

Travel restrictions and infectious disease outbreaks

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RV*, AH-C* and JS contributed to the research, analysis and, with LL, the drafting of the manuscript. RV coordinated the expert roundtable. LL and SM initiated and provided strategic direction throughout the duration of the project, supervised research, and revised the manuscript for critical content. All authors have contributed to and reviewed the final version.

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Abstract

Background

A key purpose of the IHR is to prevent unwarranted interruptions to trade and travel during large and/or transnational infectious disease outbreaks. Nevertheless, such outbreaks continue to disrupt the travel industry. This aspect of the IHR has received little attention in the academic literature despite its considerable impact on affected States and commercial activity. This paper outlines the challenges and gaps in knowledge regarding the relationship between outbreaks and the travel sector and discusses the opportunities for further research and policy work to overcome these challenges.

Methodology

We conducted a literature review on the relationship between outbreaks and travel restrictions, with a particular focus on the 2014-16 Ebola epidemic in West Africa. This review was complemented by an expert roundtable at Chatham House and further supported by case studies and qualitative interviews.

Results

Numerous travel stakeholders are affected by, and affect, large-scale infectious disease outbreaks. These stakeholders react in different ways: peer pressure plays an important role for both governments and the travel sector, and the reactions of the media and public influence and are influenced by these stakeholders. While various data sources on travel are available, and WHO is mandated to work with States, there is no recognised coordinating body to disseminate timely, consistent, reliable and authoritative information and best practices to all stakeholders.

Conclusion

This article highlights the interdependent relationship between various travel stakeholders. The reasons for interruption of travel during the 2014-16 Ebola outbreak were complex, with decisions by States only partly contributing to the cessation. Decisions by non-state actors, particularly the travel industry itself, contributed significantly and were based on a variety of factors. Further research, analysis and policy development is required to mitigate the health and economic consequences of infectious disease outbreaks. Any further research will also need to take account of COVID-19 travel related issues.

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Background

In 2019, the travel and tourism sector contributed \$2.8 trillion directly to the global economy and indirectly accounted for 10.4% of global GDP (\$8.8 trillion), 310 million jobs, \$1.6 trillion in exports, and 27.2% of services exports.¹ International tourist arrivals are estimated to increase by 3.3% until 2030, with an additional 43 million tourist arrivals occurring every year.² The sector is vulnerable to disruption during infectious disease outbreaks, acting as a disincentive for countries to report outbreaks. The International Health Regulations (IHR 2005) – a legally-binding agreement between 196 states — thus aim to strengthen reporting of infectious disease outbreaks while at the same time deter other states from imposing unwarranted travel restrictions.

According to the World Health Organization (WHO), restricting the movement of people and goods during outbreaks is ineffective in most contexts, and may instead stifle the delivery of aid and technical support in addition to the social and economic repercussions for affected countries. While specific travel measures may prove useful in the short-term in some instances, for example to allow countries to gain time to strengthen preparedness, States are required to provide WHO the public health rationale and relevant evidence for such measures within 48 hours of implementation.³

Nevertheless, unwarranted measures interfering with travel are common. During the 2014-2016 Ebola epidemic, for example, travel to and from the affected countries in West Africa was limited or suspended, disrupting the economies of Guinea, Liberia, and Sierra Leone and hampering the humanitarian and epidemic response.⁴⁻⁶ The IHR directly bind States, but minimizing the impact on travel in outbreaks also needs an understanding of the role of non-State actors including the media, social media, travel and tourism industries and the public. Drawing on the work of the post-West Africa Ebola IHR Review Committee report and incorporating research gathered during and in preparation for an expert roundtable co-convened by the Chatham House Centre on Global Health Security and the Graduate Institute of International and Development Studies Global Health Centre in 2017, this article synthesizes the available information on this issue.

At the time of writing, the world is facing an unprecedented health crisis with the global spread of novel coronavirus (COVID-19). Large-scale travel restrictions are being implemented in response to the pandemic, despite official recommendations from WHO advising against prolonged restrictions of international traffic.^{7,3} It is within this context that we reflect on the lessons learned during the 2014-2016 Ebola outbreak in West Africa, and identify gaps, challenges and opportunities for further research, action and policy making on travel and infectious disease outbreaks.

Methodology

We undertook a review of the literature related to infectious disease outbreaks, travel and tourism in 2017, with a particular focus on the 2014-2015 Ebola epidemic in West Africa. As part of this review, two case studies were developed to illustrate reactions to outbreaks using an analysis of travel-related interviews (with the consent of the interviewees) presented to the IHR Review Committee (5 individuals).

