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Cholera outbreak

For the period 1 November 2008 to 19 February 2009, South Africa has reported 10 979 cases of cholera including 57 deaths (CFR = 0.52%). Of these, 964 cases (9%) have been laboratory-confirmed. Cases have been reported from all 9 provinces (Table) with the majority occurring in Limpopo (42%, 4586/10979) and Mpumalanga (56%, 6101/10979) provinces.

All five districts in Limpopo Province have been affected. Although initial cases were predominantly seen in Vhembe district and were linked to Zimbabwe, the outbreak subsequently spread to all

districts via local transmission. The large outbreak in Mpumalanga Province was confirmed in Ehlanzeni district in the second week of January 2009 following the investigation of a cluster of deaths in adults due to severe dehydration and an increase in cases of diarrhoea reported at health care facilities. The number of new cases is now declining in both of the above-mentioned provinces

The remaining provinces have reported primarily sporadic cases of cholera with small clusters identified in Gauteng, Western Cape and North West provinces.

Table. Reported cholera cases and deaths in South Africa by province, 1 November 2009 to 19 February 2009

Province	Total cases*	Laboratory-confirmed cases no.(% of total)†	Deaths
Mpumalanga	6101	379 (6)	30
Limpopo	4586	494 (11)	23
Gauteng	265	64 (24)	3
North West	14	14 (100)	0
Western Cape	8	8 (100)	0
KwaZulu Natal	2	2 (100)	1
Northern Cape	1	1 (100)	0
Free State	1	1 (100)	0
Eastern Cape	1	1 (100)	0
Cumulative total	10 979	964 (9)	57(CFR=0.52%)

*This includes both laboratory-confirmed cases and cases meeting the current clinical case definition for cholera (all individuals with acute onset of watery diarrhoea)

†This includes all laboratory-confirmed cholera cases reported to the NICD from NHLS and private laboratories

To date, all isolates received and characterised by the Enteric Diseases Reference Unit (EDRU) (n=238) have been confirmed as *Vibrio cholerae* O1 biotype El Tor and the presence of the cholera toxin gene, *ctx* has been confirmed with PCR. Three isolates (3/238, 1%) were serotyped as *V. cholerae*

O1 Inaba and the remainder (235/238, 99%) as *V. cholerae* O1 Ogawa. Multi-drug resistance continues to be a major problem, including to nalidixic acid, cotrimoxazole and erythromycin, emphasising the need for judicious use of antimicrobials, which are

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contra-indicated in mild to moderate diarrhoea. The isolates appear highly clonal using molecular techniques and can be linked to a major southern African clone.

Mechanisms for improving community access to safe water, improvements in sanitation and extensive health promotion activities have been urgently implemented in affected provinces.

However the country will remain at high risk for waterborne disease outbreaks (including cholera) until definitive solutions for sustainable access to safe water and sanitation are implemented for all communities.

Source: Outbreak Response Unit, Enteric Diseases Reference Unit, NICD; SA-FELTP; Limpopo local and provincial Departments of Health; NHLS; Mpumalanga SD: Communicable Disease Control; Communicable Disease Control Directorates in all provinces, National Department of Health Communicable Disease Control

Food-borne disease outbreak

On 28 January 2009, a local primary school in Maruleng Sub-district, Mopani District, Limpopo Province was affected by an outbreak of diarrhoeal disease. The Limpopo Provincial Department of Health initiated an investigation in collaboration with the South African Field Epidemiology and Laboratory Training Programme (SA-FELTP). A retrospective cohort study was conducted to describe the outbreak and determine the source of infection.

Approximately 300 learners and staff members presented with diarrhoea. On 29 January 2009 Sekororo Hospital treated 163 cases; of which the majority (158/193, 97%) required admission to various hospitals in the area. Only 24 learners were available for interviews, of whom 19 reported symptoms. Five and 12 cases reported onset of symptoms on 28 and 29 January 2009 respectively. Males and females were equally affected and age ranged from 8 to 14 years. Symptoms reported included: abdominal pains (n=19, 100%), diarrhoea (n=12, 63%), body-aches (n=7, 37%), fever (n=6, 32%), nausea (n=3, 16%), and vomiting (n=1, 5%). Most cases (n=16, 84%) experienced symptoms for 1 to 2 days. All cases have made a full recovery and have been discharged. A total of 61 stool and rectal swabs specimens was collected. No pathogens were isolated.

