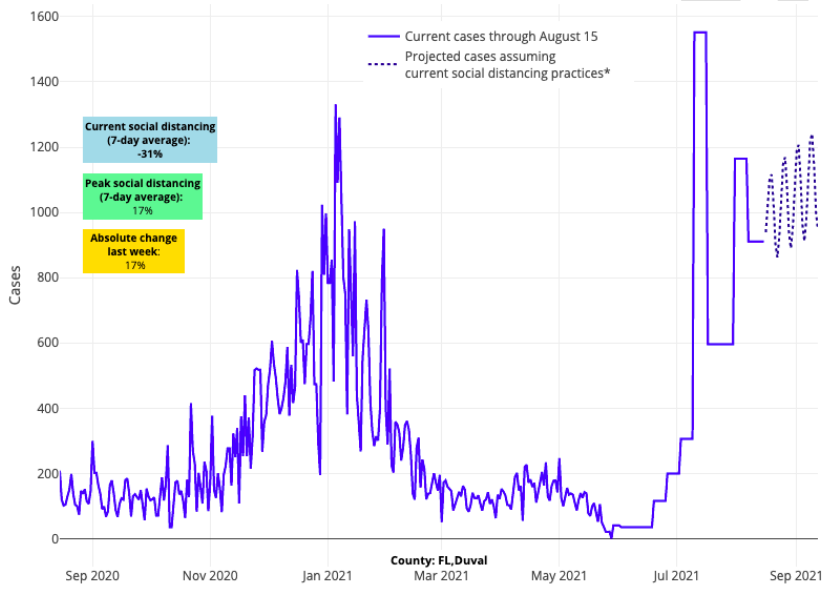
Case Report: When COVID-19 attend Classes with Children

Abstract:

Introduction*: Transmission of SAR-CoV-2 among school children had previously been viewed insignificant. As economies attempt to open with school children returning to study; reported cases of multiple diagnosis of COVID-19 challenge previously held notion that school children might not be significantly impacted due to limited exposure routes in school. This study focused on a case of COVID-19 diagnosed in an 8-year-old school child. A previously normal child who turned symptomatic and positive to PCR test 3 days after testing negative. Transmission of SAR-CoV-2 among school children is a reality. In addition to other public health measures, vaccination of school children, teachers and visitors is necessary to mitigate the exposure.*

Graphical Abstract



Source – Policylab 2021

Keyword*: SAR-CoV-2, vaccination, school children, co-habitation, transmission*

Introduction: Coronavirus Disease 2019 (COVID-19) is a Respiratory Tract Infection (RTI) caused by Severe Acute Syndrome Coronavirus-2 (SARS-CoV-2), the causative organism for the 2019 pandemic (Osakwe Adakporia, Menkiti & Ukaegbu 2020). Initial outbreak in Wuhan, China was reported in 2019 but achieved global spread in 2020 (Osakwe Adakporia, Menkiti & Ukaegbu 2020). As of 17th of January 2022; 326,279,424 cases have been confirmed; including 5,536,609 reported deaths and 9,395,059,118 vaccine doses (WHO,2021).

Initial public health response was directed at mitigation of COVID-19 virus on adults. Raft of mobilized measures includes social distancing, hand sanitization, use of suitable respirator, isolation, incessant and prolonged lockdowns, international border shutdowns and vaccination (Osakwe Adakporia, Menkiti & Ukaegbu, 2020). While several measures had been directed at adult cohort; little or no measure was specifically channeled at the protection of school children on the premise that limited exposure route exist in schools, and their immunity suffices and guarantees protection (Lee & Raszka 2020; de Souza, Lanziotti & Lee 2020; Danis et al., 2020; Rudan et.al 2021; Munro & Faust 2020; Wong 2020; Ludvigsson J. F. 2020; García-Salido A. 2020). Vaccination in adult cohort has proved seemingly effective in mitigating the severity of COVID-19 on adult; however emerging trend shows that school children will require vaccination to ameliorate the severity of COVID-19 as in adult cohort (Zhang & Zhang, 2020; Kammoun & Masmoudi, 2020; Li et al). The objective of this study is to presents and analyze a case report of an unvaccinated child who became an education contact.

Method: A descriptive study of a child with COVID-19 classified as an education contact.

Case Report: An 8-year-old boy with previously normal medical history tested negative to COVID-19 following four days of class attendance and daily contacts with peers and class teacher. The class teacher was confirmed COVID-19 positive following complaints of unwellness. Afterward, all traceable primary contacts including the class children and case in view had mandatory Polymerase Chain Reaction (PCR) test. The child of interest in this study had a negative PCR test. Two days after the negative result, the patient (child) felt unwell with mild dry hacking cough and nasal congestion. Physical assessment by the General Practitioner (GP) revealed a clinically clear chest with no evidence of chest infection. An initial diagnosis of Upper Respiratory Tract Infection (URTI) was made with advisory on vitamin, adequate fluid intake and rest. Patient became acutely ill on the 3rd after negative PCR test with non-productive, rapidly paced and hacking cough with feeling of acute unwellness. He was taken to the emergency where a repeat PCR revealed positive COVID-19 result. The COIVD-19 response protocol for positive PCR test was immediately activated. This includes home isolation for 10 days for the patient, notification of family members and school, PCR testing and isolation of family members for 7 days, adequate fluid and food intake, and daily observation. Patient is the fourth and last child in a home of six. Home isolation was eventful as presented in Table 1.

