

Communicable Diseases Communiqué

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Pertussis

A number of pertussis cases have been reported in Gauteng Province in the past 2 months. These include the following:

- A 4-month-old HIV-positive child with CMV infection and suspected PCP requiring ventilation was transferred to Rahima Moosa Mother & Child Hospital for ICU care. PCR on a nasopharyngeal aspirate specimen was positive for *Bordetella pertussis*.
- A 3-month-old child presented to Rahima Moosa Mother & Child Hospital with a 4-day history of cough with paroxysms and fever. A nasopharyngeal aspirate specimen was positive for pertussis on PCR testing. In addition, *Haemophilus influenzae* was isolated from blood culture on this patient.
- A 7-week-old child from Tshwane district presented to a local paediatrician in private practice with a clinical history suggestive of classical whooping cough. The child had been ill for \pm 5 weeks (since the age of 2 weeks), and was initially suspected to have an allergy to the milk feed. Pertussis was diagnosed on nasopharyngeal aspirate by PCR.

All the above patients were treated appropriately with erythromycin, which has long been the mainstay of treatment for pertussis. However, the newer macrolides (in particular azithromycin and clarithromycin) have been shown to be equally effective at clearing the organism, have fewer side effects, and improved compliance profiles. Choice of antibiotic should be based on availability, age of the patient, and any existing contraindications.

Pertussis is a notifiable condition in South Africa (SA), and all clinically suspected cases as well as laboratory-confirmed cases should be notified to health authorities to facilitate rapid investigation and

administration of chemoprophylaxis where indicated. Guidelines regarding follow-up of contacts of cases, dosages and duration of treatment of cases and chemoprophylaxis for contacts have recently been reviewed and updated in line with international recommendations, and are appended to this communiqué.

The confirmation of pertussis disease is challenging. Culture has always been the gold standard but is most likely to be positive during the catarrhal phase (\leq 14 days from onset of illness); although it is highly specific, the sensitivity is higher in infants than in adolescents and adults. Most cases are only recognized once they have a paroxysmal cough, when the sensitivity of culture is very poor.

Molecular methods such as polymerase chain reaction (PCR) have become very useful as they are more sensitive than culture and remain positive even once treatment is commenced—they are useful for persons presenting with \leq 3 weeks of illness (Table). The use of PCR has greatly improved the ability to confirm pertussis cases.

Although quick and easy to perform in the laboratory, serology suffers numerous drawbacks. Only anti-PT (pertussis toxin) serology has been well standardized and validated, and only anti-PT IgG ELISA testing is recommended for use in diagnosis of pertussis. IgG titres need to be interpreted in the context of a diagnostic cut-off determined by local sero-epidemiological surveys. A recommendation for considering anti-PT IgG titres between 50–120 IU/ml as highly suggestive of recent pertussis has been proposed by a collaboration of European laboratories, but this is based on numerous and extensive sero-epidemiological surveys in Western Europe.

However, there is no sero-epidemiological data for

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SA or other countries in Sub-Saharan Africa from which we could infer appropriate cut-off levels; this certainly limits the usefulness of such tests in our setting at present.

In view of the challenges discussed above, it is recommended that suspected cases of pertussis in SA should have the following tests performed for detection of *B. pertussis*:

- ideally: a nasopharyngeal swab or aspirate for PCR detection of *B. pertussis*.
- a nasopharyngeal swab or aspirate for culture of *B. pertussis* if PCR testing is not feasible or available.

Currently, most private laboratories do offer pertussis PCR testing, and there are two laboratories in the NHLS that offer PCR testing (one each in Gauteng and Western Cape provinces). Specimens submitted for pertussis PCR testing in NHLS-serviced public health sector facilities will be forwarded on to either of these laboratories for testing.

Source: Outbreak Response Unit, NICD-NHLS; Gauteng Department of Health; Rahima Moosa Mother & Child Hospital

