Infectious Disease Surveillance and Monitoring for Animal and Human Health: summary of notable incidents of public health significance: July, August and September 2020.

*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

COVID-19, Global summary ▲

By the end of September, the WHO had recorded 33.5 million COVID-19 cases and more than 1 million deaths globally. While the summer respite in weekly incidence of COVID-19 cases observed in Europe started to dissolve in August, incidence rates fell in Africa and stabilised to some degree in the Americas during this reporting period. However, every country is living through their own pandemic with distinct epidemiological features which can change rapidly. For further insight, please refer to the following excellent reports:

- WHO’s global weekly epidemiological updates
- ECDC’s weekly surveillance summary for European countries
- PHE’s national COVID-19 surveillance reports (now includes flu surveillance)

Updates to note:

- since late August, there have been increasing reports of SARS-CoV-2 re-infection, a few which have published in the scientific literature which have genomic data to confirm re-infection. Re-infection was an expected development in our SARS-CoV-2 knowledge base, but further research is required to determine the science behind re-infection, the impact it can have on an individual and at population level for disease control
- about 240 vaccines are in early development, with 40 in clinical trials and nine already in the final stages of testing on thousands of people
- at least 156 economies, representing nearly two-thirds of the global population, are eligible to receive COVID-19 vaccines through the COVAX Facility, a global initiative that brings together governments and manufacturers to ensure eventual COVID-19 vaccines reach those in greatest need
- WHO launched a global partnership program to supply low and middle income countries with 120 million rapid tests for SARS-CoV-2 over the next 6 months, a particularly useful testing option for hard-to-reach and resource limited locations as they don't require specialised staff or medical equipment to function
- widespread infection in mink farms remains a common feature particularly in the Netherlands, Denmark, the US state of Utah and Spain. Infection in domestic cats and dogs, where transmission is believed to have occurred from human contacts to
the pet, have now been reported from Hong Kong, Japan, Spain and the USA. The first case of an infected pet, a cat, was also reported in the UK at the end of July. To date, a single case of zoonotic transmission has been reported on a mink farm in the Netherlands.

- to stay up to date with latest COVID-19 research, the PHE’s COVID-19 Literature Digest team produce a summary report three times per week describing a small selection of recent COVID-19 papers that are relevant to UK settings, contains new data or insights, or emerging trends. The back catalogue of reports, as well as instructions on how to subscribe, can be found here.

Ebola virus disease (EVD), Democratic Republic of Congo (DRC), Équateur province

As of 30 September, 128 cases (119 confirmed and 9 probable) including 53 deaths have been reported from 13 health zones in Équateur province, DRC. This represents an increase of 95 cases since the last report. During the month of September, incidence slowed with only 18 cases reported, of which 3 were retrospectively validated cases from June. In early September Professor Jean-Jacques Muyembe, the Director of DRC’s National Biomedical Research Institute (INRB), was appointed as head of the response. He is also coordinating the country’s COVID-19 response, one of several ongoing outbreaks in DRC including cholera, monkeypox and the plague.

The low incidence data from the last month is promising but should be interpreted cautiously. Since mid-August, response workers across multiple health zones have been striking over standardised payments which will have affected multiple layers of the response including identifying, testing and reporting cases. Although striking has mostly been resolved, the issue continues in a few health zones resulting in protest action, including destruction of response equipment, by some workers. In addition, the geographic inaccessibility of the province combined with the increasing mobility of an already mobile population due to the early stages of the rainy season will affect contact tracing and subsequently case ascertainment. Although the latest data represent a positive step forward, there remains a strong possibility that undetected cases and possibly transmission chains remain in the community. It would not be unexpected to see sporadic cases emerge in the coming weeks as case finding, and contact tracing, continues. The risk of further outbreak escalation remains.

Circulating vaccine derived polio virus (cVDPV), Global update

The continued geographical expansion of cases and outbreaks of cVDPV, particularly cVDPV2, is of increasing concern. Thus far in 2020, 21 countries have reported acute flaccid paralysis (AFP) cases of cVDPV2 (449 cases). This compares to 16 countries in 2019 (366 cases) and 5 cases in 2018 (65 cases). Notably, in August Sudan reported their first cases since 2009 and by the end of September 22 cVDPV2 cases had been recorded across multiple states. This outbreak is not unexpected given extensive population movement by nomadic communities, people displaced by conflict, frequent movement between neighbouring countries and restricted access in some areas have made it very difficult for vaccination teams to achieve sufficient cover. Sequencing has shown the circulating viruses are related to viruses reported earlier in neighbouring Chad from where there were multiple separate introductions into Sudan from Chad. There is now local circulation in Sudan and continued sharing of transmission with Chad.

