BMJ Global Health

An analysis of WHO's Temporary Recommendations on international travel and trade measures during Public Health Emergencies of International Concern

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To cite: Worsnop CZ, Nass S, Grépin KA, *et al*. An analysis of WHO's Temporary Recommendations on international travel and trade measures during Public Health Emergencies of International Concern. *BMJ Glob Health* 2023;**8**:e012615. doi:10.1136/bmjgh-2023-012615

Handling editor Seye Abimbola

► Additional supplemental material is published online only. To view, please visit the journal online (http://dx.doi.org/10.1136/bmjgh-2023-012615).

Received 18 April 2023
Accepted 25 June 2023

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ABSTRACT

During Public Health Emergencies of International Concern (PHEICs), The International Health Regulations (IHR) require the WHO to issue Temporary Recommendations on the use of international travel and trade measures. During the COVID-19 pandemic, WHO's initial recommendation against 'any travel or trade restriction' has been questioned, and virtually all countries subsequently used international travel measures. WHO's Recommendations to States Parties also changed over the course of the pandemic. There is a need to understand how WHO's treatment of this issue compared with other PHEICs and why States Parties' actions diverged from WHO's initial Recommendations. This first analysis of WHO's Temporary Recommendations on international travel and trade measures during all seven PHEICs compares the guidance for clarity and consistency in several areas of substance and process. We find that lack of clarity and inconsistency in WHO guidance makes it difficult to interpret and relate back to IHR obligations. Based on this analysis, we offer recommendations to increase consistency and clarity of WHO's guidance on this issue during global health emergencies.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ During the COVID-19 pandemic, international travel measures were widespread and WHO's initial Recommendation under the International Health Regulations (IHR) against 'any travel or trade restriction' has been questioned.
⇒ Inconsistent and unclear language in the text of the IHR is well documented, but less is known about how WHO Temporary Recommendations on international travel measures have operated in practice and how WHO guidance during COVID-19 compares to other Public Health Emergencies of International Concern (PHEICs).

WHAT THIS STUDY ADDS

⇒ This study conducts the first comparative analysis of WHO Temporary Recommendations on international travel and trade measures issued during all PHEICs.
⇒ We find lack of clarity and inconsistency in several aspects of the substance of Temporary Recommendations and the process through which they are issued. As a result, Temporary Recommendations are difficult to interpret and relate back to IHR obligations.

INTRODUCTION

On 30 January 2020, WHO's director general (DG), Tedros Adhanom Ghebreyesus declared the outbreak and international spread of SARS-CoV-2 (and the disease it causes known as COVID-19) a Public Health Emergency of International Concern (PHEIC) under the International Health Regulations 2005 (IHR). As part of this declaration, WHO issued Temporary Recommendations advising against the adoption of 'any travel or trade restriction' beyond exit screening at China's international transit points.[1] While the IHR allow States Parties to apply 'additional health measures' that differ from WHO's Recommendations, any significant interference with international traffic—measures that refuse or delay entry/departure of people or goods for more than 24 hours—must be based on available scientific evidence and principles, be temporary in their use, be reported with their rationale to WHO, and adhere to human rights standards.[2]

Despite WHO's initial Recommendation, by the end of March 2020, almost all States Parties had adopted international travel measures that might be deemed inconsistent with WHO Recommendations.[3] During previous PHEICs such as H1N1 (2009) and Ebola (2014), about one-quarter of States Parties did so.[4–6]

During the pandemic, researchers and policy-makers have questioned WHO's initial Recommendation against international 'travel and trade restrictions'.[7–14] WHO's own Recommendations shifted over the course of COVID-19 to note that certain types of measures could be useful under certain

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Addressing lack of clarity and inconsistency in substance and process of Temporary Recommendations is a key step in improving border policy during PHEICs.

⇒ Defining language used in Temporary Recommendations, explaining Recommendations and changes to them, clarifying the significance of guidance issued through channels other than Temporary Recommendations, and identifying conditions under which Recommendations should be issued or changed would help to address interpretation challenges. Doing so may require that WHO, with states and subject matter and legal experts, reexamine the kinds of Recommendations that WHO can or should make regarding international travel measures.

⇒ The study findings should be considered in the ongoing IHR revision process because some of the proposed changes to the IHR risk exacerbating the issues we identify.

conditions. This perspective seems to differ from WHO's longstanding view that outbreaks should be contained at their source rather than at international borders. Indeed, as one global health expert notes, 'it's part of the religion of global health: travel and trade restrictions are bad.'[14]

This first comparative analysis of WHO Temporary Recommendations on international travel and trade measures traces WHO's guidance on this issue across all PHEICs. We compare Temporary Recommendations for clarity and consistency in the following areas of substance and process: (1) the top-line summary of Temporary Recommendations, (2) the language used to describe which international travel and trade measures are recommended or not, (3) the conditions under which states could or should apply such measures, (4) the rationale behind WHO Recommendations, (5) the other channels through which guidance was provided and (6) the timing of Recommendations.

METHODS

Through searches on WHO's website and publications repository, we identified all Temporary Recommendations issued during all PHEICs using IHR Emergency Committee (EC) statements and DG statements following EC meetings (covering the period April 2009–April 2023). Our initial search of Temporary Recommendations revealed that guidance has also been offered through other channels, including Situation Reports, Disease Outbreak News (DON) reports, other travel advice documents (including COVID-19 travel advice and similar statements from other PHEICs),[15] and press conferences.[i] We contacted WHO for these materials but they were not provided). As such, while our analysis focuses on Temporary Recommendations, we also discuss guidance issued through these other channels.

[i]Due to broken links, we were not able to review the Ebola press conferences dated 10 April, 11 May, 13 May, 9 September and 20 November 2015 or Ebola Situation Reports dated 1 July 2014 and 8 July 2014.

Note that we use the phrases 'international travel and trade measures,' 'international travel measures' or 'international trade measures' to refer to any measure managing cross-border travel or trade when the particular measure being referred to is unclear. These categories cover a wide range of policies, including measures like travel warnings and health screening, flight suspensions, visa restrictions, border closures, import/export restrictions and import/export bans, among others.[16] Below, all WHO language is in quotations or italicised to emphasise relevant phrases.

