



**衛生防護中心**  
Centre for Health Protection

**Scientific Committee on Enteric Infections  
and Foodborne Diseases**

**Situation of Enteric Infection  
and Foodborne Diseases in Hong Kong  
(2012 - 2021)**

**Purpose**

The purpose of this paper is to provide an update to members of the Scientific Committee of Enteric Infections and Foodborne Diseases (SCEIFD) about the situation of enteric infections under active surveillance in Hong Kong by the Centre for Health Protection (CHP) of the Department of Health (DH) for the past decade from January 2012 to December 2021.

**Introduction**

2. The CHP has been conducting surveillance on gastrointestinal infections and other foodborne diseases, with a view to closely monitoring disease trends and their burden. Through different surveillance systems, CHP also identifies disease outbreaks in both community and institutional and/or hospital settings, which are followed by timely investigation and implementation of outbreak prevention and control measures as appropriate.



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and control

3. In accordance with the Prevention and Control of Disease Ordinance (Cap. 599), there are 53 statutorily notifiable infectious diseases at present, and all registered medical practitioners are required to notify the CHP all suspected/ confirmed cases of such diseases. These include 11 enteric infections/ diseases, namely amoebic dysentery, bacillary dysentery, botulism, cholera, enterovirus 71 infection, food poisoning, listeriosis, paratyphoid fever, shiga toxin-producing *Escherichia coli* infection, typhoid fever and viral hepatitis.

4. Apart from statutorily notifiable diseases, the CHP also advises medical practitioners to report other diseases that are of topical public health concern (cryptosporidiosis is an example under such context), and encourages institutions (including but not limited to schools and residential care homes) to report clusters of suspected or confirmed acute gastroenteritis as well as hand, food and mouth disease.

### **Review of surveillance data between 2012 and 2021**

*(For details of the figures and table, please refer to annex below.)*

#### **I. Amoebic dysentery (AD)**

5. From 2012 to 2021, the CHP has recorded 78 cases of AD. The incidence of AD remained low in the past 10 years, with annual number of cases ranging from 3 to 15 (median=8) (Figure 1).

6. Majority of these were local cases (n=57, 73.1%), whilst 11 others were imported (14.1%) and 10 (12.8%) with undetermined/ unknown importation status.

7. Among the 78 cases, there were 67 male (85.9%) and 11 female (14.1%). The age of the cases ranged from 5 to 76 years (median=48 years). More than half (62.8%) were admitted to hospital. One fatal case was recorded in 2020, involving a 53-year old man with good past health. No clustering of cases was identified.

## II. Bacillary dysentery (BD)

8. For the past ten years, the CHP has recorded 406 cases of BD. The annual number of cases between 2012 and 2021 ranged from 15 to 66 (median=41.5) (Figure 2). The incidence has decreased since the COVID-19 pandemic started in 2020, from an average of 47 cases per year in 2012-2019, to an average of 16 per year in 2020-2021.

9. Over half of the cases were local cases (n=231, 56.9%), with 36.5% (n=148) being imported. The remaining cases were with unknown or unclassified importation status (n=27, 6.7%).

10. Among the 406 cases, 198 (48.8%) were male and 208 (51.2%) were female. The age of the cases ranged from 1 to 91 years (median=30 years). No fatal case has been recorded.

## III. Botulism

11. Botulism has been made notifiable since July 2008. From 2012 to 2021, the CHP has recorded 22 probable cases (Figure 3). Over half of the cases (n=15, 68.2%) were imported. No fatal case has been recorded.

12. All 22 cases were classified as iatrogenic botulism, for whom botulinum toxin was injected for cosmetic reasons<sup>1</sup>. No case of foodborne botulism has been recorded in Hong Kong so far. No clustering of cases was identified.

## IV. Cholera

13. From 2012 to 2021, the CHP has recorded 11 cases of cholera. The annual number of cases ranged from 0 to 3 (Figure 4).

14. Majority of the cases were imported (n=8, 72.7%), with cases coming from India (n=4), Bangladesh (n=1), Malaysia (n=1), Myanmar (n=1) and Pakistan (n=1). Two epidemiologically linked local cases were reported in

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<sup>1</sup> Centers for Disease Control and Prevention. Kinds of Botulism. Available from: <https://www.cdc.gov/botulism/definition.html#:~:text=iatrogenic%20botulism%20can%20happen%20if,such%20as%20for%20migraine%20headaches>. Accessed on 30 November 2022.

2013 involving a mother and her son living in the same household. One case remained unclassified.

15. Among the 11 cases, there were seven (63.6%) male and four (36.4%) female, with age ranging from 25 to 62 years (median=47). No fatal cases have been recorded.

## V. Cryptosporidiosis

16. Cryptosporidiosis is not a notifiable disease in Hong Kong, but it is one of the communicable diseases of topical public health concern and medical practitioners are encouraged to report suspected or confirmed cases to CHP for investigation. Data on cryptosporidiosis has been made available since 2005.

17. From January 2012 to December 2021, the CHP has recorded 59 cases of cryptosporidiosis. The annual number of cases between 2012 and 2021 ranged from 1 to 15 (median=6) (Figure 5).

18. Among them, 30 cases (50.8%) were male while 29 (49.2%) were female. Their age ranged from 8 to 57 years (median=32 years).

19. Most of the cases (n=40, 67.8%) acquired the disease locally. For the remaining cases, eight of them (13.6%) were imported and two (3.4%) remained unknown as patients could not be contacted. The importation status of nine cases (15.3%) could not be ascertained as they had stayed both locally and overseas during the incubation period.

20. Fifty three cases (89.8%) required hospitalisation; two patients died of other underlying diseases unrelated to cryptosporidiosis. Among the 59 cases recorded, 16 cases (27.1%) were HIV carriers.

21. The annual number of cases showed an increasing trend from 2012 to 2019 (Figure 5). There is no epidemiological linkage and common exposure among the cases identified upon extensive investigations by the CHP. This might be the result of increased diagnosis due to wider use of the high sensitivity

GE 5 panel PCR test for *Cryptosporidium* in private hospitals which had actually reported the majority of cases. The number of cases has decreased during the COVID-19 pandemic in 2020 and 2021.

## **VI. Enterovirus 71 infection (EV71)**

22. Following an increase of EV71 infection in Hong Kong in 2008 with potentially serious complications, EV71 was included in the list of statutorily notifiable infectious diseases in March 2009 to ensure prompt implementation of effective public health preventive and control measures.

23. From 2012 to 2021, CHP recorded a total of 351 cases of EV71 infection with annual number of cases ranged from 0 to 68 (median=38) (Figure 6). Over half of the cases (220, 62.7%) occurred in the summer months from May to August.

24. Out of the 351 cases, majority of them were local cases (n=272, 77.5%). Among the remaining cases, 61 (17.4%) were imported cases, while 18 (5.1%) cases had unknown or undetermined importation status.

25. The 351 cases involved 208 (59.3%) male and 143 (40.7%) female, with age ranging from 9 days to 50 years (median=4 years). Thirty-two cases (9.1%) developed severe complications (e.g. encephalitis, meningitis, meningoencephalitis, acute flaccid paralysis, and radiculomyelitis). One fatal case involving a 2-year-old female was recorded in 2014.

