

Select Subcommittee on the Coronavirus Pandemic “The Consequences of School Closures: Intended and Unintended”

Testimony by Tracy Beth Høeg, MD, PhD

Tuesday March 28th, 2023

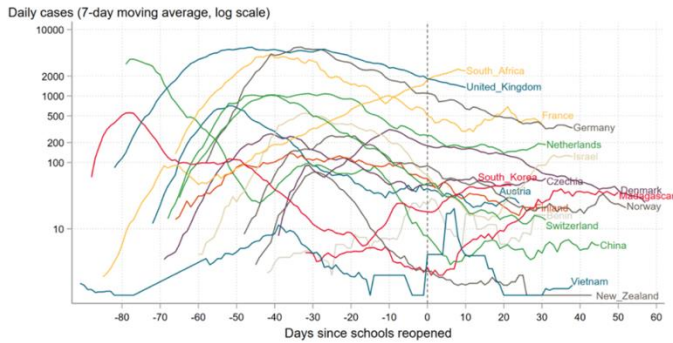
My name is Tracy Beth Høeg and I am a PhD epidemiologist currently at the University of California-San Francisco in the Department of Epidemiology and Biostatistics. I also work as a consultant epidemiologist and practicing physician in Northern California.

I have published 13 scientific publications related to the COVID-19, looking at COVID-19 transmission within schools, COVID-19 mitigation strategies in children, harm-benefit analyses in children and young people, levels of evidence we had for mitigation strategies and errors CDC has made particularly relating to overestimating COVID-19 risks in children. These have been published in such journals as *Pediatrics*, *CDC’s Morbidity & Mortality Weekly (or MMWR)*, *British Journal of Sports Medicine*, *Journal of Infection* and the *British Medical Journals’ Journal of Medical Ethics*.

I have four children and I am a Danish-American dual citizen. I moved from Denmark to the United States 5 years before the COVID-19 pandemic started. From the United States I watched the Danish news and read Danish newspapers showing with great collective excitement the reopening of primary schools in Denmark after just 6 weeks of closure in April of 2020. Norway followed almost immediately after to reopen their schools. The 3rd Scandinavian country of Sweden never closed their primary schools. There was no pattern of increased community transmission or COVID-19 cases associated with these reopenings. The three Scandinavian countries reopened their schools and demonstrated constant motivation to keep them open. These countries prioritized children’s well-being above adults’ by opening schools before reopening the rest of the society. They understood that children are among the, if not the most, vulnerable and valuable members of society and must have a safe place to go and learn and interact during the day, allowing parents to return to the workforce. In contrast, much of the United States prioritized adult well-being over children’s, reopening bars, restaurants, and beauty salons, gyms, etc, before schools. And it was not just Scandinavia that reopened schools Spring of 2020. Most countries across Europe reopened schools later that spring with the last reopenings in Europe being early fall of 2020.

Below (Figure 1) is one of the most powerful and reassuring images of the COVID-19 pandemic. As reported by the Center for Global Development in June of 2020, the reopening of schools across Europe was not associated with an increase in community COVID-19 cases and this was seen independent of the country (or their particular mitigation strategies).

Figure 1 demonstrating lack of effect of spring of 2020 school reopening on country case rates.



Graph published June 12th, 2020 by the Center for Global Development. <https://www.cgdev.org/blog/back-school-update-COVID-cases-schools-reopen>

On July 7, 2020, Swedish and Finnish Public Health Agencies issued a public report comparing, Sweden, which had kept schools open, with Finland, which had closed them from March 18th to May 13th. The report concluded, “closure or not of schools has had little if any impact on the number of laboratory confirmed cases in school aged children in Finland and Sweden. The negative effects of closing schools must be weighed against the positive effects, if any.”

Data from Holland, Germany, Australia and South Korea in the summer of 2020 found secondary infection (or transmission) rates to be very low in schools. Data out of Wuhan had shown us very early that the mortality risk to children were >1000 fold lower than elderly adults. A recent analysis released from Stanford, found the infection fatality rate in children ≤ 19 worldwide from COVID-19 to be around 3/million. In the US specifically, the infection fatality rate has been similar to and, compared with some years, less than seasonal influenza (Figure 2). The COVID-19 hospitalization rate has also been found to be less than influenza for children 5-11 in the US. Infection hospitalization rates for children prior to omicron was estimated to be around 1/500 to 1/1000.

