NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division in the National Health Laboratory Service

Communicable Diseases Communiqué

SEPTEMBER 2012, Vol. 11(9)

CONTENTS:

RABIES

During August 2012, rabies was confirmed in a 21-year-old male from Shayamoya, KwaZulu-Natal Province (KZN). The patient suffered a dog bite on his left hand on 23 July 2012. He did seek healthcare and received basic wound management (including wound cleansing and tetanus vaccination). However, rabies post-exposure-prophylaxis was incomplete. On 22 August 2012 he was admitted to a hospital in Chatsworth with headache, pain in the left shoulder and arm, palpitations, difficulty swallowing and hydrophobia; he died two days later. Rabies virus infection was confirmed by fluorescent antibody test performed on a post-mortem brain specimen.

A total of 9 human rabies cases has been laboratory-confirmed by the NICD-NHLS for 2012 to date. These cases were reported from KZN (n=4), Eastern Cape (n=1), Limpopo (n=3) and Mpumalanga (n=1) provinces.

September 28 is World Rabies Day, a global initiative to raise awareness of this neglected disease (visit www.worldrabiesday.org for more information and resources). Despite being almost completely preventable in modern times, this age-old scourge still accounts for an estimated 55 000 human deaths per year globally. The overwhelming brunt is borne in the developing countries of Asia and Africa, with 31 000 and 24 000 estimated cases annually, respectively.[1] These estimates, however, do not reflect the true burden of disease since rabies is notoriously underreported in developing countries. Since 1983, between 5 and 31 laboratory-confirmed human cases are documented annually in South Africa.[2] The majority of animal and human cases are reported from the coastal provinces of KZN and Eastern Cape. In recent years rabies has re-emerged in several locations in South Africa where it was previously under control. During 2005 and 2006, an outbreak in Limpopo Province was associated with 22 fatal laboratory-confirmed human cases, in addition to a number of suspected or probable cases where no specimens were available for laboratory testing.[3] Since then, cases of human rabies are reported annually from this province. Canine rabies re-emerged in Mpumalanga Province in 2008, and has since spread from the Nkomazi District to Ezhlanzeni and Bushbuck Ridge areas; as a result human rabies cases have been documented annually in this province as well. In 2010, the first locally-acquired human rabies case in Johannesburg was confirmed; dog rabies had been introduced to the Johannesburg Metropolitan District from KZN in 2010 and resulted in 36 confirmed animal cases that year, and another 14 in 2011 - the most recent case having been reported in June 2011.[4]

Although rabies in humans is almost always fatal, it is also entirely preventable when rabies post-exposure prophylaxis (PEP) is administered according to prescribed guidelines. It is crucial to consider rabies PEP for all animal-bite victims in South Africa. By evaluating the particulars of each case (including the nature and circumstances of the exposure, the health of the animal involved etc.), the healthcare worker should determine the need for rabies PEP. Category 2 exposures (i.e. bites or scratches without bleeding, nibbling of uncovered skin) should receive 4 doses of rabies vaccine (administered IM in the deltoid muscle on days 0, 3, 7 and 14). In the case of Category 3 exposures (i.e. bites or scratches that penetrate the skin and draw blood, licking of mucous membranes or broken skin, or bat exposures) the person should receive rabies immunoglobulin (RIG) in addition to the 4 doses of vaccine. RIG should be infused into and around the wound/s as far as possible. Healthcare workers can access the South African rabies management guidelines at: http://nicd.ac.za/assets/files/Rabies-Guide-2010-small.pdf

References:

1. World Health Organization (www.who.int)
2. Weyer J, Szmyd-Potapczuk AV, Blumberg LH, Leman PA, Markotter W et al. Epidemiology of human rabies in South Africa: 1983-2007. *Virus Research* 2011; 155: 283-290
3. Cohen C, Sartorius B, Sabeta C, Zulu G, Paweska J et al. Epidemiology and molecular virus characterization of reemerging rabies, South Africa. *EID* 2007; 13 (12): 1879- 1886
4. Data source: Rabies Unit, ARC-OVI.

Source: Centre for Emerging and Zoonotic Diseases and Division of Public Health Surveillance and Response, NICD-NHLS.

