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Measles outbreak

There have been 2414 laboratory-confirmed measles cases in 2009 to date (Figure).

Gauteng Province

The epidemic is firmly established in Gauteng Province, and the number of cases continues to increase. Among the districts, Tshwane has reported the most cases to date (853/2104, 40%). Since October, however, Tshwane has reported fewer newly-confirmed cases (325/1356, 24%) than Johannesburg (617/1356, 45%) or Ekurhuleni (362/1356, 27%). Children under 12 months are bearing the brunt of disease (603/2066, 29% cases) with 7% (156/2066) of cases occurring in infants less than six months of age.

Other Provinces

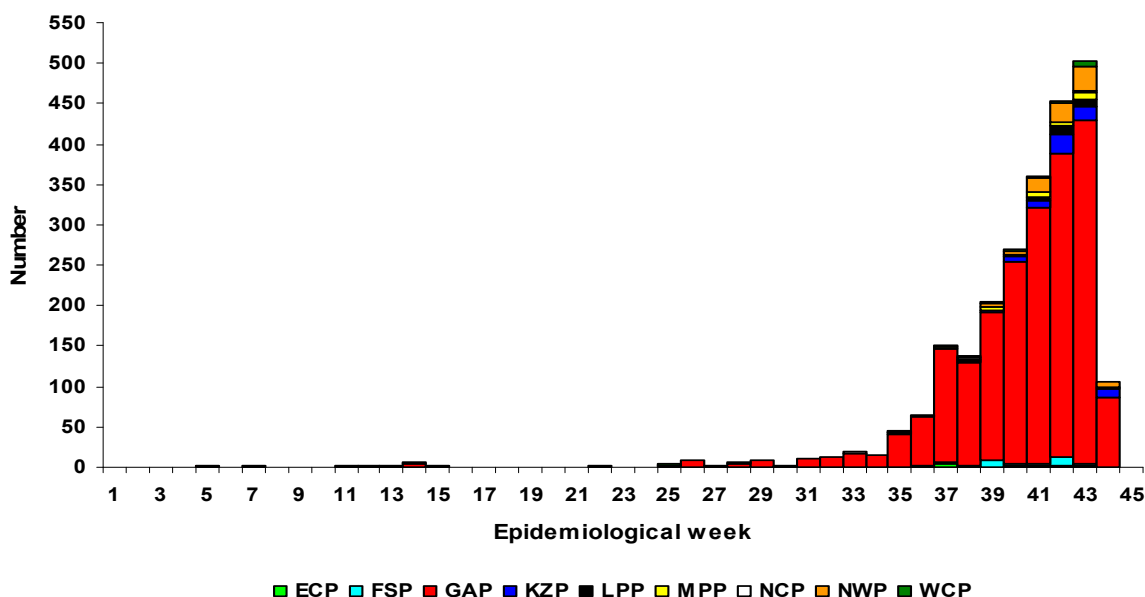
Of concern is that all provinces outside Gauteng also reported measles cases in October 2009, with

North West (80 cases) and KwaZulu-Natal (63 cases). Provinces reporting the most cases. Overall, 17% (53/304) of cases occurred in children less than 12 months, with 5% (12/304) of cases in infants less than six months of age.

The case definition for suspected measles is as follows: fever $\geq 38^{\circ}\text{C}$, rash, and one of the following: cough, coryza, conjunctivitis. All suspected cases should have a blood and urine or throat swab specimen taken, and the new measles case investigation form (available on the NICD website) completed by the person diagnosing the patient. Both are to be sent (the specimens placed on ice) to the NICD (where specimens are tested at no charge, including private sector specimens). SKYNET courier services have been contracted to collect and transport specimens to the NICD when required

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Measles IgM positive results per province : South Africa 2009



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(contact them at 011-571-4500 or 011-586-1100 and quote account number P13011). Suspected cases should be notified to the local authority health services' Communicable Disease Control directorates, as required under the Health Act. All close household contacts of the patient should receive a measles vaccination within 72 hours of

contact – this may provide some protection against infection. This primary vaccination response should occur as soon as possible (prior to the availability of the results) in order to prevent spread. Frequently-asked-question documents pertaining to measles vaccine are available on the NICD website.

