THE PATHCARE NEWS

GASTRO-INTESTINAL PATHOGEN STATISTICS

In this report we present laboratory-based data for all GIT molecular panels requested for patients at PathCare laboratories for the last two quarters (March to August 2024).

We have included graphs and data for bacterial, viral and parasitic causes of diarrhoea. Additionally, this report will include *Clostridioides difficile* data from molecular panels and a discussion around testing and interpretation.

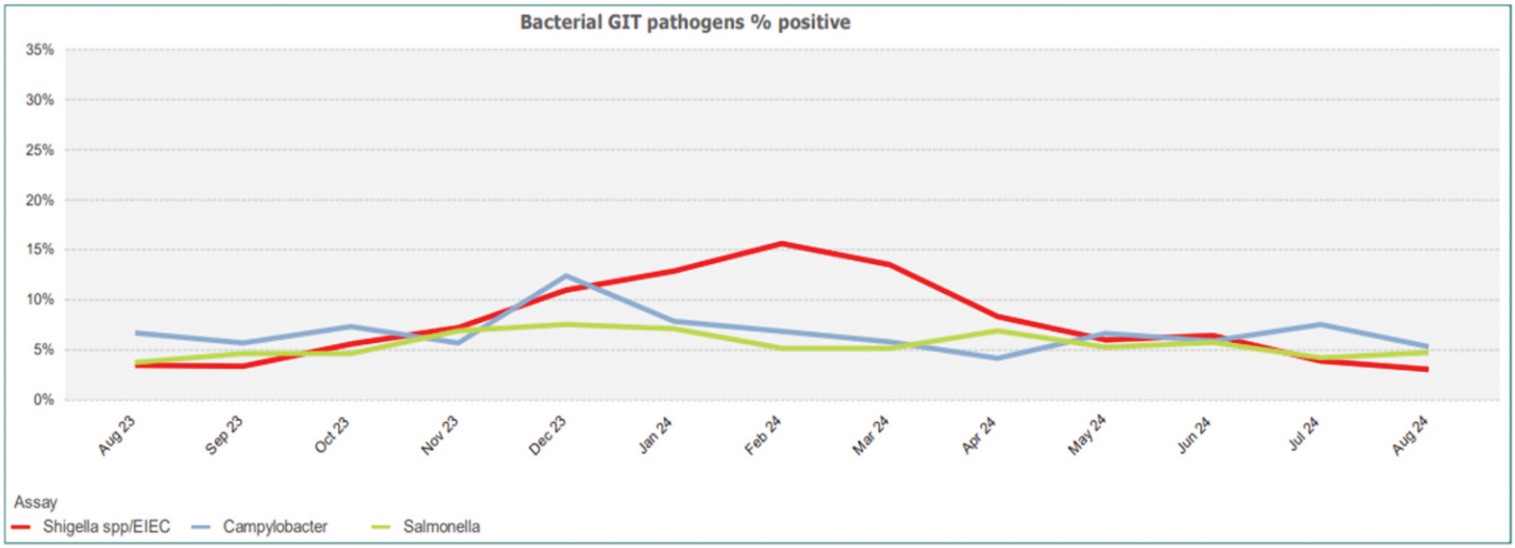
Detection of bacteria and parasites are in keeping with the previous year's trends.

As expected, there was also a significant seasonal increase in rotavirus cases detected early in winter, with a steady increase in the subsequent months.