## **VII. Food poisoning**

26. From January 2012 to December 2021, the CHP recorded 2,421 food poisoning cases/ outbreaks, affecting a total of 9,763 persons, of whom 591 (6.1%) were hospitalised. Majority of the cases (81.9%) involved less than five persons. The number of persons affected ranged from 1 to 149 (median = 3). From 2012 to 2021, the annual number of persons affected showed a descending trend while the annual number of cases remained similar ranging from 173 to 378 (Figure 7). More than one third of the outbreaks (39.0%) occurred from May to August.

27. Among the 2,421 cases, causative agent(s) could be confirmed in 786 (32%) of them (Table 1). The majority of food poisoning cases could not be confirmed as no food remnant or sample was available for laboratory investigation.

28. Two large food poisoning outbreaks occurred in 2015 and 2016, affecting 120 and 149 persons respectively. Both outbreaks occurred in primary schools with *Clostridium perfringens* found to be the causative agent.

### **VIII. Listeriosis**

29. Listeriosis has become a statutorily notifiable disease since July 2008. From January 2012 to December 2021, CHP recorded a total of 203 cases. Between 2012 and 2021, the annual number of cases ranged from 14 to 26 cases (Figure 8). Among 203 cases, 179 (88%) and 5 (3%) were local and imported cases respectively; the importation status for the remaining 19 (9%) cases remained unclassified.

30. Among the 203 cases, 69 (34%) were male and 134 (66%) were female. Their ages ranged from 0 to 95 years with a median of 61 years. Patients aged 65 or above constituted a majority (n=91, 44.8%) of all cases.

31. A significant proportion of cases were pregnancy-related (n=41, 20.2%), affecting either the pregnant mother or the neonate.

32. There were a total of 17 fatal cases due to listeriosis, giving a case fatality rate of 8.4%. Among the 17 deceased patients, 15 patients (88%) had at least one chronic medical condition, two (11.8%) were pregnancy-related and both were neonates.

### **IX. Paratyphoid fever**

33. The total number of cases recorded by the CHP from 2012 to 2021 was 140 cases. There was a general downward trend since 2012, with annual

number of cases ranging from 3 to 26 (median=11) (Figure 9).

34. For cases recorded between January 2012 and December 2021, 57 were male (41%) and 83 were female (59%), and their ages ranged from 2 to 85 years with median of 32 years. People aged 20 to 39 years accounted for 41% of all cases. There were no fatal cases recorded.

35. A significant proportion of cases (n=50, 36%) were classified as imported cases. The three most notable places of origin were India, Indonesia and Cambodia, accounting for 30%, 24% and 14% of all imported cases respectively.

#### **X. Severe paediatric enterovirus infection (other than EV71 and poliovirus)**

36. Apart from EV71, enhanced surveillance has been conducted to track the trends of severe infections due to other enteroviruses. In 2010, “severe paediatric enterovirus infection (other than EV71 and poliovirus)” was added as one of the “other communicable diseases of topical public health concern”. Medical practitioners are requested to report paediatric patients who have severe complication(s) with laboratory confirmation of enterovirus infection to CHP for prompt epidemiological investigation and control.

37. From 2012 to 2021, the CHP recorded a total of 86 cases of severe enterovirus infections (SE) other than EV71 and poliovirus with annual number of cases ranging from 0 to 21 (median= 8) (Figure 10). The number of cases has decreased drastically during the COVID-19 pandemic since 2020. Over half (53, 61.6%) of the cases occurred in the summer months from June to August.

38. Among the 86 SE cases, over half (n=54, 62.8%) were local cases. For the remaining cases, 25 cases (29.1%) were imported while seven cases’ (8.1%) importation status remained unknown or undetermined.

39. The 86 SE cases involved 50 male and 36 female, with age ranging from 6 days to 11 years (median= 3 months). The majority of patients were

complicated with meningitis (66 cases, 76.7%), and the others with encephalitis, meningoencephalitis, transverse myelitis, cerebellar ataxia, febrile convulsion, myocarditis, pneumonia and meningoencephalitis septic shock.

40. Two fatal cases, involving a 9-month-old boy and a 4-year-old boy, were recorded in 2012.

## **XI. Shiga toxin-producing *Escherichia coli* infection (STEC)**

41. *Escherichia coli* O157:H7 infection became a statutorily notifiable disease in July 2008. Subsequent to the severe outbreak of non-O157 STEC in Germany, CHP broadened the surveillance to include all STEC infections since June 2011.

42. From 2012 to 2021, the CHP has recorded 32 cases of STEC infections. The annual number of cases ranged from 0 to 8 (Figure 11). No fatal cases have been recorded.

43. Most of the cases (n=25, 78.1%) acquired the disease locally, while seven (21.9%) were imported. Among the 32 cases, there were 19 (59.4%) male and 13 (40.6%) female, with age ranging from 16 days to 80 years (median=3 years). All reported cases were sporadic.

## **XII. Typhoid fever**

44. From 2012 to 2021, the CHP has recorded a total of 214 cases. The annual number of cases showed a general downward trend in the past 10 years, with annual number of cases ranging from 10 to 33 (median=21) (Figure 12). The average incidence rate was 0.29 cases per 100 000 population per year, which is considered to be low by the WHO's classification<sup>2</sup>.

45. Among the 214 cases, there were 87 male (41%) and 127 female (59%), and their ages ranged from 2 to 94 years with a median of 29 years, 44% were people aged 15 to 34 years (Figure 13).

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<sup>2</sup> Crump JA, Luby SP, Mintz ED. The global burden of typhoid fever. Bull World Health Organ. May 2004;82(5):346-353



46. A significant proportion of cases (n=79, 37%) were classified as imported. The proportion has increased from 28% in 2012 to 60% in 2019, until the COVID-19 pandemic began in early 2020. The three most notable places of origin were India, Indonesia and Pakistan, accounting for 39%, 19% and 16% of all imported cases respectively.

### **XIII. Viral hepatitis**

47. Viral hepatitis has been made notifiable since March 1974. The data for viral hepatitis A and viral hepatitis E was available since 1988 and 1996 respectively due to the changes in classification.

#### *Viral hepatitis A*

48. From January 2012 to December 2021, a total of 658 cases were recorded by the CHP. The annual number ranged from 15 to 138 (median=28.5) (Figure 14). More than two-third of them (455, 69.1%) were local cases.

49. The 658 cases involved 393 male and 265 female (M: F ratio = 1.5), with age ranging from 3 to 93 years (median=48 years). One fatal case was recorded in 2018.

50. According to the WHO's classification, Hong Kong belonged to an area of very low endemicity (seroprevalence <50% by age 30 years) based on a study on seroprevalence of hepatitis A conducted by the University of Hong Kong in 2015-2016<sup>3</sup>.

51. In late 2015, an outbreak of hepatitis A among men who have sex with men (MSM) was noted, which continued through 2017. A vaccination campaign targeting MSM was started in early 2017 resulting in marked decrease in the number of MSM with hepatitis A thereafter. In late 2018, a cluster of hepatitis A cases related to Pakistanis affecting eight persons was recorded.

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<sup>3</sup> Liu KSH, Seto WK, Lau EHY, Wong DK, Lam YF, Cheung KS, Mak LY, Ko KL, To WP, Law MWK, Wu JT, Lai CL, Yuen MF. A Territorywide Prevalence Study on Blood-Borne and Enteric Viral Hepatitis in Hong Kong. *J Infect Dis.* 2019 May 24;219(12):1924-1933. doi: 10.1093/infdis/jiz038.