Table: Comparison of diagnostic methods for *B. pertussis*

Method	Advantage	Disadvantage
Culture	Highly specific – if positive it confirms the diagnosis. Can be done by most diagnostic microbiology laboratories provided media and SOPs are available for processing. Relatively cheap.	Poor sensitivity – highest in first two weeks (catarrhal phase) and is reduced following treatment. Higher sensitivity for infants than for adolescents and adults. Requires selective media and prolonged incubation (at least 7 days). Ideally culture medium should be inoculated at the bedside.
Molecular techniques (PCR)	Highly sensitive. Can detect <i>B. pertussis</i> DNA even after treatment has commenced, and remains positive late in the disease (≤ 3 weeks). Rapid results. At present the recommended diagnostic test of choice if available.	Specificity can be a problem. False positives do occur especially if only a single target PCR is used e.g. IS481. Requires molecular expertise and equipment. Relatively expensive.
Serology	Relatively cheap and rapid test.	Only useful if a standardized anti-PT IgG ELISA test is used (other antibodies lack sensitivity and specificity); even then, local cut-offs have not been determined. Serology can NOT be used for diagnosis of pertussis in children or adults who have received acellular pertussis vaccine in the previous year, if not longer. Not recommended alone for routine diagnosis.
Direct fluorescent antibody detection (DFA)	Rapid results.	Poor sensitivity and specificity - many false negatives and false positives. Slides are difficult to interpret and prone to reader error. No longer recommended for routine diagnosis.

Enteroviral meningitis outbreak

There is currently an outbreak of enteroviral meningitis in Nelspruit and Skukuza (within the Kruger National Park), Mpumalanga Province. South African Field Epidemiology and Training Programme (SA-FELTP) is assisting the Provincial Department of Health with the outbreak investigation, and health promotion within affected communities is ongoing. Enterovirus PCR was positive on nine of the CSF specimens tested at the Specialized Molecular Diagnostic Unit (SMDU, NICD) so far.

Although most enterovirus infections are asymptomatic, this ubiquitous group of viruses is the most common cause of aseptic meningitis worldwide. They are also associated with a range of other clinical syndromes, including encephalitis, myocarditis, myositis, acute haemorrhagic conjunctivitis, herpangina, hand-foot-and-mouth disease, and respiratory infections. Humans are the only natural reservoir for enteroviruses, which are transmitted primarily by faecal-oral contamination and less commonly by respiratory secretions. Enterovirus infections are more prevalent among

persons of lower socio-economic status and those living in urban areas, and transmission occurs within the family, chronic care facilities, institutions (e.g. schools) and the community; nosocomial outbreaks are also well described. The incidence of disease is highest in summer and autumn in temperate climates, but year-round in tropical areas.

Prevention is focussed on improving sanitation and hygiene, with health education an important aspect in preventing further transmission in outbreak settings.

Several enteroviral meningitis clusters and outbreaks in South Africa have been reported in the Communique in recent years, including a cluster of 17 people in the Eden district in Western Cape Province (November 2009) and 51 cases in Prieska, Northern Cape Province (February 2010).

Source: Outbreak Response Unit, SA-FELTP and Specialized Molecular Diagnostic Units, NICD-NHLS; Department of Health, Mpumalanga Province

Rift Valley fever update

During 2011, as of 18 February, four laboratory-confirmed human cases of Rift Valley fever (RVF) virus infection have been identified. Cases range in age from 28 to 47 years (37 years) and originate from Northern Cape (n=2), Eastern Cape (n=1) and Western Cape (n=1) provinces. All cases are farmers or farm workers. Three of the four patients had direct contact with animal tissues and body fluids when slaughtering/skinning livestock, and the fourth reported consumption of unpasteurised milk (specifically "dikmelk" or sour/fermented milk) in addition to limited contact with livestock. All cases presented with flu-like illness to their local healthcare practitioners during late January – early February 2011 (Figure). RVF was included in the differential diagnosis based on their occupational risk, and specimens were submitted to the NICD-NHLS for testing. The Special Pathogens Unit confirmed RVF virus infection by virus detection (RT-PCR and/or virus isolation). All patients are reportedly recovering, although two patients developed hepatitis during the course of their illness. During 2011 to date, the

Department of Agriculture, Forestry and Fisheries has confirmed three isolated animal RVF outbreaks: two in Western Cape Province and one in Eastern Cape Province. Further animal RVF outbreaks in previously affected areas may be anticipated following the heavy rainfall experienced throughout large parts of the country during recent months.

Should clinicians identify a suspected human case of RVF, they are requested to immediately notify the Department of Health and submit specimens to the NICD for laboratory testing. Readers are encouraged to access the 2011 Healthcare Workers Handbook on RVF, as well as keep up-to-date on recent developments through weekly situation reports, both published on the NICD-NHLS website (www.nicd.ac.za).