Source: Divisions of Epidemiology and Virology, NICD; Communicable Disease Control Directorate: Tshwane District and Gauteng Province

Pandemic influenza A(H1N1) 2009

Seven laboratory-confirmed pandemic influenza A (H1N1) cases have been reported to the NICD since 30 October 2009, all associated with travellers returning from northern hemisphere countries (Europe, the Middle East, East Asia and South-East Asia). No secondary transmission has been documented. As of 23 November 2009, a total of 12 626 laboratory-confirmed cases of pandemic influenza A(H1N1) 2009 infection, including 91 associated deaths, has been recorded in South Africa. Further detail on the epidemiology of cases and factors associated with fatalities can be viewed within the weekly situation report published on the NICD website.

There are continued reports of escalating incidence rates in the northern hemisphere, including North America, west and central Asia, the Middle East and Europe. In addition, there is recent documented pandemic influenza A(H1N1) 2009 activity within other African countries. During the month of October to 2 November, NICD confirmed pandemic influenza A(H1N1) 2009 in specimens from Mozambique, Namibia, Seychelles, Swaziland, and Zimbabwe. Somalia, Nigeria and Burundi recently reported their first confirmed pandemic influenza A (H1N1) 2009 cases. This suggests ongoing transmission within sub-Saharan Africa. Argentina is currently the only southern hemisphere location reporting unusually high pandemic influenza A (H1N1) 2009 activity. According to the WHO update of 6 November 2009, pandemic influenza A(H1N1) 2009 is still of great concern with more than 206 countries reporting confirmed cases and over 6 770 confirmed deaths. It therefore remains important for clinicians to continue to suspect pandemic influenza A(H1N1) 2009 infection in patients presenting with influenza-like-illness (ILI), especially individuals with a recent history of travel. Empiric antiviral treatment for individuals with severe acute respiratory illness should strongly be considered in returning travellers

from countries with current pandemic influenza A (H1N1) 2009 activity; and this should not be withheld whilst laboratory results are awaited. One of the recent travel-related cases reported in this month's special issue of the NICD Communicable Diseases Communiqué (vol. 8(1), additional Issue 1, available from: www.nicd.ac.za) exemplifies the importance of early recognition and treatment when pandemic influenza A(H1N1) 2009 is suspected. A 33 weeks pregnant female with a history of rheumatic heart disease, travelled from the United Arab Emirates and developed acute respiratory distress syndrome (ARDS) shortly after arrival. Following the suspicion of pandemic influenza A(H1N1) 2009 infection, treatment with oseltamivir and broad-spectrum antibiotics was immediately commenced. Both the mother and child (born prematurely by caesarean section) are now well.

Travellers to the northern hemisphere should be made aware of the risk of pandemic influenza A (H1N1) 2009 infection. They should be advised to practice hand and cough hygiene, and to seek health care promptly should they develop ILI. Travellers may be able to access the monovalent vaccine against pandemic influenza A(H1N1) 2009 virus at their destination; however, they should also be cautioned of the 10-14 day lag of protective antibody production, during which they will be susceptible to infection. Antiviral prophylaxis is not recommended for travellers; however, individuals at risk for development of severe disease may be prescribed an appropriate course of antiviral medication with instructions to begin taking the drug at the first signs of illness onset.

Source: NHLS: Epidemiology and Virology Divisions, NICD; Tygerberg Hospital; Groote Schuur Hospital; Universitas Hospital; Steve Biko Academic Hospital; Inkosi Albert Luthuli Central Hospital. Private laboratories: Ampath, Lancet, PathCare and Vermaak laboratories. Faculty of Health Sciences, University of Stellenbosch

Enteroviral meningitis outbreak

A cluster of 17 people was hospitalised with similar clinical syndromes in the Kannaland Local Municipality area (Eden District Municipality, Western Cape Province) since the second week of November, prompting an outbreak investigation. Cases ranged in age from 4 months to 20 years, with a median age of 7 years; in three instances siblings from the same family were affected. Most cases presented with fever, vomiting and/or headache. At least 10 cases had aseptic meningitis (lymphocyte-predominant pleocytosis) which resolved rapidly. Enterovirus PCR was positive in 2/2 CSF and 7/13 stool or throat swab specimens sent to the Diagnostic Virology Laboratory, Groote Schuur Hospital.

