

IMPACT OF PAEDIATRIC ACUTE GASTROENTERITIS AND ROTAVIRUS GASTROENTERITIS ON FAMILY LIFE: THE REVEAL* STUDY

*Rotavirus Gastroenteritis Epidemiology and Viral Types in Europe Accounting for Losses in Public Health and Society

Marie Van der Wielen¹, Liviana da Dalt², Carlo Giaquinto², Leif Gothefors³, Christel Huelse⁴, Frédéric Huet⁵, Martina Littmann⁴, Melanie Maxwell⁶, José María Paricio Talayero⁷, Biagio Pedalino⁸, Peter Todd⁶, Miguel Tomás Vila¹⁰, Pierre Van Damme¹, for the REVEAL Study Group.

¹University of Antwerp, Belgium; ²University of Padua, Italy; ³Umeå University, Sweden; ⁴Landesgesundheitsamt, Rostock, Germany; ⁵Hôpital d'Enfants, Dijon, France; ⁶Wirral Hospital NHS Trust, Merseyside, UK; ⁷Hospital Marina Alta, Denia, Spain; ⁸Sanofi Pasteur MSD, Lyon, France; ⁹Hospital Francesc de Borja, Gandia, Spain

INTRODUCTION

- Rotavirus gastroenteritis (RVGE) is the most frequent cause of severe diarrhoea in children <5 years old,¹ with 57% to 74% of cases occurring in those aged 6 to 23 months.²
- Up to 20 episodes of diarrhoea and vomiting can occur per day in severe RVGE cases.³ Dehydration and death can follow, with estimates of ~611,000 deaths annually worldwide⁴ and 231 deaths in the European Union (EU).⁵
- While mortality is relatively low in industrialised regions, the very high incidence of RVGE morbidity remains a substantial burden for children, families, healthcare providers and society in the EU.^{2,6-8}
- The only effective method for reducing this burden is through immunisation with recently available rotavirus vaccines. Immunisation strategies should be based on the incidence of RVGE by age, the causative serotypes, and the total disease burden, including the wider impact on families. Comprehensive Europe-wide data, however, have been lacking to date.
- The Rotavirus Gastroenteritis Epidemiology and Viral Types in Europe Accounting for Losses in Public Health and Society (REVEAL) Study has assessed the annual incidence rates of acute gastroenteritis (AGE) and RVGE in children <5 years old seeking medical attention in primary care, emergency care, and hospital settings in 7 European countries. The study findings have been reported recently.^{2,6,7,9}
- We present REVEAL Study data on the impact of paediatric AGE and RVGE on families.

METHODS

- This was a prospective, 1-year observational study conducted in the 2004–2005 season using a common protocol in Belgium, France, Germany, Italy, Spain, Sweden and the UK.
- In each country, a study area was selected (population ~255,000), in which all hospitals and emergency rooms that might see children with AGE, and a sample of primary care physicians (general practitioners and/or paediatricians), were included.
- All children <5 years old presenting with AGE during the 1-year study period were eligible. AGE was defined as an episode of at least 3 loose stools, at least 3 watery stools, or forceful vomiting associated with gastroenteritis, in a 24-hour period in the 7 days before the medical visit; the episode must have been preceded by a 14-day symptom-free period.
- If a child visited >1 healthcare setting during the AGE episode, they were included in the study at the highest level of care, in increasing order: primary care, emergency room, hospital.
- Parents completed a follow-up questionnaire at the end of the episode to assess the ongoing management and burden of illness for families (Table 1).

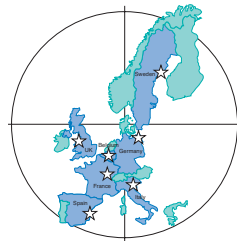


Table 1. Data collected from parents through a follow-up questionnaire to assess the ongoing management and burden of illness for families.

