## Salmonellosis, Typhoid Fever and Paratyphoid Fever

In 2017, 1,079 cases of salmonellosis (non-typhoidal) were reported (incidence rate 22.4/100,000); 32.8% were associated with international travel. *Salmonella* infection continues to be the second most commonly reported enteric disease in BC. While the *Salmonella* incidence in 2017 shows a slight decrease, the rate was similar to previous years and higher than in 2012 and 2013. These high incidence rates are mainly due to the ongoing *S.*Enteritidis outbreak. A provincial strategy to address rising incidence of human S. Enteritidis cases in BC has been developed which outlines recommended actions to be taken at the provincial level from farm to fork.

Rates were highest in children under five years of age and among residents of Kootenay Boundary, East Kootenay and North Shore/Coast Garibaldi HSDA. Cases were reported throughout the year with an increase in cases in spring and in December which coincides with known outbreaks.

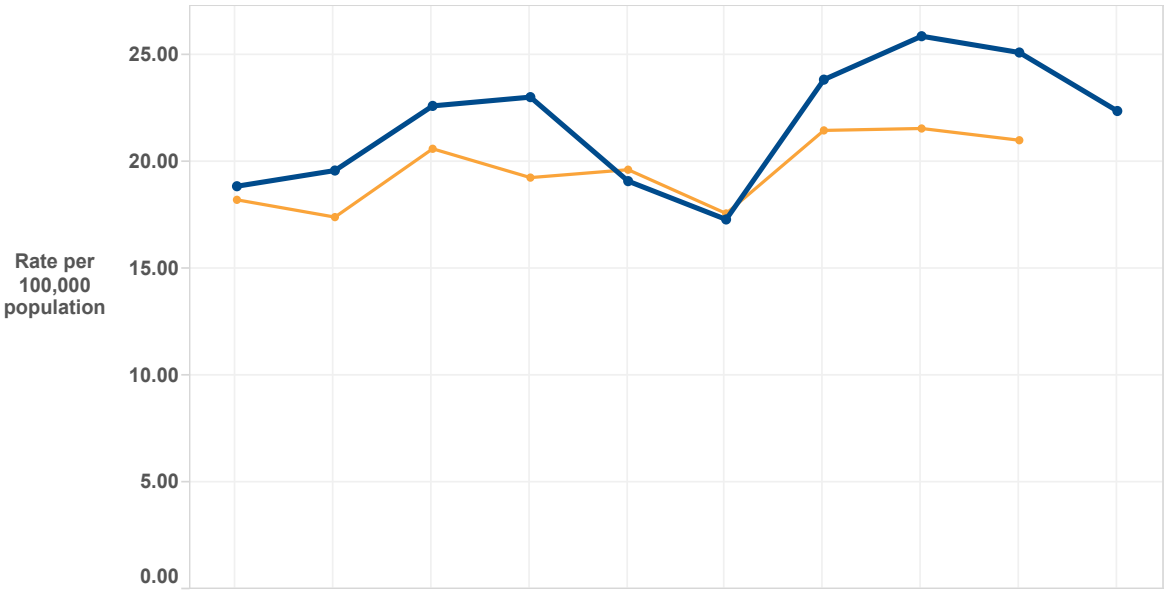
The incidence rate of typhoid fever (0.8/100,000) increased for unknown reasons whereas paratyphoid fever incidence (0.4/100,000) remained stable. The majority of these cases are associated with international travel, with South Asia being the most common travel location reported. Typhoid and paratyphoid fever cases clustered in the first third of the year, a temporal reflection of the travel patterns of BC residents. Most cases (76.8%) were reported from Fraser Health Authority. The highest incidence of typhoid fever was for children and paratyphoid fever was in adults between 20-29 years.

*S.*Enteritidis, *S.*Typhimurium and *S.*Typhi were the most commonly reported *Salmonella* serotypes in 2017. *S.*Enteritidis continued to account for more than half of the salmonellosis cases in BC, which has been true for over a decade. There was a notable shift in the most common serotypes in 2017. *S.*Heidelberg which had previously been reported in the top 5, was not reported in the top 10 in 2017. *S.*Braenderup which has not previously been reported in the top 10, ranked 6th in 2017 due to a national outbreak where chicken meat was the suspected source.

