

Communicable disease threats to public health in the European Union

Annual Epidemiological Report for 2019

Introduction

This report covers the events and threats detected by the ECDC epidemic intelligence (EI) team in 2019 and the actions taken in relation to these findings. The objective of EI at ECDC is to rapidly detect and assess public health events of any origin to ensure EU health security as defined in ECDC's mandate. This report is based on EI screening and data from 2019 retrieved from the Epidemic Intelligence Information System (EPIS), the Early Warning and Response System (EWRS) and the ECDC threat tracking tool (TTT).

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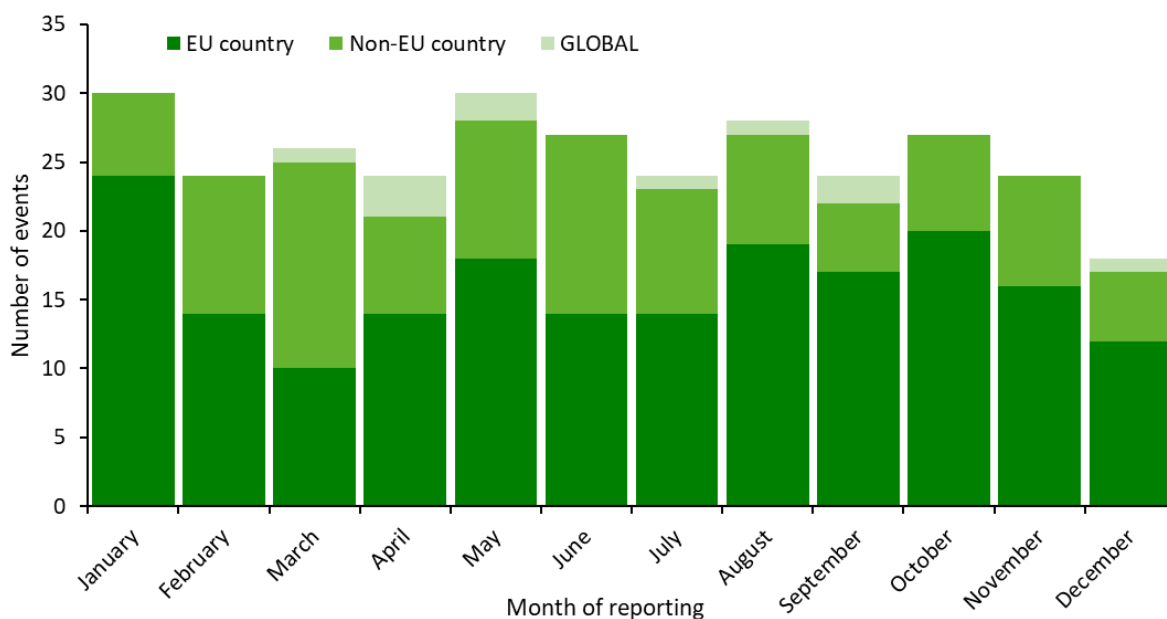
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1. Threat detection in 2019

1.1 Events originating from epidemic intelligence screening

In 2019, 306 new events were monitored and discussed at the daily round table meetings. The EI team reported an average of six new events per week. Fifty-eight (19%) of these detected events led to the monitoring of a new threat (also 19% in 2018). Of all events, 192 (63%) originated in the EU (Figure 1), 103 (34%) were related to countries outside of the European Union and 11 events (4%) had a global dimension.

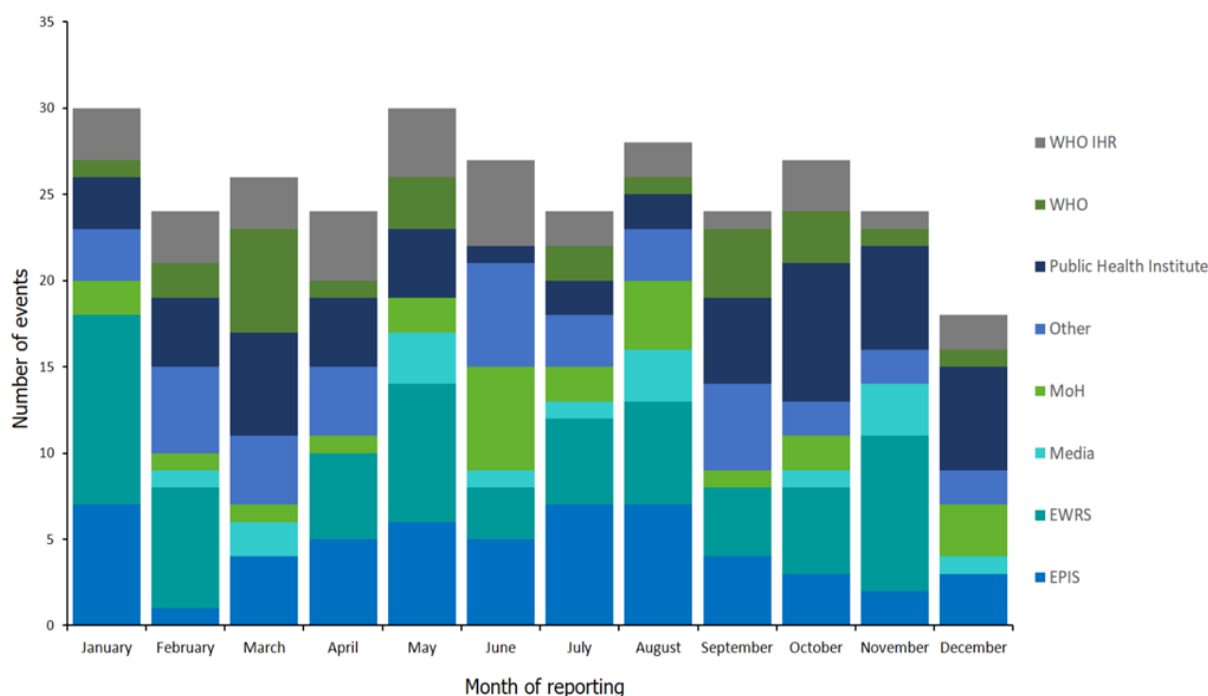
Figure 1. Distribution of events detected through epidemic intelligence by month of reporting and geographical origin, 2019 (excluding previously opened threats)



