

## Outbreak Response Unit

### BACKGROUND

The Outbreak Unit of the Epidemiology Division is tasked with providing technical support for all aspects of communicable disease outbreaks and control in the nine provinces in South Africa with special emphasis on optimizing the role of laboratory services during outbreaks. The unit works in close collaboration with the provincial and national Departments of Health to ensure a comprehensive outbreak response and the development of systems for early outbreak detection and improved reporting. In addition, close partnerships with the NHLS diagnostic laboratories and reference units of the NICD aims to deliver appropriate laboratory diagnostic services during outbreaks and specialised diagnostic tests as required.

The Outbreak Unit is a member of the National Outbreak Response Team (NORT) and assists with the development of provincial and national guidelines for priority communicable diseases. In addition, we participate actively in training public health and laboratory personnel.

### ACTIVITIES, HIGHLIGHTS AND ACHIEVEMENTS

#### KEY OUTBREAKS IN 2008

The unit has worked in partnership with the provincial and national Communicable Disease Control directorates, SA-FELTP and NICD reference units in responding to several key outbreaks in 2008. Our role in these outbreaks may include, but is not limited to, the following:

- Outbreak detection and reporting
- Field investigation
- Development of clinical and laboratory guidelines
- Management of laboratory data and interpretation of results
- Recommendations for control

Only key outbreaks will be highlighted here.

#### CHOLERA OUTBREAKS

Cholera outbreaks were investigated in 2008 in several provinces.

##### Gauteng Province

In April 2008, two cases of *Vibrio cholerae* O1 Inaba were confirmed in Gauteng Province. The index case

was a 17-year-old female learner who was admitted to hospital on 2 April 2008 with severe watery diarrhoea (described as "rice water" stool) and dehydration. She recovered fully. The second case, a 38-year-old woman (mother to the index case), was admitted on 4 April 2008 with severe watery diarrhoea. She died on day four of admission from acute renal failure. Both cases were resident in an informal settlement in Soweto. The area has an estimated population of 2 080 people and is supplied with municipal water (via 9 communal taps) and chemical toilets (one per 6-7 households). The cases had no travel history but lived in a mobile community and contact with returning travellers and other possible exposures were likely, although not verified during the investigation. An urgent outbreak response was instituted involving all partners and included health promotion activities, active clinical and laboratory surveillance by all health care facilities and other health care providers, distribution of case management and specimen collection guidelines, and epidemiological investigation of confirmed and suspected cases. Environmental sampling was also conducted but no common source was identified.

##### Mpumalanga Province

An outbreak of cholera was also identified and investigated at an illegal gold mine in Ehlanzeni district, Mpumalanga Province in May 2008. A number of interventions were implemented to control this outbreak and these included: guidelines for clinical management, provision of potable water and sanitation to affected communities and extensive health promotion activities. Active surveillance for suspected cholera cases was implemented in all health care facilities in the area and a line list of cases meeting the case definition was compiled. Data on suspected cases were collected daily for analysis from all facilities in the area. Stool or rectal swabs were obtained from all cases meeting the suspected case definition (a patient of any age from the outbreak area presenting with watery diarrhoea ( $\geq 3$  loose stools in 24 hours) for the period starting May 2008. Demographic and clinical data were obtained on laboratory-confirmed cases. Environmental sampling of raw and treated water sources was conducted by environmental health officers. Site visits were conducted at the site of illegal mining activities, households of cases and the surrounding areas to identify possible sources of infection and to assess access to potable water and sanitation. Guidelines for specimen collection and Cary and Blair transport medium were distributed to all healthcare facilities in the area. Stool and rectal swabs obtained from suspected cases were processed by the local NHLS laboratory

according to standard operating procedures for culture of stool pathogens including identification of *V. cholerae* O1. *V. cholerae* O1 isolates were referred to the EDRU for confirmation and serotyping. Isolates were then further analysed by pulsed field gel electrophoresis (PFGE).