Contamination of food served at the school on 28 January 2008 was implicated. Learners are provided lunches through the Government Nutrition Programme. Of the 24 respondents, all (100%) reported having consumed cabbage on 28 January. No other food items consumed were found to be potential risks for infection and no incidents had been reported for the previous one-year period during which the same catering service had been provided. The catering service is maintained by community

volunteers, who cook and serve foods from an informal roofed outdoor area. Traditional pots are used for cooking in a designated area on the floor. Food supplies, consisting of mostly vegetables (no meat products), are delivered to the school one day prior to use and stored at room temperature. The school is supplied by borehole water. There were no specific hand washing facilities at the site of food preparation.

Such foodborne disease outbreaks can be prevented by adherence to basic food safety guidelines including:¹

- Washing hands with soap and water before handling food, during food preparation and after using the toilet. Keep food preparation areas and equipment properly sanitized and free of insects, pests and animals.
- Separation of raw (poultry, meat and seafood) and cooked foods by using separate utensils and equipment for raw foods and separate raw food containers for storage.
- Cook food to a temperature of at least 70°C and reheat cooked food thoroughly.
- Store food at safe temperatures. Do not leave cooked food at room temperature for >2 hours. Promptly refrigerate all perishable food (<5°C if possible). Keep cooked food hot (60°C) prior to serving.
- Use safe water for cooking and washing vegetables and utensils. Use fresh foods and do not use food beyond expiry dates.

References:

1. WHO: Five keys to safer food. Available at: http://www.who.int/foodsafety/publications/consumer/en/5keys_en.pdf. Accessed 23 February 2009.

Source: SA-FELTP and the Outbreak Response Unit, NICD; Limpopo Communicable Disease Control Directorates, NICD

Meningococcal disease

The occurrence of 2 cases of laboratory-confirmed meningococcal disease from the same school in a 10-week period prompted concerns of an institutional outbreak this month. The index case was an 18-year-old matric learner who was admitted on 4 December 2008. *Neisseria meningitidis* was confirmed on culture of cerebrospinal fluid. As the isolate is no longer available further definitive serogrouping could not be performed, but bacterial latex agglutination performed at the time of presentation on a cerebrospinal fluid specimen was positive for *E. coli*/*N. meningitidis* serogroup B suggesting serogroup B disease. In response to this case, post-exposure prophylaxis was administered to 500 learners all of whom had allegedly attended the same matric dance 72 hours prior to onset of illness in the index case.

The second case, a 15-year-old learner from the same school was admitted to hospital on 16 February 2009 and subsequently died. *N. meningitidis* was isolated from a blood culture and later confirmed as serogroup W135. Post-exposure prophylaxis was widely administered in response to this case.

Both these cases occurred outside the traditional meningococcal season highlighting the need for clinical vigilance all year round. Following the review of laboratory results, these cases are no longer considered to represent an institutional outbreak and are likely sporadic. Regular review of surveillance data is essential to identify such clusters early and respond. Post-exposure prophylaxis should be provided to household and close contacts of meningococcal disease cases. Mass chemoprophylaxis is not generally recommended for control of meningococcal disease outbreaks and vaccination should be considered in outbreak settings where appropriate and feasible.¹

References:

- Centers for Disease Control and Prevention. Prevention and Control of Meningococcal Disease Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2005;54(No. RR-7):1-16.

