Annexes to Weekly Epidemiological Record (WER) Evidence Review – Public health measures in the aviation sector in the context of COVID-19: Quarantine and isolation

Tables and figures for ethical and equity considerations

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Background

This document contains annexes to the Weekly Epidemiological Record (WER) Evidence review – Public health measures in the aviation sector in the context of COVID-19: Quarantine and isolation [1]. Annex 1 contains the tables and a figure that summarize PROGRESS-CANDALS [2] assessment of primary studies. Annex 2 is a summary table of consolidated feedback from External Review Group [3] of the International Travel and Health (ITH) Guideline Development Group (GDG) [3] on the PICO [1] question on public health measures in the aviation sector in the context of COVID-19 – Quarantine and isolation. Annex 3 is the same from the Lay Perspective sub-group of External Review Group [3].

Contents

[1] The PICO framework is a standard mnemonic used in evidence-based-medicine to capture the elements of interest when crafting a question around a health intervention, and particularly informs literature search strategy. P stands for population, I for intervention, C for comparison (comparator), and O for outcome(s)

References

1. Weekly Epidemiological Record (WER) Evidence review – Public health measures in the aviation sector in the context of COVID-19: Quarantine and isolation https://www.who.int/publications/journals/weekly-epidemiological-record Weekly Epidemiological Record No.21 2021 96 (http://apps.who.int/iris/bitstream/handle/10665/341435/WER9620-eng-fre.pdf, accessed 21 May 2021)
2. Evidence to recommendations: Methods used for assessing health equity and human rights considerations in COVID-19 and aviation. Interim guidance, 23 December 2020. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/bitstream/handle/10665/338056/WHO-2019-nCoV-Aviation-evidence_equity-2020.1-eng.pdf, accessed 1 February 2021).
3. International Travel and Health Guideline Development Group. Geneva: World Health Organization (https://www.who.int/groups/international-travel-and-health-guideline-development-group-(gdg), accessed 19 December 2020)

ANNEX 1. PROGRESS-CANDALS ASSESSMENT OF PRIMARY STUDIES

Table 1. Assessment of reporting and data stratification by health equity and human rights considerations in studies of quarantine and isolation [5] as a public health intervention for mitigation of COVID-19 in aviation

HE/HR reporting in primary data sources	Any* mention (n/N)	P (n/N)	R (n/N)	O (n/N)	G (n/N)	R (n/N)	E (n/N)	S (n/N)	S (n/N)	C (n/N)	AND (n/N)	A (n/N)	L (n/N)	S (n/N)
Reported at all	14/18	13/18	0/18	0/18	5/18	1/18	0/18	0/18	0/18	3/18	0/18	6/18	0/18	0/18
Data stratification: main outcomes	6/18	1/18	0/18	0/18	5/18	0/18	0/18	0/18	0/18	0/18	0/18	6/18	0/18	0/18
Data stratification: harms	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18
Data stratification: feasibility	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18
Data stratification: acceptability	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18
Reported by traveller experience	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18
Explicit reporting of HR infringement	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18	0/18

Abbreviations: HE = health equity; HR = human rights; n = number of studies with factor addressed; N = total number of studies.

* of any PROGRESS-Plus factor. PROGRESS-CANDALS: place of residence; race/ethnicity; occupation; gender/sex; religion; education; socioeconomic status; social capital; citizenship; ability, neurotypicality or neurodiversity, disability; age; literacy and/or fluency in a language in which the aviation sector produces public communication; and size, body mass index (BMI), or its proxies.

Table 2. Narrative synthesis of the impact of PROGRESS-CANDALS and other relevant factors on outcomes reported in aggregate (across included studies)

HE/HR reporting in primary data sources	Narrative synthesis of the impact of PROGRESS-CANDALS and other relevant factors on outcomes reported in aggregate (across included studies)
Sex/Gender	1. Five studies reported sex breakdown in cohorts of repatriates, incoming travellers, or positive cases (1387 M [64.5%] : 763 F [35.5%], N=2150 total) 2. Three studies reported sex breakdowns of positive cases, with 1 study reporting higher incidence rates for males across age brackets 3. One study reported symptom severity by sex with 56% of males manifesting pneumonia (n=5/9) vs. 33% of females (n=1/3) 4. One study reported male sex as an independent correlate of longer containment delay with an AOR of 1.41 5. One study reported attack rate by sex (4.03% M vs. 5.38% F)