During the period 23 May to 9 July 2008, a total of 34 laboratory-confirmed cases of cholera was identified (Figure 1). The majority of cases in this outbreak were illegal gold miners (18/34, 53%) or their close contacts (6/34, 18%). The remaining cases (10/34, 29%) lived in the same area but direct contact with illegal miners was not established. The case fatality rate was 15% (5/34). For cases with age data (n=31), the median age was 23 years (range 1 to 65 years). The majority of cases were male (22/34, 65%). Case investigation was extremely difficult as individuals involved in illegal activities were reluctant to engage with health authorities. The source of infection and associated risk factors were not clearly established. The index case gave a history of using underground water sources in the mine for drinking. Illegal miners were alleged to spend from days up to 3 months underground with no safe drinking water or sanitation. In addition, miners and their contacts were resident in informal villages with very limited access to services.

Environmental samples from both treated and raw water sources tested negative for *V. cholerae* O1 but high levels of faecal coliforms were detected in subterranean water from the mine and from irrigation canals traversing surrounding communities, many of which were used for daily household activities. Access to potable water in the area was very limited with and no formal sanitation was accessible in many of the affected communities.

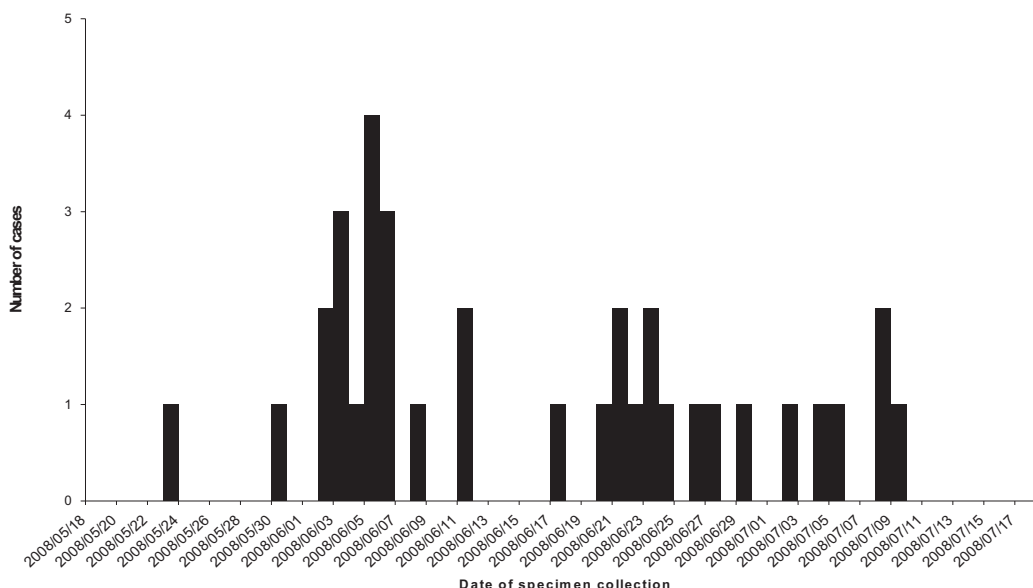
A total of 31 *V. cholerae* O1 isolates received by the Enteric Diseases Reference Unit (EDRU), for susceptibility testing and PFGE, were multi-drug resistant and clustered at 95% similarity on PFGE.



**Cholera outbreak, South Africa, 2008**



**Health promotion and communicable disease control staff during field work, Barberton, Mpumalanga Province, June 2008.**



**Figure: Epidemic curve of cases of laboratory confirmed *Vibrio cholerae* O1, Mpumalanga Province, May-June 2008 by date of specimen collection.**

**National cholera outbreak**

An outbreak of cholera, ultimately affecting all provinces in the country, was first recognised in November 2008, when information was received that the cholera outbreak in Zimbabwe had spread to Beit Bridge, Zimbabwe with over 700 clinical cases reported in that area. On 16 November, cases began presenting across the border for treatment in South Africa at Musina Hospital, Limpopo Province.