Figure 2. Historical pediatric influenza fatality rate compared to pediatric COVID-19 fatality rate.

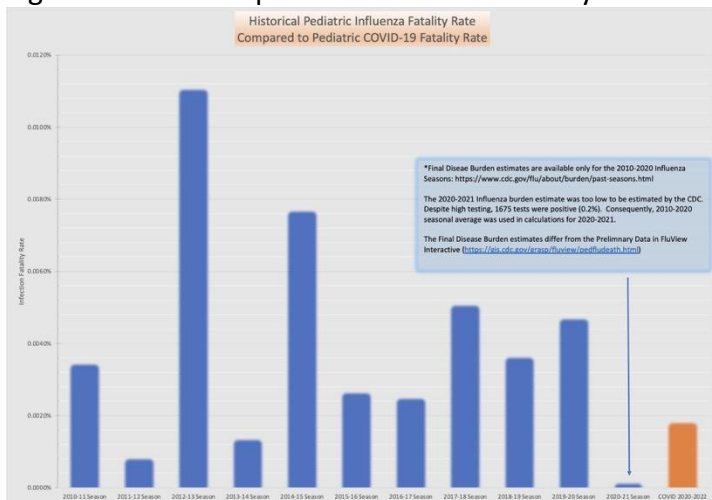


Figure by Ram Duriseti, MD, PhD based on CDC data:

<https://www.cdc.gov/coronavirus/2019-ncov/cases-up>
<https://www.cdc.gov/flu/about/burden/past-seasons.html>

Unlike Europe, virtually all 55 million K-12 students in the US remained out of school in the spring of 2020. In July of 2020 the CDC released a document supporting the reopening of schools, though this document has been removed from the CDC's website, I retained a quote and the original link. Before fall of 2020, however, the CDC set reopening metrics based on community transmission and test positivity rates without citing evidence behind them. These guidelines put about 90% of the country in a category considered "high risk" for reopening schools early fall of 2020. Initial data from Europe and elsewhere had shown in-school transmission to be limited and community case rates to be unrelated to opening or closing of schools, so why was the CDC basing their reopening recommendations on levels of community spread? There was also no high-quality evidence for their recommended mitigation strategies such as "social distancing", deep cleaning or masking, and to this day, they have not run appropriate studies to evaluate them. With states and districts often uncertain how to proceed or create enough distance in the classrooms, according to the Burbio school reopening tracker, only about 25% of students across the country returned to full time in-person learning starting fall semester 2020.

Over the summer of 2020 I was asked to be a medical and pandemic advisor at a Diocese in Northern California. In my state of California, the only reason our Diocese was able to reopen for in-person learning was because we applied for a permit to be a "daycare." Governor Newsom's requirements for reopening, put out July 17th, 2020, were so strict that >90% of California schools (public or private) did not qualify to reopen for any in-person instruction. Our diocese however with our "daycare" permit reopened primary schools August of 2020 full time and, about a month later, the middle and high schools also reopened. Our reopening was successful and we did not close again throughout the year, did not have any school-related outbreaks and experienced exceptionally low in-school transmission according to contact tracing through the Spring of 2021.

The closures of local public schools in Sacramento and across my state stood in stark contrast to those of Europe and those of the Diocese where I was working. My school-age children initially stayed in the public school system but were allowed to attend an actual daycare from which they and 40+ other children in one room could do their Zoom school. I was struck by the fact they were inside a packed all-indoor, very hot daycare without windows on their computers with spotty internet connection right next to their own (entirely closed) school with a huge locked off playground and massive amounts of outdoor space where the children were no longer allowed to play. The internet only rarely worked properly because so many kids were trying to log on at once; some days my sons reported not being able to log on at all. My youngest son who was 9 years old at the time started getting daily migraines (the days were over 100 degrees and the air conditioning in the daycare barely worked). He went from a happy kid, good at school and sports, to a child who told me on the way home on day, crying, "I don't feel like I have any reason left to live" and that's when I made the decision to move him and his 12-year-old brother to the diocese where I was working so they could go to school full time in

person. We are lucky, many families could not afford the private-school option. My kids told me that switching their school so that they could attend in person school that Fall was the best thing I had ever done for them. The fact that other children did not have the same opportunity to go back to school weighed very heavily on me and I felt like I had the ability to do something to help.

