



**Supplementary Figure S1. The period of COVID-19 outbreaks and the study implementation period (blood sampling and questionnaire survey).** COVID-19 outbreaks in hospitals occurred between March and August 2020 (arrows). The period from outbreak to study implementation (square) was about 2 weeks to 4 months.

**Supplementary Table S1. Characteristics of participating health care facilities and the result of the serologic test for SARS-CoV-2**

Health care facility	A	B	C	D	E	F	G
Region	Kyushu	Chubu	Kanto	Kanto	Kanto	Kyushu	Kanto
Number of beds	250	294	520	140	765	81	173
Inpatient treatment for COVID-19 patients	Yes		Yes		Yes		
Number of participants	515	196	179	207	570	97	135
Number of seropositive participants	32	2	25	48	19	2	33
Seropositive proportion (%, 95% CI)	6.2 (4.3–8.7)	1.0 (0.1–3.6)	14.0 (9.2–19.9)	23.2 (17.6–29.5)	3.3 (2.0–5.2)	2.1 (0.3–7.3)	24.4 (17.5–32.6)

Seven hospitals participated in the study, three of which had inpatient treatment for COVID-19 patients during the study period. Seropositivity proportion varied by facility, ranging from 24.4% (33 of 135, 95% CI 17.5–32.6) to 1.0% (2 of 196, 95% CI 0.1–3.6).

COVID-19: coronavirus disease 2019; CI: confidence interval.

**Supplementary Table S2. Possible confounding factors for each independent variable used in the multivariable logistic regression models**

Dependent variable	Independent variables	Possible confounding factors
Seropositivity of SARS-CoV-2	(Sociodemographic factors)	Sex, age, hospital, occupation, contact history with COVID-19 patients
	<ul style="list-style-type: none"> <li>▪ Sex</li> <li>▪ Age group</li> <li>▪ Occupation</li> <li>▪ Career</li> <li>▪ Any contact history with COVID-19 patients</li> <li>▪ Any medical procedures for COVID-19 patients</li> <li>▪ Aerosol-generating procedures for COVID-19 patients</li> <li>N95 mask use</li> </ul>	Sex, age, hospital, occupation
	(Frequency of contact history with COVID-19 patients)	
	<ul style="list-style-type: none"> <li>▪ Total days of contact</li> <li>▪ Average time of contact per day</li> </ul>	
	(Detailed contact history with COVID-19 patients)	Sex, age, hospital, occupation, entering the room, contact with the surrounding environment, approach within 1m, conversation, physical contact
	<ul style="list-style-type: none"> <li>▪ Entering the room</li> <li>▪ Contact with the surrounding environment</li> <li>▪ Approach within 1m</li> <li>▪ Conversation</li> <li>▪ Physical contact</li> </ul>	
	(Frequency of PPE use)	Sex, age, hospital, occupation, eye shield use
	<ul style="list-style-type: none"> <li>▪ Surgical mask use</li> <li>▪ Gloves use</li> <li>▪ Eye shield use</li> <li>▪ Gown or apron use</li> </ul>	

Of the significant factors explored using univariable analyses, those affecting the adjusted OR were included in the final models as possible confounding factors.

SARS-CoV-2: severe acute respiratory syndrome coronavirus 2; COVID-19: coronavirus disease 2019; PPE: personal protective equipment.

**Supplementary Table S3. Results of the PCR and serologic test of SARS-CoV-2 among healthcare workers in Japan between August and November, 2020**

		Serologic test		
		Positive <sup>a</sup>	Negative	Total
PCR	Positive	98	23	121
	Negative	25	819	844
	Not done	4	57	61
	Unknown	34	839	873
	Total	161	1,738	1,899

PCR results were obtained for 965 of 1,899 participants. Of the 121 participants who reported PCR positive results, 23 were seronegative.

PCR: polymerase chain reaction; <sup>a</sup> Seropositive: microneutralization titer  $\geq 5$  or antibody titer by electrochemiluminescence immunoassay  $\geq 1$ .