Epidemiological investigation showed no common food or water source, and no epidemiological linkage was identified.

### *Viral hepatitis E*

52. From 2012 to 2021, a total of 862 cases of hepatitis E were recorded by the CHP with annual number ranging from 43 to 150 (median = 84.5) (Figure 15). Vast majority of the cases (726, 84.2%) were local cases.

53. The cases involved 538 male and 324 female (M: F ratio = 1.7), with age ranging from 15 - 102 years (median=58.5 years). Sixteen fatal cases were recorded and the case fatality rate was 1.75%.

## **Outbreak surveillance**

### **I. Acute gastroenteritis (AGE)**

54. From 2012 to 2021, CHP recorded a total of 1,328 institutional AGE outbreaks with annual number ranging from 19 to 231 (median=156.5) (Figure 16). A total of 14,231 persons were affected and the number of people affected in each outbreak ranged from 2 to 181 (median=8).

55. Among these 1,328 outbreaks, 580 (43.7%) were confirmed, with the majority caused by Norovirus (448 outbreaks, 77.2%), followed by Rotavirus (64 outbreaks, 11.0%), *Clostridium difficile* (22 outbreaks, 3.8%), and others including Sapovirus, Astrovirus, Adenovirus, Salmonella, and Aeromonas.

56. AGE outbreaks occurred throughout the year. Of the 1,328 outbreaks recorded in the past 10 years, about half (n=664, 48.5%) occurred between October and January.

57. Among the AGE outbreaks, 480 (36.1%) occurred in kindergarten/child care centres, 278 (20.9%) in residential care homes for the elderly, 270 (20.3%) in primary schools, 50 (3.8%) in hospitals, and 34 (2.6%)

in secondary schools and other institutions.

## II. Hand, foot and mouth disease (HFMD)

58. From 2012 to 2021, the CHP recorded a total of 4,615 HFMD/ herpangina institutional outbreaks with annual number ranging from 0 to 875 (median= 432) (Figure 17). Among the outbreaks, 2,841 (61.6%) occurred in child care centres/ kindergartens, 1,006 (21.8%) in primary schools, and 604 (13.1%) in secondary schools. A total of 27,536 people were affected and the number of people affected in each outbreak ranged from 2 to 65 (median=4).

59. In Hong Kong, the usual peak season for HFMD and EV71 infection is from May to July (accounting for about 48.1% of people affected), while a smaller peak may also occur between October and December (accounting for about 28.1% of people affected). Higher number of HFMD/ herpangina institutional outbreaks was noted about every two to three years. An exceptionally high number of HFMD/ herpangina institutional outbreaks were recorded in 2013, 2015, 2016 and 2019.

### Way forward

60. The above review provides an overview of the trends of enteric infection and foodborne diseases over the past decade. For most diseases, a recent decreasing trend is noted, as the COVID-19 pandemic since early 2020 has brought about control measures such as social distancing and travel restrictions, which has inevitably brought along changes in the pattern of most infectious diseases.

61. Despite heightened public awareness to maintain good personal hygiene including hand hygiene and mask-wearing during the COVID-19 pandemic, enteric infection and foodborne diseases have remained prevalent in the community. With the pandemic situation becoming stabilised and related restrictions being eased up, the activity of enteric infectious diseases is expected to increase further.

62. The CHP will continue to monitor the situation closely, at the same

time promoting early reporting of any suspected and confirmed cases, which will in turn facilitate prompt outbreak detection, epidemiological investigation and control. The CHP will continue to collaborate with other departments to effectively implement prevention and control measures in case of disease outbreak.

63. All along, the SCEIFD of the CHP has been providing valuable advice and recommendations on strategy in identifying source of infection and/or transmission, as well as preventive and control measures such as vaccination and health education for enteric infection and foodborne diseases.

64. Last but not the least, CHP will keep abreast of the latest evidence and international practices on effective strategies in the surveillance, prevention and control of enteric infection and foodborne diseases.

