THE PATHCARE NEWS

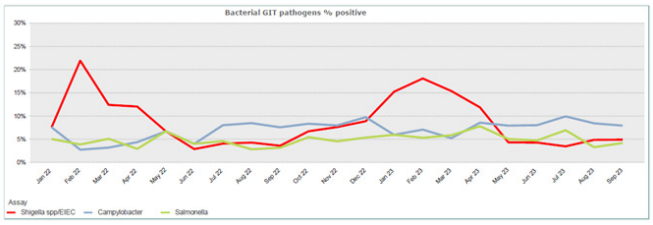
GASTRO-INTESTINAL PATHOGEN STATISTICS

In the past, our knowledge of the epidemiology of infective diarrhoea in routine clinical practice, was incomplete because the traditional methods of microscopy and culture are insensitive and detect only a limited range of pathogens. The introduction of a more sensitive and more comprehensive molecular panel enhances our understanding of the background epidemiology in our patient population.

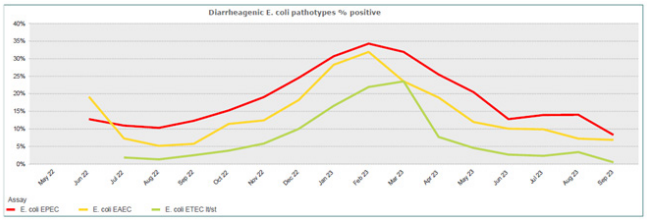
Here we present laboratory based data for all GIT molecular panels requested for patients at Pathcare laboratories since June 2022.

Bacteria

The traditional bacterial causes of diarrhoea - *Salmonella, Shigella* and *Campylobacter* – are all detected throughout the year. *Campylobacter* is the most common bacterial pathogen, detected in approximately 8% of samples, with *Salmonella* detected in 5%-6%, both with little seasonal variation. *Shigella*/Entero-invasive *E. coli* (EIEC) detection, in contrast, shows a marked seasonality, peaking at about 15% - 20% in late summer and dropping to less than 5% at other times in the year. (Please note, that with the current Biofire GIT molecular panel it is not possible to distinguish Shigella from EIEC nor typhoidal salmonella from non-typhoidal salmonella). All three pathogens may cause a self-limiting, acute bacterial diarrhoea, in a normal host and specific antimicrobial therapy is not indicated, except for severe infection or if the patient is immunocompromised.



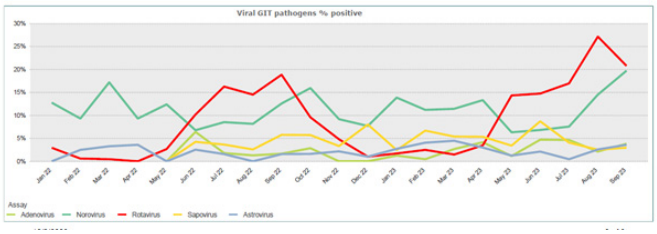
The GIT molecular panel also detects a number of diarrheagenic *E. coli* pathotypes: Enterotoxigenic *E. coli* (ETEC), Enteropathogenic *E.coli* (EPEC), Enteroaggregative *E. coli* (EAEC), Shiga toxin-producing *E. coli* (STEC) or Enterohaemorrhagic *E. coli* (EHEC) and *E. coli* (O157). Interestingly there is also an increase in detection of some of these E. coli pathotypes in summer, reaching up to 35% of all samples whereas baseline detection rates for EPEC and EAEC are around 5% - 15%. STEC is detected at low rates 2%-5% year round, and *E. coli* O157 is rarely detected. It is important to note that healthy, asymptomatic individuals, especially adults, can carry diarrheagenic *E. coli* in their gut flora and thus molecular detection of diarrheagenic *E. coli,* does not always correlate with symptomatic infection nor indicate disease.



Other bacterial pathogens such as Yersinia enterocolitica and Vibrio species are rarely detected (< 0.5%).

Viruses

Rotavirus is the leading cause of diarrhoea-related illness amongst children world-wide and the vaccine has reduced the burden of illness. This was the most common virus detected, with a clear seasonal increase in early winter, when it is detected in 15% -25% of samples. The highly transmissable caliciviruses, norovirus and sapovirus, were also commonly detected, averaging around 15-20% throughout the year. Both these viruses are associated with a sudden onset of nausea, vomiting and/or diarrhoea lasting 12 – 60 hours. Other viruses were less commonly detected, at under 5%.



Parasites

Cryptosporidium is the most common parasite detected at 4%. This is probably not surprising considering its resistance to chlorination and persistence in immunocompromised individuals. In immunocompetent adults, it causes a self-limited watery diarrhoea, not usually requiring treatment, but symptoms may persist for weeks to months. *Giardia*, which causes a slow-onset of acute diarrhoea or a chronic form with abdominal pain, loose stool, bloating and malabsorption with weight loss, is detected is <5% of samples and other parasites, such as *Entamoeba histolytica*, are rarely detected. No seasonal variation was noted for parasite detections.

Limitations

Like all routine laboratory surveillance, this data is dependent on sample submission by clinicians, and results may therefore, not be representative of the general population. These multiplex panels are often ordered at the discretion of a specialist, in patients requiring hospital admission. There is no correlation of laboratory data with clinical findings. The relatively small numbers of samples submitted for molecular testing mean that fluctuations in detection rates can sometimes occur by chance.

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