



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive



2006

**EPIDEMIOLOGY OF
ROTAVIRUS
IN IRELAND**



Table of Contents

Acknowledgements	3
Summary	4
Introduction	5
Case Definitions	6
Materials and Methods	7
Results	8
Discussion	12
References	14

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Further information:

For further information on rotavirus in Ireland, please see:
<http://www.ndsc.ie/hpsc/A-Z/Gastroenteric/Rotavirus/>

Summary

- Rotavirus remains one of the most common causes of acute infectious gastroenteritis in Ireland
- In 2006, there were 2112 cases of rotavirus notified (CIR 50.0/100,000)
- The highest burden of illness was in children under 2 years of age
- In 2006, the highest incidence rate was reported from the HSE-NW region

Introduction

Rotavirus is the most common cause of acute gastroenteritis in children worldwide and a frequent cause of diarrhoea associated deaths in developing countries. In developed countries, mortality due to rotavirus is low; however the morbidity and economic costs associated with infection are significant. Illness is characterised by sudden onset diarrhoea and vomiting, often with mild fever. Occasionally there is blood in stools. Symptoms usually last for only a few days but in severe cases hospitalisation may be required due to dehydration.

Transmission is usually person-to-person, mainly via the faecal-oral route. Children less than two years of age are most susceptible to infection, although cases are often seen in elderly and immuno-compromised adults – particularly in institutional settings. Transmission can be rapid, through person-to-person contact, airborne droplets, or contact with contaminated objects such as toys.

Case Definitions

Acute infectious gastroenteritis:

Case classification

Possible: N/A

Probable: Acute onset of diarrhoea and/or vomiting with no known non-infectious cause

Confirmed: If a laboratory diagnosis has been made see definition for specific organism

Note:

Rotavirus, although not specifically listed, should be reported under the category of acute infectious gastroenteritis

Taken from Case Definitions for Notifiable Diseases. Infectious Diseases (Amendment No. 3) Regulations 2003 (SI No. 707 of 2003). Available at <http://www.hpsc.ie>

Materials and Methods

Acute Infectious Gastroenteritis became a statutorily notifiable disease for the first time in January 2004 under the Amendment to the Infectious Diseases Regulations. Only cases of rotavirus and 'gastroenteritis unspecified' are notifiable under this disease category. Prior to 2004, rotavirus was only notifiable as a generic disease category of 'gastroenteritis in children less than two years of age'. Data for this report were extracted and analysed from the CIDR system.

Data analysis for this report was performed using Business Objects Reporting in CIDR and MS Excel. Census of Population 2006 figures were used as denominator data in the calculation of incidence rates. The acute infectious gastroenteritis and rotavirus data from CIDR presented in this report are based on data extracted from the CIDR system on 23rd July 2007. These figures may differ from those published previously, due to ongoing updating of notification data on CIDR.

Results

Incidence

There were 2306 notifications of acute infectious gastroenteritis (AIG) in 2006. Rotavirus was the causative organism identified in 2112 (92%) of these, giving a crude incidence rate (CIR) of 50.0 cases per 100,000 population (table 1).

This represents a decrease compared to 2005, when 2251 cases of rotavirus were notified (CIR 53.1 cases per 100,000).

Regional variation was observed in the number of cases reported (Table 1), with the highest incidence rate reported from the HSE-NW region, and the lowest rate reported from the HSE-E region. Most regions noted a decrease in the rate of rotavirus infection compared to 2005, but an increase was seen in the HSE-NW and the HSE-S regions. Figure 1 depicts the crude versus age standardised incidence rates for each HSE region in 2006.

Table 1. Number of cases, CIR and ASIR of rotavirus infections in Ireland by HSE area, 2006, and total number with crude incidence rate for 2004-2005.