Only 2 countries have reported cases of cVDPV1 in 2020; Malaysia (1 case in January) and Yemen which in August recorded the first cases (14 cases in total) since 2005 in the Sa’adah governorate in the war-ravaged country’s north-west, an area that has very low
routine immunisation levels and has been **inaccessible to the polio programme for more than 2 years**.

The risk of international spread of poliovirus has been regarded as a Public Health Emergency of International Concern since May 2014 and WHO assess the risk of further of cVDPV2 across central Africa and the Horn of Africa to be high. Towards the end of July several countries **resumed their vaccination campaigns**, and a **national polio campaign is planned for Sudan** for October.

### Tick-borne disease, England

In late July, **PHE confirmed** single cases of locally acquired babesiosis (**Babesia divergens**) and probable (based on **EU case definition**) tick-borne encephalitis (TBE) in England, both tickborne pathogens transmitted by **Ixodes ricinus**. **B. divergens** is a parasite of cattle that rarely causes zoonotic infections and this report represents the first confirmed case to be reported in England. TBE virus is known to be present in **limited areas in England** and only one probable case has **previously been described** in England.

### Usutu virus, avian detection, England

In August 2020, **Usutu virus (USUV) was detected for the first time in the UK** in a small number of wild birds (five Eurasian blackbirds and one house sparrow) in Greater London. This mosquito-borne flavivirus, first detected in South Africa in 1959, is maintained through an enzootic cycle involving birds. First detected in Europe in Austria in 2001 and subsequently expanded its range across Europe with **increased reporting frequency in recent years**. Researchers hypothesise that autochthonous transmission of USUV has occurred in local passerine populations in Greater London, probably vectored by indigenous mosquitoes. The HAIRS group has assessed the **UK public health risk of USUV human infection** as low, the impact as low to moderate. The vast majority of USUV infection in humans are asymptomatic or mild, but a few cases of neurological complications have been reported in endemic countries.

### Other incidents of interest

- **Brucella, accidental exposure, China**: in 2019, a leak from a biopharmaceutical company in **Gansu province**, China result in **3,245 serologically confirmed human cases** of **Brucella** (species not specified) infection. The number of clinical cases has not been provided. The cause of the accidental leak has been identified as the use of expired disinfectant during the production process of a veterinary brucella vaccine.

- **Chikungunya, Chad**: since July, **Chad’s first chikungunya virus outbreak** has been ongoing in the east of the country. Cases had risen from **~2,000 at the beginning of August** to **>35,000 cases and 1 death** by the start of October and are now reported across three different regions: **Ouaddai, Wadi Fira and Sila**. Available data suggests that the incidence is beginning to decrease or stabilise across all affected areas, as would be expected at this time of year as the dry season is less favourable for mosquito proliferation

- **Crimean-Congo Haemorrhagic fever (CCHF), Spain**: thus far in 2020, Spanish authorities have reported 3 confirmed cases of CCHF, the most reported in any year to date. All 2020 cases had a history of tick bites and lived in rural areas in the autonomous community of Castilla y León in province of Salamanca. CCHF virus (genotype Africa III and Europe V) has been **detected in different tick species** (**Hyalomma lusitanicum** and **Dermacentor marginatus**) taken from various wild
ungulate hosts (deer and boar) across different localities provides strong evidence of the wide spatial presence of CCHF virus in south-western Spain. **Authorities state there is a moderate risk** of future cases in known CCHF risk areas, although their impact should be low given that the number of people affected would not be many and there are adequate means of isolation and control of cases

- **Dengue virus**
  - **Italy:** In August, authorities in the Veneto region reported Italy’s first autochthonous dengue case associated with an imported case in a family member who had travelled to Indonesia. To date, a total of 10 locally acquired cases have been reported in this region
  - **Martinique:** the overseas French territory in the Caribbean, is currently reporting the largest outbreak reported on the island in 15 years. As of the end of September, 20,520 cases had been reported, averaging ~2,000 cases per week during September. The outbreak is still in its epidemic phase and expected to continue as environmental conditions are favourable for continuous transmission. French authorities have also reported an increased number of dengue cases in Guadeloupe, Saint Martin and Saint Barthélemy in recent months
  - **Singapore:** as of the start of October, more than 30,000 cases had been reported thus far in 2020, surpassing the 2013 record (>22,000 cases). Although a decline in weekly incidence has been noted since August, by end of September incidence was still more than five times that reported in the corresponding period averaged over the last three years. In recent weeks authorities have reported increased *Aedes aegypti* numbers, suggesting further high-level transmission is possible and the low rate of transmission normally expected at the end of the year may not be achieved

