



Literature screening report

Epidemiology of SARS-CoV-2 in school age subjects

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Abstract

The amount of evidence on issues related to the health and socio-economic aspects of the COVID-19 pandemic is increasing by the day. At the same time decision-makers worldwide are faced with critical decision to protect the populations. Rapid and reliable syntheses of the evidence are a key tool to inform decision-making. *The authors of this report were mandated by the Swiss School of Public Health plus (SSPH+), on request of the Federal Office of Public Health (FOPH), to inform the FOPH on recent findings from the literature on the following main issues: what is the prevalence of SARS-CoV-2 in school age children? what are the transmission rates of SARS-CoV-2 in school age children?* We have used research syntheses methods to search, select, appraise and synthesise the evidence from published literature. We have considered all study designs that could contain school and/or community-based data on COVID-19 in subjects 19 years old or younger.

We have included 39 studies. We report data on prevalence (and incidence) and transmission, in school and in community settings. There is a great disparity in study designs as well as on settings, ways to establish infection status and reporting.

In summary, the median prevalence of COVID-19 in school settings is 4.7% and 10.4% in the community. Transmission is also lower in schools, 2.4%, than in the community, 17.6%. There are also reports of zero cases within an outbreak context.

There seems to be consensus across studies (with a few exceptions) that children play a minor role in COVID-19 transmission, particularly in well controlled school settings.



Content

Abstract	1
Content	2
<i>Preamble</i>	2
Background	3
Questions addressed	3
Methodology	3
Results and Findings	5
What is the prevalence of SARS-CoV-2 in school age children?	5
What is the transmission of SARS-CoV-2 in school age children?	10
References	14

Preamble

A large number of scientific publications become available on a daily basis, reflecting the rapid development of knowledge and progress of science on COVID-19 related issues. Leading authorities should base decisions or policies on this knowledge; hence they need to master the actual state of this knowledge. Due to the large number of publications shared daily, decision makers heavily depend on accurate summaries of these publications, in the different public health domains. The authors of this report were mandated by the Swiss School of Public Health plus (SSPH+), on request of the Federal Office of Public Health (FOPH), to inform the FOPH on recent findings from the literature.



Background

Since the start of the COVID-19 pandemic in early 2019, numerous mutations have taken place in several areas of the genomic structure of the virus. Of particular concern is the mutation in the codon 501 of the S protein, which defines the variants (VOC, variants of concern). Several countries are monitoring the epidemiology of these variants.

Numerous studies are ongoing on the implications of these variants on transmission, immunogenicity of existing vaccines, clinical presentation and severity. Current evidence suggests that variants are, in general, more easily transmitted and cause more severe illness.

Current recommendations clearly point at not relaxing or rather strengthening non-pharmaceutical interventions (NPI) to control the pandemic while pursuing wider vaccine coverage. However, specific measures involving schools need to be carefully assessed due to the role of schools in community transmission and the important consequences of school measures.

Previous searches on VOC in children have rendered hardly any evidence, despite extensive searches using standards as well as COVID-19 specific literature databases. This paucity of evidence did not really improve even when no study quality criteria were considered for including studies.

As a result of this lack of evidence, we widened our search strategy to consider all types of SARS-CoV-2 infection, as well as the outcome and age range.

CAUTION: some data in this report may have been retrieved from preprints of submitted manuscripts, which have not undergone peer-review.

Questions addressed

- What is the prevalence of SARS-CoV-2 in school age children?
- What are the transmission rates of SARS-CoV-2 in school age children?

Methodology

- Searches of literature in electronic databases, including living search from the University of Bern and Cochrane COVID-19 register (see generic search strategy at the end).
- Assessment of relevance based on titles and abstracts by single reviewers, with the support of an alternative reviewer if doubts.