Source: Outbreak Response Unit, NICD; Health Services City of Johannesburg Region C; Respiratory and Meningeal Pathogens Unit, NICD

Pertussis cluster

A cluster of pertussis (whooping cough) was identified in January 2009. The index case was a ten-week-old infant who was admitted to hospital on 9 January 2009 with a history of persistent cough for approximately two weeks. A single target PCR performed on nasopharyngeal aspirate was positive for *Bordetella pertussis* insertion sequence 481 (IS481). Post-exposure prophylaxis was provided to immediate household and "household-like" contacts of the child including the infant's mother, father and grandparents. Nasopharyngeal swabs for *B. pertussis* PCR were also obtained from the mother (who was symptomatic) and both grandparents. The grandmother was confirmed PCR positive for IS481. She was however asymptomatic and had already received appropriate PEP/treatment. The grandmother also had possible close contact with her 21-day-old grandchild and azithromycin was provided to this infant deemed to be at high risk for severe disease. An additional secondary case was identified in a 27-year-old healthcare worker who nursed the index case during admission. She presented with a prolonged cough history on 22 January and was con-

firmed PCR positive for *B. pertussis* by single target PCR.

Follow up of household and close contacts of pertussis cases should be conducted to identify those requiring post-exposure prophylaxis (PEP). Post-exposure prophylaxis for household/"household-like" contacts of a pertussis case should be provided (if within 21 days of onset of cough in the case) under the following circumstances:^{1,2}

- If the contact is considered "vulnerable": infants <1 year, immunocompromised, chronic cardiac/lung disease, pregnant in the third trimester of pregnancy (to protect the newborn infant)
- If the contact is < 5 years and partially immunised or unimmunised i.e: has not completed at least a primary vaccine series for pertussis with the last dose at least 2 weeks before exposure
- If the contact is not vulnerable themselves but is likely to have close contact with any of those listed as "vulnerable" above in order to eliminate this reservoir of infection.

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The immunisation status of young contacts and cases should be reviewed and vaccination completed where appropriate. Symptomatic (coughing) contacts should be investigated and treated for pertussis. Erythromycin has been the mainstay of treatment and post-exposure prophylaxis for pertussis. However, the newer macrolides such as clarithromycin and azithromycin have been shown to be equally

effective at clearing the organism, have fewer side effects and improved compliance. Duration of treatment is 21 days for erythromycin and 7 and 5 days for clarithromycin and azithromycin respectively. The choice of macrolide used for treatment and/or chemoprophylaxis should be based on availability, age of the patient and any existing contraindications (Table).¹

Table. Antimicrobials for treatment and post-exposure prophylaxis for pertussis¹

Age group	Agent, dose and duration	Alternative
<1m	Azithromycin 10mg/kg per day for 5 days (limited data available for use in this age group)	Erythromycin 40-50mg/kg/day in four divided doses for 14 days Use with caution: risk of infantile hypertrophic pyloric stenosis
1 – 5m	Erythromycin 40-50mg/kg per day in four divided doses for 14 days	Azithromycin 10mg/kg daily (as a single dose) for 5 days Clarithromycin 15mg/kg/day in two divided dose for 7 days
Infants ≥ 6m and children	Erythromycin 40-50mg/kg/day in four divided doses (maximum: 2g per day) for 14 days	Azithromycin for 5 days: 10mg as a single dose day 1 then 5mg/kg daily (maximum: 500mg) on days 2-5 Clarithromycin 15mg/kg/day in two divided doses (maximum: 1g per day) for 7 days
Adults	Erythromycin 500mg QID (four times a day) for 14 days	Azithromycin for 5 days: 500mg as a single dose on day 1 then 250mg daily on days 2-5 Clarithromycin 500mg BD for 7 days

Cases admitted to hospital should be isolated using standard and droplet precautions for 5 days after commencement of appropriate antibiotics. Cases in the community should similarly be excluded from work/school/daycare for 5 days after commencement of antibiotics. Healthcare workers with close contact are at risk for nosocomial pertussis and should receive PEP where indicated. Use of appropriate personal protective equipment (PPE) at all times will help to prevent nosocomial transmission. Several countries have introduced routine booster doses with adult formulation acellular pertussis vaccines for adolescents and adults (including healthcare workers). However, these are not yet available in South Africa.

Nasopharyngeal swabs for pertussis are not indicated for asymptomatic contacts. These contacts should be assessed as above and receive PEP/treatment where indicated. "False positive" cases of pertussis may be identified when only single target

PCR is used for laboratory diagnosis. Culture should continue to be performed in addition to molecular techniques and laboratory results should be interpreted in the context of the clinical presentation of a case. Serology alone should not be used for confirmation of pertussis.

