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1 NOTIFIABLE MEDICAL CONDITIONS

a NICD and NDOH implement a new mobile and web APP to improve surveillance and reporting of outbreak-prone diseases in South Africa

In the face of exponential increase in travel and trade across nations and continents, the International Health Regulations (IHR) require every country to have an efficient real-time surveillance system that enables timely detection and reporting of notifiable medical conditions (NMC) for disease control. NMC such as tuberculosis, listeriosis, measles and malaria are outbreak-prone conditions, hence must be notified to the NMC surveillance system that comprises health authorities and the National Institute for Communicable Diseases (NICD). Timely detection and notification of these diseases creates opportunities for effective interventions to prevent local, regional and international disease outbreaks; category 1 NMC must be reported within 24 hours of detecting a case. Recent measles, typhoid and listeriosis outbreaks in South Africa emphasise the need for an effective NMC surveillance system. In South Africa, similar to other countries, notification of NMC is a legal obligation and the regulations governing this legal requirement were updated in December 2017 to align them with the National Health Act and IHR. These new regulations capitalise on existing public and private health systems and structures to create synergies between NMC surveillance users, whilst strengthening various aspects of NMC surveillance including real-time data collection, collation, analyses and dissemination for prompt public health responses to stop the spread of disease.

A recently-published study by Benson and colleagues conducted in 2015 to evaluate the then Notifiable Diseases Surveillance System (NDSS) in South Africa concluded that the NDSS was suboptimal; even though 92% of the 919 interviewed health care professionals reported having notified diagnosed NMC, only 51% notified correctly. Despite measles, a notifiable disease, being one of the most commonly diagnosed vaccine-preventable childhood illnesses in South Africa, the Benson study reports that paediatricians were unlikely to notify correctly. The study reported lack of association between correct notification and willingness by doctors and nurses to notify, experience or training on the surveillance system, understanding of the importance of NMC surveillance or perception of feedback. This points to a system and process barrier that could possibly be overcome by implementation of a streamlined, standardised and user-friendly notification system.

This study, together with other in-house NDSS evaluations, demonstrated the need to re-engineer the old NDSS to create a new NMC surveillance system. To take forward this body of work, NICD was appointed by the National Department of Health to develop and manage the national NMC surveillance system.

In the last two years, the NICD worked in partnership with national, provincial and local levels of Health Departments and numerous stakeholders in the public and private health sectors to develop and implement an integrated and simple NMC national surveillance system that allows for rapid detection and notification of outbreak-prone diseases. This new surveillance system is in the form of a mobile and web APP and is currently being rolled out nationally, starting April 2018. The NMC APP allows nurses, doctors, laboratories and medical schemes to notify diseases at point of diagnosis with in-built SMS and email alerts. Laboratory and clinical data are merged and de-duplicated to give patient-level integrated comprehensive alerts/notifications to communicable disease control personnel. The APP also has real-time communication and feedback channels as well as an anonymised reports dashboard. Furthermore, a new paper-based notification system was launched in August 2017 to strengthen notifications in regions where there is no connectivity, and hence no ability to utilise the electronic platform. Since the inception of the new surveillance system, NMC such as TB, measles and malaria are now being rapidly notified by both the public and private sector, rendering us better able to implement effective interventions for disease control. This new NMC APP will facilitate timeous reporting of infectious diseases, hence enable implementation of targeted, efficient and timely disease control measures and thus contribute towards preserving a healthy South Africa.

For more information visit www.nicd.ac.za

Source: Division of Public Health Surveillance and Response, NICD-NHLS; portiamu@nicd.ac.za

2 ZONOTIC AND VECTOR-BORNE DISEASES

a An update on rabies in South Africa

Three cases of human rabies have been laboratory confirmed from mid-March to mid-April 2018. These cases were reported from KwaZulu-Natal (n=2) and the Eastern Cape Provinces. The cases from KwaZulu-Natal Province included a 39-year-old male and a five-year-old boy. The patients were from Vryheid and KwaMashu respectively, and both were exposed to rabid dogs. The case from Eastern Cape Province was a nine-year-old boy from Lusikisiki, who was exposed to a rabid dog in December 2017. He died in April 2018. A total of seven cases of rabies has been reported in South Africa for 2018 to date (including the cases reported here). These cases were reported from KwaZulu-Natal (n=4, all laboratory confirmed) and Eastern Cape (n=2, laboratory confirmed and n=1, probable case) provinces.

Rabies should be considered as a possible cause of illness in cases of viral encephalitis when an alternative diagnosis has not been confirmed, and particularly in cases with a fatal outcome. A history of dog (or other animal) exposures is not always forthcoming, especially in children. Exposures may have involved small wounds, and therefore rabies should be considered as a possible diagnosis in viral encephalitis cases even in the absence of a link to a potentially rabid animal. For more information on the laboratory testing of suspected human cases of rabies, please visit the NICD

website at www.nicd.ac.za

A resurgence of rabies is reported from almost the entire coastal belt of KwaZulu-Natal Province, with a 400% increase in the number of cases in the past three years. This includes the districts of eThekweni, Ugu, Harry Gwala, Ilembe, King Cetshwayo and Umgungundlovu, with the eThekweni district being most severely affected. Cases of animal rabies are also being reported from the Joe Gqabi, OR Tambo and Amathole districts of the Eastern Cape Province. Mass dog vaccination campaigns are underway in the affected areas and the public is urged to ensure that dogs and cats are vaccinated against rabies.

