Infectious Disease Surveillance and Monitoring for Animal and Human Health: summary of notable incidents of public health significance. February 2017

*Incident assessment:

<table>
<thead>
<tr>
<th>Deteriorating</th>
<th>No Change</th>
<th>Improving</th>
<th>Undetermined</th>
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<tbody>
<tr>
<td>Incident is deteriorating with increased implications for public health</td>
<td>Update does not alter current assessment of public health implications</td>
<td>Incident is improving with decreasing implications for public health</td>
<td>Insufficient information available to determine potential public health implications</td>
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Notable incidents of public health significance

**Avian influenza A(H7N9), China**

The fifth annual epidemic of avian influenza A(H7N9) in China has to date resulted in the greatest number of cases in a single season since its first detection in 2013 ([a review of the season so far can be found here](#)). To 4 March 2017, 477 cases have been reported (an increase of 238 in the last month) representing more than a third of all cases reported (1,282) since in 2013. There continues to be no evidence of sustained human-to-human transmission with the majority of cases reporting recent exposure to infected poultry or contaminated environments, including live poultry markets. There are some early indications that the 2016/2017 season may have peaked and case numbers are starting to decline.

In the last month, viruses isolated from a small number of human, environmental and poultry samples have shown changes at the cleavage site of the hemagglutinin gene suggesting that the virus has adapted to being highly pathogenic in poultry. Previous strains had all been of low pathogenicity for poultry, causing no mortality or signs of illness thus making it difficult to identify potentially infected birds. This switch will affect surveillance and control strategies by making it easier to identify infected animals, and may allow for the implementation of control measures established for other highly pathogenic avian influenza viruses. To date, there is no evidence to suggest that evolving from low to high pathogenicity in poultry has resulted in differing pathogenicity or transmissibility in humans.

Although detected in previous seasons, a small proportion (approximately 7%) of viruses from human cases in the current wave possess genetic markers linked to resistance to neuraminidase inhibitors, which include oseltamivir ([WHO telebriefing](#)). To date, this mutation has not been identified in poultry samples (and only in one environmental sample) and it is thought that most human cases developed the marker following or during treatment. The situation is being closely monitored by WHO and there is currently no recommendation to change clinical management of cases.

**Yellow fever, southeast Brazil**

Preliminary epidemiological evidence suggests that the yellow fever (YF) outbreak in
Brazil may be stabilising. Since mid-December 2016, a total of 1,457 suspected cases and 361 confirmed have been reported in seven states, representing an increase of 641 cases (212 confirmed) in the last month. The vast majority of cases (278 confirmed) continue to be reported from Minas Gerais state with confirmed cases also reported from the states of Espírito Santo and São Paulo [see map]. Although suspected and confirmed cases continue to be reported, the majority of cases presented with symptom onset in mid-January, with the latest symptom onset for a confirmed case reported in the second week of February 2017. Since December 2016, concurrent epizootic outbreaks have been reported in 15 states in Brazil (including the seven reporting suspect human cases) with media sources reporting that some primate populations in Espírito Santo state have been severely affected.

Although incidence has decreased in recent weeks (likely due to mass vaccination – 14.85 million doses of YF vaccine have been sent to affected states to date), further cases are likely to be reported in affected areas amongst unvaccinated populations. Due to the speed of spread of cases in Espírito Santo state, and the proximity of epizootics and human cases to urban areas, WHO has amended their YF risk maps to recommend vaccination for travels to any areas in Espírito Santo state. The current outbreak remains sylvatic with no spillover to neighbouring countries, but reports of epizootics in border states represent a risk of international spread, especially in areas with similar ecosystems.

Other incidents of interest

- human cases of Seoul hantavirus infection association with pet rat contact continue to be reported in the US. As of 23 February, 17 human cases have been identified across seven states (an increase of seven cases in the last month). Follow-up investigations by the US CDC and public health officials in Canada have identified pet rat trade links between the two countries. Subsequently, three human infections were identified by serology in Ontario, where officials are investigating Seoul-infected premises with epidemiological links to the US rat facilities
- in December 2016, we reported an outbreak of undiagnosed febrile illness in Pakistan, specifically Karachi. The outbreak was confirmed to be caused by chikungunya virus in December, although this wasn’t officially reported until February 2017. To date, more than 4,000 cases have been confirmed by PCR but the burden of infection is thought to be much higher at more than 30,000 cases. Although this is the first confirmed outbreak of chikungunya in Pakistan, it is not unexpected given the widespread distribution of suitable vectors and virus presence in neighbouring countries. There is a concern of continued spread within Pakistan and to other countries with competent vectors, as Karachi is a major sea port for south Asia
- the twelfth meeting of the Emergency Committee under the International Health Regulations regarding the international spread of poliovirus met on 07 February. The committee unanimously agreed that the international spread of poliovirus remains a Public Health Emergency of International Concern
- in early February, an outbreak of necrotising cellulitis with severe ulcers on the lower limbs was reported from São Tomé, an island located off the west coast of Africa [map] with a population of ~200,000 people. Since October 2016 over 2,000 cases have been reported, including four fatalities. While the majority of patients have recovered, the cause is still unknown. Mycobacterium ulcerans (Buruli ulcer) was initially thought to be responsible, but the observed epidemiology is not compatible with typical Buruli ulcer disease. WHO are currently assisting with the investigation
Publications of interest