The outbreak is ongoing at the time of writing this report. For the period 1 November 2008 to 19 February 2009, South Africa had reported 10 979 cases of cholera including 57 deaths (CFR = 0.52%). Of these, 964 cases (9%) were laboratory-confirmed. Cases have been reported from all 9 provinces (Table) with the majority occurring in Limpopo (42%, 4 586/10 979) and Mpumalanga (56%, 6 101/10 979) provinces.

All five districts in Limpopo Province were 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. This outbreak subsequently spread to Ehlanzeni District, Mpumalanga Province in the second week of January 2009. The remaining provinces all reported primarily sporadic cases of cholera with small clusters identified in Gauteng, Western Cape and North West provinces (Table).

Outbreak isolates received and characterised by the Enteric Diseases Reference Unit (EDRU) (n=238) were confirmed as *Vibrio cholerae* O1 biotype El Tor and the presence of the cholera toxin gene, *ctx* was 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. The isolates were multi-drug resistant, including to nalidixic acid, co-trimoxazole and erythromycin. The isolates were also highly clonal using molecular techniques and were linked to a major southern African clone.

Emergency mechanisms for improving community access to safe water, improvements in sanitation and extensive health promotion activities were 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.



**Cholera treatment centre Musina, Limpopo Province, December 2008.**

**Table: Reported cholera cases and deaths in South Africa by province, 1 November 2008 to 19 February 2009**

Province	Total cases*	Laboratory-confirmed cases no.(% of total)†	Deaths
Mpumalanga	6 101	379 (6)	30
Limpopo	4 586	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
<b>Cumulative total</b>	<b>10 979</b>	<b>964 (9)</b>	<b>57(CFR=0.52%)</b>

\*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

**OUTBREAK OF DIARRHOEA AT A GAUTENG SCHOOL**

During August 2008, an outbreak of diarrhoeal disease occurred amongst participants in a river rafting school trip. A total of 99 people (students = 85, staff = 7 and parents = 7) participated in the seven day excursion, four days of which consisted of white river rafting on the Zambezi River starting on day two. Potable water was provided in bottles and boiled river water was also used. All participants were male. The age range was 16 to 44, with a median age of 17 years.

FELTP residents conducted further outbreak investigation. Initial interviews were conducted on a limited number of cases, followed by a cohort study to determine possible risk factors for illness amongst exposed participants. A self-administered questionnaire was distributed to all the trip participants (n=99) and completed under supervision where possible. Of those who responded (79/99, 80%), 75 reported diarrhoeal illness in relation to the trip (estimated attack amongst respondents=95%, 75/79). The first cases of diarrhoea started on day 3 of the trip and the number affected increased over the following two days. The most common symptoms reported were watery diarrhoea (n=75/75, 100%), fatigue (n=60/75, 80%), nausea (n=51/75, 68%) and abdominal pains (n=48/75, 64%). Although mostly self-limiting, the duration of illness exceeded seven days in 29% of the cases (22/75). A total of 55 cases (73%) visited a doctor upon return. Four students were hospitalized. *Salmonella* Typhi infection was confirmed in two of these (one from blood culture and one from stool). They received treatment with fluoroquinolones and recovered. A household contact of one of the cases, developed similar symptoms and was treated empirically with a fluororquinolone prior to specimen collection. A causative agent could not be confirmed and the contact recovered. *Salmonella enterica serovar* Enteritidis was cultured in a further four students (all from stool), one of whom had a mixed infection with *Campylobacter* species. All 75 affected participants recovered uneventfully.

**DIARRHOEA IN CAROLINA, MPUMALANGA PROVINCE**

A large outbreak of diarrhoea was reported in Carolina, Mpumalanga Province in November 2008. For the period 11 November to 1 December 2008, 1 199 cases of acute diarrhoea were reported from healthcare providers in the area. The source of the outbreak was identified as faecal contamination of municipal water due to a failure of chlorination. A boil water order was issued in the community and the purification plant and leaking pipes were repaired. The outbreak was further exacerbated by inconsistent access to piped water in some communities.

