Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Anxiety persists after recovery from acquired COVID-19 in anaesthesiologists

During the novel coronavirus disease (COVID-19) pandemic medical providers may develop psychosocial problems, especially these who stand at the frontline battling this contagious disease [1,2]. It was reported that an Italian nurse with coronavirus committed suicide, fearing the possibility of infecting others [3]. Anaesthesiologists are the frontline medical providers taking care of COVID-19 patients in operating rooms and intensive care units, and they provide the necessary intubations for severe COVID-19 patients. They have a high risk of contracting the novel coronavirus as well as the anxiety that accompanies this. We hypothesized that anaesthesia providers who contracted COVID-19 might have a high prevalence of elevated anxiety, and that this anxiety would persist after their physical recovery. Following approval from the institutional review board of Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, we sent an inquiry to 138 anaesthesia department leaders in 138 hospitals in Hubei Province, the epicenter of COVID-19 in China, to identify anaesthesiologists who might have contracted COVID-19. Eighteen anaesthesiologists with possible hospital acquired COVID-19 from 8 hospitals were identified. A subsequent survey (Appendix A) was sent to these 18 anaesthesiologists to investigate their wellbeing, outcome, and anxiety level. According to registration information from the Anaesthesia Quality Control Center of Hubei, the number of registered anaesthesiologists in these 138 hospitals is 1427; thus, the rate of acquired COVID-19 for all anaesthesiologists is estimated to be about 1.26% (18/1427). Only one of the responding anaesthesiologists might have contracted the infection from providing service for labor and delivery. Thus, the rate of infection for anaesthesiologists related to labor and delivery service is approximately 1 out of 1427 (0.07%). Fourteen (77.8%, 14/18) valid questionnaires were received from the 18 anaesthesiologists who contracted COVID-19. The other four of those who received questionnaires were unwilling to provide information. Table 1 shows the results from the 14 respondents. Half (50.0%, 7/14) had clear connections with COVID-19 patients while the other half were unclear of the source of their infection. Three anaesthesiologists (21.4%, 3/14) had severe symptoms; the rest had mild to moderate symptoms. The average length of hospitalization was 12.1 ± 8.7 days and the course of the disease was 21.4 ± 14.4 days. Providers were out of clinical service for an average of 44.7 ± 13.5 days and were quarantined at a centralized isolation facility for an average of 16.4 ± 5.9 days. Most had a full physical recovery at the conclusion of this investigation. However, most of them (92.9%, 13/14) reported that they had mild to severe anxiety along with fear during the course of their disease, and this anxiety and fear persisted after their physical recovery. Anaesthesiologists have many opportunities to contract the disease from patients, colleagues, and from the community. Most of the anaesthesia care for labor and delivery that was identified in this study was neuraxial anaesthesia, and we identified only one anaesthesiologist who might have contracted the disease from patient care. It appears that providing anaesthesia service for labor and delivery did not have an increased risk of contracting COVID-19, as compared to providing service in other areas. The universal policy of requiring patients coming for labor and delivery wear masks during obstetric anaesthesia in Hubei province in China could have significantly reduced hospital acquired cross-infection. We recently recommended that a mask wearing policy for everyone in the hospital be mandated [4].

Despite vigorous precautions, there is still the possibility that an anaesthesiologist may contract the disease, as indicated in this report. Half of the responding anaesthesiologists were unable to recall precisely where they contracted the disease. Careful self-monitoring of potential symptoms is needed, since symptoms can occur as early as one day after providing care for COVID-19 patients. If potential contamination is suspected, proper reporting and testing must be performed, duo to the fact that some cases may show no significant symptoms. Fortunately, most of the anaesthesiologists who contracted the disease had only mild to moderate symptom, as well as a very good prognosis. However, they lost a large number of clinical service days, putting additional stress on the already overwhelmed medical system and their colleagues fighting the outbreak. Those infected by the disease should be offered proper psychological support and care. As seen in this study, all of the respondents experienced various levels of anxiety and fear both during and after the disease. Proper social and psychological support and consultation are vital.

