

UPDATE OF GUIDANCE ON PREVENTION OF SARS-COV-2 IN CHILDREN IN PRIMARY SCHOOL AGE

RAG meeting 12/01/2021

CONTEXT AND QUESTION:

Early November, the RAG issued advice on children in primary school age. It was recommended that children in primary school should not wear masks, as harms were thought to outweigh benefits, and that the modified definition of high-risk contacts for children in primary school remained unchanged. According to this definition, all children of the same class group are considered low-risk contacts if a child is the index case in primary school (based on a lower susceptibility of children). Low-risk contacts are asked to reduce their contacts (e.g. no extracurricular activities) but can continue to go to school and are not tested.

The epidemiological evolution in Belgium is currently favorable. However, in the last weeks before the Christmas holidays, an increase in cases in children <12 years was observed which was in contrast with the general trend in the population. Moreover, concerns exist regarding the new 'UK variant' B.1.1.7 / VOC 202012/01. As there is a broad consensus that reactive school closure should be used only as a last resort, **the RAG is asked to reconsider the evidence on how schools can remain open in a safe way, in particular with regards to the use of face masks and quarantine measures.** Additionally, the RAG-group on testing will reconsider the evidence on testing strategies / screening in schools.

1. Recommendations

The following recommendations should be implemented now:

- The RAG reiterates the recommendation that **compulsory education should have the highest priority and closing schools should only be a last resort**. Additional measures for the larger society should be considered (e.g. increase compliance with mask wearing by adults) to allow schools to remain open. The RAG previously already recommended that teachers in primary school should wear masks in "code red", which is the epidemiological situation we are currently in.
- Indoor mixing of large groups of children during extra-curricular activities (indoor sports, art classes etc.) should not be allowed to jeopardize the efforts being done at schools and should therefore be prohibited. An exception is made for activities related to school proceedings, in particular for vulnerable children (e.g. "huiswerk-klassen", "voor- en naschoolse opvang"). Outdoor activities can still continue, but it is reminded that all measures taken during these activities should at least be equally strict as those in compulsory education.
- Compliance with previously defined measures (risk reducing measures as defined in protocols with color coding, quarantine of children after international travel to red zones, quarantining of children if there is a COVID-19 case in the household) should be maximized by clear communication. In particular,
 - if a household contact of a child is a confirmed case of COVID-19, the case should be isolated from the child. If this is not possible, the quarantine period for the child should

- be extended beyond the end of the infectious period of the index case (i.e. in general 7 days isolation of index case + additional 7-10 days quarantine of child).
- if there is a strong suspicion of COVID-19 in a household member, the child should be quarantined at home whilst awaiting the test result of a household member.
 - The importance of adequate ventilation has been previously stated and is repeated here. Clear, practical information should be given to school directors, e.g. as done by the [Flemish Department of Education](#).
 - If a child in primary school is the index case, children of the same class group have until now been considered to be low-risk contacts (based on lower susceptibility of children and reduced risk of onwards spread). However, as it has been shown that transmission can occur at every age and **in light of increased transmissibility of the new variant, children sitting next to index cases in the class room or during lunch breaks (indoor), should be classified as high-risk contacts**. If deemed necessary and feasible, contact tracing teams can identify additional high-risk contacts with similar exposure. All high-risk contacts require quarantine and testing. In order to reduce the number of individuals that need to be placed in quarantine, fixed seating is important. Particular attention is also needed for sports lessons at school, which should take place outdoors as much as possible, and for indoor mixing of class groups which should be avoided.

If the epidemiological situation worsens (i.e. scenario B as defined by RAG epidemiology):

- **Children of the 5th and 6th year of primary school should wear a mask under the same circumstances as adults** (e.g. public transport, in shops, enclosed public places). There is no consensus on mask wearing within the class.
 - Some RAG members insist that masks should be worn also inside class, as they feel this would be a valuable measure to help schools remain open (which has the highest priority) and has the advantage of being easy to communicate. There is also concern that most classes are not well ventilated and hence masks in the classroom are important to prevent clusters.
 - Others were in favor of exempting children from the need to wear their mask when they are within their class group, seated at their desk, and when playing outdoors. This option was felt to represent a compromise between some experts not being in favor of masks for children at all (due to concerns about effectiveness and compliance) vs. those that wanted to have identical rules for children as for adults. In this proposal, masks are considered a useful additional measure to prevent the virus from being introduced into the class group from externally. Within the class group, with fixed seating and increased ventilation in place, the potential added value is not considered to outweigh the potential harms.
- This change in policy is based on the harms/benefit balance that tilts towards a clear benefit if circulation is widespread and potentially relying on a viral strain with a higher transmissibility.