**Communicable Disease Branch**

**Centre for Health Protection**

**Department of Health**

**February 2023**

Figure 1 - Amoebic dysentery

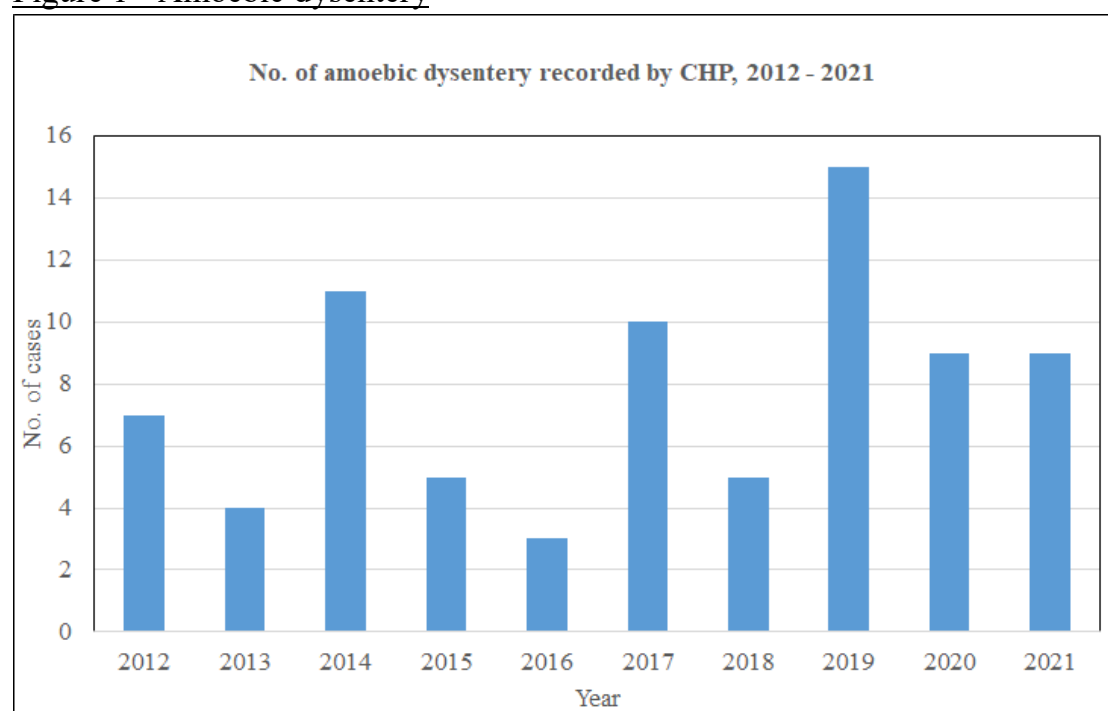
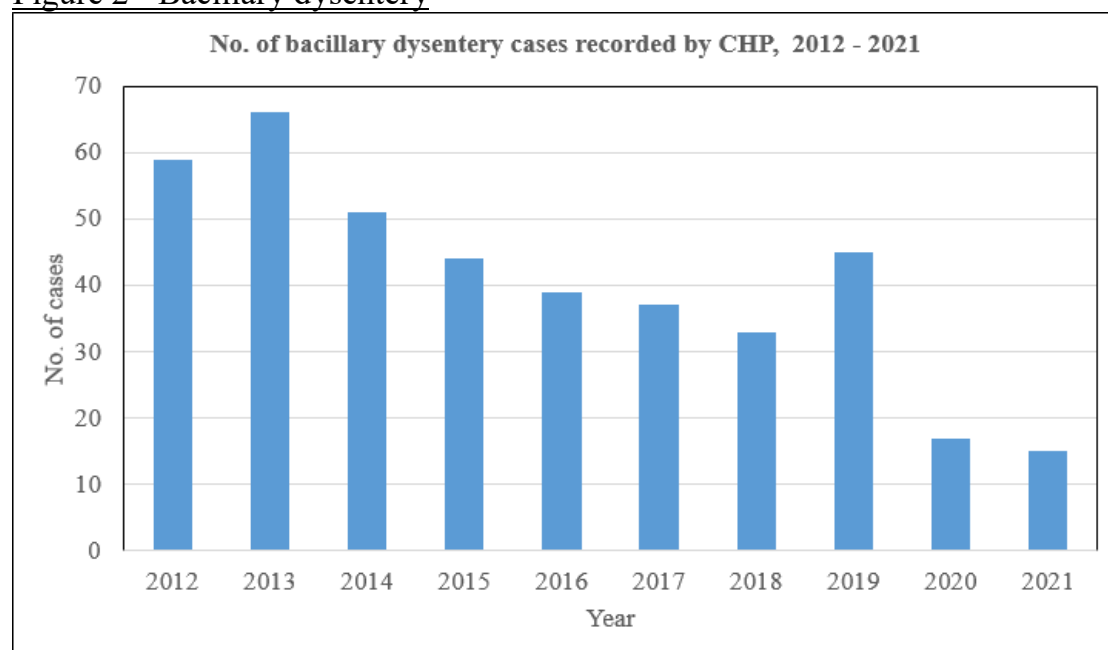
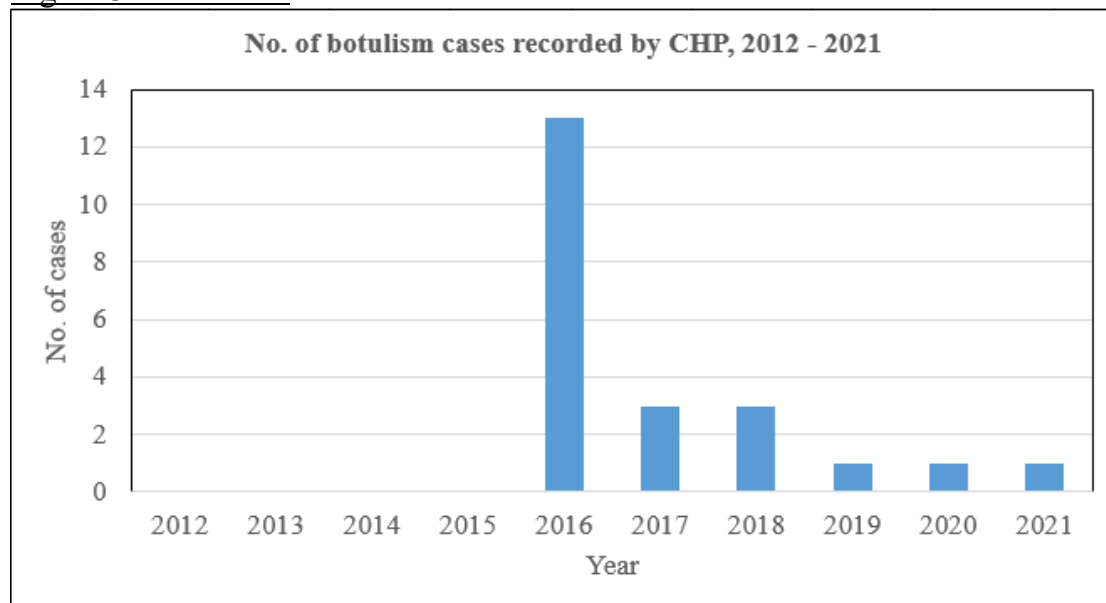