This was a retrospective survey, so it is possible that significant bias could potentially be introduced to the results. Some people may not be willing to disclose certain sensitive information. Thus, the infection rate could potentially be under-estimated.

Strategies to prevent and manage psychological issues related to COVID-19 for anaesthesia providers can be developed using a systematic approach consisting of individual, departmental, and institutional efforts. Dr. Shanglong Yao, a senior author of this letter contracted COVID-19 at the end of January of 2020 along with two of his family members. He stayed very positive and encouraged others by sharing his perspective of the importance of a personal positive attitude in many online educational efforts, and became a great role model for those coping with anxiety at an individual level. It's important to know that there are free online resources, such as this website (https://psychhub.com/covid-19/covid-individuals/covid-individual-resources/). Based on our personal communication, there are many anaesthesia departments that have initiated various programs to help departmental members cope with anxiety by providing useful information and free access to programs to help with. As an example, one academic anaesthesia department offered free access to Headspace (https://www.headspace.com/), an App that helps people relax and practice meditation. At the University of Pennsylvania, a specific website was established to assist anyone in the community who may need help for psychological issues during the pandemic (https://www.penncobalt.com/). Anyone can sign in anonymously to seek for help for him/herself, family members, or co-workers. Available time slots of psychologists

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Table 1
Detailed information of the anaesthesiologists who contracted COVID-19.

Characteristics								Related loss and injuries					
Gender	Age	Initial symptom post-event (days)	Diagnosis post exposure	Initial symptom	Type	Hospital days	Outcome	Sick days	Post-discharge isolation days	Days out of clinical services	Family member infection	Anxiety/fear severity during sick days	Anxiety/fear severity after recovery
Female	20s	3	3	Fatigue	Mild	0	Full recovery	3	15	30	No	Mild	Mild
Female	40s	3	3	Fatigue	Mild	0	Full recovery	3	15	15	No	Mild	Mild
Male	30s	Not sure	Not sure	Fever, fatigue	Mild	0	Full recovery	16	14	50	2	Mild	None
Female	40s	None	6	None	Mild	6	Full recovery	8	28	45	No	Mild	Mild
Male	40s	18	26	Dry cough	Mild	12	Full recovery	18	14	46	No	Moderate	Mild
Female	30s	3	10	Fever	Moderate	7	Full recovery	50	32	60	No	None	Moderate
Female[a]	40s	6	6	Fever, fatigue	Moderate	12	Full recovery	10	14	48	No	Mild	Mild
Male	30s	None	15	None	Moderate	14	Full recovery	15	14	42	No	Mild	Mild
Male	20s	Not sure	Not sure	Fever	Moderate	17	Full recovery	30	14	59	No	Mild	Mild
Male	30s	1	7	Fever	Moderate	18	Full recovery	26	14	50	No	Moderate	Mild
Male	40s	10	23	Fever, cough, fatigue	Moderate	20	Recovering	20	13	33	No	Mild	Mild
Female	30s	5	17	Cough, fever, fatigue	Severe	12	Full recovery	40	14	58	No	Mild	Mild
Female	30s	3	10	Fever, cough, fatigue	Severe	25	Recovering	20	14	30	No	Severe	Severe
Male	60s	Not sure	Not sure	Fever, fatigue	Severe	26	Recovering	40	14	60	No	Moderate	Mild

[a] The anaesthesiologist with COVID-19 after providing services for labor and delivery. The average age is 39 ± 10 with a range of 24–63. Among identified 18 cases, only 14 of them are willing to provide related information presented above.

are listed for those who want to make an appointment. Individuals can connect with peers, resilience coaches, therapists, psychiatrists, and others who are ready to help.

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Details of authors' contributions

JW and XDC: Data collection and analysis, write and edited the paper; SLY and RYL: Study design, data analysis, interpretation, and write and edited the paper.

Declaration of competing interest

We declare that we have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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