

## **Health and safety in the schools during a pandemic**

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### **Abstract**

The closure of our schools worldwide has become a great issue since the appearance of the novel Coronavirus (COVID-19) during the year 2019 (Denise Burnette, 2020). The disease that has been spreading all over the world, being Wuhan, China, the epicenter and quickly becoming a pandemic affecting everything in the entire world (Denise Burnette, 2020). To survive we all had to implement some protective measures like wearing mask, lockdown, curfews, only essential places open, and school were closed.

We shall investigate the health and safety in schools during a pandemic. It seems it is clearly a delicate subject to address at this time, but it must be discussed so we can figure out how are we going to be able to do it in the safest way possible. We are currently living and being affected by this situation in one way or another. It does not matter if we are students, professors, school owners, teachers, healthcare workers or parents that have children that are in school system. We are all being affected by the pandemic worldwide. Now we must be proactive and resourceful to see how we can reopen and operate the schools under these circumstances. We

have explored deeper the challenges and the impact that reopening schools or to keep them closed could have in the communities.

## **Literature review**

### ***Mitigation measures against COVID-19***

In early March Puerto Rico was put on a mitigation system that was effective an implemented non-pharmaceutical interventions (NPIs) that was use in the last pandemic of influenza in the years 1918-1919 and tries to see the peaked on detected COVID-19 cases plus the ratio on the dead that occur by the virus in the period of time (Miguel Valencia, 2020). The percentage of the growing rate in cases and the percentage of the fatality risk do to COVID-19 in the island.

The first case reported case in Puerto Rico was in March 9, 2020 by a couple traveling form a cruse for Italy them a man that travel from Chicago so to stop the community transmission (Miguel Valencia, 2020). The government then declare a state of emergency on March 15, 2020 that was extended to May base for the duration of the study. This included a mandatory curfew, a stay at home order, closure of nonessential businesses, public and private schools and universities, public agencies and travel restrictions. It was recommended a 14-day quarantine by the CDC guidelines (Miguel Valencia, 2020). At first the labs had to be sent to the USA to have the results of the test of the COVID-19 but after we had some labs on the island working and making the test and delivery the results for a faster report to the Puerto Rico Department of Health so they can develop and operation plan for the rise of cases on the island. During the time of the study from March 15 and May 15 there were a total of 70,656 results of molecular test only 1,704 (2.4%) were positive, 50.9% were male of the mean age of 46.0 and 49.1% female of the mean age of 45.5 (Miguel Valencia, 2020). The deaths related to COVID-19

were 62 females of the mean age of 74.0 and 81 male of the mean age of 70.2 (Miguel Valencia, 2020).

The peaked was around April 12, 2020, at the time of the study. The NPIs was proven to be very effective in the early detection of COVID-19 cases, the fatality risk was approximately 10% but this is based on a 2-week delay of the test on the island, But the epidemic curve was consistent in the duration of the study and the COVID-19 may also be under ascertained in Puerto Rico (Miguel Valencia, 2020). The findings confirm the effectiveness of the mitigation efforts. Public health actions contributed to an estimated 6,155 averted COVID-19 cases and 211 averted deaths by May 31, this is effective and beneficial plus an ongoing a surveillance systems, controls, quarantine and correct contract tracing to safeguard all of us in the island (Miguel Valencia, 2020).

### ***The effects of students receiving distance education***

It is shown in investigations the difference between musculoskeletal pain and the activity prevention, decision – making balance, and physical activity due to the receiving distance education during COVID- 19 pandemic showing the effects this have on the posture. The study counted with 202 students’ participants, 155 women and 47 men all receiving distance education (Aytar, 2020). They were divided into two groups, one receives training and the other one didn’t (Aytar, 2020). This did not show a significant difference between the two groups but there was a difference in favor of the control group in the exercise behavior decision – making balance pros scores (Aytar, 2020). It did show in the pain complaints in the last 7 days of the study in the back region by the training group, and at the control group it was at the shoulder region (Aytar, 2020). Both groups had pain in neck and waist. Base on the data the recommendations is to keep

physical active with exercises and the better posture while on the computer so we can avoid the risk of pain in the neck, shoulders, waist and back. So, our students can keep up with school without being distracted by the pain they are being caused by the online learning that had to be enforced as a solution to keep educating the students. To keep the body in healthy and have a great posture is recommended to exercises in combination with a healthy diet. This must be implemented by the school in the itinerary of classes like to give the PE class and in the school system of breakfast and lunch even if it is now managed in a different way like the pick up at school lunch program.

