



Public Health
England

Emerging infections

Port Health Member Forum – 19 June 2019

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Emerging Infections & Zoonoses



Objectives

1. Be able to describe surveillance system used by Public Health England for emerging infections
2. Review examples of emerging infections relevant to port health



What is an emerging infection

An emerging infectious disease can be either :

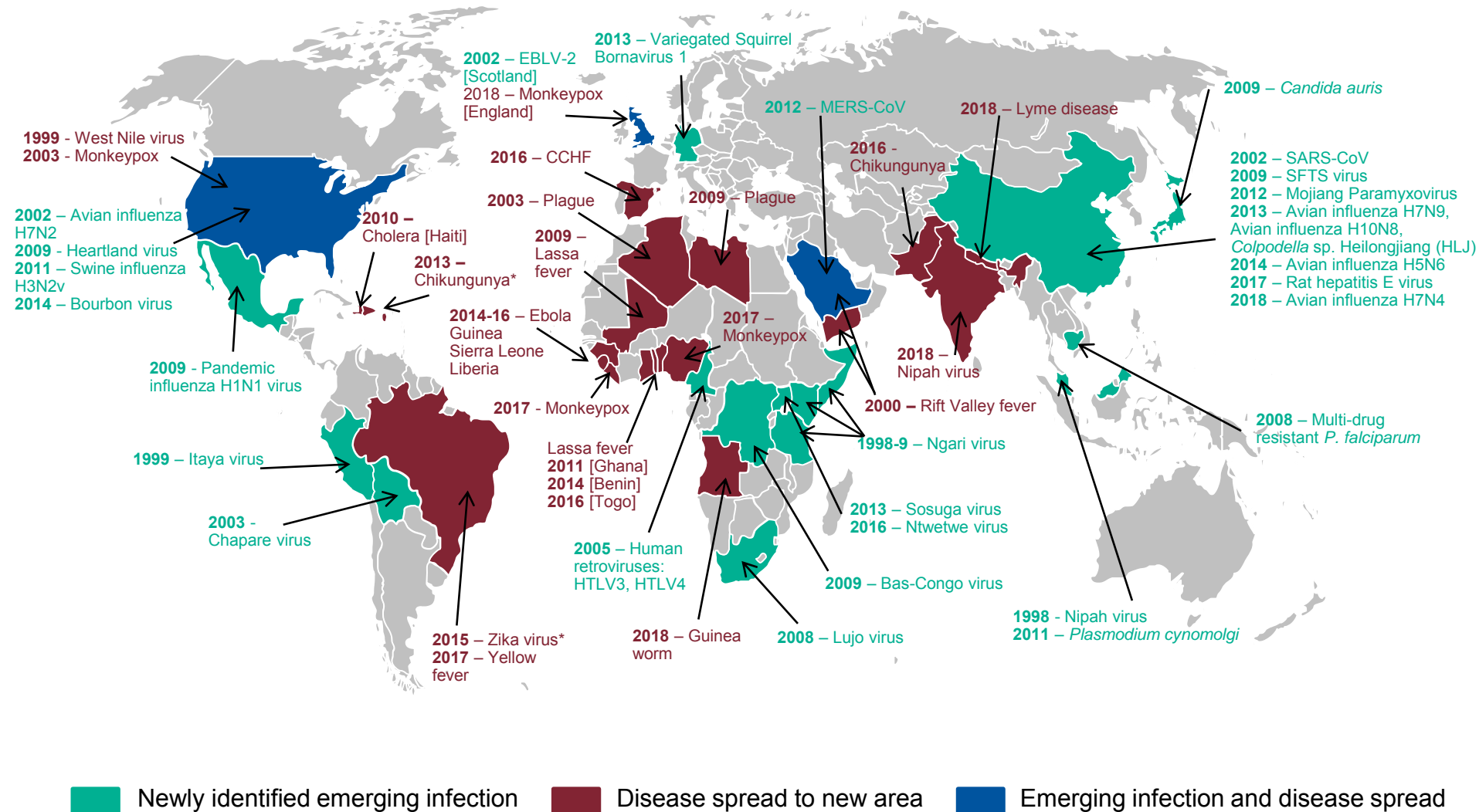
a newly recognised infectious disease

or

a known disease

whose reported incidence within the **past two decades** is increasing (or threatens to increase) in a specific place, or among a specific population

