



## UPDATED RAPID RISK ASSESSMENT

# Severe respiratory disease associated with Middle East respiratory syndrome coronavirus (MERS-CoV)

Fourteenth update, 23 February 2015

## Main conclusions and recommendations

Since April 2012 and as of 20 February 2015, 1 042 cases (including 419 deaths) of Middle East respiratory syndrome coronavirus (MERS-CoV) have been reported by local health authorities worldwide.

The incidence of MERS-CoV cases has been on an increase in Saudi Arabia since December 2014. This increase parallels the increase observed in early 2014 and may be indicative of the start of a seasonal pattern. Most of the increase in the recent weeks affects Riyadh, and one third of the recent cases may have a nosocomial origin. Twelve per cent of the recent cases have reported contact with an animal or animal product. This is consistent with the transmission pattern observed in early 2014, which showed increased transmission from a primary animal source, most likely camels or camel products, amplified by nosocomial transmission.

The importation of a case in the Philippines demonstrates the possibility of importation of cases from abroad, especially in relation with healthcare workers infected while caring for patients in Saudi Arabia.

The majority of MERS-CoV cases are still reported from the Arabian Peninsula, mainly from Saudi Arabia.

The source of MERS-CoV infection and the mode of transmission have still not been confirmed.

Taking into account the latest developments with respect to MERS-CoV, ECDC's conclusion continues to be that the MERS-CoV outbreak poses a low risk to the EU.

Because of the continued risk of cases in Europe after exposure in the Middle East, international surveillance for MERS-CoV cases remains essential. Although importation of MERS-CoV cases to the EU remains possible, the risk of sustained human-to-human transmission in Europe remains very low.

Sensitisation of healthcare staff to MERS-CoV is prudent, not only for timely detection purposes, but also in order to ensure rapid implementation of infection control measures.

## Source and date of request

Update requested by the European Commission, 20 February 2015

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## Public health issue

Assessment of the risk associated with MERS-CoV, taking into account the latest developments.

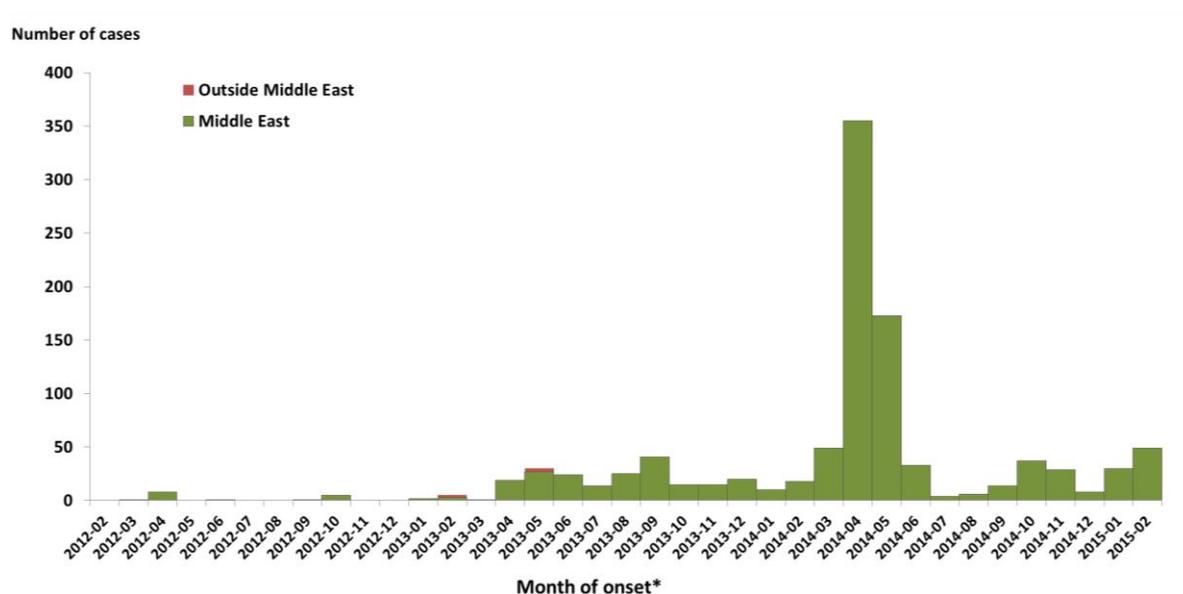
Consulted experts: Denis Coulombier, Birgitta de Jong, Kaja Kaasik Aaslav, Teija Korhonen, Pasi Penttinen, René Snacken, Silviu Ionescu