Source: Special Pathogens and Outbreak Response Units, NICD; Department of Health and Department of Agriculture, Forestry and Fisheries

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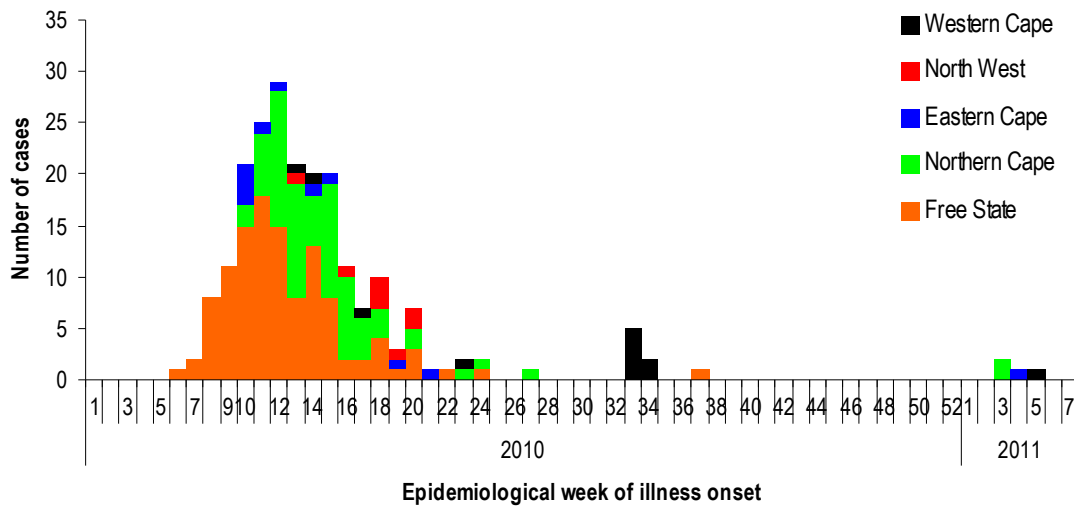


Figure: Epidemic curve illustrating the number of laboratory-confirmed RVF cases by epidemiological week of illness onset, by province, South Africa, last updated 18 February 2011

Foodborne illness outbreaks

Two foodborne illness outbreaks have been reported to the National Institute for Communicable Diseases (NICD) this month. The first involved five family members and a neighbour's child in Sharpeville, Gauteng Province. The cases were seen at two hospitals in the sub-district, and presented with headache, diarrhoea and vomiting. They had a meal together the previous day (consisting of chicken, pap (porridge) and Coke®) and started developing symptoms ± 8 hours later. The father of the household had received the cooked chicken from his employer. Left-over food samples were sent by a Gauteng Department of Health Environmental Health Practitioner to the Infection Control Services Laboratory (NHLS) in Johannesburg. *Bacillus cereus* diarrhoeal toxin was subsequently detected on chicken bone samples. All patients were treated and discharged the same day.

The second outbreak involved five children who were seen at a hospital in Lejweleputswa district (Free State Province), presenting with vomiting and abdominal cramps. About 3 hours prior to onset of illness, they had found and eaten pancakes that had been discarded at the nearby municipal dumping site. Two of the five children were admitted to hospital as they had severe vomiting, but discharged the following day. No clinical specimens were collected from the cases, but samples of the pancake were

submitted to the Infection Control Services Laboratory (NHLS) for testing. *Staphylococcus aureus* enterotoxin was detected on the pancake samples. In addition, high *E. coli*, yeast and mould counts were found, indicative of significant contamination.

S. aureus enterotoxin-mediated foodborne illness (incubation period of 1 to 6 hours) has been associated with a wide variety of foods, including: meat/meat products; poultry and egg products; various salads (tuna, egg, chicken, potato, macaroni); bakery products such as cream-filled pastries, cream pies, chocolate éclairs; sandwich fillings; and milk and dairy products. These are generally foods that require much handling during preparation and that are often kept at slightly elevated temperatures after preparation, setting the stage for *S. aureus* proliferation and enterotoxin production. *B. cereus* diarrhoeal toxin-mediated foodborne illness (incubation period of 8 to 16 hours) has also been associated with a wide variety of foods, including: meats; milk; vegetables and fish. Food mixtures such as sauces, puddings, soups, casseroles, pastries and salads have been frequently implicated in outbreaks.