We identified all public health events characterised by WHO as PHEICs since WHO was granted the authority to make such declarations under the IHR (2005), which entered into force in 2007. The seven PHEICs are: influenza A (H1N1) (2009–2010), Poliovirus (2014-), Ebola Virus Disease (EVD) in West Africa (2014–2016), Zika virus (2016), EVD in the Democratic Republic of the Congo (DRC) (2019–2020), COVID-19 (referred to as novel coronavirus when first declared a PHEIC, 2020-2023), and Mpox (referred to as Monkeypox when first declared a PHEIC, 2022-2023).

Outbreaks eventually declared as PHEICs were chosen for this analysis for three reasons. First, their declaration requires that WHO issue Temporary Recommendations related to international travel and trade. These are defined in the IHR as 'non-binding advice issued by WHO pursuant to Article 15 for application on a time-limited, risk-specific basis, in response to a PHEIC, so as to prevent or reduce the international spread of disease and minimise interference with international traffic.'[17] Several IHR articles outline a common process that should inform these Recommendations during PHEICs. As such, it is instructive to examine what actually happens in practice. Second, PHEICs are supposed to share certain characteristics. According to the IHR, PHEICs are extraordinary events that pose a public health risk to other countries through international spread of disease and may require a coordinated international response. While these criteria are not always consistently applied and PHEICs vary in many ways,[18] PHEICs are more comparable to one another than are other outbreaks. And finally, given their nature, PHEICs in particular call for coordinated action by states, including regarding international travel and trade measures. In sum, PHEICs offer a useful analytical context for comparison and are the types of outbreaks that most require actionable guidance on international travel and trade measures.

For each PHEIC, we identified all Temporary Recommendations on international travel and/or trade measures as well as all guidance on this topic issued through the other channels mentioned above. All documents identified were read and analysed for mention of international travel and/or trade measures. We then compare Temporary Recommendations within and across PHEICs for clarity and consistency in the areas of substance and process noted above. To determine clarity, we examine whether terms and phrases in Temporary

Recommendations and the process behind those Recommendations were defined or left ambiguous. To determine consistency, we examine whether terms and phrases in Temporary Recommendations and the process behind those Recommendations varied within and across PHEICs and whether differences or changes were explained.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

FINDINGS

Below, we present a set of tables and narrative that illustrate variation in clarity and consistency across the identified areas of substance and process. The narrative includes illustrative examples. For full narrative descriptions of all guidance on international travel and trade measures during each PHEIC, as well as an exhaustive list of documents that mention international travel and trade measures and used in this analysis, see the online supplemental appendix.

The substance of WHO Temporary Recommendations

We examine three aspects of the substance of Temporary Recommendations: the *top-line summary* of Recommendations, the *language* used to describe which international travel and trade measures are recommended or not, and the *conditions* under which states should or could use certain measures.

Top-line summary of Temporary Recommendations

Table 1 illustrates that Temporary Recommendations during all PHEICs aside from Polio (2014) and COVID-19 (2020) consistently recommended against 'any travel or trade restriction,' or some variation of that language. In contrast, during Polio (2014), WHO did not make a general statement against 'restrictions,' instead recommending that States Parties determined by WHO to have cases of poliovirus with risk of international spread 'Restrict at the point of departure the international travel of any resident lacking documentation of appropriate polio vaccination.'[19] And, during COVID-19, while WHO initially recommended against 'any travel or trade restrictions,' over the course the pandemic Recommendations changed to note that certain types of measures could be useful under certain conditions.

The language used to describe which measures are recommended or not

We find variation within and across PHEICs in the clarity and consistency of language used to describe which international travel and trade measures are recommended or not. Table 2 shows that during all PHEICs, some Temporary Recommendations included relatively clear language recommending that states use or avoid particular measures. These Recommendations were often directed at certain states or populations. For example, WHO recommended that 'Pregnant women should *be advised not [to] travel* to areas of ongoing Zika virus outbreaks' during Zika (2016),[20] that affected countries 'continue *cross-border screening*,' and that '*entry screening* at airports or other ports of entry [should not be used] outside the region' during Ebola (2019),[21] that China 'conduct *exit screening*' during COVID-19 (2020),[1] and that 'confirmed or suspected cases and contacts' 'should *avoid undertaking any travel*, including international' during Mpox (2022).[22] Yet, during all PHEICs other than Ebola (2019)

Table 1 Top-line summary of Temporary Recommendations on international travel and trade measures

H1N1 (2009)	Recommended 'not to close borders and not to restrict international travel'.[24]
Polio (2014)	States Parties determined by WHO to have cases of poliovirus with risk of international spread should 'restrict at the point of departure the international travel of any resident lacking documentation of appropriate polio vaccination.'[19]
Ebola (2014)	'There should be no general ban on international travel or trade.'[25]
Zika (2016)	'There should be no general restrictions on travel or trade.'[20]
Ebola (2019)	'No country should close its borders or place any restrictions on travel and trade.'[21]
COVID-19 (2020)	January 2020: recommended against 'any travel or trade restrictions.'[1] February 2020: maintained top-line recommendation, but notes conditions under which 'measures that restrict the movement of people' and 'travel measures that significantly interfere with international traffic' could be useful.[29] April 2020: dropped top-line recommendation against 'any travel or trade restrictions' and recommends that States Parties base 'travel and trade measures,' 'measures applied to international travel,' 'health measures in relation to international traffic,' etc on a set of factors that change over time.[30 35 61] January 2021: opposed requiring proof of vaccination as a prerequisite for travel.[30 62] January 2022: recommended against 'traffic bans' and 'travel restrictions,' distinguishing those from 'travel measures' which include screening, testing, isolation/quarantine, vaccination. 'Travel measures' should be based on risk assessments.[31] July 2022: dropped mention of 'traffic bans' and 'travel restrictions' and recommended that States Parties should 'continue to adjust international travel-related measures, based on risk assessments.'[32]
Mpox (2022)	Recommended 'against any additional general or targeted international travel-related measures.'[22]

Table 2 Variation in the substance of WHO Temporary Recommendations on international travel and trade measures

