

# The Second Study of Infectious Intestinal Disease in the Community (IID2 Study)

## SUMMARY

### Background

The burden of infectious intestinal disease (IID) in the UK is high. IID, often presenting as diarrhoea and/or vomiting, is caused by a range of microorganisms such as bacteria (e.g. *Salmonella* and *Campylobacter*), viruses (e.g. norovirus and rotavirus) and parasites (e.g. *Cryptosporidium*). A large proportion of IID can be prevented by employing good basic hygiene. Although transmission via food (including water) accounts for a percentage of IID, a substantial amount arises via other routes, including person-to-person spread.

### IID2 Study

The purpose of the IID2 Study was primarily to find out the incidence of IID in the UK, what microorganisms cause it and to find out if the situation had changed since a similar study conducted in England in the mid-1990s (IID1<sup>1</sup>). A secondary aim was to compare official statistics with the “true” level of IID experienced by people in the community.

IID2 involved seven separate but related studies<sup>2</sup>:

- a Prospective Population-Based Cohort Study, involving 6,836 people recruited from 88 General Practices across the UK
- a General Practice (GP) Presentation Study which involved obtaining samples for laboratory testing from everyone who consulted their healthcare team with symptoms of diarrhoea and/or vomiting in 37 practices across the UK.
- a GP Validation Study, auditing the recruitment of the 37 practices in the GP Presentation Study

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<sup>1</sup> Food Standards Agency (2000). A report of infectious intestinal disease in England. London: The Stationary Office.

<sup>2</sup> O'Brien SJ, Rait G, Hunter PR *et al.* 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. 2010 May 5; 10: 39

- a GP Enumeration Study, involving 40 practices in which Study Nurses searched practice records for patients presenting with an episode of IID.
- a Microbiology Study whereby stool samples from the Cohort and GP Presentation Studies were examined using state-of-the-art laboratory practices.
- a National Reporting Study to compare the incidence estimates from the other studies with those generated from national surveillance.
- a retrospective Telephone Survey of self-reported illness, involving 14,726 people across the UK

The results from these studies were used to generate estimates of the burden of IID in the community and presenting to General Practice in the UK and to identify the microorganisms responsible for causing IID where possible. Using results from the different elements of the study it was also possible to work out the extent to which the “true” burden of IID in the community is reflected in national surveillance statistics.

All elements, except the National Reporting Study, were piloted between 3 September 2007 and 1 December 2007. The main studies took place between 1 February 2008 and 31 August 2009. Cases were defined as: *‘People with loose stools or clinically significant vomiting lasting less than 2 weeks, in the absence of a known non-infectious cause, preceded by a symptom-free period of 3 weeks.’*

## **Key findings**

### ***UK Situation***

- The incidence of IID in the community in the UK was substantial, with around 1 in 4 of the population suffering from an episode of IID in a year – up to 17 million cases annually<sup>3</sup>. Around 2% of the population visit their GP with 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. The University of Manchester has calculated that

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<sup>3</sup> Tam CC, Rodrigues LC, Viviani L *et al.* Longitudinal study of infectious intestinal disease in the UK (IID2 Study): incidence in the community and presenting to general practice. *Gut*. 2011 Jul 5 [Epub ahead of print]

this represents in nearly 19 million days lost (over 11 million days lost in people of working age).

- The most commonly identified microorganisms found in stool samples from those with IID in the community were norovirus (16.5%), sapovirus (9.2%), *Campylobacter* spp. (4.6%) and rotavirus (4.1%).
- The most commonly identified microorganisms found in stool samples from those with IID presenting to GPs were norovirus (12.4%), *Campylobacter* spp. (13%), sapovirus (8.8%) and rotavirus (7.3%).
- 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 1 specimen tested positive for *Clostridium difficile* (<1%), suggesting that this microorganism which is usually associated with healthcare settings is not found very often in the community at large.

#### ***Situation in England in 2008-9 compared with the mid-1990s***

- The rate of IID in the community in England was 43% higher in 2008-9 (IID2) than in 1993-6 (IID1), whilst the number of people visiting their GP about IID was 50% lower.
- Reporting of IID to national statistics had improved for those presenting to their GP with symptoms, suggesting 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 GP for an episode of IID. Therefore more cases in the community now go unrecognised and, 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 general practice.
- The rates of IID estimated from the telephone survey of self-reported illness were between 2 and 5 times higher than the rates in the Cohort Study depending on the length of recall (28-days or 7-days respectively). Data from the other studies in the project and from external sources<sup>4</sup> suggest the Cohort

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<sup>4</sup> Royal College of General Practitioners (RCGP) Weekly Returns Service

Study provided more reliable estimates and so this was used to determine IID rates in the community.

## **Implications of the Study**

The Food Standards Agency (FSA) commissioned and funded the IID2 Study with contributions from the Department of Health and the NHS, to assess the public health impact of IID overall. The results provide essential information needed for estimating the burden of foodborne disease in the UK. Since not all IID is foodborne, further work is required to estimate the burden of foodborne disease and to update the models currently used to estimate foodborne disease, which were published in 2002<sup>5</sup> using data gathered between 1992 and 2000. Now, 10 years on, the findings from the IID2 Study and data collected more recently will be used to estimate the current burden of foodborne disease (cases, hospitalisations, deaths) in the UK. This data is required by the FSA for monitoring purposes but is also fundamental to identify strategic priorities for improving food safety. This work is being funded by the FSA; results are expected in 2012.

The IID2 Study findings confirm that IID continues to represent a considerable disease burden in the UK and that further efforts are required to control the microorganisms causing IID. It is already clear from the findings that the FSA's focus on tackling *Campylobacter* as part of the Foodborne Disease Strategy (FDS) 2010-15 is warranted. The FSA also recognises the importance of viral causes of IID, particularly norovirus. Since a proportion of these infections are foodborne, a research programme has been established within the Foodborne Disease Strategy to gather evidence to support development of a Norovirus Risk Management Programme in future. In addition, the Advisory Committee on the Microbiological Safety of Food (ACMSF) has established a working group on foodborne viruses to review this subject, make recommendations for prevention and control and identify research priorities. Despite spending cuts across Government, the FSA has identified the reduction of foodborne disease as a key strategic priority in the 2010-2015 Strategic Plan. This work will remain a high priority for the FSA.

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<sup>5</sup> Adak G.K., Long S.M. and O'Brien S.J. (2002). Trends in indigenous foodborne disease and deaths, England and Wales: 1992 to 2000. *Gut* **51**: 832-841.

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