

# A short note on plague: from past to present

**Keywords:** plague, black death, *Yersinia pestis*, fleas

## Introduction

Plague is a vector-borne disease with a worldwide occurrence and one of the more deadly bacterial diseases, that can be included in the millenarian diseases group, together with: (i) leprosy (Hanseniasis) which is a chronic infectious granulomatous disease caused by *Mycobacterium leprae*;<sup>1</sup> (ii) tuberculosis (consumption, phthisis and white plague are the terms used to refer to tuberculosis through history) which is caused by the human type of *Mycobacterium tuberculosis*; (iii) accidental tetanus (lockjaw) which is caused by the bacterium *Clostridium tetani*; (iv) schistosomiasis (bilharziasis) caused by blood flukes of the genus *Schistosoma*; (v) malaria (paludism) which may have contributed to the decline of the Roman Empire<sup>2</sup> is caused by Protozoa of the genus *Plasmodium*. With the present short note our objective is to review the history of the plague, and to show that more recently and in the present day this disease continues to be active in many areas of the world, in some cases due to emergence or reemergence.

## Past of the plague

(i) the authors<sup>3</sup> recount that “evidence indicates that the plague began in Egypt rather than Central Asia”; (ii) In the manuscript<sup>4</sup> is presented a detailed history of the plague of which we emphasize that: (i) “some scholars have even suggested that the collapse of the Roman Empire may be linked to the spread of the plague by Roman soldiers returning home from battle in the Persian Gulf in 165AD. For centuries, plague represented disaster for people living in Asia, Africa and Europe and because the cause of plague was unknown, plague outbreaks contributed to massive panic in cities and countries where it appeared” and “numerous references in art, literature, and monuments attest to the horrors and devastation of past plague epidemics”; (ii) the first recorded pandemic, the Justinian plague (name based on Byzantine emperor Justinian I) “began in 541AD and was followed by frequent outbreaks over the next two hundred years that eventually killed over 25 million people and affected much of the Mediterranean basin”.

## Recent and present days of the plague

Plague, with its pandemic responsible for the mortality of a large part of the human population<sup>5</sup> is a millenary infectious disease that humans have not been capable of eradicating or at least avoiding: (i) the occurrence of new outbreaks in the focus already known; (ii) the expansion of the disease to other areas; (iii) delays in diagnosis. Effectively, in Angola (west Africa), to old plague foci were added new foci,<sup>5</sup> in Madagascar, the disease was introduced in urban areas and pneumonic plague is already occurring in the cities of Antananarivo (the capital city) and its suburbs, and Toamasina, and in other non-endemic areas, and WHO estimates the risk of potential further spread of plague outbreaks at national level remains high.<sup>6,7</sup> More recently, pneumonic plague was introduced in Seychelles, according to information from the European center for disease prevention and control (ecdc) on 13 October 2017. Thus, the plague in Madagascar is an example of this disease being a threat to human health, and a constant challenge for human populations. For this fact, our note presents the actual plague situation in that country. According to

Volume 7 Issue 4 - 2018

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**Received:** August 10, 2018 | **Published:** August 16, 2018

ecdc,<sup>8</sup> an outbreak of plague in Madagascar occurred in August 2017 and expanded rapidly. More than half of the cases reported are due to pneumonic plague. The number of infections and deaths exceeded the numbers in the previous outbreaks and the majority of the cases has been recorded in the capital of Antananarivo and the main port of Toamasina, the largest cities in Madagascar. A decreasing trend in cases has been observed in recent weeks. More recently, on 13 March 2018, WHO<sup>9</sup> has implemented drastic changes in plague detection in Madagascar that led to rapid decline in severity and spread of the outbreak, and it was declared over in late November 2017, the time between sample collection and laboratory analyses was reduced from days to just a few hours, significantly improving survival and reduction of complications, in those infected. Also, as regards plague in Egypt,<sup>3</sup> the authors have considered that “Egypt is under risk of disease re-emerging and transmission do to the existence of potential foci in the neighboring countries mainly Libya”.

Our general conclusions are that the climatic changes, wars, travels with different objectives, and globalization may contribute for the dispersion of the plague to new areas. Thus, plague surveillance is necessary so that health professionals, investigators and the community in general may be kept informed in order to detect yearly situations that can lead to new outbreaks and/or dispersion of the disease. As regards health professionals, it is important that they know the document Plague Manual of the WHO<sup>10</sup> of which here we include parts referring to diagnosis and to treatment: (i) Diagnosis - when a diagnosis nor human plague is suspected on clinical and epidemiological grounds, in specimens for diagnosis should be obtained immediately and the patient should be started on specific antimicrobial therapy without waiting a definitive answer from the laboratory. Suspected plague patients with evidence of pneumonia should be placed on isolation, and managed under respiratory droplet precautions; (ii) specific treatment - Streptomycin is the most effective antibiotic against *Y. pestis* and the drug of choice from treatment of plague, particularly the pneumonic form.

## Acknowledgements

None.

## Conflict of interest

The author has no conflicts of interests in this work.

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