Of the 306 events, 63 (21%) were reported through the Early Warning and Response System (EWRS), 58 (19%) were received from the World Health Organization (WHO) or the International Health Regulations (IHR) platform, and 54 (18%) were reported through the Epidemic Intelligence Information System (EPIS) (Figure 2).

For 51 events (17%), the source of information was the public health institute of the affected country. These reports were most commonly detected through media and later verified with information from the Ministry of Health or public health institute website for the relevant country. Other sources of information (13%) included other official authorities, ProMED, or scientific articles.

Figure 2. Distribution of new events detected through epidemic intelligence by month of reporting and source, 2019 (excluding previously opened threats)



Acronyms:

IHR= International Health Regulations

MoH= Ministry of Health

EWRS= Early Warning and Response System

EPIS = Epidemic Intelligence Information System

1.2. Outbreaks and alerts reported through the Epidemic Intelligence Information System (EPIS)

Food- and waterborne diseases and zoonoses (EPIS-FWD)

In 2019, 88 urgent inquiries (UIs) were initiated by 23 participating countries (out of a total of 52 network countries) or ECDC (one UI). Most frequently, UIs were related to salmonellosis (44%), followed by listeriosis (23%), verocytotoxin-producing *Escherichia coli* (VTEC) (12%) infection and hepatitis A (9%). On average, 11 countries replied to each UI and 31 replied to at least one.

In 2019, ECDC and the European Food Safety Authority (EFSA) produced three joint rapid outbreak assessments.

Participation in EPIS FWD has increased. The number of UIs launched in 2019 was the highest since the platform was launched and 54% higher than the annual average posted in the past five years. In previous years, an annual mean of 57 UIs were published on the platform.

Sexually transmitted infections (EPIS-STI)

In 2019, alerts were posted in EPIS-STI by two EU/EEA Member States. The STI alerts were in relation to congenital syphilis infection and an unusual presentation of *Lymphogranuloma venereum* (LGV) infection as cervical suppurative lymphadenitis.

In addition, the general forum of EPIS-STI was used by several Member States and ECDC to exchange information on an outbreak of LGV caused by a recombinant strain with a non-LGV outer membrane protein A; an increase in campylobacteriosis among men who have sex with men (MSM) attending an STI clinic that coincided with the introduction of a new multiplex PCR panel assay for gastrointestinal symptoms; several clusters of hepatitis A among MSM; and the emergence of a *Chlamydia trachomatis* variant in Finland that yielded false-negative results by Aptima Combo 2 Assay CT/NG (Hologic Inc., USA) and resulted in ECDC publishing a rapid risk assessment (RRA) [1]. This risk assessment outlined some short-term measures for the Member States to consider in order to define the spread of the new chlamydia variant and inform the need for patient recall.

EPIS-STI was also used by ECDC to inform the STI network of urgent inquiries posted in EPIS-FWD that were affecting the MSM population.

European Legionnaires' disease surveillance network (EPIS-ELDSNet)

Twenty-six EU/EEA and two non-EU/EEA countries reported 1 647 travel-associated Legionnaires' disease (TALD) cases with date of onset in 2019. In total, 175 new standard TALD clusters were detected in 30 countries (14 EU/EEA countries and 16 countries outside of the EU/EEA) and on board ships (two clusters). ELDSNet shared 60 summary reports of type 1 (non-EU/EEA clusters) and 36 of type 2 (rapidly evolving clusters - i.e. three or more cases associated with the same accommodation within three months) with tour operators. Control measures were implemented in all but eight clusters, with ELDSNet receiving feedback from an initial risk assessment within two weeks and a final assessment within six weeks. Eight affected accommodation site names were published on the ECDC website in 2019.

Vaccine-preventable diseases (EPIS-VPD)

In 2019, five inquiries were posted on EPIS-VPD, generating 15 follow-up postings. Topics discussed included measles (1), invasive meningococcal disease (1), mumps (1) and general issues such as vaccine shelf-life and schedules.

The items that gave rise to the most follow-up postings included the use of hexavalent vaccines (diphtheria, tetanus, pertussis, *Haemophilus influenzae*, poliomyelitis and hepatitis B), as well as an outbreak of mumps in Ireland among young adults and discussions on similar experiences in other countries and options for response.

Antimicrobial resistance and healthcare-associated infections (EPIS-AMR-HAI)

In 2019, seven new UIs were launched through EPIS-AMR-HAI. All of them were related to the emergence of healthcare-associated and/or multidrug-resistant pathogens: Verona integron-encoded metallo-beta-lactamase (VIM)-producing *Pseudomonas aeruginosa* linked to medical tourism in Mexico; the first case of ceftazidime-avibactam resistance in *Klebsiella pneumoniae* carbapenemase (KPC)-producing *Klebsiella pneumoniae* in Finland; an outbreak of extensively drug-resistant *K. pneumoniae* in Germany; a cluster of methicillin-resistant *Staphylococcus aureus* harbouring genes that encode for exfoliative toxins in the Netherlands; an outbreak of carbapenem-resistant Enterobacterales in Lithuania, an increase of *Clostridioides difficile* ribotype 002 in Ireland and an outbreak of OXA-244 producing *Escherichia coli* in Germany.