Age	1. Six studies reported age strata and/or medians with ranges 2. Two studies reported attack rate or secondary attack rate by age strata, with lowest attack rates and secondary attack rates in those <20 years old and 10 years old, respectively • <20 yrs 0%; 20-39 yrs 4.95%; 40-59 yrs 9.86%; >60 0% • <10 yrs 0% super spreaders (i.e., transmission to >5 people); 10-65 yrs 6% super spreaders; >65 yrs 7% super spreaders 3. Two studies reported symptoms by age strata 4. One study classified 'super spreaders' by age with none <10 years of age, 6% in age bracket 10-65 years of age, and 7% >65 years of age 5. One study reported a change in the age structure of cases between 2 waves with 1st wave dominated by those >45 years of age (74%) and 2nd wave dominated by those <44 years of age (70%) 6. One study reported longer containment delays with increasing age in both univariate analysis (mean 6.1 d for >65 years of age vs. 2.4 d for <24 yrs of age) and multivariate analysis (AOR 1.01 age >65 yrs)
Citizenship	1. Three studies reported on citizenship of included cohorts (e.g., all in cohort Malaysian or Japanese; all crew Singaporean)
Place of Residence	1. One study was conducted in residents of the People's Republic of China explicitly; another study reported on students from China studying in the -Republic of Korea; and another reported data from residents of Hong Kong, Special administrative region of China 2. Two studies reported on flights repatriating residents of either Malaysia or Japan 3. One study reported data from the epidemic tree in New Zealand 4. Seven studies reported modelling data in particular countries and/or regions as follows: UK (n=2 studies); New Zealand (n=2 studies); Kenya (n=1 study); Taiwan, Special administrative region of China (n=1 study); China and Singapore (n=1 study)
Religion	1. One study reported on 14 clusters involving 77 cases during their first wave, 1 of which occurred in a Buddhist worship hall involving 19 cases

Figure 1. Assessment of reporting and data stratification by health equity and human rights considerations in studies of quarantine and isolation [5] as a public health intervention for mitigation of COVID-19 in aviation

HE/HR reporting in primary data sources	**Any* mention**	**P**	**R**	**O**	**G**	**R**	**E**	**S**	**S**	**C**	**AND**	**A**	**L**	**S**
Shaikh Abdul-Karim. Int J Emerg Med 2020														
Al-Qahtani. IJID 2020														
Arima EID 2020														
Chen. J Formosan Med Association 2020														
Chen. Lancet ID 2020														
Chen. TMAID 2020														
Clifford. pre-print 2020														
James. pre-print 2020														
Lucy. pre-print 2020														
Ryu. Int J Env Res Pub Health 2020														
Steyn. pre-print 2020														
Taylor. pre-print 2020														
Wilson. medRxiv 2020														
Wong. BMJ Glob Health 2020														

Abbreviations: HE = health equity; HR = human rights.

* of any PROGRESS-Plus factor. PROGRESS-CANDALS: place of residence; race/ethnicity; occupation; gender/sex; religion; education; socioeconomic status; social capital; citizenship; ability, neurotypicality or neurodiversity, disability; age; literacy and/or fluency in a language in which the aviation sector produces public communication; and size, body mass index (BMI), or its proxies.

Legend for reporting of PROGRESS-CANDALS:

Present	Absent	Unknown

Table 3. Assessment of reporting of health equity and human rights themes in studies of quarantine and isolation [5] as a public health intervention for mitigation of COVID-19 in aviation