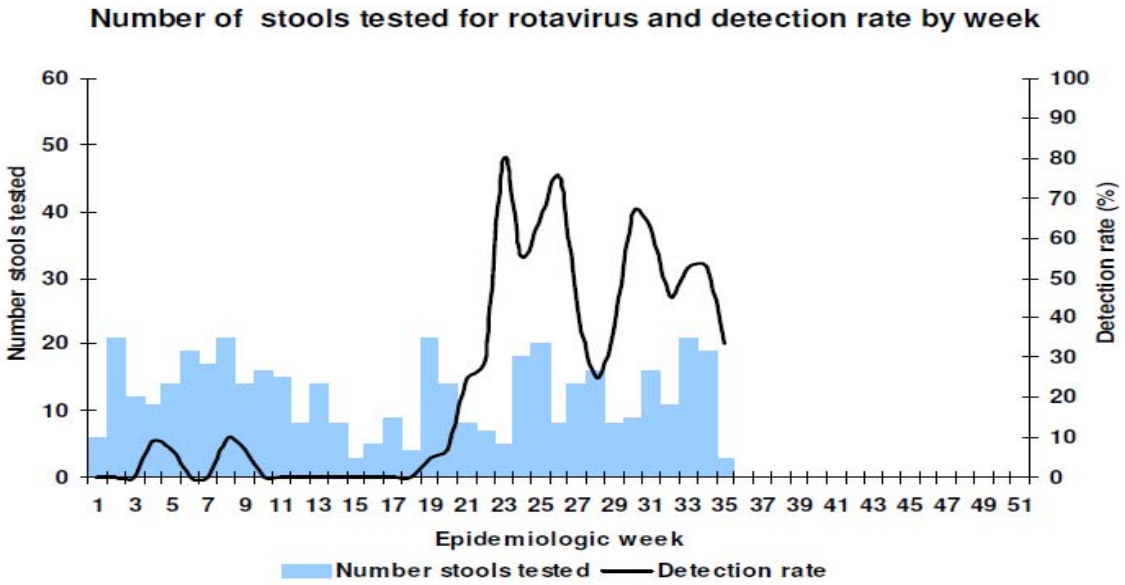
ROTAVIRUS

In 2009 the NICD-NHLS implemented a diarrhoeal sentinel surveillance programme at five hospital sites in four provinces (Gauteng, North West, KwaZulu-Natal and Mpumalanga). The aim of this programme is to evaluate the prevalence of rotavirus cases and to monitor the effect of the introduction of the monovalent Rotarix® vaccine into the expanded programme of immunisation. Children < 5 years admitted to one of the sentinel hospitals for acute diarrhoea (≥ three loose stools in a 24 hour period and onset within seven days) are eligible for enrolment. Stool specimens are collected and tested for rotavirus at the NICD-NHLS and at the Diarrhoeal Pathogens Research Unit (DPRU), University of Limpopo (Medunsa Campus) using the ProSpec T Rotavirus ELISA kit (Oxoid, UK).

Since the introduction of the vaccine in April 2009, the start of the rotavirus season has been delayed, starting in week 20 (week starting 17 May) and week 21 (week starting 23 May) in 2010 and 2011 respectively.

The 2012 rotavirus season began in week 23 (week starting 4 June) in which the detection rate for rotavirus rose to 80%. The detection rate has remained above the 20% threshold in subsequent weeks, up to and including week 34 (week starting 20 August) (Figure). A total of 447 samples has been tested for 2012, with 100/447 (22%) positive for rotavirus (Table).

Source: Centre for Enteric Diseases, NICD-NHLS.



The rotavirus detection (in percentage) is the number of rotavirus-positive stool tests divided by the number of rotavirus stool tests in acute diarrhoea hospitalisations.

Figure: Number of diarrhoea samples tested and rotavirus detection rate; rotavirus surveillance programme, South Africa 2012.

Table: Number of samples tested and number of rotavirus detections, by hospital; rotavirus surveillance programme, South Africa 2012.

Surveillance hospital	Rotavirus positive	Total samples tested
Chris Hani Baragwanath	30	176
Edendale	12	40
George Mukhari	22	113
Mapulaneng	14	46
Matikwana	22	72
Total	**100**	**447**

MENINGOCOCCAL DISEASE

Pseudo-meningococcal disease outbreak

A recent incident of pseudo-meningococcal disease is described in this communiqué as it raises important issues surrounding rumours and inappropriate public health response. In August 2012, the Outbreak Response Unit (ORU) of the NICD-NHLS was alerted to media reports of a meningococcal disease 'outbreak' in a hospital and community in North West Province (NW), which included one death and a number of suspected cases. In response, a preliminary investigation was initiated. The 'index' case, a 14-year-old patient, presented in mid-August 2012 to the hospital with seizures, meningism, fever and vomiting after a three-day history of illness; he died three days later. The cerebrospinal fluid (CSF) was noted to be 'cloudy', and the laboratory report documented numerous Gram-positive diplococci on microscopy, and *Streptococcus pneumoniae* was subsequently isolated on culture. However, the patient was notified as having fatal meningococcal disease and a public health response was initiated. Fear and panic ensued; all learners at the school received ciprofloxacin post-exposure prophylaxis (PEP), and eleven learners went to the hospital and demanded LPs to exclude meningitis (although none were symptomatic).

Media reports of meningococcal deaths or 'outbreaks', often incite anxiety, concern and even panic amongst members of the affected community. The phenomenon of rapid progression of illness leading to death in previously healthy persons, particularly children, is very emotive and the immediate reaction is to seek protection against acquiring disease – hence the often overwhelming, irrational demand for PEP. Prompt investigation of such reports is mandatory, a critical element of which is verifying the diagnosis of meningococcal disease. In this incident described above, the misclassification of pneumococcal meningitis as meningococcal meningitis sparked a series of unnecessary, costly public health actions and caused widespread alarm and panic in the community.

Meningococcal disease surveillance

Sporadic cases of meningococcal disease continued to be reported across the country. Numbers are expected to peak during the months of August to October. There are inherent delays in laboratory-based reporting, which lags behind clinical reports.

By the end of week 36 (week ending 9 September 2012), a total of 129 laboratory-confirmed cases was reported to the bacteriology laboratory at the Centre for Respiratory Diseases and Meningitis (CRDM), NICD-NHLS for 2012 (Table). Thirty-five cases had been reported in the <1 year age group this year so far, similar to the number of cases for the equivalent time period and age group in 2011 (n=40).

The reported cases have diverse serogroups, which is in keeping with sporadic endemic disease in the country. Serogroup data were available for 99/129 (77%) of cases. Serogroup B and W135 have been identified most commonly this year (32/99, 32% serogroup B and 39/99, 39% serogroup W135). Other serogroups included: C (13%, 13/99) and Y (15%, 15/99).