A total of 54 stool samples were received for testing from this outbreak. Of these, 12 specimens (22%) were positive for an enteric pathogen including *Shigella*

*sonnei* (n=6), *Shigella flexneri* (n=3), *Shigella* spp (n=1), adenovirus (n=1) and rotavirus (n=1).

**FOODBORNE DISEASE OUTBREAKS**

Several foodborne disease outbreaks were reported and investigated in 2008. Two of these occurred during mass events in the Free State Province. These were investigated by SA-FELTP residents in partnership with the Outbreak Response Unit. The first incident was reported on 19 May 2008 following an HIV/AIDS candlelight Ceremony held in Tweespruit on 18 May 2008. A total of 290 cases were reported with onset of illness on 18 and 19 May. Principal symptoms included watery diarrhoea, abdominal cramps, nausea and vomiting. The most likely source of the outbreak was food served at the lunch-time meal at 12 o'clock with the peak of cases presenting eight hours post-consumption of the implicated meal (range: 1 hour - 23 hours). Cases were seen at the local clinics and at the nearby school where many learners were complaining of symptoms. All cases were residents of a local township and 66% (n=191) were female. The median age of cases was 13 years (range, 1 to 84 years). Preliminary results from a case control study indicate that spinach (consumed by 119/126 cases vs. 64/118 controls, odds ratio [OR] =14.3, 95% confidence interval [CI] = 6.2-33.4), bean salad (118/126 vs. 72/118, OR = 9.4, CI = 4.2-21.1), and carrot salad (119/126 vs. 79/118, OR = 8.4, CI = 3.4-19.7) were significantly more likely to have been eaten by cases than controls. No stool specimens were obtained from cases and available food specimens were not submitted for testing.

The second incident took place at a conference held from 4 July to 6 July 2008 in Bloemfontein. A total of 315 cases of watery diarrhea were identified amongst delegates on 4 July 2008. There were no admissions and cases were managed symptomatically and recovered. As with the first outbreak, no clinical samples were obtained and environmental samples were not processed. The food premises had been inspected prior to the event and complied with Regulation R918 relating to Health Requirements for Food Premises and the Transportation of Food. However investigations following the outbreak revealed failures in compliance with both time and temperature control and inadequate access to hand washing and dishwashing facilities during the event. There was insufficient epidemiological data to determine the source of the outbreak and delegates sourced food from many areas including informal street vendors outside the venue.

**OUTBREAKS RELATED TO VACCINE PREVENTABLE DISEASES****Pertussis**

Several cases and clusters of pertussis were investigated in 2008. A cluster of three laboratory-confirmed pertussis cases were reported to health officials in Gauteng Province from 29 May 2008 to 11 June 2008. The first case involved a 1-month-old male infant who was admitted to the intensive care unit (ICU)

for ventilation. A throat swab was obtained on 14 May 2008 and the diagnosis of pertussis was confirmed by a positive *Bordetella pertussis* single target PCR. In addition, acute and convalescent sera showed a four-fold rise in pertussis IgG antibodies, further supporting the diagnosis. The patient responded very well to treatment. His mother had a prolonged history of cough just prior to delivery as well as post-partum, had received more than one course of antibiotics without a diagnosis, and was thus the likely source of infection for her infant. She was subsequently treated for pertussis. The second reported case, also a 1-month-old infant, presented to the same health care facility and was confirmed by a positive *B. pertussis* PCR on a throat swab obtained on 5 June 2008. This case was later confirmed to be a contact of a third case, a 2-year-old female child, who had a three week history of cough before the diagnosis was confirmed. She was initially notified as a suspected pertussis case by the attending doctor based on clinical suspicion two weeks after the onset of symptoms. A throat swab was later obtained (9 June) and the diagnosis confirmed by positive *B. pertussis* PCR. All three patients were treated with azithromycin and recovered. Follow-up of close contacts to identify additional cases and provide post-exposure prophylaxis where indicated was performed and vaccination history reviewed.