Language	Clarity: is it clear which measures are being recommended or not?	Yes	H1N1 (2009), Polio (2014), Ebola (2014), Zika (2016), Ebola (2019), COVID-19 (2020), Mpox (2022)
		No	H1N1 (2009), Ebola (2014), Zika (2016), Ebola (2019), COVID-19 (2020), Mpox (2022)
	Consistency: are changes in language describing measures that are recommended or not explained (or are no changes made)?	Yes	Ebola (2019), Mpox (2022)
		No	H1N1 (2009), Polio (2014), Ebola (2014), Zika (2016), COVID-19 (2020)
Conditions	Clarity: are the conditions under which states could or should impose measures clearly defined?	Yes	Polio (2014), Ebola (2014), Ebola (2019), COVID-19 (2020)
		No	Ebola (2014), COVID-19 (2020)
	Consistency: are changes in the conditions under which states could or should impose measures explained (or are no changes made)?	Yes	Polio (2014), Ebola (2019)
		No	Ebola (2014), COVID-19 (2020)
		No conditions provided	H1N1 (2009), Zika (2016), Mpox (2022)

and Mpox (2022), even this relatively clear language was used inconsistently. For example, during Zika (2016), the language that pregnant women be advised to avoid travel to areas with ongoing outbreaks disappeared without explanation from Temporary Recommendations starting with the fourth EC meeting in September 2016.[23]

We also find that during all PHEICs aside from Polio (2015), Temporary Recommendations also included general language that did not make clear which measures were recommended or not. These general Recommendations were often directed at all states. For example, WHO recommended 'not to close borders and not to restrict international travel' during H1N1 (2009),[24] that 'there should be no general ban on international travel or trade' during Ebola (2014),[25] that 'there should be no restrictions on travel or trade' during Zika (2016),[26] that 'no country should close its borders or place any restrictions on travel and trade' during Ebola (2019),[21] against 'any travel or trade restriction' at the outset of COVID-19 (2020),[1] and against 'any additional general or targeted international travel-related measures' during Mpox (2022).[22]

Table 2 also shows that, aside from Ebola (2019) and Mpox (2022), this language was inconsistent within PHEICs. Language was also inconsistent across PHEICs. None of this variation was explained. For example, during H1N1 (2009), Recommendations against 'restrictions' sometimes mentioned restrictions on 'international travel' or 'international traffic and trade'.[24 27] During Ebola (2014), WHO sometimes recommended against a 'general ban on international travel or trade,' but sometimes used other language such as: 'avoid *unnecessary interference with international travel and trade…* The Committee noted that more than 40 countries have implemented *additional measures…*'[28] During Zika (2016), Temporary Recommendations after the second EC meeting added the word 'general' to the following: 'there should be no *general restrictions on travel or trade…*'[20] During COVID-19, WHO initially recommended against 'any travel or trade restriction,' but later Recommendations referred to 'restricting the movement of people and goods,'[29] 'travel measures that significantly interfere with international traffic,'[29] 'travel bans,'[30] 'international traffic bans,'[31] 'travel restrictions'[31] and 'international travel-related measures'.[32]

In summary, we find the language used to describe which measures are recommended or not to be unclear and inconsistent much of the time, both within and across PHEICs.

The conditions under which states could or should impose measures

We also find variation in a second aspect of the substance of Temporary Recommendations: the clarity and consistency of the conditions under which states should or could impose certain measures. Table 2 illustrates that in three cases—H1N1 (2009), Zika (2016), and Mpox (2022)—no conditions were provided and Recommendations against 'travel and trade restrictions', or some variation of that language, seems to apply to all states under all conditions. Sometimes, though, Recommendations during other PHEICs note conditions such as state characteristics, outbreak characteristics or other factors described below.

Temporary Recommendations issued during four of the seven PHEICs included relatively clear conditions under which states could or should impose certain measures: Polio (2014), Ebola (2014), Ebola (2019), COVID-19 (2020). In these instances, certain Temporary Recommendations applied to countries affected by a given PHEIC—for example, that states with 'active outbreaks' of Ebola (2014) impose exit screening.

In two cases—Ebola (2014) and COVID-19 (2020)—Temporary Recommendations also included relatively

unclear conditions that were not defined or were otherwise difficult to operationalise. The inclusion of these conditions in Temporary Recommendations was also inconsistent in that conditions were not always provided, or conditions changed without explanation. For example, following the fifth EC meeting regarding Ebola (2014), WHO newly recommended that states 'only implement measures which are *commensurate with the current public health risks.*'[33] During COVID-19 (2020), late February 2020 Recommendations newly noted that 'measures that restrict the movement of people may prove *temporarily useful*, such as in *settings with few international connections* and *limited response capacities*,' and that 'Travel measures that significantly interfere with international traffic may only be justified *at the beginning of an outbreak.*'[29] COVID-19 Temporary Recommendations have included a variety of other conditions like being 'based on a careful *risk assessment*,' '*proportionate to the public health risk*,' '*short in duration*,'[29 34] accounting for '*transmission patterns at origin and destination*, *cost–benefit analysis*, *evolution of the pandemic*, and *new knowledge of COVID-19*,'[34] being '*evidence-based*' and '*coherent*',[35] '*coordinated*',[30] '*risk-based*'[30] and based on '*best available evidence*'.[30] This variation in conditions was not explained.

In summary, within and across PHEICs, we find variation in clarity and consistency in the conditions included in Temporary Recommendations under which states could or should impose certain measures.

The process guiding WHO Temporary Recommendations

Next, we examine three aspects of the process through which WHO issues Temporary Recommendations: the *rationale*, the other *channels* through which guidance is issued, and *timing*.

The rationale behind Temporary Recommendations

We find inconsistency and lack of clarity in the rationales supporting WHO's Temporary Recommendations regarding international travel and trade measures (see table 3). In four cases—H1N1 (2009), Polio (2014), Zika (2016), Mpox (2022)—no explanation was given to support Recommendations on international travel and trade measures. In the three other cases—Ebola (2014), Ebola (2019), COVID-19 (2020)—rationales were provided but lacked clarity because whether and how different factors were weighed against one another was unspecified. Furthermore, we find inconsistency in these cases, in that rationale was not always provided or the rationale provided changed without explanation.

