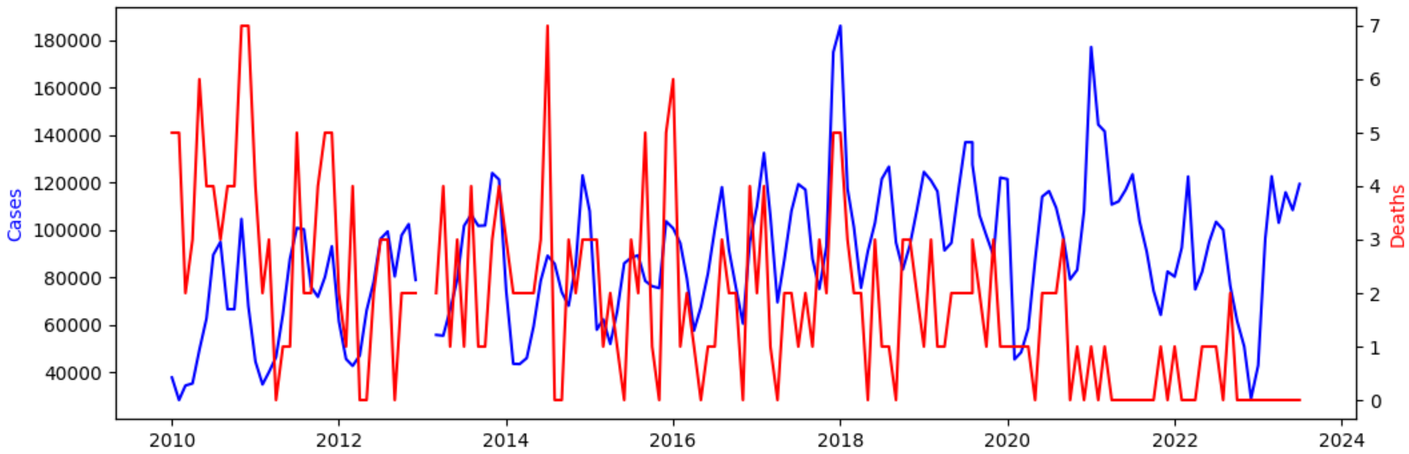

Figure 134: The Change of Infectious diarrhea Reports before 2023 July

Seasonal Patterns in the Incidence of Infectious Diarrhea in Mainland China
The provided data indicates a distinct seasonal pattern in the number of cases of infectious diarrhea in mainland China. The prevalence of cases tends to reach its peak during the summer months, namely June, July, and August, and decline during the winter months of December, January, and February. This observation suggests a potential correlation between the occurrence of infectious diarrhea and warmer temperatures.
Peak and Trough Periods of Infectious Diarrhea Cases in Mainland China
Typically, the occurrence of infectious diarrhea cases is highest during the summer months in mainland China, specifically in June, July, and August. These months consistently present the highest reported number of cases. Conversely, the trough periods, characterized by relatively low case numbers, are observed in the winter months, particularly in December, January, and February.
Overall Trends of Infectious Diarrhea Cases in Mainland China
An examination of the overall trends of infectious diarrhea cases in mainland China reveals a noticeable fluctuation pattern. The number of cases tends to rise and peak during the summer months, followed by a decline in the winter months. However, it is important to acknowledge that there are variations in the case numbers from year to year.
Discussion: Association with International Observations and Factors Influencing Seasonal Patterns
The seasonal patterns observed in the incidence of infectious diarrhea cases in mainland China align with frequently observed patterns in many other countries. The higher occurrence of cases during the summer months can be attributed to several contributing factors, including increased travel, changes in food consumption habits, and elevated temperatures that facilitate the growth and transmission of infectious agents.
Implications for Public Health Authorities
Public health authorities need to be cognizant of these seasonal patterns in order to allocate resources effectively and implement preventive measures. These measures may include promoting hand hygiene, safe food handling practices, and appropriate sanitation measures during peak periods. Additionally, understanding these patterns can assist in informing the development and distribution of vaccines and

other interventions to target the specific times of the year when cases are most likely to occur.