This review informed the roundtable co-convened by the Chatham House Centre on Global Health Security and the Graduate Institute of International and Development Studies Global Health Centre in November 2017. There were 19 participants from government, academia, the media, WHO and national public health institutes, and the travel and tourism industry, including airlines, travel security firms and industry associations. Prominent omissions included travel insurance firms and humanitarian organizations whose operations were affected by the travel restrictions imposed on affected countries in West Africa.

The roundtable addressed identification of the main challenges; understanding these within and outside each sector; listing effective tools, policies, or practices to mitigate the negative impacts of outbreaks on industries and on economies; and what new arrangements were required.

Following the roundtable, audio recordings were transcribed and analysed using inductive coding to identify and define key themes, which are presented below alongside the results of the two case studies and updated literature review.

Results

Many stakeholders either contribute to, or are adversely affected by, travel restrictions, including (but not limited to) States; international governmental organizations; industry, workers and their international associations; the media, including social media; the public; and humanitarian organizations who rely on travel and trade resources to respond to emergencies (Figure 1).

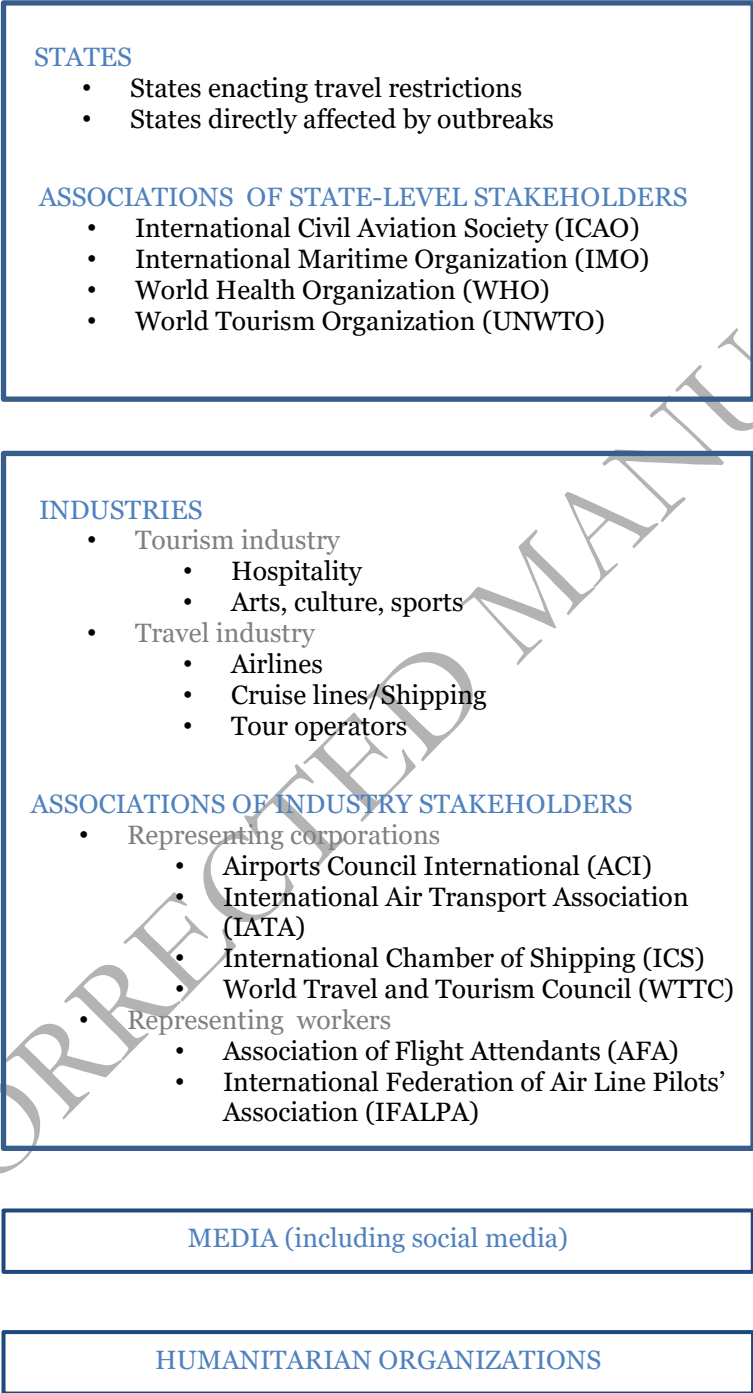


Figure 1: Examples of key stakeholders

States' reactions during outbreaks

Despite the IHR, States often react in ways that interfere with international traffic sometimes without a public health justification, including border closures, visa bans, denial of entry,

mandatory quarantines, requirement of medical certificates, border screenings and travel advisories.