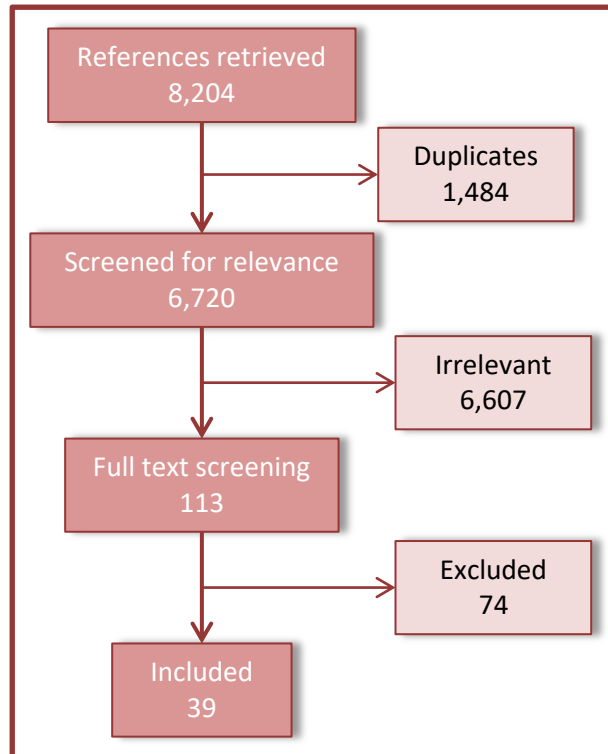


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- Assessment of inclusion criteria based on the full texts by single reviewers, with the support of an alternative reviewer if doubts.
 - Data extraction by single reviewers, with the review of data extracted by an alternative reviewer.
 - Outcomes' analyses: reporting list of findings. Meta-analyses to be considered depending on the availability of comparable data.
 - Outcomes reported stratified by age subgroups, where data is available (years): pre-school: 0 to 3; Kindergarten: 4 to 6; primary school: 7 to 12; secondary I: 12 to 15; secondary II (Baccalaureate): 15 to 19.
 - Reporting: report template provided by SSPH+.
 - We consult with Swiss TPH and University of Calabar experts as required.
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Results and Findings

Figure. Flow of studies in this review.



What is the prevalence of SARS-CoV-2 in school age children?

Summary:

- Note of caution: prevalence is often reported using the number of tested subjects as denominator; therefore, prevalence largely depends on the criteria to perform a diagnosis test, as well as the diagnostic sample and technique. Prevalence estimates cannot be extrapolated to the whole population of the same age ranges.
- Median (with interquartile ranges) prevalence in children below 19 years old were:
 - o in school settings: 4.7% (3.0% to 8.9%)
 - o in community settings: 10.4% (1.6% to 26.2%)
- Authors generally conclude that prevalence in school age subjects:
 - o tends to be lower than in adults;



- within the children age group (below 19 years old) studies report hardly any significant differences or a mild trend to increase as age increases;
- is higher in symptomatic individuals.

Results:

- We have included 25 studies reporting prevalence data. The studies were carried out in Austria, Belgium, Canada, Chile, France, Germany, Israel, Peru, Russian Federation, Spain, Switzerland, United Kingdom and United States.
- Studies were carried out in school (Boey 2021, Fontanet 2020, Lachassine 2021, Kriemler 2021, Ladhani 2021, Stein-Zamir 2020, Ulyte 2020, Ulyte 2021 and Willeit 2021) as well as in community (Alvarez-Antonio 2021, Doyle 2021, Manny 2021, Perramon 2021, Popova 2020, Richard 2020, Tönshoff 2021, Torres 2020 and Wood 2020) settings.
- Infection status was assessed by detecting antibodies in blood and by PCR of nasal, nasopharyngeal or saliva samples.
- Prevalence among tested subjects in school settings, ranged as follows:
 - Saliva PCR: from 0.20% to 1.39%.
 - Nasopharyngeal PCR. Ladhani 2021, reported increasing prevalence by age groups (from 8.4% to 15.5%); but Stein-Zamir 2020 suggested an inverse trend in an outbreak 10 days after opening schools in Israel (from 2% in 12th grade up to 20% in 7th grade; with only the 9th grade showing higher values of 33%).
 - Antibodies detection: from 1.5% to 15%. In the age series of Ulyte 2021, point estimates do not increase with age groups -6 to 9 year, 9 to 13 years and 12 to 16 years), although confidence intervals overlap, suggesting that differences are not significant). The largest prevalence (15%) reported by Fontanet 2020 was among pupils exposed to infection. Torres 2020 reports a decreasing prevalence with age (from 12% in preschool up to 6% in high school level).



- Prevalence among tested subjects at community level, ranged as follows:
 - Nasopharyngeal PCR: one study (Perramon 2021) based on community surveillance reports 5.2% prevalence in <18 years old¹, and another one 0.8%, in a purposive sample of 119 children.
 - Antibodies detection: four studies report different prevalence values in three very different context:
 - Tönshoff 2021 reports a community survey with prevalence values of 0.5% (0.2% to 0.9%) and 0.7% (0.4% to 1.4%) in children 0 to 5 and 6 to 10 years old, respectively.
 - Manny 2021: prevalence of 1.6%, both pre- and post-schools opening;
 - Richard 2020: 0.9% among children wearing masks and 4.2% among those not wearing masks;
 - Popova 2020: 22.9% to 34.7% in different age ranges (34.7% in 1 to 6 years; 22.9% in 7 to 13 years; and 25.5% in 154 to 17 years), with overlapping confidence intervals, suggesting no significant differences.
- Several studies reported on incidence rates. McCartney 2021 reported on the number of cases in schools and non-school settings in Australia for ages up to 18 years old over a period of 3.5 months. Out of 98 cases, there were 12 (12%) primary cases (without any obvious age patterns), 7 (7%) secondary cases (with more cases in the 0 to 5 years age group) and 79 (79%) cases outside school settings, without any age pattern. Ismail 2021 (UK), based on surveillance data, reported monthly incidence by setting (i.e., school or institution) and by school attendants; for the latter, the incidence ranged from 6 to 18 cases per 100,000 attendants, without a clear age pattern. Authors conclude that there was an overall 'low' risk of infection after reopening schools.

