THE PATHCARE NEWS

GASTROINTESTINAL (GIT) PATHOGEN STATISTICS

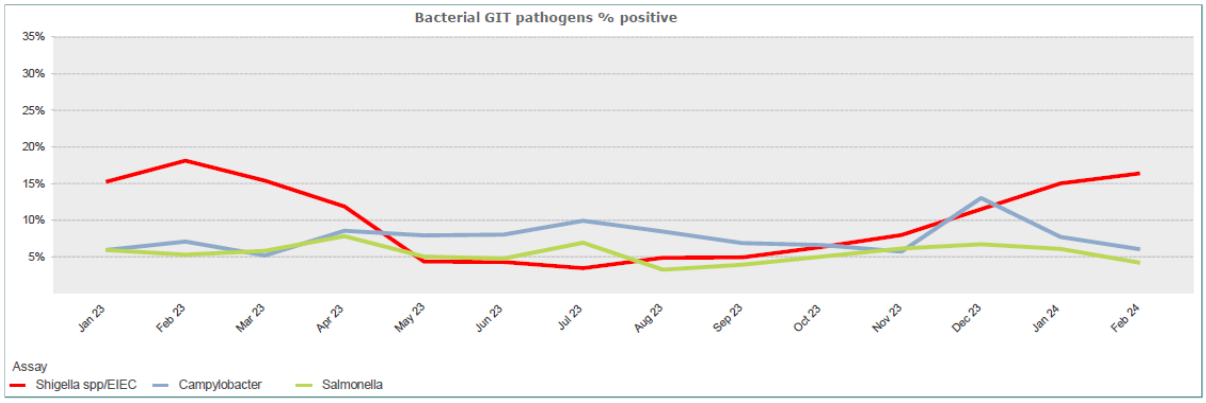
This report presents laboratory data for last quarter (December 2023 to February 2024) obtained from GIT molecular panels requested for patients via PathCare laboratories. Graphs include bacterial, viral and parasitic causes of diarrhoea detected on these panels for the past 14 months, enabling monitoring of seasonal trends. Overall, the distribution of pathogens detected in the last quarter is similar to that in the last summer season (Dec 2022- February 2023).

Bacteria

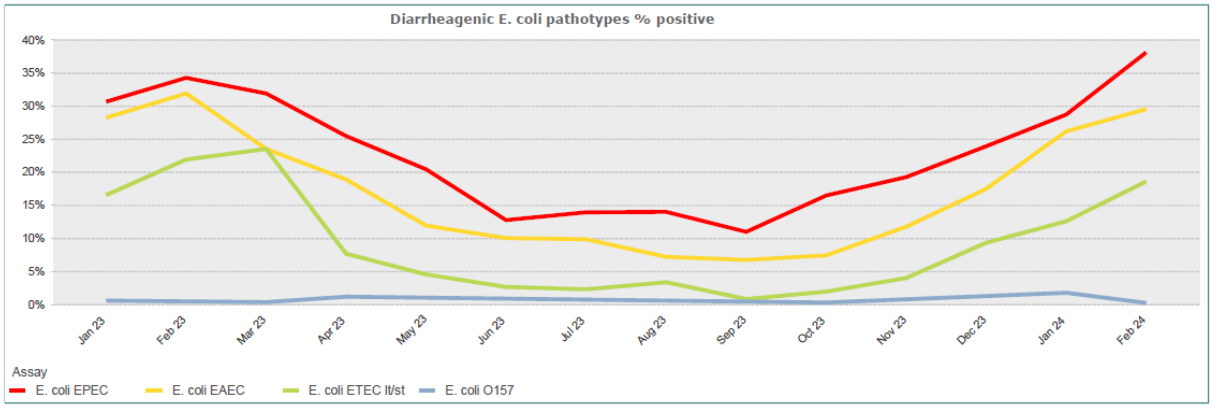
Increased numbers of *Shigella*/EIEC were detected over the past 3 summer months, ranging from 12- 16% of cases. Please note that *Shigella* species and Enteroinvasive *E.coi* (EIEC) cannot be differentiated by current molecular panels.

Campylobacter species detection rates increased modestly in the last quarter from approximately 7% to 13% although detection occurs throughout the year.