## Event background information

### Worldwide situation

Since April 2012 and as of 20 February 2015, 1 042 cases (including 419 deaths) of MERS-CoV have been reported by health authorities worldwide (Figure 1).

**Figure 1. Distribution of confirmed cases of MERS-CoV by month and probable place of infection, March 2012–20 February 2015 (n=1 042)**



\* If month of onset is unknown, month of reporting is used.

### Geographical distribution

Most of the cases have occurred in the Middle East (Saudi Arabia, United Arab Emirates, Qatar, Jordan, Oman, Kuwait, Egypt, Yemen, Lebanon and Iran) (Table1).

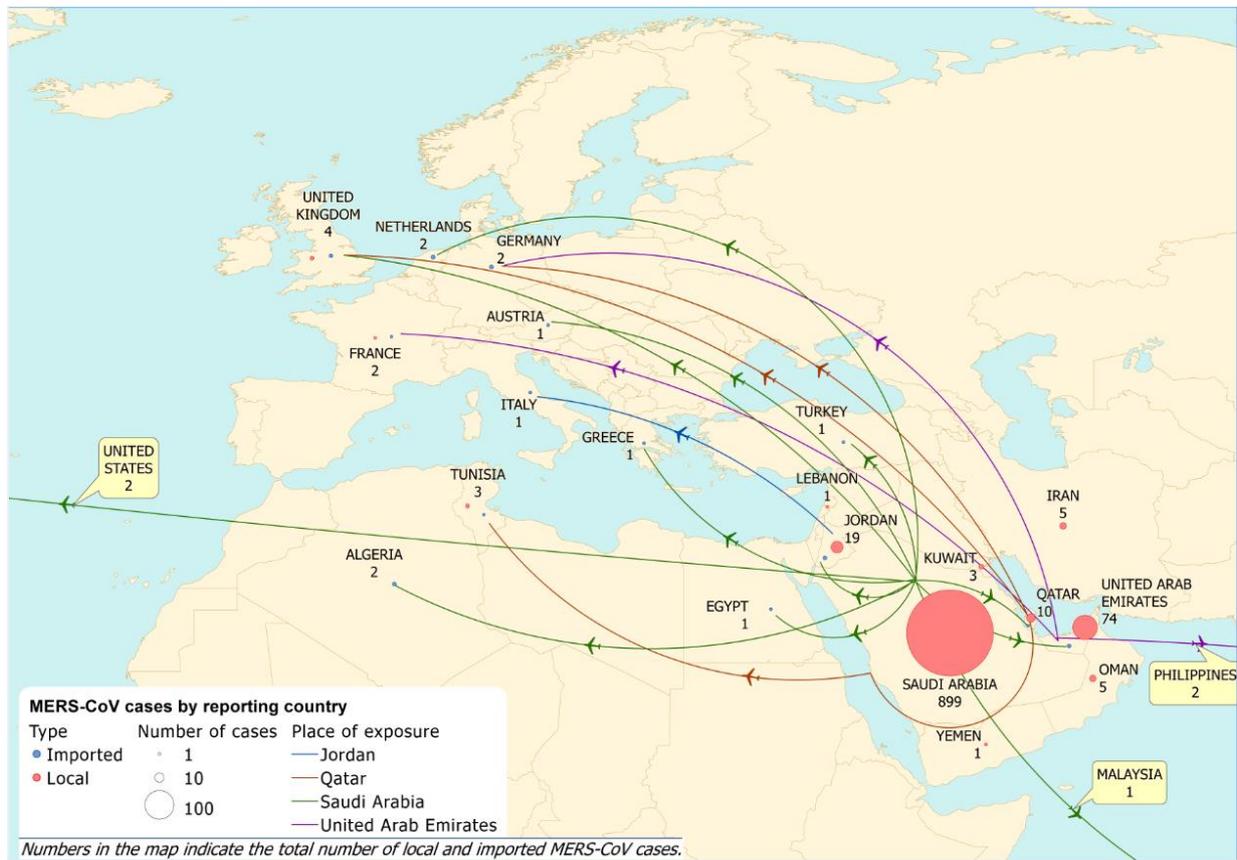
**Table 1. Number of confirmed cases and deaths, by country of reporting, March 2012–20 February 2015**

