1 Network Expansion and Disease Spread along the Former and Present Straits of the Silk Road(S) and Other International Straits

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Abstract

The term Silk Road was created in the Middle Ages for a rather low spectrum of streets (roads) being used to transport goods from China to Europe and back, passing different cultures. However, not only goods had been and are still today (intensively) spread along this pathway, but also agents of (often) severe diseases. Thus, constant control systems have to be established and permanently controlled with respect to their efficacy. Today, it takes only a few days (if not hours) until persons, goods, and agents of diseases are transported from one continent to the other. The old and the present pathways are enlarged daily, thus increasing the worldwide network.

Keywords

Cultural and economic spread · Pathways of wandering diseases as severe epidemics · Control measurements · Worldwide transportation of agents of diseases by cars · Ships · Planes

The precursors of the recent mankind on earth apparently started their successful leadership in rather small groups, which had been able to adapt themselves to the changing of living conditions in special regions, which forced them to develop capacities to get sufficient food for the slowly but continuously growing mankind. This afforded that mankind had to organize a constant spreading of groups, which finally settled on all continents. Wandering human groups and their contacts with animals, which mostly had been ingested in a raw or poorly cooked status, helped to spread permanently a broad spectrum of agents of diseases among groups of many

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persons and animals. Since the temperatures varied on the different continents, humans started very early contacts with other humans in other regions of their own continent and in other ones. This led to the fact that in former centuries agents of diseases were easily spread potentially in a few months and today even within a few days. Since at the beginning the symptoms of infections are mostly rather low-graded and thus mostly not noted immediately, agents of diseases had and have significant changes to become easily spread—especially in countries where many people live close together.

1.1 Examples of Agents of Selected Diseases along the Silk Roads and further Related Sites

Thus, the spreading of humans (sensu stricto "homo sapiens") around the globe led to the fact that also agents of diseases are spread, often leading to high death rates among people in regions where people had not been infected before. The increasing business contacts between people in Eastern, Western, Northern, and Southern regions on earth induced the spreading of severe, often fatal diseases. Thus, it was not astonishing that different and often severe diseases become spread via business activities from continent to continent. Some of them had been spread in special periods as shown below:

- Cholera: ~1500 BC in China.
- Tuberculosis: ~730 BC in Palestine.
- Plague of Justinian: ~600–750 AD in Palestine.
- Plague in Europe (1347–1353) killing about one-third of the population.
- Repeated plague epidemics: e.g., fifteenth century in Germany, sixteenth century in Southern Europe, seventeenth century in Italy and England, fifteenth century in France, nineteenth century in India and surrounding regions, 1910–1911 in Manduria, 1946–1947 in Algeria and later single case imported, but individually treated in Europe.
- So-called "large plague" (1615) starting in London and spreading from there to Europe.
- Plague also occurred in countries in East and North Europe in 1707–1713.
- So-called Indian Ganges-Brahmaputra pandemic spreading in whole Asia (1817–1823).
- Second large cholera pandemic (1826–1837) in various countries in America, Europe, North Africa, and Asia.
- Plague epidemic in China (1855) growing up to a worldwide pandemic.
- Repeated plague epidemics starting in 1885 and spreading into Europe and America.
- 1865–1896: fourth and fifth cholera pandemic
- 1892: Cholera epidemic in Hamburg, Germany
- 1894–1912: Worldwide plague pandemic in countries in Asia, Europe, and North and South America

- 1918–1920: Influenza pandemic (Spanish flu): about 30 million death cases in Europe
- 1918: Spotted fever in Russia
- 1957–1958: Asian flu (A-H2N2)
- 1961: Start of the seventh cholera pandemic, which is still ongoing today
- 1976: First Ebola epidemic in Zaire
- 1980: Starting of the HIV epidemic in the USA
- 1991: Cholera epidemic in the whole of South America
- 2002–2003: Starting of the SARS pandemic
- 2008: Broad dengue fever in Brazil (~300,000 cases per year)
- 2009: So-called Pig flu, still spreading in recent times
- 2015: Zika virus epidemic started in its homelands, spread from there to Brazil, and endangered in the year 2016 also the visitors of the Olympic Games.

1.2 The Shrinking of our Recent World by Enlarging the Former Straits

In the Medieval times, the human world population started increasingly to get into closer contact, whereby goods, culture, and also agents of diseases became spread over the continents. At this time, it was much easier to transport large amounts of goods back and forth on streets stretching from Europe to Asia than across the oceans. However, this type of transport took time, so people got in contact with local people and thus with local agents of diseases, leading to several epidemics (e.g., plague) spreading in both directions. Today, the longest flights may require less than 24 h. Thus, diseases (e.g., plague, coronavirus) can be spread unnoted in many countries. On the other side, helpful goods and new knowledge can be distributed in a few days.

