Plague outbreak in the Libyan Arab Jamahiriya

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Plague is circulating regularly in localised areas worldwide, causing sporadic cases outside Africa and remains endemic or causes limited outbreaks in some African countries. Furthermore, some notable outbreaks have been reported in Asia in the last 20 years. A limited outbreak with five cases has recently been notified by the health authorities of the Libyan Arab Jamahiriya.

Introduction

Plague is a zoonosis caused by the bacillus *Yersinia pestis*. This disease may have caused over 200 million deaths in the history of humanity [1]. The disease is principally transmitted from animal to animal by fleas. Humans usually become infected through the bite of an infected flea (mainly *Xenopsylla cheopis*). The occurrence of bubonic plague cases is therefore the result of the presence of fleas, rodents and humans in a given place at a given time.

Since the first description of what may have been a plague outbreak in 430 BC in Ancient Greece [2], the plague has spread worldwide during the course of several pandemic waves. Between 1998 and 2008, more than 23,278 cases were reported including 2,116 fatalities (case fatality ratio, CFR, of approximately 9%) in 11 countries [3]. Over 95% of the 23,278 cases, however, were reported in Africa with well-identified endemic plague foci (mainly in three countries: Madagascar, the Democratic Republic of Congo [DRC] and Tanzania).

The bubonic plague is the most common form of the disease (93% of plague cases in Madagascar [4] and 81% of plague cases in the United States (US) [5]. Without adequate treatment, the case-fatality rate of bubonic plague ranges from 50 to 90%. Bubonic plague does not give rise to direct human-to-human transmission.

Pulmonary plague is not the most frequent form of the disease (3% of the plague cases in the US, 8% in DRC, sometimes more frequent in outbreaks with sustained human-to-human transmission), but is deadly in almost all cases in absence of adequate and timely treatment. This clinical presentation may give rise to human-to-human transmission through droplet transmission.

Table

Reported human plague cases/outbreaks since January 1945

Country	Year	Location	Confirmed or probable cases	Deaths
Morocco No cases reported since 1945	1945	Countrywide, mainly around Marrakech	811	ND
Algeria No cases reported from 1950 to 2003	1945-1946	Oran	12	1
	1945	Algiers	5	ND
	1946-1950	Countrywide	8	ND
	2003	Kahelia (Tafraoui, Oran)	18	1
	2008	Laghouat	4	3
Tunisia No cases reported since 1945	1944-1945	Bizerte/Ferryville	34	27
Libya No cases reported from 1984 to 2009	1972	Nofilia	18	3
	1976-1977	Tobruk	30	12
	1984	Tobruk	9	ND
	2009	Betnane (Tobruk)	12	1
Egypt No cases reported since 1947	1945	Port-Said, Suez, Ismailia	218	ND
	1946	Port-Saïd, Suez, Ismailia, Damietta	66	ND
	1946-1947	Alexandria	145	39

Source: Department of international and tropical diseases, Institut de Veille Sanitaire (DIT-InVS) based on numerous reports and the literature

Available evidence points to effective prevention of human-to-human transmission of pneumonic plague through isolation and treatment of cases and the observance of standard precautions completed by droplet and contact precautions during healthcare [6,7]. There is no available vaccine for large-scale use.

Outbreak report

On 14 June 2009, the health authorities of the Libyan Arab Jamahiriya reported suspected cases of bubonic plague (including one death) to the World Health Organization in compliance with the Revised International Health Regulations (IHR). The case definition proposed by the World Health Organization was used [8]. The outbreak occurred in a semi-nomadic setting. Subsequent epidemiological investigations by an international team ascertained a total of five cases. Three of these occurred in a family cluster in the Tobruk rural area (near the border with Egypt). The first identified case was a child who presented with pneumonic plague and died. Two siblings were subsequently identified as having bubonic plague. Two other epidemiologically unlinked cases occurred in young women living in the same district. Confirmatory testing is ongoing. Rodent control measures have been implemented locally.

