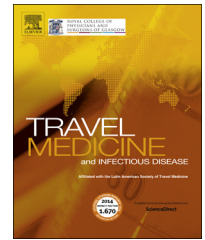




Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevierhealth.com/journals/tmid](http://www.elsevierhealth.com/journals/tmid)



# Health risks facing travelers to Russia with special reference to natural-focal diseases

Svetlana M. Malkhazova<sup>a</sup>, Varvara A. Mironova<sup>a</sup>,  
Natalia V. Shartova<sup>b</sup>, Polina V. Pestina<sup>a</sup>, Dmitry S. Orlov<sup>a,\*</sup>

<sup>a</sup>Department of Biogeography, Faculty of Geography, Lomonosov Moscow State University, GSP-1, Leninskie Gory, Moscow, 119991, Russian Federation

<sup>b</sup>Department of Landscape Geochemistry and Soil Geography, Faculty of Geography, Lomonosov Moscow State University, GSP-1, Leninskie Gory, Moscow, 119991, Russian Federation

Received 6 July 2014; received in revised form 16 February 2015; accepted 22 September 2015  
Available online 3 October 2015

## KEYWORDS

Russia;  
Travel health;  
Natural-focal diseases;  
Spatiotemporal dynamics;  
GIS

## Summary

**Background:** Russia, an enormous country almost completely located within temperate latitudes, has a broad spectrum of natural landscapes which attract increasing numbers of tourists, from arctic deserts in the north to steppes and deserts in the south. Currently, tourism is undergoing active development in Russia: new travel routes, including ones that involve visiting the wilderness, are steadily appearing. Among the multitude of infectious diseases that can endanger travelers, natural-focal diseases, whose agents and/or carriers are integral to natural landscapes, are especially prominent. Some of the results of the study of natural-focal infections and parasitoses, which are necessary to evaluate the recreational and travel potential of the Russian Federation, are presented and discussed in this article.

**Method:** A cartographical and statistical analysis of infectious and parasitic natural-focal diseases, spanning more than a decade (1997–2013), is the basis of this article.

**Results:** This analysis, along with that of additional cartographical and textual sources, reveals that natural-focal infections are most diverse between 48° N and 60° N and least diverse in the northern regions of the Far East of Russia. Different regions have different numbers of nosoforms and different morbidity level, which signifies an irregularity in the distribution of parasitic diseases.

**Conclusions:** This medico-geographical information may be useful both for individual tourists planning trips to Russia and tour agencies organizing tour groups. It also can be used by health advisers when they consult people before a trip, to assess the actual risks, suggest a number of precautions and pick the particular diseases out of those listed that actually constitute a risk in certain regions, and suggest a suitable preventative treatment if needed.

© 2015 Elsevier Ltd. All rights reserved.

\*Corresponding author. Tel.: +7 495 9394717.

E-mail addresses: [sveta\\_geo@yahoo.com](mailto:sveta_geo@yahoo.com) (S.M. Malkhazova), [mironova.va@gmail.com](mailto:mironova.va@gmail.com) (V.A. Mironova), [shartova@yandex.ru](mailto:shartova@yandex.ru) (N.V. Shartova), [polechka10@gmail.com](mailto:polechka10@gmail.com) (P.V. Pestina), [orlovmsu@gmail.com](mailto:orlovmsu@gmail.com) (D.S. Orlov).

## 1. Introduction

Travel, besides being a source of new experiences and cultural enrichment, can be dangerous to the travelers' health. The importance of this issue is supported by the emergence of a special branch of medicine, emporiatrics, or travel medicine, approximately 40 years ago [1]. Travel medicine is dedicated to the health issues of tourists and travelers, especially in environments that are unfamiliar to them. It is evident that travel medicine is tightly intertwined with medical geography. Data on disease occurrence and spread may be quite useful for planning travel routes, as well as for other recreational and travel activities.

Infectious and parasitic diseases play a leading role among the health problems that tourists face while traveling. A number of diseases are controlled by specific prevention techniques: vaccination, chemoprophylaxis and other specific tools of protection (mosquito nets and protective clothing). However, these techniques don't offer protection from all diseases, and travelers should know about the health risks associated with the possibility of contracting these diseases, some of which may lead to complications or even death.