HE/HR themes in primary data sources	Reported (n/N)	Narrative synthesis of themes reported in aggregate
Economic factors or implications	7/18	1. One study reported that each quarantined person in government quarantine was charged at least $20/day in catering costs 2. One study noted individual financial stress as a general concept of harm 3.Two studies cited work exclusion with lost work productivity as a negative economic consequence 4. One study reported the danger of front-line workers being reluctant to get tested or report symptoms for fear of workplace exclusion without pay. The study cited the need for comprehensive paid sick leave as a mitigation strategy. 5. Three studies reported larger negative economic impacts through reduced tourism and business operations 6. One study reported that early isolation/quarantine/border closures actually increased domestic travel and consumer spending, which offset economic losses
Parental separation from children during isolation or quarantine	2/18	1. Two studies reported that children were allowed to quarantine upon arrival with either their mother (1 study) or families (1 study)
Violation of privacy protection and information governance, or differential experience of treatment of personal data pursuant to Article 45 of IHR (2005) *(8)*	0/18	
Differential experience of detention, exclusion, or entry denial	1/18	1. One study reported that charging those in quarantine for their costs "led to an uproar from the general population" and to a few individuals escaping quarantine
Freedom of religious expression	0/18	
Differential experience of specific PHI harms (e.g. mask-related subjective dyspnoea, epistaxis/NP trauma, exacerbation of cynophobia)	1/18	1. One study reported that charging those in quarantine for their costs "led to an uproar from the general population" and to a few individuals escaping quarantine
Differential experience of health measures relating to entry of international travellers as outlined in Articles 31[a] and 42 of IHR (2005)	0/18	
Differential experience of treatment of international travellers as outlined in Article 32[b] of IHR (2005)	0/18	
Other theme: Psychological effects	1/18	1. One study cited the negative psychological effects of social isolation
Other theme: Fast track lanes	1/18	1. One study cited the presence of fast track lanes at the PoE for children, elderly, and responders

Other theme: Social impacts	1/18	1. One study cited reduced travel as a contributor to adverse social impacts by decreasing business interactions, tourism, and movements of international students
Other theme: Police brutality	1/18	1. One study reported that government quarantine facilities are an avenue to perpetuate police brutality
Other theme: Limitations of data	1/18	1. One study cited the lack of data on ethnicity as a methodological limitation
Other theme: Social acceptability and feasibility of PHI uptake	1/18	1. One study reported that uptake of PHIs to control the pandemic is dismal in the context of densely populated cities, overcrowded housing, high use of public transport, and limited access to soap, water, and hand sanitizer

Abbreviations: HE = health equity; HR = human rights; IHR = International Health Regulations; PHI = public health intervention; NP = nasopharyngeal; n = number of studies with factor addressed; N = total number of studies.

a. For example, invasive medical examination, vaccination, or other prophylaxis as a condition of entry of any international traveller to the territory of a State party.

b. For example, provision of adequate meals, accommodation and clothing, protection for baggage and other possessions, appropriate medical treatment, means of necessary communication, if possible, in a language understood by the international traveller.

ANNEX 2. Consolidated feedback from External Review Group (ERG) of the International Travel and Health (ITH) Guidelines Development Group (GDG) for COVID-19 public health mitigation measures in the aviation sector.

PICO 5. What is the effectiveness of self-isolation and/or self-monitoring and/or quarantine of air travellers (passengers and/or crew) on arrival in preventing the importation and transmission of SARS-CoV-2 into a destination country?	
P: Air travellers (passengers and/or crews) in 2020	Receiving country population '2020' – Yes this is a key question and one which WHO has been actively discussing with the industry participants within the structure of the CAPSCA report now with ICAO's Council Aviation Recovery Task Force.
I: Air travellers (passengers and/or crews) self-isolation (voluntary but recommended) post arrival Air travellers (passengers and/or crews) self-monitoring (voluntary but recommended and no isolation) post arrival Air travellers (passengers and/or crews) quarantine (= required by the destination country) post arrival	Obligatory quarantine has a similar effect with border closure since people will not travel if they know they will be quarantined for 14 days when arriving and maybe another 14 days when returning back Clearly define Quarantine (Government facility vs home vs hotel) and self-isolation (any exceptions?) Government managed quarantine is more effective, once voluntary passengers often do not stay at designated facility – may hamper study Self-monitoring is very different to quarantine in terms of consequence – suggest splitting this question Additional question around allowing free travel between countries of similar risk Additional question about select origin / destination pairs with controls in place versus opening borders completely between countries
C: Air travellers (passengers and/or crews) not recommended to self-isolate post arrival Air travellers (passengers and/or crews) not recommended to self-monitor post arrival Air travellers (passengers and/or crews) not required to quarantine (no isolation, no restriction of movements) post arrival	
O: Rates: a. Importation of COVID-19 cases into the destination country. b. SARS-CoV-2 transmission in the destination country? Fiscal: costs	How does one determine a potential contact or passenger suspected of being infected with COVID-19 in order to accurately determine importation? What are the denominators and ratio's? In Melbourne, Australia, our 'second wave' of cases appears to have originated from returned travellers (international air passengers) housed in hotel quarantine (i.e. mandatory 14-day period of quarantine on arrival into the country for all incoming passengers). This is well-supported by genomic data and is an example of a quarantine policy having a negative impact on transmission. However, this