For example, during Ebola (2014), EC statements only sometimes explained the Recommendation that affected states implement exit screening by noting that it 'remains critical for *minimising the risk of exportation of Ebola cases*'.[28 33] Explanations for other Recommendations were also inconsistent. October 2014 Temporary Recommendations noted 'a general travel ban is likely to *cause economic hardship*, and *could consequently increase the uncontrolled migration of people* from affected countries, *raising the risk of international spread of Ebola*…normalising air travel and the movement of ships…*[will] reduce the isolation and economic hardship of the affected countries*'.[36] But, rationales were not always provided, and when they were provided the language often changed. For example, in January 2015, Temporary Recommendations added that 'such measures are *impeding the recruitment and return of international responders. They also have harmful effects on local populations by increasing stigma and isolation*'.[28]

Examples from Ebola (2019) and COVID-19 (2020) are also illustrative. During Ebola (2019), the Temporary Recommendation that 'no country should close its

Table 3 Variation in the process through which WHO Temporary Recommendations on international travel and trade measures are issued

Rationale	Clarity: is it clear which factors are being evaluated and how?	Yes	No cases
		No	Ebola (2014), Ebola (2019), COVID-19 (2020)
	Consistency: are changes in rationales explained (or are no changes made)?	Yes	No cases
		No	Ebola (2014), Ebola (2019), COVID-19 (2020)
		No rationale provided	H1N1 (2009), Polio (2014), Zika (2016), Mpox (2022)
Channel	Temporary Recommendations		H1N1 (2009), Polio (2014), Ebola (2014), Zika (2016), Ebola (2019), COVID-19 (2020), Mpox (2022)
	Disease Outbreak News reports		H1N1 (2009), Polio (2014), Ebola (2014), Zika (2016), Ebola (2019), COVID-19 (2020), Mpox (2022)
	Situation Reports		Zika (2016), Ebola (2019), COVID-19 (2020)
	EC commentary/advice		Ebola (2014), Ebola (2019), COVID-19 (2020)
	Other document (other travel advice, joint statements)		H1N1 (2009), COVID-19 (2020)
	Press conferences		Ebola (2014), Polio (2014), Zika (2016), Ebola (2019), COVID-19 (2020)

EC, emergency committee.

borders or place any restrictions on travel and trade' was only sometimes explained by noting that 'such measures are *usually implemented out of fear and have no basis in science'* while causing the '*movement of people and goods to informal border crossings that are not monitored, thus increasing the chances of the spread of disease'* and that 'these restrictions can also *compromise local economies and negatively affect response operations from a security and logistics perspective*'.[21] The Temporary Recommendation against entry screening outside of the region was never explained.

During COVID-19, initial Recommendations against 'any travel or trade restriction' did not include an explanation. Later Recommendations against 'travel or trade restrictions' cited their *limited public health value* and potential to '*divert resources* from other interventions…*interrupt needed aid and technical support… disrupt businesses*, and… have *negative social and economic effects* on the affected countries'.[29] Recommendations regarding other measures sometimes cited other rationales. For example, in April 2021 the EC recommended to states: 'do not require proof of vaccination as a condition of entry, given [limited *evidence about their effectiveness*] and the *persistent inequity* in the global vaccine distribution'.[37] Often, though, rationales were not provided for new or modified Temporary Recommendations during COVID-19.

In summary, we find lack of clarity and inconsistency across and within PHEICs in the rationales guiding Temporary Recommendations.

The channel through which guidance was issued

Our analysis also revealed inconsistency in the channel through which guidance was issued (see table 3). Sometimes, as with Situation Reports, these channels reiterated Temporary Recommendations. Often, though, the language used, conditions provided and rationales given were inconsistent across channels. For example, during H1N1 (2009), while the EC statements did not explain the Temporary Recommendations, WHO did provide a rationale for its Recommendation against 'trade restrictions' in a 2 May 2009 joint statement with the Food and Agriculture Organization, World Organization for Animal Health (OIE) and World Trade Organization.[38]

During Ebola (2014), outside of the 'Temporary Recommendations' section of EC statements, the EC sometimes discussed measures not mentioned in Temporary Recommendations. For example, in September 2014, the EC acknowledged that *quarantine* may sometimes be considered necessary 'in States with intense and widespread transmission'.[39]

During Polio (2014), a January 2019 DON report, issued well after the PHEIC was declared, noted that 'WHO does not recommend *any restrictions on travel and/or trade* to the DRC'.[40] Temporary Recommendations during the PHEIC have not included similar language.

During COVID-19 (2020), guidance that differed from Temporary Recommendations was often provided through COVID-19 Travel Advice documents. For example, on 11 February 2020, a COVID-19 Travel Advice document diverged from the latest Temporary Recommendations against 'any travel or trade restriction' by noting conditions under which these might be justified and a new rationale: '*travel measures that significantly interfere with international traffic*…may have *public health rationale* at the *beginning of the containment phase* of an outbreak, as they may allow affected countries to *implement sustained response measures*, and non-affected countries to *gain time* to initiate and implement effective preparedness measures'.[41]

Other travel advice provided guidance on 'a risk-based approach to international travel,'[42–44] initially developed in July 2020. The approach highlights conditions for States Parties to consider in decision-making about international travel measures, including health capacities and the status of the pandemic in origin and destination countries.

November 2021 travel advice in response to Omicron used new language and cited new rationales: '*Blanket travel bans* will *not prevent the international spread*, and they place a *heavy burden on lives and livelihoods*…they can *adversely impact global health efforts* during a pandemic by *disincentivizing countries to report* and *share epidemiological and sequencing data.*'[45] The advice also noted that, 'National authorities…may apply *a multi-layered risk mitigation approach*…Such measures may include *screening of passengers prior to travelling and/or upon arrival, including via the use of SARS-CoV-2 testing or the application of quarantine to international travelers*… [any] travel-related risk mitigation measures should be *part of an overall national response* strategy.'[45] While some components of these advice documents were eventually incorporated into Temporary Recommendations, not all were; and, when the advice documents were initially issued they differed from the current Temporary Recommendations.