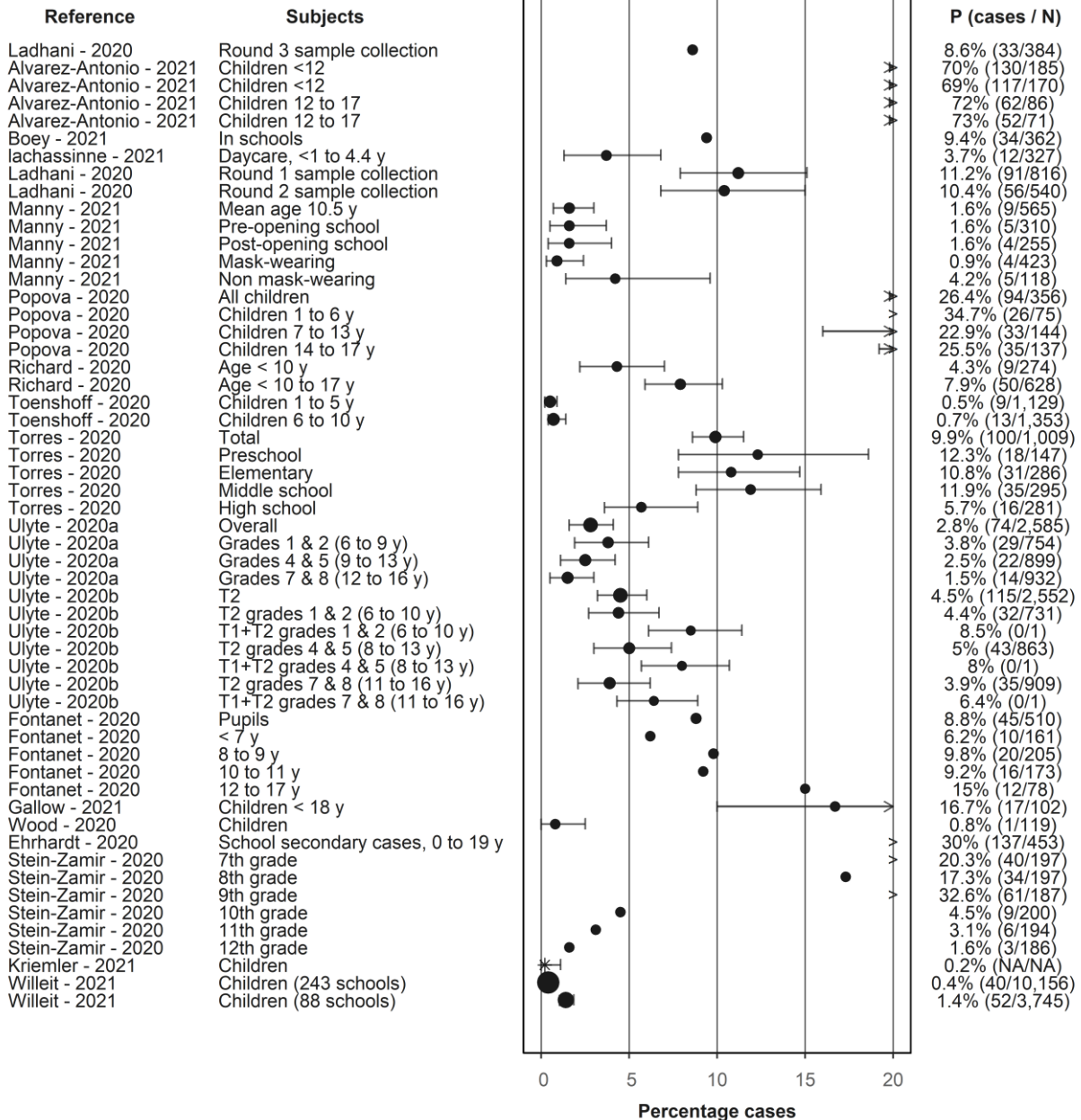


- Other studies reported unusual findings:
 - one study (Ulyte 2020) reports on the number of school related groups with at least 1 positive case, by serological tests in summer 2020: 65% of 55 schools and 34% of 125 classrooms across several schools;
 - Alvarez-Antonio 2021 reported unusually high infection prevalence form Peru, around 70% in a group of children below 12 years of age and another group between 12 and 17 years old.