Global map of significant and new emerging infections in humans: spread to new areas since 1998



*Incursion followed by regional spread

Emerging Infections Epidemic Intelligence

Epidemic Intelligence is an emerging infections early warning system

Epidemic Intelligence composed of three parts:

1. **Scanning:** the detection and verification of incidents/events of potential threat to public health, via systematic review of informal and formal reports
2. **Assessment:** determining the potential public health threat
3. **Communication:** notifications to those within PHE and partner agencies; speed of notification is subject dependent



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Scanning

ProMED-mail
CIDRAP
Flu & Ebola Map | Virus & Contagious Disease Surveillance
WHO | Disease Outbreak News (DONs)

Cayman Islands MoH

Influenza at human-animal interface

Hurricane Matthew

Haiti - Cholera

NEJM — Zika Virus

Zika Map | Virus & Contagious Disease Surveillance

Brazil - epi bulletin

Zika | CIDRAP

GPEI - polio this week

WHO EMRO | Situation reports | Yemen-infocus

Zika in Texas – Information for News Media

Zika in Texas - case updates

Avian influenza in wild birds: winter 2016 to 2017

WHO | Neglected tropical diseases

Nigeria Centre for Disease Control - Iassa fever

FAO H7N9 situation update - Avian Influenza A(H7N9)

Africanews | The latest African, international news, and the latest information and developments

WHO H5N1 table

Philippines MoH Press

EID Ahead of Print

HPT look-up

epidemiological Resource Center

Health & Families | Lifestyle | The Independent

Public Health England - Zika virus: information for the public

Falling Rain- Maps of towns and cities

Newsroom | Florida Department of Health

OIE World Animal Health Information System

UNICEF press centre

- Africa
- Asia
- Europe
- North America
- Central America
- South America
- Caribbean
- Australasia
- Middle East

- South-East Asia Regional Office
- Western Pacific Region
- Regional Office for Africa
- AFRO - Epidemic and Pandemic Alert and Response
- WHO/Europe | Home <https://www.who.int/europe/>
- WHO EMRO
- PAHO WHO | Pan American Health Organization | World Health Organization America |
- WHO/Europe | Media centre
- Press releases - WHO | Regional Office for Africa
- WPRO | News releases

Singapore Ministry of Health

Madrid MoH CCHF

Singapore - Zika Clusters

Zika sequences from Miami mosquitoes | Andersen Lab

Public Health England - Zika virus: information for the public



frica

Office for Africa

(CR)

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since 2006



Epidemic Intelligence Log

ID	M	Y	Daily Reg	Incident	Country	Designation	Date post	Date ente	Initial So	Informati	Link	Description of incident
835	Februar y	2019	0	Cholera	Yemen	Follow-up	24/02/2019	25/02/2019	ProMED	Media	https://www.almushahid.net/?p=40144	[Report in Arabic] The Director of Epidemiology and Surveillance at the office of Public Health and Population, Dhamar governorate, Dr Anas Hassan, has revealed to Almushahid news that suspected cases of cholera in various provinces of the governorate reached 2476 cases, with 594 confirmed cases, in the period from 1-23 Feb 2019, and the number is expected to rise with time.
852	Februar y	2019	0	MERS	Saudi Arabia	Follow-up	24/02/2019	26/02/2019	Twitter	AFD	http://afludiar.y.blogspot.com/2019/02/saudi-moh-udi-moh-wadi-aldwasirs-50th-mers-case.html	While the number of new cases continues to dwindle, today the Saudi MOH announced the 50th MERS case since January 29th in the relatively small (pop 106,000) town of Wadi Aldwasir, located about 500 km south of Riyadh. <i>Details on all 50 cases</i>
853	Februar y	2019	0	Undiagnosed mortality - weakness and lost sight	Kenya	New	25/02/2019	26/02/2019	EIOS	Media	https://www.tuko.co.ke/299197-kakamega-family-fear-strange-disease-wipes-entire-lineage.html-299197	Kakamega family in fear as strange disease wipes out entire lineage A family in Kakamega county is now living in fear of extinction after a mysterious disease attacked and killed several of its members. Over 10 family members have already succumbed to the disease which medical experts initially suspected was related to genetics. According to KTN News, the disease is said to be attacking the family members slowly, with the victims first losing sight, strength on the hands and legs before they gradually die. "These children were attacked by a
854	Februar y	2019	0	Undiagnosed mortality	India	New	25/02/2019	26/02/2019	EIOS	Media	https://www.dhakatribune.com/bangladesh/nation/2019/02/25/mysterious-virus-kills-five-members-of-a-family-in-Thakurgaon	Mysterious virus kills five members of a family in Thakurgaon Locals of Baliadangi upazila of Thakurgaon are panicking because, over the past 15 days, five members of a local family have died of a mysterious disease. Taher and his wife died within two days of each other, while his son-in-law died a few days later. On Sunday, Yusuf died while Mehedi was being admitted to Rangpur Medical College and Hospital. Mehedi then died while undergoing treatment there. "The infected individuals