An increase in the number of meningococcal cases is usually identified in the winter and spring seasons, so there should be a high index of suspicion for meningococcal disease in patients who present with nonspecific early signs and symptoms. Disease typically has a rapid progression and should be managed as a medical emergency in order to reduce morbidity and mortality. All cases of suspected meningococcal disease (meningitis and sepsis) should be notified telephonically to the Department of Health.

Table: Number of laboratory-confirmed meningococcal disease cases reported until end of week 36, 2011 and 2012, by province

Province	2011	2012
Eastern Cape	28	16
Free State	16	4
Gauteng	98	52
KwaZulu-Natal	17	16
Limpopo	7	2
Mpumalanga	13	3
Northern Cape	6	0
North West	3	3
Western Cape	31	33
South Africa	**219**	**129**

Source: Division of Public Health Surveillance and Response and Centre for Respiratory Diseases and Meningitis, NICD-NHLS.

INFLUENZA

Viral watch: influenza-like illness (ILI) surveillance programme

The 2012 influenza season which started in week 21 (week ending 27 May) continues, but the number of specimens submitted per week has started to decline. The influenza detection rate peaked in week 33 (week ending 19 August) at 61.4% (Figure 1). For 2012 to date (as at 14 September) a total of 693 influenza detections has been made. Of the 682 influenza-positive samples that have been subtyped, 403/682 (59%) have been identified as influenza A(H3N2), 277/682 (40%) as influenza B and 4/182 (1%) as influenza A(H1N1)pdm09. Influenza has been detected in all provinces.

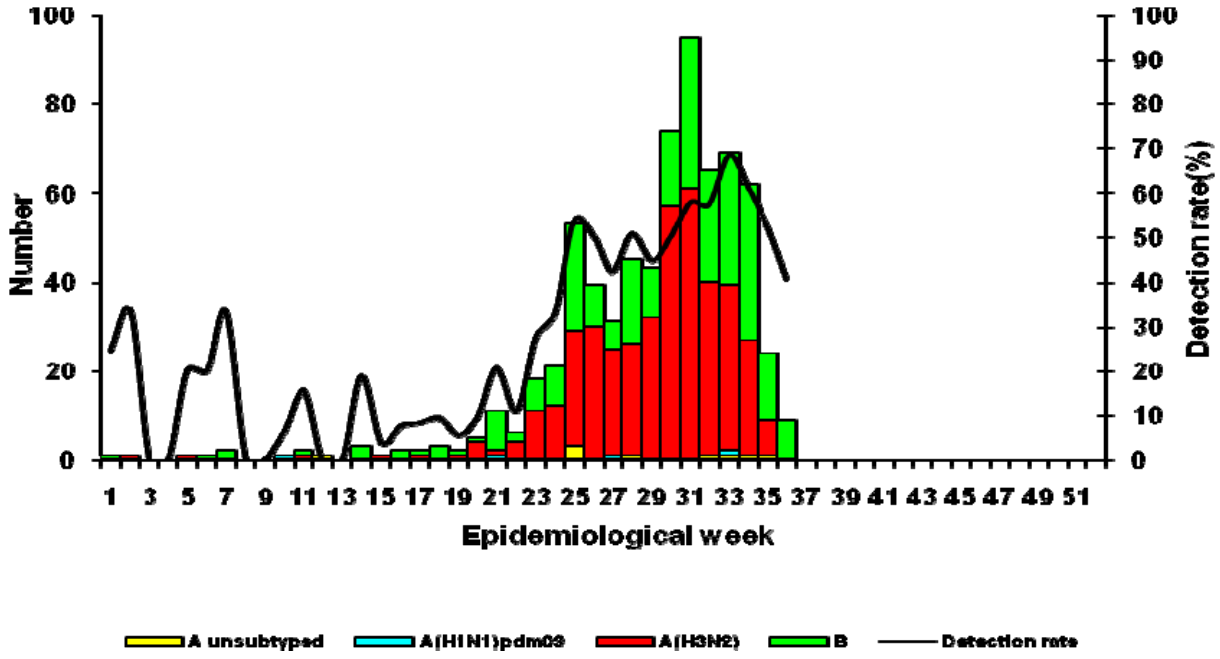


Figure 1: Number of positive samples by influenza types and subtypes, and detection rate by week; viral watch surveillance programme 2012

Severe acute respiratory illness (SARI) surveillance programme

For 2012 to date (as at 14 September), 3 587 patients admitted with severe respiratory illness at the five SARI sentinel sites were tested for influenza. Of the 186 influenza-positive samples that have been subtyped, 106/186 (57%) have been identified as influenza A(H3N2), 79/186 (42.5%) as influenza B and 1/186 (0.5%) as influenza A(H1N1)pdm09 (Figure 2). Although the 2012 season has been predominated by influenza A (H3N2), the proportion of samples testing positive for influenza B has been increasing over the past three weeks (week starting 13 August 2012 to date).

Clinicians are advised that influenza is still circulating and should consider it in their differential diagnosis for patients presenting with influenza-like illness and severe respiratory illness.

Source: Centre for Respiratory Diseases and Meningitis , NICD-NHLS.