### ***Mortality in the pandemic***

It was estimated that in May of 2020 more than 100,000 persons had died from COVID-19 (Jody W. Zylke, 2020). But reports said that it is likely an underestimate number due to it may have been misdiagnosed like the person may have died from another respiratory disease or due to the lack of tests in the beginning of the pandemic (Jody W. Zylke, 2020). Comparing the numbers of deaths from previous years 2014-2019 was 419,058 to the 2020 that was 505,059, living an excess of 87,001 of deaths, 65% were attributable to COVID-19, but leaving a 35% of deaths unexplained. Just like it happens in Puerto Rico after Hurricane Maria the estimated counts of excess of deaths due to the disaster was a range from 1,139 to 4,645, in comparison with an official death toll of 64 that was informed to the public (Jody W. Zylke, 2020).

But the pandemic has also had effects in other areas in the regular death counts because people are not going to the doctor or to the emergency rooms due to fear of contracting COVID-19 leaving their other conditions unattended (Jody W. Zylke, 2020). Less people in the street due to the stay at home order is getting less car crashes (Jody W. Zylke, 2020).

### ***Direct and indirect effect of the stay at home orders and school closures***

The measures have been proven successful in decreasing the rate of the spread of the COVID-19 virus. But it has had an indirect effect in different areas like:

\*An increased in reports of domestic violence, woman, children, LGBTQ community, the elderly and men (Jody W. Zylke, 2020).

\*The social isolation that we all had to deal with has been a psychological distress (Jody W. Zylke, 2020).

\* The unemployment rate in May 2020 was at 13.3%

\*The closures of businesses

\*School closures can affect kids in there education, must kid depend of the breakfast and lunch to eat and the may not receive some based health center services (Jody W. Zylke, 2020).

### ***Education in the COVID-19 pandemic***

The education system has faced an unprecedented challenge in the pandemic do to COVID-19. The majority of the countries have put an end to the school or institutes that do learning physically present do the pandemic. But this create an over night problem of how to keep going with the education this involves students, teachers, professors, parents and institutions. For the teachers and professors it mean to change the way the teach even do the are using some of the technology they have be already been using but is at a new hole other level they need to adapt and add new program's and technology over night so teachers are learning in the proses how to teacher in a different way. Doing a distance virtual education way if they have the resources that is a key point in all of this, not everybody has the access to internet let alone a computer. That when the government or institutions come in to give the employees what they

need to keep working. The staff preparation and training, health and safety protocols, brief and simple updates and creating a way for teacher to stay in touch collectively (Daniel, 2020).

The students have different needs they have been cut out of there social group overnight (Daniel, 2020). The part that is changing school next year or the ones that are going college or entering a new program in the university and they have to be evaluate through an exam but now they are not offering the exams at the moment is a different time that requires special arrangements. To parents and students this is an uncertain and anxious time and the most important thing for them is that the institution, school and teachers maintain a clear channel of communication. On top of that parents are deeply anxious about their own economic future, so studying at home is not easy, especially for children with low motivation and such homes often lack the equipment and connectivity the students, or parent need to study or work (Daniel, 2020). This article points out that one of the adjustments is the classrooms in real time, flexibility, technology challenges or glitches and adds to the curriculum online on- demand videos short 5-10 minutes or recorder classes or lectures help the student and give time to the teach to prepare new material (Daniel, 2020). Can give the time to do appointments for students with particular need or questions. They also discus that there is way for teachers to enrich of high-quality learning material available now as freely usable Open Educational Resources (Daniel, 2020). The Open Learn website, for example, contains over 1,000 courses at both school and university levels (Daniel, 2020). There is no dishonor in teaching through good materials prepared by others which I found it to be a great resource for teachers in these pandemic times. They have understood that even do this event have been hard to learn in a different way it opens up an opportunity to benefit form this mechanisms and training for when we enter the new reality after COVID-19 or future crisis.