- **Diphtheria outbreak, Vietnam:** since June an outbreak of diphtheria has been reported in Vietnam. As of the end of September, 198 cases and 4 fatalities had been reported, the majority (172 cases, 87%) in the Central Highland provinces. This represents a nearly 5-fold increase on cases reported in the same period in 2019 (41 cases, 3 deaths). Populations affected in the Central Highland provinces include ethnic minority groups who have a history of poor vaccine uptake. A mass vaccination campaign has been launched by the Ministry of Health but logistical delays, including insufficient vaccine stocks, have caused delays

- **Tick-borne encephalitis (TBE) Germany:** According to the Robert-Koch-Institute, TBE cases for 2020 are likely to surpass previous annual records. As of 11 September, 567 cases were reported which is 14% more cases than observed in the same period of 2018, the highest peak year to date (2018 total: 583 cases). Most of 2020’s cases (around 90%) were acquired in the two southern states of Baden-Württemberg and Bavaria. The increase in cases this year could be attributed to human behavioural changes caused by COVID-19 restrictions with many Germans spending their summer holiday visiting popular destinations in mountainous recreational areas within these regions. But it has also been observed that the number of *Ixodes ricinus* adult ticks, a known vector of TBE virus, present in southern Germany this year is three-fold higher than compared to 2019

- **West Nile virus (WNV), Europe**
  During the current transmission season for WNV, which usually runs from June to November, the epidemiological situation in the following countries is worth noting:
Spain: thus far in 2020, Spain has reported 75 human cases of WNV infection, including 7 deaths in the regions of Sevilla (57 cases), Cadiz (14 cases) and Badajoz, of which 40 (53%) have been officially confirmed. This is the largest outbreak of human WNV infection to date in Spain and it follows very low and sporadic reporting of human cases since 2010. The increase in the incidence of WNV-related meningoencephalitis during this summer is unprecedented, but mirrors an increase in equine cases in the same regions. Competent vectors, as well as circulating WNV, and equine cases have been observed in this area for many years. There are reports that vector activity may be particularly high in affected regions this season. There remains a risk of further cases in these areas for the rest of the vector season.

Germany: in mid-August German authorities reported the first locally acquired human cases of WNV infection for the 2020 transmission season. This is the only the second-year human cases were reported in Germany, after 5 cases, all symptomatic, were recorded in 2019. By early October 2020, a total of 12 cases were reported in a wider geographical area than described in 2019.

Netherlands: in late August/early September WNV was detected for the first time in a bird and Culex mosquitoes in the same area in Utrecht, providing evidence of enzootic transmission of WNV in the Netherlands. The infected bird, a common whitethroat, was captured and tested negative for WNV in May before testing positive in late August, indicating a local infection source. By the end of September, no locally acquired human or equine cases have been reported in the Netherlands, but surveillance activities continue.

- **Wild polio virus eradication, Africa**: in late August, the WHO African region was declared free of wild polio. Wild polio virus remains endemic in Afghanistan and Pakistan who have reported 47 and 74 cases respectively thus far in 2020.

**Publications of interest**

- Researchers involved in a long-term dengue and Zika virus cohort study in Nicaragua have shown that while dengue virus transmission was very low in the 2 years after a Zika virus outbreak, (repeating similar results from a 2019 study showing Zika provides cross-protection for dengue) they also noted that prior Zika virus infection creates an increased risk for severe dengue virus serotype 2 infection. Enhancement of other serotypes is also possible but not observed in this cohort. This observation could pose a challenge to the ongoing development of dengue and Zika virus vaccines.

- A review paper published in Cell in September succinctly summarises factors that effect the emergence and re-emergence of pathogens, describing the dynamic balances and imbalances which determine whether a new infectious disease could result in a pandemics such as COVID-19, or dead-end infections.

- In mid-September the Global Preparedness Monitoring Board (GMPB) released their second reported titled A World in Disorder. The GPMB calls for urgent actions on five core measures to strengthen the current response to COVID-19 and better prepare the world for future pandemics and health emergencies: responsible leadership; engaged citizenship; strong and agile national and global systems for global health security; sustained investment in prevention and preparedness, commensurate with the scale of a pandemic threat; and robust global governance of preparedness for health emergencies.
ECDC have urged EU states to prepare against possible new outbreaks of **avian influenza** in birds this year following outbreak of highly pathogenic avian influenza in wild and domestic birds in western Russia and Kazakhstan over the **past few months**, a region known to be part of the autumn migration route for wild water birds heading to Europe. Based on previous years, countries in northern and eastern Europe will be most at risk, but subsequent spread to countries in southern and eastern Europe is also possible. The risk of transmission of avian influenza viruses to the general public in Europe remains very low.

