Travel Medicine and Infectious Disease (2015) 13, 285–294

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevierhealth.com/journals/tmid

FIRST LOOK - STUDENT RESEARCH

Chinese travellers visiting friends and relatives — A review of infectious risks

Tara Ma [a,*], Anita Heywood [a], C. Raina MacIntyre [a,b]

[a] School of Public Health and Community Medicine, UNSW Australia, Kensington, NSW, Australia
[b] National Centre for Immunisation Research and Surveillance (NCIRS), The Children's Hospital at Westmead, Westmead, Australia

Received 13 May 2014; received in revised form 31 March 2015; accepted 4 May 2015
Available online 14 May 2015

KEYWORDS
Travel medicine;
China;
Hong Kong;
Infectious diseases;
Emerging infectious diseases

Summary *Background:* Travellers are potential vectors in the transmission of infectious diseases across international borders. Travellers visiting friends and relatives (VFR) have a particularly high risk of acquiring certain infections during travel. Chinese VFR travellers account for a substantial proportion of all travel in Western countries with high migrant populations.
Methods: A literature review was undertaken regarding major infectious disease risks for VFR travellers visiting China. This included an examination of the previous pandemics arising in China, the likelihood of future outbreaks in China from H5N1 and H7N9 avian influenza viruses, the potential role of travellers in disease transmission, and the special risks for VFR travellers.
Results: China has been the origin of several influenza pandemics in past few decades, and the origin of several emerging infectious diseases with pandemic potential, including SARS. Travel to and from China has the potential for global spread of emergent infectious diseases, as seen in the SARS outbreak in 2003. For VFR travellers, the risk of other infectious diseases may also be greater in China compared to their countries of migration, including hepatitis A and B, dengue fever, typhoid, and other diseases.
Conclusions: VFR travel to China may be associated with increased risk of acquiring a range of infectious diseases, and also poses a potential risk for importation of future pandemics to other countries. Chinese VFR travellers need to be cognisant of these risks and health professionals should consider educational interventions to minimise these risks.

* Corresponding author. School of Public Health and Community Medicine, University of New South Wales, Kensington, NSW, Australia. Tel.: +614 2270 7170.
E-mail addresses: c.h.ma@student.unsw.edu.au (T. Ma), a.heywood@unsw.edu.au (A. Heywood), r.macintyre@unsw.edu.au (C.R. MacIntyre).

http://dx.doi.org/10.1016/j.tmaid.2015.05.004
1477-8939/

1. Introduction

In light of the recent outbreak of human H7N9 influenza cases in China [1], concerns of an influenza pandemic have again been heightened. Emerging infections, once they arise, can spread rapidly around the world via international travel, as was the case with Severe Acute Respiratory Syndrome (SARS) [2—4]. Travellers are an important vector in the global spread of infectious diseases, especially during outbreaks. Historically, China has been a major source of emerging infectious diseases of international concern [5]. The easing of government-imposed travel restrictions has resulted in a rapid expansion of international travel to and from China over the last decade. In 2012, outbound Chinese were the largest tourist source nation and China ranked third in the number of inbound tourist arrivals, and is expected to receive the largest number of international arrivals by 2020 [6]. With this high and increasing volume of cross-border movements, the global spread of infectious diseases from China warrants consideration.

Travellers are at risk of acquiring and transmitting infectious diseases, both in the country to which they travel and upon their return. The risk of infectious disease and subsequent importation of disease is greater in travellers visiting friends and relatives (VFR) travellers [7—9]. VFR travellers commonly acquire similar infectious diseases as do other travellers [10], but they may be especially at risk for certain diseases [11]. Whilst there is no standard definition of a VFR traveller, the term most commonly refers to both first and second generation immigrants who are ethnically distinct from the majority population of their country of residence, who return to their country of origin to visit friends and relatives [12,13]. The term generally refers to those travelling from high income to lower income countries [12] where their risk of infectious diseases are greater [7—9]. A range of factors related to higher risk of exposure and lower uptake of preventative health measures contribute to the higher risk in VFR travellers [11]. While there are no data on the travel patterns and travel health practices of Chinese VFR travellers, evidence suggests that the proportion of Asian travellers seeking pre-travel health information is lower than that of Western travellers [14—16].

There is a strong correlation between migration and VFR travel and an increase in global migration, coupled with the affordability of travel for migrants and their children, is contributing to the increase in the proportion of travel for the purpose of visiting friends and relatives [17]. Globally, international travel for the purpose of visiting friends and relatives accounted for a quarter of international tourist arrivals in 2012 [6], particularly originating from Western countries [18,19]. In 2011, 46% of outbound international travel by US residents was to visit friends and relatives [18], whilst the main purpose of travel for 23% of Australian resident departures in 2012 was for the purpose of 'visiting friends and relatives' [19]. Ethnic Chinese are one of the largest cultural groups in many Western countries including Australia [20], Canada [21] and the USA [22] and was the largest source country for migration to Organisation for Economic Co-operation and Development (OECD) countries in 2011 [23]. In Australia, travel to mainland China and Hong Kong accounts for a significant proportion of all overseas travel. Of resident Australian departures in 2010, 4.7% were to mainland China and 3.0% were to Hong Kong [24], of those 28.9% were for the purpose of visiting friends and relatives [25]. Chinese VFR travellers contribute substantially to the volume of travel to China from Australia and other Western countries.

This review describes recently emerged and travel-associated infectious diseases originating from China and the risk to international travellers, particularly those visiting friends and relatives. Travellers play a pivotal role in the spread of infectious diseases across international borders, and infectious disease risk awareness, preventative practices and behaviour modification are crucial to the comprehensive control of infectious diseases on a global scale. Awareness of emerging infectious disease risks is important for travellers to China and for health professionals providing pre-travel health advice to Chinese VFR travellers.

2. Methods

A literature review was conducted of infectious disease risks in China, and with a focus on [1]: recent outbreaks including the 2003 SARS outbreak and the H5N1 and H7N9 avian influenza outbreaks and [2] diseases identified as highly relevant for Chinese VFR travellers. Only diseases identified as highly relevant for Chinese VFR travellers, either due to a known increased risk for VFR travellers in general [26] or relevance across multiple urban and rural regions of China, were explored. The diseases identified include hepatitis A and B, tuberculosis, malaria and typhoid. Hepatitis A and B and tuberculosis are prevalent across China [27,28], and tuberculosis, malaria and typhoid are all known to disproportionately affect VFR travellers [7].

The Medline database Published literature were retrieved from the Medline database for each included disease using a combination of keywords and MeSH headings, for example, 'SARS' and 'China' or 'Hong Kong'. Articles were assessed using their titles and abstracts and selected for possible inclusion based on their relevance. Articles potentially relevant to travel health, articles discussing the spread of the outbreak, and articles discussing potential future outbreaks in China or Hong Kong were considered for inclusion. All study designs, including review papers, were considered for inclusion. As H7N9 was a new outbreak virus that had only caused outbreaks in China, no restriction of the search to articles on China was applied. Articles published before 31 March 2014 were included. Studies were restricted to English language. References of all relevant articles, including reviews, were checked to identify additional studies.

We also searched the grey literature, including the WHO, CDC and Australian government websites for information on infectious risks of relevance to Chinese VFR travellers. In addition, a general overview of other infectious disease risks present in China, according to the WHO, CDC and Australian government websites, was prepared. To provide a geographical reference for readers unfamiliar with the location of Chinese provinces, maps showing the origins of