2. Elements of discussion

- The situation can change very quickly and dramatically as is illustrated by the case of Ireland. Although it is important to slow the introduction and spread of new variants with increased transmissibility, it will be impossible to completely avoid this. We should therefore be prepared and able to act quickly.
- RAG members are in favor of stricter measures in schools / for children if this would allow the schools to remain open. It needs however to be stressed that schools are not islands and transmission in schools is influenced by the level of community transmission. Hence it is important to keep community transmission low.
- Infection prevention is always a multi-faceted intervention that consists of several aspects. Contact tracing and mask wearing are only two elements of this and need to be combined with hand hygiene, reduction of close contacts, improved ventilation, testing symptomatic cases etc.
- Contact tracing always implies an element of individual risk evaluation. However, currently a large number of people with variable backgrounds and expertise is performing contact tracing and clear rules are needed to help and guide them in their decisions. Detailed risk analysis taking into account multiple factors also requires a lot of time. In case of increased transmission, this poses a risk to school health services to become overwhelmed.
- Broadening the definition of high-risk contacts for children in primary school is warranted because of the increased transmissibility of the new variant and already available data on onwards transmission in primary schools. However, this means that more children will be put in quarantine, which puts a strain both on their own opportunities for learning and on their families. It is therefore even more important to prevent the introduction of the virus in the class, e.g. by insisting on respect for quarantine rules if household members are sick, quick testing of adults in case of symptoms etc.
- Whether or not masks should be imposed relies on different aspects: what is the potential benefit, what is the potential use, are there alternatives, is it practically feasible? There is no clear evidence on this topic, which is reflected by very different policies in different countries and different advices being issued by international organizations. Some RAG members feel that the current and previous RAG advices on mask wearing are going against the WHO advice, since there is widespread virus circulation in Belgium. However, the WHO recommendation to weigh risk and benefits has always been mentioned in the RAG advices, but the majority of RAG members felt that risks of imposing mask in primary schools outweighed benefits. Whilst the usefulness of masks in adults is undisputed, the evidence is less clear for children (compliance, poorer fit..).
- If the situation worsens dramatically, imposing masks for children <12y might only be “a drop in the ocean.”
- The compliance of children with proper mask wearing is being questioned by some (see section 3.6 for the limited evidence), especially for younger children. If teachers need to constantly make remarks about proper mask-wearing, this might negatively affect the time they can spend on teaching.
- We should be careful with imposing mask-wearing for some children (e.g. if they have a vulnerable household member or after a risk exposure) and not for others, as it might induce stigma and anxiety.
- Risk perception and communication is extremely important. Schools should be depicted as relatively safe spaces and parents be encouraged to allow their children to attend school.

3. Evidence updates (in addition to evidence in previous advice)

3.1. ECDC TECHNICAL REPORT “COVID-19 IN CHILDREN AND THE ROLE OF SCHOOL SETTINGS IN TRANSMISSION – FIRST UPDATE” (PUBLISHED 23 DECEMBER 2020)

The aim of this document is to provide an update on the knowledge surrounding the role of children in the transmission of SARS-CoV-2 and the role of schools in the COVID-19 pandemic, based on the experience in the EU from August–December, 2020. This report does not consider the epidemiology of COVID-19 in relation to new variants of SARS-CoV-2, for which robust evidence on the potential impact in school settings is not yet available, such as one recently observed in the United Kingdom [2].