The rabies virus is transmitted following direct contact with the saliva of a rabid animal. The infected saliva enters the body through a breach in the skin (following bites, scratches, nicks etc.) or contact with mucosal membranes (for example eyes). When such exposures occur, rabies infection can be prevented through prompt post-exposure prophylaxis. The latter includes a regimen of four doses of rabies vaccine and the infiltration of rabies immunoglobulin at the wound site. More information on rabies post-exposure prophylaxis is available from the NICD website: www.nicd.ac.za

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; januszp@nicd.ac.za

3 VACCINE-PREVENTABLE DISEASES

a A case of diphtheria in KwaZulu-Natal Province

A 20-year-old male from Malukazi in KwaZulu-Natal (KZN) Province was diagnosed with diphtheria. Onset of illness was on 30 March 2018 with sore throat, fever and general body weakness progressing to a 'bull neck', with severe inflammation of the tonsils. He was admitted to Inkosi Albert Luthuli Hospital on 1 April 2018. Toxin-producing *Corynebacterium diphtheriae* was isolated from him. He recovered and was discharged on 3 April 2018. Contact tracing and active case finding for additional patients is ongoing.

A cluster of eleven laboratory-confirmed respiratory diphtheria cases occurred in KZN in 2015. Subsequently, two additional cases were reported in 2016 from the same region. In 2017, a cluster of three cases occurred in the Western Cape Province (WCP), and a single case in the Eastern Cape Province. Isolates from KZN and WCP were confirmed to be the same genotype.

In view of the ongoing circulation of *C. diphtheriae*

in the country, we urge clinicians throughout the country to have a high awareness of the suspected diphtheria case definition and to notify these cases by completing the new notifiable medical conditions case notification form. Please email it to NMCSurveillanceReport@nicd.ac.za and send a copy to your local or district Communicable Diseases Control focal person.

Any person who presents with an upper respiratory tract illness characterised by sore throat, low-grade fever and an adherent membrane ('pseudomembrane') of the nose, pharynx, tonsils or larynx should be considered as a suspected case. Please collect throat swabs (preferably in Amies/modified Stuart's transport medium with charcoal) and/or tissue from the 'pseudomembrane' and send to local National Health Laboratory Service (NHLS) or private laboratories or to the Centre for Respiratory Diseases and Meningitis (CRDM) at the National Institute for Communicable Diseases (NICD) for culture and polymerase chain reaction (PCR).

Additionally, we remind all NHLS and private laboratories nationally to actively screen for *C. diphtheriae* by plating all throat/tonsillar swabs onto Hoyle's (tellurite-containing) medium. *C. diphtheriae* reduces potassium tellurite to tellurium to produce grey-black coloured colonies. On blood agar, *C. diphtheriae* is easily overlooked as glistening, creamy-white colonies resembling *Staphylococcus aureus*. Alternately, please submit throat swabs or Hoyle's plates with suspected *C. diphtheriae* colonies to the NICD for confirmation and/or detection of toxin by Elek and PCR.

Please contact CRDM to assist with identification of suspected organisms or supply of Hoyle's plates or

swabs [Laboratory 011 555 0315/17/18, Linda de Gouveia (011 555 0327, lindad@nicd.ac.za), or Mignon du Plessis (011 555 0387, mignond@nicd.ac.za), or Nicole Wolter (011 555 0352, nicolew@nicd.ac.za)].

For clinical queries please contact the NICD Hotline (082 883 9920) or Dr Anne von Gottberg (011 555 0316 or annev@nicd.ac.za).

Guidelines for diphtheria management and laboratory detection can be accessed at <http://www.nicd.ac.za/index.php/diphtheria/>

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS; annev@nicd.ac.za

4 SEASONAL DISEASES

a Malaria alert for returning travellers

With the recent Easter holidays and an upcoming long weekend, many people have returned, or will shortly return, from destinations where there is a risk of acquiring malaria, both in and outside the country. Preliminary data from the National Department of Health indicate that the total number of cases across the three malaria-endemic provinces (northeastern Limpopo, eastern Mpumalanga, and northern KwaZulu-Natal) has risen in March 2018, compared to February 2018 (Figure 1), and some of these are likely to be travellers returning from neighbouring countries, particularly Mozambique. Anyone who has been in a malaria risk area in the past 10 days to three weeks, and who gets ill with 'flu-like symptoms (headache, muscle and joint pains, chills, fever and sweating; vomiting and loss of appetite in young children) should remember that malaria is a possibility and seek medical attention, which should include a malaria blood test, re-

peated if necessary. Travellers should tell healthcare workers about travel and possible exposure, as they may forget to ask. Using anti-mosquito measures (nets, repellents etc) and/or prophylactic medicines does not guarantee perfect protection from malaria. Many people will dine or socialise outdoors in the evening in warm weather and forget to protect bare skin, especially ankles, where mosquitoes like to bite. Delayed diagnosis of malaria often leads to more severe illness with the danger of serious complications or even death. Information about malaria risk areas and prevention and treatment of malaria is available on the NICD website: www.nicd.ac.za.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; (johnf@nicd.ac.za)