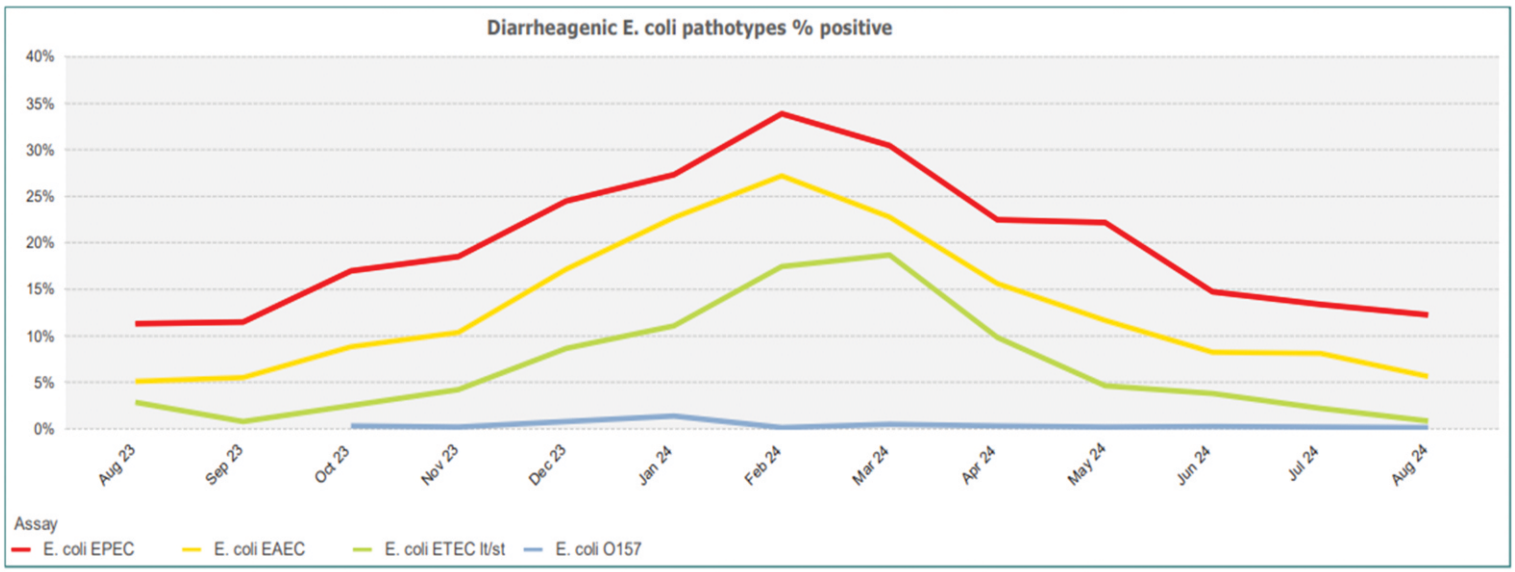
BACTERIA

Campylobacter species and *Salmonella* species are detected throughout the year and in the last two quarters were detected in an average of 6% and 5% of samples respectively.

Shigella/Entero-invasive *E. coli* (EIEC) showed the usual seasonal peak in late summer with detection rates of approximately 15% followed by a steady decline thereafter, seeing detection rates drop to approximately 4.5% in samples submitted from May to August (please note that it is not possible to distinguish *Shigella* from EIEC with the current Biofire GI molecular panel).



In keeping with seasonal trends observed last year, there was a significant increase in some *E. coli* pathotypes in summer, with a gradual decline to baseline rates from March to August. The last quarter (June to August) detected baseline rates averaging 7% and 13% for Enteroaggregative *E.coli* (EAEC) and Enteropathogenic *E.coli* (EPEC) respectively. Enterotoxigenic E.coli (ETEC) was detected at much lower rates of approximately 2% in the same time period.



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VIRUSES

Rotavirus was the most common virus detected with a clear seasonal increase in winter and early spring. Detection rates increased steadily from May to August peaking at 37%.

Rotavirus is transmitted via the faecel-oral route, by close person-to-person contact and from contaminated environmental sources.

