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Title	SARS-CoV-2 transmission in K-12 schools in the Vancouver Coastal Health Region: a descriptive epidemiologic study
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Reviewer 1	Shuliang Cheng
Institution	University College London Medical School
General comments (author response in bold)	This is very well written and statistically well analysed. Conclusions are supported by the data they collected. I would say it would be prudent in the background to provide full context of the lockdown restrictions in the time period analysed. Otherwise, everything else is excellent. **The following was added to the background: "During the study period, while mass gatherings remained prohibited, schools and businesses were open with safety plans in place, and masks were encouraged but not required. Travel and gatherings in private residences were restricted gradually starting in November 2020. There were no stay-at-home requirements(39). Symptomatic testing was widely available and contact tracing was conducted for all positive cases(40)." (page 4).**
Reviewer 2	Jeannette Comeau
Institution	Pediatrics, The Montreal Children's Hospital
General comments (author response in bold)	This is an excellent, timely article looking at SARS-CoV-2 transmission in schools. It is a comprehensive descriptive epidemiological study. I have few comments/ suggestions; these are as follows: Methods: Public Health Investigation and Response: - please specify which testing modality was used to constitute a positive case - eg. PCR, NAAT or Ag testing **The testing modality has now been specified as follows: "SARS-CoV-2 Nucleic Acid Amplification testing (NAAT) was available for anyone with symptoms" (page 5).** - the authors could elaborate slightly on what constitutes a high risk or low risk exposure in the school setting - eg. are all classmates considered high risk? are other mitigating factors (masking, distance) taken into account? **Further to our statement on the individual risk assessments to identify high risk contacts among classmates, we have now elaborated as follows: "Factors constituting high risk exposures included direct contact with infectious body fluids (e.g., via sharing vapes, being coughed or sneezed upon) and prolonged (>15 minutes) contact with a symptomatic case face to face or at close range; thus, close contacts were identified among classmates. Factors constituting low risk exposures included the absence of interactions or interactions outdoors of limited duration and at a distance (>2m)" (page 5).** Figure 1A: - the dashed line is hard to read; could this be small dots or a lighter grey so easier to see fluctuations? **The figure has been updated as below (page 9):**

