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For most of us, our experience of crossing borders will be a queue at an airport or seaport, passport in hand, awaiting scrutiny by an immigration official. If our documents are in order, we then proceed through customs where officials cast their eyes over goods entering or leaving the country. From this occasional experience, we could be forgiven for thinking that the crossborder flow of people and goods occurs without difficulty.

The reality is very different. Although formally the front line of border control, immigration and customs officials face an impossible logistical task. According to the International Organisation for Migration, more people are on the move than ever before. In 2006, one in 33 people in the world was an international migrant, living outside their country of birth. The booming tourist trade moves still more people around the world, with international arrivals growing by 4·5% (842 million) in 2006, and accounting for 6% (US$800 billion) of global exports. Added to these figures are the tens of thousands of undocumented migrants crossing national borders each day. World trade has also boomed since the end of World War II as more and more countries have become integrated into the global economy. The World Trade Organisation estimates that the volume of world trade was 22 times higher in 2000 than it had been in 1950. During this period, merchandise exports grew by an average of 6% annually. Illicit trade, in the form of counterfeit, smuggled, or illegal products is also a growing part of the story.

This growth in global trade and travel has brought many benefits to millions worldwide, but it has had wider social, environmental, and health effects. As described in Ann Marie Kimball’s Risky Trade: Infectious Disease in the Era of Global Trade, we neglect these factors at our peril. Focusing on what she calls the “unseen travellers” on this “global express”, Kimball assembles a sobering picture of how bacteria, spores, viruses, and prions are spreading more readily via trade and population movements. Of course, microbes and trade have gone hand in hand for centuries. What is different today is the scale and reach of this shared journey, heightening the risk of infectious disease. Thus, as the world economy restructures around a new global logic, microbes are adapting to this changing environment.

Importantly, Kimball goes far beyond the “scary bugs” scenarios reported in the popular press. The usual suspects—Ebola, plague, and the severe acute respiratory syndrome (SARS) outbreak—are all given due attention. However, it is the risks of infectious disease arising from this global interconnectedness that makes more worrying reading. For example, in developed countries we have come to take for granted ready access to fresh fruit and vegetables that are grown abroad and then transported across the seas to our local shops. This globalised food-supply chain, with only a small proportion of imports inspected at borders, increases the risk of contamination. Similarly, Kimball avoids making the frequently drawn, yet often distorted, association between immigration and the spread of infectious disease. Instead, changing disease risks are understood in the context of varied population movements. Risks to host and migrant populations do arise from people moving from “high risk” to “low risk” settings. But they are also created by the relatively affluent, jetting away to far flung destinations.

As well as behavioural change—both individual and collective—global trade is also changing our natural and built environments which, in turn, alters our vulnerability to infection. For example, a major change (antigenic shift) in the influenza virus, into a potentially pandemic strain, is most likely to occur in Asia where human and animal populations live in ever closer proximity. Intensive farming methods have been used in the region, not only to feed growing populations, but to fuel the poultry export market, which has increased 25-fold in three decades. Worldwide, our insatiable demand to buy more for less exerts pressure on producers to constantly increase outputs; as Kimball observes, “the human community is outstripping the planet’s ability to accommodate it”.

Alongside the many treaties now in force to facilitate trade liberalisation are agreements intended to protect public health. For example, the Codex Alimentarius and the Sanitary and Phytosanitary Agreement set out trade standards, codes of practice, guidelines, and other recommendations for food safety and animal and plant health. The International Health Regulations represent a legally binding agreement among member states of WHO “to ensure maximum security against the international spread of diseases with a minimum interference with world traffic”. Such agreements are, in principle, supported by national institutions that regulate crossborder flows of goods and people. Medical screening of travellers before, or on arrival, by immigration officials is intended to detect risks to public health. In practice, however, these agreements are problematic because of their limited
capacity to police the sheer volume of goods and people now flowing in and out of countries. For many countries, such as Japan which imports 60% of its food, only a small proportion of traded goods can ever be subject to close inspection. Moreover, the efficacy of systems to detect infectious disease risks at the border must be questioned. Compulsory health screening is often discriminatory, usually carried out by immigration rather than public-health officials, and found to be ineffective, costly, and counterproductive to protecting public health.