There were 10 *Salmonella* outbreaks in 2017, including six *S.*Enteritidis outbreaks, 1 *S.*Branderup, 1 *S.*Chailey, 1 *S.*Weltevreden and 1 *S.*Heidelberg. All were foodborne and nine were solved. Chicken meat was identified as the source in six of them and the majority of them were community-wide outbreaks with a widely distributed food product (see Enteric Outbreak section).

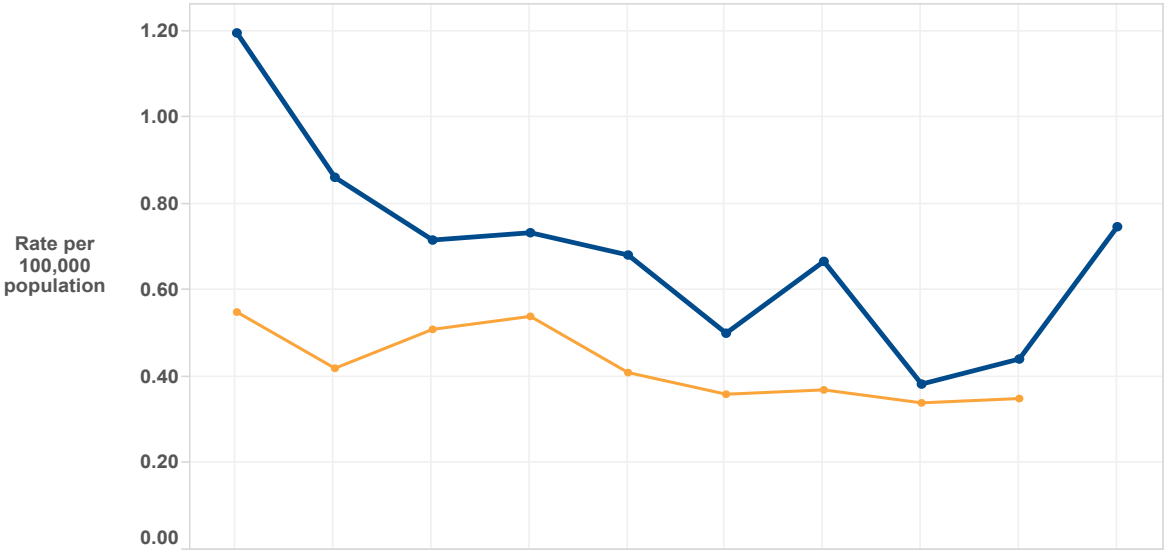
Additional analyses comparing *Salmonella* human and food chain surveillance data are available through the BC Integrated Surveillance of Foodborne Pathogens program (www.bccdc.ca/integratedfoodchainsurveillance).