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

Source: Eden District Health Department, Western Cape Province; Diagnostic Virology Laboratory, Groote Schuur Hospital, University of Cape Town; Outbreak Response Unit, NICD

Diarrhoeal diseases

Limpopo: Fatal *Clostridium perfringens* enteritis

A 61-year-old male with a history of untreated type 2 diabetes presented with a one-day history of fever with rigors, nausea and weakness, followed by profuse watery diarrhoea. The patient deteriorated rapidly, and on admission to hospital was noted to be febrile and shocked with a decreased level of consciousness and continuous green watery diarrhoea, together with clinical evidence of disseminated intravascular coagulation (DIC). He died soon after despite intensive resuscitation. *Clostridium perfringens* was detected by PCR on a blood specimen sent to the NICD.

C. perfringens enteric infection is associated with a number of distinct clinical syndromes, depending on the strain type and toxins it produces. Although rarely encountered nowadays, enteritis necroticans ('pigbel') is a rapidly progressive necrotizing infection of the small bowel caused by *C. perfringens* type C. It presents as an acute enteritis which may be complicated by systemic toxicity or intestinal obstruction, and carries a high mortality

rate (15-45%). Fulminant disease in diabetic patients is well described, and perhaps attributable to diabetes-related gastrointestinal dysfunction allowing overgrowth of the organism and facilitating its pathogenesis.

C. perfringens type C is ubiquitous, found in soil and the gastrointestinal tracts of many animals, including humans (asymptomatic carriage is common in endemic regions). Outbreaks and sporadic cases of enteritis necroticans have been linked to inadequately cooked food-animal products. Affected persons usually have underlying risk factors, including the classic association with protein malnutrition and the more recently recognized association with diabetes.

Cholera: Zimbabwe

As of 8 November 2009, 9 districts are affected by the ongoing cholera outbreak, with 116 cases notified to the WHO since 7 September 2009. It is feared that the summer rains and movement of

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people during the festive season may worsen the situation. All provinces in South Africa need to be on high alert to ensure early detection of cholera cases and prevention of transmission. All suspected cases presenting with acute watery diarrhoea should be immediately notified and investigated. Stool or rectal swab samples should be sent in transport medium and a specific request made to the

laboratory for cholera testing. Aggressive rehydration remains the mainstay of treatment, with prompt intravenous Ringer's lactate therapy in the severely dehydrated patient being a lifesaving measure.

Source: Physician: Limpopo Province, Outbreak Response, Special Pathogens and Enteric Diseases Reference Units, NICD

Rift Valley fever

An outbreak of Rift Valley fever (RVF) has been detected on farms around Kakamas (Siyanda District, Northern Cape Province). The outbreak was initially suspected based on histopathology of the liver from cattle that died within the area, and later confirmed by immunohistochemistry conducted by University of Pretoria, Department of Para-Clinical Sciences on 21 October 2009. Following this report, the Northern Cape Provincial Outbreak Response Team initiated investigations to establish the extent of the outbreak, conduct active human case finding, and implement control measures.

Investigations conducted on the index farm found a total of 5 cattle deaths and two abortions between 7 and 14 October. The farm owner, together with two other people, conducted a necropsy on the animals on 7 October. On 13 October, the farm owner reported onset of a flu-like illness and fever and was subsequently hospitalised. A second human case, a veterinary assistant who took part in the post-mortem of a cattle carcass, was hospitalised on 19 October with flu-like illness, fever and epistaxis. A third suspect case, admitted to hospital with onset of similar symptoms (including epistaxis) on 28 October, reported exposure to a goat that died seven days earlier on a separate farm, and was autopsied.

Blood specimens were collected from all three cases and transported to the NICD for laboratory testing. The first two human cases reported here were confirmed by RVF virus PCR and IgM ELISA, while the third case tested negative on IgM ELISA. A total of seven human RVF cases has been confirmed during 2009 to date; the above two cases from Northern Cape Province, and five cases from KwaZulu-Natal (which occurred during the first six months of 2009).

Human cases confirmed in South Africa in 2008 (n=17) and 2009 have all been associated with occupational exposures and included farmers, farm workers, veterinarians and veterinary students. During the current RVF outbreak period the Department of Agriculture, Land Reform and Rural Development embarked on serologic and clinical surveillance of all the farms neighbouring the index farm, as well as farms reporting mortality/abortion in livestock during the previous two months within the vicinity. Information sessions among local farmers, radio interviews, and press statements were also conducted, resulting in additional farms reporting abortions and deaths. To date 88% (15/17) of farms surveyed have confirmed RVF infection in livestock by PCR, ELISA, and immunohistochemistry. Farms with confirmed livestock cases are all adjacent to the Orange River. Inactivated RVF vaccines have been provided to farms within five kilometres upstream and downstream of the index farm. To date a total of 787 cattle, 1 627 sheep and 534 goats has been vaccinated.