Our review identified four published studies investigating country adherence to IHR guidance during outbreaks. One study by Worsnop (2019) investigated reasons for delays in States reporting outbreaks to WHO.⁸ Two reasons were proposed: first, some States do not have capacity to detect outbreaks in a timely manner (as in the 2014-16 Ebola outbreak) and second, some States conceal outbreaks to forestall trade and travel restrictions from other States (for example, the 2003 SARS outbreak). The author also noted that WHO has not publicly criticized (“name and shame”) governments imposing excessive trade and travel restrictions.

An earlier study by Worsnop (2016) investigated reasons why governments imposed trade and travel restrictions during the 2009 H1N1 outbreak, contrary to WHO recommendations.⁹ Of the 47 States that imposed restrictions, the author found that democracies with weak health infrastructure were more likely to impose restrictions. The author suggests that restrictions can “quell public fear and instil confidence... by signalling to domestic constituents that the state is taking action.” To an “electorally-minded government,” these domestic gains are likely to outweigh the international backlash to flouting of the IHR, especially where States lack confidence in their own ability to effectively respond to an outbreak. Worsnop additionally highlights evidence that the public overestimates the effectiveness of restrictions during outbreaks, citing one survey where 70% of Americans expressed a desire for the imposition of more restrictive border measures during the 2014-16 Ebola outbreak.¹⁰

A 2017 study by Rhymer and Speare investigated governments’ reactions during the 2014-16 Ebola outbreak. Of the 187 countries, 58 (31.0%) imposed restrictions that exceeded or appeared to exceed WHO’s temporary travel recommendations: 43 (23.0%) prohibited entry to foreigners travelling from countries with widespread Ebola transmission. A further 15 (8.0%) applied other types of exclusions and restrictions, including the requirement to produce a medical certificate verifying no Ebola infection (eight countries, 4.3%) and mandatory quarantine (six countries, 3.2%). One country allowed entry to foreigners working in affected countries but denied entry to citizens from those same countries.¹¹ In addition, some countries imposed a 21-day quarantine on ships trading along the West Coast of Africa if they had visited an Ebola affected country.¹²

Patterson (2018) found that African States were more likely than non-African States to impose Ebola-related travel restrictions, highlighting the role of proximity.¹³ In addition 66% of democracies and 63% of autocracies in sub-Saharan Africa imposed restrictions, suggesting that Worsnop’s hypothesis (2016) may not hold for States proximal to outbreak-affected countries. Of African States hosting more tourists than the continental average, 92% imposed travel restrictions on Ebola-affected countries, suggesting States were willing to prioritise travel restrictions on outbreak-affected countries in order to maintain their own travel and tourism industry.

Mouchtouri et al. (2019) highlight a point raised by several roundtable participants: specific measures taken during outbreaks may serve a legitimate purpose even if they have limited effectiveness in identifying cases. Entry and exit screenings cannot detect asymptomatic cases, with a negligible number of cases identified during the 2016 Zika, 2014-16 Ebola, 2009 H1N1

and 2003 SARS outbreaks. However, it is argued that such measures may “maintain confidence that air travel is safe,” thereby avoiding more excessive restrictions (there is a need for further research to support this contention).¹⁴

Travel sector reactions during outbreaks

Non-state actors are not directly bound by the IHR, with no single set of rules or norms for companies and industry associations with respect to outbreaks. This makes it difficult for businesses to strike an appropriate balance between implementing necessary measures to protect their commercial interests and imposing unwarranted travel restrictions.⁴

However, it is often difficult to isolate the reactions of travel organizations from those of States. The case studies below demonstrate the intertwined nature of outbreak-related decision-making between all stakeholders.

Case study 1: H1N1 influenza outbreak and Mexico

The 2009 H1N1 influenza pandemic originated in Mexico. On 1st May, WHO released a statement titled ‘No rationale for travel restrictions’ asserting that restrictions on travel would have minimal impact on preventing the spread of the virus, ‘but would be highly disruptive to the global community’.¹⁴ Despite this, half of 56 countries surveyed advised their citizens to avoid travelling to affected states.¹⁵

These included the UK, whose Foreign and Commonwealth Office issued advice against ‘all but essential travel’ to Mexico.¹⁶ Several UK-based travel operators such as Thomson, First Choice Holidays, and Thomas Cook cancelled trips to Mexico during the advisory period and beyond.¹⁷ It is unclear whether this was a direct response to the travel advisory, or for some other reason, such as cancelled bookings, pressure from their insurers, or concerns over healthcare provision in Mexico.

