Epidemiological profile of diarrheagenic pathogens detected by the FilmArray Gastrointestinal Panel in children with gastroenteritis in Parma, northern Italy
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Introduction and purpose
Gastroenteritis is a global health problem, resulting in high morbidity and mortality in children [1]. Despite the substantial burden of pediatric gastroenteritis, the etiologic profile of this disease remains poorly defined [2]. Clinical laboratories currently employ a variety of methods to detect the plethora of bacterial, viral and parasitic causes of gastroenteritis, a strategy that suffers from poor sensitivity, long turnaround times and costs [3]. In recent years, several multiplex PCR assays are available for the laboratory diagnosis of enteric infections [4]. This study shows the results of a 6-months study (January–August 2016) hospital-based surveillance activity for a large spectrum of diarrheagenic pathogens detected by a multiplex PCR system, FilmArray Gastrointestinal (FA-GI) Panel of BioFire, USA. Methods, Subjects: in children attending the University Hospital of Parma, northern Italy, with a clinical suspicion of bacterial and/or viral gastroenteritis admitted in the pediatric ward during the study period.

Results
The FA-GI Panel detected at least one agent in 247 (48%) of the 514 tested specimens. Of the 247 positive samples, 172 (71%) contained a single agent, whereas 75 (30%) contained multiple pathogens for a total of 342 agents (Figure 1). In particular, 52 specimens (21%) contained two agents, 15 (6%) contained three agents, 6 (2%) contained four agents, 19 (8%) of different agent combinations involving almost all detected pathogens were found (Table I).

Conclusions
The present study documents our experience adopting a multiplex, culture-independent panel for the detection of causative agents of gastroenteritis. The use of the FA-GI Panel has improved our capacity to detect infectious agents in gastroenteritis cases. The data reported herein historically underestimates the difficulty in predicting a specific etiology and in providing appropriate assays for pathogen detection. It also adds information about the high burden of co-infections in this disease, in most of the cases requiring hospitalization. A multiplex approach with comprehensive assay panel is pivotal to depict a complete picture of the etiology of gastroenteritis, to optimize the laboratory workflow and improve the timeliness of diagnosis.

Table I

Table II

Figure 1: Negative and positive cases resulted by the FA-GI Panel and number of agents detected.

Figure 2: Distribution of agents detected by the FA-GI Panel on single and mixed infection (A) in inpatients and outpatients (B) and by age group (C). In 247 stools belonging to children with gastroenteritis, January–August 2016.

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