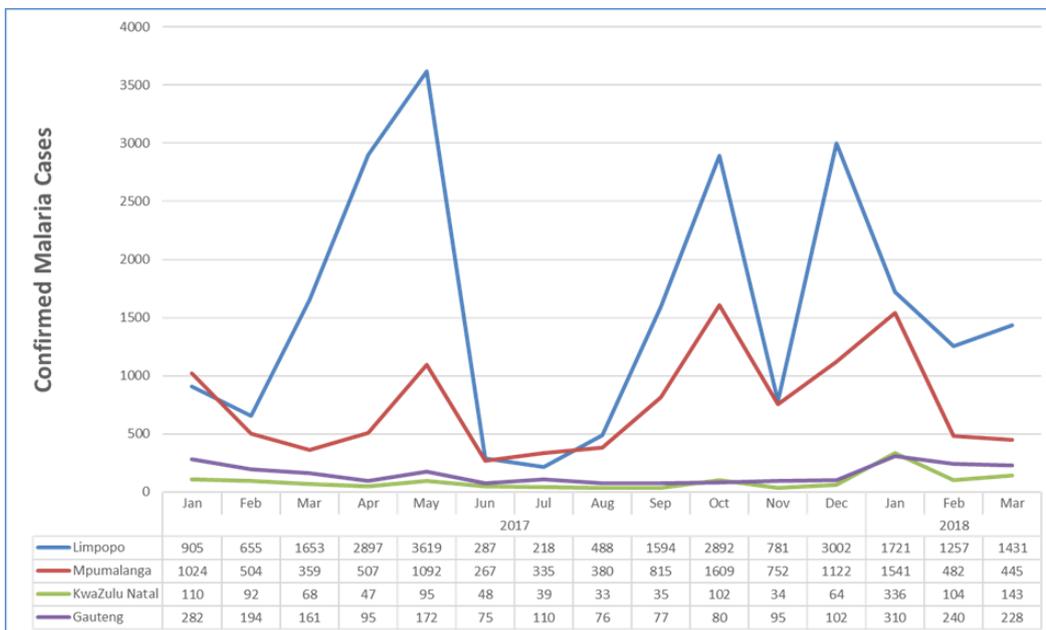


Figure 1. Total malaria cases in high-reporting areas of South Africa, 2017 and 2018.

Source: National Department of Health. Note that figures are provisional and subject to updating as new data is received.

b Influenza - preparing for the 2018 season

The 2018 influenza season has not started as yet. However, there have been sporadic detections of influenza reported from the influenza surveillance programmes: influenza-like illness surveillance (ILI) (systematic ILI at public health clinics and Viral Watch) and pneumonia surveillance for severe disease in hospitalised patients. The influenza season is considered to have started when the detection rate of specimens from Viral Watch, tested at the NICD has risen to $\geq 10\%$ and is sustained for ≥ 2 weeks.

In the first 14 weeks of 2018 (week ending 8 April), 167 specimens were received from Viral Watch sites. Of these, 19 tested positive for influenza, five were positive for influenza A(H1N1)pdm09, three for influenza A(H3N2) and 11 were positive for influenza B. Of the 19 influenza positive cases, seven had history of international travel. During the same period, 277 specimens were received from three ILI sites (public health clinics) and none tested positive for influenza. In this time period, specimens from 1 172 patients with severe respiratory illness were received from the six sentinel sites. Influenza A(H1N1)pdm09 was detected in the specimens of three patients.

Influenza vaccination

Influenza vaccination, which provides protection against at least three strains of influenza each season, remains the most effective measure to prevent illness and possibly fatal outcomes. Protecting those who are at increased risk of severe influenza outcomes plays an important role in prevention of respiratory illnesses. Individuals at

risk of influenza and severe disease include, among others, pregnant women, the elderly (≥ 65 years) and those vulnerable due to pre-existing illnesses or risk factors like diabetes, asthma, HIV and tuberculosis.

Influenza vaccine for the 2018 season is currently available at public health facilities and private pharmacies. Clinicians are encouraged to vaccinate individuals in the groups that are targeted for influenza vaccination. Vaccines should be given sufficiently early to provide protection for the influenza season, though it is never too late to vaccinate. A protective antibody response takes about 2 weeks to develop. Detailed recommendations on target groups, dosages and contraindications for influenza vaccine can be accessed at http://www.nicd.ac.za/wp-content/uploads/2017/03/Influenza-guidelines-final_24_05_2017.pdf

The 2018 NICD recommendations for the diagnosis, prevention, management and public health response of influenza has been published and can be found at the link below.

http://www.nicd.ac.za/wp-content/uploads/2017/03/Influenza-guidelines-rev_-23-April-2018.pdf

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS; (cherylc@nicd.ac.za)

5 CURRENT OUTBREAKS

a An update on the outbreak of *Listeria monocytogenes* infection, South Africa

On 04 March 2018, Health Minister Dr Aaron Motsoaledi announced that the source of the listeriosis outbreak was identified as the Enterprise Foods' production facility in Polokwane, Limpopo Province. The outbreak strain was isolated from numerous areas within the Enterprise Foods' Polokwane production facility, including post-processing areas. Enterprise Foods issued a recall of several ready-to-eat processed meat products the same day, and halted production at both their Polokwane and Germiston production facilities.

