

The second study of infectious intestinal disease in the community (IID2 Study)

Area of research interest: [Foodborne pathogens](#)

Study duration: 2006-04-01

Planned completion: 1 March 2012

Project code: FS231043 (B18021)

Conducted by: University of Manchester

Background

The public health impact of gastrointestinal infection was underlined by the publication of the IID (Infectious Intestinal Disease) Study in England by our organisation in 2000. As well as defining disease burden, a major component of the IID study was calibration of national surveillance systems, in other words, estimation of the factor by which the number of cases of infection with specified pathogens needed to be multiplied to establish the actual number of infections in the community.

Our foodborne disease reduction target has been a major Government public health initiative. Progress is measured using laboratory surveillance data for five key pathogens: salmonellas, campylobacters, *Clostridium perfringens*, *Escherichia coli* O157 and *Listeria monocytogenes*. However, to reflect on recent figures and to measure future progress, we will need to know whether or not the relationship between disease burden in the community and official statistics is similar to the situation over a decade ago.

Since the original IID Study was undertaken in the mid 1990s, several structural changes have occurred in national surveillance and these might have altered that relationship to a greater or lesser degree. Therefore, contemporary information on the relationships in the reporting pyramid is required. To determine this information, a second IID study was commissioned by our organisation and was undertaken by the University of Manchester in collaboration with the Health Protection Agency (Centre for Infections and Local and Regional Services), Medical Research Council General Practice Research Framework, London School of Hygiene and Tropical Medicine, University of East Anglia, University of Nottingham, Communicable Disease Surveillance Centre Northern Ireland, National Public Health Service in Wales, Health Protection Scotland and NHS Direct.

The main aims of this study were:

- to estimate prospectively the burden and causes of IID in the population and presenting to general practitioners in the UK and to compare these results with national surveillance data
- to estimate the burden of self-reported IID in each UK nation via a telephone survey and to compare these results with the prospective estimate

Research Approach

Two studies were conducted in parallel:

A prospective study involving 84 GP practices across the UK using 'future-proof' microbiological techniques and comprising:

- a population cohort study (8,400 person-years of follow-up)
- a study of cases of IID presenting to GPs
- a study of routine clinical practice in primary care
- a study to estimate the completeness of reporting to the four national surveillance centres
- a telephone survey (sample size 3,600 per country)

The study was designed to be able to detect a 20% decline in severe disease and data will be used to re-calibrate national surveillance data, defining the relationship between disease in the community and official statistics.

Results

The key findings of the IID2 Study are provided below.

UK situation

- The incidence of IID in the community in the UK is substantial, with around 25% of the population suffering from an episode of IID in a year – equivalent to 17 million cases annually. About 2% of the population visit their GP for symptoms of IID each year – an estimated 1 million consultations annually.
- Approximately 50% of people with IID reported absence from school or work because of their symptoms. We have calculated that this represents nearly 19 million days lost (more than 11 million days lost in people of working age).
- The most commonly identified microorganisms found in stool samples from those with IID were norovirus, sapovirus, Campylobacter spp. and rotavirus.
- For every case of IID in the UK reported to national surveillance there were around 10 GP consultations and 147 cases in the community.

Only one specimen tested positive for *Clostridium difficile* (<1%), suggesting that this microorganism, which is usually associated with healthcare settings is not found very often found in the community.

Situation in England compared to mid 1990s

- The incidence of IID in the community in England was 43% higher in 2008-09 (IID2) than in 1993-96 (IID1) while the number of people visiting their GP about IID was 50% lower.
- Reporting of IID to national statistics had improved since the mid 1990s for those presenting their symptoms to their GP. This suggests that GPs are more likely to take a stool sample and/or there have been improvements in recording episodes of IID for those using primary healthcare services. However, fewer people are visiting their GPs due to an episode of IID. As a result more cases in the community now go unrecognised and are therefore unreported.
- A very small proportion of people with IID (~2%) contacted NHS Direct. Contact with NHS Direct was insufficient to account for the observed drop in rates of consultation to GP.
- The incidence of IID estimated from the telephone survey of self-reported illness were between two and five times higher than the cohort study depending on the recall period (28 days and seven days respectively). Data from other studies in the project and from external sources suggested that the cohort study provided more reliable estimates and so this was used to determine IID rates in the community.