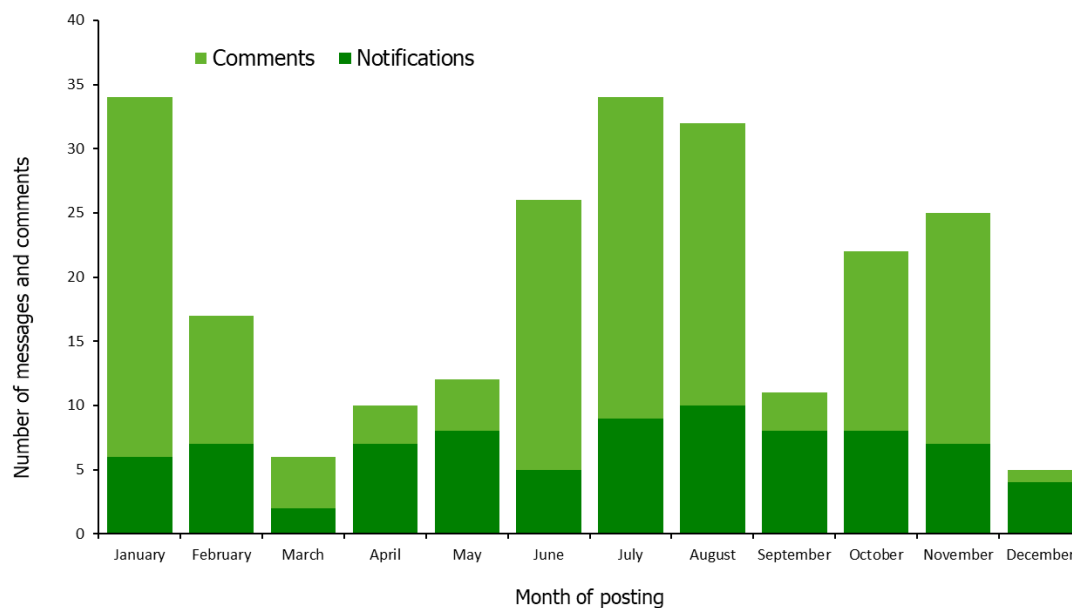
The urgent inquiries from EU countries related to the three outbreaks of carbapenem-resistant Enterobacterales in Lithuania and Germany resulted in the production of rapid risk assessments that included the analysis of whole genome sequencing data provided by national reference laboratories, or generated with ECDC support [2][3][4]. The UI regarding VIM-producing *P. aeruginosa* linked to medical tourism in Mexico was posted by ECDC to provide information on the related rapid risk assessment [5].

1.3. Threats reported through EWRS

In 2019, 81 EWRS notifications and 153 comments were posted (Figure 3). Seven EWRS notifications were classified as 'alert notifications', and 74 as 'other information' (outside the scope of Article 9 in Decision No 1082/2013/EU); 11 resulted in ECDC opening a new threat in the Threat Tracking Tool (TTT).

Of the 11 threats opened, seven resulted in rapid risk assessments.

The number of messages and comments posted on EWRS has been stable over the past 12 years except in 2009, when 1 400 postings were made in relation to the influenza pandemic. From January 2005 until the end of 2019, 5 551 messages and comments were posted in the EWRS platform, including 234 in 2019.

Figure 3. Distribution of EWRS notifications and comments by month of posting, 2019 (n=234)