Salmonella species detection rates remained constant at 6%. Current molecular panels cannot differentiate typhoidal from non-typhoidal *Salmonella*. However, typhoidal *Salmonella* are very rare and the diagnosis would be confirmed by additional culture-based testing with clinical correlation.



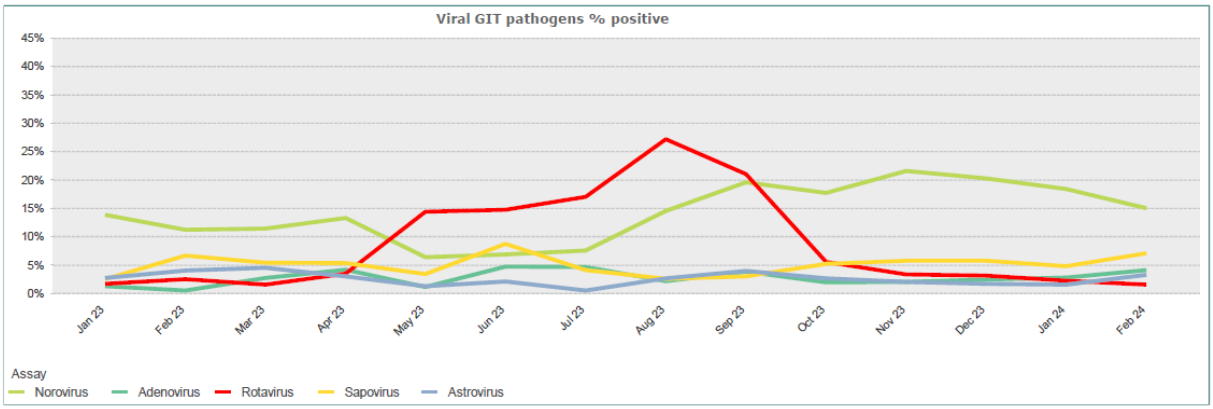
A seasonal increase in the detection of several diarrheagenic *E. coli* pathotypes was noted, reaching a peak of ≥ 30% for Enteropathogenic *E. coli* (EPEC) and Enteroaggregative *E. coli* (EAEC), and close to 20% for Enterotoxigenic *E. coli* (ETEC) in February.



Viruses

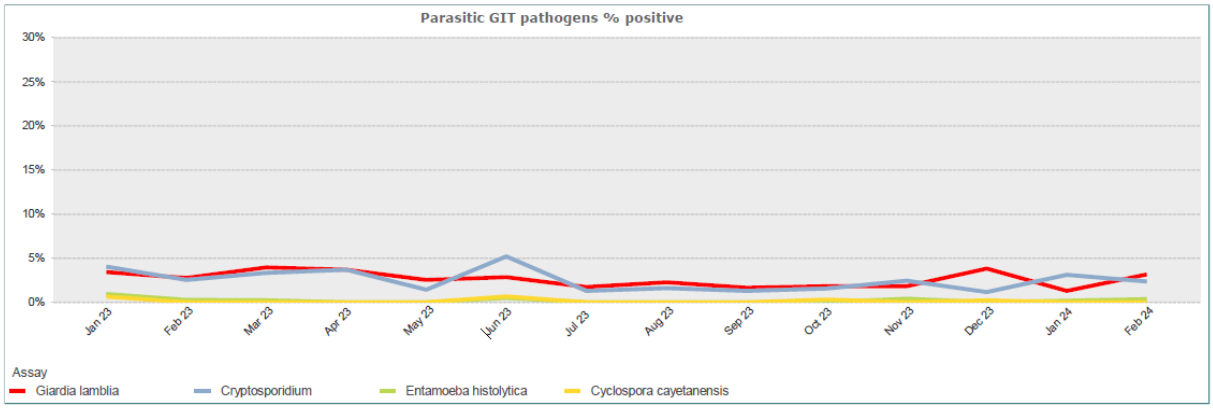
Norovirus was the predominant viral pathogen detected over the past 3 months with detection rates rising since August (14.5%) and peaked in November (21.5%), declining somewhat to 15% in February.

There has been a slight increase in detection rates of sapovirus rising to 7% in February. Other viral GIT pathogens, including rotavirus, remained very low (< 5%).