Clinical follow-up	
■	Description of symptoms and their duration, including vomiting, diarrhoea, fever, dehydration and behavioural symptoms
Additional healthcare utilisation since study inclusion visit	
■	Number of primary care, emergency room and home visits, including out-of-hours services
■	Telephone consultations
■	Hospitalisation and duration of hospitalisation
Cost and inconvenience of illness for families	
■	Number of working days lost by parents or other persons
■	Overnight stays by family members during hospitalisation
■	Number of days of exclusion from childcare settings
■	Need for alternative childcare arrangements (e.g. baby sitters, other family members)
■	Self medication (non-prescribed), including rehydration fluids
■	Extra nappies
■	Transportation needs
Levels of stress experienced by parents during the illness	
■	Ranking on a scale of 1 to 10 (1 = no stress experienced; 10 = felt extremely stressed)

Figure 1. Percentage of parents or another person who lost at least one work day due to their child's RVGE.

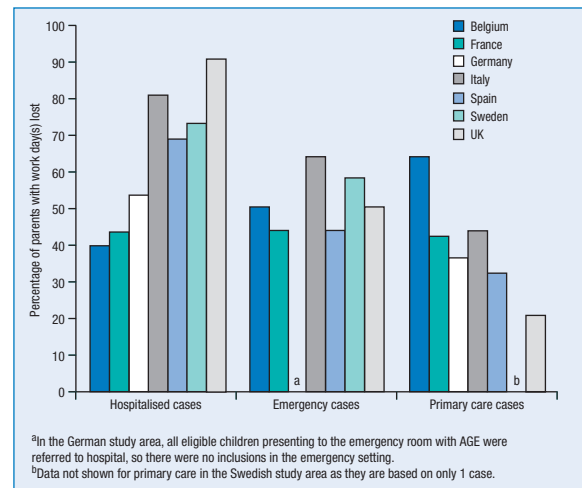
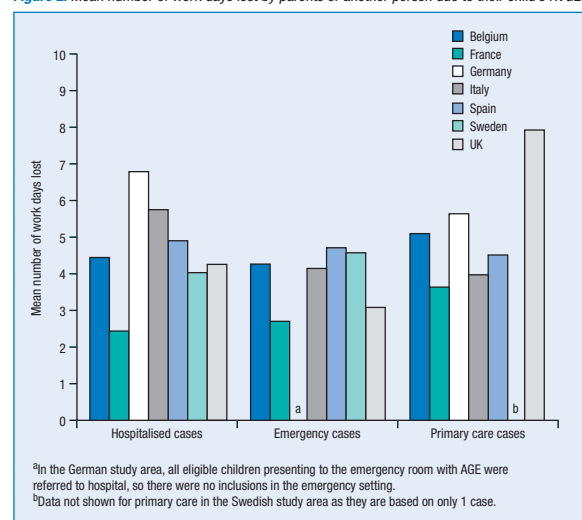


Figure 2. Mean number of work days lost by parents or another person due to their child's RVGE.



RESULTS

- Across all settings and study areas, at least one parent or other relative was absent from work for 20% to 91% of RVGE episodes (in primary care and hospital settings, respectively, in the UK; Figure 1).
- The mean number of work days lost by parents was 2.3 to 7.5 for RVGE (Figure 2) and 1.2 to 7.1 for non-rotavirus AGE, and was generally higher for RVGE.
 - Mean work days lost were higher with RVGE than non-rotavirus AGE in the primary care setting in all study areas and in the hospital setting in 4 study areas.
- Across study areas, for both RVGE and non-rotavirus AGE, additional childcare was required in up to ~22% of episodes and for up to 7 days.
- Parents of children with AGE experienced high levels of stress (Table 2).
 - With few exceptions across settings and study areas, mean stress levels were 5 or more on the 10-point scale.
 - In hospital, emergency room and primary care settings, maximum mean stress levels were 9.0, 8.6 and 8.4 for mothers and 8.6, 8.3 and 7.8 for fathers, respectively.
 - Mean stress levels were consistently higher for parents of children with RVGE in primary care; whereas, in hospital or emergency room settings, stress levels were similar irrespective of the type of AGE.