Natural-focal diseases, according to E.N. Pavlovsky's theory, are diseases that are caused by live infectious agents that are integral to natural landscapes [2]. Currently, the natural focus of an infectious disease is believed to be any natural ecosystem that includes a population of the pathogen [3]. These diseases are characterized by the fact that their pathogens can indefinitely survive in their natural ecosystems without human involvement. Therefore, all these diseases are zoonoses by definition. As a rule, humans contract the disease if they find themselves in a natural focus. There is a wide variety of natural-focal diseases. Their pathogens belong to various zoological taxa, ranging from viruses to helminthes. Natural-focal diseases also have different ways of transmission: infection can occur from arthropods' bites, from consuming infected food or water, etc.

According to the WHO [4], there are about 200 zoonoses registered in the world, the majority of which primarily arise in natural ecosystems. Due to growing human involvement in natural landscapes, natural foci of infections, which have undoubtedly existed for a long time, have become more and more active. This problem is especially pressing because of the wide involvement of previously untouched territories in agriculture and recreational activities, as well as increased rates of tourism and migration. The worldwide rise of zoonosis-related diseases is a result of the combined effects of natural and socio-economic factors, among which tourism plays an important role [5].

Recent rapid development of new forms of tourism, such as eco-tourism (which involves spending time in the wilderness), ethnographical trips (which include contact with local populations), gastronomical tourism (which involves eating local food), etc., raises the risk of infection. The number of reported cases of diseases among those who visit natural landscapes when they travel is constantly growing. This is contributed to by tourists' and travel companies' lack of knowledge about the potential health risks associated

with travel. The medico-geographical aspects of tourism have not received sufficient attention in research. Studies on travelers that visit tropical developing countries show that they have an insufficient understanding of the health risks involved with this sort of travel [6-8]. Even less information is available or accessible on health risks in non-tropical countries, including those risks arising from natural-focal diseases. For example, the Centers for Disease Control and Prevention website [9], which travelers often use to find information on countries and diseases, has detailed information about many natural-focal diseases, such as tick-borne encephalitis or Lyme disease. However, it can be hard to find information about disease risks in a specific country, especially if said risks are relatively low.

In recent years, the Moscow State University's Geography Faculty has been studying and mapping natural-focal diseases [10-13]. This research is based on experiences in time-space studies in medical geography [14] and is dedicated to natural-focal infections and parasitoses, which are crucial for the assessment of Russia's travel and recreational potential.

## 2. Materials and methods

We implemented cartography analysis as the primary research method. Based on statistical data from the Federal Statistics Service and the Federal Service for the Protection of Consumer Rights and Well-being (*Rospotrebnadzor*), a unified database and a set of analytical maps were created. The database contains over a decade's worth (1997-2013) of information on infectious and parasitic natural-focal diseases. Multiple additional cartographical and textual sources dedicated to Russia and its various regions were also utilized in the analysis. Constituent entities of the Russian Federation (Russian *sub'ekt federacii*, total number - 83) were used as cartographical units. At the moment, data are being collected in order to keep the informational and analytical database up to date.

In order to analyze the pattern of infectious natural-focal disease distribution, maps of human morbidity for the main reported diseases (tick-borne encephalitis, borreliosis, North Asian tick-borne rickettsiosis, hemorrhagic fever with renal syndrome (HFRS), West Nile fever, tularemia, leptospirosis, brucellosis, anthrax, ornithosis, pseudotuberculosis, rabies, and tetanus) were compiled on a scale of 1:30,000,000. Maps of the distribution of the most relevant parasitic infections (diphyllobothriasis, opisthorchiasis, taeniarhynchosis, taeniosis, echinococcosis and toxocariasis) were also developed. The annual average number of cases is shown for each constituent entity in Russia.

A comprehensive map of the structure of the natural-focal morbidity rate for Russia's population was compiled. The primary registered nosoforms and their diversity for each administrative region in Russia, as well as the share of each infection in the total natural-focal morbidity, are shown on this map.

Maps were developed using ArcGIS software (cartographical base, editing, coordination, and data storage), STATISTICA software (statistical data analysis) and Adobe Illustrator (editing, graphic design, and production).

Download English Version:

<https://daneshyari.com/en/article/6126156>

Download Persian Version:

<https://daneshyari.com/article/6126156>

[Daneshyari.com](https://daneshyari.com)