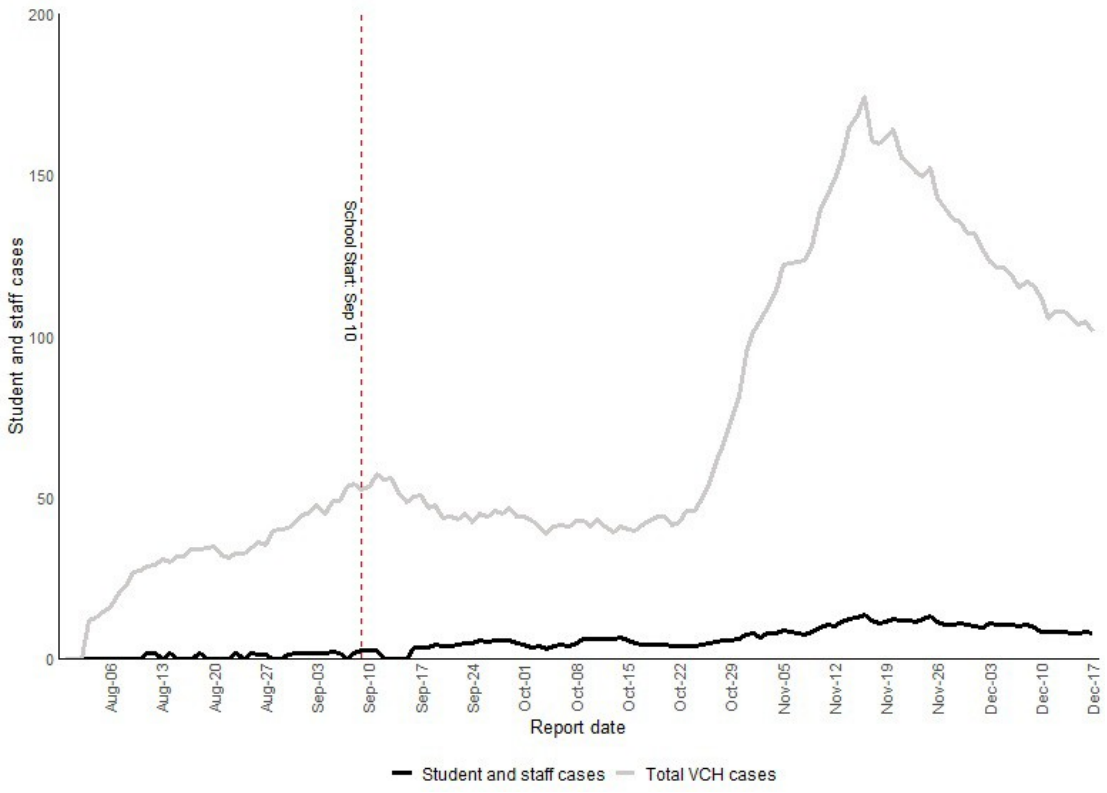
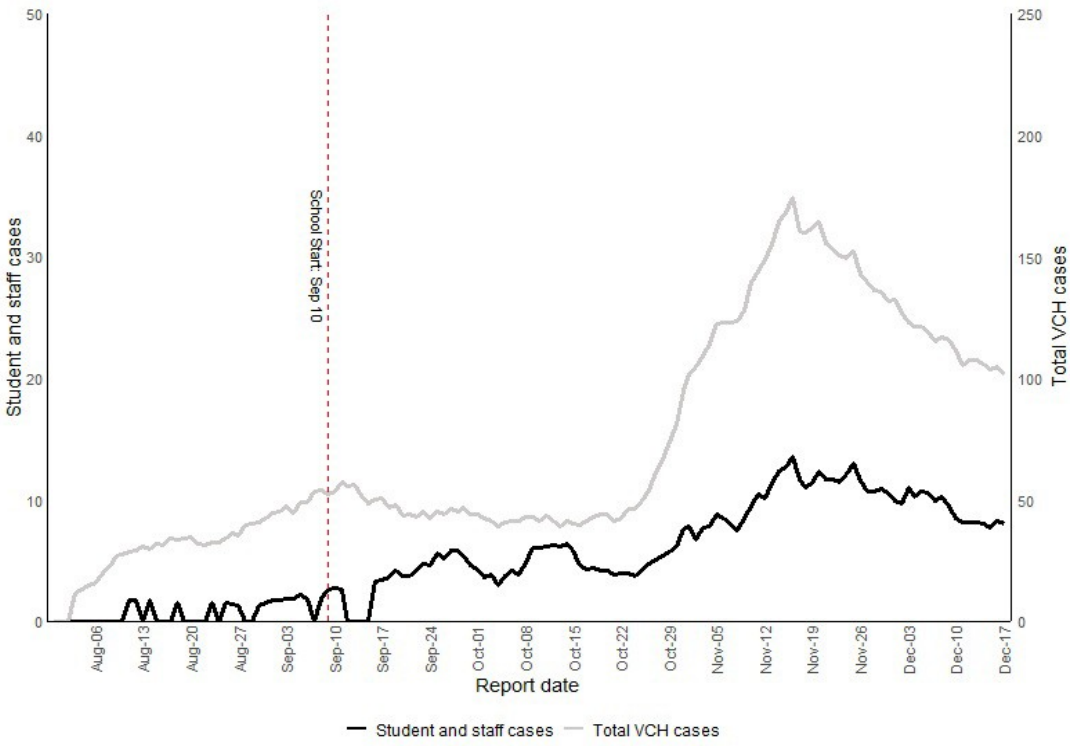


Figure 1B:
- while the authors did mention the two axis, given the overlap of the lines, could this be clearer if the student/staff cases have a higher maximum (eg. to 50) so the lines don't overlap?
The figure has been updated as below (page 10):

	 Table 1: - by definition, these populations are different so I do not think p-values are necessary; could simply delete this and highlight anything the authors find notable in the text. **The p-values column was removed (pages 8-10) and notable findings were highlighted in the text as follows "Notably, adults (18+) more frequently reported comorbidities and were less frequently linked to a confirmed case/cluster compared to children (5-17 years) (p-values <0.01)" (page 8).** Results: Cases with evidence of school-based transmission: - final sentence - does the percent of index and secondary cases in each of K-7, grade 8-12 and K-12 mirror the overall distribution of students/staff in these schools? Is there a group that is over-represented with cases? **Unfortunately, as we received the number of students/staff as aggregate values at the school district level, we do not have the staff/student denominators stratified by these grade groups. However, a group that appeared to over-represent the index cases was the staff members, so we have highlighted this finding in our revisions as follows: "The index case was a staff member in just over half of the clusters (54%), although staff only constituted 35% (28/81) of all cases linked to school-based transmission and 14% of the overall school community" (page 15).**
Reviewer 3	Catherine Birken
Institution	Paediatric Medicine, Hospital for Sick Children