¹ The study also shows incidence by time period and age groups. In general, younger age groups show less incidence. However, the paper does not allow to understand whether incidence has been estimated over the whole population or using specific age groups population.



(A) SARS-CoV-2 prevalence | Children





What is the prevalence of SARS-CoV-2 in school age children?

Summary:

- Note of caution: transmission is often reported using several definitions of index cases and contacts; transmission data also depend on the diagnostic sample and technique. Transmission estimates cannot be extrapolated to the whole population of the same age ranges.
- Median (with interquartile ranges) transmission in children below 19 years old were:
 - o in school settings: 2.4% (0.6% to 4.5%)
 - o in community settings: 17.6% (10.4% to 28.9%)
- In age subgroups below 19 years old, transmission rates do not seem to correlate with age.
- Reports of zero transmission have been found, although with short surveillance time periods and a low number of index cases.

Results:

- We have included 19 studies reporting data on transmission. The studies were carried out in Australia, China, Germany, Ireland, Italy, Norway, Spain, United Kingdom and the United States).
- Studies were carried out in school (Brandal 2020, Dawson 2021, Falk 2021, Gillespie 2021, Larosa 2021, MacCartney 2021, NCIRS 2020, Shoeps 2021 and Yong 2020) as well as in community (Brotons 2020, Danilo 2021, Gallow 2021, Hua 2021 and Soriano-Arande 2021, Wang 2020) settings. Studies also reported on a mix of settings: Ehrhard 2020, Heavy 2020 and Lopez 2020.
- Infection status was assessed by detecting antibodies in blood and by PCR of nasopharyngeal or saliva samples.
- In general terms transmission assessed in community settings is larger than in school settings.
- Studies reporting transmission in school settings used PCR to detect the infection status. Transmission across the 11 schools in this category are below 11% and there are reports of 0 cases among contacts, in children and staff in a secondary



school (McCartney 2021). There does not seem to be differences between primary school and pre-school, with rates between 1.7% and 5.7%. Gillespie reported the R_0 in two schools (0.49 and 0.02). Another study, comparing ages, found no statistically significant differences in secondary cases of index cases of 0 to 5 years (1.7%), 6 to 10 years (0.62%), 11 to 15 years (1.04%) and 16 to 20 years (0.59%) (Shoeps 2021, Germany); data on cluster level transmission showed similar results (from 1.7% to 2.5%, with a crude relative risk higher in the smallest age group). Zero transmission from six index cases was reported by NCIRS 2020 (Australia, 3 months in 2020) in education services; and also by Yong 2020 in two preschool and one secondary school setting.

- In community settings:
 - Antibodies detection: two studies report data in this category. Brotons 2020 reports transmission between 15.6% and 19.2% in different age groups (from less than 1 year up to the group of 15 to 24 years); there does not seem to be a sub-group age pattern. Danilo 2021 reports 50.0% transmission in children below 5 years of age and 53.8% in older children.
 - When detected by PCR transmission from household contacts ranged from 5.0% to 34.5% (e.g. Gallow 2021, SAR from index cases younger than 18 years old, 15%, 95% CI 5% to 27%; Wang 2020, 11% in children household contacts). Soriano-Arande 2021, reports higher transmission in adults (72.7%); index and secondary cases show similar transmission rates (see Figure).
- Transmission: Fontanet 2020 report high prevalence in school settings (up to 15%) among exposed pupils, although he argues that this did not translate into higher transmission rates.
- School and other settings.
 - Ehrhard 2020 reports on secondary cases (N= 453) by source of infection in Germany between May and August 2020: 3.3% cases were infected from schools, while other sources had higher rates (festivity / event: 8.4% and household: 41.9%). Only travel had lower rates (1.1%); other sources: 0.9%