Reporting country	Cases	Deaths	Date of onset/reporting for most recent cases
<b>Middle East</b>			
Saudi Arabia	899	382	19 February 2015
United Arab Emirates	74	10	11 February 2015
Qatar	10	4	11 February 2015
Jordan	19	6	25 December 2014
Oman	5	3	11 January 2015
Kuwait	3	1	13 February 2014
Egypt	1	0	22 April 2014
Yemen	1	1	17 March 2014
Lebanon	1	0	22 April 2014
Iran	5	2	25 June 2014
<b>Europe</b>			
Turkey	1	1	25 September 2014
Austria	1	0	24 September 2014
United Kingdom	4	3	6 February 2013
Germany	2	1	8 March 2013
France	2	1	8 May 2013

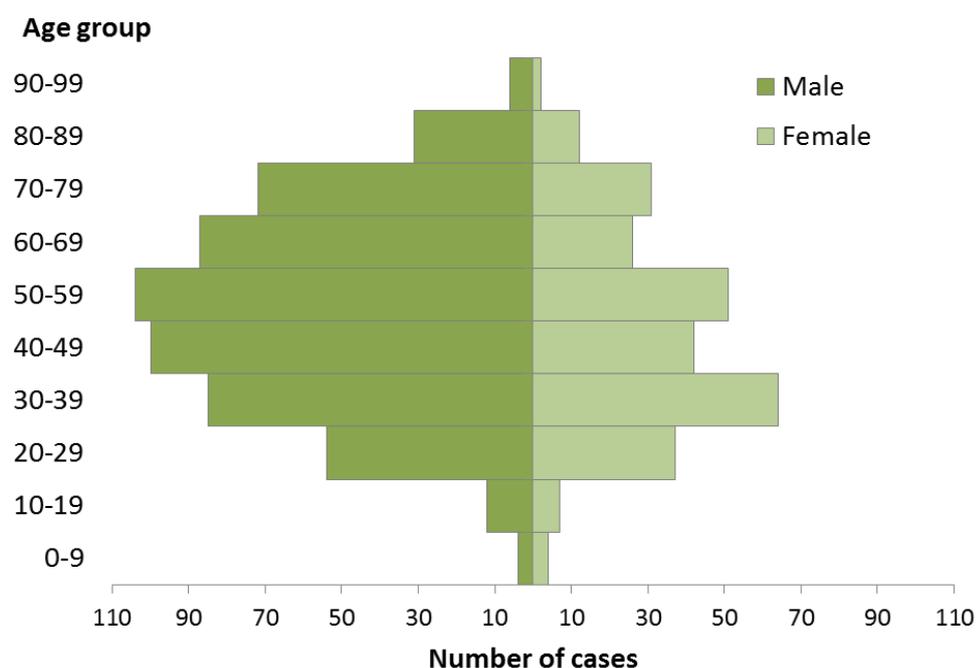
Reporting country	Cases	Deaths	Date of onset/reporting for most recent cases
Italy	1	0	27 May 2013
Greece	1	1	8 April 2014
Netherlands	2	0	5 May 2014
<b>Rest of the world</b>			
Tunisia	3	1	16 May 2013
Algeria	2	1	13 May 2014
Malaysia	1	1	9 April 2014
Philippines	2	0	26 January 2015
United States of America	2	0	1 May 2014
<b>Total</b>	<b>1 042</b>	<b>419</b>	

