



Long-term effects of the coronavirus disease 2019 pandemic on the health and safety of children and mothers around the world

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Review Article

Abstract

BACKGROUND: Coronavirus disease 2019 (COVID-19) epidemic is a global health disaster with significant effects on the health of children and mothers on a scale not seen in 100 years.

METHODS: We searched in Google Scholar, PubMed, and Scopus databases with keywords of “COVID-19”, “children”, “mothers”, “health”, “impact”, “effect”, and “pandemic”. We found 33 related new studies and wrote a narrative review article. Some of them were full-text articles and others were organizational statistics or expert comments.

RESULTS: Analyses showed that the COVID-19 epidemic led to widespread disruption of health systems and reduced access to food, and low- and middle-income countries should expect large increases in maternal and child mortality. The long-term effects of COVID-19 on the physical and mental health of children and mothers are very different and challenging compared to other people. During the pandemic, many mothers denied access to prenatal care. In addition to the many indirect effects, although most children have mild symptoms, they should be treated in the intensive care unit (ICU) if children are hospitalized with the same percentage of adults.

CONCLUSION: It is very necessary for politicians and organizations in charge of children's health to have comprehensive and long-term plans to limit the destructive and unintended effects of the pandemic on children and mothers around the world, with a greater focus on underdeveloped and less developed countries.

KEYWORDS: Long-Term Effects; COVID-19 Pandemic; Children; Mothers

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Introduction

Coronavirus disease 2019 (COVID-19) epidemic, a disease caused by severe acute respiratory syndrome coronavirus (SARS-CoV), is a catastrophe in world health and economy, on a scale never seen before in 100 years.¹

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However, children do not face the disease. But they are the most dangerous victims, and while they are largely safe from the direct effects of COVID-19 on their physical health, the crisis has a profound effect on their long-term health. All children, at any age and in all countries, are affected by socio-economic influences and restrictive measures that may inadvertently do more harm than good. The impact of this pandemic is a global crisis, and the devastating effects will last for some

children for the rest of their lives.²

Exact statistics on the effects of the pandemic on mothers are not available, but according to the previous epidemic, pregnant women are more affected than others, because on the one hand, anxiety causes more preeclampsia, premature birth, and other complications of pregnancy and on the other hand, mothers' worry about infection is less common than in the past, seeing a doctor or health center.³

Materials and Methods

We searched in Google Scholar, PubMed, and Scopus databases with keywords of "COVID-19", "children", "mothers", "health", "impact", "effect", and "pandemic". We found many new articles and wrote a narrative review article. Some of them were full-text articles and others were expert comments. We did not have a limitation on time. Each of the articles contained English abstract and full text and expert comments were included in this review.

Results

Analyses showed that COVID-19 epidemic led to widespread disruption of mothers and children's access to health services and food, and as a result low- and middle-income countries should expect large increases in maternal and child mortality, so that 18% up to 23% will have additional deaths in children. The recent epidemic is expected to affect the health of women and children more than we expect, and even in other ways that are currently unknown to us.⁴

Clinical features of COVID-19 in children usually include fever, dry cough, and pneumonia or gastrointestinal (GI) symptoms. Children, like adults, acquired COVID-19 through explicit transmission routes, including close contact with family members or a history of being in densely-populated areas.⁵

Although most cases reported in children

are not severe, physicians should maintain a high susceptibility to COVID-19 infection in children and monitor disease progression, especially in infants and children with underlying disease.⁶

Children are less likely to be symptomatic than adults, and most have mild or no symptoms, but the manifestations of COVID-19 in children may be different from those in adults. Although the hospitalization rate for children is much lower than adults, if children are hospitalized, they will need to be admitted to the intensive care unit (ICU) for treatment in a similar proportion to adults.⁷⁻¹¹

Children with congenital heart or respiratory disease, genetic, metabolic or neuromuscular problems, and children under 1 year of age are also at higher risk for serious COVID-19.^{12,13}

It is noteworthy that the immune system of children responds differently to the coronavirus compared to that of adults, and that the adults' immune system appears to overreact to the virus, causing more damage to their body. This can also happen in children and lead to damage to various organs of their body.¹⁴

Although children are less likely than adults to develop severe forms of COVID-19, the consequences of the disease in children are unpredictable and can sometimes lead to serious organ damage. We report a novel pediatric case of fulminant hepatic failure (FHF) associated with COVID-19.¹⁵

Multisystem inflammatory syndrome in children (MIS-C) is a disease in which various systems of the body, including the heart, lungs, kidneys, brain, skin, eyes, or GI tract become inflamed by the coronavirus. MIS-C is a rare but severe disease that has been reported in children and adolescents approximately 2-4 weeks after the onset of COVID-19. MIS-C is a dangerous, new, and potentially deadly disease.¹⁶⁻¹⁸

25% to 50% of mothers with SARS-CoV-2 are asymptomatic, and infants can become

infected with the virus during childbirth or when exposed to postpartum caregivers. Of course, perinatal transmission is unlikely if proper hygienic measures are taken during childbirth and breastfeeding and resting the baby are accompanied by effective education, necessary parental precautions, and the use of baby protection strategies.¹⁹⁻²²