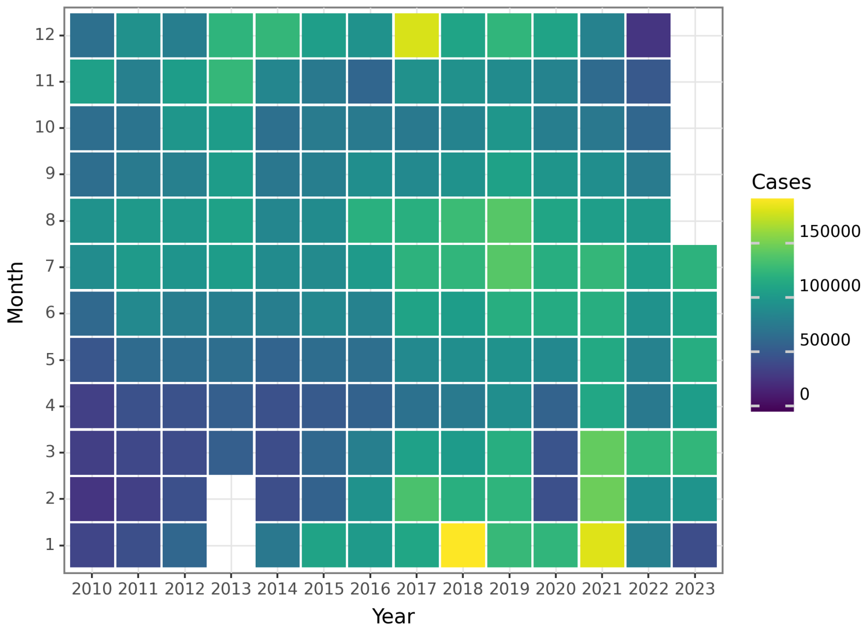

Figure 135: The Change of Infectious diarrhea Cases before 2023 July

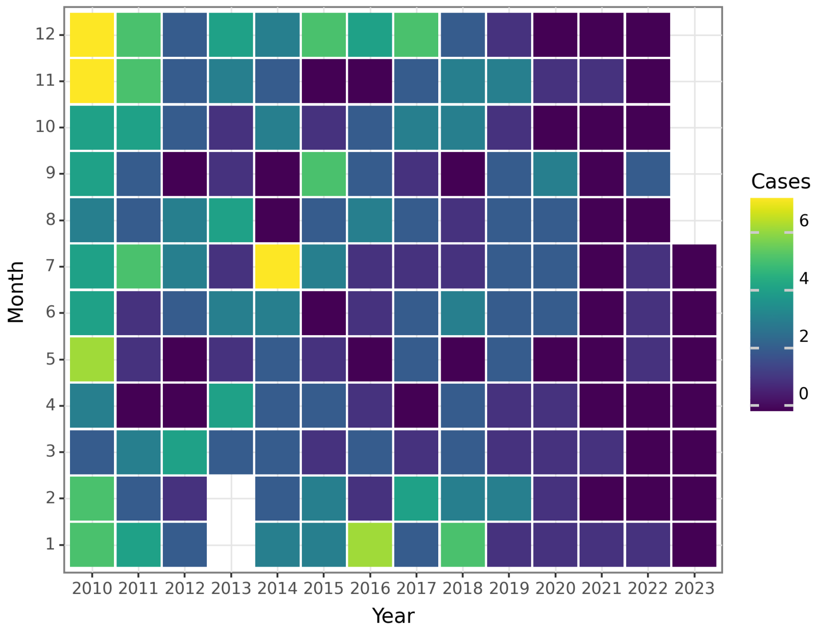

Figure 136: The Change of Infectious diarrhea Deaths before 2023 July

Hand foot and mouth disease

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

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

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

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

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

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

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

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

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

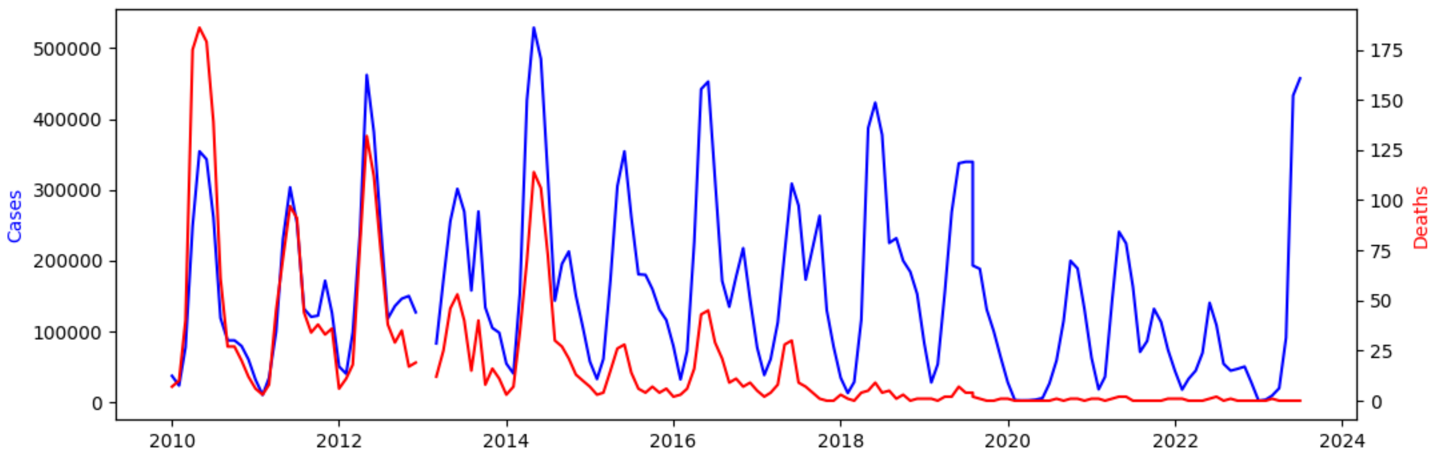

Figure 137: The Change of Hand foot and mouth disease Reports before 2023 July

Seasonal Patterns: Based on the data provided, cases of Hand-foot-and-mouth disease in mainland China exhibit a distinct seasonal pattern. The incidence of cases is highest during the summer months and lowest during the winter months. This pattern remains consistent throughout the years analyzed.
Peak and Trough Periods: The peak periods for Hand-foot-and-mouth disease cases in mainland China occur between May and July, with the highest number of cases reported during this time. Conversely, the trough periods occur between December and February, with the lowest number of cases reported.