This followed months of intensive investigation by a multisectoral team comprising numerous governmental departments (Health; Agriculture, Forestry and Fisheries; Trade and Industry), other national stakeholders (NICD, NHLS, private sector clinical laboratories, public healthcare sector, private healthcare sector), supported by the World Health Organization and United States Centers for Disease Control and Prevention.

RCL Foods also issued a recall of several ready-to-

eat processed poultry products following detection of *L. monocytogenes* in retail chicken polony products sampled by environmental health practitioners. On whole genome sequencing, these *L. monocytogenes* isolates belong to two sequence types (ST204 and ST321) that are not related to the outbreak strain (ST6).

A multisectoral incident management team (IMT) has been formed by the National Department of Health (NDoH) to strengthen co-ordination of outbreak response and strengthen health systems to prevent future outbreaks. The number of laboratory-confirmed listeriosis cases reported per week has decreased since the implicated products were recalled on 04 March 2018, with eight additional cases reported in the week of 17 April 2018. Of the eight cases reported this week, one case occurred in October 2017 and was retrospectively reported. Since the recall, a total of 50 cases has been reported. Twenty-four (48%) were among neonates ≤ 28 days old and three (6%) were among children aged 1 month to 14 years.

As of 17 April 2018, a total of 1 019 laboratory-confirmed listeriosis cases has been reported to NICD since 01 January 2017 (Figure 2). Most cases have been reported from Gauteng (59%, 597/1 019) followed by Western Cape (13%, 127/1 019) and KwaZulu-Natal (7%, 73/1 019) provinces. Cases have been diagnosed in both public (65%, 658/1 019) and private (35%, 361/1 019) healthcare sectors. Outcome is known for 698/1 019 (68%) patients, of whom 199 (29%) have died (Figure 3).

Females account for 56% (551/987) of cases where gender is reported. Where age was reported (n=993), ages range from birth to 93 years (median 17 years). Neonates aged ≤28 days account for 43% (424/993) of cases. Of neonatal cases, 96% (408/424) had early-onset disease (birth to ≤6 days).

A team of interviewers from the NICD has conducted over 70 semi-structured interviews with listeriosis case-patients to obtain detailed food consumption history. Analysis of this data shows that ready-to-eat processed meat products were consumed by >90% of these patients.

Ready-to-eat (RTE) processed meat products have been linked to numerous outbreaks of listeriosis worldwide. This includes viennas, polonies, russions, ham, other 'cold' meats, sausages, various corned meats, salami, pepperoni, refrigerated meat spreads/pâtés and similar products typically found in the processed meat sections of food retailers and butcheries. These products can be infected when contaminated raw product is inadequately cooked,

or more commonly, contamination can occur post-processing (i.e. at any stage after the cooking/curing process – for example, during packaging or slicing). *L. monocytogenes* survives and grows at refrigeration temperatures, and since many RTE processed meat products have a long shelf-life, this provides an ideal opportunity for proliferation of the bacteria. Such products are usually not cooked/heated before eating, so the bacteria escape a final opportunity to be killed before consumption.

We encourage persons at high risk for developing listeriosis (pregnant women, neonates ≤28 days of age, persons >65 years of age and persons with immunosuppression (due to HIV infection, cancer, diabetes, chronic renal disease, chronic liver disease, transplantation and immunosuppressive therapy)) to avoid OR cook all RTE processed meat products whilst further investigations are underway. Such products can be rendered safe if thoroughly cooked in boiling water or heated to high temperatures (≥70°C) before eating.

Further resources on listeriosis, including clinical management guidelines and FAQs can be found on the NICD website at www.nicd.ac.za, Diseases A-Z, under 'Listeriosis'.