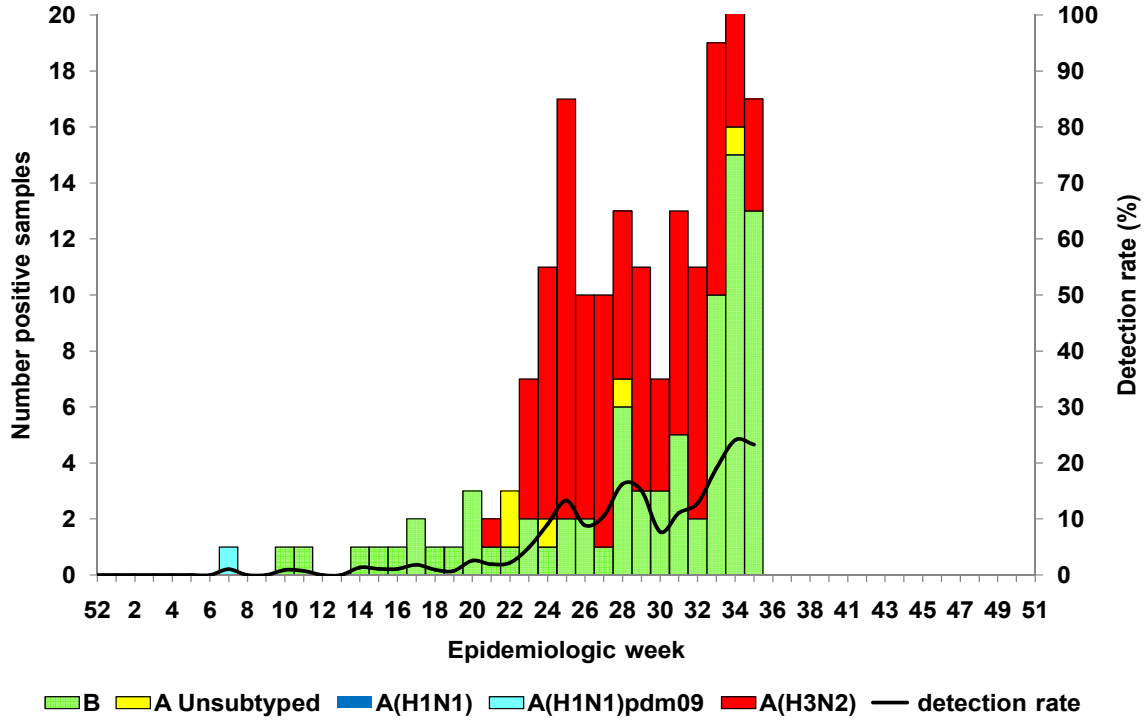


Figure 2: Number of positive samples by influenza types and subtypes and detection rate by week, SARI surveillance program

RUBELLA

As part of the measles elimination strategy, patients meeting the suspected measles case definition (rash and fever with at least one of the 3Cs - (cough, coryza or conjunctivitis) should have specimens taken and submitted to the NICD-NHLS for measles IgM testing. In addition, specimens are tested for rubella IgM antibodies. The data shown here represent specimens received by the NICD-NHLS and may differ from those presented by the National Department of Health as they may receive information on cases not tested at the NICD-NHLS.

This year to date (10 September), the NICD-NHLS has tested 3 442 specimens for cases with onset of illness in 2012; 28% (981/3 442) were rubella IgM positive (three of which were also positive for measles) while 0.7% (25/3 442) were measles IgM positive (11 of which were vaccine related). Rubella IgM positive cases were reported from all nine provinces, with KwaZulu-Natal (246/981, 25%), Eastern Cape (231/981, 23%) and Western Cape (150/981, 15%) provinces accounting for the highest proportion of the total cases (Table). Age was reported in 98% (n=961) of the cases, and cases ranged in age from <1 month to 87 years, with a median of six years. A higher proportion of cases was among children aged 5 to 9 (519/961, 54%) and 1 to 4 (246/961, 26%) years (Figure 1). This is similar to what has been described previously. Where age and sex were recorded (n=933), females accounted for 48% (450/933) of the cases and 5% (50/933) were among women of child-bearing age (12-49 years). The temporal distribution of rubella is shown in Figure 2. At present, the highest detection rate was noted in week 25 (week staring 18 June). In South Africa, an increase in the number of rubella cases is usually observed during winter months and peaks during spring.

There has been a sustained heightened index of suspicion for measles given numbers of specimens being submitted. However, patients presenting with suspected measles were more likely to be rubella IgM positive than measles IgM positive. Rubella is generally a mild disease affecting mainly children. However, rubella may be of concern if acquired during pregnancy (especially during the first trimester). Rubella infection may be transmitted to the foetus and can lead to congenital rubella syndrome (CRS) which may cause severe birth defects. The annual incidence of CRS in South Africa is unknown. Rubella vaccination is currently not part of the routine expanded programme on immunisation schedule in South Africa. Pregnant women should be advised to avoid exposure to rubella, especially during the first 16 weeks of

pregnancy, and if they have been exposed should seek immediate medical attention for appropriate investigation and management.

Source: Centre for Vaccines and Immunology , NICD-NHLS.