Assessment & Communication

Assessments

- Informal: discussion to determine action, involve other teams and X-gov



Communication – one of our most important roles

Human Animal Infections and Risk
Surveillance (HAIRS) group

Risk assessment of the Ebola virus disease outbreak
in West Africa: Updated 20 November 2015

Human Animal Infections and Risk
Surveillance (HAIRS) group

Qualitative assessment of the risk to
newly emerging tick-borne zoonoses
present to the UK population

Qualitative assessment of the risk that
virus presents to the UK population

- Team
- Daily Colindale 9:15 meeting – Department Heads, Duty Doctors & Comms
- Daily summary of output – PHE, Cross Government & Devolved Admins
- PHE National Situational Awareness Cell
- Weekly National 09:15 meeting
- Weekly Cross Government reports (Go-Science)
- Monthly ministers briefing
- Ad hoc reporting
- Monthly Emerging Infections Summary and High Consequence Infectious Disease Report – global distribution

Summary

Following almost 29,000 cases of Ebola Virus Disease (EVD) in West Africa, the outbreak has been brought under control. In West Africa it is significantly improved. Liberia and Sierra Leone have been declared free of Ebola transmission and following weeks of low levels of active transmission in Guinea, no new cases have been reported for two weeks. There remains a low possibility of new cases arising during the 90 day period of enhanced surveillance which follows a country's declaration of freedom from EVD transmission. Although persistence of virus in survivors has been increasingly reported, the risk of transmission is very small and this risk will decrease with increasing time from the original onset of disease symptoms. There is a diminishing risk to the population of the United Kingdom and the likelihood of further new EVD cases being treated within the UK is very low with the risk of transmission occurring within the community in the UK remaining as negligible.

The situation could change and will continue to be monitored very closely.



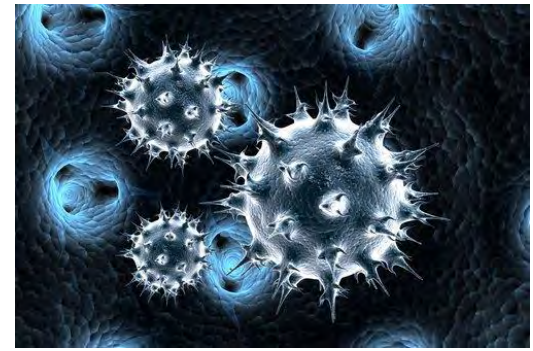
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Let's start looking at some examples



Public health threats

The ever-increasing speed and scope of human mobility by international air travel has led to a global transport network for infectious diseases with the potential to introduce pathogens into non-endemic areas, and to facilitate rapid spread of novel or mutated zoonotic agents



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✈️ TRANSPORTATION CLUSTERS

3.200 airports
60.000 routes

EUROPE

Color = Longitude
Number of routes

Wor

rk??



LATIN AMERICA

MIDDLE EAST

OCEANIA

Pacific islands

ASIA

CC-BY martingrandjean.ch 2016
Data: openflights.org



Reported infections transmitted on cruise ships and commercial airlines

Airborne/fomites	Number of reports	Comments
Food-borne		
Campylobacter jejuni	2	
Cyclospora	4	
E. Coli	0	
Norwalk virus	2	None since ventilation regulations
Salmonella	0	
Shigella	3	
SRSV		
Staphylococcus	15	No recent outbreaks
Cholera	8	No recent outbreaks
Respiratory	3	No recent outbreaks
C. Diphtheria	3	During an epidemic
Influenza	1	Common on other types of transport
Legionella		
Rubella	7	Probably underestimated
Dengue	1	Likely to be airport transmitted
Yellow fever	0	None since disinsection of aircrafts
Bioterrorism agents		
Smallpox	1	Before eradication