All children, at any age and in all countries, are affected by socio-economic impacts and in some cases, by mitigation measures that may inadvertently outweigh the benefits. This is a serious crisis in the world and for some children, its harmful effects will be lifelong. These harmful effects are not evenly distributed in children around the world. These harms are expected to be more devastating for children in the poorest countries, in the poorest neighborhoods, and for people who are already poor or vulnerable.^{23,24}

While the available evidence suggests that the direct impact of COVID-19 on child and adolescent mortality is limited, the indirect effects on child survival including health system problems such as loss of household income, reduced medical care, and disruption of preventive services such as vaccination are significant. According to a study of 118 low- and middle-income countries by Johns Hopkins University, United States of America (USA), 1.2 million deaths of children under the age of five years may occur in just six months due to declining of routine health care levels.²³

188 countries around the world have imposed school closures on students, affecting more than 1.6 billion children and young people. The potential losses that may be incurred in the learning of the young generation and the development of human capital of the countries are understandable. More than two-thirds of countries have introduced a national distance education platform, but this share is only 30% among low-income countries. It is unfortunate that before this pandemic, almost a third of young

people were digitally excluded. School closures in their current form are very different from summer vacations, and while learning is expected to continue digitally, it is likely to widen the learning gap, especially between children from low-income families and higher-income families. Children from low-income families live in conditions where it is difficult for them to study at home. Online learning environments usually require computers and secure internet connections, and epidemics are predicted to lead to recession, exacerbating child poverty and affecting children's online learning outcomes.^{23,25}

More vulnerable children are malnourished due to low family income, the quality of diets created during the epidemic, and the extent of its inhibition. The number of 36 million hungry children increased to 132 million in 2020. In the early days of the COVID-19 epidemic, United Nations International Children's Emergency Fund (UNICEF) estimated that food service coverage would be reduced by 30 percent, to 75 to 100 percent in limitation context, and that the food crisis would be more pronounced in fragile countries.²³

During COVID-19 epidemic, the prevalence of breastfeeding has dropped significantly due to reduced health care utilization, while worldwide breastfeeding can prevent 823000 infant deaths per year. Women's reluctance to visit and use the health system has led to less coverage of prenatal care, postpartum care, breastfeeding support, and counseling centers.²⁶

Every year, 2 to 3 million people worldwide are saved from death by routine vaccination, but COVID-19 has led to a reluctance on the part of parents to turn to children for access to these life-saving services and decades of progress in reducing mortality will disappear in the world. According to new data, approximately, 14 million children in 2019 did not receive the vaccine. In addition, nearly 6 million children have received some but not all of the vaccines needed to fully protect against

life-threatening illnesses. As COVID-19 intensifies its pressure on weakened health systems, the number of unvaccinated children is expected to increase, exacerbating existing inequalities and exposing the lives of many children to serious illness or death. According to COVID-19 measures, approximately, 80 million children under the age of 1 year in at least 68 countries may lose life-saving vaccines.²³

The sharp decline in vaccination rates comes at a time when the COVID-19 epidemic is a reminder of the importance of vaccination. Significant reductions in routine pediatric vaccine orders and prescribed doses indicate that children in different countries are at increased risk for vaccine-preventable diseases. Parents' concerns about their children's potential exposure to COVID-19 during a healthy child's visit may play a role in reducing normal growth care. As a result, reminding parents of the vital need to protect their children from serious vaccine-preventable diseases such as measles is vital, even as COVID-19 epidemic continues. It is essential to reassure parents and provide conditions for social distance, to raise public awareness and to make a concerted effort by governments to maintain previous achievements in order for all children to have immediate access to vaccination.²⁷

The continuation of the COVID-19 crisis could increase the number of children living in poor housing to 117 million worldwide by the end of 2020. Immediate loss of income often means that families are less financially able to provide food and water, less likely to receive health care or education, and more likely to be exposed to violence, exploitation, and abuse.²³

Closing of schools is an imminent threat to the health and well-being of children, especially to those living in poverty.²⁸

With the loss of jobs and income of workers due to the COVID-19 epidemic, the number of people who do not have access to employer

insurance and are not eligible for health insurance coverage will increase. Reduced insurance coverage will reduce the number of poor families seeking treatment for the disease and, in the near future, will have irreparable consequences for individuals and the health system.²⁹

New cases of human immunodeficiency virus (HIV) infection among young children have been halved in the last decade; however, disruption of COVID-19-induced services could reverse these valuable gains. It is predicted that if prevention services are disrupted for 6 months, 124000 new children become infected with HIV.²³

Unfortunately, in the recent epidemic, the mental health of children and adolescents is often neglected due to relatively lower mortality than adults. Smartphone addiction, internet addiction, anxiety about communicating with family or friends, separation anxiety, fear of physical harm to oneself or others due to poor hygiene, fear of being in the community, and finally disorders of depression, panic, and general anxiety are much more common in children and adolescents than before. Infection of a family member or friend with the coronavirus is also associated with increased levels of anxiety. The prevalence of clinical depressive symptoms in children was 22.28% at the time of COVID-19 prevalence, which is much higher than before the pandemic (13.2%).³⁰