Compared with Temporary Recommendations, statements during COVID-19 press conferences also used different language and noted different conditions under which states could or should use certain measures. For instance, during the second half of 2020, officials sometimes noted negative implications of travel measures by placing partial blame on 'travel restrictions' for 'disruptions to immunisation activities,'[46] but sometimes justified States Parties' use of measures not recommended by WHO by noting that states were acting according to the 'precautionary principle' when imposing 'travel restrictions'.[47]

In early 2023, when asked about several states' new testing requirements for all travellers from China (at times including Hong Kong and Macau), Michael Ryan, WHO Executive Director for Health Emergencies, noted that 'the reality for China now is that many countries have felt that they *don't have enough information to base their risk assessment*. So, they're taking *a precautionary approach*, they're applying *precautionary principle* and requiring testing'.[48] Ryan further commented that '*testing* in itself *is not a travel restriction*. It's a requirement for travel. It's *not an excessive measure* based on any individual country's risk

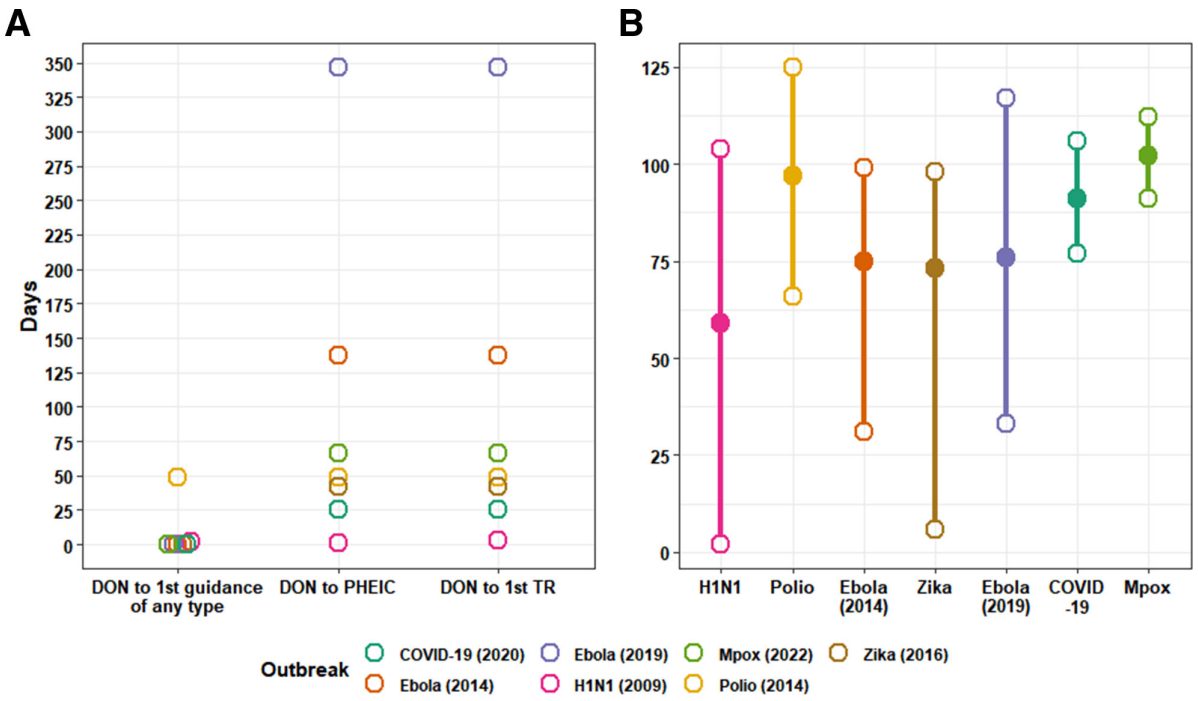

Figure 1 The timing of guidance on international travel and trade measures during PHEICs. (A) Days between first Disease Outbreak News (DON) report and first guidance of any type, the PHEIC declaration, and the first Temporary Recommendation. (B) Frequency of EC meetings (bottom transparent circle is minimum number of days between meetings, middle solid circle is the average number, and top transparent circle is the maximum number). EC, emergency committee; PHEICs, Public Health Emergencies of International Concern.

assessment.' Ryan went on to say that '*travel measure* in themselves, particularly *restrictive travel measures*, are often *counterproductive*' but that the testing requirements many countries imposed on travellers from China was '*a risk-based testing requirement* and *not restrictive travel measures.*'[48] In that same press conference, the DG noted that 'with *circulation in China so high* and *comprehensive data not forthcoming*…it is understandable that some countries are taking steps *they believe will protect their own citizens.*'[48] This language and the rationales provided differ from the Temporary Recommendations in place at the time.

In summary, we find variation in the channels through which guidance is provided within and across cases, and in some cases, inconsistency in the substance of guidance across channels.

The timing of guidance

The timing of guidance was also inconsistent within and across cases (see figure 1). For each outbreak, figure 1A shows variation in the time between the first DON report and the first guidance of any type, the PHEIC declaration, and the first Temporary Recommendation regarding international travel and trade measures. In five of the seven cases, the first guidance on international travel and trade measures was issued in WHO's first DON report on the outbreak. During H1N1 (2009), 2 days passed until the first guidance was issued. In the case of Polio (2014), 49 days passed between the first DON report and the first guidance. There was also variation in the timing of the first Temporary Recommendations on international travel and trade measures, which were issued fastest during H1N1 (2009) at 3 days from the first DON and slowest during Ebola (2019) at 347 days from the first DON. In one case—H1N1 (2009)—the initial PHEIC declaration did not include Temporary Recommendations on international travel and trade measures. In most cases, after a PHEIC was declared, subsequent Temporary Recommendations were issued through EC statements, and so the timing of such Recommendations was driven by when those meetings were held. Figure 1B shows that those meetings, and so the issuance of Temporary Recommendations, occurred at irregular intervals.

While guidance was issued irregularly over time during all of the PHEICs, COVID-19, in particular, illustrates this within-case variation. As noted above, during COVID-19 (2020), in addition to Temporary Recommendations, substantive guidance on international travel and trade measures was often issued through COVID-19 Travel Advice documents, even after the PHEIC was declared. Figure 2 illustrates the timing of guidance on international travel and trade measures issued through Temporary Recommendations or COVID-19 Travel Advice documents. While guidance was issued fairly frequently at the outset of the outbreak, after issuing revised Recommendations on 29 February 2020, no guidance on international travel and trade measures was issued until the next EC meeting on 30 April 2020. Within that time, COVID-19 spread globally and travel measures proliferated as well, with nearly all states imposing some kind

Figure 2 Timing of guidance on international travel and trade measures during COVID-19. PHEIC, Public Health Emergencies of International Concern.

of travel measure at the border. Figure 2 illustrates that guidance continued to be issued irregularly over time.

DISCUSSION

We find that WHO guidance during all PHEICs aside from Polio (2014) and COVID-19 (2020) reflects WHO's long-standing view that outbreaks should be contained at their source rather than at international borders. During COVID-19, WHO initially recommended against 'any travel or trade restrictions,' but over the course the pandemic recommended that certain types of measures could be useful under certain conditions. Novel crises may challenge pre-existing practices so it is not necessarily surprising that WHO's position on this issue would evolve during COVID-19 and differ compared with other PHEICs.

