

Supplementary Material

Air recirculation role in the infection with COVID–19 during the quarantine period, lessons learned from Diamond Princess cruise ship **Orouba Almilaji**

Table S1. Confirmed Passengers Counts.

Date	Count	Explanation	Reference
5 th Feb 2020	3711	Population onboard at 5 th of Feb; passengers (2666) and crew members (1045).	NIID (19 th Feb), 2020
19 th Feb 2020	717	717 passengers disembarked from the ship on 19 th of Feb after a two-week quarantine, showing no symptoms of COVID-19 such as coughing or fever, and had not been in close contact with anyone who tested positive.	Asahi Shimbun, 2020
20 th Feb 2020	619	confirmed cases of passengers (537) and crew members (82) with positive test results. All confirmed cases that were detected through testing, disembarked, and transferred to isolation.	NIID (21 st Feb), 2020
20 th Feb 2020	634	confirmed cases of passengers & crew members with positive test results.	Mizumoto <i>et al.</i> , 2020
20 th Feb 2020	Over 1600	As of 20 th of Feb 2020, over 1600 passengers & crew members disembarked from the ship (mainly non-case passengers).	NIID (21 st Feb), 2020

21 st 2020	Feb	970	Disembarkation of 970 asymptomatic passengers with negative results was completed. $970 + 634 = 1604 \approx 1600$	Nakazawa <i>et al.</i> , 2020
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References:

NIID (19th Feb), Field Briefing: Diamond Princess COVID-19 Cases, <https://www.niid.go.jp/niid/en/2019-ncov-e/9407-covid-dp-fe-01.html>, Last Access: 12 Nov, 2020.

Asahi Shimbun, 450 cleared to leave on 3rd day of departures from cruise ship, <http://www.asahi.com/ajw/articles/13153083>, Last Access: 12 Nov, 2020.

NIID (21st Feb), Field Briefing: Diamond Princess COVID-19 Cases, 20 Feb Update, <https://www.niid.go.jp/niid/en/2019-ncov-e/9417-covid-dp-fe-02.html>, Last Access: 12 Nov, 2020.

Mizumoto, K., Kagaya, K., Zarebski, A., and Chowell, G. (2020). Estimating the Asymptomatic Proportion of Coronavirus Disease 2019 (COVID-19) Cases on Board the Diamond Princess Cruise Ship, Yokohama, Japan, 2020. *Euro surveill.* 25(10): 2000180.

Nakazawa, E., Ino, H., and Akabayashi, A. (2020). Chronology of COVID-19 Cases on the Diamond Princess Cruise Ship and Ethical Considerations: A Report from Japan. *Disaster medicine and public health preparedness*. <https://doi.org/10.1017/dmp.2020.50>

Table S2. Calculations of the observed symptomatic infection rates with recoded symptom onset dates in cabins with/without previous confirmed cases.

	Passengers in cabins without previous confirmed cases	Passengers in cabins with previous confirmed cases
Number of confirmed cases after the incubation median day	20	8
Population at risk at the first day of the quarantine period after the incubation median day	$970+717+20=1707$	$2666-1707=959$
$SIRR_{QPM}$	1.17% ($20*100/1707$)	0.83% ($8*100/959$)

Table S3. Performance of HVAC air filters*.

MERV	particle size	Typical application
1-4	$>10 \mu\text{m}$	To protect equipment
5-8	$[3.0,10] \mu\text{m}$	To collect particles in residential and commercial setting
9-12	$[1.0-3.0] \mu\text{m}$	To collect particles in superior residential, commercial, and industrial settings
13-16	$[0.3-1.0] \mu\text{m}$	To collect particles in hospitals, and specific manufacturing facilities
17-20	$<0.3 \mu\text{m}$	To protect individuals from harmful airborne contaminants

*Reference: Miao, M., and Xin, J. (2017). Engineering of High-Performance Textiles, 1st ed, Woodhead Publishing.