Other commercial airlines decreased flight numbers in response to reduced demand, for example Continental Airlines (US) air traffic to and from Mexico reduced by 40%, indicating public concern influenced commercial activity.¹⁸ A study modelling the impact of air-traffic reduction showed that it only delayed the spread of the infection by three days.¹⁸ In addition, five large global cruise lines cancelled their stops at ports in Mexico with US travel agents reportedly recommending that clients travel to alternate destinations.¹⁹ The overall impact resulted in nearly one million cancelled trips at an estimated \$2.8 billion loss to Mexico’s tourism industry.²⁰ A more extreme reaction was China which forcibly quarantined asymptomatic Mexican nationals in hotels, allegedly under instruction from the Chinese government after one Mexican entered the country who had contracted H1N1.²¹

The IHR Review Committee report emphasized the need for governments to make travel-related decisions based on available evidence, and for WHO to ‘energetically’ attain public health and scientific-based rationales for unwarranted restrictions.²² However, few governments informed WHO that they were implementing travel restrictions, and even fewer responded to WHO’s requests for justification of their restrictions.¹⁵

Case Study 2: Air travel during the 2014-2016 Ebola outbreak—British Airways and Brussels Airlines

During the 2014-16 Ebola outbreak in West Africa, transport to and from the three most affected States was disrupted by flight cancellations.²³ All but two airlines, Brussels Airlines and Air Maroc, suspended their flights. This case study summarises the IHR Review Committee's findings and the experience of two airlines.

The IHR Review Committee identified key barriers to ensuring uninterrupted travel during the outbreak:

- A lack of clear and consistent communication between relevant travel and transport entities (e.g. IATA and ICAO) and public health authorities (e.g. WHO) resulted in inconsistent, inappropriate and delayed information for private companies.
- Non-affected States introduced a variety of travel restrictions or requirements that obstructed flight operations. For example, government restrictions relating to recent travel to affected States made scheduling of operations and crew very difficult.
- Some States denied flights permission to overfly and/or land for refuelling or transit, even when no passengers with Ebola were on board. This complicated the evacuation of individuals with other health issues (e.g. malaria and gastroenteritis).
- Airline companies could not guarantee medical care in-country or via aeromedical evacuation for their crew and ground staff who developed non-Ebola health issues.
- In certain cases, individuals who appeared ill during exit screening were quarantined in unhygienic conditions with Ebola patients.²³

Despite British Airways and Brussels Airlines apparently facing the same set of challenges, their responses diverged. British Airways suspended flights to West Africa and has yet to resume service as of January 2020. While an inability to ensure a safe working environment for its staff was noted as the main reason for flight suspension, interview respondents also identified other factors including staff anxiety, which was largely fuelled by media and social media reporting, and the business imperative: airlines are commercial entities that must protect their financial interests, which means suspending flights that are economically non-viable owing to reduced demand. One roundtable participant also highlighted the incongruence between the Ebola advisories coming from different public health authorities such as the US Centers for Disease Control and Prevention (US CDC), the European Centre for Disease Prevention and Control (ECDC), Public Health England, and WHO; this disconnect undermined confidence in the advisories and had a negative impact on staff.

In contrast to British Airways, Brussels Airlines continued flights to West Africa, transporting more than 80,000 passengers and 2,000 tons of freight, mostly aid supplies, to the region.²⁴ The airline frequently commented that the humanitarian imperative underpinned its decision. For example, Geert Sciot, a vice president at Brussels Airlines, told *Time*: 'Without our flights it would become almost impossible for medical staff to reach the country'.²⁵

Reasons for Brussels Airlines maintaining operations included its small size which made communication and trust-building with staff and trade unions easier; instituting an 'opt-out' rather than 'opt-in' system for staff who did not wish to fly to affected countries; partnering with

Médecins Sans Frontières to deliver safety briefings to trade union representatives; upper management taking on roles as air stewards to and from Ebola-affected countries to demonstrate that flying was safe; and relocating the West African crew base to Senegal, thus removing the need for overnight accommodation in affected countries.^{5,24,26,27} Interview respondents also highlighted that Brussels Airlines was more dependent on its commercial activity in West Africa than British Airways and other major airlines. As a consequence, the company and its employees had a more significant stake in maintaining services.

One roundtable participant highlighted the indirect impact of restrictions during the 2014-16 Ebola outbreak when some US states imposed a quarantine period which affected flight crews carrying out aeromedical evacuation of Ebola patients. These quarantine periods thereby reduced crew availability for (non-Ebola) routine aeromedical evacuations within the US. This example also highlights a further complication in State's reactions to outbreaks, as in some federal States (such as the US), the individual states have a significant degree of autonomy with unclear divisions of authority between sub-national and national levels.