KEY MESSAGES

- There is a general consensus that the decision to close schools to control the COVID-19 pandemic should be used as a last resort. The negative physical, mental health and educational impact of proactive school closures on children, as well as the economic impact on society more broadly, would likely outweigh the benefits.
- In surveillance data, among childhood COVID-19 cases, children between 1-18 years of age have lower rates of hospitalisation, severe hospitalisation and death than do all other age groups.
- **Children of all ages are susceptible to and can transmit SARS-CoV-2. Younger children appear to be less susceptible to infection, and when infected, less often lead to onward transmission than older children and adults.**
- This report does not consider the epidemiology of COVID-19 in relation to new variants of SARS-CoV-2, for which robust evidence on the potential impact in school settings is not yet available, such as one recently observed in the United Kingdom.
- School closures can contribute to a reduction in SARS-CoV-2 transmission, but by themselves are insufficient to prevent community transmission of COVID-19 in the absence of other non-pharmaceutical interventions (NPIs) such as restrictions on mass gathering.
- The return to school of children around mid-August 2020 coincided with a general relaxation of other NPI measures in many countries and does not appear to have been a driving force in the upsurge in cases observed in many EU Member States from October 2020. Trends in case notification rates observed since August 2020 for children aged 16-18 years most closely resemble those of adults aged 19-39 years.
- Transmission of SARS-CoV-2 can occur within school settings and clusters have been reported in preschools, primary and secondary schools. Incidence of COVID-19 in school settings appear to be impacted by levels of community transmission. Where epidemiological investigation has occurred, transmission in schools has accounted for a minority of all COVID-19 cases in each country.
- Educational staff and adults within the school setting are generally not seen to be at a higher risk of infection than other occupations, although educational roles that put one in contact with older children and/or many adults may be associated with a higher risk.
- Non-pharmaceutical interventions in school settings in the form of physical distancing that prevent crowding as well as hygiene and safety measures are essential to preventing transmission. Measures must be adapted to the setting and age group and consider the need to prevent transmission as well as to provide children with an optimal learning and social environment.

3.2. UK VARIANT

Evidence, although still preliminary, is accumulating that VOC 202012/01 is more transmissible than other strains. How this increase in transmissibility affects children is currently unclear. Initially, the increase in transmissibility seemed to affect children disproportionately, as noted by [Volz et al](#):

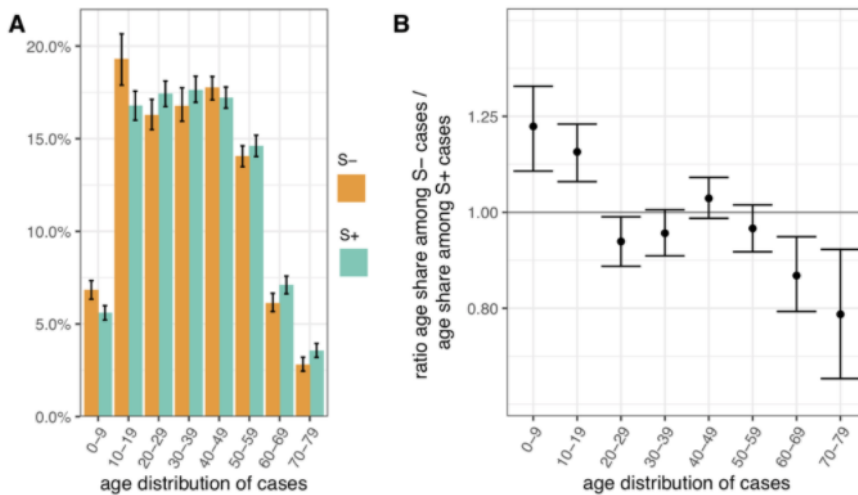


Figure 4 | Age distribution of S-gene negative (S-) and S-gene positive (S+) PCR-positive pillar 2 cases from the SGSS dataset (not adjusted for TPR). Case numbers are weighted to compare S-cases from each NHS STP region and epidemiological week with an equal number of S+ cases from that STP and week (a case-control design), and standardised for differences in the age composition of each STP area. (A) Age distribution of S- and S+ cases. (B) Ratio of S- to S+ proportions of cases in each 10 year band. Results shown are for weeks 46-51. Ages were capped at 80. 95% empirical confidence intervals calculated by bootstrapping over STP areas and weeks, and sampling variation within STP areas and weeks.