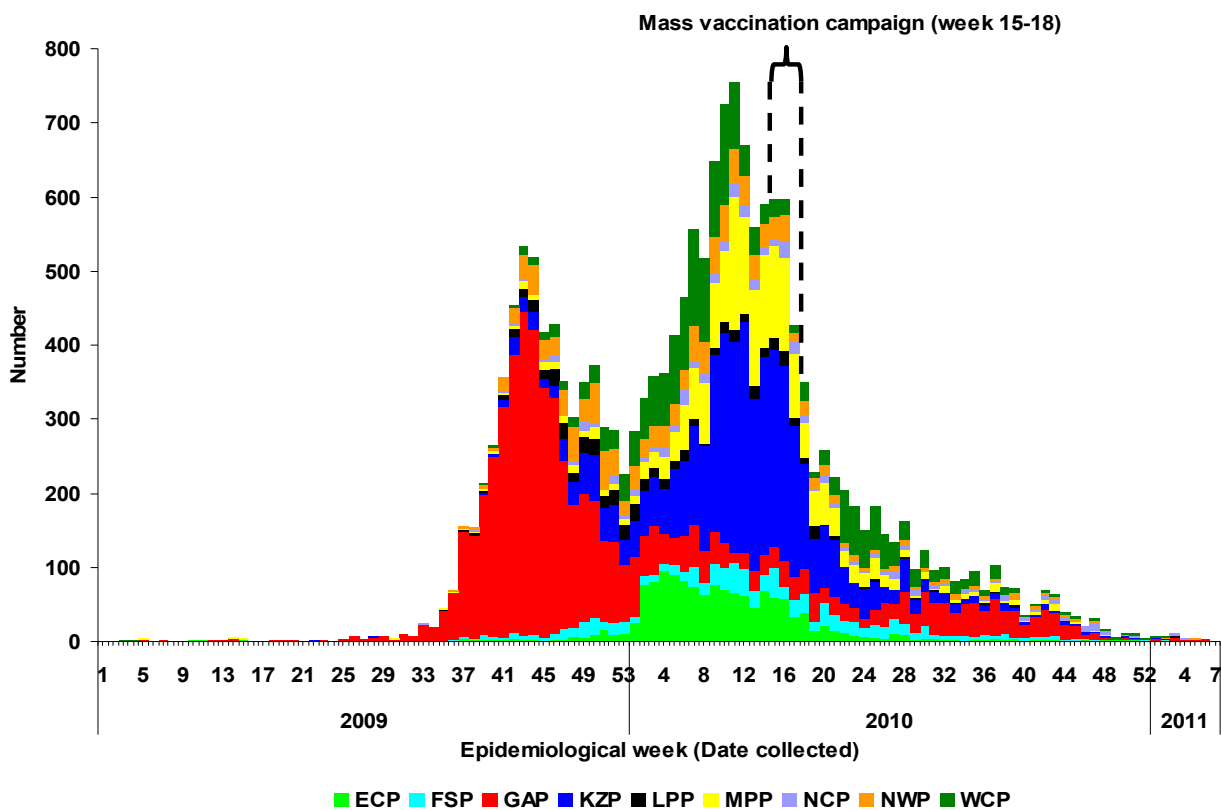
Source: Outbreak Response Unit, NICD-NHLS; Infection Control Services Laboratory, NHLS; Department of Health, Gauteng and Free State Provinces

Measles update

There have been 33 additional laboratory confirmed measles cases since the last published Communiqué, bringing the total to 18, 396 cases from January 2009 to 8 February 2011. Cases have been reported from all nine provinces, with Gauteng (31%, 5 747/18 396), KwaZulu-Natal (23%, 4 265/18 396) and Western Cape (11%, 2 009/18 396) provinces accounting for the highest proportions of the total (Figure 1). Of patients with known age (n=17, 500), children under five years account for

52% of cases, with 26% occurring in those aged 6-11 months. Although measles cases continue to occur, the number of cases reported each week has generally declined to relatively low numbers in the past two months.

Source: Divisions of Epidemiology and Virology, NICD – NHLS



Province abbreviations: ECP=Eastern Cape; FSP=Free State; GAP=Gauteng; KZP=KwaZulu-Natal; LPP=Limpopo; MPP=Mpumalanga; NCP=Northern Cape; NWP=North West; WCP=Western Cape

Figure: Measles IgM positive results per province: South Africa, January 2009 - 8 February 2011

Rabies update

No cases of human rabies have been confirmed for 2011 to date. In 2010, a total of 11 human rabies cases has been confirmed in South Africa; cases have been reported from Northern Cape (n=1), Mpumalanga (n=1), Gauteng (n=1), KwaZulu-Natal (n=3), Eastern Cape (n=2) and Limpopo (n=3) provinces.