A broader approach to addressing the risk of infectious diseases arising from global trade is what Kimball calls the “remedies pyramid” that is comprised of three levels of prevention. The primary level is the point of emergence where microbes mutate, jump species, or multiply. The secondary level is when direct contagion occurs, spreading locally as an outbreak or epidemic. International attention currently remains focused at the tertiary level where geographically dispersed clusters threaten to become a pandemic. Kimball’s message is clear. If we are to prevent such pandemics, greater emphasis must be given to strengthening action at the primary and secondary levels.

This lesson has been partly learned. Preparations for a potential influenza pandemic have drawn overdue attention to the weak state of national public-health systems. Many high-income countries are allocating additional resources to improve disease surveillance systems, and to stockpile antivirals and vaccines for domestic use. Unfortunately, in our global economy homeland health security alone will prove of limited value. Microbes are far more likely to emerge and spread through trade and travel in low-income and middle-income countries. It is here that the costs of globalisation are disproportionately found, creating fertile conditions for infectious diseases to emerge and spread. Ultimately, the creation of a trading system safe from such public-health risks will depend on the extent to which the politically and economically powerful can isolate themselves. The rise in foodborne diseases worldwide, the continued spread of HIV/AIDS, and the growing threat of pandemic influenza suggests that such isolationism is misguided. Policy measures must change to reflect the global nature of infectious-disease risks.

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In brief

Book  Snow’s map
On Sept 8, 1854, the Board of Governors of St James’ Parish, London, removed the handle of a communal water pump on Broad Street in Soho. They acted on the advice of John Snow, a local doctor and anaesthetist, who believed that disabling the pump would end a violent cholera epidemic in the parish. Many writers have construed this event as a pivotal moment in the history of disease: proof that cholera (and, by implication, all infectious diseases) was caused by a specific contagious agent rather than by a miasma—a bad smell. In The Ghost Map Steven Johnson reminds us that the story was not so straightforward. Rather than making a material contribution to the end of the epidemic, the removal of the pump handle reflected Snow’s persuasive way with the Board.

The Ghost Map fits neatly into an extremely successful genre: the “biography of a thing”. Johnson uses many perspectives—genetic, pathological, social, historical, demographic—to construct a biography of cholera, interleaved with a detailed narrative of the Soho outbreak. The eponymous map was, incidentally, drawn up by Snow to illustrate the clustering of cholera cases around the Broad Street pump. Like Peter Ackroyd and A N Wilson, Johnson is adept at evoking Victorian London, the social and sanitary implications of 2 million people living within 5 miles of London Bridge, the economy of excrement underpinning urban life. In the hands of Ackroyd or Wilson, this “biographical” approach can be breathtaking. In Johnson’s hands the result is sometimes engaging, more often disappointing. Good historians, like good anthropologists, resist the temptation to reduce their subjects to crudely drawn heroes or villains. The fact that we now accept Snow’s account of contagion is perhaps the least important aspect of this complex historical narrative. But Johnson stages a Victorian melodrama in which Snow is Right and the miasmatists are Wrong—end of story. Snow is a cold, glassy, Victorian sort of hero, a Sherlock Holmes without the wit. The miasmatists, by contrast, are windy, pompous, duplicitous, “blind”. As history The Ghost Map is hopelessly one-sided, leaving the reader with little sense of the wider medical and political contexts in which Snow and the miasmatists worked. The final chapter, an essay on the future of urban life, seems to be the real subject of Johnson’s interest, and it is a pity that his talents as essayist and commentator have been occupied so fruitlessly. Hindsight is always 20/20, but history need not be this myopic.

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The Ghost Map: a Street, an Epidemic and the Two Men who Battled to Save Victorian London
Steven Johnson. Allen Lane, 2007 Pp 299. £16.99. ISBN 0-713-99974-7.