Figure 2 - Bacillary dysentery



**Figure 3 – Botulism**



**Figure 4 – Cholera**

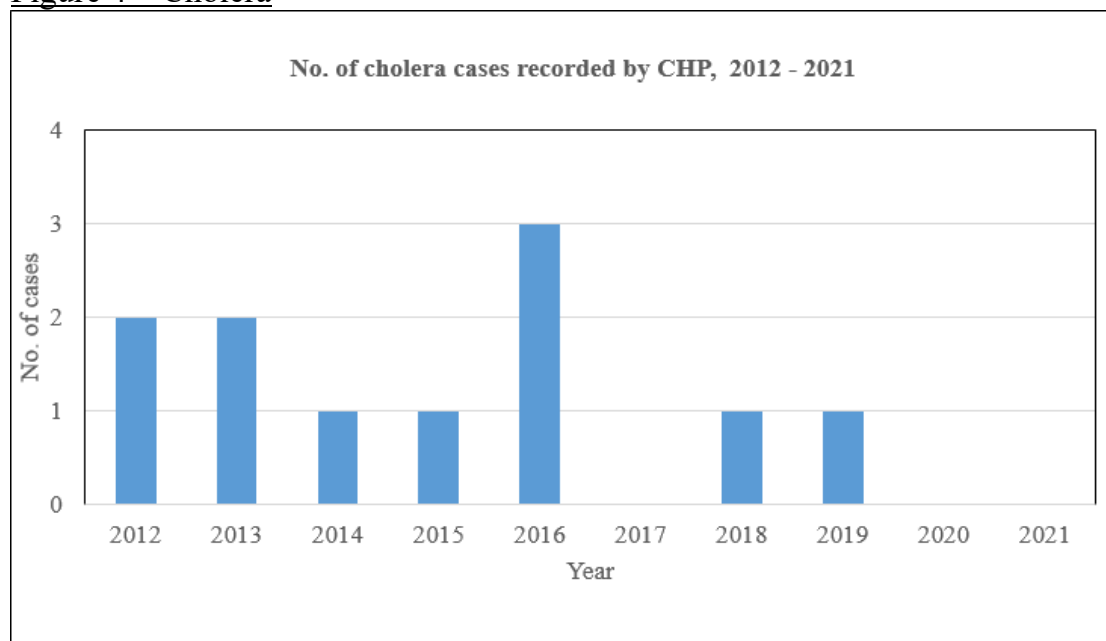


Figure 5 – Cryptosporidiosis

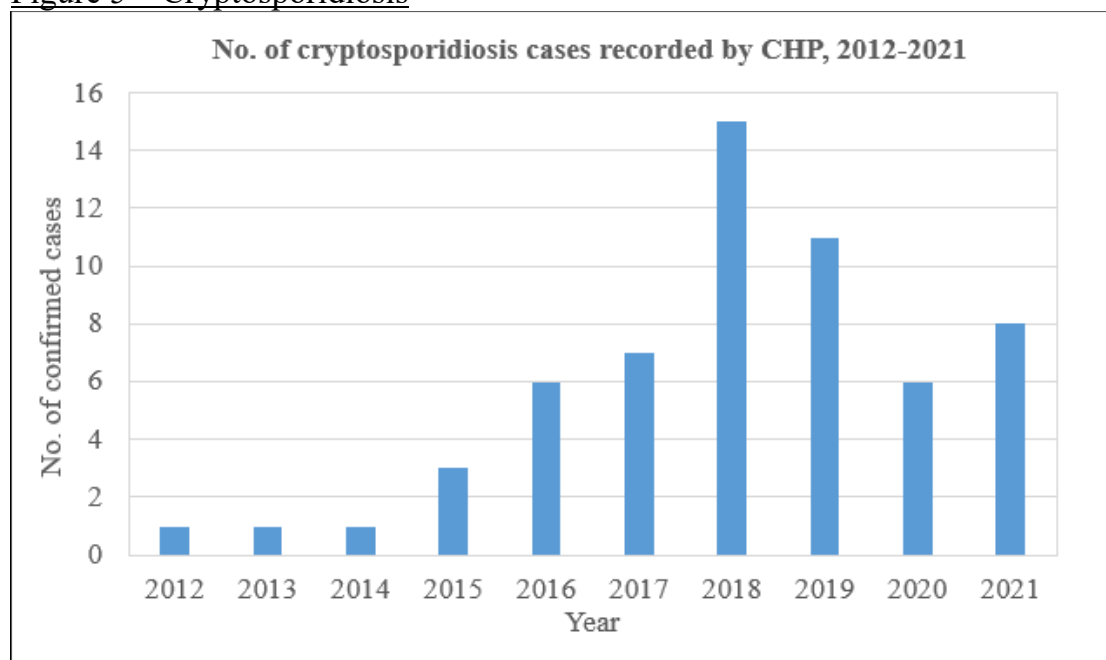


Figure 6 – Enterovirus 71 infection (EV71)

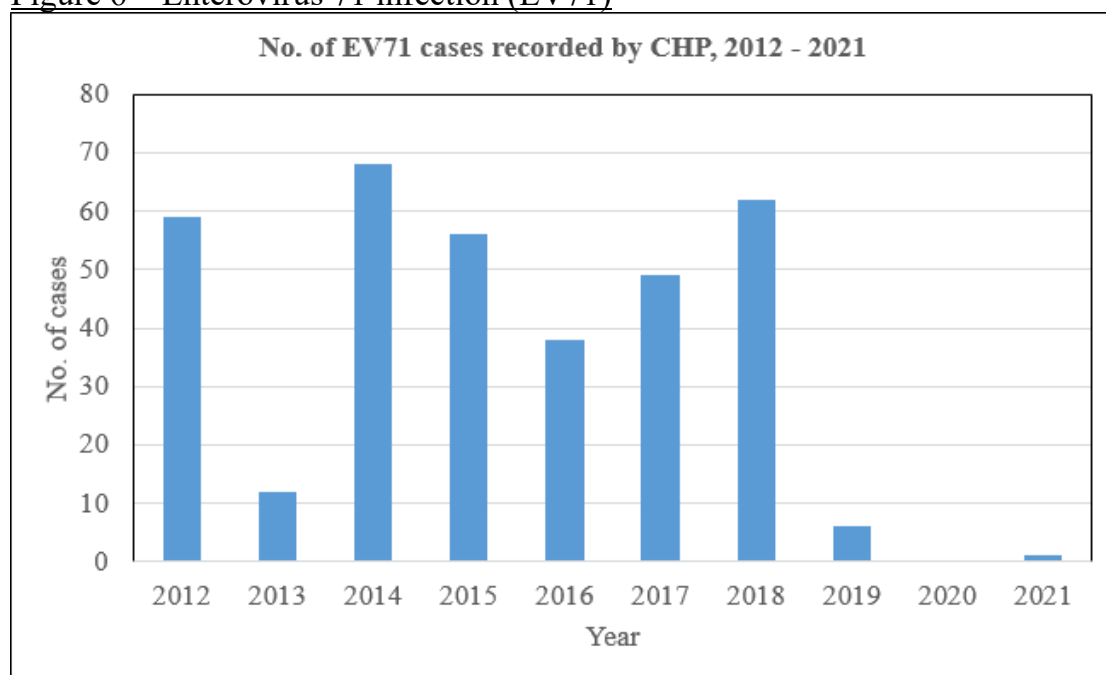


Figure 7 – Food poisoning

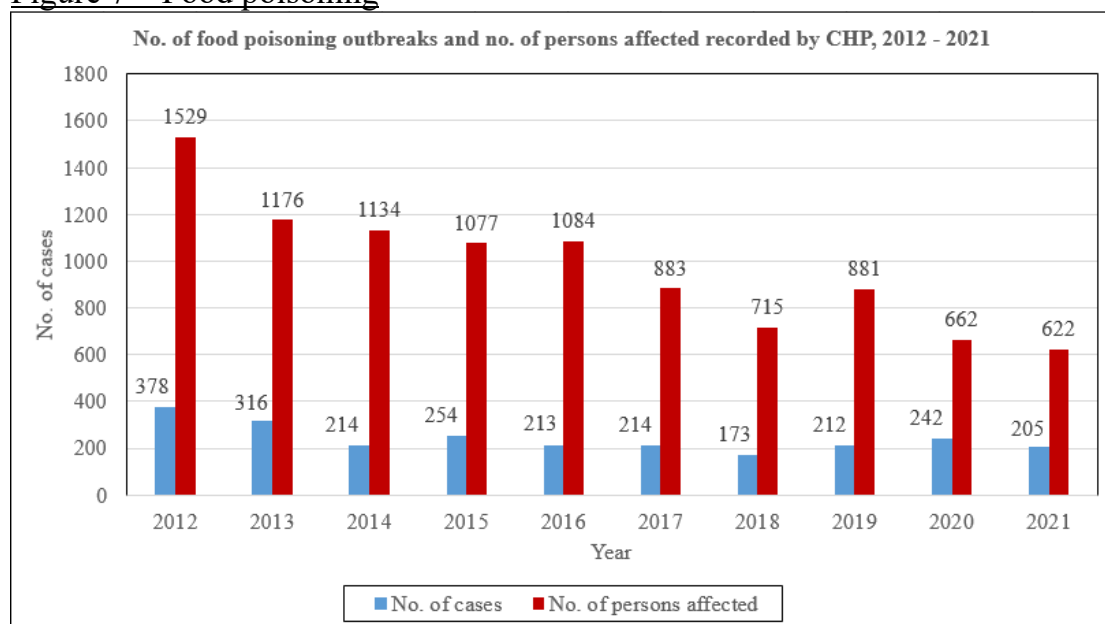


Table 1. Number of cases and number of persons affected by groups of causative agents from 2012 to 2021

Group of causative agents	No. of cases		No. of persons affected	
	Confirmed	Probable/Suspected	Confirmed	Probable/Suspected
Bacteria	563	1,208	2,347	5,057
Virus	88	308	582	1,307
Biochemical	125	94	274	124
Chemical	10	23	13	56
Others	0	2	0	3
<b>Subtotal</b>	<b>786</b>	<b>1,635</b>	<b>3,216</b>	<b>6,547</b>
<b>Total</b>	<b>2,421</b>		<b>9,763</b>	