Source: Centre for Enteric Diseases, and Division of Public Health Surveillance and Response, NICD Provincial Epidemiology Teams; NICD-NHLS; Provincial CDCs; (junot@nicd.ac.za; outbreak@nicd.ac.za)

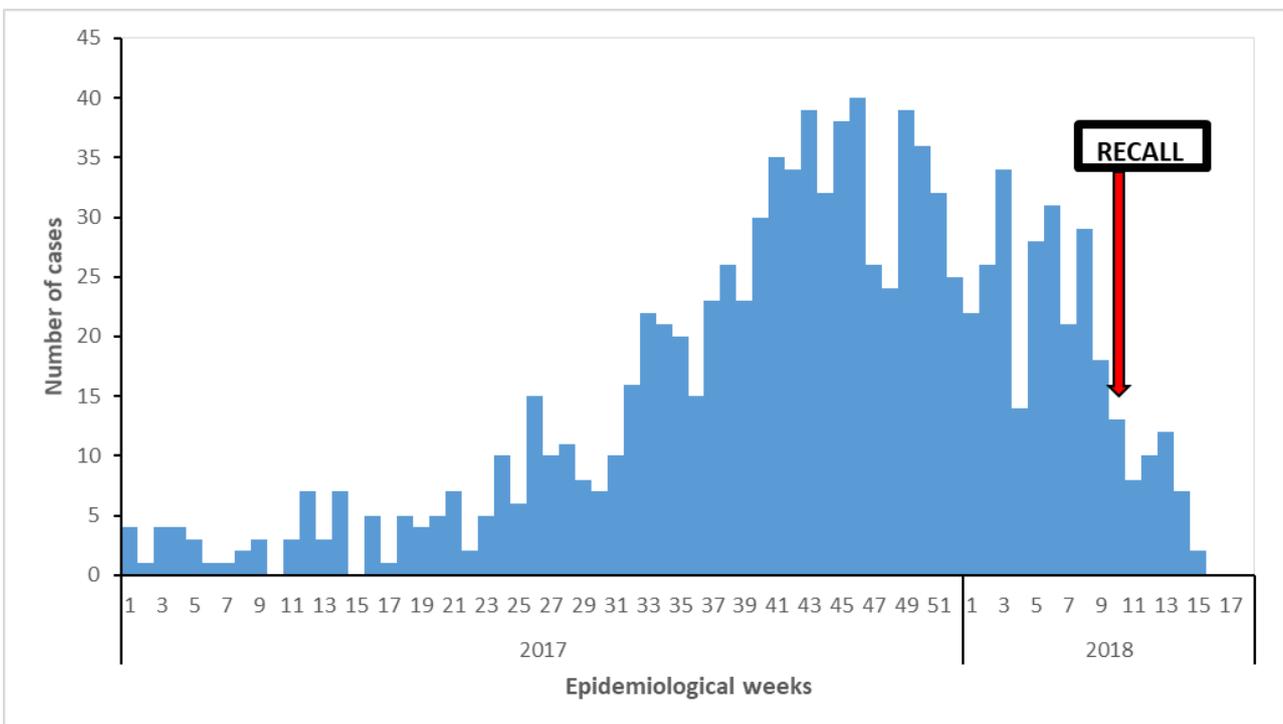


Figure 2. Epidemic curve of laboratory-confirmed listeriosis cases by epidemiological week, South Africa, 01 January to 17 April 2018 (n=1 019).

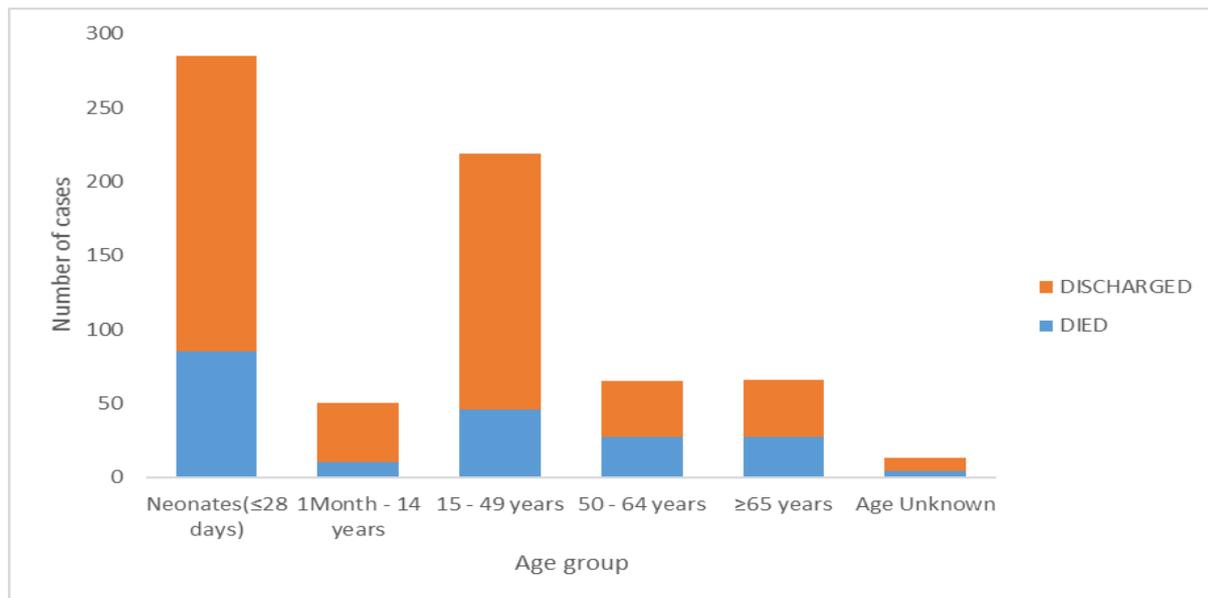


Figure 3. Outcome by age category of laboratory-confirmed listeriosis cases, South Africa, 01 January 2017 to 17 April 2018 (where outcome is known, n=698).

