

The impact of the COVID-19 pandemic on child and adolescent development around the world

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COVID-19 Special Section Editors

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On March 11, 2020, the World Health Organization declared COVID-19 a pandemic. Sixteen months later, by mid-July 2021, the virus had profoundly affected the families and networks of 188 million people who contracted COVID-19 and the 4.05 million who succumbed to it (WHO, 2021). COVID-19 has severely affected the way we study, work, and our physical movements. In terms of health and economics, it has already widened and expected to further expand, pre-existing inequalities between disadvantaged and more advantaged populations within many countries, and has highlighted the stark disparities among high-, middle-, and low-income countries. In short, this globally changing unprecedented crisis has affected all humankind and its effects are expected to continue for some time into the future.

This special section of *Child Development* focuses on the impact of COVID-19 on child development around the world. At the time of writing, home confinement measures and school closures were still in effect in many countries; and access to the COVID-19 vaccine, as well as attitudes toward and rates of vaccination, varied widely both within and across countries (UNESCO, 2021); and variants of the virus were causing new surges in infection rates in many locations.

In the span of recorded history, there have been only a handful of global pandemics, and in each case these events had significant impacts on humanity. In the mid-1300s, the Black Death spread across Europe, parts of North Africa, the Middle East, and Asia, killing at least a third of the European population and millions more elsewhere. More than a century ago, the Influenza Pandemic of 1918–1919 decreased the human population by one-third with 500 million infections and 50 million deaths being

recorded within a 2-year period. During both of these episodes, a limited amount was known about the causal mechanisms of these illnesses, leading to inconsistent and often ineffective strategies for preventing transmission.

Fast-forward 100 years to a far more globally interconnected and technologically advanced world. Modern medicine not only has the capacity to precisely identify biological pathogens, but also to employ a range of strategies to prevent and cure illnesses associated with these pathogens. This made it possible when COVID-19 began to spread around the world for the virus to be quickly isolated and genetically sequenced, and for a range of pharmaceutical interventions to be rapidly developed and deployed in order to contain the effects of the virus and to manage the symptoms of those who have contracted it. Genomic sequencing has allowed differentiation among alpha, beta, gamma, and delta variants, and for the ongoing development of effective treatments for these variants. Impressively, more than 3.4 billion COVID-19 vaccine doses had been administered by July 2021 (WHO, 2021). In addition to vaccinations, stringent scientifically informed, non-pharmaceutical public health measures (mask wearing; contact tracing; lockdowns; school closures) have been introduced to decrease transmission and mitigate the physiological impact of the virus (ventilators). These measures have further reduced infection and mortality rates from COVID-19 in many areas.

It is important to note that both biomedical and public health activities have been highly politicized in some key countries. In the United States, Brazil and to some extent India, politically motivated skepticism of science led to delays in mobilizing the resources necessary to combat the virus, and also produced significant polarization around willingness to comply with public health

Abbreviations: LMIC, low- and middle-income countries; WEIRD, western, educated, industrialized, rich, and democratic.

measures (including vaccinations). This has undoubtedly prolonged the pandemic and led to extensive unnecessary illness and death.

Just as the fields of medicine and public health were much less well developed during the last global pandemic a century ago, psychology and the subfield of child development were in their infancy. As such, there are no empirical data, to our knowledge, on the impact of the 1918 Influenza Pandemic on children, youth, and families. Circumstances are quite different now. One of the silver linings of the COVID-19 pandemic is the extent to which child development researchers rose to the challenge of collecting data during these uncertain times on how children, adolescents, and their families were being affected. Notably, many developmental scientists, who were already collecting prospective longitudinal data before the pandemic, were determined to have their research continue as the pandemic took hold and developed innovative strategies to allow studies to continue remotely. These data are providing an invaluable record of a global “experiment of nature” with pre-pandemic, trans-pandemic, and ultimately post-pandemic evidence of its impact on children and families. In addition, numerous new studies and surveys have been initiated. Indeed, the response of the field has been of such magnitude that a google scholar search with the terms “COVID-19,” “children,” “adolescents,” and “youth” yielded thousands of results. Consequently, there is beginning to emerge an extensive scientific literature on the impact of COVID-19 on child development.

This Special Section contains only a small sample of the groundbreaking research that has been conducted on the effects of the pandemic on child and adolescent development across the world. When the call for papers for the Special Section was posted on July 20, 2020, the response from the research community was immense—we received a total of 215 letters of intent by the submission deadline (the magnitude of this response is actually unprecedented in the history of *Child Development*, making the selection of proposed manuscripts to invite for submission quite challenging). We wished to include manuscripts based on original, empirical studies of the impact of the pandemic on children, youth, and families, and on efforts to mitigate the effects of the pandemic on children. We ultimately invited 30 corresponding authors to submit a full manuscript by December 31, 2020. Among these, and after careful peer review, nine were eventually selected for inclusion in this Special Section. These selected submissions reflect our editorial judgment of the unique contribution of each of the articles and showcase rigorous research on the impact of COVID-19 on children and their families across the globe.

