

Viral Gastroenteritis Unit

BACKGROUND

The Viral Gastroenteritis Unit has been tasked with the establishment of a national surveillance system for the detection and characterization of viruses associated with gastroenteritis. This includes rotavirus, adenovirus type 40 and type 41, astrovirus, norovirus and sapovirus. In addition, the incidence of newly emerging viruses including picobirnavirus, aichivirus, torovirus and picotrnavirus will have to be assessed in the South African population. The unit also aids the Epidemiology Department in identifying any viral aetiology involved in diarrhoeal outbreaks and characterizing the viruses isolated.

ACTIVITIES, HIGHLIGHTS AND ACHIEVEMENTS

The major focus of 2008 was to strengthen and expand the surveillance of rotavirus in South Africa, especially in light of the introduction of rotavirus vaccines into the national expanded program of immunization (EPI). Funding was secured to conduct diarrhoeal surveillance in sentinel sites in Gauteng, North West, Mpumalanga and Kwa-Zulu Natal Provinces. The protocols have been issued ethical clearance and surveillance is due to start shortly.

A total of 1767 stool specimens were received in the laboratory for analysis during 2008. Similarly to last year, the majority of the stools specimens were received from the Western Cape. The bulk of the burden of rotavirus disease was evident in children less than 18 months of age (Figure 1). The slight increase in the infection of older children during 2007 may have coincided with the introduction of serotype G12 strains in the Western Cape, a serotype not previously identified in this area and first detected in South Africa in the Ga-Rankuwa area during 2004.

In addition, the seasonal distribution of rotavirus infections was investigated, with the peak of rotavirus infection seen between March and May in the Western Cape (Figure 2). This is one month earlier than the season typically seen in Gauteng, Pretoria and Ga-Rankuwa regions. The increase in rotavirus infections evident during October 2007 coincided with an increase in the circulation of serotype G12 strains. During 2007, serotype G1P[8] strains predominated in the Western Cape with G2P[4] and G1P[6] strains also circulating at lower levels. During 2008, serotype G1P[8] strains were still circulating but were co-dominant with serotype G2P[4] strains. Serotype G12 strains and mixed serotype G1/G12 infections were also detected at increased levels in July, August, September and December.

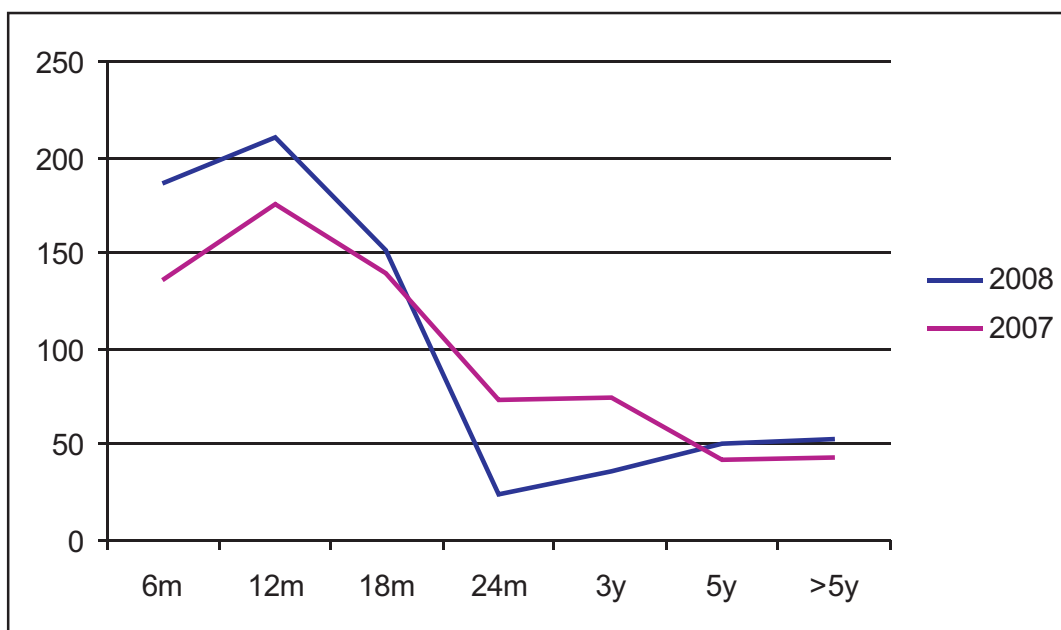


Figure 1. Age distribution of the patients infected with rotavirus diarrhoea collected in the Western Cape during 2007 and 2008.