Parasites

Parasite detection rates remained consistently low (< 3%).



Co-detection of potential pathogens

Multiplex panels frequently detect potential pathogens concurrently, making it difficult to attribute disease to a particular organism. The significance of diarrheagenic *E. coli* in particular is difficult to determine since these organisms have not previously been detected outside of research settings.

For the 14 month period, 1 or more of EPEC, EAEC and ETEC pathotypes were detecetd in 36% of samples, with all three pathotypes detected in 10% of samples. The frequency of detection for the three pathotypes was EPEC 24%, EAEC 18% and ETEC 10%.

Samples containing these 3 pathotypes were also more likely to contain other pathogens such as *Shigella*/EIEC, *Campylobacter* species, norovirus, sapovirus, giardia or *Cryptosporidiium* species .

Diarrheagenic *E. coli,* such as EPEC and ETEC, cause infection mainly in young children especially in resource limited settings, while ETEC is a recognised cause of travellers' diarrhoea. Adults with immunity from previous infection may be asymptomatic carriers of these pathotypes. EAEC is not clearly associated with disease in adults or children in various settings, and it may more often be associated with asymptomatic carriage.[1]

Thus molecular detection of diarrheagenic *E. coli,* particularly in adults, does not always correlate with symptomatic infection nor indicate disease.

Entamoeba histolytica **infections**

E. histolytica causes intestinal infection or amoebic colitis. Extra-intestinal infection occurs occasionally affecting mainly the liver. Amoebiasis is rarely diagnosed in South Africa nowadays though it was more common in the past.

Based on analysis of molecular testing, we detected infection in 7 patients over the past 14 months. The patients included both adults and children and both males and females and were geographically dispersed over the country. The majority appeared to be significantly ill with sub-acute to chronic symptoms and evidence of inflammation. No parasites were detected on stool microscopy in the 3 cases in which microscopy was performed. Amoebiasis appeared to be an unexpected and delayed diagnosis in several patients. High dose metronidazole (750mg tds) for a prolonged duration of 10 days is the recommended treatment.

E. histolytica infection is uncommon but is probably under-diagnosed in the absence of molecular testing. It should be considered in any patient with persistent symptoms of diarrhoea and abdominal pain and inflammation.

Antimicrobial susceptibility patterns of GIT bacterial pathogens

Available antimicrobial susceptibility data for *Salmonella*, *Shigella* and *Campylobacter* species was analyzed for the past 12 - month period. Susceptibility data was available for a total of 1433 isolates comprising 741 *Salmonella* species, 659 *Campylobacter* species and 33 *Shigella* species.

Majority of the *Salmonella* isolates (99%) were non-typhoidal *Salmonella* species and only 7 isolates of *Salmonella* typhi were tested.

Variable susceptibility to ciprofloxacin was detected in the non-typhoidal *Salmonella* species, ranging between 60 – 90% susceptibility. Only 1 non-typhoidal *Salmonella* isolate showed resistance to ceftriaxone and was confirmed to be ESBL positive. Azithromycin susceptibility data was available for 367 (50%) of non-typhoidal *Salmonella* isolates, of which all tested susceptible.

Of the *S. typhi* isolates analyzed 4 were susceptible to ciprofloxacin, and all 7 isolates were susceptible to ceftriaxone.

All *Shigella* species isolates were susceptible to both ciprofloxacin and ceftriaxone. 90% of *Shigella* species were susceptible to azithromycin.

Of note there was significant resistance to ciprofloxacin detected amongst *Campylobacter* species with only approximately 30% isolates testing susceptible. Susceptibility rates of *Campylobacter* species to the macrolides (erythromycin and azithromycin) were high at approximately 90%.

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 requested at the discretion of a specialist, in patients requiring hospital admission who are likely to have more severe illness. The relatively high cost of certain molecular panels may also restrict routine use. 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.

References

1. Schuetz, A. Emerging agents of gastroenteritis: Aeromonas, Plesiomonas, and the diarrheagenic pathotypes of Escherichia coli. Seminars in Diagnostic Pathology 36 (2019) 187–19. https://doi.org/10.1053/j.semdp.2019.04.012

Compiled by Dr Colleen Bamford and Dr Magendhree Moodley **1 March 2024**