Protecting the safety, health, and nutrition of vulnerable women around the world is a major challenge in times of crisis and must be based on the best evidence and appropriate and effective solutions, so that valuable successes in reducing mortality and improving women's health and nutrition are not reversed.³¹

COVID-19 precautions affect the availability of essential health services for pregnant women and infants that cannot be delayed or rescheduled. Some hospitals are converting maternity wards to create space for COVID-19

patients, limiting the number of birth attendants in the delivery room, and providing outpatient services as soon as possible. Neonatal ICUs (NICUs) are at a disadvantage as more and more health workers are exposed. In low- and middle-income countries, the impact of containment and preparedness policies on maternal and infant health can be more pronounced. Even before the advent of COVID-19, high-quality and timely maternal health services were unavailable to millions of women. Currently, restrictions on travel and community, limited health care facilities, depletion of health care, increased unemployment of women after pregnancy and childbirth, and lack of access to essential care exacerbate and negatively affect women's health.³²

Discussion

In addition to providing infection control strategies, the community should support measures to ensure that the educational, nutritional, physical, and mental needs of children during school holidays are met and considered during reopening programs. The effects of COVID-19 become apparent and the effects of epidemics and economic instability disproportionately affect children, especially in poor countries and families who rely more on school services for nutritional, physical, and mental health needs. Recent laws neglect adequate child protection. Public health experts are preparing for the second wave of COVID-19, as well as future epidemics. Therefore, we must prioritize careful research and planning to guide safe and equitable school-opening programs and develop a free universal distance education system and additional support for children with disabilities. Rapid action is also needed to expand special nutritional programs for women, infants, and children, and to develop child and maternal health insurance to improve access to health care. Resources are needed to support

telecommunications and face-to-face communication strategies to reach at-risk children. As child leaders, we must support strategic, rapid, and long-term response efforts to offset the harmful effects on children by reducing access to vital school resources.²⁸

As a global community, overcoming the negative effects of the epidemic requires focusing on six key areas of concerted action and investment priority. First, we must ensure the health of children by providing protective equipment to health care providers and children affected, especially in low-income countries, and continuously monitor access to adequate child nutrition. Maternal and child health services, routine vaccinations, and access to HIV treatment should be saved. Second, we must immediately prioritize funding and support for safe water supply and health promotion. Combined work of governments and the private sector will be needed to increase handwashing performance and benefit from local innovation and global partnerships. Third, learning and communication between children must be maintained and governments must be asked to provide solutions without technology or low technology. Prior to the crisis, UNICEF was working on the development of digital infrastructure to ensure that all children could learn, no matter where they were in the world or under what circumstances, and that the program should be pursued immediately. Fourth, we must recognize parents and families as the front line and support them through social actions including cash and nutrition support and insurance coverage. More than ever, families need paid family leave and paid maternity leave to care for children. Fifth, services to prevent and combat gender-based violence - including counseling - should be designed and delivered, and these services should be easily or online portrayed as the current crisis makes women and children more vulnerable to violence. Finally,

we must not forget about refugee and immigrant children. An effective response to COVID-19 is when it involves all children in a country. We need to think of new and innovative ways to support children and their families, and focus on these services to reach everyone, even the poor.^{31,33}

The final impact of the crisis on children and mothers depends on how long it takes for the epidemic to end. Prolonged control of the virus is likely to have long-term or persistent effects on children. At the household level, migrant families increasingly see breadwinners lose their jobs or be forced to sell productive assets to survive, and the long-term consequences are the devastating effect of child poverty. The same is true of other effects of the epidemic. The more schools are closed, the less children are involved in learning and basic life skills. The longer the immunization activities are suspended, the more time-consuming and costly the fight to eradicate polio and manage the measles outbreak will be. For children at the height of the crisis, there is a real prospect whose effects will change their lives forever. Children who are exposed to acute deprivation for long periods of toxic stress are more likely to face lifelong challenges due to neurodevelopmental disorders. Children who drop out of school will not only be at greater risk for child marriage, child labor, and teenage pregnancies, but also will see a significant reduction in lifelong income. Children who experience family breakdown during this period of increased stress lose the risk of support and security. This is an unprecedented crisis and poses unprecedented risks to the rights, safety, and health of mothers and children around the world. These dangers can only be reduced through unprecedented international solidarity for humanity.²⁴

Conclusion

COVID-19 pandemic, despite having a lower burden and severity among children than

adults, has significantly affected all aspects of health and safety of children and mothers around the world, and these effects are clearly evident in poor or less educated families. Therefore, it is very necessary for politicians and organizations in charge of health to have comprehensive and long-term plans to limit the destructive and unintended effects of the pandemic on children and mothers around the world with a greater focus on underdeveloped and less developed countries. We have the opportunity not only to eradicate or control this epidemic, but also to change the way young people are raised and invested. But we must act now; we must act decisively, on a very large scale, and quickly to improve the vision of human society in the future.

Conflict of Interests

Authors have no conflict of interests.

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