With my background in epidemiology, public health and medicine, I started doing COVID-19 research and was soon senior author on a study in Wood County Wisconsin published by the CDC in their journal MMWR in January 2021. As expected from Europe's Spring data, in-school transmission was low, even at times of high community spread, and disease rates were 37% higher in the community outside of the school than within the school. This study took place in the Fall of 2020 and gave more data to support the notion students should have been in school all along- perhaps *especially* at times of high disease transmission as exposures out of school for many children in daycares or with multiple caretakers may have been higher. Similar findings of very low in-school transmission of COVID-19 were also reported around the same time from my research colleagues in North Carolina. That fall, The UK, as well as Norway and other Scandinavian countries, reported similar and also found that teachers of students learning in-person were at no higher risk of infection than the general population.

CDC's Spring Guidance continued to keep children out of school

In early February of 2021, despite now copious amount of data indicating K-12 school reopenings were not leading to the increased community transmission as people feared, even at times of high community transmission and even without distancing or masks for the children under 12 in Scandinavia, the CDC released new guidance (subsequently removed from their website) again based on community disease levels, which left more than 90% of the country in the most restrictive tier for reopening, where CDC recommended against full-time, in-person learning for elementary-aged students and any in person learning at all for most high school children. The CDC continued to recommend 6 feet of distance in schools based on levels of community transmission. However, again, the CDC's guidance was not based on solid evidence; it was arbitrary prevented most schools from reopening full time or at all. Indeed 6 feet of distance was not found to be necessary in our already-published Wood County Wisconsin study setting (where we had found limited in school transmission in fall of 2020 even at times of high community transmission) and soon additional research would find the 6 feet of distancing did not appear to be correlated with in school transmission rates. Why were independent researchers left responsible for investigating the CDC's arbitrarily-recommended mitigation strategies, which were unnecessarily keeping children out of school?

It later came to light that the restrictive guidance may have been based on language requested by the American Federation for Teachers to the CDC instead of discussions with scientists studying COVID-19 transmission in schools or harms vs benefits of school closures. The concern in the end was the CDC guidance may have disproportionately focused on the requests of teachers at the expense of children's well-being and society at large. But perhaps even more

importantly, the guidance that Spring was certainly not based on the available scientific evidence nor did it weigh the known harms of keeping schools closed with the (a year into the pandemic) still undefined benefits of keep schools closed or in hybrid learning.

Pre-Pandemic Studies on the Impacts of School Closures

Pre-pandemic research found remote learning to be correlated with worse academic outcomes, and that low-income students rely more heavily on the social services and safety net resources that public schools provide. Students put into online learning have been found to perform worse than their in-person peers. Decreased learning time regardless of cause (teacher strikes, weather, other absenteeism) have been found to be significantly related to academic performance.

The CDC failed to have an earnest discussion about the known downsides of school closures nor were they transparent about the ineffectiveness of closing schools to prevent COVID-19 transmission. Had they done this, school reopenings in the US might have been prioritized more similarly to the way they were in Europe. I reiterate, that even by the spring and summer of 2020, there was no high quality evidence that closing schools would protect either children or more vulnerable older adults. Indeed, a large systematic review of school closures published in August 2021, found that the most well-done studies “reported no associated increases in transmission” and a very well-done study from Brazil found-as expected- no link between school closures and community case rates or COVID-19 mortality.

Pandemic Experience

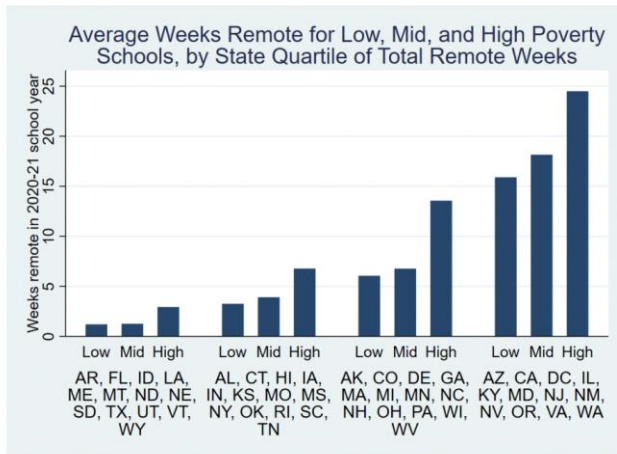
Children lost an estimated 14 million life years in the US based on the closures through the spring of 2020 alone. In districts such as the Los Angeles Unified School District, more than half of students never logged on at all in spring 2020 and fall 2021 .