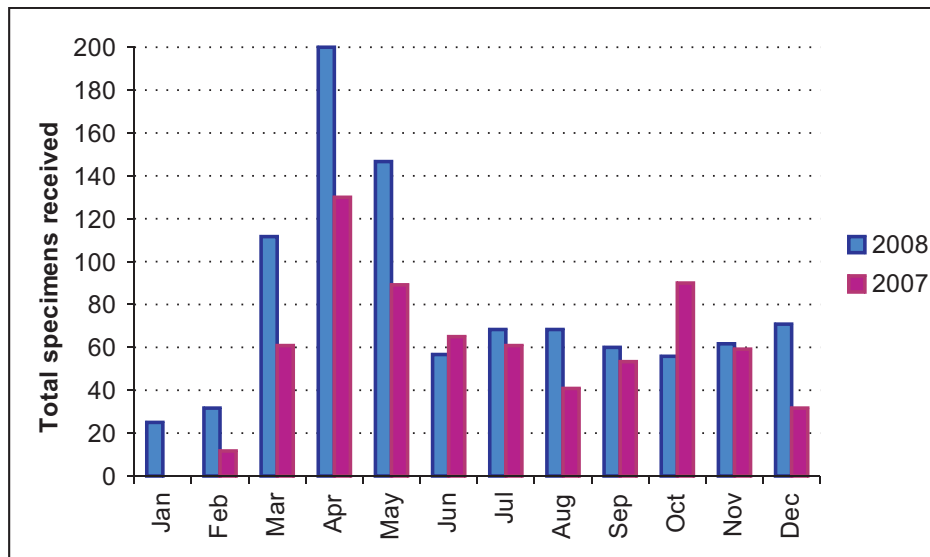


Figure 2. Seasonal distribution of rotavirus infections in the Western Cape during 2007 and 2008.

Stool samples were also received from a hospital in the Western Cape, after an outbreak of diarrhoea in the neonatal ward. It was interesting to note that a large proportion of infections could be attributed to G12 strains, although G1/G12 mixed infections were also detected during the outbreak. The data, when analyzed with additional surveillance data from this area seems to suggest that neonatal wards may provide a source of infection for the introduction of unusual strains or the maintenance of unusual strains in a community.

Sporadic stool specimens were also received from outbreak investigations in Northern Cape, Western Cape, Eastern Cape and Mpumalanga. Six stool specimens were received from an outbreak of rotavirus diarrhoea in a crèche in Mosselbay, Eastern Cape. A total of eight children were infected and two had been vaccinated against rotavirus. The vaccinated children developed mild diarrhoea while the remaining six unvaccinated children required treatment in hospital. Serotype G1P[8] strains were identified further illustrating that rotavirus vaccines do not prevent all diarrhoea or all rotavirus diarrhoea but simply prevent the first very severe infection that often requires hospitalization. Outbreak specimens from Nelspruit, Mpumalanga revealed G2P[4], G1P[4] and G1P[8] strains while specimens from the Northern Cape revealed G1 and G2 strains and specimens from East London, Eastern Cape revealed predominantly G1P[8] strains although lower levels of G2P[4] were also detected.

COLLABORATIONS

Dr Johann Görgens, Department of Process Engineering, University of Stellenbosch, Prof Emile van Zyl, Department of Microbiology, University of Stellenbosch, Prof Albie van Dyk, North-West University, Dr AC Potgieter from the Onderstepoort Veterinary Institute, Prof Ed Rybicki, University of Cape Town, Mrs Ina Peenze, Diarrhoeal Pathogens Research Unit, University of Limpopo Medunsa Campus for the Rotavirus/HPV subunit vaccine consortium funded by

the South African Department of Science and Technology for the South Africa Cuba science collaboration project.

Prof Maureen Taylor and Dr Walda van Zyl for the project titled “The development of real-time detection techniques and increased surveillance of diarrhoeal disease viruses in the South African population” funded by the PRF.

Mrs Ina Peeze, Mr Pieter Bos, Miss Mapaseka Seheri and Prof Jeff Mphahlele, Diarrhoeal Pathogens Research Unit (DPRU), University of Limpopo Medunsa Campus for projects including rotavirus antigenemia, rotavirus vaccine trials and rotavirus surveillance in South Africa and various other African countries.

CAPACITY BUILDING

Co-supervisor for Mr Harry Ngoveni, Miss Leah Nemarude and Mr Phathutshedzo Ramudingana at the University of Limpopo Medunsa Campus for MSc (Med) Medical Virology degrees.

Supervisor for Mr Khuzwayo Jere at the University of Limpopo Medunsa Campus for MSc (Med) Medical Virology degree. The Masters degree has been submitted for examination.

Supervisor for Mrs Ina Peenze at the University of Limpopo Medunsa Campus for PhD degree.

Dr Page participated in the training of African scientists during the eighth African Rotavirus Network Workshop held at the DPRU laboratory from the 5th - 30th May 2007. The workshop was organized by Dr Jason Mwenda, co-ordinator WHO AFRO and staff at the Diarrhoeal Pathogens Research Unit (DPRU), University of Limpopo Medunsa Campus and the workshop was attended by ten delegates from nine African countries. Delegates attended lectures and were trained in rotavirus analysis techniques including ELISA-detection, electron microscopy, polyacrylamide gel electrophoresis and RT-PCR genotyping.