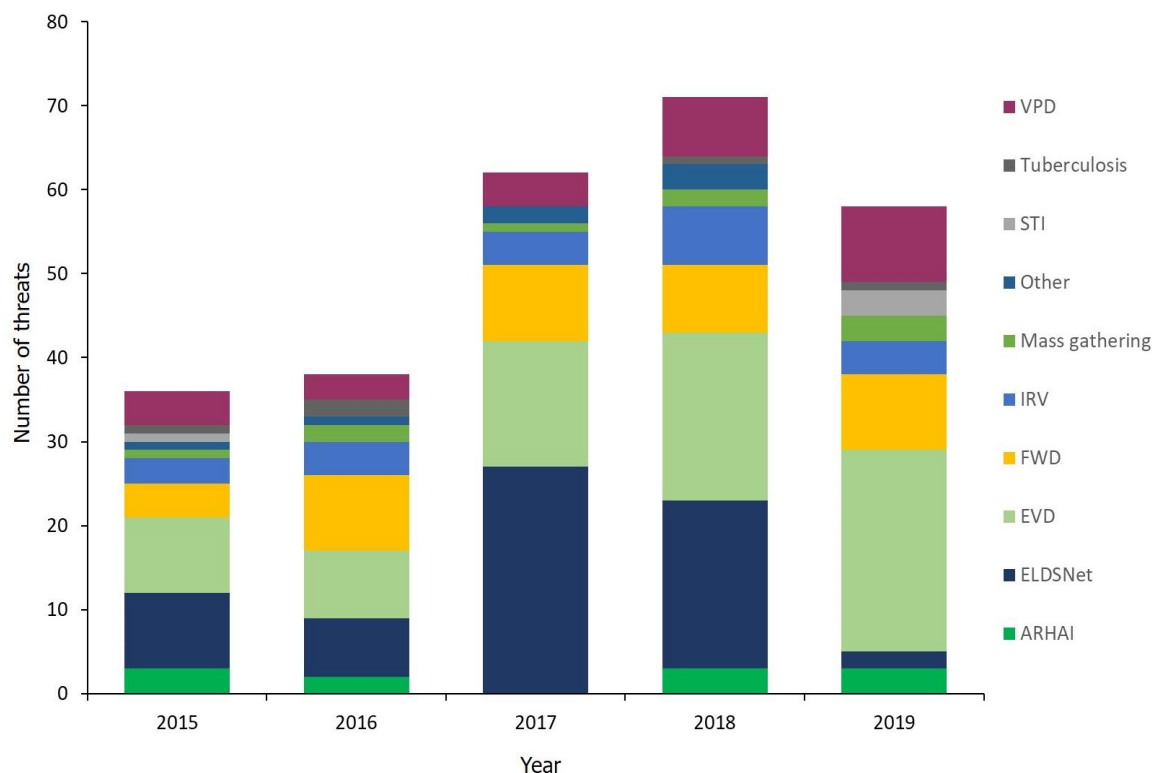
2. Threat monitoring in 2019

In 2019, ECDC opened and monitored 58 new threats in the threat tracking tool (TTT) in addition to the 12 carried over from previous years (Table 1, Table 2). This is less than the number of threats monitored in 2018 (71), mainly due to the decrease in threats related to TALD (Figure 4). Due to a change in procedure, rapidly-evolving TALD clusters reported in EPIS-ELDSNet are no longer recorded as threats in the TTT.

Table 1. Distribution of threats by disease group and year, 2015–2019

Disease group	2015	2016	2017	2018	2019
Legionnaires' disease	9	7	28	20	2
Food- and waterborne diseases	4	9	11	8	9
Emerging and vector-borne diseases	9	8	16	20	24
Vaccine-preventable diseases	4	3	5	7	9
Influenza and other respiratory viruses	3	4	4	7	4
Sexually transmitted infections	1	0	0	0	3
Tuberculosis	1	2	1	1	1
Antimicrobial resistance	3	2	0	3	3
Mass gathering	1	2	1	2	3
Other	1	1	2	3	0
TOTAL	36	38	62	71	58

In 2019, emerging and vector-borne diseases represented the majority of the new threats (41%), followed by food- and waterborne (15%) and vaccine-preventable diseases (15%) (Figure 4). Of the 58 threats opened and monitored in 2019, 38 (66%) affected European countries.

Figure 4. Distribution of threats by disease group and year, 2015–2019**Acronyms:**

VPD= Vaccine-preventable diseases

STI= Sexually-transmitted infections

IRV= Influenza and other respiratory viruses

FWD= Food and waterborne diseases

EVD= Emerging and vector-borne diseases

ELDSNet= European Legionnaires' disease surveillance network

ARHAI= Antimicrobial resistance and healthcare-associated infections

Table 2. Threats carried over from previous years

Long-term threats	Creation date
Influenza A(H5N1) and other strains of avian influenza – Non EU/EEA countries	15 June 2005
Poliomyelitis – Multi-country (World) – Monitoring global outbreaks	8 September 2005
Cholera – Multi-country (World) – Monitoring global outbreaks	20 March 2006
Measles – Multi-country (World) – Monitoring European outbreaks	9 February 2011
Middle East respiratory syndrome coronavirus (MERS-CoV) – Multi-country	24 September 2012
Influenza A(H7N9) – China – Monitoring human cases	31 March 2013
Influenza A(H5N6) – China – Monitoring human cases	6 May 2014
Chikungunya and dengue – Multi-country (World) – Monitoring global outbreaks	27 January 2017
Ebola virus disease - tenth outbreak - Democratic Republic of the Congo - 2018-2020	1 August 2018

Seasonal monitoring

West Nile virus – Multi-country (Europe)

Monitoring of environmental suitability of *Vibrio* growth in the Baltic Sea

Influenza – Multi-country (Europe)

3. Response to threats in 2019

3.1 Rapid risk assessments and epidemiological updates

Rapid risk assessments (RRAs) aim to support EU/EEA countries and the European Commission in their preparedness and response to a public health threat. They provide a timely summary and risk assessment of a public health threat for EU/EEA countries related to a specific event. They also include potential options for response. As outbreaks or public health events evolve, ECDC may update its risk assessments. Developments in an outbreak that do not affect the overall assessment result in an epidemiological update.

In 2019, ECDC produced 24 RRAs, all published on the ECDC website (Annex 1). Eleven RRAs referred to emerging and vector-borne diseases, five to antimicrobial resistance and hospital-acquired infections and three to food-and waterborne diseases (Table 3, Figure 5). The latter were jointly published with EFSA. The remaining RRAs were on health threats related to Cyclone Idai in southern Africa, the risk of measles in the EU/EEA, *Chlamydia trachomatis* false-negative tests, public health treats related to the Hajj pilgrimage and the regional situation assessment for seasonal influenza.