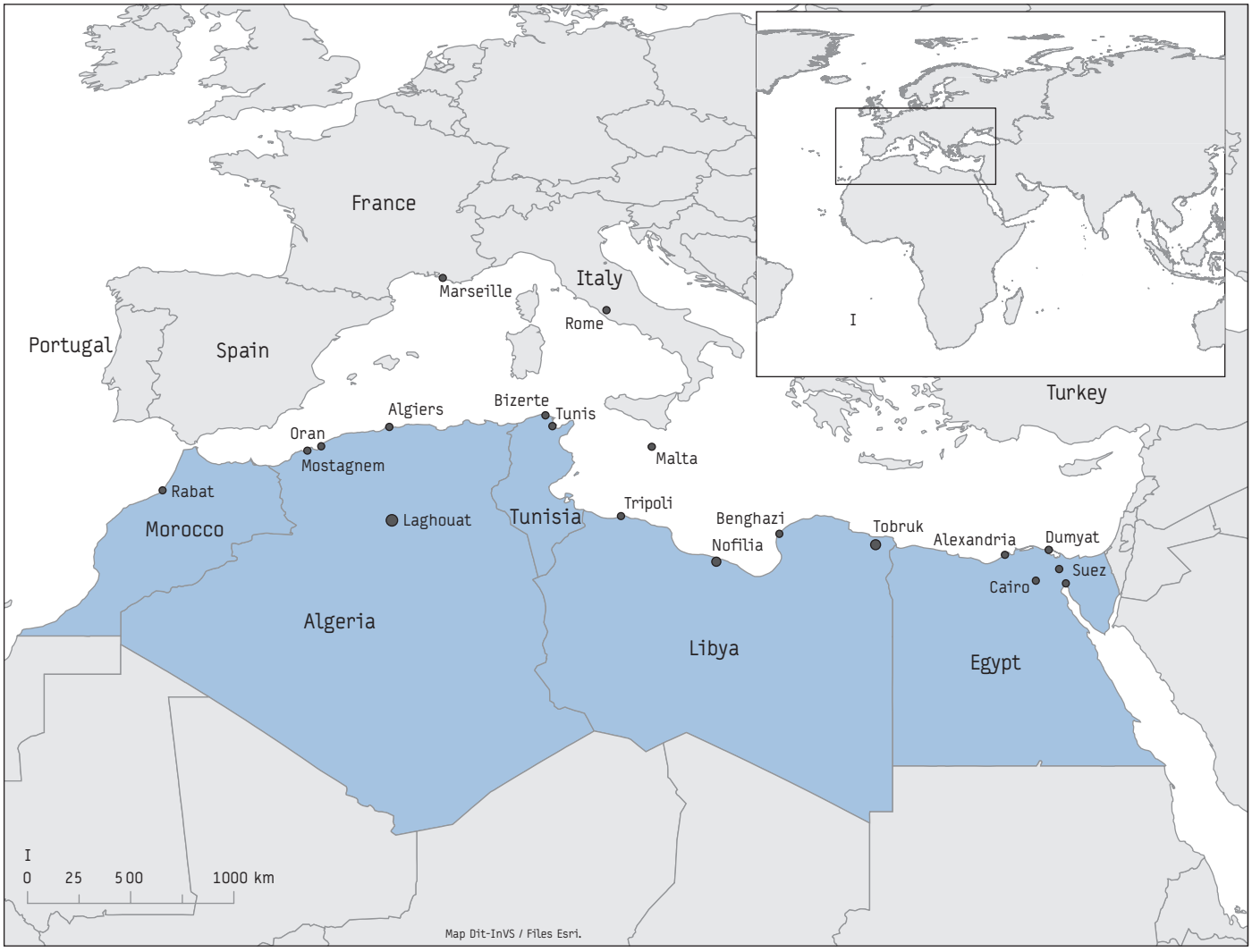
The last outbreak reported in the Maghreb to date occurred in Algeria in July 2008. At that time, the Algerian health authorities reported four cases including three fatalities in Laghouat [WHO, unpublished data]. All identified cases presented with bubonic plague. The last outbreak reported by the Libyan Ministry of Health occurred in 1984 with eight cases of bubonic plague (no deaths) [1]. The last deaths due to plague reported in that country occurred during a 1977 outbreak that affected 11 people (six deaths).

Discussion and conclusion

The implementation in 2007 of the revised IHR and improved surveillance in many countries has strengthened communication

Figure

Map of the Mediterranean region, including locations where plague cases have been reported since 1945.



Source: Department of international and tropical diseases, Institut de Veille Sanitaire (DIT-InVS)

between countries and the World Health Organization. Regional networks have also emerged which facilitate cross-border and regional exchange of public health alerts. The Libyan health authorities have been prompt in describing and reporting the outbreak described here, thereby enabling speedy confirmation and the implementation of control measures.

The Maghreb is no longer considered an endemic area for plague [9]. The recent human plague clusters, however, raise the issue of the persistence of a large focus or of several limited natural foci which have been quiescent for decades and remain capable of "re-emergence" at various dates and locations (Table, Figure). These clusters of human cases are generally sporadic and limited, but they may continue to occur despite the necessary extensive rodent control measures which will probably be insufficient to eradicate the plague reservoir in wild animals. Healthcare workers require training to better recognise signs of a disease which is no longer endemic. Informing and increasing awareness of populations living in and around plague foci, strengthening of local health systems and targeted public health measures around the cases remain the key control strategies in plague-prone areas. Improved knowledge of the natural foci is also a pre-requisite for any rational vector and rodent control

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