Within and across PHEICs, we also find inconsistency and lack of clarity in the other areas of substance and process identified above. As a result, WHO's guidance is hard to interpret and difficult to relate back to relevant articles of the IHR. While COVID-19 highlighted these issues in particular, our analysis points to similar issues during most PHEICs. Addressing the inconsistency and lack of clarity in Temporary Recommendations is necessary for States Parties to interpret and follow WHO's guidance.

First, inconsistency and lack of clarity in the language used in Temporary Recommendations makes it difficult to determine which measures are recommended or not. Recommendations against a 'general ban on international travel or trade' (Ebola 2014), 'any travel or trade restriction' (COVID-19 2020), or 'additional general or targeted international travel-related measures' (Mpox 2022) do not define which measures fall under such categories. These statements seem to suggest that States Parties not adopt any measures at their borders. Of course, general language that does not specify particular measures is not intrinsically problematic. But, the lack of clarity regarding which measures were recommended or not, in conjunction with variation in this language across and within PHEICs, leads to interpretation issues. For instance, are there meaningful distinctions between different phrases used within and across PHEICs such as 'general ban on international travel or trade' and 'any travel or trade restriction,' or are they meant to refer to the same set of measures? Ebola 2014 provides an illustration. Most travel measures imposed included flight suspensions, visa restrictions, and entry restrictions targeting the states affected by the outbreak: Guinea, Liberia and Sierra Leone. Are these measures inconsistent with WHO's recommendation against 'general bans on international travel' even though they target particular countries? Sometimes, even seemingly clear language is hard to interpret. For example, during Ebola (2019), WHO recommended that affected states continue 'cross-border screening'. Does this mean both entry and exit screening?[ii]

Attempts during COVID-19 to clarify language still raised questions. For instance, WHO eventually sought to distinguish between different types of measures and recommended that States Parties should 'lift or ease international *traffic bans*… [but that] '*travel measures* (eg, masking, testing, isolation/quarantine, and vaccination) should be based on risk assessment…' Yet, which measures constitute unacceptable 'traffic bans' and acceptable 'travel measures' remains unclear. For instance, there is no mention of countries or populations targeted by such policies—would an entry restriction on travellers from one country be a 'traffic ban' and so not recommended, whereas a quarantine requirement on travellers from all countries still be a 'travel measure' and so potentially acceptable?

Inconsistent language within and across PHEICs is not necessarily problematic. Outbreaks differ from one another and so may necessitate different Temporary Recommendations regarding international travel and trade measures. And, learning can occur over time during an outbreak, resulting in updated Recommendations. However, since language is often not defined and changes in language are not explained, it is difficult to identify substantive changes in Recommendations. As a result, it is often hard to interpret which measures are being recommended or not.

[ii]Lee *et al*[16] also point to the lack of a shared definition of terms describing the wide range of travel measures used during COVID-19, suggesting that this is an issue not only for WHO but also states and the media.

Furthermore, language used in Temporary Recommendations does not clearly relate to relevant articles of the IHR. Article 18 notes different types of Recommendations that WHO can deliver to States Parties with respect to persons, baggage, cargo, containers, conveyances, good and postal parcels (see online supplemental appendix box 3). WHO's language often differs from what is included in Article 18. For example, Article 18 notes the option of 'no specific health measures are advised,' but WHO has never used that language when it makes Recommendations against 'travel or trade restrictions'.

Second, inconsistent and unclear conditions under which states could or should apply international travel and trade measures makes it difficult to ascertain when measures should be used. For example, during Ebola (2014), did the addition of the Recommendation to 'only implement measures which are *commensurate with the current public health risks'* to the Recommendation that 'There should be no general ban on international travel or trade' signify a substantive change in WHO's Recommendations to acknowledge that there were some conditions under which travel measures not recommended by WHO could be warranted?[25] If so, which conditions and which measures are these?

Similarly, Temporary Recommendations during COVID-19 note a number of conditions related to timing, state characteristics, the status of domestic response, status of the pandemic and available evidence, among other factors. While it is true that lessons learnt from COVID-19 suggest that timing and the status of the domestic response influence the utility of international travel measures,[8 49 50] it is not clear how these factors are assessed and applied in practice, or what States Parties should make of their inconsistent inclusion in Temporary Recommendations.

More detailed interim guidance documents on a 'risk based approach to international travel' offered a more systematic way to think about the many contextual factors that could influence the use of travel measures. And, 'risk-based' language was often used in WHO Recommendations starting in mid-2020. But, the guidance remains ambiguous. For example, in the interim guidance, WHO asks states to consider: 'Will the number of cases to be imported from the country of departure likely have a significant impact on the current transmission level in the country of destination?' The guidance does not note which measures to use if that threshold is met. And, there is no definition of 'significant impact'. To be sure, the interim guidance was meant to inform and not determine States Parties decisions. Furthermore, it may not be possible to specify a threshold of cases that would have a significant impact in every case, so flexibility in how 'significant impact' is defined makes sense. Nevertheless, the lack of clarity even in a document meant to help states implement a risk-based approach reflects the overall lack of clarity regarding the conditions that States Parties should or could consider in decisions regarding travel measures.

Again, it is not clear whether or how some of these factors relate to the IHR. Article 43 notes conditions under which States Parties may impose measures not recommended by WHO (see online supplemental appendix box 4). How do conditions mentioned during COVID-19 such as 'coherent', 'risk-based', 'coordinated' and 'settings with few international connections and limited response capacities' relate to Article 43? Others have pointed to the subjectivity of terms included in Article 43[51 52]; therefore it is possible that some of these factors align with the Article. But, this remains uncertain since none of the terms are defined in Temporary Recommendations.

Third, inconsistent and unclear rationales behind WHO's Recommendations make it difficult to understand why WHO is issuing certain guidance. In the majority of PHEICs, rationales were not provided. When rationales were provided, it is not clear why certain factors were being weighed more heavily than others, or how. For example, during Ebola (2014), the Recommendation that affected countries impose exit screening cites the positive public health impact, while the Recommendation against 'a general travel ban' cites the negative public health, economic and social impacts. Does that mean that there were no positive public health impacts of the latter and no negative public health, economic or social impacts of the former; or, that on measure, analysis of all of these possible impacts favours the use of exit screening but not 'general travel bans'? Decisions about international travel and trade measures may be complex and politically sensitive for States Parties—without a clear rationale behind Temporary Recommendations or changes to those Recommendations, it may be difficult for States Parties to justify following WHO guidance.