School closures were a regressive policy that disproportionately affected minority children and children of lower socioeconomic status.

Shown in Figure 3, schools with the highest poverty levels within their states were the ones that were closed the longest.

Figure 3. Differences in remote instruction by school poverty status and state.

Figure 1. Differences in Remote Instruction by School Poverty Status and State



The state groupings were important in Figure 3 because of differing school reopening policies based on states’ dominant political affiliations.

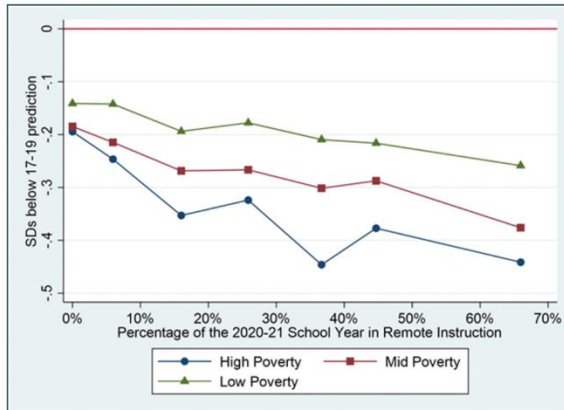
Academic Achievement

Nationwide National Assessment of Educational Progress (NAEP) found math scores dropped to where they were 2 decades ago and reading scores are now at the lowest level measured by the NAEP.

The academic losses have been the greatest among those students with the highest poverty levels. The striking dose-response relationship between the length of school closures and academic achievement declines suggests strongly that school closures were at least in some part causal in the academic achievement declines. Meanwhile Catholic schools, which largely remained open, saw little corresponding decline according to NAEP testing.

Figure 4. Pandemic achievement effects by remote schooling and school poverty, math

Figure 2. Pandemic Achievement Effects by Remote Schooling and School Poverty, Math



Note: The vertical axis represents the difference between mean fall 2021 achievement and expected achievement based on pre-pandemic growth model estimates. The horizontal axis is the percentage of the 2020-21 school year that a school was in remote instruction. Given the small number of districts that were remote all year, the top category of percent remote combines those who were remote between 50 and 100 percent of the year. Low-poverty schools had fewer than 25 percent of students receiving federal Free or Reduced Price Lunch while high-poverty schools had more than 75 percent of students receiving the federal lunch programs.

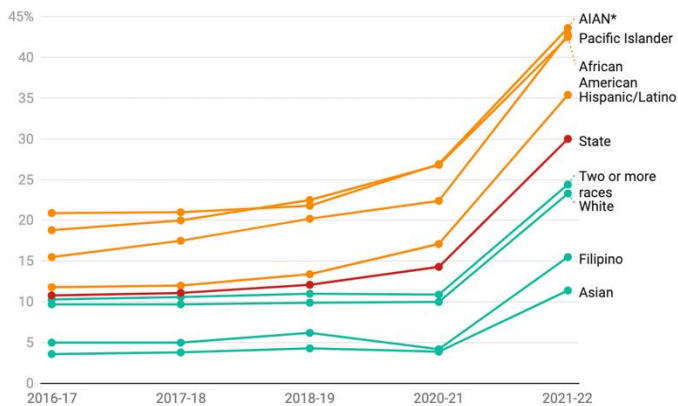
Notably, Sweden, which made the choice to keep preschools and primary schools open entirely and reopened secondary schools open very early in the pandemic did not experience educational setbacks or deepening educational inequities. They also reported “students from disadvantaged socio-economic backgrounds were not especially affected.”

Absenteeism

In my home state of California, 271,000 K-12 students left the public school system and 150,000 of those remain unaccounted for. A recent analysis done by Stanford has found around a quarter of a million children from 21 states are still unaccounted for in the school system. As shown in Figure 5, the rates of chronic absenteeism have almost tripled in California comparing last year with pre-pandemic levels, with Black, Latino and American Indian students having >35% chronic absenteeism.

Figure 5. Statewide chronic absenteeism by racial/ethnic groups since the 2016-2-17 school year

Statewide chronic absenteeism by racial/ethnic groups since 2016-17



AIAN: American Indian or Alaska Native

Chart: Yuxuan Xie • Source: California Department of Education • Created with Datawrapper

New York has also been reporting alarming and unprecedented rates of chronic absenteeism in K-12 schools with 45% of those in poverty chronically absent and over half of those with disabilities are chronically absent. Absenteeism there is also more likely among Black and Hispanic children. The youngest and oldest students also seem to be most affected, raising concerns about high school graduation rates this year, especially for the most disadvantaged students. Treating school as something inessential during the pandemic or creating habits which deprioritized school may have contributed to the current “education crisis” as some have recently called it.