Table 3. ECDC rapid risk assessments by disease programme/topic area, January–December 2019

Subject	Number of risk assessments
Emerging and vector-borne diseases	11
Antimicrobial resistance and hospital-acquired infections (ARHAI)	5
Food-and waterborne diseases	3
Mass gathering	1
Vaccine-preventable diseases	1
Influenza and other respiratory viruses (IRV)	1
Microbiology	1
Weather events	1
TOTAL	24

Figure 5. Distribution of rapid risk assessments produced in 2019 by month and disease programme/topic area (n=24)

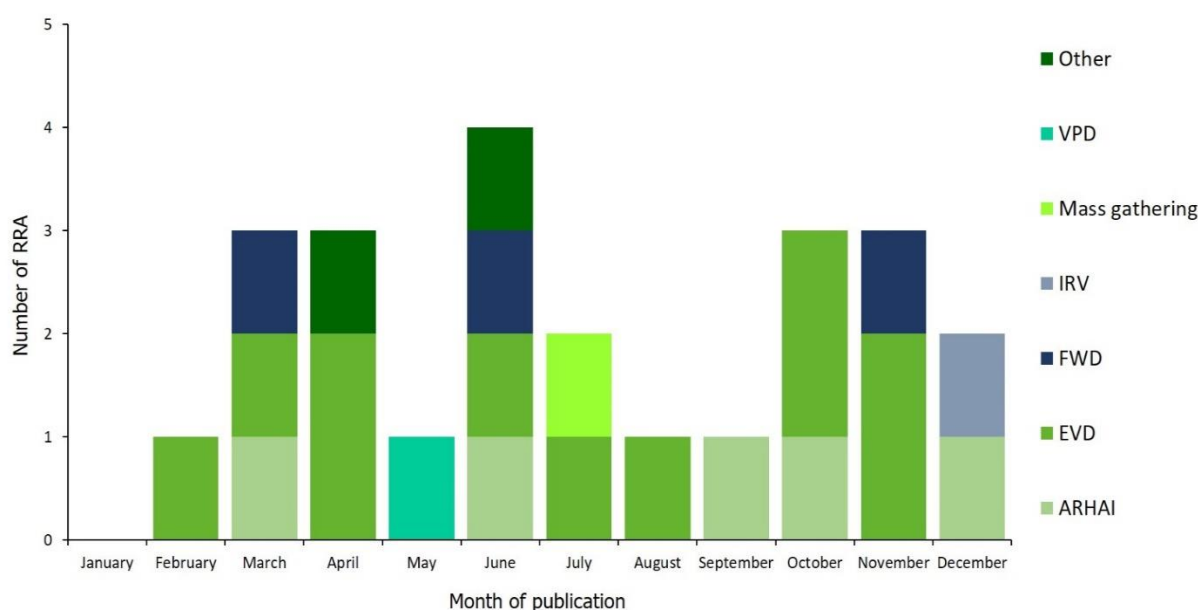
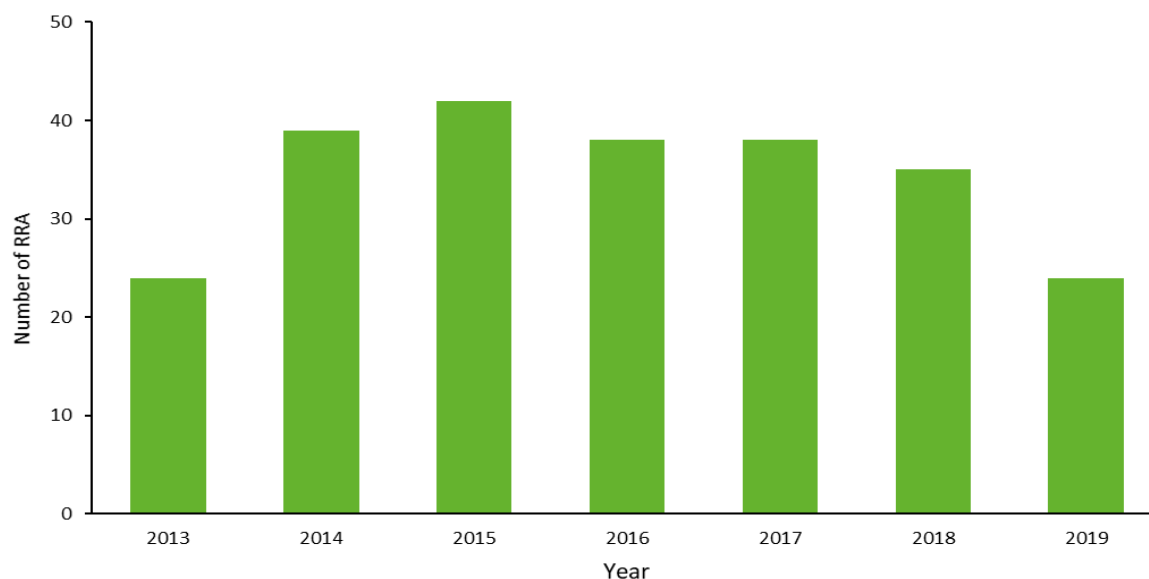


Figure 6. Distribution of rapid risk assessments produced between 2013 and 2019

The total number of RRAs in 2019 has decreased compared to the last five years (Figure 6). Since 2015, 177 RRAs have been produced: 42 in 2015, 38 in 2016, 38 in 2017, 35 in 2018 and 24 in 2019.

Ten epidemiological updates were produced in 2019 (Table 4). Seven of them were related to emerging and vector-borne diseases: three concerned the Ebola virus disease outbreak in the Democratic Republic of Congo (DRC), two related to locally-acquired Zika virus disease in France, one concerned malaria caused by *Plasmodium cynomolgi* in Denmark and one was on the subject of West Nile virus.