Human case findings in the area revealed a total of 46 human contacts (in addition to the aforementioned cases) that reported exposure to animal carcasses and/or aborted foetuses between 13 and 27 October. Identified contacts came from four farms (all reporting confirmed RVF animal infection) and three facilities that received meat that was traced back to the index farm. Health promotion sessions were held with contacts, and they were provided with thermometers to self-monitor their temperature for seven days following exposure. None of these contacts reported any symptoms of RVF during this period of observation. Further investigations are required to elucidate the cause this outbreak as it does not fit the normal pattern of high-rainfall activity.

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RVF virus causes large epizootics among ruminant animals (e.g. cattle, buffalo, sheep, goats, and camels), with high rates of mortality and abortions among affected animals as well as significant economic losses. The virus, however, may also be transmitted to humans and usually results in an asymptomatic infection or mild disease characterised by fever, muscle and joint pain, and headaches. In rare instances complications such as retinitis, meningoencephalitis, hepatitis or haemorrhagic fever may occur. Interventions to

control and prevent outbreaks primarily include: vaccination of livestock, education of high-risk groups (incl. veterinarians and farmers) to take precautionary measures against infection (including the use of personal protective equipment), and/or vector control.

Source: South African Field Epidemiology and Laboratory Training Programme (SAFELTP), Special Pathogens and Outbreak Response Units, NICD; Departments of Health, Agriculture, Land Reform and Rural Development, Northern Cape

Viral haemorrhagic fever

There have been no new laboratory-confirmed cases of viral haemorrhagic fever in South Africa in the last month. Typically, most cases of Crimean-Congo haemorrhagic fever (CCHF) in the past have been reported in the summer months so health care workers should have a high index of suspicion for CCHF in persons presenting with an acute febrile illness with a history of exposure to ticks and animal blood or tissue. Bleeding generally occurs 3-5 days

after onset of fever. Thrombocytopenia and a transaminitis are invariable once bleeding is present, and are important cues for CCHF testing.

To date in South Africa in 2009 there has been one laboratory-confirmed case of CCHF.

Source: Special Pathogens and Outbreak Response Units, NICD

Rabies update

Two cases of human rabies were confirmed in the last month, one case from Newcastle, KwaZulu-Natal Province and another case from Hamangilasi, Limpopo Province. In both incidents the human bite victims were not taken to a health care facility because of no perceived risk of rabies.

Fourteen human rabies cases have been laboratory-confirmed in South Africa for 2009 to date, with cases from the Eastern Cape (n=7); KwaZulu-Natal (n=4), Limpopo (n=2) and Mpumalanga (n=1) Provinces. In addition the laboratory has also

confirmed 7 cases from Namibia and 1 case from Swaziland. Rabies remains a neglected disease. The awareness of risk factors for rabies and the need to seek urgent health care for post-exposure prophylaxis following animal exposures is alarmingly low even in hyperendemic areas. Improving community awareness is key in preventing human cases.

Source: Special Pathogens and Outbreak Response Units, NICD

Fungal infection counters insecticide resistance in African malaria mosquitoes

Research has shown that mosquitoes infected with common soil-living fungi will die before they are old enough to transmit the malaria parasites. In areas where malaria mosquitoes have become resistant to pesticides, mosquito-killing fungi can be an effective

alternative tool. Researchers from the University of the Witwatersrand and the National Institute for Communicable Diseases (NICD, a division of the National Health Laboratory Service - NHLS) and

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their colleagues from the University of Wageningen in the Netherlands have published an article in PNAS (*Proceedings of the National Academy of Sciences*) describing how insecticide-resistant mosquitoes infected with fungal spores lose some of their resistance to insecticides.