Table: Number of rubella IgM positive cases by province, South Africa, 1 January – 10 September 2012

Province	Number of rubella IgM positive cases	% positive
Eastern Cape	231	24
Free State	22	2
Gauteng	103	11
KwaZulu-Natal	246	25
Limpopo	24	2
Mpumalanga	84	9
Northern Cape	70	7
North West	51	5
Western Cape	150	15
South Africa	**981**	**100**

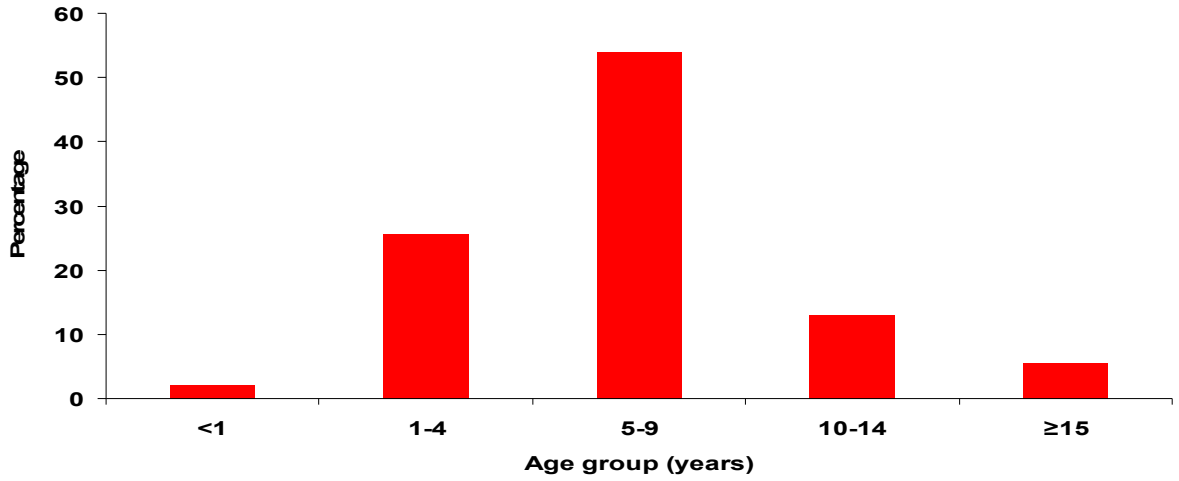


Figure 1: Age distribution of patients with rubella, South Africa, 1 January -10 September 2012

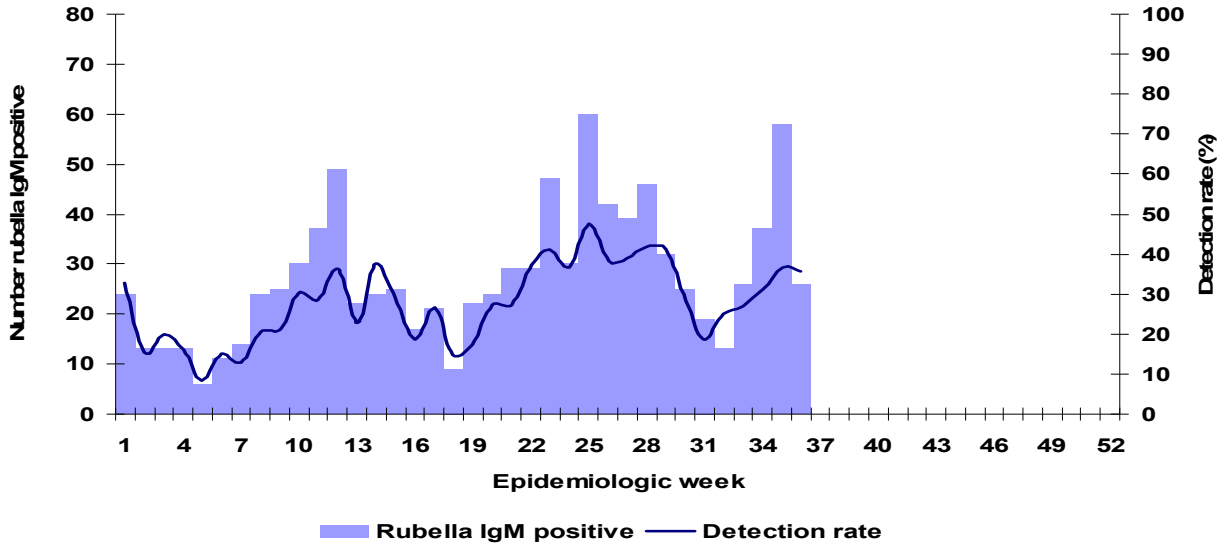


Figure 2: Number of rubella IgM positive samples and detection rate by week specimens were collected, South Africa, 1 January - 10 September 2012

CIPROFLOXACIN-RESISTANT TYPHOID FEVER

The Outbreak Response Unit, NICD-NHLS has received many recent queries regarding antimicrobial treatment of patients with culture-confirmed *Salmonella* Typhi infection where the isolate is intermediately-resistant or resistant to ciprofloxacin. This is a result of the recent revision of the CLSI guidelines used by laboratories when interpreting antimicrobial susceptibility results. The 'breakpoints' for ciprofloxacin susceptibility thresholds for *Salmonella* spp have been revised, based on cumulative research-based evidence that isolates previously reported as 'susceptible' would not respond to ciprofloxacin in-vivo and resulted in treatment failures, relapses, and thus increased morbidity and mortality. Because the 'breakpoints' (MIC values) for ciprofloxacin have been lowered, many of the isolates that would previously have been reported as 'susceptible' will now be reported as 'intermediately resistant' or 'resistant'. This has major implications for antimicrobial treatment, since there is compelling evidence that treating ciprofloxacin-resistant and even ciprofloxacin intermediately-resistant *S.* Typhi with ciprofloxacin (even at maximal doses for prolonged duration) leads to treatment failures and relapses.