Media reactions during outbreaks

At the outset of a health emergency, the public and other stakeholders often use the news media and increasingly social media for up-to-date information and guidance. The news media is particularly influential when the urgency of the public health situation is not matched by the speed at which authoritative information is provided from actors such as States or the WHO.²⁸ The IHR Review Committee noted critical limitations in WHO's capacity to provide timely, relevant, and evidence-based information to stakeholders to inform their decision-making during the 2014-2016 Ebola epidemic,²³ thus requiring the public and other key stakeholders to turn to the news media to understand complex scientific information and develop advice on response measures.²⁹ In such a context, media coverage can sometimes be sensationalized or exaggerated rather than objective²⁹⁻³¹ and sometimes not entirely accurate. For example, a roundtable participant highlighted a news outlet describing Ebola as 'biological ISIS', whilst during the SARS outbreak, studies demonstrated that media reporting tended to create unwarranted fear and exaggerate the real risk of travelling to affected areas.^{30,32}

Social media, such as Twitter, WhatsApp, and Facebook, increasingly provides new avenues for communication and information sharing. On the one hand, social media platforms are an important tool for disseminating accurate information, engaging the public, and dispelling rumours and misinformation shared during crises.³³ On the other hand, it provides an opportune platform for misinformation to spread rapidly.³⁴ Participants agreed that once an inaccurate message has been circulated through either news or social media, it is very difficult to counter. Encouragingly, at the time of writing, a number of social media companies are actively enforcing measures to combat the spread of misinformation regarding COVID-19 on their platforms.³⁵

A number of participants highlighted the importance of 'geo-specificity' during outbreak reporting, arguing that the media tend to focus on the entire State or region rather than the specific pockets affected. This lack of geo-specificity can lead travellers to perceive unaffected areas or even entire regions (e.g. Africa), as 'high-risk'.^{33,37,36} The impact on the tourism sector is particularly high given its reliance on discretionary spending with tourists able to change their plans relatively easily in response to media coverage,³⁷ with widespread disruption of tourism across Africa during the West African Ebola outbreak.³⁸ Participants also postulated that sensational media reporting may have deterred aid workers travelling to West Africa and was a

key reason behind private sector decision-making, for example suspension of flights owing to the anxieties of crew and their families. Interviewees also perceived the media to have influenced the UK government during the 2014-2016 Ebola outbreak leading it to implement increasingly restrictive measures so as to appear to the public that it was ‘doing something’ to stop the virus from spreading to the UK.

Media roundtable participants emphasised that their ability to report responsibly is dependent on their access to accurate, timely and authoritative information. They will prioritize information from official sources such as governments and WHO, however, this is not always available. WHO was singled out by media participants as being too slow, leading them to rely on alternative sources during the 2014-16 Ebola outbreak such as Médecins Sans Frontières.

A participant from a national news service who was praised for their accurate and responsible coverage of the Ebola outbreak in West Africa highlighted the importance of having daily conversations with experts (although there was an issue as to who constituted an “expert”) and on-the-ground health workers. The general view of participants was that the news media could and would make positive contributions during outbreaks if relations between them and public health authorities (including WHO and national authorities) could be proactively developed.

Key challenges

Peer pressure

Several participants highlighted the role of peers in influencing the actions of private actors and governments. One participant described how company executives react to other companies suspending operations: ‘Executives say, “Well, that company is protecting their employees this much, and we also value our employees,”’ and then proceed to follow suit. A representative from a national public health institute spoke about the experience of working alongside the national government during the global 2009 H1N1 outbreak:

‘[Politicians] will say, “So, that country has entry screening [for H1N1], why don’t we?” And, then we argue, “Yes, but it’s not evidence-based, and the WHO is not recommending it.” Then they will say, “Yes, but that country is doing it, and they have epidemiologists as well advising them to do so.”’

It was widely agreed that peer pressure compounds the problems arising from inadequate risk communication and uncertainty during outbreaks.

Inadequate communication of risk to decision-makers

Roundtable participants noted that the lack of authoritative, accurate and timely information during outbreaks available to decision-makers made them more likely to implement travel restrictions. In the case of the Ebola epidemic in West Africa, the routine WHO briefings, conducted in ‘Geneva time’ were considered by participants to be insufficient in a 24-hour world, where decisions must be made rapidly regardless of the time of day or night, and also across time zones.

