411. Significance of a Known Epidemiological Link to a COVID-19 Index Case and Severity of COVID-19 Infection
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Background. Several factors have been associated with severity of COVID-19 disease, but there remains a paucity of data surrounding whether the nature of exposure is impactful. Evidence demonstrating the correlation between initial viral exposure dose and disease severity exists for many viral infections. Observational studies have suggested that the exposure context, which can be considered a proxy for magnitude of viral inoculum, may influence severity of COVID-19 infection. We aimed to assess whether having a known exposure, as a proxy for higher inoculum dose to COVID-19, was associated with more severe outcomes for individuals hospitalized with COVID-19.

Methods. We created a retrospective cohort of community-dwelling adults hospitalized for COVID-19 in south-central Ontario from April 1, 2020 - January 31, 2021. Individuals or next of kin were contacted to ascertain exposure history. The primary outcome was death, intensive care unit (ICU) admission, or mechanical ventilation (MV) within 30 days of admission. A multivariable logistic regression model was used to determine whether a known exposure was associated with worse outcomes.

Results. 1,097 individuals with community acquired COVID-19 required hospitalization; of these, 942 (86%) had available exposure data. In this group, the median age was 65, 44% were women, 84% lived in a private residence, 56% had a frailty score (FS) of 1 – 3, while 40% had a FS of 4 – 9, and 28% had a known exposure. Overall, the primary outcome occurred in 368/942 (39%) patients. Having a known exposure was not associated with worse outcome (OR 1.14, 95% CI 0.84 – 1.54, p = 0.41). Male gender (OR 1.41, 95% CI 1.06 – 1.89; p = 0.018), age (OR 1.01/year, 95% CI 1.00 – 1.03, p = 0.03), frailty (OR 1.04/point, 95% CI 1.09 – 1.16, p = 0.001) and living with at least one other person (OR 1.57, 95% CI 1.09 – 2.28, p = 0.017) were all associated with death, ICU admission, or MV within 30 days of admission.

Conclusion. While having a known exposure to a person with COVID-19 was not associated with worse outcome, the identified increased severity of illness associated with cohabitation suggests context of exposure may have a role in disease severity. This data and future studies can be used to guide public health recommendations to not only minimize transmission, but severity of COVID-19 infection.

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414. Observed Time Burden with Nursing Practices in an Emergency Room COVID-19 Isolation Zone at a University Affiliated Hospital in Korea
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Background. The coronavirus disease 2019 (COVID-19) has caused great burdens on emergency room (ER) and front-line ER healthcare personnel faced with great challenges, including threats to their safety. This study aimed to provide a basis for additional workload of ER nurses who are charged with providing care for COVID-19 confirmed or suspicious cases.

Methods. Using publicly available population and COVID-19 case count data from Durham County, we calculated a weekly average number of new confirmed COVID-19 cases per week between May 3, 2020 and August 22, 2020 according to age categories: < 5 years, 5-9 years, 10-14 years, and 15-19 years. We collated average classroom cohort sizes and enrollment data for each age group by grade level of education for the first month of the 2019-2020 academic school year. Then, using a SEIR compartmental model, we calculated the number of susceptible (S), exposed (E), infectious (I) and recovered (R) students in a cohort size of 15, 30 and 100 students, modelling for classroom reproduction number (R0) of 0.5, 1.0, 2.5 and within a closed classroom cohort over a 14-day and 28-day follow-up period using age group-specific COVID-19 prevalence rates.

Results. The SEIR model estimated that the increase in cohort size resulted in up to 5 new COVID-19 infections per 10,000 students whereas the classroom R0 had a stronger effect, with up to 88 new infections per 10,000 students in a closed classroom cohort over time. When comparing different follow-up periods in a closed cohort with R0 of 0.5, we estimated 12 more infected students per 10,000 students over 28 days as compared to 14 days irrespective of cohort size. With a R0 of 2.5, there were 49 more infected students per 10,000 students over 28 days as compared to 14 days.

Conclusion. Classroom R0 had a stronger impact in reducing school-based COVID-19 transmission events as compared to cohort size. Additionally, earlier isolation of newly infected students in a closed cohort resulted in fewer new COVID-19 infections within that group. Mitigation strategies should target promoting safe practices within the school setting including early quarantine of newly identified contacts and minimizing COVID-19 community prevalence.

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