The full report is available at the link below.

Additional Info

For further information or access to the IID2 specimens, you should email either: Professor Sarah O'Brien at S.J.Obrien@liverpool.ac.uk or Paul Cook at paul.cook@food.gov.uk

Published Papers

'A Longitudinal study of infectious intestinal disease in the UK (IID2 Study): incidence in the community and presenting to general practice' is available on GUTs website at the link below.

Other related papers include:

1. Food Standards Agency (2000). A report of infectious intestinal disease in England. London: The Stationary Office
2. O'Brien SJ, Rait G, Hunter PR et al. (2010) Methods for determining disease burden and calibrating national surveillance data in the United Kingdom: the second study of infectious intestinal disease in the community (IID2 Study). *BMC Med Res Methodol.* May 5; 10:39
3. Tam, C.C., Rodrigues, L.C., Viviani, L., Dodds, J.P., Evans, M.R., Hunter, P.R., Gray, J.J., Letley, L.H., Rait, G., Tompkins, D.S. & O'Brien, S.J. (2012) Longitudinal study of infectious intestinal disease in the UK (IID2 Study): incidence in the community and presenting to general practice. *Gut* 61(1), 69-77 doi: 10.1136/gut.2011.238386
4. Tam, C.C., O'Brien, S.J., Tompkins, D.S., Bolton, F.J., Berry, L., Dodds, J., Choudhury, D., Halstead, F., Iturriza-Gómara, M., Mather, K., Rait, G., Ridge, A., Rodrigues, L.C., Wain, J., Wood, B., Gray, J.J. & the IID2 Study Executive Committee (2012) Changes in causes of acute gastroenteritis in the United Kingdom over 15 years: microbiologic findings from two prospective, population-based studies of infectious intestinal disease. *Clin. Infect. Dis.* (2012) 54(9),1275-1286, doi: 10.1093/cid/cis028
5. Nawaz S, Allen DJ, Aladin F, Gallimore C, Iturriza-Gómara M (2012) Human Bocaviruses Are Not Significantly Associated with Gastroenteritis: Results of Retesting Archive DNA from a Case Control Study in the UK. *PLoS ONE* 7(7): e41346. doi:10.1371/journal.pone.0041346
6. Royal College of General Practitioners (RCGP) Weekly Returns Service
7. Tam CC, Viviani L, Rodrigues LC, O'Brien SJ. The second study of infectious intestinal disease (IID2): increased rates of recurrent diarrhoea in individuals aged 65 years and above. *BMC Public Health* 2013, 13:739. DOI: 10.1186/10.1186/1471-2458-13-739
8. Viviani L, van der Es M, Irvine L, Tam CC, Rodrigues LC, Jackson KA, O'Brien SJ, Hunter PR; IID2 Study Executive Committee. Estimating the Incidence of Acute Infectious Intestinal Disease in the Community in the UK: A Retrospective Telephone Survey. *PLoS One.* 2016 Jan 25;11(1):e0146171. doi: 10.1371/journal.pone.0146171
9. O'Brien SJ, Donaldson AL, Iturriza-Gomara M, Tam CC. Age-Specific Incidence Rates for Norovirus in the Community and Presenting to Primary Healthcare Facilities in the United Kingdom. *J Infect Dis.* 2016 Feb 1;213 Suppl 1:S15-8. doi: 10.1093/infdis/jiv411
10. Harris JP, Iturriza-Gomara M, O'Brien SJ. Estimating Disability-Adjusted Life Years (DALYs) in Community Cases of Norovirus in England. *Viruses.* 2019 Feb 21;11(2). pii: E184. doi: 10.3390/v11020184.
11. Harris JP, Iturriza-Gomara M, Allen DJ, Kelly S, O'Brien SJ. Norovirus strain types found within the second infectious intestinal diseases (IID2) study an analysis of norovirus circulating in the community. *BMC Infect Dis.* 2019 Jan 25;19(1):87. doi: 10.1186/s12879-019-3706-z

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