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Gastroenteric infections in Italy: cases reported in the area of Parma in the period January 2011 - April 2016

Adriana Calderaro¹, Sara Montecchini*², Mirko Buttrini³, Fabio Tummolo¹, Monica Martinelli¹, Silvia Covan¹, Maria Cristina Arcangeletti¹, Maria Cristina Medici¹, Carlo Chezzi¹, Flora De Conto¹

¹*Unit of Microbiology and Virology, Department of Clinical and Experimental Medicine, University of Parma*

²*Unit of Microbiology and Virology, Department of Medicine and Surgery, University of Parma*

³*University of Parma; Unit of Microbiology and Virology; Department of Clinical and Experimental Medicine*

Background: Despite the major efforts in public health to improve the quality of food and water and hygiene measures during the last century, acute gastroenteritis (AGE) still remains a major cause of morbidity and mortality worldwide. Although AGE in industrialized countries is usually characterized by low mortality and most cases are self-limiting, the direct and indirect costs can be significant. AGE is a common disease in both outpatients and inpatients that presents diarrhoea, nausea, vomit, and abdominal pain. The presence or absence of epidemiologic evidence (such as travel, hospitalization, antibiotic use) and clinical evidence (such as diarrhoea frequency and duration, severity of abdominal pain and fever, character of stools, presence of chronic illness or immune deficiency) can change the probability to detect each pathogen. However, the burden of AGE in the Italian population is usually underestimated mainly because the notification is poorly accomplished by physicians. The aim of the present study was to investigate the prevalence of pathogens causing gastroenteritis presenting to the University Hospital of Parma in the period January 2011-April 2016.

Material/methods: From January 2011 to April 2016, a total of 26,713 stool samples belonging to 22,751 patients (20,526 Italians and 2,225 foreigners) with acute gastroenteritis attending the University Hospital of Parma, Northern Italy, as inpatients and outpatients were submitted to virological (4,749 belonging to 4,318 patients) and/or bacteriological (21,964 belonging to 18,433 patients) investigations. The faecal specimens

were submitted to conventional assays (viruses cell cultures, electron microscopy, latex agglutination for group A rotavirus and adenovirus, polymerase chain reaction for norovirus, and culture for bacteria) or to gastrointestinal FilmArray Panel (from January 2016 for paediatric patients).

Results: A total of 2,352 patients (10.33%), 1,914 Italians (9%) and 438 foreigners (20%), were positive for at least one agent in the examined stools. In particular, viruses were detected in 1,121 patients (26%), 903 were Italians and 218 foreigners, 629 male (575 children and 54 adults) and 492 female (443 children and 49 adults); the most frequently identified viruses were norovirus (454), rotavirus (388), adenovirus (173), enterovirus (77). Bacteria were detected in 1,286 patients (7%), 1,073 were Italians and 213 foreigners, 707 male (406 children and 301 adults) and 579 female (288 children and 291 adults); the most frequently enteropathogenic bacteria detected were *Salmonella* spp. (318), *Campylobacter* spp. (213), *Escherichia coli* (65) and *Yersinia enterocolitica* (14).

Conclusions: This study emphasizes the high number of stools annually analyzed in the last years for AGE. The number of positive cases detected is unexpected in a restricted geographical area, and highlight the diversification in AGE etiology probably due to different factors, such as immigration, increased travelling, market globalization, modern food lifestyle, scientific progress as well as their biological characteristics and their high genetic variability.