Roundtable participants claimed that outbreak-related guidance issued from WHO via member States is often insufficient, the language used is not perceived as authoritative, and may thus have contributed to decisions to reduce or stop travel. Roundtable participants from the travel and tourism industry, for example, found difficulty in translating technical advice into informed decisions about mitigation activities and this was compounded by incongruent advisories from the many States with which they interacted. Within this context, participants agreed that the

private sector would rather cease operations than risk their employees' health and wellbeing. It was also recommended that WHO develop a more transparent process for providing advice during outbreaks, justifying their recommendations with scientific evidence. This is especially relevant, as WHO's credibility has been questioned following its delay in declaring the 2014-16 Ebola outbreak a Public Health Emergency of International Concern, which some have also highlighted as a concern regarding the ongoing COVID-19 outbreak.⁶

In summary, both private actors and States grapple with the issue of insufficient and conflicting information associated with an outbreak. Consequently, decision-makers must make a judgment based on perceived risk, influenced by their varying levels of risk tolerance and approaches to mitigating risk. A participant shared an anecdote reflecting this point:

‘We held a simulation on outbreaks and travel... where the head of state of an economy with 80% of GDP based on tourism stood up and said, “In the absence of overwhelming information that suggests otherwise, I will act with an abundance of caution despite any technical recommendations to the contrary.”’

No agreed-upon central coordinating body

Many roundtable participants suggested that no substantial progress can be made in mitigating the impact of outbreaks on travel and tourism without a central coordinating body to provide reliable communication channels between all stakeholders, disseminate evidence-based information, monitor stakeholders' reactions and provide a mechanism for accountability if travel-related decisions by public and private actors unjustifiably interfere with global traffic and trade. This also reflects the post-Ebola IHR Review Committee recommendation to develop a taskforce to address this issue.²³

Some suggested that WHO was the most intuitive candidate for a central coordinating body, whilst others argued that WHO lacks the authority as its mandate is to advise national governments, not to regulate or coordinate private actors.

Data collection and public monitoring would be important roles for any coordinating body. WHO collected data on reactions to the 2014-16 Ebola response, however this was focused on the reaction of States. Other international organizations collect potentially relevant data (Annex 1) though many organizations charge access fees and the purpose of the data is currently unrelated to outbreaks. Roundtable participants highlighted three additional areas where monitoring by a coordinating authority could be useful:

- Addressing incongruences between outbreak-related communications of public health authorities (e.g. WHO, US CDC, ECDC);
- Co-ordinating travel- and outbreak-related communications by relevant private actors (e.g. airlines and tourist agencies);
- Monitoring and correcting of outbreak-related messages on social media.

Discussion

IHR seeks to facilitate rapid communication by a State that it has identified an infectious disease outbreak whilst minimizing the economic consequences for that State by limiting restrictions on trade and travel to those necessary for public health. Applying unreasonable and unnecessary restrictions is likely to be a disincentive to early reporting. Despite the IHR, travel restrictions

exceeding WHO Temporary Recommendations were imposed during the 2014-16 Ebola outbreak,³⁹ and similar restrictions are being applied during the current COVID-19 outbreak.⁴⁰ Our findings suggest that the issue of travel restrictions is much more complicated and nuanced than has been assumed and dependent on the decision-making of several interconnected stakeholders most of whom are not directly bound by IHR.

However, States play a significant role, and are sometimes responsible for the cessation of trade and travel (e.g. the UK and China during the 2009 H1N1 outbreak in Mexico). In other cases, States did not physically or legally prevent trade or travel, but rather imposed measures that influenced public perception of safety or did nothing to quell the fears of the public. Our research also highlighted the impact of 'peer pressure' of states on each other.

Our study confirms the finding in the IHR Review Committee report that travellers and other stakeholders employ their own semi-independent decision-making processes in the face of outbreaks. In essence, this is an assessment of the risk of continuing operations. For the travel industry and other commercial actors that rely on international travel it is influenced by official communications from various bodies; by the media; perceptions of the public and their workforce; and by the policies of other companies. Their assessment considers economic factors in addition to health and safety responsibilities and the scope for mitigation of risks. Perhaps inevitably, different stakeholders will come to different conclusions. Brussels Airlines applied different weights to individual factors compared to British Airways, and mitigated its risk using a variety of technical and other measures. Whether the technical measures could be scaled up to facilitate the functioning of other larger airlines requires further research. Table 1 Examples of factors which impact on travel during outbreaks.

Individual travellers may also undertake their own risk assessment and be swayed by information from governments, the media and (in the case of workers) from their employer. They may also be forced by the actions of industry stakeholders (e.g. airlines or insurance companies) to forego their travel plans. Their risk appetite will also differ according to their purpose for travel, e.g. a holiday that can be rescheduled versus a business meeting that cannot wait.