Figure 8 – Listeriosis

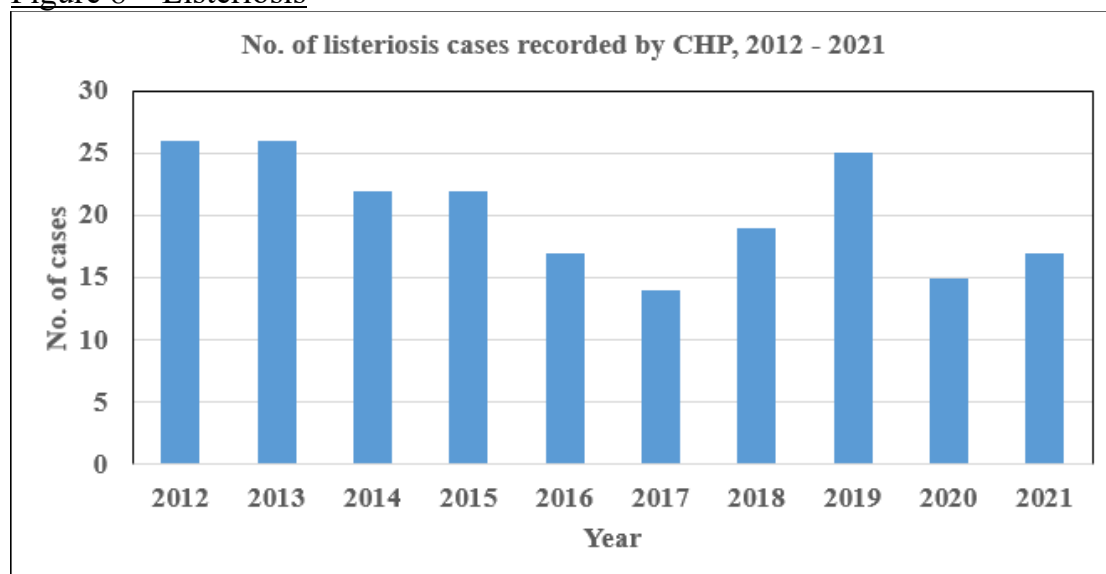


Figure 9 – Paratyphoid fever

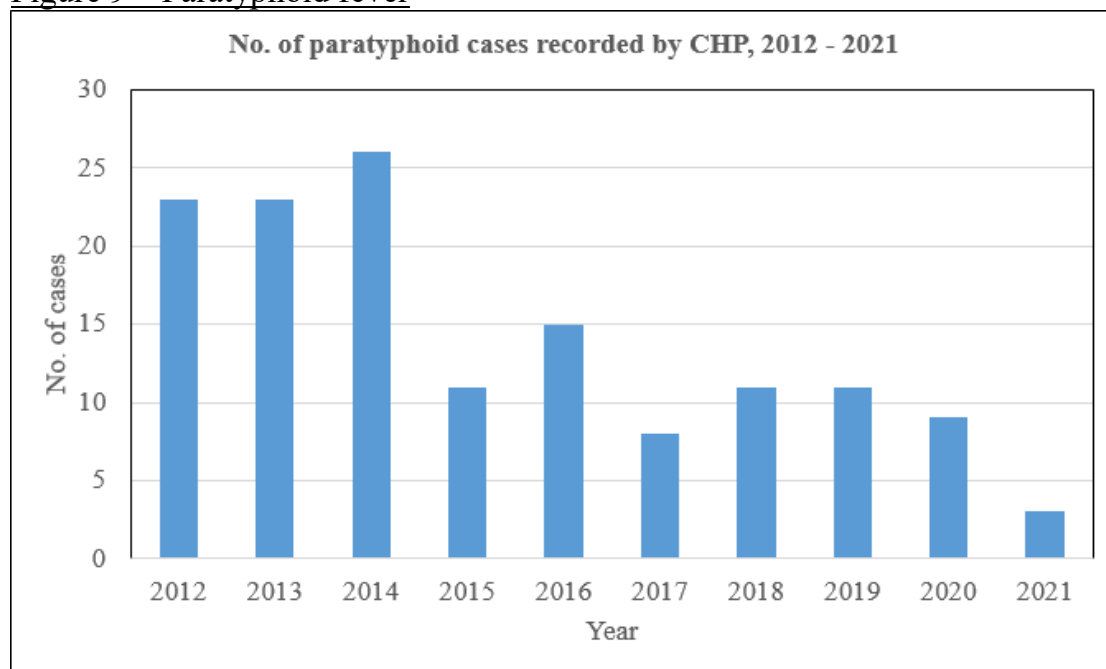


Figure 10 – Severe paediatric enterovirus infection (other than EV71 and poliovirus) (SE)

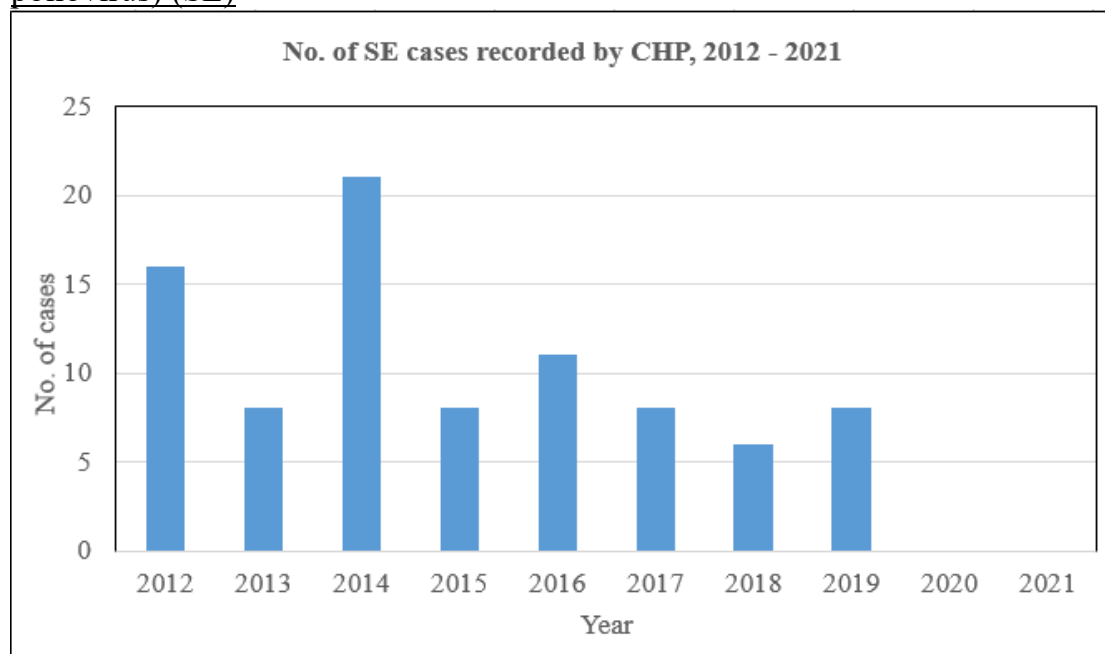


Figure 11 – Shiga toxin-producing *Escherichia coli* infection (STEC)