Table 4. List of epidemiological updates by subject and date of publication, January–December 2019

Subject	Date of publication
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo	25 January 2019
Health risks during the Carnival season in Brazil	7 February 2019
Multi-country cluster of <i>Listeria monocytogenes</i> ST1247 in five EU countries	27 March 2019
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo	3 April 2019
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo	13 June 2019
Travel-related case of malaria caused by <i>Plasmodium cynomolgi</i> reported in Denmark	3 October 2019
Increase of XDR typhoid fever in travellers returning from Pakistan	9 October 2019
Second case of locally-acquired Zika virus disease in Hyères, France	23 October 2019
Third case of locally-acquired Zika virus disease in Hyères, France	31 October 2019
West Nile virus transmission season in Europe, 2019	5 December 2019
TOTAL	10

3.2 Deployment of experts in 2019

In 2019, three ECDC experts were deployed in the field.

In April 2019, one expert was sent to Mozambique through the European Union Civil Protection Team (EUCPT) following the Cyclone Idai. The expert provided epidemiological support to the cholera task force under the coordination of the Ministry of Health and the World Health Organization.

Two other experts were deployed in the Democratic Republic of the Congo between October and December 2019 to provide technical support in the context of the Ebola epidemic. Both were deployed under the umbrella of the Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO) to support WHO and the DRC Ministry of Health.

4. Threats of particular interest in 2019

4.1 Autochthonous dengue cases in Spain and France

In 2019, 11 autochthonous dengue cases were reported in continental EU/EEA, in France (9) and Spain (2).

France

Between July and September 2019, French authorities detected nine autochthonous dengue cases: two from Rhône department and seven from Alpes-Maritimes department.

In July 2019, the regional public health agency of Auvergne-Rhône-Alpes reported two locally-acquired dengue cases in Caluire-et-Cuire – a suburban area of the city of Lyon – in the Rhône department [6]. The cases were linked to an imported case in the area [7].

On 20 September 2019, the regional public health agency of Provence-Alpes-Côte d'Azur reported a locally acquired dengue case in a resident of the city of Vallauris in the department of Alpes-Maritimes [6]. The case had onset of symptoms on 30 August and did not report any recent travel history outside of mainland France. This case was laboratory-confirmed by the French National Reference Centre for Arboviruses (Marseille). Door-to-door active case finding was implemented around the home of the autochthonous case on 19 September. As of 16 October 2019, six additional cases in the direct vicinity were identified [8].

Spain

On 16 September 2019, the Catalan public health agency confirmed an autochthonous case of dengue in a resident of Barcelonès county in Catalonia, Spain. The case had onset of symptoms on 6 September 2019, with no recent travel history outside of Spain. Dengue infection was confirmed by the Catalan reference laboratory for arboviruses and the Spanish national reference laboratory for arboviruses.

In September 2019, Spain reported the first probable sexual transmission of dengue between two men. One of the men travelled to Cuba and the Dominican Republic and returned to Spain on 4 September 2019. He developed symptoms of dengue on 5 September. In the days following his return, the man had unprotected sex with his partner, who had not travelled outside of Spain in the previous 45 days. His partner developed dengue symptoms on 15 September. This is the first documented sexual transmission of dengue in the EU/EEA. An RRA was published on 18 November 2019 [9].

There are no epidemiological links between these four events in France and Spain. Based on previous observations of autochthonous arbovirus transmission during the past decade, reports of sporadic autochthonous cases or limited clusters of dengue are expected in the Mediterranean region and southern parts of the EU/EEA. ECDC published an RRA on local transmission of dengue fever in France and Spain on 1 October 2019 [6].

4.2 Measles in the EU/EEA

In 2019, cases of measles were reported by all EU/EEA countries. Overall, 14 736 cases were reported through the epidemic intelligence monthly screening. The countries reporting most of the cases were Romania (3 308), France (2 636 cases), Italy (1 627 cases), Poland (1 492 cases), Bulgaria (1 230 cases) and Lithuania (834) [10]. New outbreaks were also reported by Slovakia (334 cases) and Slovenia (48 cases) [10] [11]. Ten deaths were reported in the EU/EEA: Romania (5), France (2), Italy (1), Hungary (1) and the United Kingdom (1) [10].

One measles outbreak in a ski resort, Val Thorens in France, was followed as a separate threat due to its potential for international spread. In February 2019, France reported an outbreak of measles among workers and visitors to the ski resort, coinciding with the French school holidays. The outbreak resulted in 28 cases reported from Denmark, Belgium and Scotland [12].

In light of continued reporting of new measles cases among adults and children in the EU/EEA, ECDC published an RRA [13]. In May 2019, WHO classified measles outbreaks across the European Region as a Grade 2 emergency [14].

On 29 August 2019, the European Regional Verification Commission for Measles and Rubella Elimination (RVC) determined that, for the first time since the verification process began in the Region in 2012, four countries (Albania, the Czech Republic, Greece and the United Kingdom) had lost their measles elimination status [15].

4.3 Ebola virus disease in the Democratic Republic of the Congo

Since 2018, the Democratic Republic of the Congo (DRC) has experienced its largest Ebola virus disease outbreak. On 17 July 2019, WHO's Director-General declared that the Ebola outbreak met the criteria for a public health emergency of international concern (PHEIC) under the International Health Regulations [16].

In 2019, the outbreak spread to thirteen new health zones in the DRC with reports of 2 778 new Ebola virus disease cases (2 708 confirmed, 70 probable) and 1 866 new deaths throughout the year.

The outbreak affected North Kivu, South Kivu and Ituri Provinces in the north east of the country, close to the border with Uganda. These provinces are some of the most populated provinces in the country. Response measures in these areas are challenging due to the prolonged humanitarian crisis, resistance among the population and an unstable security situation. In February, May and October–November 2019, major security incidents led to an interruption of response activities in the affected areas.