HSE Area	No. of cases	CIR incl. 95% C.I.	ASIR incl. 95% C.I.
E	588	39.2 [36.0 - 42.4]	40.3 [37.0 - 43.5]
M	187	74.3 [63.7 - 85.0]	67.1 [57.4 - 76.7]
MW	96	26.6 [21.3 - 32.0]	26.8 [21.4 - 32.2]
NE	116	29.4 [24.1 - 34.8]	26.2 [21.4 - 30.9]
NW	203	85.6 [74.0 - 97.3]	84.3 [72.7 - 95.8]
SE	221	48.0 [41.6 - 54.2]	46.6 [40.5 - 52.7]
S	394	63.4 [57.1 - 70.0]	65.9 [59.4 - 72.4]
W	307	74.1 [66.0 - 82.3]	76.9 [68.3 - 85.4]
Total 2006*	2112	50.0 [48.0 - 52.0]	-
Total 2005*	2251	53.1 [50.9 - 55.3]	-
Total 2004*	1600	37.8 [35.9 - 39.6]	-

*Rates calculated using 2006 census data and may differ from previously published rates

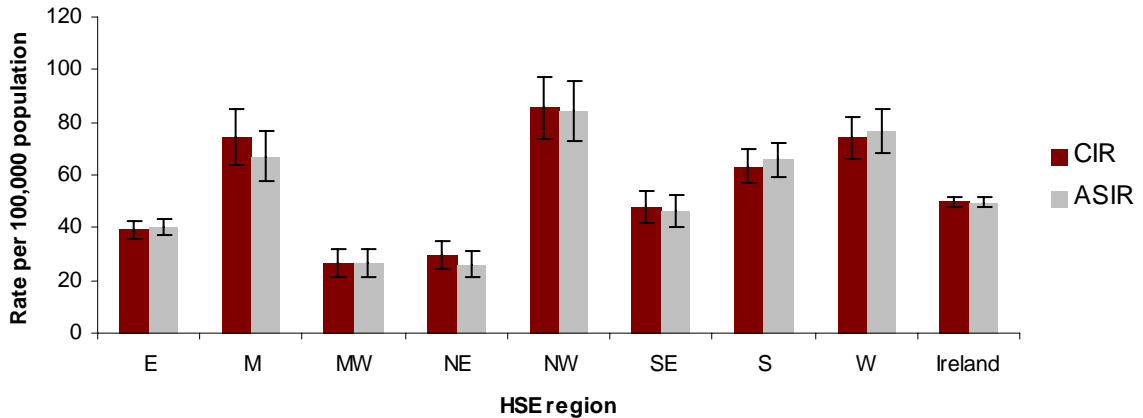


Figure 1. Crude incidence rate versus age standardised incidence rate for human rotavirus infections in Ireland, 2006.

Seasonal distribution

Rotaviral infection has a well documented seasonal pattern with peaks in cases occurring each year in later winter/ early spring. Analysis of the data by week of notification from 2004 to 2006 is shown in Figure 2. In 2006, a peak in cases was observed during week 17, which was the same week the 2005 peak occurred. (There is a ‘false’ second peak seen in 2005 during week 33, 2005 which is attributable to bulk uploading of notifications for the HSE-W region).

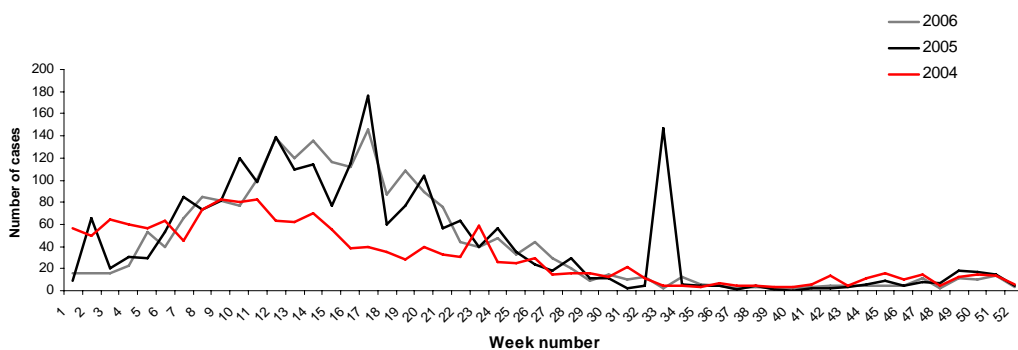


Figure 2. Seasonal distribution of rotavirus events by week, 2004-2006

Age

Rotavirus is primarily a paediatric illness and when the distribution of cases by age-group is examined, it is evident that the highest burden of illness is seen in children less than five years (Table 2). A further breakdown of these figures reveals that the majority (n=2026) of infections occurred in children less than two years of age. There has been a continuous increase in the number of cases affecting this age group over recent years (Figure 3). However, as rotavirus only became notifiable in 2004 it is possible that figures for previous years underestimate the true burden of infection and this should be borne in mind when analyzing these data.