All cases reported from outside the Middle East have a recent travel history to the Middle East or contact with a case who travelled from the Middle East (Figure 2).

**Figure 2. Geographical distribution of confirmed MERS-CoV cases and place of probable infection, as of 20 February 2015 (n=1 042)**



**Figure 3. Age and gender distribution among confirmed cases of MERS-CoV (n=831)**



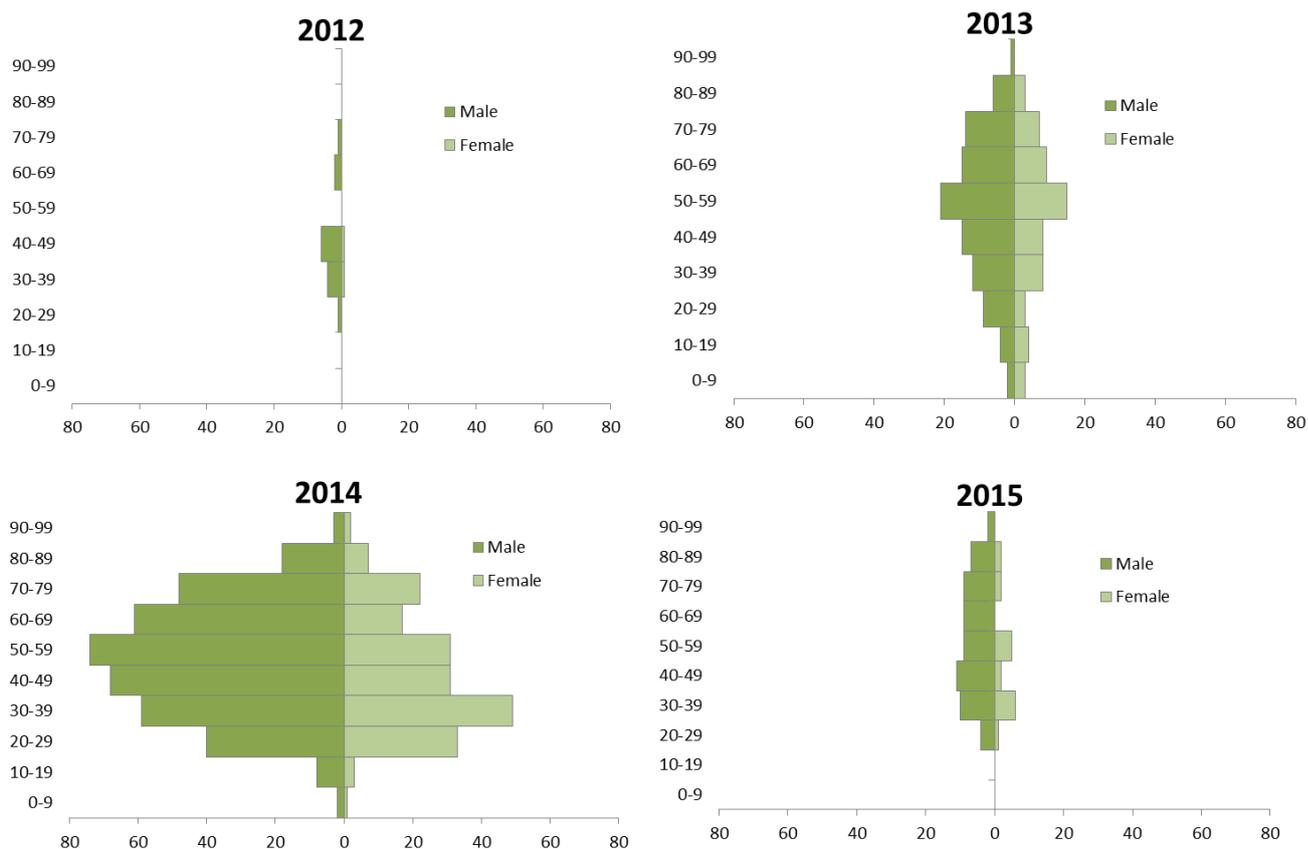
\* Excluded are 211 cases for which data on age or gender were missing.