References

- Centers for Disease Control and Prevention. Recommended antimicrobial agents for the treatment and postexposure prophylaxis of pertussis: 2005 CDC guidelines. *MMWR* 2005; 54(No. RR-14): 1-13.
- Dodhia H, Crowcroft NS, Bramley J, Miller E. UK Guidelines for use of erythromycin chemoprophylaxis in persons exposed to pertussis. *J Public Health Med* 2002; 24:200-6.

Source: Outbreak Response Unit, NICD; Ampath laboratories

Rabies

To date, a total of three laboratory-confirmed cases of human rabies has been identified in South Africa for 2009, including cases from KwaZulu Natal (n=2) and the Eastern Cape provinces (n=1). In addition two cases have also been confirmed from Namibia.

Rabies was suspected in a child admitted with a diagnosis of Guillain Barré syndrome to a hospital in Gauteng Province. The patient was exposed to a stray dog picked up in Florida, Gauteng Province. The dog subsequently died of an unknown cause. Although preliminary laboratory results supported a diagnosis of rabies, this was eventually definitively excluded on molecular tests on saliva and CSF from the patient. The patient is recovering. While the risk of rabies is uncommon in Gauteng, confirmed cases in dogs have been reported from Cullinan, Hartebeespoort and Heidelberg. Recently rabies was also confirmed in a litter of puppies from Limpopo Province brought to suburban homes in both Johannesburg and Middleburg in Mpumalanga Province.

Rabies survivor

Recently the second case of a human survivor of rabies using the "Milwaukee protocol" was reported.¹ In essence the treatment regimen entails the induction of coma to allow for immune responses to develop. This involved a 15-year-old boy from Recife,

Brazil who was bitten by a vampire bat while sleeping. Despite receiving some rabies post-exposure vaccination, he developed signs of rabies and was admitted to hospital. It was decided to attempt the experimental treatment described in the controversial "Milwaukee protocol". After a 3 week coma and a month of hospitalization the Pasteur Institute of Brazil declared that the boy had recovered. The latest news is that the boy is responding to verbal commands but further neurological damage will only be assessed with time. The first case was the highly publicized 2004 case of Jenna Giese, a teenager from Wisconsin who was also exposed to a rabid bat.¹ She has since recovered and was able to finish her school career and even obtain a driver's license. The exact mechanism of action of the Milwaukee protocol is still unclear and although it has been attempted many times it has only been successful twice. Nevertheless this second case provides more evidence that the protocol may be successfully used.

References:

1. Willoughby RE, Tieves KS, Hoffman GM, et al. Survival after treatment of rabies with induction of coma. *N Engl J Med* 2005;352:2508-2514.

Source Special Pathogens Unit and Outbreak Response Unit, NICD

Viral haemorrhagic fevers (VHFs)

There were no cases of VHF confirmed in South Africa in the last month or to date this year. Typically CCHF is more common during the summer months so there should always be a high index of suspicion in patients with an acute febrile illness with a history of exposure to ticks and/or livestock. There have been numerous reports of cases of tick bite

fever in many parts of South Africa in the past month, a number with severe illness and complications.

Source Special Pathogens Unit and Outbreak Response Unit, NICD

Beyond Our Borders: Infectious Disease Risks for Travellers

The "Beyond Our Borders" column focuses on selected and current international disease risks that may affect South Africans travelling abroad. This issue reflects selected disease events from 22 January 2009 to 20 February 2009.