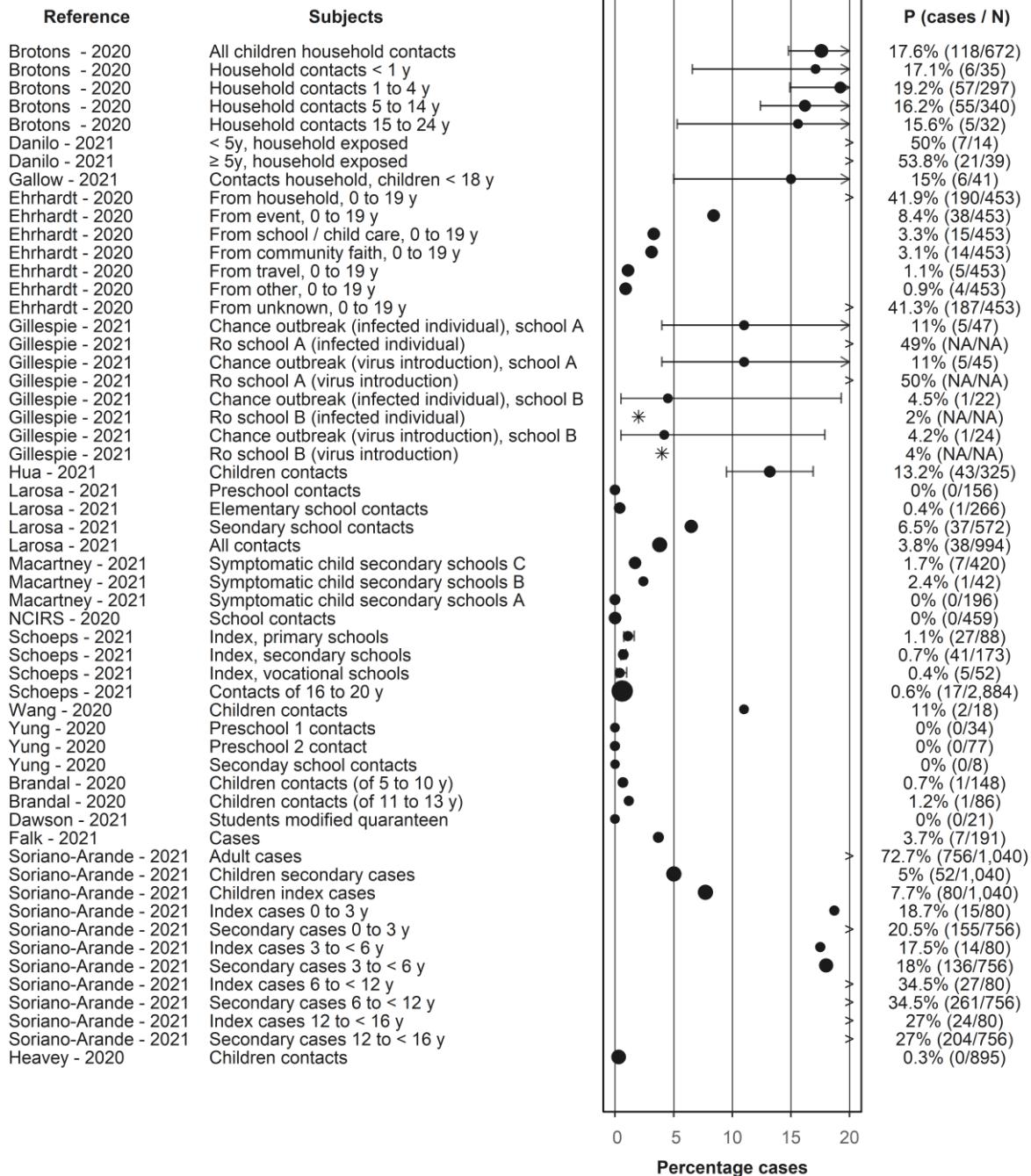


and unknown 41.3%). Lopez 2020 reported 14% COVID-19 children cases (PCR) from 83 any age contacts.

- Heavey 2020 (Ireland), in a very limited sample of cases, reported no secondary cases from 895 children contacts of three children between 10 and 15 years.
- Mensah 2021 (UK) reported changes in incidence and daily growth rate of infections. Because these findings are hardly comparable with most of the studies, we omitted the data.



(B) SARS-CoV-2 transmission | Children



○ Denominator available
Size of points proportional to denominator. * No denominator data



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All references: .ris file



Generic search strategy

1. Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <1946 to April 07, 2021> Searched 8th April 2021