***The effect on the healthcare system if schools are kept closed***

The healthcare workers sector has a big predicament to keep working and saving life or to go home and stay to take care of their kids because of the mandatory stay at home orders and schools are close. The order to close schools comes from the experience with the influenza to reduce infection and mortality from the novel virus COVID-19. Due to its short time that we have dealing with this virus there is no evidence that confirm that schools or children can become super spreader that's why we are acting by the example of the influenza. Dose closing the schools is benefits saving life, and in what scale vs the healthcare worker to show up and increase the probability of a patient's COVID-19 survival. A 29% of health care workers have kids from 3-12 years old that most provide care for them, assuming they have nobody older than 13 years old to watch them in the US (Jude Bayham, 2020). But in Puerto Rico your kid must be 18 to be left alone at home or in charge of other kids, or due to the new circumstances of the pandemic the kid capacities, age and time left alone are taken in consideration. If we then add the 7% of healthcare worker that are a single-parent households thing get even more complicated (Jude Bayham, 2020). The parameters cannot exceed the infection and mortality rate to 2.35%, and the health care workforce cannot decline by 15% for this plan of school's closures to work. This most reduce cases by 25% or more to be effective (Jude Bayham, 2020).

There is no certain way to know how the closing the school can affect the transmission or life saved this need to be weighed against the uncertain of the healthcare worker absenteeism due to the childcare obligations' situation. This must be done to protect the public health system from crashing down by the overcrowding the system and to keep the mortality rare down.

### ***The impact of COVID-19 in a supply chain***

In this article they explain the effect of COVID-19 in the supply chain if it hit a big city or productive city. They base the study on others studies and in the data base of several research companies in Japan. The economy has been affected all over the world so this article is trying to make an estimated of the losses if Tokyo were to go in lockdown like in Wuhan China, how and what or who this will affect in the worse case scenario. The research indicated Their result indicates that the propagation effect of an economic shock through supply chains can be substantially larger than its direct effect. Inoue and Todo explain it like this if the business had a more complex network a characteristic in the supply chains like scale free properties or complex loops this will aggravate the propagation effect making having a larger effect. (Todo, 2020) But instead if the network had no complexity and if they assume no firm level linkage but only inter-industry linkages and without the complexity the propagation effect is quite small in the supply chain for less problems down the line.

Do to the possibility of a lockdown of Tokyo they with the Organization for Economic Co- operation and Development estimate in the worst case scenario all the countries are hit by the COVID-19 by early March, 2020 it would reduce the Gross Domestic Product of China by 6.2%, Japan 9.9%, the United Kingdom 6.0% and in the United States 8.4%. but it may be largely undervalued (Todo, 2020). This may be the economic effect of the COVID-19 across the regions. But lest be clear this only demonstrate the effect that this could have in mayor city's this simulation did not included small cities. This study demonstrates the problems that way faced in the supply chain for evening that we depend on like the mega shortage on mask and the shortage on computers for virtual work and school at a distance.



### ***Innovation in meal service***

We found this article to be one of the most important seems it perfect for our topic the health and safety in school and the first way to address this to know that the students have food to eat during this pandemic and what better way than keep up with the meal programs at school. Is a shame that the national school lunch and breakfast programs were stop when school were close do to the COVID-19 pandemic. Some of school started closing in the United State of America in March 2 and by March 23 it was a statewide mandate for all school to be close (Kinsey, 2020). But the thing is that the 9 weeks that kids went without their regular breakfast or lunch for school that they clearly need it (Kinsey, 2020). It is estimated that weekly meal for a student is of \$30 dollars this could mean a significant financial burden for the families especially when they are losing their jobs due to the pandemic (Kinsey, 2020). They estimate that in the period from March 9 to May 1 more than 1.15 billion meals were not served in school because of the pandemic outbreak of COVID-19 (Kinsey, 2020). Several Waivers were in place to cut the complex bureaucracy of the lunch and breakfast programs so they can feed their students (Kinsey, 2020). They made a few places to give the food with the necessary precautions and implemented delivery services plus at some location you could order by phone if that day you would go to get your meals. For us the most impressive thing in this article is the way that Maryland state manage the situation. They close Thursday, March 12 and on Monday, March 16 started the replacement meal for all the students (Kinsey, 2020). They only took 1 business day to prepare a plan and the logistic that met the social distancing guidelines (Kinsey, 2020). This is management the look at a problem a need and developed a strategy to solved it with a rapid innovation and implementation. The need that was so big that in some state they implement meals for dinner and snack for kids and they also integrated the adults in need of a meal. In some

state started doing it not only 5 days a week but 7 days (Kinsey, 2020). We now more than ever know the need for the nutrition program of schools and the P-EBT for the households (Kinsey, 2020). This crisis has made the program of school nutrition in a new way and opened our eyes to the real need that occurs when schools are not in session so we have identified the possible solution to this current problem. This shows how critical the school is in the life of parents and kids in many different ways.

