

# Exposures and transmission routes associated with *Cryptosporidium* infection: a systematic review

Caoimhe McKerr<sup>1,2,6</sup> & Wendi Shepherd<sup>7</sup>

Rachel M Chalmers<sup>3</sup> / Roberto Vivancos<sup>1,2,4</sup> / Sarah J O'Brien<sup>1</sup> / Robert M Christley<sup>2</sup>

<sup>1</sup> NIHR Health Protection Research Unit in Gastrointestinal Infections, The University of Liverpool / <sup>2</sup> NIHR Health Protection Research Unit in Emerging and Zoonotic Infections, The University of Liverpool / <sup>3</sup> Cryptosporidium Reference Unit, Public Health Wales, Swansea / <sup>4</sup> Field Epidemiology Services, UK Health Security Agency, Liverpool / <sup>5</sup> Institute of Infection and Global Health, University of Liverpool / <sup>6</sup> Public Health Wales / <sup>7</sup> Health Protection, UK Health Security Agency

## INTRODUCTION

- Cryptosporidium* is a protozoan parasite, reported in 1-3 percent of immunocompetent patients with diarrhoea in industrialised countries. [1-3]
- The parasite has characteristics which favour spread via person-to-person (*C. hominis* and *C. parvum*) or animal-to-person (*C. parvum*), as well as indirect transmission through ingestion of water and food contaminated with infectious oocysts [4]
- Risk exposures are often identified from outbreak investigations, but a subset of cases remain unexplained, and pathways to infection are still unclear, especially for sporadic disease

## METHODS

- Followed Cochrane Handbook for Systematic Reviews of Interventions
- Quality was assessed using the Newcastle-Ottawa Scale
- Screening undertaken by two reviewers and data extracted using a standardised form
- Papers were sporadic cases and published between 2008 and 2018
- Exposures were grouped
- Measures of association were reported by relevant pathway (calculated if necessary)

### Box 1: Search terms

Included electronic database searching using PubMed, Scopus and Web Of Science; reference list trawling; and an exploration of the grey literature

Population: cases	risk factor(s), transmission	Study type(s): designs
1 cryptospor*	4 epidemiolog*	10 cohort
2 humans	5 risk factors	11 case-control
<b>3 1 8 2</b>	6 exposure	12 "case control"
	7 transmission	13 case-crossover
	8 association	14 "disease outbreaks"
		15 meta-analysis
		16 longitudinal
		17 ecological
		<b>18 or/10-17</b>

**To describe exposures associated with sporadic infection in industrialised countries and identify potentially under-explored transmission pathways**

## RESULTS

- Eight articles (comprising 11 studies) were included
- Seven (comprising 10 studies) were suitable for further synthesis
- None of the identified grey literature was included
- Four studies described case-control methods, two case-case studies, one cross-sectional

- Water and animal exposures most frequently investigated
- Recreational water not a major source of sporadic illness
- Person-to-person pathway represented the most consistent finding**, with all reporting studies demonstrating correlations between exposure and disease. This applied particularly to the home environment.

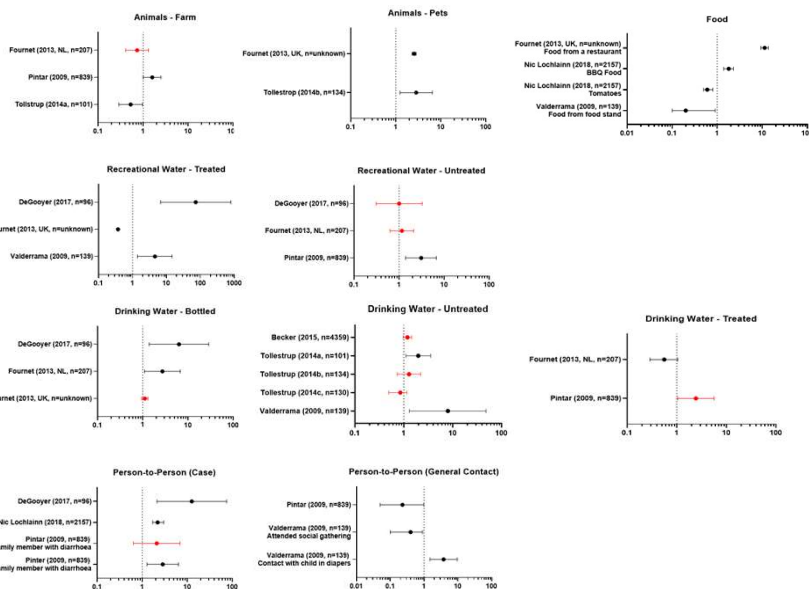
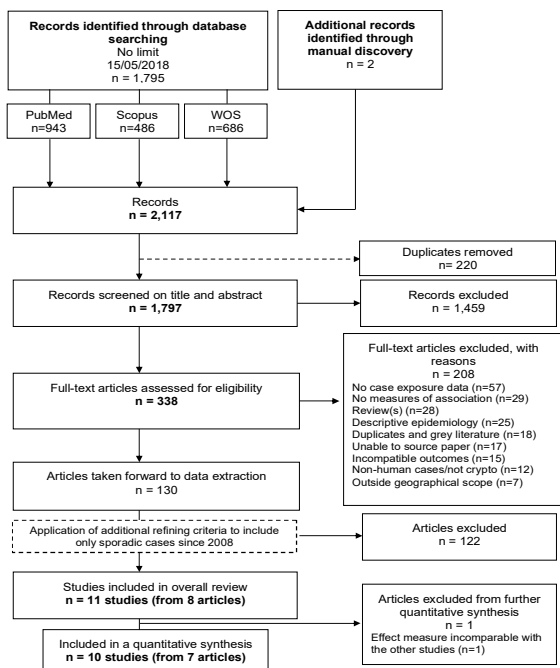


Figure 1: PRISMA flow diagram: results

Figure 2: Forest plots – Study ORs by exposure pathway

### Key messages

- The home is increasingly understood to be a significant setting for spread of *Cryptosporidium* infection and this work supports public health messaging on preventing spread of disease at home
- Although person-person was well investigated, exposures were variable, with most results incidental to the study. We should seek to quantify and ascertain spread of infection in the home environment, through better observational studies and more routine sub-typing of isolates

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