- on 31 January 2017, the Africa Center for Disease Control and Prevention was officially launched in Addis Ababa, Ethiopia. It will focus on establishing early warning and response surveillance systems, boosting technical expertise and responding to health emergencies. Work will be conducted through regional collaborating centres in the five African Union regions to foster cross-border collaboration and coordination and information sharing.

- use of a non-invasive assay to detect antibodies to Ebola virus using oral fluid samples has determined that asymptomatic infection likely played a minimal role in the Ebola virus disease (EVD) outbreak in Sierra Leone. The new anti-glycoprotein IgG capture assay has high specificity (100%) and sensitivity (95.9%) and it was used to screen 481 household contacts of confirmed EVD cases, of whom 229 (47.6%) reported high level exposures such as direct contact with a corpse or body fluids of a case. Ten individuals (of 388 (2.6%) who reported no symptoms during the outbreak) tested positive for Ebola virus antibodies indicating possible asymptomatic infection, seven of whom had direct reported contact with a confirmed case. In previous household contact studies, evidence of infection in asymptomatic individuals ranged from 1.0% to 45.9%. Further research is needed to determine if asymptomatic individuals are infectious and play a significant role in EVD outbreaks.

- a quantitative assessment of the association between deforestation and EVD outbreaks has provided further support to the argument that outbreaks occur in highly disturbed forested areas. Index cases of previous outbreaks in West and Central Africa were found to mostly occur in areas with significantly higher forest and increased fragmentation, greater population density and higher average forest cover over time than other regions. These results are not unexpected as all are thought to be associated with greater human-animal interaction, thus increasing the risk of EVD spillover from host species.

Novel agents, rare pathogens and disorders

- although a well-described zoonosis, neurological complications associated with Bartonella henselae (cat scratch disease - CSD) are rarely described. Generally resulting in a mild, self-limiting disease, a case recently diagnosed in Switzerland presented with meningoencephalitis and acute transverse myelitis. The case report describes the difficulty in diagnosing cases of CSD with neurological involvement as the patient's CSF samples were PCR negative but a biopsy sample from the right index finger (site of cat scratch) was PCR positive. It is currently unclear as to whether the pathogenesis of myelitis in CSD is the result of direct invasion of the spinal cord by B. henselae or an immune-mediated postinfectious process.

- a human Francisella tularensis type B infection (tularaemia) was recently described in the US with an unusual exposure. Generally associated with animal contact, mostly lagomorphs (type A), and fresh water exposure (type B), this case appeared to result from a fish hook injury, the first time this type of exposure has been described in the literature.

- a review of helminth infection following organ transplant found that helminths are a small, yet significant source of disease following transplantation either via transplantation-mediated transmission, reactivation of latent infections in an immunosuppressed context, or possible de novo infection during the immunosuppressed peritransplant period. The review summarises cases of transplant-mediated infection associated with nematodes (eg Halicephalobus gingivalis), cestodes (eg Taenia solium), and trematodes (eg Schistosoma spp.).
• a recent article suggests that nodding syndrome is an autoimmune disorder caused by molecular mimicry with antigens of the parasitic worm *Onchocerca volvulus*. Nodding syndrome is an epileptic syndrome of unknown aetiology of young children in East Africa (South Sudan, Tanzania and Uganda) that results in neurological deterioration and occasionally death.

• following an illness characterised by tetraplegia, a snake keeper in France tested positive for *Streptobacillus moniliformis* (rat bite fever). The infection is usually associated with rat bites; however the man denied receiving any rat bites (although he bred rats) prior to illness, only snake bites. It is possible that regular contact with feeder rats or being bitten by a snake shortly after it fed on an infected feeder rat may be a potential source of *S. moniliformis*.

• the first case of zoonotic necrotising myositis caused by *Streptococcus zooepidemicus* has recently been reported. The patient was a farmer who had lesions on his fingers and close direct contact with ponies prior to becoming ill. His clinical course included septic shock and organ dysfunction, but he ultimately recovered. Multilocus sequence typing identified the strain as ST 364, a novel sequence type closely related to types previously reported in horses and cattle.