A recent study outlining **imports of wild animals into the UK** determined that 48 million individual wild animals (non-CITES species) were legally imported into the UK from 90 countries between 2014 and 2018. In terms of volume, discounting semi-domesticated pigeons and game birds, amphibians were the most commonly imported group (73%, >2.4 million of which the majority were frogs), followed by reptiles (17%), mammals (4%), and birds (3%). The largest volumes of wild animals were imported from North America and Asia, but most of the individual import records were from Europe and Africa. While this figure does not include all wild animal importations, including those imported illegally, it highlights the potential human and animal health risk from this large, and generally poorly understood, industry.

A **serological survey of pigs** across Uganda has found evidence of **ebolavirus** exposure across multiple regions with variable temporally associated seropositivity. Reactivity to multiple ebolavirus strains (Sudan, Zaire and Reston ebolaviruses) was observed. Together these results suggest multiple introductions of ebolavirus into the pig populations in Uganda. The role of pigs in the maintenance and/or transmission of ebolavirus is yet to be elucidated.

**Novel agents, rare pathogens and disorders**

- In late June a case of **feline rabies** was reported in Tuscany, Italy. Post-mortem testing determined the infection to be caused by **West Caucasian Bat Lyssavirus** (WCBV, >98% homology) which has only been isolated once before in 2002 in bats (Schreibers’ bent-winged bat (Miniopterus schreibersi)) in the western Caucasus Mountains of south eastern Europe, although there is serological evidence that the virus may also be present in Africa. This is the first detection of a bat lyssavirus in Italy. A bat colony close to the cat’s residence is the suggested source of infection. Spillover infections of bat lyssaviruses into terrestrial animals and humans are very rare events and considered dead-end infections. Although the zoonotic risk of WCBV is not understood, all close contacts (13 people) of the cat received post-exposure prophylaxis and are under monitoring. It should be noted that the vaccine and immunoglobulin used to prevent classical rabies virus infection may not confer protective immunity against WCBV. The Schreibers’ Bent-winged bats are common in the Mediterranean Basin, but are not found in the UK.

- Clinicians in Leicester, UK report a **rare case of fatal amoebic encephalitis** cases by **Balamuthia mandrillaris**. The patient, an 85-year-old Gujarati woman, had no recent travel history and initially presented to hospital with suspected stroke. CT & MRI scans of the patient's brain showed multiple cortical and subcortical, hypodense lesions with surrounding vasogenic oedema. Cultures, serology and lumbar puncture were inconclusive, as was tests for tuberculous meningitis. The patient died 11 days after admission. With assistance from the **US CDC**, *B. mandrillaris* was identified in post-mortem histopathology samples. A 2min video synopsis of the case is available here.
B. mandrillaris is an emerging protozoan parasite (free-living amoeba), an agent of granulomatous amoebic encephalitis involving the central nervous system, with a case fatality rate of >98%, even in immunocompetent individuals. It was first isolated in 1986 from the brain tissue of a mandrill baboon in California. It is a free-living amoeba found in soil and dust worldwide. Over 200 cases of disease have been reported globally, the majority in Latin America and the US. Infection is thought to occur via inhalation of airborne cysts or through direct skin inoculation, although transplantation associated clusters have also been reported.

- following the confirmation of canine cases of Ehrlichia canis infection, a tickborne (Rhipicephalus sanguineus) zoonotic pathogen, in two states in Australia (Western Australia and Northern Territory) in May/June 2020, Australia can no longer be considered E. canis free. Research is ongoing to determine the distribution of E. canis in Australia but it is likely the disease has been present in these areas for some time

- a recently reported French case of variant Creutzfeldt–Jakob disease (vCJD) was most likely acquired via accidental occupational exposure. In 2010 the patient had a laboratory exposure accident involving a laceration to her thumb with an instrument used to handle murine samples contaminated with a sheep-adapted form of BSE. The wound was cleaned and disinfected promptly. In late 2017 the patient began to develop neurological symptoms, with a diagnosis of vCJD confirmed by neuropathological examination after her death in 2019. The 7.5-year delay between the laboratory accident and her clinical symptoms is consistent with the incubation period in the transfusion transmission form of vCJD, which may equate to this type of exposure. According to the authors, this is the 2nd vCJD case in the last 5 years to report potential occupation exposure and highlights the needs for improvements in the prevention of transmission of vCJD and other prions that can affect humans in the laboratory and neurosurgery settings.

- in late September, health authorities in French Guiana reported the first emergence of Oropouche fever. To date 37 clinically compatible cases have been reported of which 7 have been confirmed (9 tested) in the remote town of Saül [map]. Oropouche fever is caused by Oropouche virus, an Orthobunyavirus common to certain countries in South and Central America and the Caribbean. It is likely that Oropouche fever is an underreported arbovirus infection in the Americas given the similarities in clinical disease presentation with other common arboviral diseases in the region (eg dengue, chikungunya and Zika virus) and the widespread distribution of the competent vector (Culicoides paraensis midge)