These fungi were tested for the first time on various species of insecticide-resistant malaria mosquitoes housed at the NICD. The research team compared the effectiveness of fungi on mosquitoes that are susceptible to insecticides as well as those mosquitoes that are resistant. The fungus *Beauveria bassiana* was able to kill both susceptible and resistant malaria mosquitoes (*Anopheles arabiensis*, *An. gambiae* and *An. funestus*). This indicates that malaria mosquitoes that are resistant to the insecticides are not resistant to the fungus. In addition, the team studied to what extent fungal-infected mosquitoes are also susceptible to insecticides. To this end, resistant mosquitoes were infected with spores of the fungi *Beauveria bassiana*

or *Metarhizium anisopliae*. Both fungus species increased the mosquitoes' susceptibility to DDT and permethrin; more mosquitoes died after exposure to the chemicals when they were infected with fungus. The researchers believe that the toxins excreted by the fungi undermine the mosquitoes' resistance mechanisms. Fungi enhance the effectiveness of pesticides against resistant mosquitoes and the researchers see a fungus-insecticide combination as an important addition to the limited arsenal of anti-malaria weapons. The use of fungi as a biological control agent is seen as a sustainable alternative to avoid resistance.

Reference:

Farenhorst M., Mouatcho JC, Kikankie C, et al. 2009. Fungal infection can counteract insecticide resistance in African malaria mosquitoes. PNAS (e-pub ahead of print).

Source: Vector Control Reference Unit, NICD

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
<u>Polio</u>	The World Health Organization (WHO) is currently recommending immunisation or boosting for travellers to 25 countries: Afghanistan*, India*, Nigeria*, Pakistan*, Afghanistan, Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d'Ivoire, Democratic Republic of Congo, Ethiopia, Ghana, Guinea, India, Kenya, Liberia, Mali, Nepal, Niger, Nigeria, Pakistan, Sierra Leone, Somalia, Sudan, Togo, Uganda. Four of these countries remain *polio-endemic with indigenous poliovirus circulation. The remainder reported imported polio (or related) cases in the past two years.	Travellers who have previously received three or more doses of OPV or IPV should be offered a booster dose of polio vaccine before departure. Non-immunised individuals require a complete course of vaccine.
<u>Chikungunya:</u> Asia and Indian-Ocean region: India, Thailand, Malaysia, Réunion	Chikungunya has recently been confirmed in a South African traveller returning from India. Extensive outbreaks were reported in India during October 2009. Thailand (incl. Phuket) and Malaysia reported over 42,300 and 3,185 cases to the end of September respectively.	†Chikungunya fever is caused by a virus, which is transmitted through infected mosquitoes. No medications or vaccines are available for prevention. Travellers should take precautionary measures to avoid mosquito bites.

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Disease & Countries	Comments	Advice to travellers
<u>Dengue & dengue haemorrhagic fever (DHF):</u> Saudi Arabia, Central and South America, Pacific region	During 2009, areas endemic for dengue fever (incl. regions throughout the tropics and subtropics within the South Pacific, Asia, Caribbean, the Americas, and Africa) have reported increased activity. Elevated incidence in Saudi Arabia includes cases from Jeddah and Mecca, which are popular travel destinations and important to observers of the Hajj pilgrimage (25-30 November).	†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.
<u>Yellow fever: Côte d'Ivoire</u>	As of 16 November 2009, 10 suspected yellow fever virus infections, with 3 confirmed, has been reported within the northwest Denguuele region.	†Under the International Health Regulations, South Africans travelling to endemic countries (incl. Côte d'Ivoire) must receive yellow fever vaccine at least ten days before departure. Yellow fever vaccination certificates are valid for 10 years. The vaccine is contraindicated in pregnant women, infants <9 months, individuals with egg allergies, and certain immunosuppressed individuals (HIV-infected with CD4 <200/mm ³). These individuals still require a health certificate indicating the reason for non-compliance when travelling.
<u>Rabies:</u> Bali (Indonesia)	An outbreak of rabies has been ongoing on the island of Bali since December 2008, with 17 human deaths as of October 2009. Most human and animal rabies cases have been confirmed near popular tourist destinations on the southern tip of Bali.	Travellers should avoid animal bites - avoid contact with all wild animals, and domestic animals with unknown rabies exposure or vaccination history. Inform them of post-exposure measures if bitten or scratched; including to: thoroughly wash the wound with soap and water, and to seek immediate medical treatment to receive vaccine and/or rabies immunoglobulin (depending on the exposure).

†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.

Source: Travel Health and Outbreak Response Units, NICD.

References: ProMED-Mail (www.promedmail.org), World Health Organization (www.who.int), The Center for Disease Prevention and Control (www.cdc.gov), Europe Media Monitor (<http://medusa.jrc.it/medisys/helsinkiedition/en/home.html>); last accessed 2009/11/18.

This communiqué is published by the National Institute for Communicable Diseases (NICD) 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.