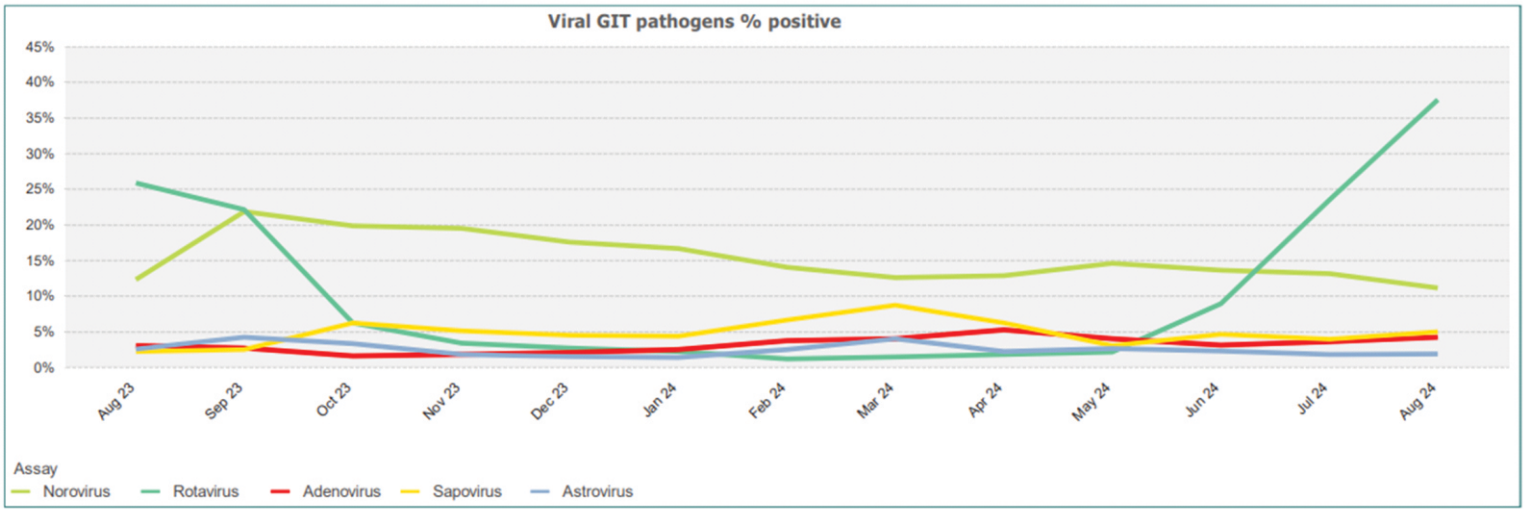
Rotavirus is the leading cause of diarrhoea in children under 5 years world-wide. Infants and young children between the ages of 3 months and 2 years, immunocompromised individuals and the elderly, are at higher risk of severe disease.

Symptoms usually begin 1-3 days after infection and include diarrhoea, vomiting, fever and abdominal cramps. Rehydration is the mainstay of treatment.

Vaccination against rotavirus is the most important prevention method. The South African Expanded Program of Immunization (EPI) includes the routine administration of the Rotarix vaccine at 6 weeks and 14 weeks. Studies have shown that 2 doses are associated with a 77% reduction in severe disease.

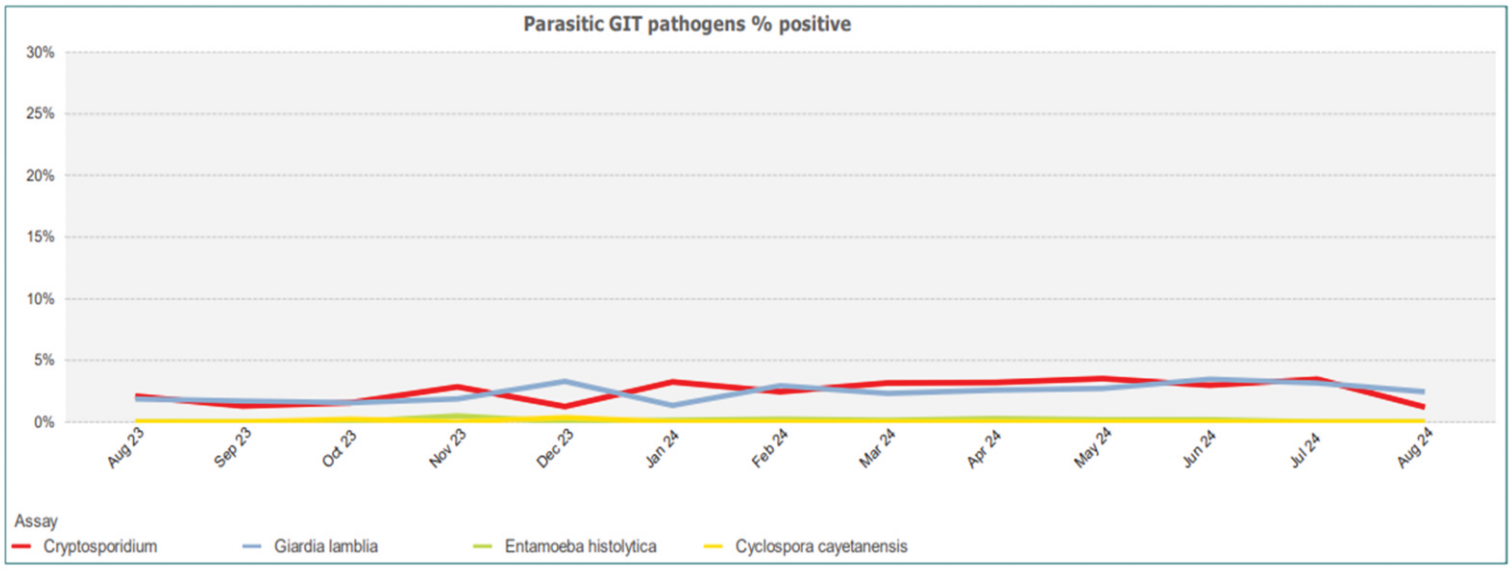
Norovirus is the second most common virus which is detected throughout the year, averaging around 13% in the last 6 months.