Functions of Port Health Authorities

1. Prevent the importation of disease, e.g. visit and inspect aircraft
2. Vector and rodent control, e.g. ships must be inspected every 6 months
3. Imported food, e.g. inspection and clearance of Products of Animal origin into the EU
4. Fish and shellfish, e.g. FSA monitor quality of local shellfish
5. Animal health, e.g. assist with enforcement of rabies controls.
6. Food premises inspections, e.g. monitors standards in shore-based premises and in-flight catering



Undiagnosed morbidity, Guinea

A strange disease that has been raging for the month of February in the Forest Region, killed 9 of 15 reported cases. 4 of the fatal cases are HCW,

Further details of undiagnosed illness: Symptoms include diarrhoea and bleed anus, nose & ear. 9 fatal cas

mostly developing this disease vomiting, diarrhea, fatigue, a endemic in Guinea; but only bleeding (?? milder symptom be investigated: cholera, lassa?

Any ideas?

local media reports within days



Countries with Widespread Transmission and other Countries Affected During the Epidemic

Country	Total Cases (Suspected, Probable, Confirmed)	Laboratory Confirmed Cases	Total Deaths
<i>Countries with Widespread Transmission</i>			
Guinea	3,814	3,358	2,544
Liberia	10,678	3,163	4,810
Sierra Leone	14,124	8,706	3,956
<i>Affected Countries</i>			
Italy	1	1	0
Mali	8	7	6
Nigeria	20	19	8
Senegal	1	1	0
Spain	1	1	0
United Kingdom	1	1	0
United States	4*	4	1
Total	28,652	15,261	11,325

* While there were 11 patients with EVD in total treated in the United States, only four patients became ill after they arrived in the United States, either after exposure in West Africa or in a healthcare setting.



Monkeypox

- rare viral infection that can be
- usually a mild self-limiting illness. In some individuals, illness can occur in some individuals with immunosuppression
- Direct contact with affected individuals are presumed drivers of human transmission has been reported



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Headache, muscle aches, backache, swollen lymph nodes, chills develop on the face before spreading to other parts of the body. The rash and becomes vesicular, then pustular before finally forming a scab. The patient remains infectious until the last scabs fall off (between 14-21 days).

It was recorded in 1970 in the Democratic Republic of Congo.

There are two main clades of monkeypox: the Congo Basin and West African. There are differences in these two clades in clinical presentation and epidemiological





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UK

- 7 September 2018 - first ever case diagnosed in the UK
 - Nigerian naval officer attending training course in Cornwall
- 11 September - second case diagnosed in Blackpool
 - UK resident who returned from 22-day holiday in Nigeria. Visiting family
- both cases had recent travel from Nigeria
 - no UK epidemiological link between the two cases
- 25 September – third case diagnosed
 - Epidemiological link to the second case

• First case reported in 1971. No cases since 1978 until re-emergence in September 2017
• Between Sept 2017 and 01 Jan 2019, total of 311 cases had been reported from 26 states. 132 confirmed.

Majority from South-South region



Between 1969 and 1999

- 26 cases in France
- 17 cases in Belgium
- 14 cases in the UK
- 4 cases in Germany
- 4 cases in the US

Airport Malaria (“suitcase malaria”)

- transmission results from the bite of an infected mosquito imported in an

- Owing to the fact that there are six resident and potentially competent anopheline mosquito vector species, where the current climate is considered to be permissible for transmission, and that infected travellers return to the UK regularly, the **possibility already exists for transmission locally.**

- Recently, 2 cases in France in 2018

- Sites and ways of

- Imported by aircraft
- Inside the airport
- Nearby residents

Competent vector??

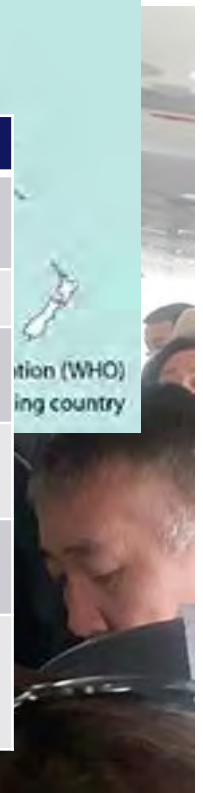
- After a second transport of the vector – travel by car
- Luggage malaria
- In-flight infection – stopover in endemic area



Bring out your dead!