Overall Trends: In general, there appears to be an upward trend in Hand-foot-and-mouth disease cases in mainland China over the years. The number of cases steadily increased from 2010 to around 2014, remained relatively high until 2016, and then began to gradually decline. However, it is important to note that there was a significant increase in cases in 2019 and 2020, likely due to the COVID-19 pandemic and its impact on healthcare services and reporting.
Discussion: Hand-foot-and-mouth disease is a prevalent viral illness, particularly affecting young children. The observed seasonal pattern in mainland China aligns with previous studies conducted in other regions. The increased incidence during the summer months can be attributed to various factors, including more time spent outdoors, higher transmission rates in crowded places like schools and daycare centers, and favorable weather conditions for the survival and spread of the virus.
It is noteworthy that the spike in cases in 2019 and 2020, following a period of declining cases, may be influenced by several factors such as changes in reporting methods, increased awareness and testing, or the impact of the COVID-19 pandemic on healthcare-seeking behavior. Further analysis and investigation are necessary to comprehend the underlying factors contributing to these trends.
Overall, this analysis offers valuable insights into the seasonal patterns, peak and trough periods, and overall trends of Hand-foot-and-mouth disease cases in mainland China. This information can aid in the development of targeted prevention and control strategies to mitigate the impact of this disease on public health.

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

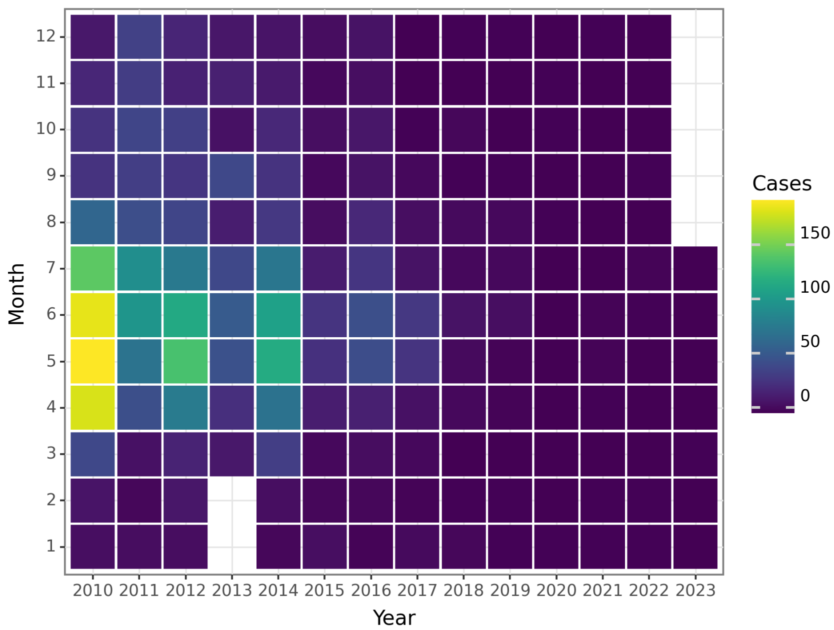

Figure 139: The Change of Hand foot and mouth disease Deaths before 2023 July