It is again unclear whether and how provided rationales relate to the IHR. Article 17 notes factors and stakeholders that the DG should consider when issuing, modifying, or terminating Temporary (and standing) Recommendations (see online supplemental appendix box 2). It is not clear whether or how these informed Temporary Recommendations. While further deliberation may have taken place outside of public view, the rationales provided are the best approximation of WHO's decision-making about Temporary Recommendations using publicly available information. That the majority of PHEICs never include a rationale for Temporary Recommendations points to an opaque process. Further, rationales that are provided do not necessarily accord with Article 17's 'criteria for recommendations'. For example, the EC often cited equity concerns to explain its Recommendation that States Parties not require proof of COVID-19 vaccination to travel. While equity is an important factor to consider, it is not immediately clear where it fits in Article 17. Further, Article 17 applies to the DG, not the EC. That the DG tends to accept the advice of the EC regarding Temporary Recommendations verbatim raises the question of how this body makes its suggested Temporary Recommendations. What factors is the EC considering?

These are not outlined in the IHR and EC statements do not offer clarity on the decision making process.

Inconsistency in the channel through which guidance on international travel and trade measures is issued adds to the difficulties in interpretation already discussed. Issuing guidance through channels other than Temporary Recommendations makes sense in some cases—for instance, before a PHEIC is declared WHO cannot issue Temporary Recommendations but may still want to provide guidance on international travel and trade measures. It also makes sense to reiterate or further explain Recommendations during press conferences. During a novel and fast evolving outbreak such as COVID-19, it also might be prudent to issue advice or further explanation more frequently as with the COVID-19 Travel Advice documents. But, there were inconsistencies in language, conditions and rationales across channels, particularly during COVID-19. For example, Ryan's statement that testing requirements on travellers from China in January 2023 were 'a risk-based testing requirement and not restrictive travel measures' raises the question of which measures are 'restrictive' and which measures are 'risk-based', and whether he means that there are no conditions under which the former are acceptable.[48] The statement also implies that the testing requirements could be interpreted as acceptable or even recommended by WHO under the risk-based approach to international travel. But, it is not clear how the risk-based approach is being applied in this case.

How should conflicting guidance issued through different channels be interpreted? Under Article 43, States Parties are supposed to consider 'any available specific guidance or advice from WHO' when deciding whether to impose trade or travel measures, including those not recommended by WHO. But, the IHR do not outline a process for developing or issuing such guidance or advice, or specify how and whether such guidance differs from Temporary Recommendations. This is important because, as shown above, guidance issued through other channels has sometimes differed from Temporary Recommendations. They have also often included language and conditions that are not clearly related to the IHR. For example, Article 43 does not cite the precautionary principle, beliefs in the utility of measures, or a lack of data sharing by countries—all conditions mentioned by WHO officials during COVID-19 press conferences—as justifiable conditions for States Parties' use of travel measures. And, it is not clear whether or how these conditions relate to the criteria laid out in Article 43.

Variation in the timing also raises questions about the interpretation of WHO's guidance. It is not surprising that the timing of guidance would vary across PHEICs given their differing characteristics, especially regarding the use of travel and trade measures. But, it is not currently clear why guidance is issued at certain times rather than others across and within PHEICs. This has been especially true during COVID-19 in which there have been several long gaps in guidance (through any channel) when it would have been useful to states given the trajectory of the pandemic or the proliferation of international travel measures. IHR Article 15 (see online supplemental appendix box 1) does refer to the timing of Recommendations, noting that they must be issued when a PHEIC is declared, when they expire, and how long they can be in force. But, the IHR do not otherwise note how often Recommendations should be issued or updated, other than when factors identified in Article 17 point to issuing new or modified Recommendations. As such, it is not currently clear how States Parties should treat guidance that seems to lag behind current circumstances.

Overall, this analysis finds that lack of clarity and inconsistency in WHO Temporary Recommendations regarding international travel and trade measures make them difficult to interpret and act on. Furthermore, there are several areas of potential disjuncture between the IHR text and WHO's issuance of guidance in practice.

Recommendations

Based on this analysis, we make six recommendations for WHO, together with states and legal and subject matter experts. First, clarify the meaning of language used to describe international travel and trade measures and use that language consistently in Recommendations and guidance on this topic (and explain changes in language). One option is to define what terms such as 'restriction', 'ban' or 'measure' mean, along with modifiers such as 'general', 'unnecessary' and 'additional'. Terms need not be newly defined every time they are used, but instead WHO could release a guidance document with clear and agreed definitions that could be periodically updated, similar to the guidance documents and toolkits that support implementation of IHR core capacities.[53]

In addition to clarifying definitions, WHO can offer examples of previously used language that can serve as a model for improved clarity in the future. One example from Ebola 2014 is illustrative. Temporary Recommendations from the seventh EC meeting noted that, 'There should be no general ban on international travel or trade; there should be no restrictions on the travel of EVD survivors; only those restrictions outlined in these recommendations regarding the travel of EVD cases and contacts should be implemented…Those States which currently implement excessive or inappropriate travel and transport measures that go beyond these temporary recommendations should terminate such measures by end of October 2015'.[54] While the general statement 'no general ban on international travel or trade' is unclear for reasons specified in the above discussion, the following statement that 'only those restrictions outlined in these recommendations regarding the travel of EVD cases and contacts should be implemented' provides clarification.

Second, WHO should clarify the types of conditions that could be used by governments to justify use of travel or trade measures, including those not recommended by WHO. These conditions should be referenced consistently in Temporary Recommendations, or changes in

conditions should be explained. Definitions for conditions such as 'coordinated', 'coherent', 'commensurate with the current public health risks' could be provided in the guidance document recommended above. If it is not possible to define certain terms, WHO should consider not including such terms in its Recommendations or guidance.

Third, WHO should explicate rationale behind guidance and changes in guidance. Establishing a standard format for reporting Temporary Recommendations would facilitate this, along with the prior two recommendations. For instance, all Temporary Recommendations could include the following sections: (1) recommendations (with subsections for types of states as is often done already), (2) other conditions to consider, (3) modifications compared with previous recommendations and (4) rationale for recommendations and modifications. During COVID-19, WHO occasionally made clear when modifications were made to Temporary Recommendations, but this was inconsistently done.