### **Diphtheria**

A laboratory-confirmed case of diphtheria was notified to local health authorities in the Western Cape Province in March 2008. This was the first case of diphtheria notified in the country since 2005. The patient was an 11-year-old child, who was referred from a local clinic to hospital for further management. He was admitted to the Intensive Care Unit (ICU) a day after admission, with a diagnosis of necrotizing pharyngitis with upper airway obstruction, pneumonia, acute renal failure and shock. The patient died two days after admission to ICU due to respiratory, cardiac and renal complications.

In response to notification of this case, public health officials traced the close contacts (family, close friends at school and in the neighborhood). Throat swabs were obtained from these contacts, post-exposure chemoprophylaxis was given and immunization was offered to both adults and children. All close contacts were monitored for symptoms of diphtheria. All surveillance swabs from close contacts were negative for *Corynebacterium diphtheriae*.

Diphtheria is a notifiable condition in South Africa. The true incidence of disease in SA is unknown. No cases of diphtheria were reported through the national notification system for 2004 and two cases in 2005 (personal communication national Department of Health).

### **Measles outbreak**

On the 14 April 2008 a cluster of confirmed adult measles cases was identified in the West and/Krugersdorp and Carltonville areas in Gauteng and

Northwest provinces respectively. The confirmed cases (n=4) presented to health care facilities (HCFs) in the Krugersdorp and Carltonville area between 11 March and 15 April 2008.

The index case was a 32-year-old adult male who was admitted to a private HCF in Krugersdorp on 11 March 2008 with a history of headache, fever and cough. He was initially treated as a non-specific viral infection after then presented with fever, rash, conjunctivitis, coryza and Koplik's spots. Measles was confirmed on serological testing (positive anti-measles virus IgM) on 17 March 2008. A secondary case (sister of the index) presented with an onset of rash on the 22 March 2008. The third confirmed case was a 19-year-old male who worked in an administrative capacity at the HCF where the previous two cases had been treated. His onset of illness was 7 April 2008 and it is likely that he had an exposure to the second case although a clear contact has not been established. The fourth case was a 19-year-old student nurse. This case was from a neighbouring area (Carltonville) and had no confirmed link to any of the above cases. Her onset of illness was 15 April 2008. All four confirmed cases had no history of childhood vaccinations against measles.

No further cases were identified through enhanced surveillance in the affected areas. Urine samples were not submitted on any of these cases and measles genotyping was therefore incomplete.

### **Varicella outbreak**

In January 2008, an outbreak of primary varicella zoster infection (chickenpox) was reported amongst laboratory technologists in Port Elizabeth, Eastern Cape Province. The index case, a 21-year-old student technologist, presented with illness on 10 January 2008 and was followed by a secondary case (a 22-year-old student) on 23 January 2008. Both patients worked in the same laboratory. A further 34 exposed individuals were identified in the laboratory complex. Of these, 10 (29.4%) gave a definite history of previous varicella infection and were considered immune. The remaining individuals (laboratory personnel) were considered "potentially susceptible". Ten (29.4%) stated they had "definitely not" had prior infection and 14 (41%) were uncertain. No one was identified as being pregnant or immunocompromised (on history alone). Varicella IgG serology was performed on 23/24 "potentially susceptible" individuals. Only 4 individuals were identified as non-immune based on negative varicella zoster IgG results (all of whom gave a definite negative history of previous varicella). These individuals were offered HIV testing and informed about varicella vaccine to prevent infection in the long-term. They were also advised to seek medical care at the first signs of illness and start treatment with acyclovir or valacyclovir to prevent complicated disease, which occurs more commonly in adults. The susceptible individuals were not involved in direct patient care and no work exclusion was recommended. No further cases were identified during the surveillance period.

### VIRAL HAEMORRHAGIC FEVERS

#### Crimean-Congo haemorrhagic fever

A total of 11 laboratory-confirmed cases of CCHF were identified in 2008. These cases were investigated by members of the Outbreak Response Unit in partnership with the Special Pathogens Unit, NICD. Cases were identified from the Northern Cape (n=4), Free State (n=3), Eastern Cape (n=2), Mpumalanga (n=1) and North West (n=1) Provinces.