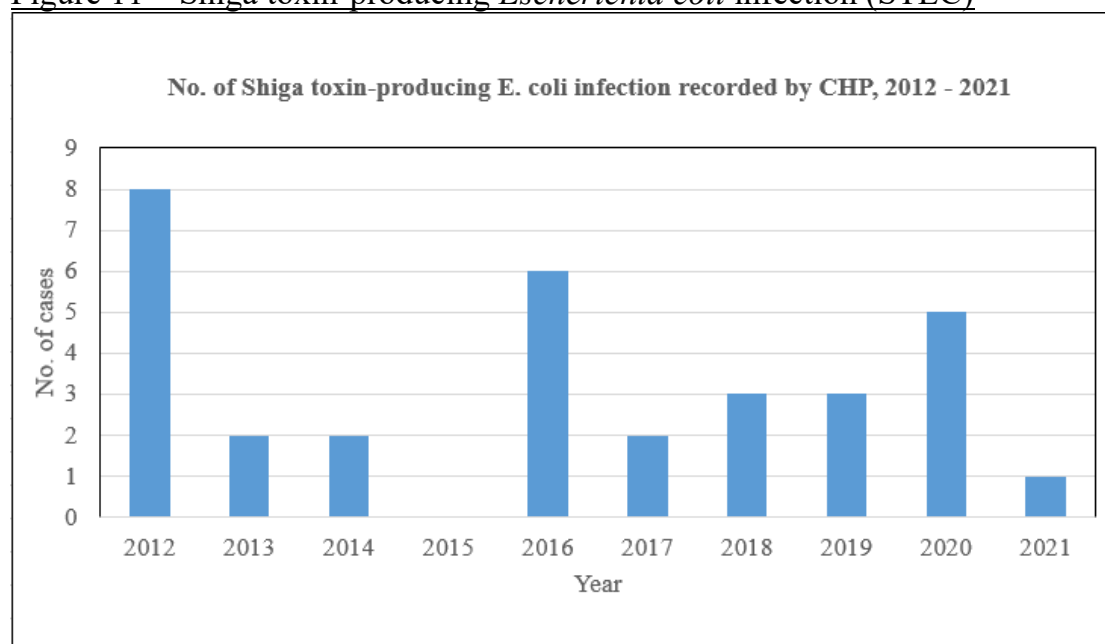


Figure 12 – Typhoid fever

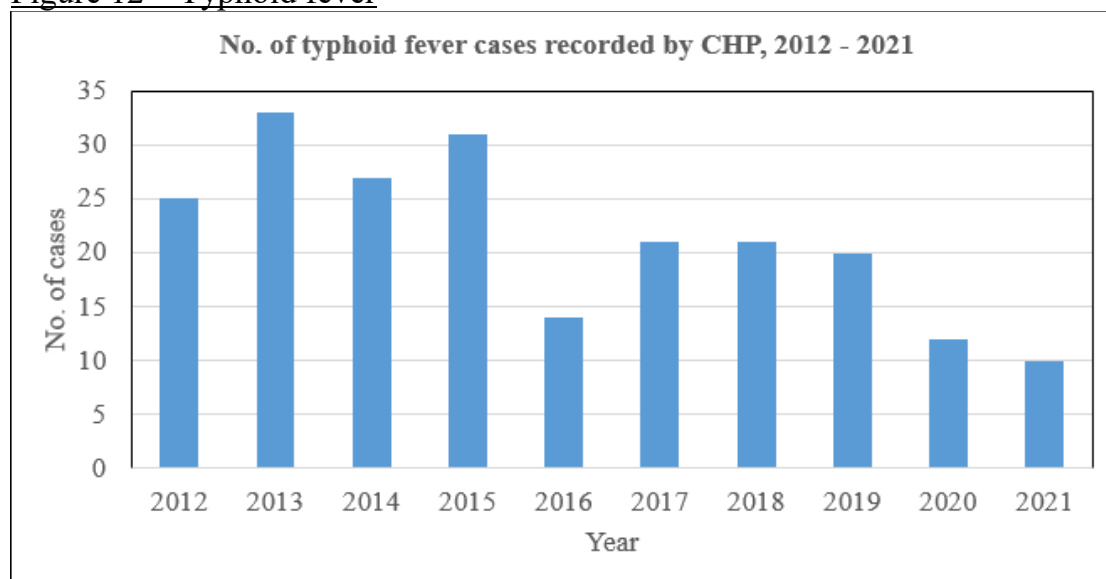


Figure 13 – Typhoid fever

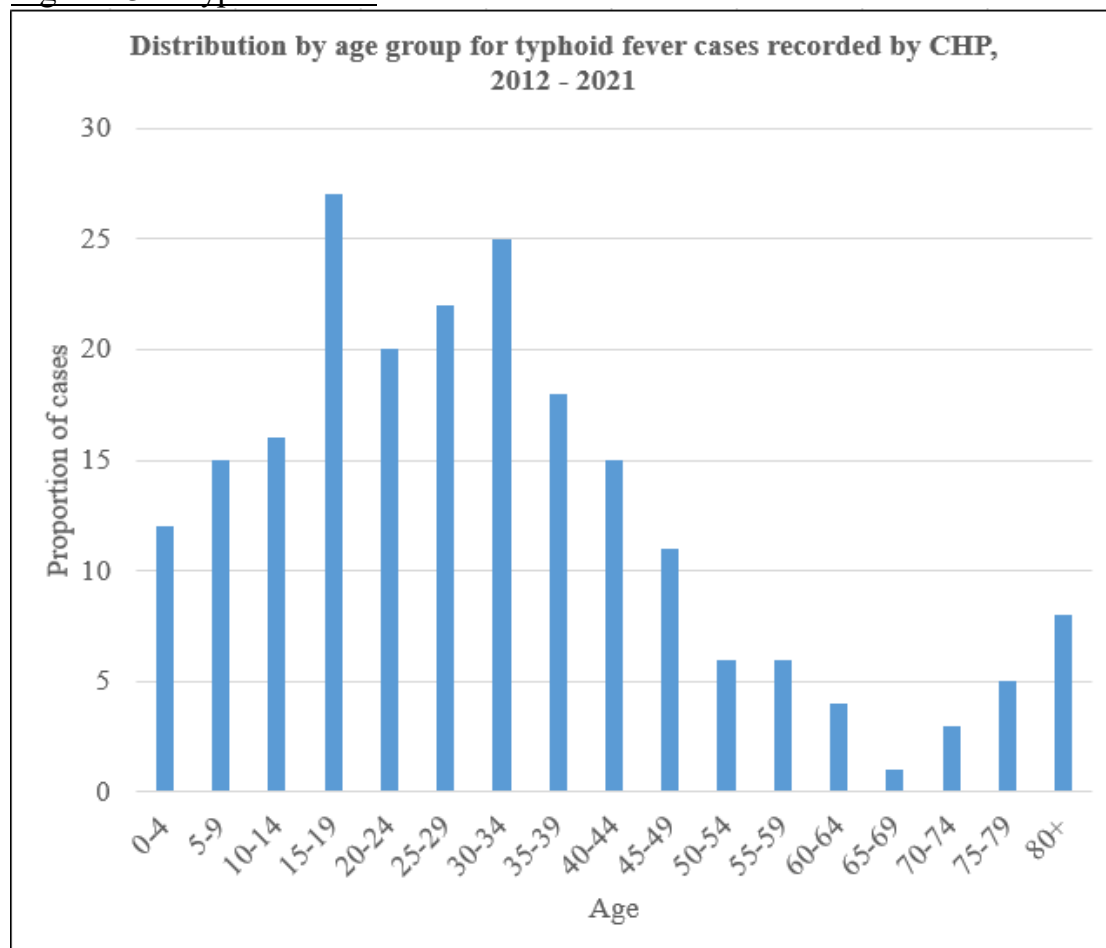


Figure 14 – Viral hepatitis A