Disease	Countries	Comments	Advice to travellers
Meningococcal Meningitis	Uganda (Arua, Hoima, Masindi)	At least 35 people have died in a meningitis epidemic in several districts in Uganda over the past 2 weeks.	Transmission occurs by direct contact with respiratory droplets. Vaccination is recommended for individuals travelling to areas currently experiencing epidemics, and should be targeted towards serogroups in circulation. Currently only polysaccharide meningococcal vaccines are available in South Africa (limited effectiveness in individuals <2 years old). Protective efficacy in those age ≥2 approximately 85% and for limited duration - approximately 3 years.
	India (North Eastern), Bangladesh	Over 2500 cases with 230 deaths reported due to serogroup A meningococcus in northeastern India bordering Bangladesh and Myanmar over the past month.	
Yellow Fever	Brazil, Bolivia, Columbia, Peru	4 deaths from yellow fever have been confirmed in Rio Grande do Sul, Brazil. The areas at risk of yellow fever now include the northern, northwest, and central regions of the state, covering a population of 1.75 million, of which 88 % are already vaccinated.	Yellow fever is transmitted by mosquitoes*. Vaccination is mandatory for travellers to endemic countries a minimum of 10 days prior to departure; vaccine contraindicated in pregnancy, infants <9months, egg allergies, and certain immunosuppressive states (HIV+ with CD4<200). Vaccine certificates are valid for 10 years.
Viral Haemorrhagic Fevers	Lassa: London ex-Mali and ex-Nigeria	2 travellers have died from Lassa fever in London. The first case travelled to Nigeria, and the second worked in Mali. Nigeria is reporting an 80% increase in the number of cases seen this year. They reported 229 suspected cases and 30 deaths due to Lassa fever in 2008.	Lassa fever virus is primarily transmitted to humans via infected rodents (multimammate rat). This occurs through contact, consumption, or inhalation of materials and foods contaminated by the rat's urine or droppings; or contact with the infected rat. Person-to-person spread may also occur through contact with blood or body fluids of an infected individual. Travellers to endemic countries should avoid contact with rats and should store foods in rodent-proof containers.
	Ebola: Democratic Republic of Congo	The DRC Ministry of Health has declared their Ebola outbreak over.	
Legionnaires' disease	United Arab Emirates (Dubai)	Three travellers staying within a Dubai hotel have contracted Legionnaires' disease; one of them has died. To date, environmental sources tested at the hotel are negative for <i>Legionella</i> spp.	Legionnaires' disease is caused by infection with <i>Legionella</i> spp. (usually <i>L. pneumophila</i>), which is transmitted by inhalation of airborne bacteria. <i>Legionella</i> proliferate in hot water plumbing systems and cooling towers. Infectious aerosols are generated by air conditioning systems, shower heads, misters, and whirlpool spas. Symptoms include high fever, chills and cough. 5 to 15 % of cases are fatal. Travellers should avoid staying in hotels currently reporting outbreaks and poorly-maintained air conditioning/plumbing systems. Person to person transmission does not occur.
Hepatitis A	Egypt	A cluster of hepatitis A cases was identified among European travellers returning from Egypt. Infection among these cases may have occurred through consumption of contaminated food or water during a cruise on the Nile River.	Disease typically presents with fever, malaise, anorexia, nausea, abdominal discomfort and jaundice. Travellers are advised to take standard precautions with food and water**. Vaccination should be considered prior to visiting endemic countries. In healthy travellers age 2 to 40 years, hepatitis A vaccine can be given as soon as travel is considered (regardless of time to travel). For travellers who are at high risk for severe illness and/or are <2 years or >40 years of age departing in ≤ 2 weeks, immunoglobulin should be provided (in addition to vaccine) to ensure immediate protection. A booster dose of vaccine 6-12 months after the first dose is likely to provide protection for many years, if not lifelong.

*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.

**Prevention of food and waterborne diseases: Drink water that is bottled or bring it to a rolling boil for 1 minute. Bottled carbonated water is safer than uncarbonated water. Avoid ice unless made from bottled or boiled water. Avoid food products (eg. ice cream) that may have been made with contaminated water. Eat foods that have been thoroughly cooked and that are hot and steaming. Avoid raw vegetables and fruits that cannot be peeled. Peel the fruit and vegetables yourself after washing your hands with soap. Do not eat the peelings. Avoid foods and beverages from street vendors. These are a common source of infection in travellers.

Source: Travel Health, Outbreak Response, SA-FELTP, Epidemiology Division; Public Health Registrars, University of Witwatersrand

References: ProMED-Mail (www.promedmail.org) and World Health Organization (www.who.int); last accessed 2009/02/20.

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