#### Outbreak due to a novel arenavirus October 2008

The Outbreak Response Unit of the NICD was part of the outbreak response team that investigated an outbreak of a novel arenavirus infection in October 2008.

Five laboratory-confirmed cases of a novel arenavirus infection (proposed name Lujo virus) were detected for the period 12 September to 21 October 2008 in Gauteng Province. The primary case (case 1) had onset of illness on 2 September 2008 in Zambia. An additional three secondary cases (case 2, 3 and 4) and one tertiary case (case 5) occurred via transmission of the virus in the health-care setting. Age of cases ranged from 33 to 47 years. Four cases were female and one male. The source of infection is, as yet, unknown for the primary case. The remaining four cases all had potential exposure to blood and/or body fluids of a primary or secondary case in the health-care setting. The primary case was a safari booking agent resident in Zambia. She was flown to South Africa on 12 September 2008 for medical care in a critically ill condition. She died on 14 September. Case 2 was a paramedic who cared for case 1 during the transfer from Zambia on 12 September and case 3 was a nurse who cared for case 1 in the intensive-care unit from 12-14 September. Case 2 was admitted on 27 September and died on 2 October and case 3 was admitted on 30 September and died on 5 October. On 14 September, case 4 performed terminal cleaning of the room in which case 1 was hospitalized. The fifth patient was a nurse who cared for case 2 from 27 September to 2 October. She was involved in a traumatic insertion of a central venous catheter on 27 September and became ill on 9 October. She recovered following prolonged hospitalisation and treatment with ribavirin. Extensive follow up of all contacts was conducted for a period of 21 days following last exposure to a known case. No further cases were detected.

#### Rift Valley Fever Outbreak in South Africa, January 2008

In January 2008 Rift Valley Fever (RVF) was confirmed on a buffalo-breeding facility and a cattle farm near Komatipoort, Mpumalanga, close to the southern border of the Kruger National Park. Further outbreaks of Rift Valley Fever in animals were later confirmed in Limpopo Province; in a buffalo-breeding facility near Phalaborwa and on a dairy farm in Bela-Bela. Between January and April 2008, 14 human cases of RVF had been confirmed by PCR and virus isolation or anti-RVF IgM detection. All of these cases involved occupational exposures and included veterinarians, veterinary students, farmers and



**Field investigation - Rift Valley fever outbreak, March 2008.**

farm workers as well as staff of veterinary research farms. Three of these patients suffered from encephalitis. All patients subsequently recovered.

### MENINGOCOCCAL DISEASE CLUSTERS

A cluster of four meningococcal disease cases was reported on 14 July 2008 in an urban residential area in Gauteng Province. The index case (Case 1) was an 11-month-old baby with onset of illness on 11 July 2008. He was admitted to hospital with fulminant meningococcaemia on 12 July and died the same day. The second patient (Case 2) was a 25-year-old female child-minder to the index case that developed symptoms on the same day as Case 1. She presented to a local clinic with headache, and a description of "black patches" on the body on 11 July but was allegedly discharged with only analgesics. She was subsequently admitted to hospital the following day and died. Case 3 was the 2-year 8-month-old son of Case 2. He was admitted on 12 July, recovered. All three of the above-mentioned cases were laboratory confirmed. Serogrouping was performed and *Neisseria meningitidis* serogroup W135 was identified. The dates of onset of illness in these cases (all within 24 hours) suggested the source of infection may have been another unrecognized case or carrier. The fourth reported case was a 25-year-old female who was an additional caregiver to Case 1 and was admitted with suspected meningococcal disease on 13 July. She was discharged the following day. The subsequent review of the clinical presentation and laboratory results did not support a diagnosis of meningococcal disease.