*10.1 Salmonellosis (non-typhoidal) Rates by Year, 2008-2017*



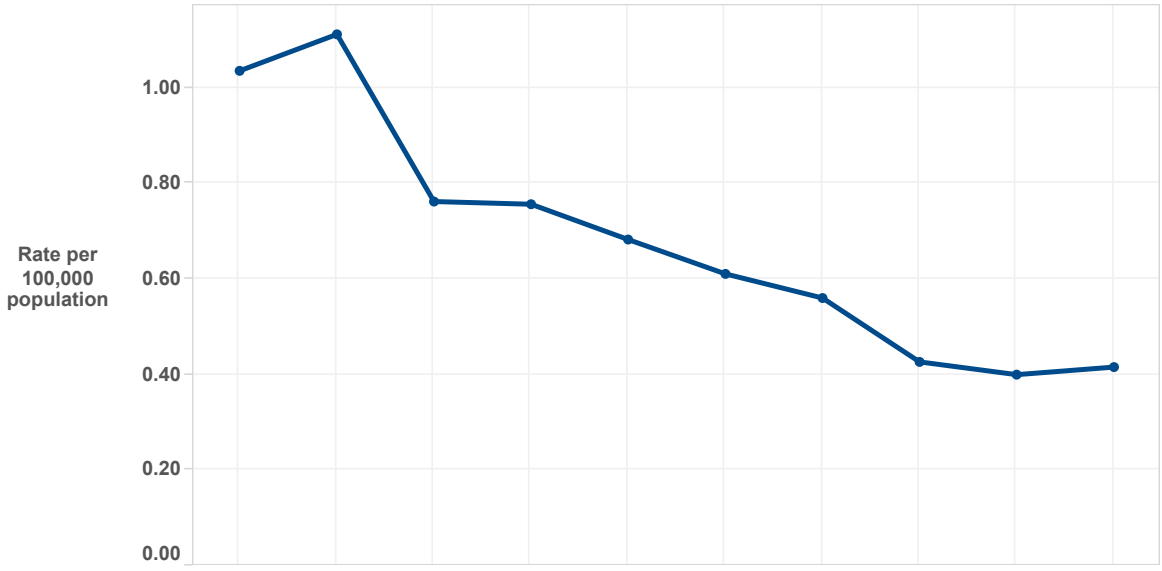

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| Reports | 821 | 865 | 1,011 | 1,037 | 869 | 795 | 1,109 | 1,216 | 1,196 | 1,079 |
| BC Rate | 18.88 | 19.61 | 22.64 | 23.05 | 19.11 | 17.32 | 23.87 | 25.90 | 25.14 | 22.40 |
| Canada Rate | 18.24 | 17.43 | 20.63 | 19.28 | 19.65 | 17.60 | 21.49 | 21.58 | 21.03 | |

*10.2 Salmonella Typhoid Fever Rates by Year, 2008-2017*



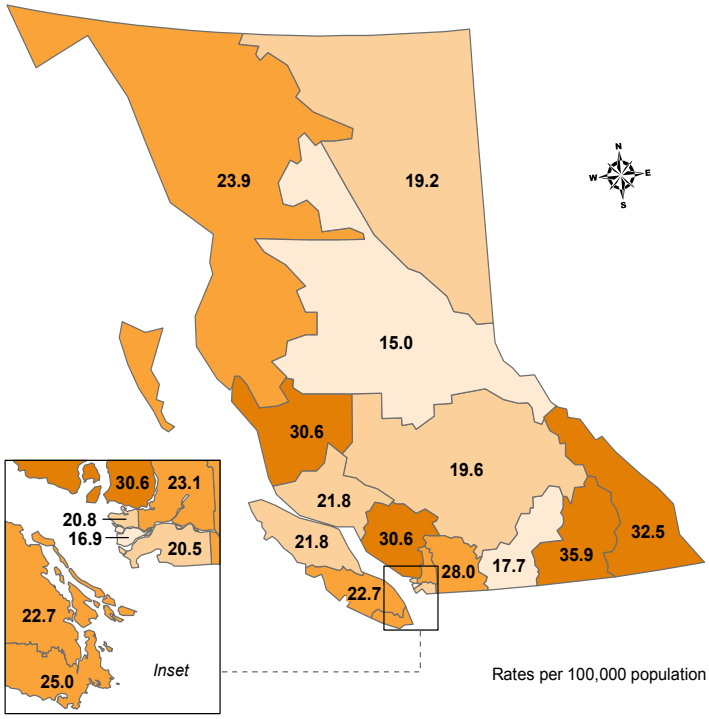

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| Reports | 52 | 38 | 32 | 33 | 31 | 23 | 31 | 18 | 21 | 36 |
| BC Rate | 1.20 | 0.86 | 0.72 | 0.73 | 0.68 | 0.50 | 0.67 | 0.38 | 0.44 | 0.75 |
| Canada Rate | 0.55 | 0.42 | 0.51 | 0.54 | 0.41 | 0.36 | 0.37 | 0.34 | 0.35 | |