Table 2. Level of stress experienced by parents of children with RVGE (RV+) or non-rotavirus AGE (RV-); mean (SD) values on a scale of 1 = no stress to 10 = extremely stressed.

Study area	Parent	Hospital		Emergency room		Primary care	
		RV+	RV-	RV+	RV-	RV+	RV-
Belgium	Mother	7.4 (1.9)	7.9 (2.0)	4.5 (5.0)	7.5 (2.1)	6.6 (2.2)	5.1 (2.6)
	Father	6.8 (2.4)	6.2 (2.9)	4.5 (5.0)	7.5 (2.1)	6.4 (2.7)	5.0 (2.2)
France	Mother	8.3 (1.5)	7.9 (2.1)	7.1 (2.4)	6.1 (2.6)	5.8 (2.4)	5.4 (2.2)
	Father	6.9 (2.1)	6.6 (2.5)	6.1 (2.6)	5.4 (2.6)	5.1 (2.4)	4.6 (2.5)
Germany	Mother	8.5 (1.8)	7.4 (2.4)	— ^a	— ^a	6.6 (2.3)	5.7 (2.3)
	Father	7.4 (2.9)	4.9 (2.7)	— ^a	— ^a	5.7 (2.6)	4.0 (2.4)
Italy	Mother	7.5 (2.4)	9.0 (1.3)	7.7 (2.1)	8.1 (2.0)	5.5 (2.6)	4.4 (2.6)
	Father	7.3 (2.5)	8.2 (1.8)	6.9 (2.4)	7.6 (2.1)	4.8 (2.5)	3.8 (2.3)
Spain	Mother	9.0 (1.4)	8.4 (1.6)	8.6 (1.5)	8.3 (1.6)	7.2 (2.1)	7.1 (2.0)
	Father	8.6 (1.6)	8.2 (1.8)	8.3 (1.8)	7.7 (2.0)	6.6 (2.3)	6.0 (2.4)
Sweden	Mother	6.7 (2.2)	6.4 (2.6)	6.5 (2.5)	6.1 (2.4)	8.0 ^b	4.8 (2.7)
	Father	5.3 (2.5)	5.9 (2.1)	5.8 (2.7)	5.2 (2.3)	7.0 ^b	4.1 (2.5)
UK	Mother	8.9 (1.5)	7.0 (2.0)	7.4 (2.0)	8.5 (1.6)	8.4 (1.4)	7.4 (2.2)
	Father	7.5 (2.7)	7.1 (1.5)	6.6 (2.4)	8.2 (1.6)	7.8 (1.8)	6.6 (2.1)

^aIn the German study area, all eligible children presenting to the emergency room with AGE were referred to hospital, so there were no inclusions in the emergency setting.
^bSD not calculated. Data for Sweden are based on only 1 case in primary care and should be interpreted with caution.

CONCLUSIONS

- The REVEAL Study was the first large, prospective, international study to investigate systematically the burden of paediatric AGE and RVGE across Europe in 3 clinical settings using a common protocol.
- The REVEAL Study has shown that RVGE has significant economic consequences for families resulting, in part, from work days lost and the cost of additional childcare.⁷
- RVGE was associated with greater loss of working days than non-rotavirus AGE in this and other studies.^{10,11} This might be because RVGE is more severe than non-rotavirus AGE, causing more frequent vomiting, dehydration, lethargy and fever.⁶
- Furthermore, our results show that paediatric RVGE is a source of considerable stress for parents. This is consistent with the results of a small study, which showed that paediatric RVGE causes parental fear, stress, worry and inconvenience – thus disrupting normal family life.¹²
- Our study has shed further light on the substantial economic burden, stress and disruption for families caused by paediatric RVGE. This burden could be reduced by routine rotavirus vaccination of infants, as a live oral pentavalent rotavirus vaccine has been shown in a pivotal trial to reduce lost work days associated with G1, G2, G3 and G4 RVGE by ~87% compared with placebo.¹³
- The REVEAL Study has provided essential data that support the introduction of routine immunisation for paediatric RVGE in Europe.

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