It should be noted that these statistics represent only molecular testing for rotavirus and adenovirus, as antigen results are not included in this report.



PARASITES

Cryptosporidium species and *Giardia lamblia* remain the two most common parasites detected by molecular GIT panels throughout the year. Detection rates averaged 3% for both parasites in the last six months.



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CLOSTRIDIOIDES DIFFICILE

Clostridioides difficile formerly known as *Clostridium difficile*, can cause disease in humans ranging from mild and moderate cases to severe life-threatening infections in certain risk groups. It is the leading cause of antibiotic-associated diarrhoea world-wide.

C. difficile spores are common in health-care settings and are difficult to eradicate, as they are generally resistant to many commonly used disinfectants, including alcohol-based disinfectants. Spores are accidentally ingested through contact with contaminated surfaces. Improper hand hygiene exacerbates the spread.

Antibiotic use disrupts the bowel microbiota, creating a favourable environment for spores to germinate into toxin-producing cells that can cause *C. difficile* infection (CDI). *C. difficile* is divided into non-toxigenic and toxigenic strains. Non-toxigenic strains are not associated with clinical CDI.

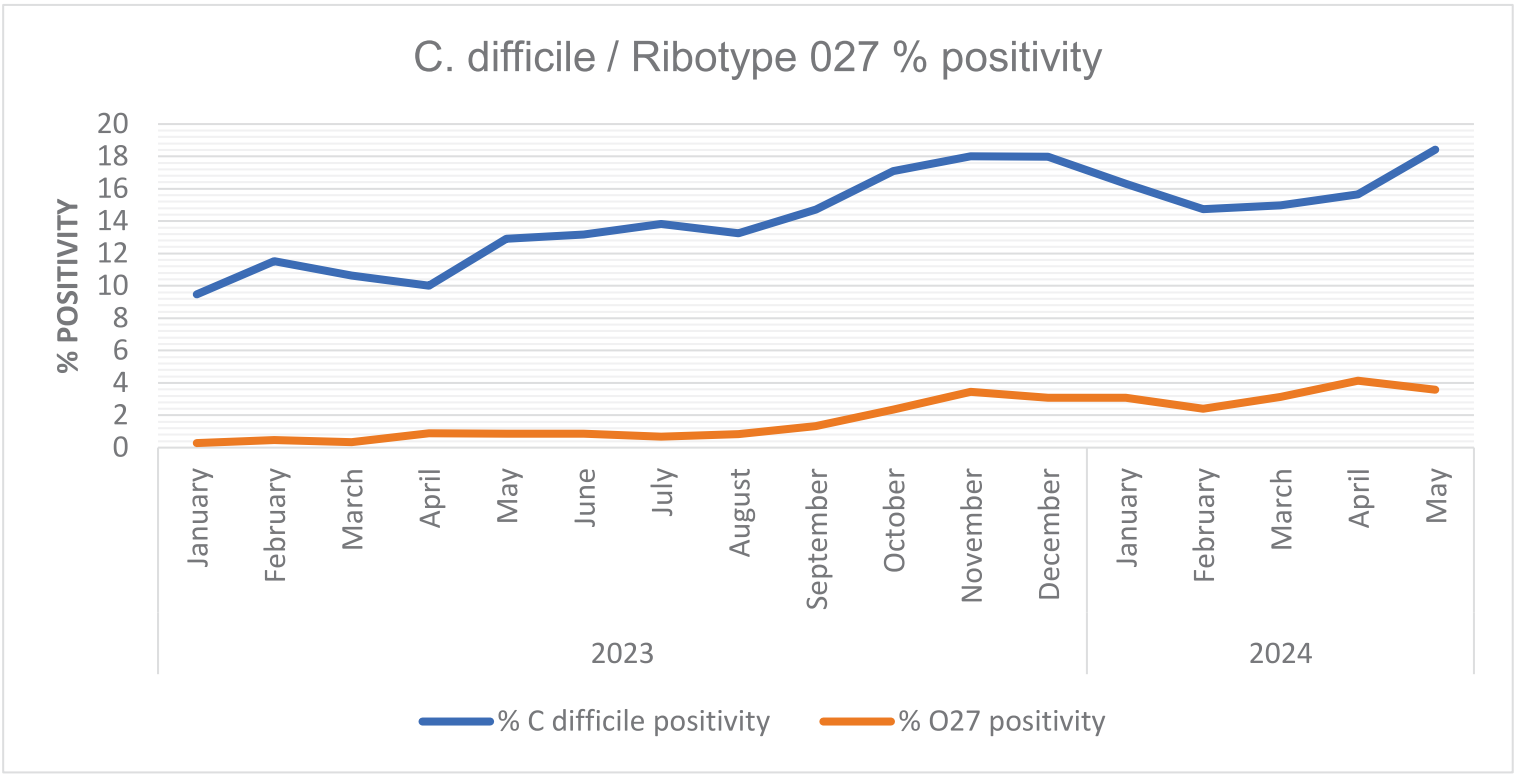
Most toxigenic strains produce 2 toxins (toxin A and B), but certain epidemic strains produce a 3rd toxin- binary toxin which is considered a virulence factor that may increase the severity of CDI. One *C. difficile* strain, called *C. difficile* Ribotype 027, reported mainly in USA, has been associated with hypervirulence and has a potential for causing outbreaks. Ribotype 027 is not commonly detected in South Africa, but we have noted a modest increase locally in the past year.

Several different PCR assays are able to detect toxigenic *C. difficile*. The Xpert *C. difficile* assay detects 3 gene targets: *tcdB* (toxin B), *cdtA* (binary toxin) and *tcdC* (for the presumptive diagnosis of Ribotype 027) and is the preferred test for suspected CDI.