6 ENTERIC DISEASES

a Suspected foodborne disease outbreak, Limpopo Province

On 05 April 2018, Sekhukhune District Department of Health (DoH), Limpopo Province, in collaboration with the Municipal Environmental Health and Provincial DoH, investigated a suspected foodborne illness involving eight family members, including one death in a 10-year old boy. The age of the cases ranged from 3 – 64 years (median 12 years). The other seven presented to the health facility on 05 April 2018 following the death of their family member. They presented with gastrointestinal symptoms such as diarrhoea, abdominal cramps, as well as loss of appetite, fever, rigors and muscle pains. Symptoms were experienced approximately 4 hours following consumption of dinner (pap and chicken neck) on 04 April 2018. Rectal swab samples were collected from five cases. Environmental investigations were conducted and food samples were sent for testing. A postmortem was performed on the deceased.

Staphylococcus aureus was isolated from two cases (2/5, 40%); and *S. aureus* and *Clostridium perfringens* were isolated from one case (1/5, 20%). Rectal swab results for two cases were negative. Blood culture taken >24 hours from the deceased grew *Enterococcus faecalis*, *Klebsiella pneumoniae* and *Escherichia coli*. The other postmortem findings, and findings from the environmental samples, are still pending at the time of this report.

Staphylococcal food poisoning occurs when foods contaminated with toxins produced by the *S. aureus* bacterium are ingested. Staphylococcal toxins are fast-acting, with symptoms (vomiting, nausea, ab-

dominal cramps and diarrhoea) usually developing within 30 minutes to 6 hours (<https://www.cdc.gov/foodsafety/diseases/staphylococcal.html>). The reported 4-hour incubation period is compatible with the incubation period for toxin-producing *S. aureus* food poisoning. This may have been a staphylococcal food poisoning outbreak. However, without further testing for the toxins of both *S. aureus* and *C. perfringens*, and unavailable results from the food samples, we cannot definitively implicate an organism. The cause of death may have been unrelated to the food consumed.

This outbreak investigation highlights the importance of presenting early at health facilities following suspected food poisoning. Poor food-handling practices are often linked to foodborne related outbreaks. This can be addressed by intensifying food safety practices through health promotion activities in communities and institutions. Healthcare workers are reminded that a foodborne illness outbreak (food poisoning) refers to any food poisoning incident involving two or more individuals that are epidemiologically linked to a common food/beverage source. A suspected foodborne disease outbreak constitutes a category A notifiable medical condition in South Africa, and must be reported to the relevant health authority telephonically within 24 hours for appropriate public health response to occur.

Source: Limpopo Provincial Department of Health; NICD Provincial Epidemiology Team, Division of Public Health Surveillance and Response, NICD-NHLS; outbreak@nicd.ac.za

7 MISCELLANEOUS OUTBREAKS OF INTEREST

a Outbreak of furuncular myiasis due to *Cordylobia anthropophaga*, the tumbu fly

NICD has been consulted about numerous cutaneous maggot infestations in humans in North West Province, as well as increased sporadic cases in Gauteng Province. Our laboratory has confirmed that the maggots are those of the tumbu fly (also known as the 'mango' or 'putsi' fly). The increase in the number of cases is most likely related to the recent marked increase in seasonal rainfall, leading to the expansion of the fly's normal range, namely the warmer northern and eastern parts of the country. The adult female tumbu fly (*Cordylobia anthropophaga*) deposits eggs usually on urine- or faeces-contaminated sand, soil or clothing. The larvae (maggots) hatch and on contact with skin, penetrate and cause enlarging boil-like skin lesions, each with a small opening at the apex through which the larva breathes (furuncular myiasis) (Figure 4). The lesions may be complicated by secondary bacterial infection. The condition is readily treated by applying petroleum jelly (Vaseline) or liquid paraffin to the lesions, to suffocate the maggots and lubricate the cavity in the

skin; usually they then emerge or are easily expressed with finger pressure. Incision or use of forceps or other instruments is unnecessary and should be avoided, as inflammation or secondary infection is more likely if the larva and/or skin is damaged. Domestic dogs and rodents are commonly affected, sometimes with large numbers of lesions.