“We observe a small but statistically significant shift towards under 20s being more affected by the VOC than non-VOC variants (Figure 4), even after controlling for variation by week and region. However, as with our earlier results, this observation does not resolve the mechanism that might underlie these differences. Differences between the age-distributions of VOC and non-VOC community cases may result from the overall increase in transmissibility of the VOC (especially during a time where lockdown was in force but schools were open), increased susceptibility of under 20s, or more apparent symptoms (and thus a propensity to seek testing) for the VOC in that age range.”

The most recent [technical briefing of Public Health England](#), which was published Friday 8th of January, mentions an overall increase of transmissibility across age groups and sexes, with maintained differences in secondary attack rates between adults and children: see figures below taken from this report.

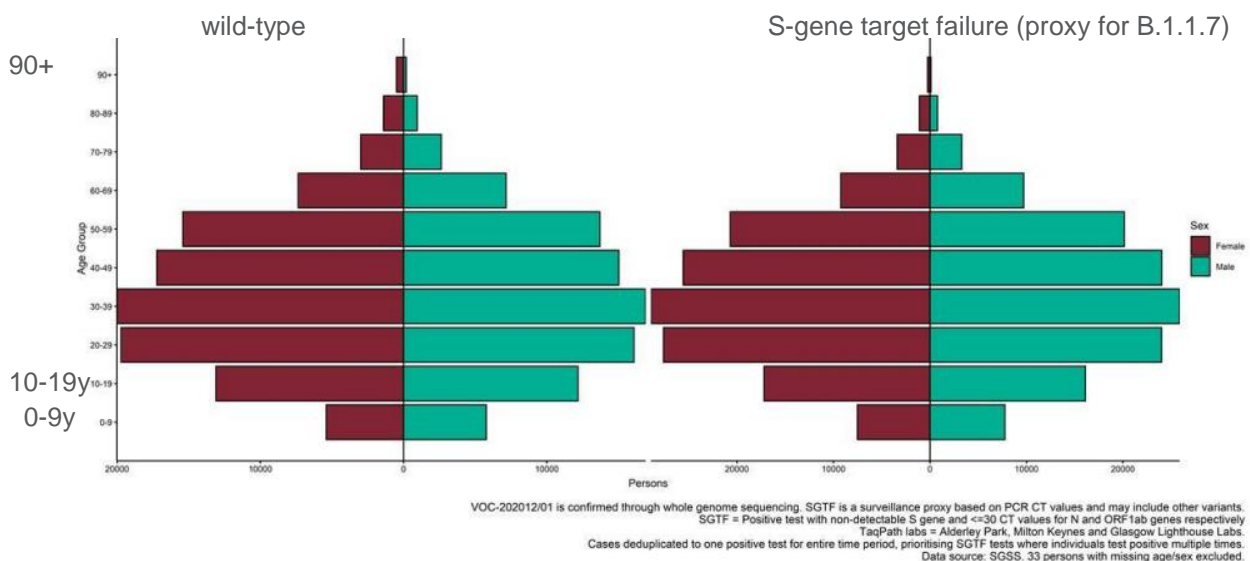


Figure 6. Sex-age pyramid of COVID-19 cases tested by TaqPath labs, S-gene detection, Pillar 2 cases only (1 December 2020 to 4 January 2021)

Attack rate: contacts becoming cases

Characteristic of contact		All contacts	Contacts of people with VOC 202012/01			Contacts of people with wild type (not VOC 202012/01)			Contacts of people without sequencing
			All contacts	Contacts that became cases	%	All contacts	Contacts that became cases	%	%
Level of contact*	Direct	875,237	8,399	1,299	15.5	10,088	1,193	11.8	13.2
	Close	79,867	829	62	7.5	863	45	5.2	6.9
Age group	0 – 9	135,998	1,345	121	9.0	1,536	93	6.1	7.2
	10 – 19	172,506	1,659	196	11.8	1,943	186	9.6	10.4
	20 – 29	111,391	1,020	167	16.4	1,352	192	14.2	15.1
	30 – 39	111,712	1,145	229	20.0	1,361	175	12.9	16.7
	40 – 49	126,005	1,241	263	21.2	1,448	199	13.7	16.8
	50 – 59	101,501	953	190	19.9	1,236	181	14.6	17.1
	60 – 69	44,985	366	74	20.2	610	92	15.1	17.7
	70 – 79	17,817	142	34	23.9	198	38	19.2	18.1
	80+	7,429	53	11	20.8	93	14	15.1	17.7
Not known	127,175	1,304	76	5.8	1,492	74	5.0	5.3	