In addition, there is high mobility among the area's population and refugees to neighbouring countries, including Burundi, Tanzania and Uganda. In 2019, several imported cases from the DRC were detected in Kasese, Uganda. This included a family cluster of three imported cases reported in June (later reclassified under their health zone of origin in the DRC) and a single imported case reported at the end of August 2019.

Since the beginning of the outbreak, and as of 31 December 2019, 3 380 Ebola virus disease cases (3 262 confirmed, 118 probable) and 2 232 deaths were reported in 29 health zones in the DRC. Among the cases, 168 were healthcare workers.

As of 22 December 2019, 259 024 people had been vaccinated with the rVSV-ZEBOV-GP (also known as Ervebo) Ebola vaccine which was prequalified by WHO in November 2019. In addition, 2 938 people had been vaccinated with the first dose of the Ad26.ZEBOV/MVA-BN-Filo (Johnson & Johnson) vaccine introduced in two health areas in Goma in November 2019.

Figure 7. Geographical distribution of confirmed and probable cases of Ebola virus disease, Democratic Republic of the Congo and Uganda, as of 31 December 2019

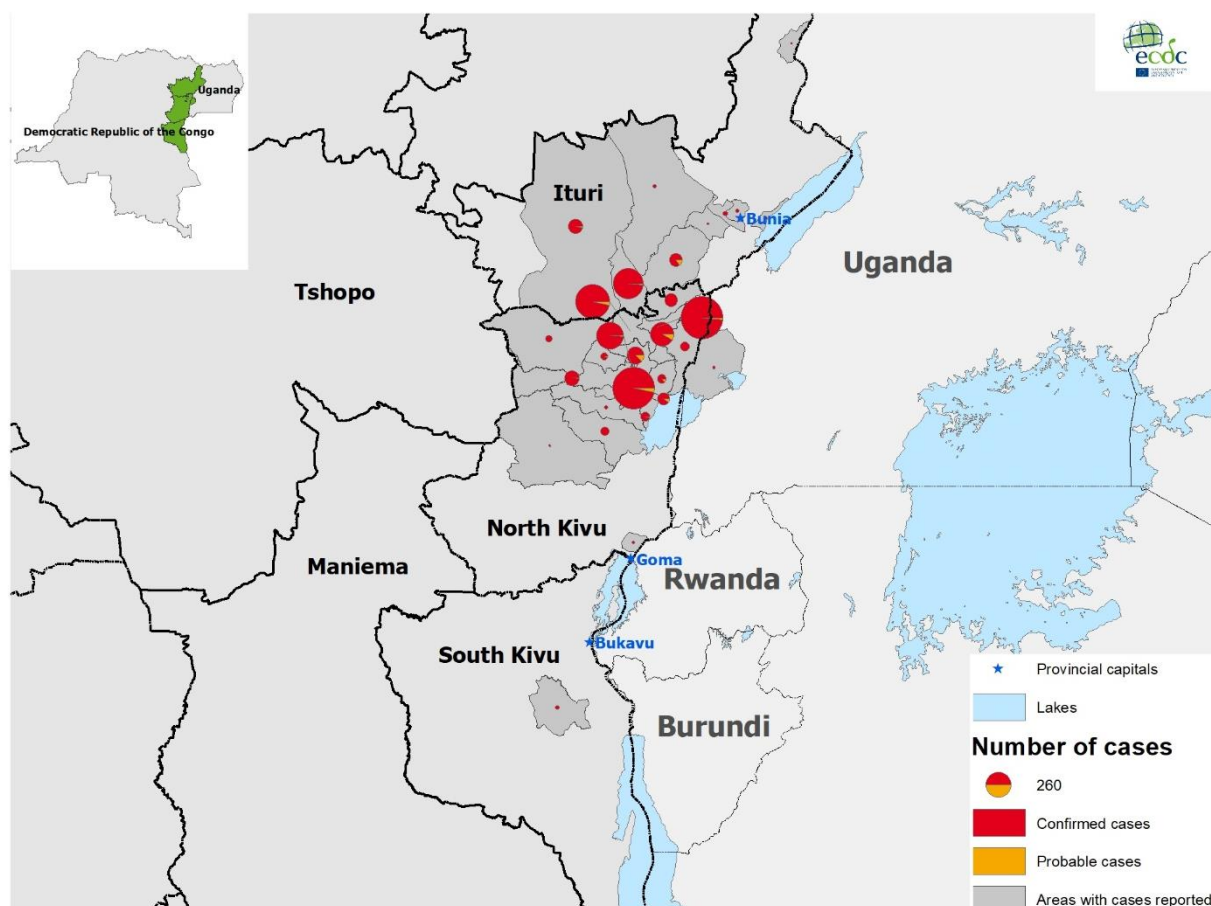
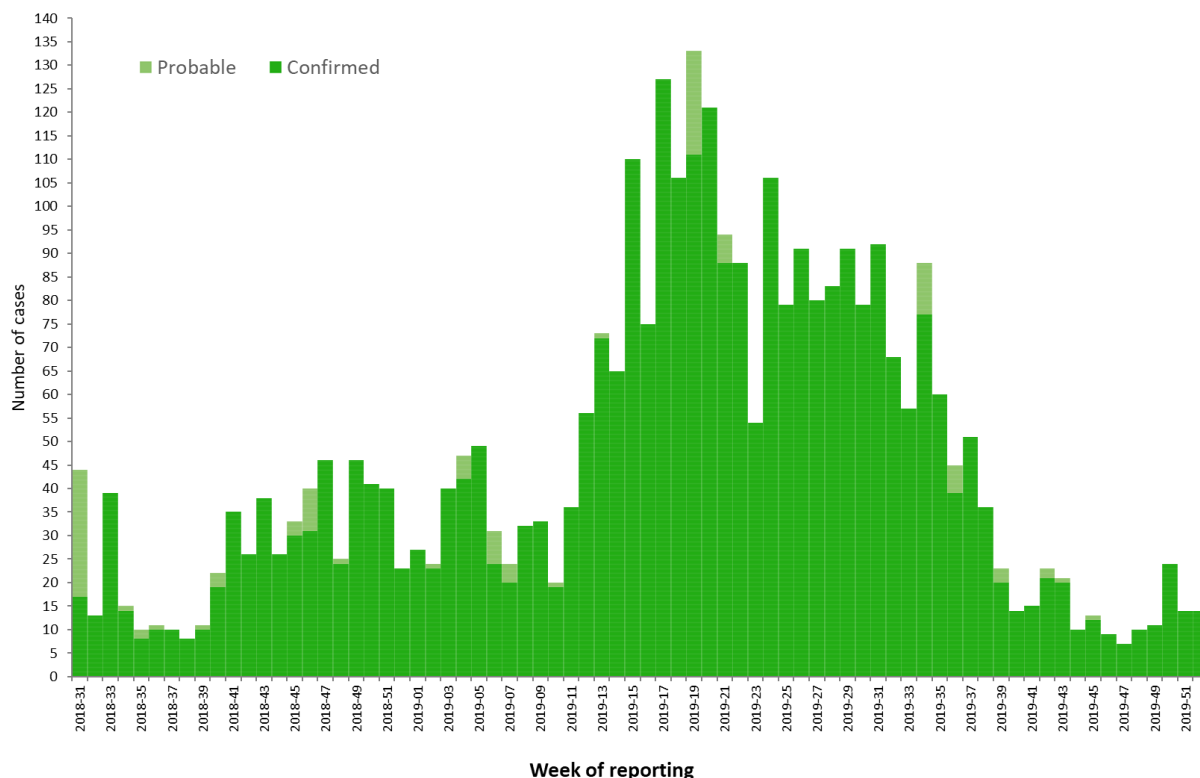