- 1 Epidemiologic studies/ (8608)
- 2 exp case control studies/ (1155815)
- 3 exp cohort studies/ (2110314)
- 4 ((cohort or case-control) adj (study or studies or analy*)).tw. (345504)
- 5 Follow-up Studies/ (659482)
- 6 (Follow up adj (study or studies)).tw. (50877)
- 7 observational study/ (95900)
- 8 ((observational or field) adj (study or studies)).tw. (135498)
- 9 Longitudinal studies/ (143620)
- 10 Longitudinal.tw. (263001)
- 11 Retrospective studies/ or Prospective studies/ (1426186)
- 12 (Retrospective or prospective or sham).tw. (1231935)
- 13 Interrupted Time Series Analysis/ (1177)
- 14 (time series or time point?).ti,ab. (156406)
- 15 ((Ecologic* or Panel) adj (study or studies)).tw. (8748)
- 16 "case reference".tw. (58)
- 17 risk factors/ or (factors adj2 risk*).tw. (1086841)
- 18 or/1-17 (3851673)
- 19 (coronavir* or coronavirus* or betacoronavir* or "beta-coronavirus" or "beta-coronaviruses" or "corona virus" or "virus corona" or "corono virus" or "virus corono" or hcov* or covid* or "2019-ncov" or cv19* or "cv-19" or "cv 19" or "n-cov" or ncov* or (wuhan* and (virus or viruses or viral)) or "2019-ncov-related" or "cv-19-related" or "n-cov-related" or sars* or sari or "severe acute respiratory syndrome" or antisars* or "anti-sars-cov-2" or "anti-sars-cov2" or "anti-sarscov-2" or "anti-sarscov-2" or "post-COVID-19" or "Not-of-COVID-19" or "corona patients").ti,ab,kw. (140197)
- 20 coronavirus infections/ep, pc, tm, mo or severe acute respiratory syndrome/ep, pc, tm, mo or coronavirus/cl, ge, ip, py or sars virus/cl, ge, ip, py or betacoronavirus/cl, ge, ip, py or sars-cov-2/cl, ge, ip, py (36088)
- 21 ("b.1.1.7" or "b.1.351" or "501Y.V2" or "b.1.1.28" or "A.23.1" or "e484k" or "b.1.525" or "uk1188" or "20I-501Y.V1" or "20B-501Y.V1" or "501Y" or "501.V2" or "N501Y" or "D614G" or "L452R" or "SARS-CoV-2 P.1" or "SARS-CoV-2 P.2" or "B.1.427" or "B.1.429" or "B.1.526" or "b.1.525").ti,ab,kw. (441)
- 22 ("voc-202012/01" or "voc-202012/02" or "vui-202101/01" or "voc-202101/02" or "vui-202102/01" or "voc-202102/02" or "vui-202102/03").ti,ab,kw. (22)
- 23 or/19-22 (142316)
- 24 exp infant/ (1161935)
- 25 (infant* or infancy or newborn* or neonat* or toddler* or kindergar* or "nursery school*" or "primary school*" or "high school*" or "middle school*" or "secondary school*" or pediatric or paediatric).ti,ab,kw. (1122070)
- 26 Child/ or Child, Preschool/ or Adolescent/ or schools/ or schools, nursery/ (3103029)



- 27 (child* or schoolchild* or school-age* or adolescen* or teen* or youth or (young adj2 (people or person*))).ti,ab,kw. (1696774)
- 28 or/24-27 (4367471)
- 29 18 and 23 and 28 (3893)
- 30 limit 29 to yr="2020 -Current" (3126)

- 31 meta-analysis/ or "systematic review"/ (215461)
- 32 (((Systematic* or synthes*) adj3 (research or evaluation* or overview or finding* or thematic* or report or descriptive or explanatory or narrative or meta* or review* or data or literature or studies or evidence or map or mapping or quantitative or study or studies or paper or impact or impacts or effect* or compar*)) or ((scoping or evidence) adj2 review)).ti,ab,kw. (420256)
- 33 or/31-32 (492848)
- 34 (non-pharmaceutical or NPI* or (mitigat* adj2 communit*) or mask* or distanc* or (hand* adj2 (wash* or saniti* or hygien* or disinfect*)) or isolat* or (surface* adj2 (saniti* or clean*)) or (protect* adj2 (equipment or clothing)) or (contact* adj2 (trac* or identif*)) or quarantin*).ti,ab,kw. (1771365)
- 35 masks/ or laryngeal masks/ or personal protective equipment/ or protective clothing/ or gloves, protective/ or gloves, surgical/ or inhalation exposure/ or respiratory protective devices/ (34504)
- 36 hand hygiene/ or hand disinfection/ or contact tracing/ or quarantine/ or disinfection/ or mandatory testing/ or universal precautions/ or social isolation/ (47954)
- 37 or/34-36 (1824727)
- 38 23 and 28 and 33 and 37 (77)
- 39 limit 38 to yr="2020 -Current" (70)

2. Embase Classic+Embase (Ovid) <1947 to 2021 April 08> Searched 9th April 2021

- 1 epidemiology/ or cross-sectional study/ (633520)
- 2 case control study/ or population based case control study/ (186907)
- 3 cohort analysis/ (694178)
- 4 ((cohort or case-control) adj (study or studies or analy*)).ti,ab,kw. (500591)
- 5 follow up/ (1718920)
- 6 (Follow up adj (study or studies)).ti,ab,kw. (75079)
- 7 observational study/ (229196)
- 8 ((observational or field) adj (study or studies)).ti,ab,kw. (209303)
- 9 longitudinal study/ (154931)
- 10 Longitudinal.ti,ab,kw. (373079)
- 11 retrospective study/ (1067380)
- 12 prospective study/ (681563)
- 13 (Retrospective or prospective or sham).ti,ab,kw. (1956576)
- 14 time series analysis/ (28896)
- 15 (time series or time point*).ti,ab,kw. (237963)
- 16 ((Ecologic* or Panel) adj (study or studies)).ti,ab,kw. (9588)
- 17 panel study/ (1266)
- 18 "case reference".ti,ab,kw. (110)