Table 6. Breakdown by contact characteristics using genomic sequencing data

3.3. INTERNATIONAL DATA ON SCHOOL OUTBREAKS

The UK's "Children's Task and Finish Group" published an update of evidence on transmission in children, schools and transmission on the 17th of December which was approved prior to the emergence of data on the new variant. Some remarkable findings are included below:

- "Children can transmit within households as well as in educational settings. Previous analysis of ONS data discussed at SAGE 65 indicated that children aged 12-16 were playing a higher role in introducing infection into households than those 17 or over (i.e. being the index case). An update of this analysis with data until 2nd Dec 2020 still supports this, however the increased likelihood has reduced (medium confidence). The difference remains less marked for those under 12 (medium confidence).
- As discussed in SAGE 65 there is some evidence from contact tracing studies that preschool and primary aged children are less susceptible to infection than adults (low-medium confidence). The evidence is more mixed for secondary aged children and older children, who seem to have similar rates to adults. Analysis of ONS data on household transmission risk also indicates that children aged 16 or under are less susceptible to infection from others in their household than those 17 or over (medium confidence).
- No two schools are the same, with differences for example in class sizes, structures and ventilation, among other things. Differences in the school environment and the level of mitigations in place will influence the potential for transmission in schools. Mitigations such as ventilation, social distancing and handwashing (and others) are important in all school settings."

3.4. EVOLUTION OF THE EPIDEMIC IN BELGIAN SCHOOLS

An extensive descriptive report is publicly available ([NL/FR](#))

"Het contactonderzoek dat in de scholen wordt uitgevoerd door de diensten voor gezondheidsbevordering op school (PSE/PMS in het Franstalig onderwijs en CLB in het Nederlandstalig onderwijs) levert belangrijke bijkomende informatie over COVID-19 in scholen in België. Elke databank heeft echter zijn eigen beperkingen. Om de analyse aan te vullen kijken we daarom ook naar gegevens uit de centrale databank met testresultaten (Sciensano). De cijfers worden niet enkel beïnvloed door de reële evolutie van het aantal besmettingen, maar ook door zaken als de

test-strategie en de bereidheid van mensen om zich te laten testen. Bovendien wordt de rol die scholen spelen in de epidemie sterk beïnvloed door de maatregelen die op school en daarbuiten gelden. Dat alles maakt dat de gegevens niet altijd makkelijk te interpreteren zijn. Dit rapport heeft tot doel om de situatie in de scholen te beschrijven in de loop van de 15 eerste weken na de start van het schooljaar in september. Beslissingen over eventuele maatregelen zullen genomen worden door de bevoegde overheden, op basis van expertengroepen zoals de Risk Assessment Group en de GEMS. Ook in de toekomst zal de toestand in de Belgische scholen van nabij opgevolgd worden. Ondanks de beperkingen die hierboven worden aangegeven, kunnen we volgende conclusies trekken:

- De tendensen die we zien bij analyse van de verschillende databanken, lijken met elkaar in overeenstemming te zijn. Ze vertonen bovendien vergelijkbare trends met de internationale literatuur¹ over de epidemie op scholen.
- Er lijkt sprake te zijn van een verschil volgens leeftijd. Jongeren (16-18 jaar) en jongvolwassenen (19-25 jaar, de leeftijd van de studenten in het hoger onderwijs) kunnen net als volwassenen een belangrijke rol spelen in de epidemie. De evolutie van de epidemie verliep verschillend in de verschillende regio's, met een hogere piek in Brussel en Wallonië dan in Vlaanderen. In het algemeen zagen we aan het begin van de tweede golf eerst een toename van de incidentie bij adolescenten en jonge volwassenen, daarna bij de beroepsbevolking en ten slotte bij jonge kinderen. Ook op de piek lag in alle regio's de incidentie in kinderen <16 jaar lager dan in de algemene bevolking.
- De epidemische curve in de scholen volgt de evolutie van de epidemie in de algemene bevolking. Het totaal aantal gevallen in scholen stijgt nadat het aantal gevallen in de algemene bevolking begint te stijgen. De curve van het aantal gerapporteerde gevallen in het Franstalig onderwijs volgt een andere vorm dan de curve van het aantal gevallen in het Nederlandstalig onderwijs. Er is geen typisch "school"-patroon waarbij de curves gelijk zouden lopen in de drie regio's en in de verschillende leeftijdsgroepen over de regio's heen, maar de school-curves volgen in tegendeel het verloop van de epidemie in de algemene bevolking.
- Uit de gegevens blijkt dat minder dan één op vijf van de gerapporteerde besmettingen waarschijnlijk op school plaatsvond. Hoewel het absolute aantal gerapporteerde infecties in de basisschool opvallend lager is, kunnen besmettingen (zowel op school als daarbuiten) in alle leeftijdsgroepen voorkomen.
- Volgens de gegevens die op school verzameld werden, werden leerkrachten en ander schoolpersoneel vermoedelijk vooral geïnfecteerd door collega's en minder door leerlingen tijdens de periode van september tot het begin van de herfstvakantie (31/10). Voor de periode nadien zijn er onvoldoende gegevens om hierover uitspraken te doen.
- Kinderen onder de 12 jaar lijken minder gevoelig te zijn voor het virus maar ook zij kunnen besmet raken. In december zien we een toename van het aantal gevallen onder lagere schoolkinderen, terwijl er voor de meeste andere leeftijdsgroepen nog steeds sprake is van een afname. Ondanks de veel minder strenge maatregelen in deze groep, blijft de absolute incidentie in deze groep wel laag (in vergelijking met andere leeftijdsgroepen), maar toont ze het belang van actieve opvolging ook bij de jongere leeftijdsgroepen.

¹https://covid-19.sciensano.be/sites/default/files/Covid19/20201112_Advice_RAG_transmission%20primary%20school_final_NL.pdf
<https://www.ecdc.europa.eu/en/publications-data/children-and-school-settings-covid-19-transmission>

3.5. INTERNATIONAL RECOMMENDATIONS

The usefulness of masks is undisputed. WHO updated their [guidance on mask wearing](#) on the first of December, but the advice on mask-use in children is unchanged, favouring a risk-based approach:

“For children between six and 11 years of age, a risk-based approach should be applied to the decision to use a mask; factors to be considered in the risk-based approach include intensity of SARS-CoV-2 transmission, child’s capacity to comply with the appropriate use of masks and availability of appropriate adult supervision, local social and cultural environment, and specific settings such as households with elderly relatives, or schools.”

[CDC](#) also updated its webpage on the use of masks on December 18th but made no changes to the recommendations and continues to support the use of masks in children from the age of 2 years, although less stringently if distance can be maintained.

Additional Considerations for the Use of Masks among K–12 Students

Possible Student Scenario	Masks recommended	Masks may be considered	Additional considerations
Students are seated less than 6 feet apart while riding a bus or carpooling	✓		<ul style="list-style-type: none"> Masks should always be worn by bus and carpool drivers as able* Open windows to increase circulation. Be sure that the children’s safety is not affected.
Students are less than 6 feet apart while entering or exiting school (e.g., carpool drop off/pick up) or while transitioning to/from other activities	✓		<ul style="list-style-type: none"> Consider having staff monitor students during transitions to encourage correct use and distribute masks as needed. Teachers and staff should wash or sanitize hands (using a hand sanitizer that contains at least 60% alcohol) before and after helping a student put on or adjust a mask.
Students are seated at least 6 feet apart in the classroom		✓	<ul style="list-style-type: none"> Adaptations and alternatives should be considered whenever possible to increase the feasibility of wearing a mask or to reduce the risk of COVID-19 spreading. Open windows to increase circulation. Be sure that the children’s safety is not affected.