We have already seen community college enrollment fall among Black students by 18% from Fall 2019 to fall 2021, with an even sharper decline among Black men, with their enrollment declining an estimated 24%.

Economic/Earning Impacts

This has lifelong implications for students. A recent Stanford study estimates California students may lose more than \$70,000 in lifetime earnings, again disproportionately affecting disadvantaged students. As a result of the decreased learning achievement, the study also estimates GDP is expected to be about 1.4 % lower each year in California over the next 75 years compared to if the learning disruptions had not occurred. In dollar terms, the loss comes to \$1.3 trillion through 2099.

School Sports Closures and Decreased Physical Activity

Children also lost critical opportunities to gain college scholarships through school sports, which were shut down along with the schools. COVID-19 sports restrictions were also associated with worsening mental health among students.

Schools offer children opportunities for physical activity on the playground, in physical education and through the sports programs. One recent study also found children's physical activity levels in the US dropped dramatically by 20% or 17 minutes a day which corresponds to over 100 hours less of physical activity a year per child.

Another study of 432,302 children ages 2-19 years found alarming rates of weight gain increased with body mass index (BMI) increase rates nearly doubling during the COVID-19 pandemic compared to a pre-pandemic period. This was most pronounced in children with overweight or obesity and the youngest children.

Children with Special Needs

Children with disabilities benefit from or are already reliant on a wide variety of therapies including physical, occupational, speech, or mental health services. Sadly, millions of children were cut off from these in-person services, many of which come through the school system. These disruptions were likely to have had negative impacts on both their short and long term development and early disruptions may have a larger cumulative impact on developmental outcomes. It has been estimated that speech disorder diagnoses in children approximately doubled between the ages of 3 and 12 during the pandemic. However, referrals and the number of children receiving early intervention services has dropped since 2019, meaning fewer children with disabilities are being identified and referred for these services, it is unlikely that the need is decreasing.

Mental health

It is well documented there has been a "deterioration in the mental health of adolescents and young people, with increased depression, anxiety and psychological distress" since the start of the pandemic. One study from the United States found older children in remote schooling had more mental health difficulties than those attending in-person schooling.

A systematic review of 36 studies from 11 countries, showed that school closures and social lockdowns during the first COVID-19 wave were associated with adverse mental health symptoms such as distress and anxiety and unhealthy behaviors including increased screen time and decreased physical activity among children and adolescents. In public schools in the US, 84% of teachers and administrators surveyed agreed or strongly agreed that COVID-19 negatively impacted student behavioral development.

Children's suicide rates increased significantly in the first year of the pandemic – with staggering 20-30% increases in black and American Indian males though it is unclear what role of any school or sports closures may have had in this increase. Meanwhile, self-harm, suicidal ideation and feelings of sadness and hopelessness increased particularly among adolescent females during the pandemic.

Abuse

Data from the CDC suggest a doubling (from 5.5 to 11%) of adolescents reporting child abuse during the first year of the COVID-19 pandemic compared with a similar survey pre-pandemic. Unfortunately, school, sports and extracurricular closures meant children had fewer adults in their lives to report abuse to or to notice symptoms and alert authorities.

Global school closures

I am focusing on the consequences of school closures in the United States but it is important to realize that, as global role models, the policies we recommend here in the US can and do affect much of the world. The World Bank estimated that school closures affected 1.6 billion children by the end of 2021, putting up to 70% of the world's children into learning poverty, defined as being unable to read and understand a simple text by age 10. The World Bank estimates worldwide learning losses to be valued at \$17 trillion.

Conclusion

We have known from early on that COVID-19 transmission was low in school and that kids faced similar risks from COVID-19 as from seasonal influenza. Yet, we kept children at home, sometimes alone, sometimes scared, sometimes hungry or in an abusive situation, for the purpose of protecting adults from COVID-19. But even that consequentialist and deeply unethical policy decision, to sacrifice children for adults, failed. We never had good evidence school closures would “work” let alone that their benefits would come anywhere close to outweighing the harms they would inflict. We gambled with our children. In some cities and states, we gambled for over a year. We gained nothing, but our children lost so much.

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