Table 1: Observations and Events during home isolation

Day	Observations

1	Acutely ill-looking with rapidly paced nonproductive dry hacking cough and feeling of grave unwellness, nasal congestion, throat pain (8/10), Shortness of Breath (SOB), occasional tearing. Nil vomiting and fever. Child was treated symptomatically and placed on amoxycillin for the sore throat, diclofenac throat spray for the painful throat, nasal decongestant spray for the nasal congestion and cough suppressant for the dry hacking cough.
2	Condition was same as in day 1. Result of rest 5 members of the family returned negative with non feeling unwell.
3	Condition was same as in day 1 with no obvious improvement.
4	Additional holding of throat, crying, restless and twice vomiting.
5	Condition was same as above.
6	Condition was same as above. Vitamin C and Zinc supplement (pediatric formulae) was added to the therapeutic support regimen.
7	Repeat PCR test for rest 5 members of the family returned negative.
8	Child verbalized wellness. Reduced frequency of cough, nasal congestion relieved, verbalized feeling of wellness. Family members were discharged from Isolation.
9	Improvement continued with reduced frequency of cough, verbalized feeling of wellness, resolved nasal congestion, improved sleeping, appetite, not ill looking.
10	Sustained improvement evidenced by significantly reduced frequency of dry cough, nil nasal congestion, improved appetite, and verbalised feeling of wellness,
11	Discharge from home isolation.

Discussion

In pre-symptomatic COVID-19 cases, PCR test undertaken at the onset of incubation period will be negative. Although several data *(Lauer et al. 2020; Nie et al. 2020; Cheng 2021)* abound on the duration of COVID-19 incubation period, the United States (US) Center for Disease Control (CDC) posit its ranges from 2-14days (CDC 2021). In this study, it was however, impractical to decipher the date of infection. However, for patient to become positive three days after an initial negative test shows that he had been infected but asymptomatic

during initial PCR test. A negative test does not preclude the presence of COVID-19 infection.

This justifies serial PCR testing especially in symptomatic individuals. Transmission amongst school children have been reported to be low when compared with transmission in Adult (CDC, 2021). Conversely, resumption of school activities would expose children to increased transmission routes including parents, peers to school visitors, teachers, and school staff. The risk is further amplified by prolonged indoor activities, innumerable contact points within school infrastructure, impractical social distancing proximal play contacts and more. Given the unvaccinated status of children in several climes, multiple interfaces, and risk factors in school attendance; the risk of transmission among children is significantly high. In this report, the school was temporarily shut down due to multiple cases involving children and teachers in all the classes in the school despite teachers mandatory vaccinated status.

This corroborates CDC position on the possibility of SAR-CoV-2 transmission among children, hospitalization, and transmissibility (CDC 2021). The efficacy of vaccine in mitigating ameliorating the impact or exposure to SAR-CoV-2 was put to test as four members of the family had been doubly vaccinated. They were serially tested (PCR) on day 1 and 7 of diagnosing (PCR) the case of interest with negative results. The 5th child who is 10yr old did not test positive in the serial PCR tests on day 1 & 7 (Klass & Ratner 2021). Given the study scenario is a family setting home, cohabitation of 5 family members with a sixth but youngest with COVID-19 was a challenge (D'Onofrio, Buono & Cooper 2021; Posfay-Barbe et al. 2020).

The clinical presentations were suggestive of moderate illness hence home admission with symptomatic treatment sufficed. Supportive treatment given include nasal decongestant, antibiotics (amoxycillin), analgesics, cough suppressant, vaporizer, vitamin, and fluid intake. The patient verbalized significant relief on daily use of vaporizing hot water with mixed with e*ucalyptus, peppermints, oil of watergreen and Levander oil.* Daily telehealth review involved self-administered electronic questionnaire completed by parents followed by a tele-call by a medical officer. Questions in electronic questionnaire explored and sought to know patient condition, confirm presence or absence of abdominal pain, vomiting, fever, appetite, rule-out difficulty in breathing and presence of any life-threatening situation. The medical officer calls after completion of electronic questionnaire to verbally review patient condition. The electronic questionnaire might be repeated in the evening should morning responses suggest acute condition. Welfare of the family was supported via contactless delivery by the government, non-governmental and faith-based organization. Deliveries were kept at the doctor followed by a phone call from suppliers notifying parents of delivery. This enabled parent compliance on isolation for 10 days. While the rest member of the family isolated for 7 days, infected child isolated for 10 days. Cohabitation during

mandatory isolation of Covid patient with the rest members of the family is a grey area that presently requires more study (D'Onofrio, Buono & Cooper 2021; Posfay-Barbe et al. 2020). In this context a room was dedicated to the patient with reduced traffic and frequent anti-virus wiping of surfaces and contact points in the house.

Conclusion – This case report has revealed that there is significant risk of transmission among children in school setting with significant potentials for moderate to severe illness. In addition to other public health measures, vaccination of school children, teachers and visitors is necessary to mitigate the exposure.

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