Prior to 2005 most confirmed human rabies cases were from the coastal provinces of KwaZulu-Natal and the Eastern Cape, but since then cases from elsewhere in South Africa have increased. Cases are now noted annually from Limpopo and Mpumalanga provinces, and the first locally-acquired

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human rabies case in Gauteng Province was described in 2010. The last dog rabies case from Gauteng Province was confirmed on the 6th December 2010 (source: Rabies Section, Agriculture Research Council-Onderstepoort Veterinary Institute). These more recent outbreaks have occurred in areas where rabies was previously controlled, and therefore underpins the importance of sustained

control efforts in all areas of South Africa. The single most important intervention for preventing rabies in humans is the routine vaccination of dogs.

Source: Special Pathogens and Outbreak Response Units, NICD-NHLS

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
Yellow fever: Côte d'Ivoire, Uganda	<p>As of 17 January 2011, the Côte d'Ivoire Ministry of Health reported an outbreak of yellow fever involving the following districts: Seguela (14 cases, including 10 deaths), Mankono (1 case), Beoumi (18 cases including 9 deaths) and Katiola (46 cases, including 16 deaths).</p> <p>The Ugandan Ministry of Health recently reported a confirmed outbreak in the northern regions of the country. As of 3 January 2011, the outbreak had affected 224 people with 53 deaths. A mass vaccination campaign is planned for this month, targeting 2.5 million people across 26 districts.</p>	<p>Yellow fever is an acute viral haemorrhagic disease transmitted by infected mosquitoes. Vaccination is the single most important preventative measure against yellow fever. South Africans travelling to endemic countries must receive yellow fever vaccine at least 10 days prior to departure. The vaccine is contraindicated in pregnant women, infants <9 months, individuals with egg allergies, and certain immunosuppressed persons. Vaccinated travellers should still take precautionary measures to avoid being bitten by mosquitoes, including: use of insect repellents (containing 30-50% DEET), wearing light-coloured clothing, and use of insecticide-treated bed nets.* An additional policy of mandatory yellow fever vaccination for travellers moving between East African yellow fever endemic countries was recently implemented.</p>
Rabies: Indonesia	<p>Within Indonesia, during 2010 more than 74,800 people were potentially exposed to rabies following dog bites requiring prophylaxis. A total of 195 fatal human rabies cases was recorded, the highest number of which were identified on the popular tourism island of Bali (with 119 fatal human rabies cases and more than 57 800 animal bites).</p>	<p>Travellers should avoid animal bites - avoid contact with all wild animals and domestic animals with unknown rabies exposure or vaccination history. Health workers should inform travellers of post-exposure measures if bitten or scratched, including to: thoroughly wash the wound with soap and water, and seek immediate medical treatment to receive vaccine and/or rabies immunoglobulin (depending on the exposure). Pre-travel rabies vaccination may be considered if activities during travel will likely result in close contact with potentially rabid animals.</p>

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Disease & Countries	Comments	Advice to travellers
Dengue: Brazil, St. Maartin, Latin America, El Salvador, Peru (Madre de Dios), Saudi Arabia (Jeddah), Australia (northern Queensland), Philippines	Areas reporting an increase in dengue cases include: <ul style="list-style-type: none"> •Brazil: 26 034 cases,100 severe cases and 12 deaths •St. Maartin: 4 cases, 1 death; •El Salvador: 136 confirmed cases; •Latin America: 46 600 cases, 31 deaths. •Peru: 30 000 suspected and 5 confirmed cases, 2 fatal confirmed cases; •Saudi Arabia: 61 suspected and 6 confirmed cases; •Australia (Queensland): 15 confirmed cases; and •Philippines: 1340 cases, 3 deaths. 	Dengue fever is the most common cause of fever in travellers returning from these areas. The mosquitoes responsible for transmission commonly breed within households and are most active during the day. Travellers should take precautionary measures to avoid mosquito bites.*

*Vector-borne transmission by mosquitoes. Travellers should take precautionary measures to avoid bites: use insect repellents (containing 30-50% DEET), wear light-coloured clothing, and use insecticide-treated bed nets.

References: ProMED-Mail (www.promedmail.org), World Health Organization (www.who.int), Centers for Disease Control and Prevention (www.cdc.gov), Europe Media Monitor (<http://medusa.jrc.it/medisys/helsinkiedition/en/home.html>); last accessed 2011/02/17

Source: Outbreak Response and Travel Health Medicine Units, NICD-NHLS

This communiqué is published by the National Institute for Communicable Diseases (NICD), a division of the National Health Laboratory Service (NHLS), on a monthly basis for the purpose of providing up-to-date information on communicable diseases in South Africa. Much of the information is therefore preliminary and should not be cited or utilised for publication. Questions and comments may be addressed to: The Outbreak Response Unit: outbreak@nicd.ac.za; Private Bag X4, Sandringham, 2131, South Africa

