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# Epidemiological Characteristics of COVID-19 Outbreak at Fitness Centers in Cheonan, Korea

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## ABSTRACT

**Background:** In February 2020, a coronavirus disease 2019 (COVID-19) outbreak was reported in fitness centers in Cheonan, Korea.

**Methods:** From February 24 to March 13, an epidemiological investigation was conducted on the fitness center outbreak. All those who were screened were tested for severe acute respiratory syndrome coronavirus-2 (SARS CoV-2) using real-time reverse transcriptase polymerase chain reaction. Contacts were traced and self-isolated for 14 days. We determined the epidemiological characteristics of confirmed cases of SARS-CoV-2 infection, and estimated the time-dependent reproduction number to assess the transmission dynamics of the infection.

**Results:** A total of 116 cases were confirmed, and 1,687 contacts were traced. The source cases were 8 Zumba instructors who led aerobics classes in 10 fitness centers, and had the largest average number of contacts. A total of 57 Zumba class participants, 37 of their family members, and 14 other contacts were confirmed as cases. The attack rate was 7.3%. The contacts at Zumba classes and homes had a higher attack rate than other contacts. The mean serial interval ( $\pm$  standard deviation) were estimated to be 5.2 ( $\pm$  3.8) days. The time-dependent reproduction number was estimated to be 6.1 at the beginning of the outbreak, but it dropped to less than 1, 2 days after the epidemiological investigation was launched.

**Conclusion:** The results suggest that the COVID-19 outbreak was effectively contained with rigorous contact tracing, isolating, and testing in combination with social distancing without a lock-down.

**Keywords:** Coronavirus; Disease Outbreak; Epidemiology; Basic Reproduction Number; Fitness Centers

## INTRODUCTION

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and often presents with cough, fever, and shortness of breath.