These cases were initially notified to the local health authority as probable meningococcal disease. Based on this clinical notification, close contacts of the cases were traced and post-exposure prophylaxis (PEP) was provided. In addition, several overnight visitors to the household of Case 1 who returned to Mpumalanga Province were traced by the provincial Department of Health and PEP provided.

A second small cluster of meningococcal disease was also identified in the Northern Cape Province in September 2008. The index case was a 10-month-old male who was admitted to hospital on 4 September 2008. *Neisseria meningitidis* was isolated from a CSF sample. In response to this case, close contacts were identified and post-exposure prophylaxis (PEP) was administered. On 6 September 2008, a second case, a 4-year-old female, presented to the same hospital with signs and symptoms of meningococcal disease and subsequently died. A clinical diagnosis of meningococcal disease was not made by the attending physician despite a history of close contact with the index case (these cases were related and lived in an extended household-type setting). *Neisseria meningitidis* was subsequently isolated from CSF. On investigation it was noted that Case 2 had not received PEP at the time of follow-up of the index case as she was not considered a "household contact".

### **HEPATITIS A**

In January 2008 an increase in the number of cases of hepatitis A was detected in a north-eastern suburb of Johannesburg, Gauteng Province. After further investigation and active case finding, 11 laboratory-confirmed cases of hepatitis A were identified. All the cases were from a religious community in the area. The median age of cases was 38 years (range 7 to 60 years). The dates of onset of illness were from 12 to 29 January 2008 suggesting a common-source exposure (likely food-borne). A detailed case questionnaire was administered telephonically for 9/11 (82%) cases. Reported symptoms in these cases included: fatigue (n=4, 44%), nausea (n=5, 55.6%), vomiting (n=3, 33.3%), abdominal discomfort (n=2, 22.2%), jaundice (n=3, 33.3%) and fever (n= 4, 44.4%). A case control study was conducted by SA-FELTP residents. No definite risk factor was identified to be associated with infection.

An outbreak of hepatitis A was also reported and investigated at a school for children with special needs in the Western Cape Province. A total of four laboratory-confirmed cases of hepatitis A (three males and one female) were identified between 28 May and 28 July. The age range of cases was 8 to 12 years, and two cases were from the same class. Post-exposure prophylaxis (PEP) was provided to 66/84 children (with parental consent) and 6 class assistants. They had all been exposed to a case within the last 14 days either in class or during aftercare in an environment where the level of personal hygiene and sanitation placed them at risk for infection. Those who were not given PEP on site were either immune, or obtained appropriate PEP privately. Since institutions such as these are at high risk for such outbreaks, hepatitis A vaccine was also recommended to ensure long-term protection.

This outbreak was identified late as cases were seen by different health care facilities and a link to a common school was not initially recognized. The available data

suggested this was a propagated outbreak via person-to-person transmission with at least 25 days between onset of illness in each of the first 3 cases. The source of infection for the index case remains unknown.

### **INFLUENZA OUTBREAK**

An outbreak of influenza A was confirmed in the community of Marydale, Northern Cape Province in July 2008. This followed the investigation of a reported increase in the number of patients presenting to local healthcare providers with signs and symptoms of flu-like illness including fever, sore throat, and cough. The first reported case was a 3-year-old male with date of onset of illness on 15 July. He presented to the local clinic with dizziness, coryza and a headache. A total of 162 cases were reported who met the clinical case definition, 94 (58%) of whom were from the local primary school.

During the outbreak investigation, throat swabs were obtained from 28 patients for virological and microbiological analysis. No bacterial pathogens were isolated (normal flora only). Influenza A H1N1 was confirmed by PCR in 22/28 samples (78.6%). Of these, 6 (40%) were in the 1 to 4 year age group. Assessment of the school by environmental health officers (EHOs) noted satisfactory ventilation and personal hygiene in the boarding house. Health promotion activities were conducted in the community. No severe illness or deaths were reported in association with this outbreak.