Figure 8. Distribution of confirmed and probable cases of Ebola virus disease, Republic of the Congo and Uganda, as of 31 December 2019



In 2019, ECDC published four updates of its RRA on the Ebola virus disease outbreak in North Kivu and Ituri Provinces, DRC. The last update was published on 7 August 2019 [17]. ECDC also produced epidemiological updates, monitored the situation weekly and reported updates in the restricted round table report. Weekly summaries and maps, showing the distribution of confirmed cases and the areas at risk in the Democratic Republic of the Congo were published in the Communicable Disease Threats Report (CDTR) and on ECDC's website [18].

Conclusions

In 2019, 306 new events were monitored and discussed at the daily round table meeting. The Member States and the European Commission posted 81 notifications and 153 comments on the EWRS platform. ECDC opened and monitored 58 new threats in the TTT, 38 (65%) of which originated in the EU/EEA. In all, 24 RRAs (including rapid outbreak assessments) were produced, published and shared with Member States and the European Commission.

Compared to 2018, the number of risk assessments decreased, but again, most were related to emerging and vector-borne diseases, especially the large outbreak of Ebola virus disease in the DRC.

The EI team has been monitoring measles since 2011, and the epidemiological situation has not made it possible to close the threat since then, with a further increase in the number of cases being observed in 2019.

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Annex 1. ECDC risk assessments, January–December 2019

Risk assessment	Publication date
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo – third update	14 February 2019
Rift Valley fever outbreak in Mayotte, France	8 March 2019
Outbreak of VIM-producing carbapenem-resistant Pseudomonas aeruginosa linked to medical tourism to Mexico	11 March 2019
Multi-country outbreak of Salmonella Poona infections linked to consumption of infant formula	12 March 2019
Cyclone Idai - risk of communicable diseases in southern Africa	11 April 2019
Zika virus transmission worldwide	11 April 2019
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo – fourth update	17 April 2019
Who is at risk of measles in the EU/EEA?	28 May 2019
Multi-country outbreak of Listeria monocytogenes clonal complex 8 infections linked to consumption of cold-smoked fish products	4 June 2019
Regional outbreak of New Delhi metallo-beta-lactamase-producing carbapenem-resistant Enterobacteriaceae, Italy, 2018–2019	4 June 2019
Chlamydia trachomatis false-negative test results by Aptima Combo 2 CT/NG assay (Hologic) in the EU/EEA, 2019	17 June 2019
Dengue outbreak in Réunion, France, and associated risk of autochthonous outbreak in the EU/EEA	18 June 2019
Public health risks related to communicable diseases during the hajj 2019, Saudi Arabia, 9–14 August 2019	2 Jul 2019
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo – fifth update	19 July 2019
Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo - sixth update	7 August 2019
Carbapenem resistant Enterobacteriaceae - second update	27 September 2019
Autochthonous cases of dengue in Spain and France	1 October 2019
Zika virus disease in Var department, France	16 October 2019
Outbreak of carbapenemase-producing (NDM-1 and OXA-48) and colistin-resistant Klebsiella pneumoniae ST307, north-east Germany, 2019	18 November 2019
Sexual transmission of dengue in Spain	18 November 2019
Multi-country outbreak of Listeria monocytogenes sequence type 6 infections linked to ready-to-eat meat products	26 November 2019
Cases of Lassa fever in the Netherlands ex Sierra Leone	29 November 2019
Outbreak of carbapenemase-producing Enterobacterales in Lithuania, 2019	18 December 2019
Regional situation assessment - Seasonal influenza, 2019–202	18 December 2019