

## Waterborne Cryptosporidiosis Outbreak, North Battleford, Saskatchewan, April 2001

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*Background:* On April 25, 2001, Saskatchewan Health requested assistance from Health Canada to investigate the scope and likely source of a community-wide outbreak of gastroenteritis in the Battlefords area of northwestern Saskatchewan.

*Methods:* We compiled a descriptive case-series study through hospital records and public health surveillance data using a sensitive case definition for diarrheal illness. We reviewed 'over-the-counter' antidiarrheal drug sales of three community pharmacies. Using a more specific case definition, we conducted a cross-sectional telephone survey of a random sample of households within the Battlefords area to investigate risk factors associated with gastroenteritis, to explore spatial trends in disease risk, and to estimate the burden of diarrheal illness from this outbreak. We reviewed the water quality and operational parameters of the municipal water treatment systems in the Battlefords area.

*Results:* The case-series included 1907 cases; 597 (31%) reported visiting a physician and 50 (3%) reported hospitalization. No deaths were reported. The majority was from Saskatchewan, but some were from neighbouring provinces. Median age was 27 years (range: <1-103 years); 1031 (54%) were female. The onset of diarrhea increased after March 21 and reached a peak on April 25, 2001. Of the 378 submitted stool specimens, 275 (73%) were laboratory confirmed for *Cryptosporidium parvum* oocysts. No other enteric pathogens were identified. All three pharmacies experienced an approximate five-fold increase in antidiarrheal drug sales beginning in late March or early April 2001. In the cross-sectional study of 652 individuals from 259 households, we identified 196 primary and 51 secondary cases; overall crude attack rate of 38%. Individuals exposed to the City of North Battleford water at home *or* at work/school were 1.5 (95% CI: 0.90-2.54), and at home *and* work/school were 2.7 (95% CI: 1.55-4.81) times more likely to develop gastroenteritis than unexposed persons. North Battleford residents living in the southeast part of the city were two to four times more likely to have gastroenteritis compared to those individuals living in the northwest. An estimated 5800-7100 persons living in the City of North Battleford and the Town of Battleford had gastroenteritis as a result of this outbreak. After maintenance of the solids contact unit on March 20, 2001, the Surface Water Treatment Plant (SWTP) in the City of North Battleford was functioning sub-optimally as indicated by an increase in finished water turbidity. There were no abnormalities in bacterial quality or chlorine residuals found in the finished water in the distribution system. However, *Cryptosporidium* oocysts were found in the treated drinking water from the SWTP.

*Interpretation:* A large outbreak of cryptosporidiosis associated with contaminated municipal drinking water in the City of North Battleford, Saskatchewan occurred in the spring of 2001. The evidence suggests a malfunction at the SWTP contributed to the contamination of the distribution system. This outbreak demonstrates the potential vulnerability of municipal water supplies dependent upon surface water sources and highlights the need for adequate water treatment at all times.