

UIC COVID-19 TASK FORCE

RAILsilence

Contamination Rates on Trains

State of the art - December 2020



INTERNATIONAL UNION
OF RAILWAYS

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UIC COVID-19 TASK FORCE

Amid the coronavirus disease outbreak, UIC set up a task force combining UIC member companies, experts and other relevant stakeholders (AAR, AFRA, African Union, ALAF, AllRail, ANPTrilhos, APTA, CER, CIT, EIM, EPF, ERFA, ETF, ETOA, IATA, OTIF, UIC Alliance of Universities for HSR UITP, UNECE and UNIFE) to work together to find ways to respond to this crisis that were adapted to the railway sector.

The UIC Covid-19 taskforce's main purpose is to provide a trusted space for our members and fellow transport associations to share information with one another regarding this crisis. As this is an unprecedented, global crisis, being able to come together and benefit from each other's experiences has been key in the fight to protect lives while still providing a minimum of our essential service: transport.

As this continues to be a global crisis, it needs a global response, and UIC is uniquely placed to create a space where rail stakeholders the world over can come together and cooperate. At our taskforce meetings we bring together railway stakeholders from Asia, Africa, Europe, the Middle East, Oceania and the Americas, and all are benefiting from each other's knowledge and experience.

Response to this crisis for the rail sector requires them to navigate a changing environment, with a day-to-day, agile approach, in the now and also continuing on to the short and medium terms.

Between March and October 2020, five UIC Guidance Documents and two state of the art papers for Railway Stakeholders have been published and made available online at: uic.org/Covid-19.

Since then, information has continued to be shared among members.

All the information shared by the members is available upon joining the task force and registering for UIC Extranet access at the Covid-19 Task Force Workspace at extranet.uic.org/en.

Relevant multimedia information is available in the UIC Media Center at mediacenter.uic.org.

The UIC Covid-19 task force has also created a Linked-In group where relevant newspaper articles and upcoming webinars are shared. Join us: www.linkedin.com/groups/13846065.



1. INTRODUCTION

The Covid-19 pandemic is gathering momentum in some European and North and South American countries, while it has stabilised or even disappeared in Asian countries, thanks to extremely stringent measures.

The key goal for our societies is to keep the economy and our businesses running while limiting the spread of the virus as much as possible. This applies during the crisis and even more so when restrictions on travel are lifted in those countries affected.

6 Business can be carried out via remote meetings and working from home, but some in-person activities are also necessary, either due to the type of business or because companies need face-to-face meetings to maintain a personal connection with their employees. But travel is not simply associated with work. There are many other reasons to travel, including school or university classes, exams and competitive examinations, and personal reasons: shopping, healthcare appointments, urgent family reasons, supporting disabled persons, legal summonses and other administrative processes, etc.

It would be very harmful if all these journeys were undertaken using private transport, especially those that are less environmentally friendly like private cars, as, according to the World Health Organisation (WHO), air pollution is a contributing factor in the spread of the virus.

It is therefore necessary to restore public confidence in train travel and ensure that users are aware that the transmission risk in trains is very low.

The other documents produced by the UIC Covid-19 Taskforce present the various measures designed to restore passenger confidence in public rail transport: disinfection, mask wearing, social distancing rules, ventilation, etc.

But this has unfortunately not been sufficient to restore passenger confidence. The media, with little knowledge of the subject, all too frequently point the finger at public transport as a major vector of transmission, when in fact infection on public transport is far less likely than in other situations, such as in the workplace, during family gatherings, etc.

The aim of this document is to provide the facts to indicate that the transmission risk on trains is very low.

For the purposes of evaluating the transmission risk on trains, this document is based on scientific studies carried out by competent bodies. Accountability for the results in this document rests with the studies cited, and the results may naturally be affected by evolving scientific knowledge on the subject of infection on trains or the introduction of new measures for rail transport.



2. COVID-19 TRANSMISSION IN TRAINS AND OTHER PUBLIC TRANSPORT – STUDY RESULTS

2.1 CLUSTERS

Multiple studies provide evidence that clusters in trains are extremely rare. A systematic review of 65 studies which involved 108 cluster infections identified only one cluster related to a train journey [1]. This train journey took place from Wuhan to Beijing in January 2020, masks were not worn, and it appears most likely that a coughing train passenger infected a family of four [2]. In Germany, recent data also found that no Covid-19 clusters could be traced back to train travel [3]. Further, in Japan, no clusters were able to be tracked to commuter trains [4] and a more in-depth analyses of Covid-19 cases reported between January 15 – April 4, 2020 found zero clusters originating on trains [5].