Harms: a. individual (harms of isolation & exclusion from society); b. societal (collective harms of isolation & exclusion from society); c. economic (aviation, other); d. health equity and human rights (safety [e.g., domestic violence], accessibility, child development) Feasibility User Acceptability	experience would not be captured by the current proposed questions or inclusion criteria. See my general comments below re: expanding inclusion criteria in terms of study designs For all questions where you state harms: aviation I would add tourism. We speak classically of direct, indirect and induced economic impacts.
Additional Comments	In countries populations (P), how does obligatory self-isolation and/or self-monitoring and/or quarantine of all incoming travellers from certain country origin (I) compared to countries that do not implement those measures (I) affect importation of COVID-19 cases (O) within the past 10 months (T)?

ANNEX 3. Consolidated feedback from Lay Perspective Sub-Group of ITH GDG ERG for COVID-19 public health mitigation measures in the aviation sector.

PICO 5. What is the effectiveness of self-isolation and/or self-monitoring and/or quarantine of air travellers (passengers and/or crews) on arrival in preventing the importation and transmission of SARS-CoV-2 into destination country?
• Requirements of self-isolation are difficult to achieve and be controlled by concerned authorities as compared to mandatory quarantine as enforced by government • Effective and necessary for at least a week • Quite effective if strictly observed. Participants have to make arrangements for food and the necessities for daily living activities so they may require family or third party support to increase its effectiveness
During the current COVID-19 pandemic, do you have any issues / thoughts / questions / concerns / anxieties / frustrations / expectations / comments on: various approaches to isolation and/or monitoring and/or quarantine of air travellers (passengers and/or crews) on arrival?
• Many of the Indigenous communities we represent have extreme overcrowding and a shortage of housing, leaving no available isolation/quarantine space on arrival for air travellers • Most remote Indigenous communities have been in a state of lockdown since the Covid-19 pandemic began, leaving no accommodations in an emergency (i.e., bad weather, low cloud ceiling common) for pilots/crew; many communities have asked flight crews to stay outside the terminals and limit their contact with others • Due to the expansive geographic area in northern Ontario, most commercial flights serving Indigenous communities operate in a “milk run” fashion; this means flights stop in multiple locations to pick up and drop off passengers in a given day; this increases the risk of inter-community spread • Some disabled people require care from others to be able to live their regular lives. They also may require regular access to assistive technologies, medications, or supplies. They may also need adaptations in their environments (e.g., accessible toilets, showers, beds). Any approaches to isolation or quarantine need to ensure they don’t cut people off from the things or people they need in their lives to survive. Otherwise, you may be preventing COVID but creating other health issues from the physical and mental strain of being without. • This is one area that I particularly dread, because from experience, any approach that is composed of a blanket rule applied to all people (e.g., you must stay in this hotel room alone for 2 weeks), will fail people like me. • Massive difference between the way the UK and Canada monitor the 14-day quarantine. Was not contacted at all by the UK gov, whereas had to complete a day-by-day check-in during the 14-day period in Toronto, also was rung 3 times. Definitely felt more stressed/controlled when arriving in Toronto rather than London. • Are there quantitative measurements for answering each of these questions so that each issue is treated equally? As a traveller, I want to know weak points are being covered. Concern is if a weak spot is identified, what are the remedial actions? In other words, are each of these points equally safe? • Are there mechanisms to make sure each step of a traveller’s journey is safe from home to destination? Are there mechanisms to ensure travellers that every effort has been made to protect them? What actions and which is the steps in the journey are there recommendations for the traveller so the onus is on them. • As a travel writer, the primary fears/concerns are a. physical or face to face contact within the airport b. contact with other passengers on the plane that are behaving inappropriately i.e. Removing their masks once the plane has departed • Travel confidence would be bolstered if contactless payment, security and boarding could be made possible. Is there a question that could be added to cover this eventuality? • Notification in advance of delays could limit time at airport, so if delays or cancellations occur, mechanisms need to be in place. • Is the answer to all the questions going to result in travellers reassurance that they will be safe from home to airport and airport to final destination? • Once you have all the information, how does it translate into safety protocols? • Do you have sufficiently sharp tools to answer every single one of your questions with a high level of accuracy?

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