## 10.3 Salmonella Paratyphoid Fever Rates by Year, 2008-2017

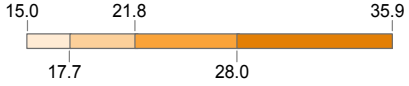



| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| Reports | 45 | 49 | 34 | 34 | 31 | 28 | 26 | 20 | 19 | 20 |
| BC Rate | 1.03 | 1.11 | 0.76 | 0.76 | 0.68 | 0.61 | 0.56 | 0.43 | 0.40 | 0.42 |

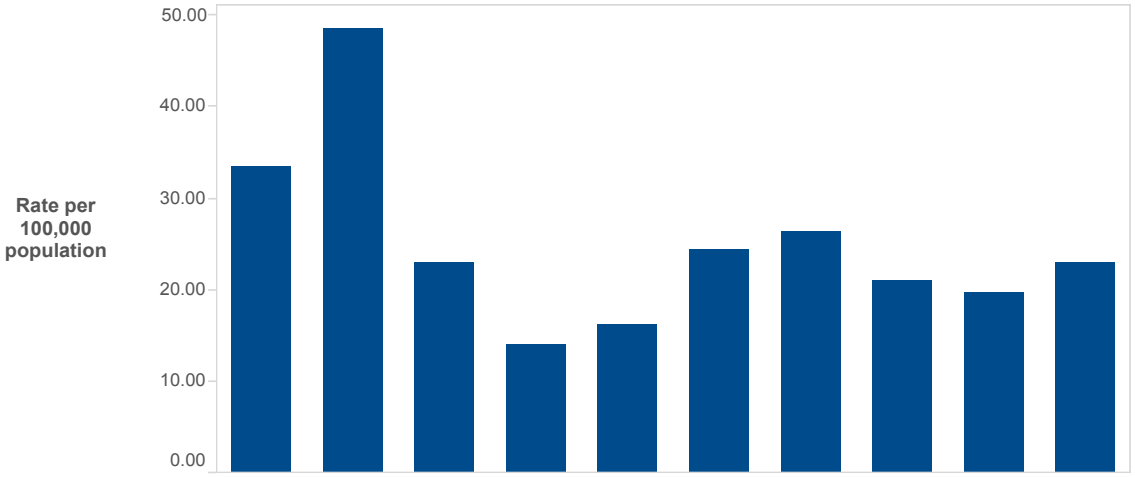
## 10.4 Salmonellosis (non-typhoidal) Rates by HSDA, 2017




| ID | Health Service Delivery Area | Cases | Rate |
|---|---|---|---|
| 11 | East Kootenay | 25 | 32.5 |
| 12 | Kootenay Boundary | 28 | 35.9 |
| 13 | Okanagan | 66 | 17.7 |
| 14 | Thompson Cariboo Shuswap | 45 | 19.6 |
| 21 | Fraser East | 85 | 28.0 |
| 22 | Fraser North | 154 | 23.1 |
| 23 | Fraser South | 171 | 20.5 |
| 31 | Richmond | 37 | 16.9 |
| 32 | Vancouver | 141 | 20.8 |
| 33 | North Shore/Coast Garibaldi | 88 | 30.6 |
| 41 | South Vancouver Island | 98 | 25.0 |
| 42 | Central Vancouver Island | 63 | 22.7 |
| 43 | North Vancouver Island | 27 | 21.8 |
| 51 | Northwest | 17 | 23.9 |
| 52 | Northern Interior | 21 | 15.0 |
| 53 | Northeast | 13 | 19.2 |