The transportation and exchange of many products were done from Europe to China and back. Since, at this time, one of the transported goods had been silk or silk products, all relevant streets had been named *Silk Road*. This name is still used today, although many more or less parallel streets are actually available to transport goods from the East to the West and back (Fig. 1.1). Since large and economically powerful countries like China, Korea, and India detected African countries and other regions as a growing markets, especially China has developed further "Silk roads" to transport huge amounts of products to Africa and along the African coast to Europe (Fig. 1.1).

The "land-based part of the silk road" (line Shenzhen, China—Duisburg, Germany), which actually covers at least 60 trains per week passing Lanzhou, Almaty, Tashkent, Teheran, Istanbul, Moscow, and Duisburg, is expanding. From there, goods are transported to the Netherlands and Venezia, which is also reached by ships sailing via the South road along East Africa (Fig. 1.1). Thus, both "New Silk Roads" connect by their back and forth activities (via trains and ships) Africa, Asia, South East Asia, and Europe and thus increase the benefits for all countries along their routes. The inclusion of African countries into the activities of Asia and Europe

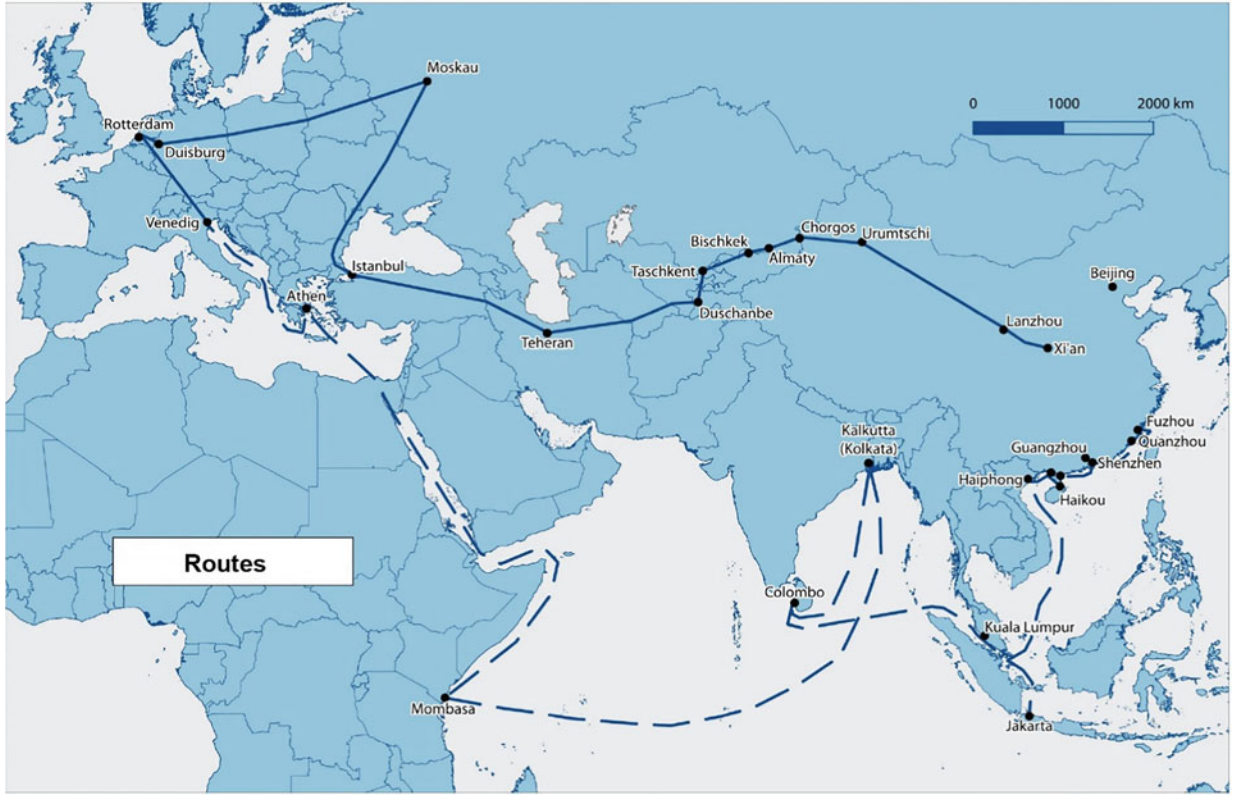

Fig. 1.1 Diagram of actual existing and planned "Silk roads" connecting Asian, African, and European countries enabling quick product exchanges in both directions (Shenzen City planning exhibition): routes by train and routes by ship. P.S.: There are also existing "roads" passing Africa from the South to the Mediterranean coast

is especially important since many of these countries suffer from the ongoing lack of connections to the rest of the world, although their economic potential is large.

Further Reading

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