THE PATHCARE NEWS

GASTRO-INTESTINAL PATHOGEN STATISTICS

Laboratory-based data for all GIT molecular panels requested for patients at PathCare laboratories nationally, for the period June to August 2025, are presented in this report.

The trends observed for major bacterial and viral pathogens detected from stool samples of patients investigated for diarrhoeal disease over the winter period are in keeping with last year.

The use of a GIT molecular panel to identify the aetiology in a recent foodborne outbreak is included in this report.

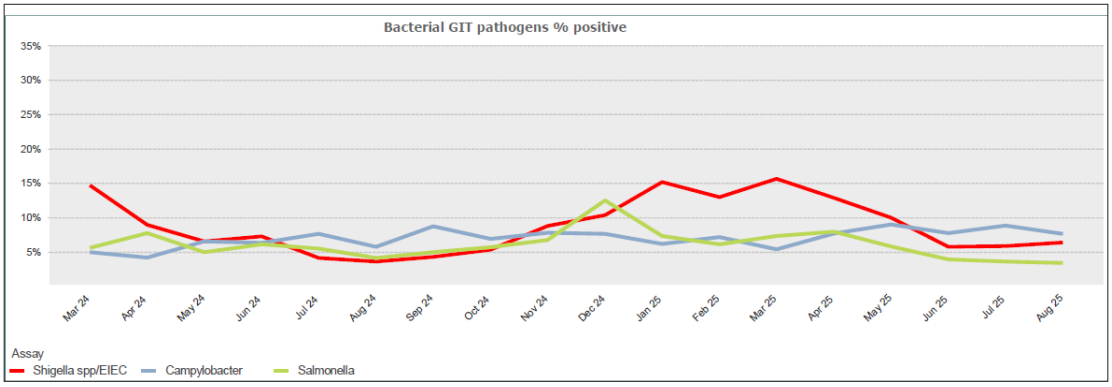
Bacteria

It is important to note that the current diagnostic multiplex panels cannot distinguish *Shigella* species from Enteroinvasive *E.coli* (EIEC) or typhoidal *Salmonella* from non-typhoidal *Salmonella*.

Shigella/EIEC was the most common bacterial stool pathogen detected during the period January to May 2025 with a peak detection rate of 20%. In the last 3 months cooler temperatures lead to a significant decline with an average detection rate for *Shigella*/EIEC of 7%.

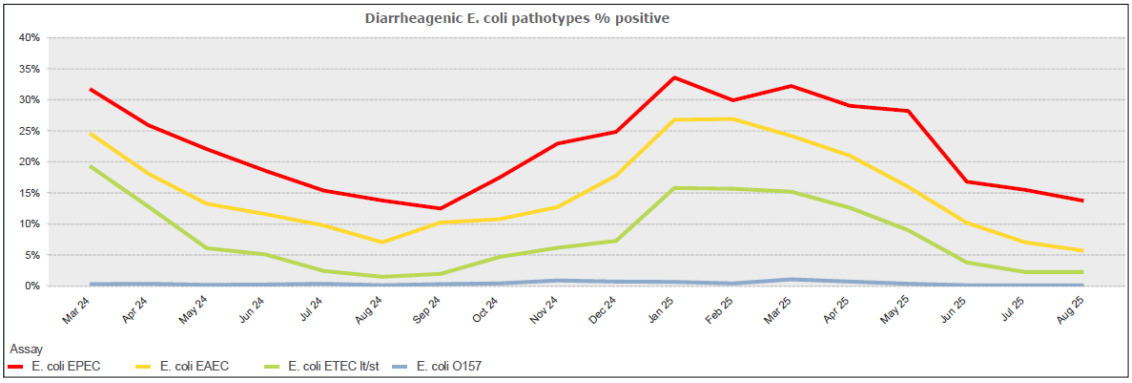
Salmonella species was also detected less frequently in winter, with an average detection rate of approximately 4% in the last 3 months.

Campylobacter species has been associated with a year-round baseline detection rate of between 5 to 10% from GIT panels. In the months of May to August detection rates are noted to be on the upper end, ranging from 7.6% to 9%.



The detection of *E.coli* pathotypes associated with diarrhoeal disease declined gradually following a peak in summer.