[ECDC](#) advises against the use of masks in schools in their Q&A on schools and COVID (no updates) *“In primary schools, the use of face masks is recommended for teachers and other adults when physical distancing cannot be guaranteed, although it is not recommended for the students”*

3.6. EFFECTIVENESS OF MASK USE IN CHILDREN

The effectiveness of mask use is generally accepted for adults. Younger children might however not be able to correctly use the mask or the efficacy might be lower due to poor fit. The previous RAG advice referred to the [WHO recommendation on use of masks in children](#) which discusses the (limited) available evidence of use of masks in children:

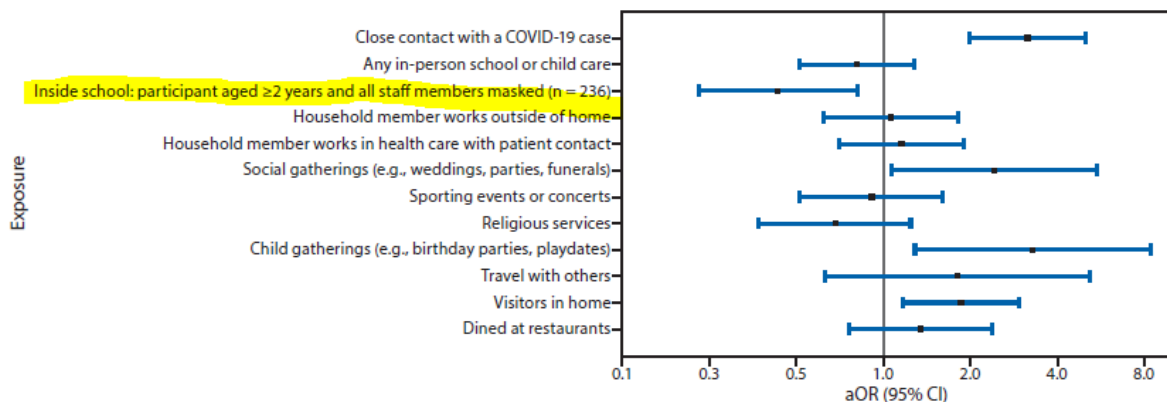
“Evidence on the benefits and harms of children wearing masks to mitigate transmission of COVID-19 and other coronaviruses is limited. However, some studies have evaluated the effectiveness of mask use in children for influenza and other respiratory viruses³⁰⁻³⁴. A study of mask wearing during seasonal influenza outbreaks in Japan noted that **the use of masks was more effective in higher school grades (9-12 year old children in grades 4-6) than lower grades (6-9 year old children, in grades 1-3)**³⁴. One study, conducted under laboratory conditions and using non-betacoronaviruses, suggested that children between five and 11 years old were significantly less protected by mask wearing compared to adults, possibly related to inferior fit of the mask³⁵. Other studies found evidence of some protective effect for influenza for both source control³⁰ and protection in children³⁴, although **overall compliance with consistent mask wearing, especially among children under the age of 15, was poor**.

Some studies, including studies conducted in the context of influenza and air pollution, found the **use and acceptability of mask wearing to be highly variable among children**, ranging from very low to acceptable levels and decreasing over time while wearing masks^{30,31,33,36-38}. One study was carried out among primary school children during COVID-19 and reported 51.6% compliance³¹.

Several studies found that factors such as warmth, irritation, breathing difficulties, discomfort, distraction, low social acceptability and poor mask fit were reported by children when using masks^{30,33,36,37}. So far, the effectiveness and impact of masks for children during play and physical activity have not been studied; however, a study in adults found that N95 respirator and surgical masks reduced cardiopulmonary capacity during heavy exertion³⁹.”

Since then, a study has been published by [Hobbs et al.](#) which describes factors associated with SARS-CoV-2 positivity in children and adolescents <18 years in Mississippi where consistent mask wearing by all participants >2 years of age and all staff members decreased the risk of infection:

FIGURE. Adjusted odds ratios (aORs)* and 95% confidence intervals (CIs) for close contact, school or child care, and community exposures† associated with confirmed COVID-19 among children and adolescents aged <18 years (N = 397) — Mississippi, September–November 2020



However, the odds are each time adjusted for sex, age and ethnicity but not for other exposures. Also, it is unclear in the report how many children were not consistently wearing a mask, but this group seems limited to only 20 children (since the recommendation was that both staff and students should wear masks) and their age is not reported. Moreover, “69% of children and adolescents with COVID-19 reported close contact with a person with COVID-19”. The true additional effect of masks in <12y is therefore not clear from this publication.

The following experts contributed to this advice:

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