- 19 risk factor/ or (factors adj2 risk*).ti,ab,kw. (1360809)
- 20 or/1-19 (6025870)
- 21 (coronavir* or coronavirus* or betacoronavir* or "beta-coronavirus" or "beta-coronaviruses" or "corona virus" or "virus corona" or "corono virus" or "virus corono" or hcov* or covid* or "2019-ncov" or cv19* or "cv-19" or "cv 19" or "n-cov" or ncov* or (wuhan* and (virus or viruses or viral)) or "2019-ncov-related" or "cv-19-related" or "n-cov-related" or sars* or sari or "severe acute respiratory syndrome" or antisars* or "anti-sars-cov-2" or "anti-sars-cov2" or "anti-sarscov-2" or "anti-sarscov-2" or "post-COVID-19" or "Not-of-COVID-19" or "corona patients").ti,ab,kw. (144118)
- 22 Coronavirinae/ or betacoronavirus 1/ or human coronavirus oc43/ or coronavirus infection/ or severe acute respiratory syndrome/ or sars coronavirus/ or sars-related coronavirus/ (28262)
- 23 ("b.1.1.7" or "b.1.351" or "501Y.V2" or "b.1.1.28" or "A.23.1" or "e484k" or "b.1.525" or "uk1188" or "20I-501Y.V1" or "20B-501Y.V1" or "501Y" or "501.V2" or "N501Y" or "D614G" or "L452R" or "SARS-CoV-2 P.1" or "SARS-CoV-2 P.2" or "B.1.427" or "B.1.429" or "B.1.526" or "b.1.525").ti,ab,kw. (342)
- 24 ("voc-202012/01" or "voc-202012/02" or "vui-202101/01" or "voc-202101/02" or "vui-202102/01" or "voc-202102/02" or "vui-202102/03").ti,ab,kw. (16)
- 25 or/21-24 (148902)
- 26 juvenile/ or exp adolescent/ or exp child/ (4022206)
- 27 (infant* or infancy or newborn* or neonat* or toddler* or kindergar* or "nursery school*" or "primary school*" or "high school*" or "middle school*" or "secondary school*" or paediatric or paediatric).ti,ab,kw. (1577309)
- 28 (child* or schoolchild* or school-age* or adolescen* or teen* or youth or (young adj2 (people or person*))).ti,ab,kw. (2327984)
- 29 nursery school/ or school child/ or school hygiene/ or school/ or high school student/ or primary school/ or middle school/ or high school/ or middle school student/ (491595)
- 30 or/26-29 (4936488)
- 31 20 and 25 and 30 (5601)
- 32 limit 31 to (exclude medline journals and yr="2020 -Current" and covid-19) (697)
- 33 "systematic review"/ or meta analysis/ (397781)
- 34 (((Systematic* or synthes*) adj3 (research or evaluation* or overview or finding* or thematic* or report or descriptive or explanatory or narrative or meta* or review* or data or literature or studies or evidence or map or mapping or quantitative or study or studies or paper or impact or impacts or effect* or compar*)) or ((scoping or evidence) adj2 review)).ti,ab,kw. (518555)
- 35 or/33-34 (693383)
- 36 (non-pharmaceutical or NPI* or (mitigat* adj2 communit*) or mask* or distanc* or (hand* adj2 (wash* or saniti* or hygien* or disinfect*)) or isolat* or (surface* adj2 (saniti* or clean*)) or (protect* adj2 (equipment or clothing)) or (contact* adj2 (trac* or identif*)) or quarantin*).ti,ab,kw. (2246950)
- 37 protective clothing/ or exp protective glove/ or shoe cover/ or splash shield/ or face mask/ or surgical mask/ or mask/ or surgical glove/ or protective glove/ or glove/ or latex glove/ or hospital hygiene/ or personal hygiene/ or hygiene/ or social hygiene/ or hand disinfection/ or hand sanitizer/ or hand washing/ or contact examination/ or quarantine/ or disinfection/ or mandatory reporting/ or mandatory testing/ or patient isolation/ or social isolation/ (171676)
- 38 or/36-37 (2368210)
- 39 25 and 30 and 35 and 38 (117)