Enteropathogenic *E.coli* (EPEC) which was the most prevalent pathotype decreased from an average detection rate of approximately 30% in summer to 15% in the last 3 months. Enteroaggregative *E.coli* (EAEC) was detected in approximately 7% of samples in the last 3 months, followed by Enterotoxigenic *E.coli* (ETEC) having been detected in approximately 3% of stool samples in winter.



Viruses

Rotavirus

As expected, rotavirus detection rates increased significantly in the colder winter months. Case detection increased from the beginning of May, with the highest rate of 20% observed in August this year. Rates are expected to remain high in early spring.

Rotavirus remains the leading cause of diarrhoea in children under 5 years globally, with children between the ages of 3 months and 2 years being most at risk of severe rotavirus disease. Immunocompromised patients as well as the elderly are also at risk of severe rotavirus disease. The prevalence of rotavirus cases is the same in both low and high income settings.

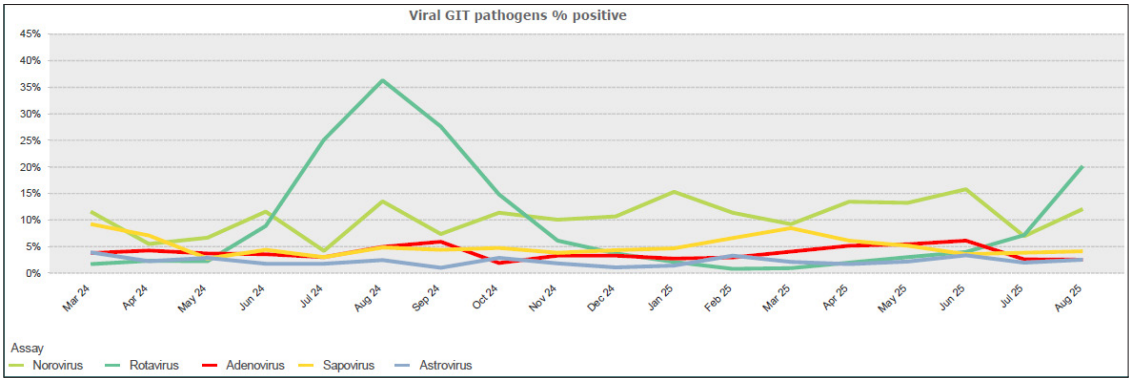
Rotavirus is transmitted easily via the faecal-oral route. Outbreaks occur in child care centres as well as hospitals. Vaccination against rotavirus has been the single most important intervention to significantly decrease morbidity and mortality.

The rotavirus vaccine is a live attenuated vaccine included in the South African Expanded Immunisation Program (EPI). It is usually administered as 2 doses at 6 weeks and 14 weeks of age. The vaccine is not administered after 24 weeks of age as it may increase the risk of intussusception. HIV infection is not a contraindication to rotavirus immunisation. A recently vaccinated infant may shed the rotavirus for a number of weeks after vaccination.

Symptoms of rotavirus infection include vomiting, watery diarrhoea, fever and stomach cramps. These symptoms occur 1-3 days after infection and may persist for 3-8 days. Children with profuse diarrhoea can develop severe dehydration rapidly. Fluid and electrolyte replacement is the mainstay of treatment.