A review of quinolone and fluoroquinolone resistance in *S.* Typhi isolates received by the Centre for Enteric Diseases (NICD-NHLS), when applying the new CLSI breakpoints, reveals emerging intermediate resistance to fluoroquinolones in *S.* Typhi, which corresponds to nalidixic acid resistance in these organisms (Figures 1 and 2).

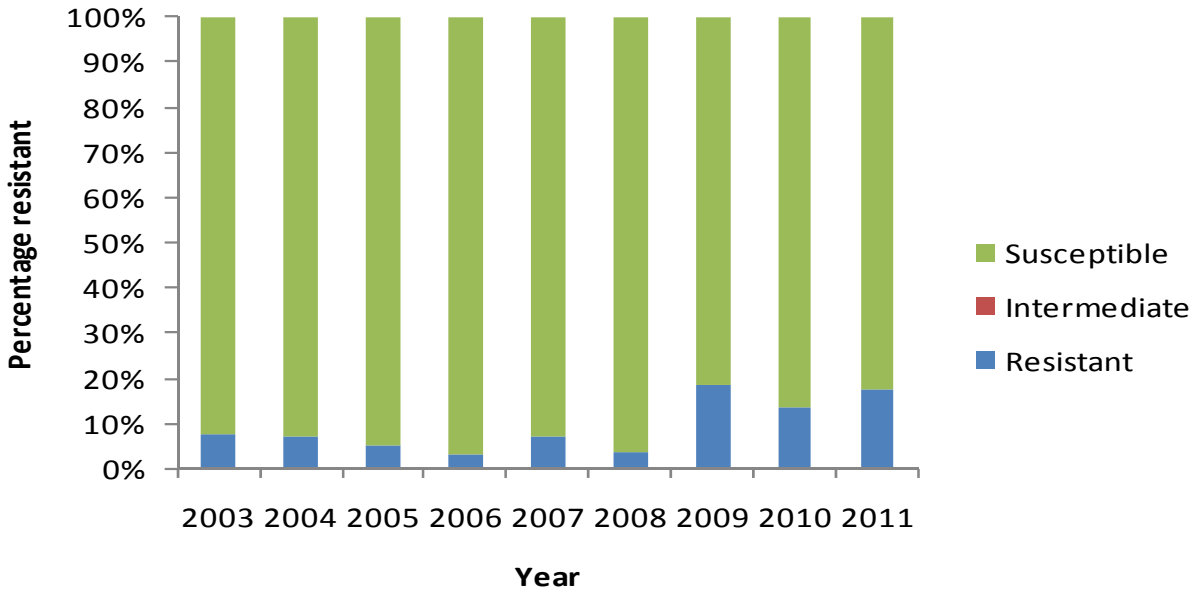


Figure 1: Nalidixic acid resistance trends in *Salmonella* Typhi isolates received by the Centre for Enteric Diseases, NICD-NHLS, 2003 to 2011

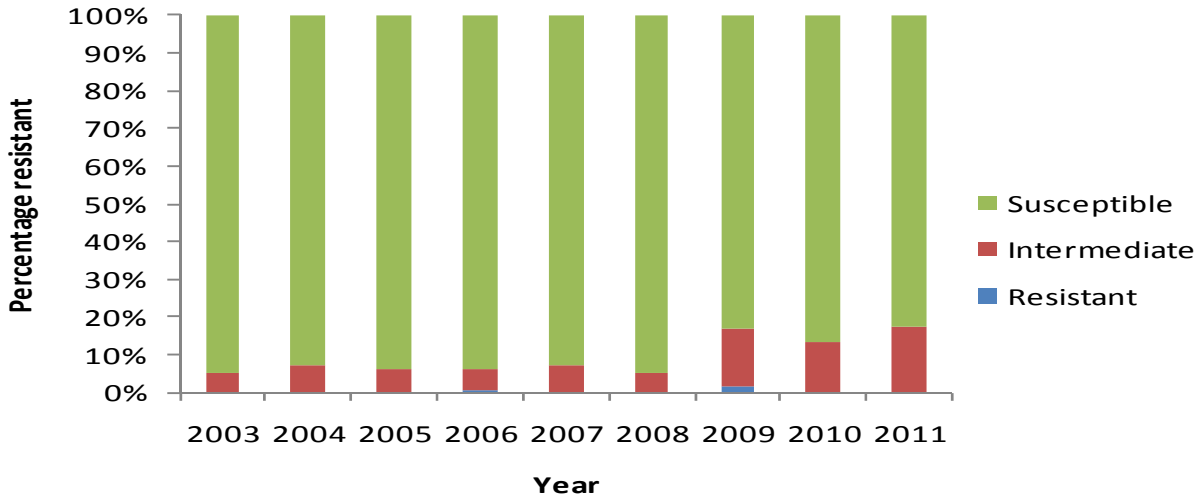


Figure 2: Ciprofloxacin resistance trends in *Salmonella* Typhi isolates received by the Centre for Enteric Diseases, NICD-NHLS, 2003 to 2011

The current WHO typhoid fever management guidelines (2003) recommend treating quinolone-resistant typhoid fever with azithromycin or ceftriaxone (optimal therapy) and mention use of cefixime as alternate effective therapy. However, there is subsequent evidence that cefixime treatment of uncomplicated typhoid fever results in treatment failure rates of up to 37.6%. Gatifloxacin was shown in trials to be effective treatment for uncomplicated typhoid fever, and there is (limited) evidence that it is effective treatment for *S.* Typhi with decreased ciprofloxacin susceptibility; however, this drug has been withdrawn from many countries (including South Africa) following serious reports of hypoglycaemia and hyperglycaemia (including deaths) in patients both with and without diabetes, prompting an FDA alert in February 2006.