Of the 831 cases with known age and gender, 48% (n=400) were males above 40 years of age (Figure 3). The mean age for both females and males remains above 40 years (cases with known age), with a range between 1 and 94 years of age (Table 2).

**Table 2. Distribution of confirmed cases by reporting year and gender, as of 20 February 2015**

	2012	2013	2014	2015	Overall
Male	14	99	381	61	555
Female	2	60	196	18	276
Total number of cases	16	159	577	79	831
Male–female ratio	7:1	1.7:1	1.9:1	3.4:1	2:1
Mean age of males	44	52	48	56	50
Mean age of females	42	48	40	49	45

**Figure 4. Distribution of confirmed MERS-CoV cases by age and gender and year of reporting**



### Current epidemiological situation

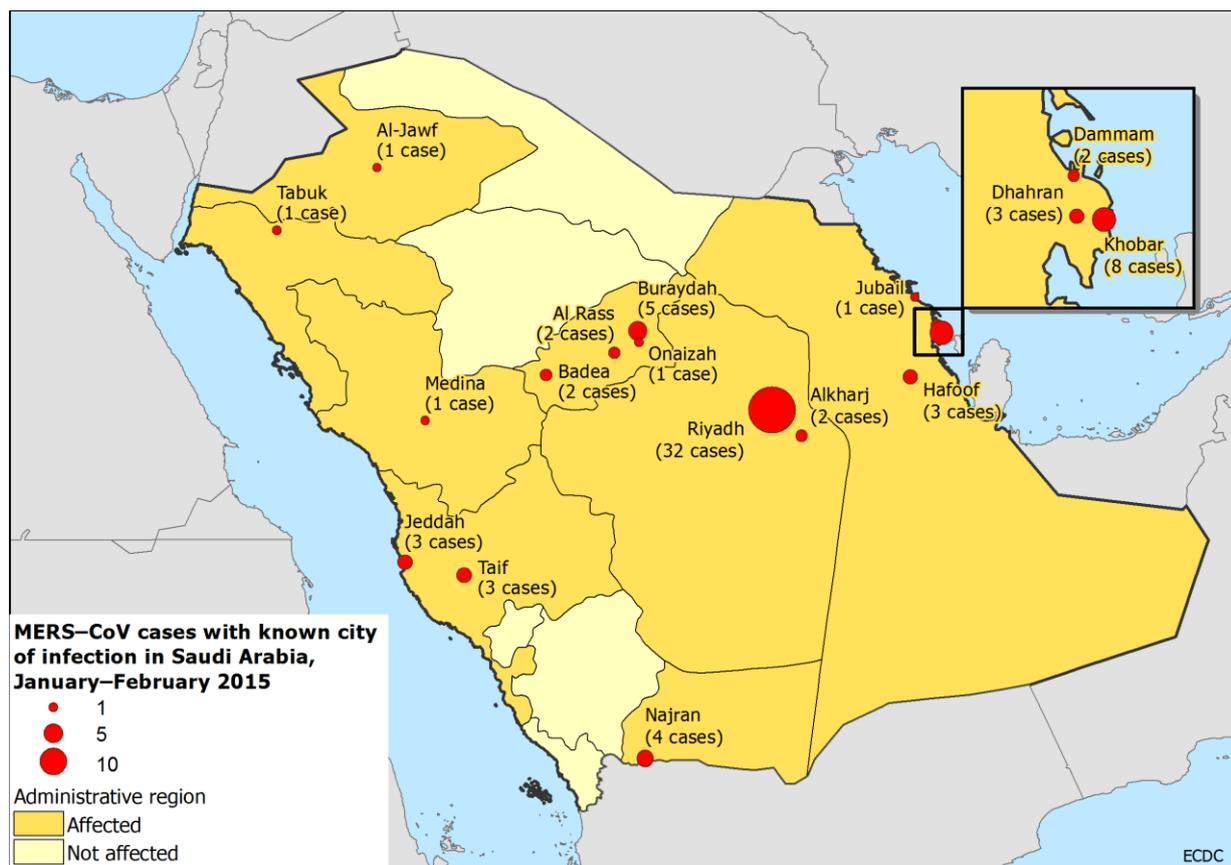
Since the ECDC Rapid Risk Assessment on severe respiratory disease associated with MERS-CoV, updated on 15 January 2015, there have been 70 additional cases of MERS-CoV reported globally: Saudi Arabia (66), Qatar (1), Oman (1) United Arab Emirates (1) and the Philippines (1).