Most national studies undertaken regarding clusters do not specify train travel but refer to a more general category of transport. Even within this category, clusters are rare. For example, in France the Public Institute on Health Information (Santé Publique France) analysed data collected between 9 May and 28 September 2020 only linked 1% of clusters to transport [6]. In Spain, the Centre for Coordination of Health Alerts and Emergencies of the Ministry of Health has linked only 0.05% of all clusters to transport [7]. In Austria, as of October 2020, only one cluster in a public transport context could be found [8].

Clusters are particularly hard to assign to transport as many countries do not have in place a rigorous contact tracing system and may not be able to identify all persons who rode in the same train as a Covid-19 positive case.



However, the lack of traceability is not the only reason why clusters are rarely found on trains, as it is also due to the nature in which people ride on trains: they are quiet (talking loudly has been shown to spread the virus), they wear masks and, depending on the type of voyage, may not spend much time on the train compared to other settings and remain seated for long distance journeys, leading to a lower general risk level than other areas where clusters have been found (e.g. bars, restaurants and family gatherings).

2.2 CASE STUDIES

Beyond using contact tracing to determine clusters, infection rates of Covid-19 from using public transport can also be studied by examining rates of infection and rates of public transit use.

The American Public Transport Association (APTA) carried out an analysis of public transit ridership in 15 American cities and found no correlation with the rise or fall of local Covid-19 cases and the rise or fall of public transport use [9]. They found similar results for several international cities: Tokyo, Hong Kong, Seoul, Singapore, Paris, Vienna and Milan [9].

Thus, they conclude what you do at the end of your journey (e.g. going to restaurant vs. going home) has more effect on your risk of contamination than the use of public transport. This is consistent with a survey of public transport agencies carried out by the New York Times whereby they did not find any links between Covid-19 cases and public transport [14]. The New York Times concluded that public transportation should not be considered as a transmission source [14].

Many public transport stakeholders have also had their trains and facilities tested for Coronavirus and found no traces of the virus, as was the case for Metrovalencia [10] and Tranvía de Murcia [11] in Spain or Transport for London [12] and Govia Thameslink Railway [13] in the UK.

2.3 MODELS

Another way researchers are examining the contamination risks of train travel is through the creation of mathematical models.

RSSB's model demonstrated that when wearing masks, infection risk per average passenger journey in the UK, based on a travel time of 60 minutes, was found to be only 0.005% (1 in 20,000), regardless of train type, for a checkboard seating style (therefore not full capacity) [15].

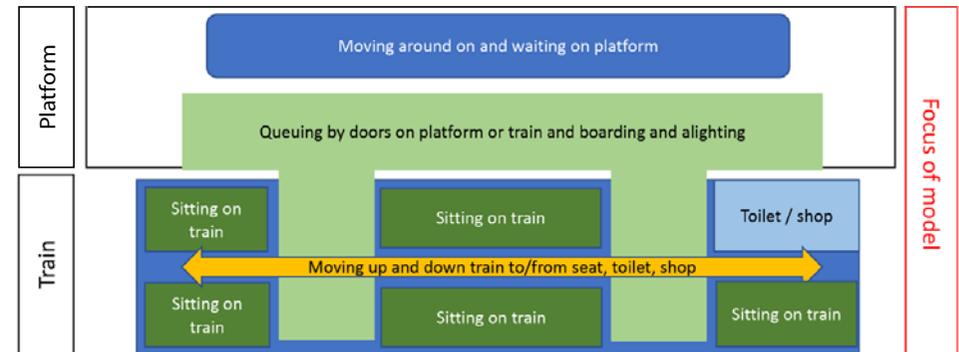


Figure 1 RSSB mathematical model parameters schema taken from [15]

The University of Colorado Boulder has published their own model which found that the probability of being infected in a subway setting to be less than 1% [16].