### **AVIAN INFLUENZA (AI) AND PANDEMIC INFLUENZA PREPAREDNESS**

The unit continues to play a role in national AI and pandemic influenza preparedness. In 2008 activities included:

- Distribution of regular AI situation reports to key health personnel
- Screening of suspected imported AI cases and liaison regarding decision making for laboratory testing conducted by the Influenza Reference laboratory at NICD.
- Training of Rapid Response Teams (RRTs) for Avian and Pandemic Influenza in collaboration with the national DOH at the provincial level
- Support for training of RRTs at district level
- Assisting provinces in operationalising plans for pandemic preparedness

### **THE "OUTNET" PROGRAM**

This program is a laboratory-based Outbreak Network for SA which was developed in 2005 and piloted in 2006 with the nomination and training (in collaboration with the SA-FELTP) of 9 provincial laboratory "OutNet" representatives. These individuals continue to act as the key points of contact for provincial public health staff and facilitate the role of the laboratory for detection and response to outbreaks in collaboration with the Outbreak unit at NICD. Regular updates and contact with these representatives is maintained via monthly

teleconferences and direct contact during outbreaks. In addition, the OutNet representatives are actively involved in training activities at provincial level.

### DEVELOPMENT OF AUTOMATED LABORATORY ALERTS/EARLY WARNING SYSTEMS

In partnership with the team from the NHLS Corporate Data Warehouse - a centralized database of all laboratory data from the NHLS laboratories (excluding KwaZulu Natal), the unit developed and validated an email-based system for laboratory alerts for selected epidemic prone diseases. Further development of these systems and expansion to other applications of this data for outbreak detection is underway.

The Outbreak Unit continues to spearhead the development of the epidemiological capacity of the corporate data warehouse for the NICD.

### NATIONAL GUIDELINES

- Updated "NICD Guidelines for the control of hepatitis A in South Africa"
- Handbook for management of foodborne disease outbreaks
- Draft guidelines for response to a typhoid fever case

### NATIONAL WORKING GROUPS

Member of the national working group for the development of hepatitis guidelines for South Africa

Member of the National Outbreak Response Team

Member of the working group for development of Communicable Disease Control Regulations

### 2010 PREPAREDNESS

The unit is actively participating in national preparedness activities for 2010 with specific emphasis on the role of the laboratory.

## COLLABORATIONS

Communicable disease Control Directorates national and provincial departments of health  
National Department of Agriculture  
Department of Water Affairs and Forestry

## CAPACITY BUILDING

### EPIDEMIC PREPAREDNESS AND RESPONSE (EPR) TRAINING

In 2008 the unit continued to assist the national and provincial Departments of Health in training provincial public health personnel and doctors in EPR with an emphasis on case management and appropriate laboratory diagnostic tests.

### "CASE OF THE MONTH" SERIES

This is a laboratory capacity building activity that has been distributed on a quarterly basis to all NHLS laboratories in South Africa since 2005. The series aims to train staff in diagnostic laboratories in basic principles of epidemiology as applied to the role of the laboratory in communicable disease control. Over 350 NHLS staff continue to participate regularly in this activity in 2008 for which they earn professional development credits.

### TRAINING WORKSHOPS FOR THE INVESTIGATION OF FOODBORNE DISEASE OUTBREAKS

The unit partnered with national DOH in training provinces. Workshops were conducted in the Northern Cape Province.

### EXTERNAL LECTURES

The unit presented lectures for various groups in 2008. These include:

- General practitioner groups
- Hospital-based healthcare staff
- Specialists
- Private healthcare

### SA-FELTP

Staff of the Outbreak Response Unit are integrally involved in supervision of SA-FELTP residents during outbreaks. In addition, the unit lectures for both short and long courses offered by the program.

### COMMUNICATIONS

The Unit publishes a monthly Communicable Diseases Communiqué which reports recent outbreaks and communicable disease cases/issues of relevance. This is distributed to a wide audience including: general practitioners, specialists, infectious diseases and travel medicine societies, national and provincial public health personnel.

In addition the Unit published special urgent advisories and Communiqués as required in response to acute events requiring immediate dissemination of information.