PLEASE NOTE: *C. difficile* testing should only be undertaken in patients with clinically suspected CDI and should not be performed routinely for screening purposes or as a test of cure in patients after treatment for CDI.

Molecular tests are considered very sensitive, and organism detection does not always indicate active disease and must be differentiated from incidental detection/asymptomatic carriage of toxigenic *C. difficile*. Therefore, the pre-test probability is important and testing should only be done in patients who are considered at-risk, with unexplained and new onset of >3 unformed stools in 24 hours.

The graph below shows the positivity rate for toxigenic *C. difficile* detection, including the rate of the 027 Ribotype. It is a summary of results obtained from various molecular assays performed across PathCare laboratories.



Over a 17-month period, a gradual increase in both incident detection of *C. difficile* cases and in the proportion of Ribotype 027 can be seen. This increase may reflect a true increase in CDI prevalence but does not exclude the asymptomatic detections.

Multiplex PCR assays are commonly requested for paediatric diarrhoeal cases. Because of the high prevalence of asymptomatic carriage of toxigenic *C. difficile* in infants, positive results for patients <2 years of age should always be interpreted with care and regarded as a true positive when other causes of diarrhoea have been excluded, and if the history and clinical presentation supports the diagnosis.

The marginal increase in Ribotype 027 among detected cases does, however, suggest an increase of this strain type among circulating isolates that may have implications for the severity of CDI cases. Severe CDI is associated with significant morbidity and mortality. Implementation of appropriate infection prevention and control (IPC) measures is essential to minimize transmission. PathCare will continue to monitor trends and include these in our surveillance reports.

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. There is no correlation of laboratory data with clinical findings.