2.4 TRAIN STAFF

Another good indication of train travel being Covid-19 safe is the lack of cases found by various train companies in their staff. The recent Deutsche Bahn AG (DB AG) study tested over 600 train attendants who have frequent, direct contact with passengers, and found zero cases of SARS-CoV-2 infection, which they associate with the success of the current hygiene rules (e.g. masks) [17]. Further, the study added that testing from DB Fernverkehr demonstrated no statistically significant difference in infection rates of onboard service staff from other employees, all of whom had a lower infection rate than the general population of Germany [17]. Also in Germany, the public transport industry association Verband Deutscher Verkehrsunternehmen (VDV) recently conducted a survey with their members and found that only a very small number of employees had confirmed corona cases (0.29%) compared to the German national value (0.54%¹) [18].



1. Figure from October 27 2020

3. RISK PERCEPTION OF PUBLIC TRANSIT

Based on the scientific evidence laid out in section 2, when recommended behaviours such as mask wearing are followed, the risk of Covid-19 transmission on trains is less than 1%. This begs the question, are people still afraid to travel on trains due to Covid-19?

Despite the new scientific evidence and recent publications touting the safety of public transport [19][20], such as when APTA stated, “a large portion of travelers’ fear of riding transit is based on unsubstantiated perceptions regarding the safety of transit vehicles and risk of infection [9],” due to early claims that closed spaces such as public transport, including trains, were likely to be Covid-19 transmission hot spots, a general fear of catching Covid-19 in such spaces seemed to be widespread.

Recent surveys however are demonstrating that the general population are eager to return to public transport if mitigation measures are in place. A YouGov survey carried out between 14 and 21 May 2020 and covering 21 cities across 6 European countries (France, Germany, Italy, Spain, the U.K. and Belgium) found that more than 80% of public transit users “are willing to regain previous habits if the right precautions are in place” [21].

Transport Focus in the UK has carried out over the last 27 weeks surveys regarding public transport and public risk perception. The most recent survey (November 2020) found that 87% of passengers who travelled by train felt safe in relation to Covid-19 while travelling, and 45% of respondents said that if they had to make a journey at the moment, they would feel safe doing so by train [23].



When asked to self-report what measures could be taken by transport operators to make them feel safer on transport, a similar study carried out in the USA found that 92% offered up measures (as opposed to saying no measure would make them feel safe), many of which are already being undertaken: increased cleaning, requiring masks, reducing maximum passenger occupancy, ensuring physical distancing and supplying more trains [22].

The link between mitigation measures and risk perception of public transport with regard to Covid-19 led the authors of a policy brief to the European Parliament to suggest that public transportation could re-establish trust and reduce the perception of transit being high risk by “guaranteeing physical distance and obliging passengers to use masks” and that “assets should be constantly cleaned and disinfected, and these operations should be visible to commuters” [21]. UIC offered similar advice in its guidance document *Potential measures to restore confidence in rail travel following the Covid-19 pandemic* published in April 2020.

4. CONCLUSIONS

It is safe to travel by rail during Covid-19

As seen in section 2, ever more scientific evidence is demonstrating that one can travel safely by rail thanks to the many mitigation measures that transport operators and station managers have put into place, such as requiring masks, increased cleaning and disinfecting, making sanitary gel available and ensuring physical distancing as much as possible.

Train travel is increasingly perceived as safe

As seen in section 3, when mitigation measures are put in place, recent studies show that the public are increasingly reassured as to the safety of train travel. The best way to increase this growing perception is to continue to apply measures and communicate about them in masse.

Research on Covid-19 continues

Research into the safety of train travel in relation to Covid-19 is still ongoing. DB AG is continuing into the long term the study of infection rates among train staff. RSSB is working on updating their model. A newly funded research project in the UK, TRACK, will study how the virus spreads (e.g. air particles, touch) and how much in the enclosed space of a train or bus [24]. The project LUQAS between DB AG and the German Aerospace Center aims to investigate droplet and aerosol dispersion in train carriages and assess safety measures (e.g. masks, ventilation) against existing infection risks. This new and ongoing research will help railway stakeholders in implementing mitigation measures to fight the spread of Covid-19.



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Contact: COVID19@UIC.ORG
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INTERNATIONAL UNION OF RAILWAYS
16, rue Jean Rey - 75015 Paris - France
Tel. +33 (0)1 44 49 20 20
Fax +33 (0)1 44 49 20 29
E-mail: info@uic.org

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