On 13 February 2015, the World Health Organization [1] announced a mission to Saudi Arabia at the request of the Saudi government in order to implement preventive measures for a possible upsurge of cases of a respiratory virus linked with camels.

### Saudi Arabia cases reported in 2015

Since the beginning of 2015, Saudi Arabia has reported 74 cases of MERS-CoV (Figure 4).

**Figure 5. MERS-CoV cases with known city of infection in Saudi Arabia, January–February 2015**



Of the 74 reported cases, six were healthcare workers. Nine of the 74 cases had been exposed to animals, four had direct contact with camels and two had drunk camel milk. Thirteen of the 74 cases reportedly had contact with suspected or confirmed cases in hospitals or clinics, and an additional 11 cases are still under investigation for possible nosocomial transmission. Five cases had contact with a suspected or confirmed case in the community. Twenty-nine of the 74 cases were classified as expatriates, while the rest (45) were of Saudi nationality.

### Qatar

On 11 February 2015, WHO was notified of one additional case of MERS-CoV infection in Qatar: a 55-year-old man from Al-Shahaniya City, with onset of symptoms on 28 January 2015. The case had frequent contact with camels and goats.

### United Arab Emirates

On 11 February 2015, WHO was notified of one additional case of MERS-CoV infection in the United Arab Emirates: a 38-year-old man from Abu Dhabi, with onset of symptoms on 29 December 2014. The patient was in critical condition and passed away on 6 February.

### Oman

On 23 January 2015, WHO was notified of one additional case of MERS-CoV infection in Oman – a 43-year-old man from Dakhelyia Region. The case was a direct contact of a laboratory-confirmed, fatal MERS-CoV case and was identified through contact screening. The case remained asymptomatic.

### Philippines

On 13 February 2015, WHO was notified of an imported case of MERS-CoV infection in the Philippines in a 31-year-old female who worked as a healthcare professional in Riyadh, Saudi Arabia, with onset of symptoms on 26 January 2015, while still working at the hospital. On 1 February, she flew with a family member to Manila, Philippines, where they stayed at their home. On 2 February 2015, the patient sought medical care at a local private hospital, where she was admitted. Following laboratory confirmation of MERS-CoV infection, she was transferred to an isolation room at the Research Institute for Tropical Medicine in Manila on 10 February.

The Philippines Department of Health actively traced the passengers on the flight to Manila (1 February 2015) as well as all household and healthcare contacts. According to media reports, all contacts tested negative for MERS-CoV.