Prevention: washing should not be laid on the ground to dry. Ironing of clothes will kill eggs or larvae. Affected dogs should be dipped in an appropriate insecticide solution, as for prevention of tick or flea infestation, under veterinary guidance.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; (johnf@nicd.ac.za)

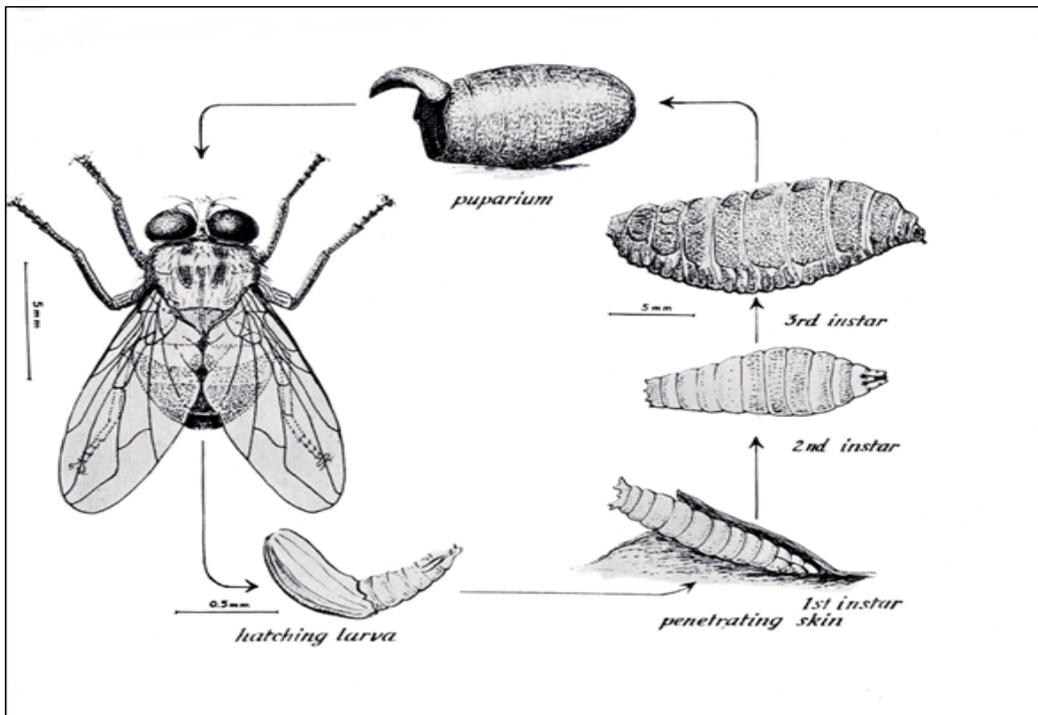


Figure 4. Life cycle of *Cordylobia anthropophaga*. Larval instars 1-3 are the stages causing the skin lesions.

From: Zumpt F. The Arthropod Parasites of Vertebrates in Africa South of the Sahara. Vol III. Publ. of the SAIMR (1966); 13(52): 48-49.

8 BEYOND OUR BORDERS

The 'Beyond our Borders' column focuses on selected and current international diseases that may affect South Africans travelling abroad. Numbers correspond to Figure 5 on page 9.

1. Listeriosis: Australia

As of 2 March 2018, the Australian National Focal Point (NFP) notified WHO of an outbreak of *Listeria monocytogenes* infection (listeriosis) associated with the consumption of rockmelons (cantaloupe) from a single grower. From 17 January 2018 through to 6 April 2018, 20 outbreak cases (19 confirmed and 1 probable) of listeriosis were reported. All of the cases were hospitalised and there have been seven deaths and one miscarriage associated with the outbreak. All of the outbreak cases have had illness onset since 17 January 2018.

2. Cholera: Somalia

The ongoing cholera outbreak in Somalia started in December 2017. As of 18 March 2018, a total of 1 613 cholera cases, including nine deaths (case fatality rate = 0.6%), has been reported from four regions: Hiraan, Banadir, Lower Juba and Middle Shabelle. Of the 66 stool samples tested in 2018, 19 were positive for *Vibrio cholerae* serogroup O1 serotype Ogawa.

3. Lassa Fever: Nigeria

From 1 Jan - 15 Apr 2018, a total of 1 849 suspected cases has been reported from 21 states. Of these, 413 were confirmed positive, nine are probable, 1 422 are negative (not cases) and five are awaiting laboratory results (pending). Since the onset of the 2018 outbreak, there have been 105 deaths in confirmed cases, nine in probable cases. Case fatality rate in confirmed cases is 25.4%. In the reporting week 15 [9-15 April 2018], no new healthcare worker was infected; 27 health care workers have been affected since the onset of the outbreak in seven states: Ebonyi (16 workers), Nasarawa (1), Kogi (2), Benue (1), Ondo (3), Edo (3) and Abia (1) with eight deaths in Ebonyi (6), Kogi (1) and Abia (1).

4. Lassa Fever: Liberia

From January 2018 to date, a total of 67 suspected cases, including 19 deaths (case fatality rate 28.3%)

has been reported from six counties. Of the total suspected cases, nine were confirmed positive by RT-PCR at the National Reference Laboratory. The confirmed cases originated from Nimba (4 cases), Montserrado (3), Bong (1), and Grand Bassa (1); 8 of the 9 confirmed cases died, a case fatality rate of 89%. The confirmed cases are predominately female (78%) and the age range among confirmed cases is 1 to 57 years with a median age of 32 years.

5. Typhoid fever: Pakistan

The first known epidemic of extensively drug-resistant typhoid is spreading through Pakistan, infecting at least 850 people in 14 districts since 2016, according to the National Institute of Health Islamabad. The typhoid strain, resistant to five types of antimicrobial agents, is expected to disseminate globally, replacing weaker strains where they are endemic. Experts have identified only one remaining oral antibiotic (azithromycin) to combat it; one more genetic mutation could make typhoid untreatable in some areas.

