Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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CORRESPONDENCE

Imported cases of Middle East respiratory syndrome: An update

KEYWORDS
Middle East respiratory syndrome;
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Dear Editor,

In a recent paper published in Travel Medicine and Infectious Disease, Al-Tawfiq and colleagues state with reason that despite a great concern regarding the potential for the Hajj to cause a global epidemic of Middle East Syndrome Coronavirus (MERS-CoV); only a limited number of travel-associated cases were reported with no major event related to the Hajj [1]. Screening for MERS-CoV carriage was conducted among cohorts of Hajj pilgrims in 2012 and 2013 and resulted negative [2–4]. Up to 1 November 2014, 21 cases of travel-associated MERS have been reported from various sources including ProMED (http://www.promedmail.org/), WHO (http://www.who.int/csr/outbreaknetwork/en/), ECDC (http://www.ecdc.europa.eu/en/Pages/home.aspx) and USCDC (http://www.cdc.gov/) updates, some of which were also reported in the medical literature as summarized recently by Pavli and colleagues [5].

In Table 1, we are describing the MERS cases identified out of the Middle Eastern countries among individuals who traveled to and/or from the Middle Eastern countries. All cases but two were confirmed by polymerase chain reaction on at least two specific genomic targets. The majority of cases were in Europe (10 cases), North Africa (5 cases) and Asia (4). Two cases were imported to the US. Likely place of exposure was in the Kingdom of Saudi Arabia (KSA) in the majority of cases. Three patients were Middle East nationals transferred to European hospitals for medical care. Seven cases were among expatriates living in the Middle East and traveling back to their country of origin, including one patient living in Qatar who participated to the Umrah in KSA (a shorter pilgrimage to Mecca that can be undergone at any time). Ten cases were among short-term travelers with a mean time of stay in the Middle East of 18 days (range 3 h–40 days). Among short-travelers, 7 participated to the Umrah, one traveled for holidays, one was in transit in Abu Dhabi airport and the information is missing in one case. Nine patients died, nine recovered, one was asymptomatic and the information missing in two cases. Possible source of infection was identified in some patients including exposure to camels or their products (four cases) or bats (one case), exposure to MERS patients (six cases of which three were health care workers) and visit to Saudi hospitals (two cases).

From this figure, it is notable that 8 out of 21 travel-associated cases were in patients who participated to the Umrah (38%), a proportion which culminate to 70% among short-term travelers. Among the 8 patients participating to the Umrah, two were exposed to MERS patients, one was hospitalized in Saudi Arabia prior contracting MERS and one drank camel milk in KSA. No risk factor was identified in two patients and the information was missing in two cases.

These 8 Umrah-associated MERS cases over an estimated 20 million pilgrims who visited Mecca from 2012 through 2014 are not significant in terms of public health. The high prevalence of participation to Umrah among the few travel-associated MERS cases in short-term travelers likely reflects the fact that tourism in the region is significantly dependent on religious tourism. According to the Saudi Tourism and Antiquities Committee (SCTA) data, of the 17 million international tourists who visited Saudi Arabia in 2013, 6.9 million (40.6%) did so for religious reasons. From a clinical perspective, physicians should have a high degree of suspicion for MERS in patients with severe respiratory symptoms following pilgrimage to Mecca; however, surveillance data in England and France showed that a diagnostic of influenza was most likely in such travelers [3,6,7].

Conflict of interest

None.

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Table 1 Characteristics of travel-associated cases of Middle East coronavirus syndrome (2012–2014)[a].

Country of diagnostic	Country of current residence	Year	Age (years)/ gender	Likely place of exposure	Travel duration (days)	Reason for travel	Outcome	Possible source of infection	PCR target genes	References[a]
UK	Qatar	2012	49/M	Qatar and KSA	NA	Medical transfert	Died	Visited a camel farm	UpE and ORF1	[1,2]
Germany (Essen)	Qatar	2012	45/M	Qatar	NA	Medical transfert	Recovered	Contacts with camels	UpE and ORF1	[3,4]
Germany (Munich)	UAE	2013	73/M	UAE	NA	Medical transfert	Died	Contacts with camels	UpE and ORF1	[5,6]
France	France	2013	64/M	UAE	8	ND	Died	ND	UpE and ORF1	[7,8]
Italy	Italy	2013	45/M	Jordan	40	Holiday	Recovered	ND	UpE	[9]
Tunisia	Tunisia	2013	66/M	Qatar and KSA	31 in Qatar and 8 in KSA	Visit family + Umrah	Died	None identified	ORF1 and N2	[10]
Tunisia	Qatar (expatriate)	2013	30/F	Qatar and KSA	NA	Umrah + attended funerals in Tunisia	Recovered	Exposure to MERS patient	UpE and ORF1	[10]
UK	UK	2013	55/M	Pakistan and KSA	35 in Pakistan, 8 in KSA	Visit family + Umrah	Died	None identified	UpE and two other genes	[11]
Netherlands	Netherlands	2014	70/M	KSA	16	Umrah	Recovered	Hospitalization in Saudi Arabia	UpE, N and ORF1	[12,13]
Netherlands	Netherlands	2014	73/F	KSA	16	Umrah	Recovered	Exposure to MERS patient	UpE, N and ORF1	[12,13]
Algeria	Algeria	2014	66/M	KSA	14	Umrah	Recovered	ND	UpE, N and ORF1	[14-16]
Algeria	Algeria	2014	59/M	KSA	24	Umrah	Died	ND	UpE, N and ORF1	[14-16]
Greece	KSA (expatriate)	2014	69/M	KSA	NA	Visit to citizenship country	Died	Visited hospitals in Saudi Arabia and had indirect contacts with bats	UpE, N and ORF1	[17,18]
US (Indiana)	KSA (expatriate)	2014	65/M	KSA	NA	Visit to citizenship country	Recovered	Exposure to MERS patients (HCW)	ORF1 and N2	[19,20]
US (Florida)	KSA (expatriate)	2014	44/M	KSA	NA	Visit to citizenship country	Recovered	Exposure to MERS patients (HCW)	ORF1 and N2	[20]
Malaysia	Malaysia	2014	55/M	KSA	13	Umrah	Died	Drank raw camel milk	UpE, N and ORF1	[21]
Egypt	KSA (expatriate)	2014	27/M	KSA	NA	Visit to citizenship country	Recovered	Exposure to MERS patients	Confirmed according to ECDC report	[22,23]
Philippines	UAE (expatriate)	2014	ND/M	UAE	NA	Visit to citizenship country	Asymptomatic	Exposure to MERS patients (HCW)	Confirmed according to ECDC report	[24]
Bangladesh	US	2014	53/M	UAE	3 h transit in Abu Dhabi airport	Visit to citizenship country	ND	ND	ND	[16]
Turkey	KSA (expatriate)	2014	ND/M	KSA	NA	Visit to citizenship country	Death	ND	ND	[25,26]
Austria	KSA	2014	29/F	KSA	NA	ND	ND	ND	Confirmed according to ECDC report	[27,28]

[a] See online appendix.

Appendix 1. References of Middle East coronavirus cases among travelers outside the Middle East.

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