Table 2. Age specific incidence rates for rotavirus in Ireland, 2006

Age Group (Years)	Number of cases	Age specific incidence rate
0-4	2045	676.6
5-9	32	11.1
10-14	6	2.2
15-19	0	0
20-24	0	0
25-34	0	0
35-44	3	0.5
45-54	1	0.2
55-64	2	0.5
65+	17	3.6
Unknown	6	0
Total	2112	50.0

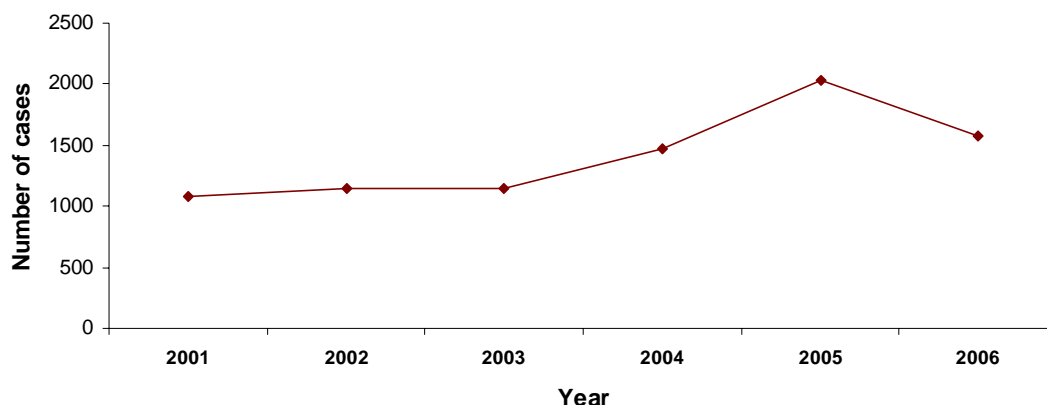


Figure 3. Number of cases of rotavirus in children less than two by year, 2001 to 2006

Gender distribution

Males accounted for 1068 cases (50.6%); females 1026 (48.6%), with 0.9% of cases unknown. This represented a ratio of 1.04:1. This was similar to previous years when a significant gender bias was not observed (1.11:1 in 2005).

Outbreak data

There were three rotavirus outbreaks notified in 2006, 2 general and one family. The general outbreaks occurred in a hospital and a residential institution and there were six people reported ill in each.

Discussion

In 2004, rotavirus infections became statutorily notifiable for the first time under the disease category Acute Infectious Gastroenteritis (Amendment to the Infectious Diseases Regulations). Prior to 2004 only gastroenteritis cases in children under two years of age were notifiable.

The crude incidence rate (CIR) of rotavirus decreased in Ireland in 2006 (50 cases/100,000) compared to 2005 (53 cases/100,000). Most regions noted a decrease in the rate of rotavirus infection compared to 2005, but an increase was seen in the HSE-NW and the HSE-S regions. The overall national rate of infection in Ireland is still considerably higher than that in England and Wales¹ (25.6/100,000), Northern Ireland² (25.3/100,000) and Scotland³ (33.4/100,000). However it should be borne in mind that as rotavirus is not statutorily notifiable in the UK, meaningful comparisons cannot be made.

Rotavirus has a well documented seasonal trend with peaks each year in countries with temperate climates in late winter/ early spring. The 2006 data demonstrates a consistent trend with a peak reported in the same week as in 2005 (week 17).

Rotavirus is the commonest reported cause of acute gastroenteritis in children under five years of age in Ireland, as well as worldwide and it is a widely accepted theory that every child will have a rotavirus infection within the first five years of life⁴. These early infections induce long-lasting immunity and are the reason infections are uncommon in adulthood. This acquired immunity has prompted much research into the development of an effective vaccine in recent decades and is a high priority for international agencies such as WHO and the Global Alliance for Vaccine and Immunisations^{5,6}. Major developments have taken place in this field of research in recent years, with the licensing of two vaccines against rotavirus in Europe in the past year (*Rotarix and Rotateq*). The United States have already introduced one of

these vaccines (*Rotateq*) as part of their national childhood vaccination schedule⁷, while the majority of European countries, including Ireland, are still considering this decision.

These new safe and effective vaccines offer the best hope of reducing the toll of acute gastroenteritis due to rotavirus in both developed and developing countries.

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