One common factor impacting the decision-making process is the lack of clear communication from different authorities and apparently differing advice from such authorities. Ships and aircraft receive directives and advice from authorities of the State in which they are based and of those to which they travel, in addition to advice from international bodies (such as WHO) and the media. Social media can also provide differing advice and information, some of it false. Differing advice causes confusion and a lack of confidence in any advice.

The development of timely, consistent and authoritative information and advice is key to influencing behaviour of all stakeholders. Indeed, recognising such gaps has led WHO to develop new guidelines for emergency risk communication which will be followed by detailed manuals and training tools to elaborate the recommendations.⁴¹ A number of measures taken by WHO since 2014 may also act to minimize the adverse impact on travel and tourism. These include WHO's restructuring and its Health Emergencies Programme;⁴² the development of the Joint External Evaluation tool to assess States IHR capability;⁴³ WHO's strengthened monitoring through media signals of measures imposed by states which can limit international travel; its more regular communication with ICAO, IATA, and the IMO; and the inclusion of findings related to travel in situation reports.⁴⁴ The World Economic Forum has also developed a 'travel and tourism' platform as part of its Epidemic Readiness Accelerator. The platform, to be

launched in 2020, will bring the private sector together with states and WHO for greater coordination and communication related to outbreak preparedness and response.⁴⁵ However, there is still no clear answer as to who is responsible for communicating with, and monitoring the actions of, the wide variety of public and private travel and tourism stakeholders, many of whom have a multi-national presence.

The role of the media in influencing States' decision-making needs further consideration. WHO interacts with individual States via Health Ministries and their National Focal Points, but it is often Heads of State and other Ministries who make final decisions. Addressing the other players and factors that impact travel and tourism may minimise the risk of States imposing unnecessary measures. WHO is expected to release guidelines on the health and economic impacts of the different measures that States often impose in response to outbreaks in 2020 and it is hoped that such guidance will provide the evidence decision-makers need to refrain from implementing ineffective measures that interfere with travel.⁴²

Our study has limitations. Although our literature review attempted to be thorough, it was not systematic and may have missed some relevant studies. Those attending the roundtable were identified through existing networks of the authors, their colleagues at Chatham House and Graduate Institute of International and Development Studies, and participants at earlier roundtables convened on the topics of monitoring⁴⁶ and the health and economic consequences of outbreaks.⁴ Many invitees were unable to attend and funding limited the ability to host a number of roundtables or any outside of Europe. Regrettably, stakeholders from countries affected by the 2014-16 Ebola outbreak were not present, although most stakeholder industries were represented. The case studies were selected based on information gathered at the earlier roundtables, and are provided as heuristics rather than as a comprehensive dataset. Furthermore, this paper is published during the ongoing COVID-19 pandemic which is outside the scope of the original research. The authors hope that the data and discussions presented herein will contribute to ongoing discussions as to the widespread travel restrictions currently in place.

Conclusion

Infectious disease outbreaks will inevitably impact travel and tourism. Given the complexity of decision-making during outbreaks, careful strategizing is required to consider how to mitigate this impact. The research and analysis provided herein will now need reviewing in light of the current COVID-19 outbreak. No doubt, as with the 2014-16 Ebola epidemic reviewed herein, the reasons and mechanisms will be found to be complex and nuanced with the greatly increased risk of COVID-2019's spread through air travel compared to Ebola a contributing factor. The epidemiology of the COVID-19 outbreak may also inform hypotheses on the impact of travel restrictions on limiting or slowing the spread of a viral respiratory pathogen. Further work is also required to determine whether some of the successful risk mitigation processes (such as those employed by Brussels Airlines during the Ebola epidemic in West Africa) can be scaled up in future outbreaks, especially where the risk of spread via air travel is limited.

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Table 1 Examples of factors which impact on travel during outbreaks

EXAMPLES OF MAIN DRIVERS OF DECISIONS ON TRAVEL POLICY		
Area/Subject	Impact	Mitigation