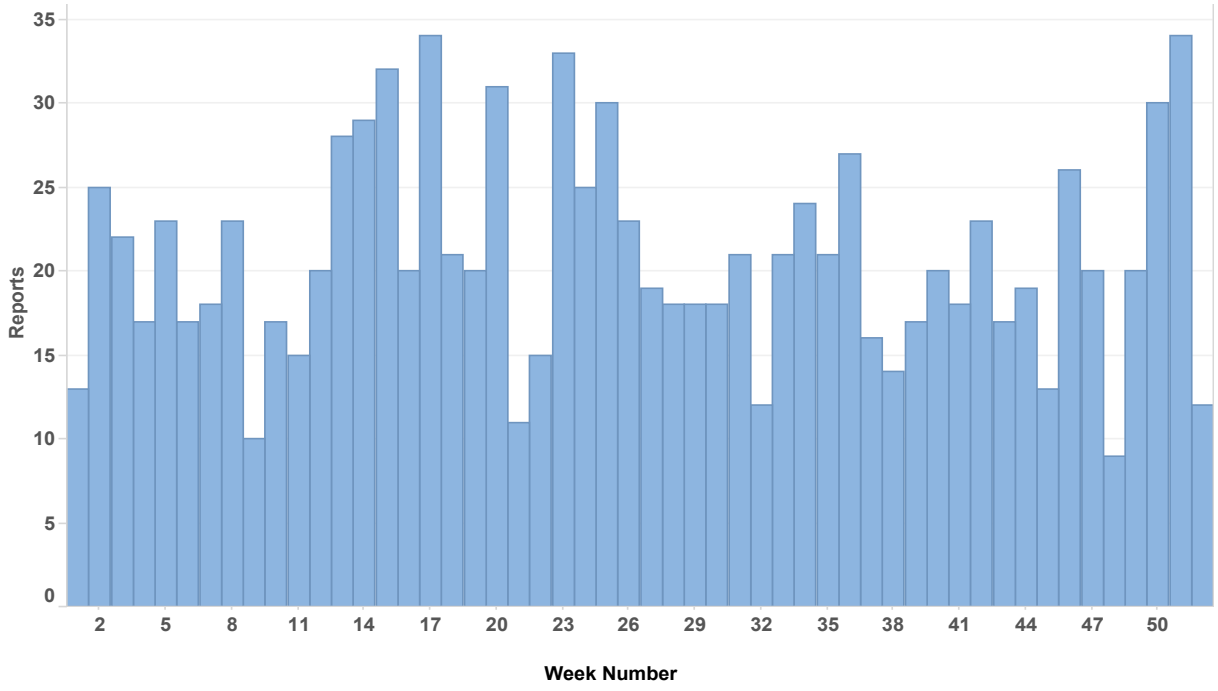


*10.5 Salmonellosis (non-typhoidal) Rates by Age Group, 2017*




| | | <1 | 1-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-39 | 40-59 | 60+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Reports | Female | 4 | 38 | 27 | 12 | 27 | 51 | 40 | 76 | 141 | 140 |
| | Male | 11 | 51 | 27 | 21 | 17 | 30 | 46 | 61 | 123 | 136 |
| | Total | 15 | 89 | 54 | 33 | 44 | 81 | 86 | 137 | 264 | 276 |
| BC Rate | Female | 18.36 | 42.70 | 23.77 | 10.54 | 20.40 | 32.19 | 24.78 | 22.99 | 20.85 | 22.21 |
| | Male | 47.74 | 54.34 | 22.15 | 17.31 | 12.19 | 17.33 | 28.05 | 18.85 | 18.79 | 23.67 |
| | Total | 33.46 | 48.68 | 22.93 | 14.04 | 16.19 | 24.43 | 26.43 | 20.94 | 19.84 | 22.90 |

*10.6 Salmonellosis (non-typhoidal) Reports by Week, 2017*



*10.7 Salmonella Serotype Distribution, 2017*

| Rank | Serotype | Number of Cases | Proportion |
|---|---|---|---|
| 1 | Enteritidis | 603 | 51.7% |
| 2 | Typhimurium | 41 | 3.5% |
| 3 | Typhi | 40 | 3.4% |
| 4 | *Salmonella ssp I 4,5,12:i:* | 24 | 2.1% |
| 5 | Newport | 23 | 2.0% |
| 6 | Branderup | 21 | 1.8% |
| 7 | Infantis | 21 | 1.8% |
| 8 | Paratyphi A | 21 | 1.8% |
| 9 | Salmonella ssp I 4,12:i:- | 20 | 1.7% |
| 10 | Stanley | 20 | 1.7% |
| | Other | 333 | 28.5% |
| | Total | 1167 | 100.0% |

Note: Serotype distribution is based on BCCDC PHL data. Numbers may vary from those reported in Panorama.