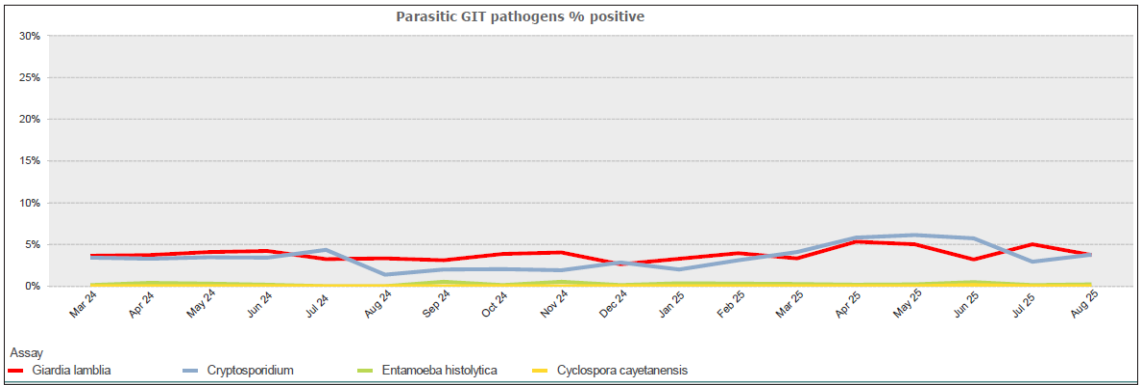
Norovirus

Norovirus monthly detection rates have ranged between 6.9% and 15.8% this year. An increase in rotavirus cases coincided with a transient decrease in norovirus cases mid-winter. This pattern was also observed last year. However, the higher case detection rates of norovirus was also observed in the colder winter months with rates of 15.8% in June and 12% in August.



Parasites

Cryptosporidium species and *Giardia lamblia* remain the most commonly detected parasites in the last 3 months with rates ranging between 3-5%.



The application of Molecular Diagnostics in Outbreak Investigations

In July this year the NICD published a report titled *"Investigation of a foodborne disease outbreak linked to a restaurant, City of Cape Town Metropolitan, Western Cape, South Africa, February 2024"* in the Public Health Bulletin South Africa. PathCare laboratories was involved in this outbreak investigation.

Foodborne outbreaks may be associated with significant morbidity, mortality and can raise public alarm. A coordinated response from various role players including public health authorities is necessary to address a suspected (or confirmed) outbreak.

Laboratory diagnostics plays a critical role in an outbreak investigation. This includes confirming the existence of an outbreak, identifying the source of the outbreak, and identifying additional cases. Furthermore, the functions of a modern diagnostic laboratory can significantly contribute to the efforts to contain the spread of an outbreak, as well as, aid in the management of affected cases. Early directed antibiotic therapy can improve clinical outcomes, decrease further shedding, and assist in containing the outbreak.

In February of 2024, PathCare was contacted by a general practitioner who raised the first suspicion of an outbreak, when two symptomatic patients had presented to him. The role of the laboratory and pathologist in a case like this is to advise appropriately on further actions as may be necessary and to provide diagnostic stewardship in terms of advising appropriate testing and screening of suspected cases.

The infectious agent of the outbreak was subsequently confirmed by our laboratory with a molecular multiplex PCR test, the Biofire® Gastrointestinal (GI) panel. Stool cultures of the index patients were negative, and this points to the added value of molecular tests such as the Biofire® (GI) panel over culture-based methods, offering rapid and superior diagnostic sensitivity.

This outbreak demonstrated the utility of molecular diagnostics in both the successful management of a foodborne outbreak with an advantage over routine culture, highlighting the usefulness of molecular assays in the correct setting.

An excerpt from the NICD report is included below. This report highlights the importance of food safety training to prevent foodborne diseases.

"Foodborne diseases (FBD) are a major contributor to morbidity and mortality worldwide, with an estimated 420 000 deaths globally each year and a loss of 33 million healthy life years. FBD outbreaks are a category 1 notifiable medical condition in South Africa and should be investigated to identify causative factors and institute corrective action to decrease morbidity and mortality. This report details the outbreak investigation and response following the notification of a suspected FBD outbreak linked to a restaurant. Overall, 46 suspected cases were identified: 12 staff members and 34 patrons. Clinical specimens (stool or rectal swabs) were collected from 49 individuals, and 33 tested positive for Shigella spp./Enteroinvasive Escherichia coli (EIEC) (6 patrons and 27 staff members). An inspection of the restaurant identified overstocking of cold storage and non-compliance with the first-in, first-out recommendation. Three food specimens had coagulase positive staphylococci higher than the acceptable limits, and one food specimen tested positive for Bacillus cereus. No definite source could be identified in this outbreak; however, it was hypothesised that a foodborne source was implicated (through contaminated food or a food handler). Shigella spp./EIEC was considered to be the causative organism. The outbreak was contained after the restaurant was closed for cleaning, retraining of restaurant staff, and isolation of ill staff."

Limitations

In keeping with other routine laboratory surveillance, this data is dependent on sample submission by clinicians. Results may, therefore, not be representative of the general population. There is no correlation of laboratory data and clinical findings.

Compiled by Dr Magendhree Moodley and Dr Hannes Slabbert **September 2025**