To preserve the last line of defense, public health officials have launched a campaign to vaccinate 250 000 children in Hyderabad using a new typhoid conjugate vaccine, Typbar-TCV, recently prequalified by the WHO. The vaccine lasts at least five years and can be given to children as young as 6 months, according to the WHO. Experts are also reinforcing hygiene habits for prevention: washing hands frequently, boiling drinking water, and eating well-cooked foods. In the longer term, modern sanitation infrastructure is needed.

Source: (www.promed.org) and the World Health Organization (www.who.int)



Figure 5.

Current outbreaks that may have implications for travellers. Numbers correspond to text above. The red dot is the approximate location of the outbreak or event.

9 WHO-AFRO: OUTBREAKS AND EMERGENCIES

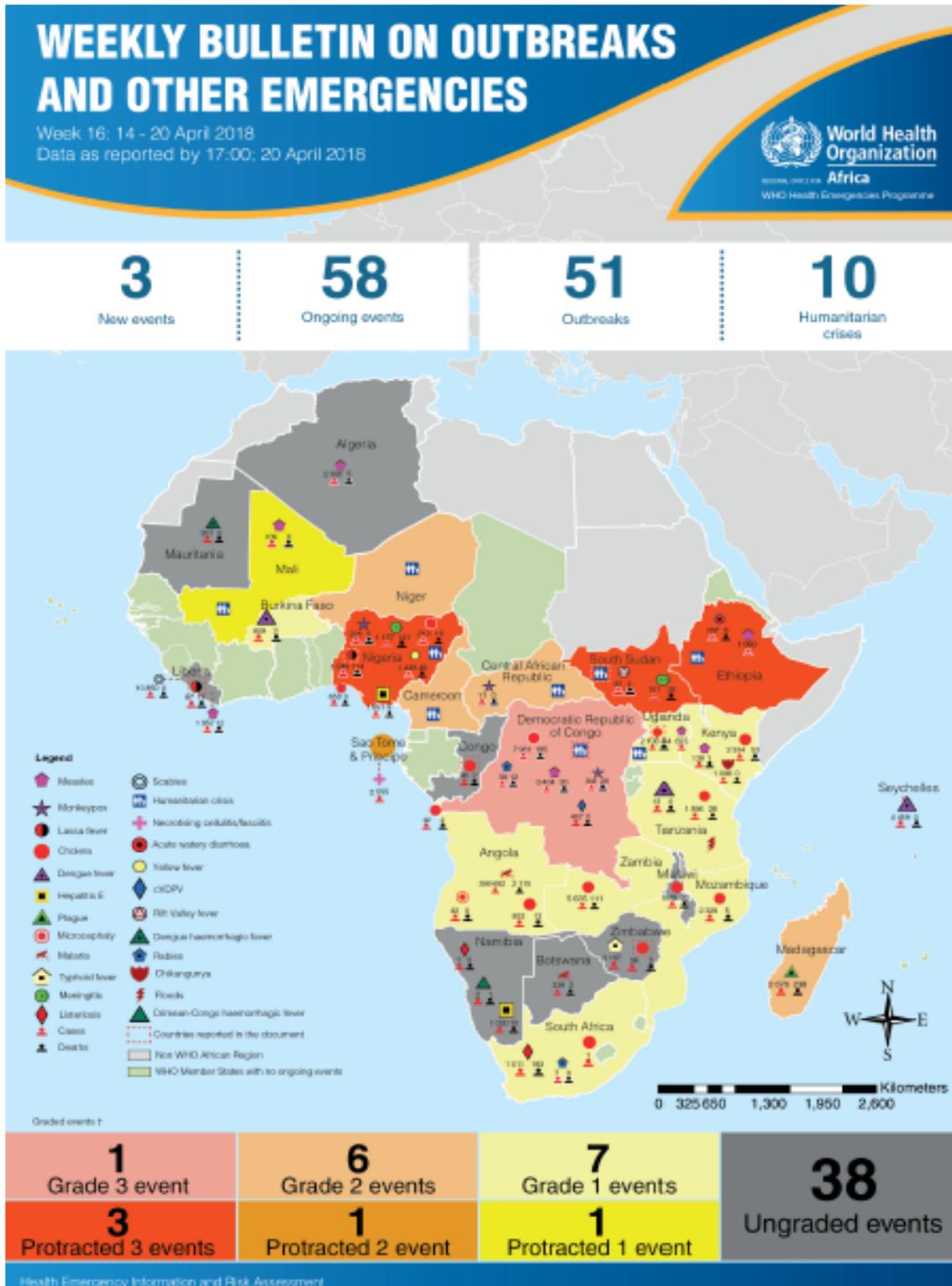


Figure 6. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 61 events, of which 51 are outbreaks and 10 humanitarian crises. For more information see link: <http://apps.who.int/iris/bitstream/handle/10665/272386/OEW16-142042018.pdf>