Therefore, according to current evidence and published expert opinion, the options for treating *S.* Typhi with decreased ciprofloxacin susceptibility are limited to azithromycin as a 7-day course (for uncomplicated disease) and IV ceftriaxone/ cefotaxime as a 10-14 day course for severe disease (Table). This does pose a problem in advising treatment for public sector facilities, since azithromycin is not included in the current EDL - patients with uncomplicated typhoid who would otherwise be discharged on oral therapy will require admission for 10 to 14 days of IV treatment as there is no alternative. Currently, there are no published CLSI guidelines for minimum inhibitory concentrations (MICs) for the clinical use of azithromycin in typhoid fever. Clinicians are urged to monitor patient response to treatment, in order to avoid treatment failures.

Source: Division of Public Health Surveillance and Response and Centre for Enteric Diseases, NICD-NHLS.

Table: Recommended treatment of *S.* Typhi according to ciprofloxacin susceptibility*

Susceptibility	Antibiotic	Paediatrics Dose	Days	Adults Dose	Days
UNCOMPLICATED DISEASE					
Susceptible to CIP	Ciprofloxacin	15 mg/kg/day po in two divided doses (i.e. 12 hourly)	5-7	500-750 mg po 12 hourly	5-7
Intermediately resistant OR resistant to CIP	Azithromycin	10 mg/kg daily po (max 500mg)	7	500 mg po daily	7
	OR				
	Ceftriaxone	50-75 mg/kg/day IV in two divided doses (i.e. 12 hourly)	10-14	1-2 g IV 12 hourly	10-14
	OR				
	Cefotaxime	40-80 mg/kg/day IV in 2 divided doses (i.e. 12 hourly)	10-14		
SEVERE DISEASE					
Susceptible to CIP	Ciprofloxacin**	15 mg/kg/dose (max 500 mg) po 12 hourly	10-14	500-750 mg po 12 hourly	10-14
		OR		OR	
		10 mg/kg/dose (max 400 mg) IV 8 hourly	10-14	400 mg IV 8 hourly	10-14
Intermediately resistant OR resistant to CIP	Ceftriaxone	50-75 mg/kg/day IV in two divided doses (i.e. 12 hourly)	10-14	1-2 g IV 12 hourly	10-14
	OR				
	Cefotaxime	40-80 mg/kg/day IV in 2 divided doses (i.e. 12 hourly)	10-14		

*Ciprofloxacin susceptibility as determined using 2012 CLSI breakpoints for *Salmonella* spp
** Oral or intravenous ciprofloxacin may be used for severe disease

DENGUE FEVER

Dengue fever was confirmed in two South Africans who presented with an acute febrile illness after returning from a holiday in Kerala (southern India). Both patients reported numerous mosquito bites, and presented with fever, myalgia, and retro-orbital pain. Neither patient reported a rash. Leucopenia and thrombocytopenia were noted in both patients, and significant transaminasemia was present in one case. One of the patients developed a pleural effusion during convalescence. While neither patient experienced any major complications, the course of the illness was protracted; subsequently, both patients have recovered.

The history of travel to a region where transmission of dengue is well-described (particularly during the summer months) together with the reported mosquito exposure prompted the possible diagnosis of dengue fever. Malaria and Chikungunya were also considered as possible aetiologies, but tests were negative. The diagnosis of dengue fever was confirmed by positive PCR for flavivirus, with dengue type 3 infection confirmed by DNA sequencing. Seroconversion was evidenced by the subsequent appearance of dengue IgM and IgG antibodies.

Currently, outbreaks of dengue are being reported from many countries in Central and South America (notably Mexico), as well as various regions in South East Asia. Dengue is endemic in these regions and must always be considered in the differential diagnosis of acute febrile illness in returning travellers. Malaria must always be considered and excluded as a matter of urgency in travellers returning from at-risk countries/areas.

Dengue fever is classically characterized by a sudden onset of fever with frontal headache, retro-orbital pain, and myalgia. Dermatological manifestations occur in up to 50% of patients as either facial flushing, erythematous mottling or an eruption between days 2 and 6 of illness. An intense erythematous pattern with islands of normal skin is characteristic of a dengue fever rash. Thrombocytopenia is a common finding and is typically self-limiting. Effusions, including pleural effusions, are frequently reported. Dengue haemorrhagic fever (DHF) is primarily a disease of children under the age of 15 years but can also occur in adults. Manifestations of DHF occur most frequently from about 24 hours before to 24 hours after the temperature normalises. A spectrum of manifestations ranging from a positive tourniquet test with scattered petechiae (Grade 1) to profound shock (Grade 4) can occur. Treatment is supportive, with close monitoring for complications.

Source: Division of Public Health Surveillance and Response and Centre for Emerging Infections, NICD-NHLS; Ampath private laboratory.

Beyond our borders: infectious disease risks for travellers

The 'beyond our borders' column focuses on selected and current international diseases that may affect South Africans travelling abroad.