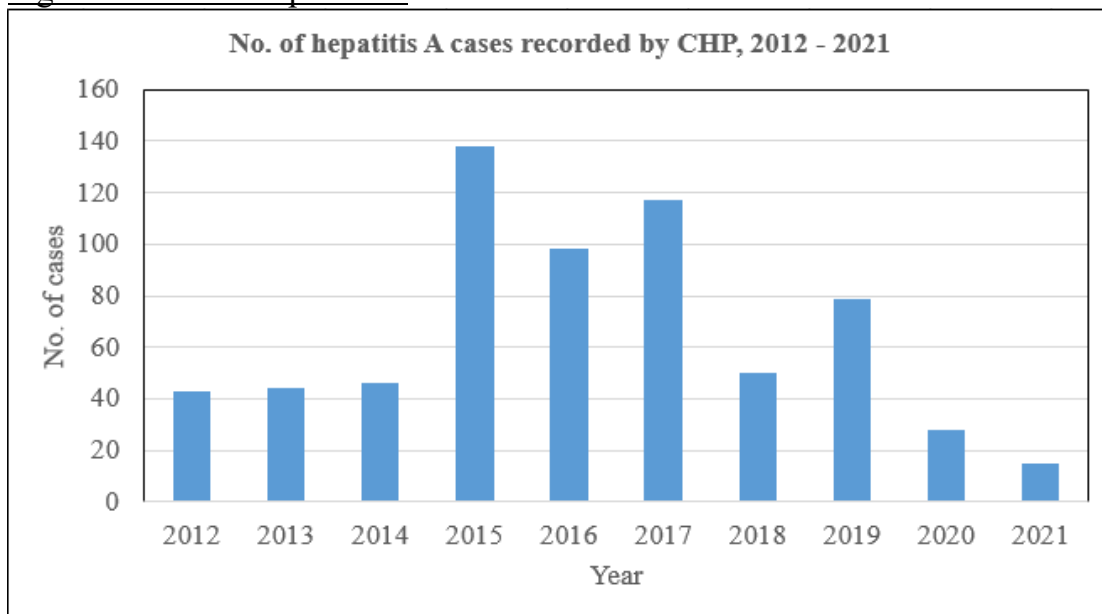


Figure 15 – Viral Hepatitis E

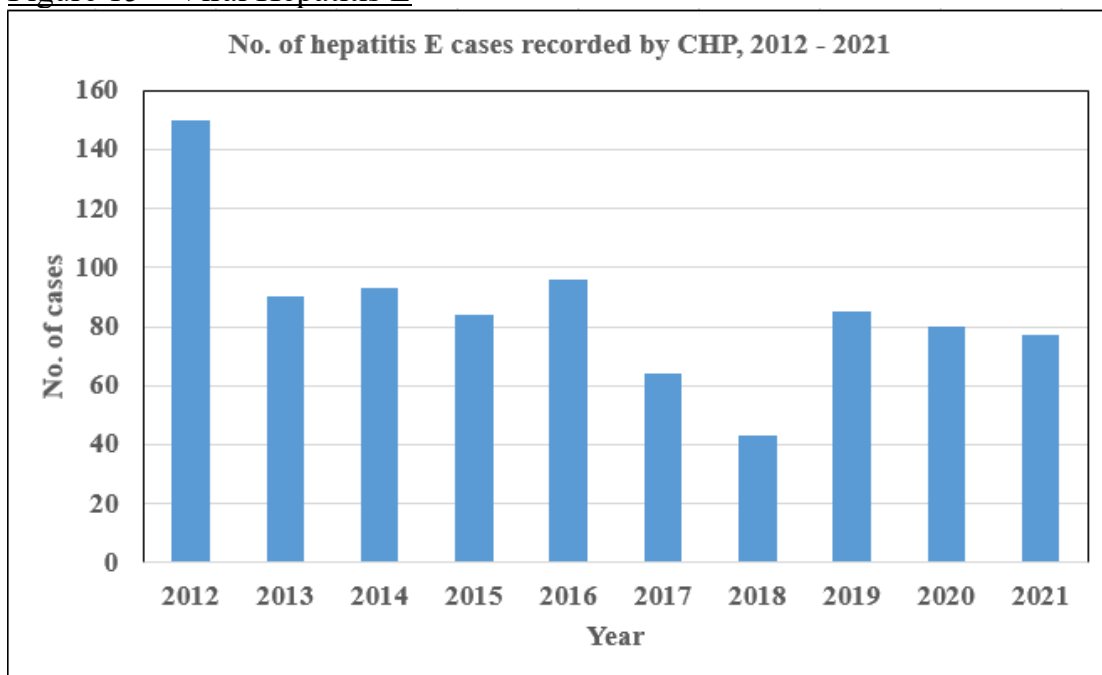


Figure 16 – Acute gastroenteritis (AGE) outbreak

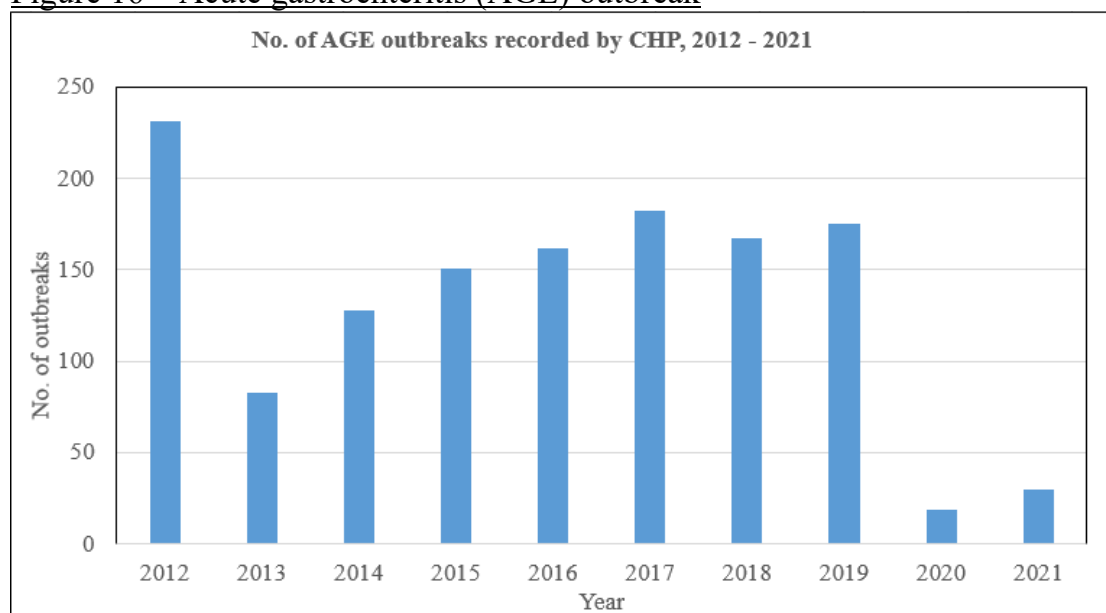


Figure 17–Hand, foot and mouth disease (HFMD)