### ***Reopening of schools affect the elderly***

The oldest population is affected directly by the reopening of the schools in Puerto Rico during the COVID-19 pandemic. This is the higher risk population and Latinos have two times higher rates of hospitalizations and mortality than non-Latino Whites in the U.S. By June of 2020, the majority of confirmed cases were aged 65+, 26.5% were aged 60+, 33.1% and the 50+ were 53.1% this put them at a disadvantage over the younger population because of the rate of mortality at this age. (Denise Burnette, 2020) Since the pandemic hit Puerto Rico the unemployment had quadrupled by May 2020 at a 37% (Denise Burnette, 2020), schools are closed obligating parents to become a one-income family for one of the parents to stay at home with the kids because if they give them to the grandparents to watch over them while parents go to work putting them at risk since kids are the perfect carrier for the virus COVID-19 because for the most part they don't usually present symptoms this will be a back and forward between households. So, there for if schools reopened the parents go back to work but it leaves the grandparent's generation in charge of the kids that can get COVID-19 at school and give it to the very high-risk grandparent. It is known that older adults are at higher risk due to the possible contributor of preexistent conditions like a higher age-related multi-morbidity rate, declines in the immune system function and an increased inflammatory pathway (Denise Burnette, 2020).

This generation is so isolated, poor, depress, anxiety, loneliness, is social and fiscal disconnected from the rest of society because of the pandemic, that they would love nothing else that have there kids and grandkids around even if this put them at risk. So is cleared that ones the schools open we will see an increase of cases of COVID-19 in the elderly population.

### ***The COVID-19 effects on children***

\*Reports of children developing a multisystem inflammatory syndrome like the Kawasaki syndrome after having had COVID-19 (Jody W. Zylke, 2020).

\* It had emerged some potential cardiac damage (Jody W. Zylke, 2020).

\* It is too soon to determent if there is some permanent or long term respiratory implications or severe pulmonary damage from those who recovered from severe COVID-19 (Jody W. Zylke, 2020).

### ***Recommendations if we have to reopened schools:***

It is going to sound a bit repetitive, but it is the most effective way to combat the COVID-19 virus is:

\*Wearing masks at all times preferably surgical masks, N95, KN95 or a cloth with a filter.

\*Washing hands with soap and water frequently and have available hand sanitizer or alcohol.

\*Keep at least six feet apart to keep physical distance.

\*Have a robust contact tracing to protect school personal, students and their families.

\*There should be a scheduled timeline drop off for the different grades and the same in pick-ups.

\*At the school entrance there must be a screening area were the temperature is taken and a screening of symptoms is done.

\*At the time of class change the teachers must be the ones to change classrooms instead of the students to minimize the risk with proper sanitation between changes.

\*Study the possibility of establishing the bubble system in certain activities that students may do together such as sports, band or extracurricular activities.

\*Bathroom areas must be clean after every use.

\*School meals must be grab and go.

\*All schools must have online education as well in person education should be available for all students.

\*In the event of two COVID-19 positive cases the classroom must be close, and students put in quarantine.

\*Two or more classrooms reporting cases the whole school must close and go into quarantine.

## **Conclusion**

During this investigation we have discover several razon why the schools must reopen. The delay on educational progress, the negative effects of social distancing, the lack of physical activity, the mental and emotional toll, the increase in domestic violence and child abuse, the lack of the secure meals at school, the needed of the parents for the students to go to school in order for theme to go to work therefore impulsing an economic bust. But public heath is above all of this to make sure everybody is safe, and the health care system is not overwhelmed. All the other things can be work with in different ways, but we cannot bring back our dead. We have to deal with are new reality, it a new normal.

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