40 limit 39 to (exclude medline journals and covid-19) (24)

3. Cochrane Library – Searched 10th April 2021 – Systematic Reviews only for NPIs

- #1 (coronavir* or coronavirus* or betacoronavir* or "beta-coronavirus" or "beta-coronaviruses" or "corona virus" or "virus corona" or "corono virus" or "virus corono" or hcov* or covid* or "2019-ncov" or cv19* or "cv-19" or "cv 19" or "n-cov" or ncov* or (wuhan* and (virus or viruses or viral)) or "2019-ncov-related" or "cv-19-related" or "n-cov-related" or sars* or sari or "severe acute respiratory syndrome" or antisars* or "anti-sars-cov-2" or "anti-sars-cov2" or "anti-sarscov-2" or "anti-sarscov-2" or "post-COVID-19" or "Not-of-COVID-19" or "corona patients"):ti,ab,kw 5787
- #2 MeSH descriptor: [COVID-19] explode all trees 305
- #3 MeSH descriptor: [Coronavirus Infections] this term only 610
- #4 MeSH descriptor: [SARS-CoV-2] this term only 229
- #5 MeSH descriptor: [Coronavirus] this term only 3
- #6 ("b.1.1.7" or "b.1.351" or "501Y.V2" or "b.1.1.28" or "A.23.1" or "e484k" or "b.1.525" or "uk1188" or "20I-501Y.V1" or "20B-501Y.V1" or "501Y" or "501.V2" or "N501Y" or "D614G" or "L452R" or "SARS-CoV-2 P.1" or "SARS-CoV-2 P.2" or "B.1.427" or "B.1.429" or "B.1.526" or "b.1.525"):ti,ab,kw 24
- #7 ("voc-202012/01" or "voc-202012/02" or "vui-202101/01" or "voc-202101/02" or "vui-202102/01" or "voc-202102/02" or "vui-202102/03"):ti,ab,kw 0
- #8 #1 or #2 or #3 or #4 or #5 or #6 or #7 5809
- #9 (non-pharmaceutical or NPI* or (mitigat* NEAR/2 communit*) or mask* or distanc* or (hand* NEAR/2 (wash* or saniti* or hygien* or disinfect*)) or isolat* or (surface* NEAR/2 (saniti* or clean*)) or (protect* NEAR/2 (equipment or clothing)) or (contact* NEAR/2 (trac* or identif*)) or quarantin*):ti,ab,kw 71898
- #10 [mh ^masks] or [mh ^"laryngeal masks"] or [mh ^"personal protective equipment"] or [mh ^"protective clothing"] or [mh ^"gloves, protective"] or [mh ^"gloves, surgical"] or [mh ^"inhalation exposure"] or [mh ^"respiratory protective devices"] or [mh ^"hand hygiene"] or [mh ^"hand disinfection"] or [mh ^"contact tracing"] or [mh ^quarantine] or [mh ^disinfection] or [mh ^"mandatory testing"] or [mh ^"universal precautions"] or [mh ^"social isolation"] 3287
- #11 #9 or #10 72467
- #12 (infant* or infancy or newborn* or neonat* or toddler* or kindergar* or "nursery school*" or "primary school*" or "high school*" or "middle school*" or "secondary school*" or pediatric or paediatric):ti,ab,kw 109574
- #13 [mh ^Child] or [mh ^"Child, Preschool"] or [mh ^Adolescent] or [mh ^schools] or [mh ^"schools, nursery"] 133239
- #14 (child* or schoolchild* or school-age* or adolescen* or teen* or youth or (young NEAR/2 (people or person*))) :ti,ab,kw 256287
- #15 #12 or #13 or #14 302813
- #16 #8 and #11 and #15 in Cochrane Reviews 9



4. Prospero Register of Systematic Reviews (York University UK) – Searched 12th April 2021

Result = **66**

(child* OR infant* OR adolescen* OR school*) AND (non-pharmaceutical OR mask* OR hand* OR distanc*) AND (Review_Completed_not_published OR Review_Completed_published):RS AND (Systematic Review OR Meta-Analysis OR Review of reviews):RT AND (covid-19):HA

5. Love Evidence COVID-19 Database – Searched 10th April 2021

Searched using a series of database filters which include primary studies, broad syntheses, systematic reviews, age, setting (schools), and epidemiology and prevention.

Results: **2715 (Observational Studies); 93 (Systematic and other reviews of non-pharmaceutical interventions)**

6. WHO Covid-19 Database – Searched 12th April 2021

Basic search string (child* OR infant* OR adolescen* OR school*) applied to database filters which include Observational, Systematic Review

Results: **1663 (Observational Studies); 23 (Systematic and other reviews of non-pharmaceutical interventions)**