## Risk assessment: association with dromedary camels

Several studies have found antibodies against MERS-CoV in dromedary camels, but not in other animals surveyed [2]. Dromedary camels appear to get infected during their first year after birth [3]. The large peak of cases in the spring of 2014 coincided with the weaning period of camel calves and the seasonal peaks in calf diarrhoea episodes. This has led to hypotheses around potential transmission routes, such as excretion in milk or faecal contamination of milk [4].

In addition to the affected countries on the Arabian Peninsula, seropositive camels have been found in surveys from several countries in Africa and the Canary Islands [2]. Recently, Iran reported an outbreak of MERS-CoV among dromedary camels illegally imported from Pakistan [5].

Although previous studies of the presence of MERS-CoV antibodies in abattoir workers and the evidence that the virus has circulated in camels for decades suggested that the virus is not easily transmitted from camels to humans, evidence of the role of dromedary camels as a potential reservoir of MERS-CoV and the direct transmission of the virus from infected camels to humans is accumulating [2]. However, a recent serological study among exposed people showed no evidence of infection of people who had close contact with infected camels. This does not refute the hypothesis of infection from camels, but rather points at a low transmission rate, which is in line with the observed epidemiology of only a low proportion of exposed persons who actually become infected [6].

## Conclusions

The incidence of MERS-CoV cases in Saudi Arabia has been on the increase since December 2014. This increase parallels the increase observed in early 2014 and may be indicative of the start of a seasonal pattern. Most of the increase in recent weeks affects Riyadh, and one third of the recent cases may have a nosocomial origin. Twelve per cent of the recent cases have reported contact with an animal or animal product. This is consistent with the transmission pattern observed in early 2014, which showed increased transmission from a primary animal source, most likely camels or camel products, amplified by nosocomial transmission.

The importation of a case in the Philippines demonstrates the possibility of importation of cases from abroad, especially in relation with healthcare workers infected while caring for patients in Saudi Arabia.

The source of MERS-CoV infection and the mode of transmission have still not been confirmed. Dromedary camels are a host species for the virus, and many of the primary cases in the disease clusters are reported to have had direct or indirect camel exposure. However, close contact with infectious camels does not always seem to result in human infections [6]. In addition, despite evidence of seropositive camels in several African countries and PCR-positive camels from Pakistan, no autochthonous cases arising from presumed camel contacts have been reported from outside the Middle East, which might be due to lack of diagnostic capacity in these countries. Serological screening kits are now commercially available for both humans and camels.

The majority of MERS-CoV cases are still reported from the Middle East, mainly from Saudi Arabia. All cases have epidemiological links to the outbreak epicentre. The increase shows that MERS-CoV continues to circulate, particularly in the Middle East, and the risk for transmission is greatest for people in this area.

The large surge in infections seen in the spring of 2014 was mainly due to an outbreak in Jeddah, but driven by an increase in primary infections [8]. A similar increase is possible in spring 2015, and public health authorities in the epicentre are currently preparing appropriate response measures. In Saudi Arabia, response activities have recently been decentralised and are now managed by the regional health departments [9].

In the EU/EEA, public health authorities are prepared for the timely detection and appropriate treatment of cases in returning travellers, should the need arise. Sensitisation of first-line healthcare staff to the fact that MERS-CoV is still circulating in the Middle East is prudent, not only for timely detection purposes, but also in order to ensure rapid implementation of infection control measures.

Taking into account the latest developments with respect to MERS-CoV, ECDC's conclusion continues to be that the MERS-CoV outbreak poses a low risk to the EU. Because of the continued risk of the importation of cases to Europe after exposure in the Middle East, international surveillance for MERS-CoV cases remains essential.

Although importation of MERS-CoV cases to the EU remains possible, the risk of sustained human-to-human transmission in Europe remains very low.

An overview of MERS-CoV infection is presented in an ECDC fact sheet [2].

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