General comments (author response in bold)	Overall this was a well written manuscript with a highly important study with immediate importance to policy makers, teachers, parents, and the public. This was a descriptive study using contact tracing data included all SARS-CoV-2 cases reported to Vancouver Coastal Health between September 10 and December 18, 2020 who worked in or attended schools in-person. Case and cluster characteristics were described. Most of the cases were linked to a household, not school contact. Clusters within the schools showed over half were staff members as index cases, and almost 90% were fairly small. Most of the transmission in clusters were from shared classrooms; the authors concluded that children in schools do not play a major role in spread of COV2. This study benefited from a population based approach and limited bias due to cluster selection. Several limitations were noted including data collection with routine public health operations, and not part of a standardized research protocol. There was no method to assess asymptomatic transmission cases, which may have been prevalent in this setting. **We agree, and have acknowledged this in our limitations.** There was potential for misclassification of the source of cases (reduced with independent review of data). Further, this time period was prior to emergence of the cov-2 variants, in which clusters may be larger with different patterns of transmission within schools. I think these limitations should be strengthened. **We agree that our study was conducted during a time period when variants of concern were not circulating widely. Of note, a similar analysis of cases due to variants of concern is underway at Vancouver Coastal Health, and has thus far had similar results.** Can the authors expand upon the public health measures undertaken in schools during this time period. Substantial variation may occur in schools across different jurisdictions, and this may be a strong indicator of clusters. Define cohorts; were teachers able to move between cohorts?

While teachers could move between cohorts as necessary, it was limited. The following row was added to the data dictionary in the Appendix on page 22:

Cohort	**A group of students and staff who remain together throughout a school term, the composition of which is consistent for all activities that occur in schools(42). While classes are the primary form of grouping where students spend the majority of their time, classes within a shared cohort may interact with each other for activities like physical education or music.**

Due to word limits, we were only able to provide a synopsis of public health measures in schools on page 4 as follows: "Prior to reopening, schools implemented COVID-19 safety plans developed with support from Public Health, which included public health measures (e.g. testing and contact tracing protocols), environmental measures (e.g. enhanced cleaning and disinfection), administrative measures (e.g. scheduling and work practices, health and wellness policies, and cohorting), personal measures (e.g. staying home when sick, physical distancing, hand hygiene and respiratory etiquette), and personal protective equipment. Non-medical mask use was supported, but not required(42)." We will append the BC Centre for Disease Control COVID-19 Public Health Guidance for K-12 School Settings in this submission for complete details on the public health measures.

Please define probable cases.
There were two probable case types, defined in the data dictionary in the Appendix on page 19:

Probable-lab case	**A person (who has had a laboratory test) with fever (over 38 degrees Celsius) or new onset of (or exacerbation of chronic) cough AND who meets the COVID-19 exposure criteria and in whom a laboratory diagnosis of COVID-19 is inconclusive. Inconclusive is defined as an indeterminate test on a single or multiple real-time PCR target(s) without sequencing confirmation or a positive test with an assay that has limited performance data available.(47)**
Probable epi-linked case	**A person (who has not had a laboratory test) with fever (over 38 degrees Celsius) or new onset of (or exacerbation of chronic) cough AND either close contact with a confirmed case of COVID-19 or lived in or worked in a closed facility known to be experiencing an outbreak of COVID-19 (e.g., long-term care facility, prison).(47)**

Were children under 5 excluded because they do not attend school? Please clarify.
Yes; this study was limited to K-12 school settings, and excluded those attending a daycare exclusively.

Are there schools that are k-7 and 8-12? Why were these the two groups selected?
All K-12 schools were included in our study. We analyzed our data by the grade groups K-7 and 8-12 to identify any differences between elementary and secondary schools (which are the two primary groupings of schools in BC).

Please define cohort in table 3 – were some classes cohorted, beyond the classroom? Did

	teachers move within cohorts? **In addition to the Appendix, the definition of cohort was also added in the text below the table as follows: "bA cohort is a group of students and staff who remain together throughout a school term, the composition of which is consistent for all activities that occur in schools" (page 14). As stated, the cohort applies to all school activities including those in and outside of the classroom (e.g. lunch, recess). Teacher movement between cohorts was discouraged, and classes were cohorted for the purposes of all school activities including instructional time, breaks, etc.** The authors recommend schools stay open with moderate community transmission – can this be defined, based on this or other studies? **Moderate community transmission was defined as follows: "However, our findings suggest that schools may be able to safely remain open in settings with moderate community transmission (i.e., weekly incidence of 10-100 cases per 100,000 as observed in this study)" (page 17).** Conclusions – what do the authors conclude for policy makers? **Our conclusion was amended as follows: "Acknowledging harms associated with decreased school attendance, policy makers should focus on the implementation of measures to safely operate in-person learning and consider school closures and widespread quarantine of students and staff with great caution" (page 17).**