Disease & Countries	Comments	Advice to travellers
Cholera: Sierra Leone	As of 5 September 2012, a total of 16 360 cases including 255 deaths with a case fatality rate (CFR) of 1.6% has been reported from 12 of 13 districts. The western area of the country where the capital city of Freetown is located, reported more than 60% of all new cases.	• Cholera is a bacterial disease that can cause diarrhea and dehydration. Cholera is most often spread through the ingestion of contaminated food or drinking water. The following are important measures for preventing cholera in travellers: • Drink bottled water or water brought to a rolling boil for 1 minute before you drink it. • Avoid ice or popsicles made from contaminated water. • Eat food that has been thoroughly cooked, and eat it while still hot and steaming. Eat fruit and vegetables that can be peeled, peel them yourself after washing hands and do not eat the peels. • Avoid foods and beverages from street vendors.

Disease & Countries	Comments	Advice to travellers
Ebola haemorrhagic fever: Uganda and Democratic Republic of Congo (DRC)	**Uganda:** There have been no new confirmed cases of EHF reported in Kibaale district since 3 August 2012. A total of 24 probable and confirmed cases, including 17 deaths, has been reported since the beginning of the outbreak. Of these, 11 cases were laboratory-confirmed. The last confirmed case was discharged on 24 August 2012 following recovery. All contacts of probable and confirmed cases have been followed up daily and have completed the recommended 21 days of monitoring for any possible signs or symptoms of Ebola. The EHF outbreak in Uganda is officially considered over after 42 days have elapsed without any new confirmed cases. Since there have been no confirmed cases since 3 August 2012, the outbreak has ended. **DRC:** As of 18 September 2012, a total of 46 cases of Ebola haemorrhagic fever (EHF) has been reported (14 laboratory-confirmed, 32 probable) with 19 deaths. The cases reported were from Isiro and Viadana, two health zones in Haut-Uélé district in Province Orientale. Additionally, 26 suspected cases have been reported and are under investigation.	The World Health Organization (WHO) does not recommend any travel restrictions to Uganda or the DRC. The Ebola virus is transmitted by direct contact with the blood, secretions, organs or other body fluids of infected persons. Healthcare workers have frequently been infected while treating patients with Ebola virus infection, through close contact without appropriate infection prevention and control precautions and inadequate barrier nursing procedures. The incubation period is 2 to 21 days, and disease is characterised by the sudden onset of fever, intense weakness, muscle pain, headache and sore throat. This is often followed by vomiting, diarrhoea, rash, impaired kidney and liver function, and in some cases, both internal and external bleeding. Laboratory findings show low counts of white blood cells and platelets as well as elevated liver enzymes. More information regarding Ebola haemorrhagic fever and updated alerts can be found on the NICD website (http://www.nicd.ac.za/?page=current_outbreaks&id=156).
Hantavirus pulmonary syndrome: United States of America	As of 13 September 2012, the Yosemite National Park Service announced that there were 9 confirmed cases of hantavirus pulmonary syndrome (HPS) in visitors who stayed in cabins at Curry Village in Yosemite National Park since June this year. The park is advising visitors who stayed in cabins at Curry Village from mid-June through the end of August to seek immediate medical attention if they exhibit symptoms of HPS.	HPS is a rare but serious disease caused by a virus transmitted by contact with urine, droppings or saliva of infected rodents. There is no specific treatment or cure for hantavirus pulmonary syndrome infection. Early recognition and treatment of infected individuals can reduce disease progression. Early symptoms include fatigue, fever, chills, and muscle aches; these usually begin 2 to 4 weeks following exposure. Fifty percent of cases may also experience headache, nausea, vomiting, dizziness and abdominal pain. The disease can progress rapidly (4-10 days after initial symptoms) to include coughing, shortness of breath and severe difficulty in breathing. Travellers are advised to avoid exposure to rodents and their excreta.

Disease & Countries	Comments	Advice to travellers
West Nile Virus: United States of America	For 2012 to date, 48 states have reported West Nile virus (WNV) infections in people, birds, or mosquitoes. A total of 2 636 cases of WNV disease in people, including 118 deaths, have been reported to the Centers for Disease Control and Prevention (CDC). Of these, 1 405 (53%) were classified as neuroinvasive disease (i.e. meningitis or encephalitis) and 1 231 (47%) as non-neuroinvasive disease. The 2 636 cases reported thus far in 2012 is the highest number of WNV disease cases reported to CDC through the second week in September since 2003. Two thirds of the cases have been reported from six states (Texas, Louisiana, South Dakota, Mississippi, Michigan, and Oklahoma) and 40% of all cases have been reported from Texas.	Although only 20% of WNV infections are symptomatic, severe disease (including meningitis and encephalitis) is well described. The incubation period is 2 to 14 days. Typical clinical features of West Nile fever include: fever, headache, fatigue, and occasionally truncal skin rash, lympadenopathy and orbital pain. No human vaccine against WNV is currently available. Mosquito-biting hours for many of the species that are important vectors of WNV are from dusk to dawn. Travellers should be advised to take preventive measures to reduce mosquito bites, including: wearing long sleeves and trousers during the late afternoon, evening and early morning; use of insect repellents (containing 30-50% DEET); sleeping under insecticide-treated bed nets; keeping windows and doors closed/screened, and use of insecticide aerosol and/or coils at night.

Source: Division of Public Health Surveillance and Response, NICD-NHLS.

References and additional reading:

ProMED-Mail (www.promedmail.org),
World Health Organization (www.who.int),
Centers for Disease Control and Prevention (www.cdc.gov). Last accessed: 20 September 2012.

NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division in the National Health Laboratory Service

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