Epidemiology	Nature of disease, potential for spread etc. For new diseases, uncertainty tends to more extreme restrictions.	Investment in research and development, e.g. understanding disease; vaccine development etc
International Government Organizations, especially WHO	Provision of recommendations.	
Declaration of Public Health Emergency of International Concern	Primary impact: perception of policy makers and public.	Pressure on States not to exceed any WHO Temporary Recommendations
States – note character of States important (eg political, proximity to outbreak etc)	May directly restrict travel via Visa bans etc or indirectly via wording of “advisories”.	Pressure on Governments not to exceed WHO recommendations.
In Federal States (eg USA), individual states (eg California)	Individual states may have different policies on for example quarantine	As for State Governments.
International Non-Government organizations, eg IATA	Advice will be industry specific; should be coherent with WHO recommendations.	Communication with national representatives. Identify a co-ordinating body.
Messaging from media and social media	Can be influential in driving behaviour of policy makers and public.	Open and objective engagement with media; active rebuttal of “false news”
Peer pressure	Evidence that States, business and travelling public influenced by other States, businesses etc	Maintaining active messaging in support of objective policies
Travel Insurance policies	Non-availability will deter most from travelling.	
Economics	May make travel uneconomic.	Government subsidy.
EXAMPLES OF IMPACT OF SPECIFIC POLICIES		
Industrial relations	Those having the trust of their employees less affected	
Overflying restrictions		Re-routing where feasible.
Quarantine for those arriving from affected countries	May impact on availability of flight crews	Re-routing to alternative airfields where feasible
Weak in-country health facilities	May make overnight stops by flight crew unsafe	Adding a technical stop (see Brussels Airlines case study)
Availability of aeromedical evacuation.	If routine evacuation stops., places workers at risk	Not allowing travel crew to disembark in affected country.
Incoherence between policies of different States or between similar businesses	Leads to lack of confidence in any recommendations.	Active messaging and support of individual policies.

Annex 1. Examples of travel- and tourism-related data collected by international organizations

Organization	Data Collected	Data Accessibility
Airports Council International (ACI) https://aci.aero/	Monthly airport data on passenger, cargo, and traffic movements; publishes reports on traffic forecasts and special topics such as airport networks	Fee required; pre-2018 annual reports available online
Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA) www.capsca.org/	Conducts gap analyses in states and airports, compiles formal reports for respective states/aviation authorities but does not publish these	Not applicable
International Air Transport Association (IATA) www.iata.org/	Monthly data on domestic and international traffic, publishes passenger and freight forecasts; also publishes the Global Aviation Data Management program, which provides aggregated data on safety and accidents, and global benchmarking and analysis	Payment required
International Civil Aviation Organization (ICAO) www.icao.int/	Has been collecting data for 30+ years on air carrier traffic, airport traffic, air carrier fleet, airline finances, and flight personnel	Payment required
International Maritime Organization (IMO) www.imo.org/	No systematic data collection relevant to travel; publishes meeting summaries and outbreak communiqués	Publicly accessible
International Labour Organization (ILO) www.ilo.org/	Extensive employment data available by sector	Publicly accessible
United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) www.unocha.org	No systematic data collection relevant to travel; releases annual reports that cover infectious disease emergency response	Publicly accessible
Ports, Airports and Ground Crossings Network (PAGNet) extranet.who.int/pagnet/	No publicly available data collection; however, it is a platform for public health officials to share information on public health activities at ports, airports, and ground crossings	Not applicable
States Parties to the IHR (2005)	States Parties may provide a source for information on any travel and transport restrictions they have implemented during outbreaks, and the motivations behind these restrictions,	Not applicable

	however, this information would have to be sourced on a state-by-state basis	
World Bank www.worldbank.org	Measures annual Gross Domestic Product (GDP), transport services, travel services, and relevant various health, international tourism and infrastructure (including air transport and passengers) indicators	Publicly accessible
World Health Organization (WHO) www.who.int	Monitors reports of additional measures during outbreaks, such as travel restrictions and bans; however, these data are based on incomplete information as few countries actively inform WHO of these measures and very few justify the use of these measures when requested for more information; IHR Event Information Site (EIS) is used to disseminate information and alerts on public health events and allows for communication between the WHO and National IHR focal points	Available for WHO staff and national focal points only
World Economic Forum (WEF) Epidemic Readiness Accelerator https://www.weforum.org/projects/managing-the-risk-and-impact-of-future-epidemics	No data collection at the time of publication; ‘travel and tourism’ platform, to be launched in 2020, will bring private sector together with WHO and states for greater coordination and communication related to outbreak preparedness and response	Not applicable
World Tourism Organization (UNWTO) www.e-unwto.org	E-library with data on tourism in more than 198 states and territories from 1995 – 2018 (depending on the state)	Payment required
World Trade Organization (WTO) www.wto.org	Uses UNWTO and WTO-UNCTAD-ITC data to produce annual reports that include analyses of international travel and tourism	Publicly accessible
World Travel and Tourism Council (WTTC) www.wttc.org	Produces quarterly ‘Economic Impact’ reports including data on business and domestic tourism spending, and total contribution of tourism to employment and	Publicly accessible

UNCORRECTED MANUSCRIPT