Fourth, WHO should clarify the significance of different channels through which guidance is issued, and ensure that statements and commentary issued across channels is consistent, or that inconsistencies and clarifications are explained. As discussed above, it may be useful for WHO to have mechanisms for issuing guidance separate from Temporary Recommendations. But, without more attention paid to consistency, communicating through multiple channels risks mixed messaging.

Fifth, to address inconsistent timing of Recommendations and guidance, identify the conditions under which guidance should be issued, reiterated or modified. Currently, Temporary Recommendations on travel and trade measures are often tied to the timing of EC meetings. We recommend that these be decoupled so that it is possible to issue Temporary Recommendations outside of EC meetings. We do want to offer a cautionary note here, however. COVID-19 has made clear that the effect of a range of travel measures is dependent on the domestic response and the response of other countries. As such, making it possible to issue Temporary Recommendations on travel and trade measures outside of EC meetings should not result in further isolating this component of outbreak response. It should be one component of a broader set of inter-related interventions. An alternative to decoupling, then, would be to revisit the timing of EC meetings so that all types of guidance are issued at relevant intervals.

Clarifying and explaining Temporary Recommendations in the ways just described requires consideration of several questions regarding the kinds of Recommendations WHO can or should make on this issue. Some of these questions include: how specific can WHO Recommendations be given the state of the evidence base on travel and trade measures? Should WHO focus on recommending what States Parties should do, what they should avoid doing, both, or either depending on the circumstance? Are WHO Recommendations meant to be prospective, reactive, both, or either depending on the circumstance? What implications do the answers to these questions have for improving and assessing compliance with the IHR? Indeed, even if the clarity and consistency of WHO Recommendations improve, language always leaves some room for interpretation. Relatedly, how do or should Temporary Recommendations and other guidance on this issue relate to IHR provisions? For example, must language in and rationales for Temporary Recommendations adhere to the text of the IHR, or can they deviate given that they are non-binding?

These last questions relate to our sixth and final recommendation, that the issues of clarity and consistency identified in this analysis should be considered in the ongoing IHR revision process. The above discussion pointed out several inconsistencies and unanswered questions in how Temporary Recommendations and guidance is issued in practice when compared with the text of the IHR. Several proposals currently under consideration for revising the IHR have potential to exacerbate these issues and raise new questions. Three examples are illustrative.[55 56] First, several proposals seek to make WHO Recommendations more binding, by, for example, removing 'non-binding' from the definition of Temporary Recommendation in the current IHR. Second, States Parties have proposed strengthening implementation and enforcement of the IHR by forming a 'compliance committee' or 'implementation committee' to create monitoring and evaluation frameworks, and possibly name and shame states for noncompliance. Third, several proposals seek to establish intermediate health alerts that would be declared for events that do not yet constitute a PHEIC—some call this a 'traffic light' approach.[57]

There are legitimate arguments for and against these proposals and it is not clear what will be included in a final revised text. Failing to address the issues of clarity and consistency identified in this analysis, however, would complicate the implementation of these and other proposals. Making Temporary Recommendations binding will not improve compliance if States Parties cannot interpret the Recommendations they are bound to follow. Tracking compliance through a compliance or implementation committee will prove difficult for similar reasons. Finally, this analysis shows that issuing Recommendations in practice has been fraught with only one level of health alert. Introducing a traffic light approach to health emergency declarations would require careful revision to the Articles discussed here that relate to Temporary Recommendations on international travel and trade measures. We do not suggest that changes to the IHR should not be made in these areas and others. Rather, if current issues related to Temporary Recommendations and other guidance on international travel and trade measures are not considered and addressed, many proposed changes to the IHR risk exacerbating the issues we identify.

CONCLUSION

While inconsistent and unclear language in the text of the IHR has been documented,[51 52 58] this analysis shows how these are manifest in practice in WHO's guidance on international travel and trade measures.

Addressing the issues demonstrated here is difficult. Crises such as COVID-19 can highlight problems that may have existed before but had not been tested or seen as significant. As such, this analysis is meant to support WHO on this challenging issue rather than to criticise. During COVID-19, when these issues were most pronounced, WHO was strapped for resources, the team in the IHR Secretariat working on international travel and trade measures was small while the number of measures adopted by states numbered in the tens of thousands. Monitoring States Parties actions and making sense of them in real time, amid an evolving global pandemic, was a monumental challenge. Furthermore, the evidence on the utility of international travel and trade measures remains contested, as it has been throughout the pandemic. Therefore, it was not possible then and is still not possible now to issue Recommendations on which specific measures certain countries should take under which specific conditions.

Nevertheless, we highlight several areas that deserve attention moving forward and make a set of recommendations to improve clarity and consistency of WHO's guidance. While difficult to solve, scrutinising the issues of substance and process identified here can frame an important discussion on the authority of WHO and the IHR regarding international travel and trade measures. There are many reasons why states may not follow WHO guidance on travel and trade measures during global health emergencies.[3–5 59 60] And, future research should investigate whether and how lack of consistency and clarity in guidance contributed to the widespread and uncoordinated use of international travel measures during COVID-19. The text of the IHR already allows for states to exercise some policy flexibility regarding whether they follow WHO guidance; inconsistency and lack of clarity in the guidance itself makes it that much easier for states to ignore it or interpret it the way they see fit. Addressing these issues of substance and process will not completely solve compliance issues with the IHR, or immediately improve border policy during major outbreaks, but it is a crucial step forwards in doing so.

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Contributors CZW conceptualised the study, developed the methodology, led data analysis and drafted the manuscript. SN collected data, conducted data analysis and contributed to manuscript drafting. KAG and KL contributed to study conceptualisation and provided input into the manuscript. All authors have approved and are accountable for the final version of this submission.

Funding This study was funded by New Frontiers in Research Fund (operating grant awarded under the Canadian Institutes of Health Research Rapid Research Funding Opportunity) (NFRFR-2019-00009).

Competing interests CZW was a member of a WHO guideline development group and technical consultation in 2019. KL was a member of two donor-funded reviews of WHO in 1995 and 1997. She was previously a codirector of the WHO Collaborating Centre on Global Change and Health, and has received WHO funding for research on globalisation and infectious diseases, global health governance, tobacco control and COVID-19. She is currently a member of an expert group and editorial board supporting the WHO Programme of Work on the Economic and Commercial Determinants of Health.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as online supplemental information.

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