Bubonic	Pneumonic	Septicaemic
Buboes (painful, swollen lymph nodes)	High fever	Fever and chills
Sudden onset of fever and chills	Weakness	Shock
Headache	Pneumonia	Abdominal pain, diarrhoea and vomiting
Fatigue	Nausea	Bleeding from mouth, nose or under skin
Muscle aches	vomiting	Blackening and death of tissue in extremities
60% mortality rate	Approaching 100% if treatment not initiated within 24 hours of symptom onset	100%



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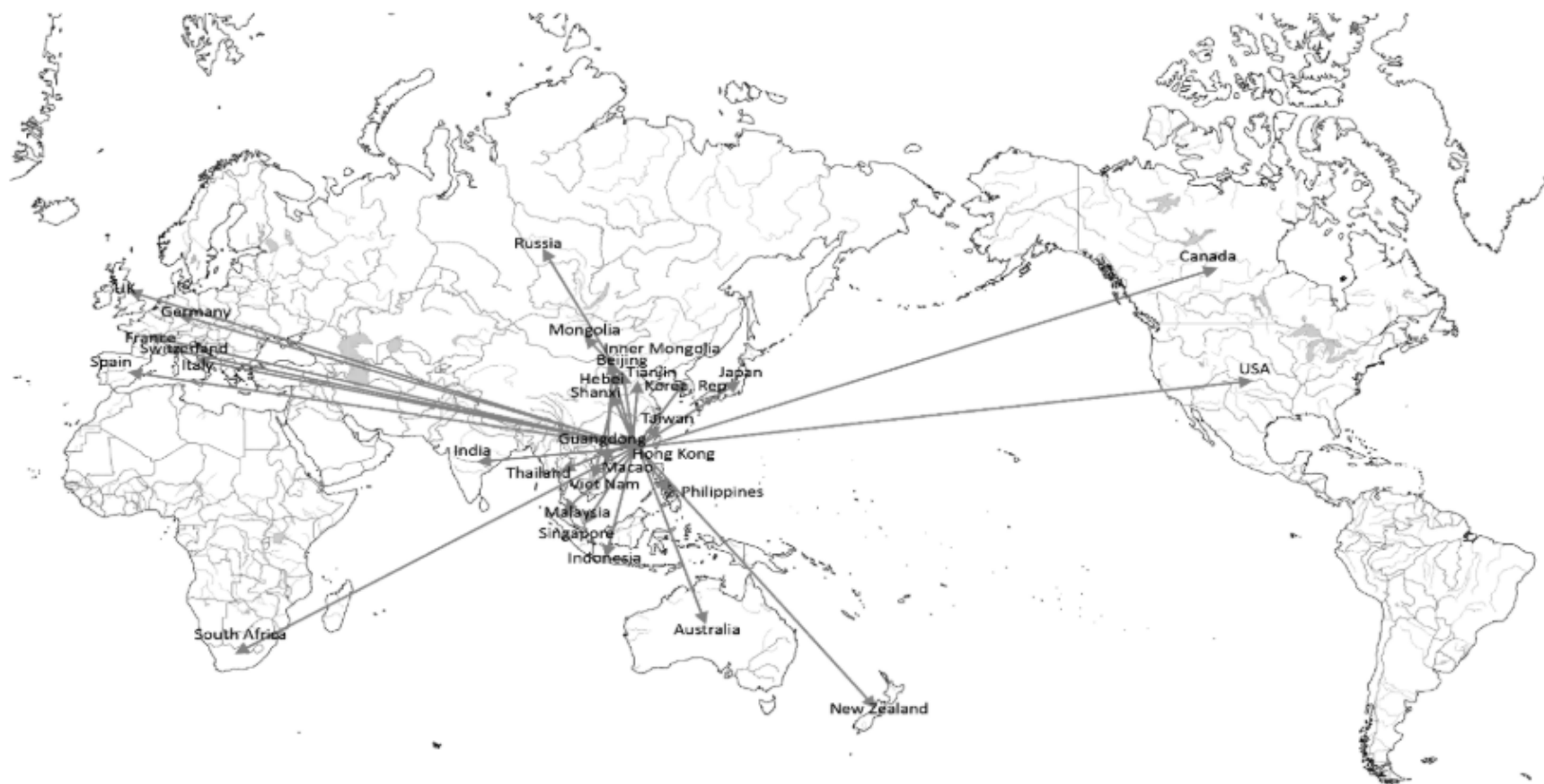
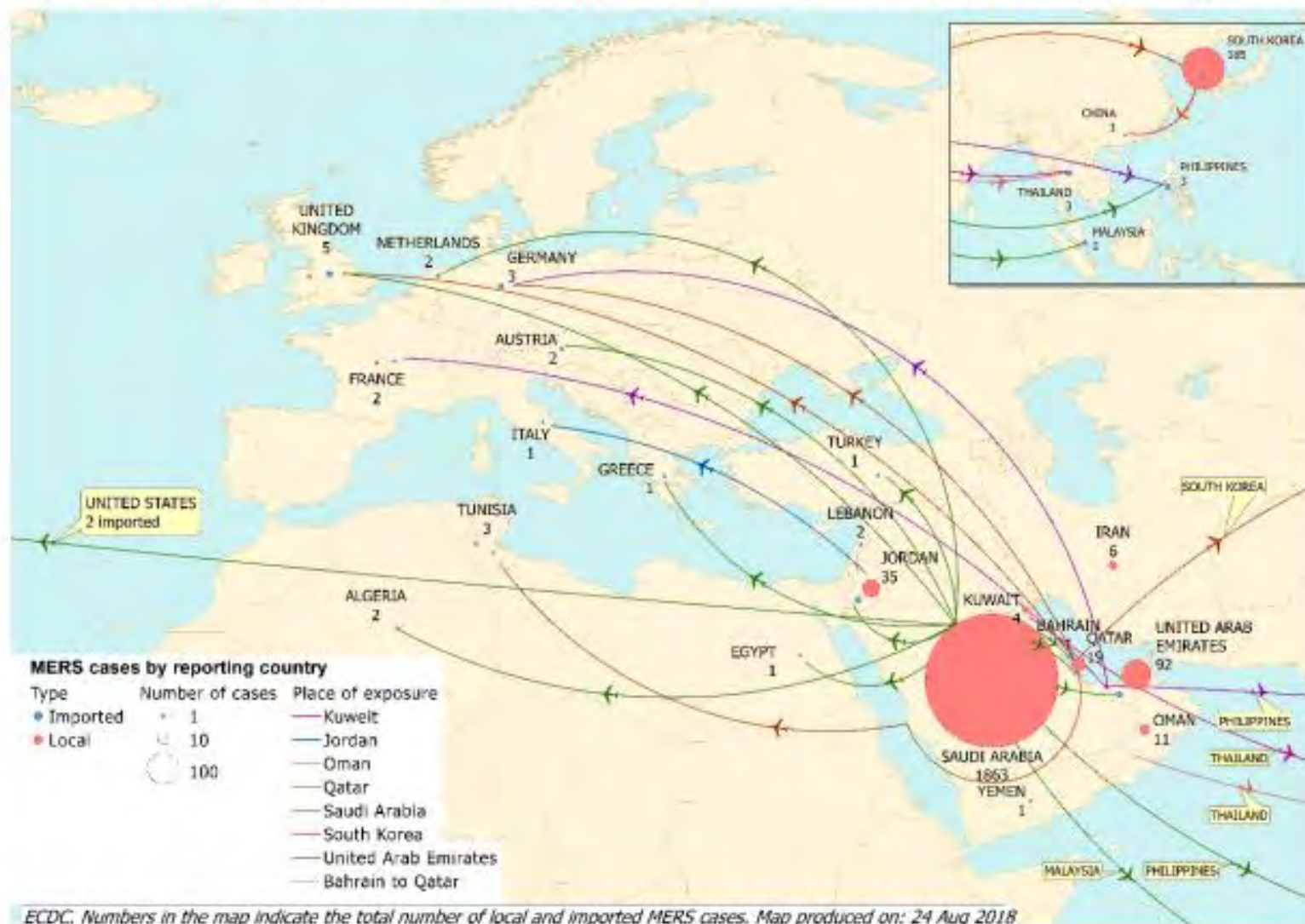


Figure 2. Distribution of confirmed MERS cases by place of probable infection, as of 24 August 2018 (n=2 253)





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Questions?

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