Several important notes are necessary to contextualize the manuscript selection process. First, the field of child development research has been scrutinized for over-representing participants from western, educated,

industrialized, rich, and democratic (WEIRD) countries (Henrich et al., 2010). Indeed, samples from WEIRD countries, wherein a minority of the world's population live, are prominent in the developmental psychology literature (Nielsen et al., 2017). As editors of this Special Section, we endeavored to select articles that represented a wide range of non-WEIRD contexts and methodologies, as well as research emanating from more conventional sources.

Second, we are aware that COVID-19 has disproportionately affected children from certain subgroups. Children from economically disadvantaged backgrounds, those historically subjected to structural inequalities based on race/ethnicity, those with additional health and/or special needs, those with limited access to digital resources, those from families in which there are mental health and addiction issues, and those from low- and middle-income countries (LMIC) have been the most impacted. In this introduction, we endeavor to provide a global perspective on the above-mentioned issues. Moreover, given the centrality of schools on child and family well-being and considering school suspension across the world, we also invited a comment on the Right to Education (Fredman, 2021).

Third, there are clearly commonalities and distinctions in the impact of the COVID-19 in different parts of the world. All children, regardless of where they lived experienced social restrictions and/or isolation because of government restrictions. COVID-19 also affected fertility and the number of siblings a child may have in the future. History tells us that pandemics lead to a decrease in fertility in the short term and increases after some time. However, we are not yet in a position to determine the impact of COVID-19 on fertility rates. On the one hand, it is assumed that fertility rates will go down in high-income countries where prospective mothers are older and assisted reproductive technologies were suspended. On the other hand, the closure of family planning clinics and no access to contraception may lead to an increase in unwanted pregnancies (Aassve et al., 2020) and lack of access to abortions in LMIC.

From a systems science perspective, global pandemics represent a “shock to the system,” affecting every aspect of society. Relatedly, macrosystem changes during the pandemic, such as lockdowns/curfews/stay at home orders, transactionally affect family, school, and work life. As such, in considering the impact of COVID-19 on child development, we sought manuscripts that would allow us to (i) differentiate between the impact of COVID-19 per se and the impact of the measures enforced to decrease virus transmission; (ii) note the varying impact of the disease on high- and low-resource contexts; (iii) be aware of the deleterious consequence of unpredictability on human functioning; and (iv) recognize the role of protective factors in alleviating some of the potentially adverse impacts of COVID-19 on children and families.

DIRECT IMPACT OF COVID-19 ON CHILDREN AND ADOLESCENTS

We are still in a state of flux concerning information about COVID-19 and there will be much ongoing learning about the effects of COVID-19 and its variants. We are yet unsure about numerous issues, including how long the virus remains in the body, the exact nature of transmission, reasons for variations in reactions to contracting the virus, vaccine availability, and efficacy. We do know that the influence of population density on COVID-19 transmission varies across country contexts (Bhadra et al., 2021). We also know that countries have experienced ebbs and flows in the number of active cases, as shown in Figure 1. This means that countries that had surges in infection rates at different times had access to different amounts of scientific information about the virus when the surges occurred. That stated, as previously noted, it is also apparent that governmental leaders in some countries did not privilege scientific information in issuing directives related to wearing masks, practicing physical distancing, and studying and working remotely.

Physiological impact

Although children appear to be less likely to contract the virus and to be less affected by the virus than adults, it is important to note that scientific knowledge in this area is still evolving. Moreover, as adults and adolescents have been receiving vaccinations, the proportion of children contracting COVID-19 has increased. For example, in July 2021, the Academy and of Pediatrics (2021) reported that 22% of all new cases in the United States were in children. The differences between adults and children in the impact of COVID-19 infection are assumed due to physiological factors (developmental differences in ACE-2 expression), innate immunity, low likelihood of comorbidities, and school closures (Dhochak et al., 2020).

In addition to developmental differences, racial, ethnic, and socioeconomic variations in COVID-19 have been documented in the United States (Hooper et al., 2020) as have country-wide differences in fatality rates (WHO, 2021). Clearly, one would assume that children residing in contexts with well-developed public health systems should have fared better than their less advantaged peers who resided in contexts with poorly resourced health systems, but

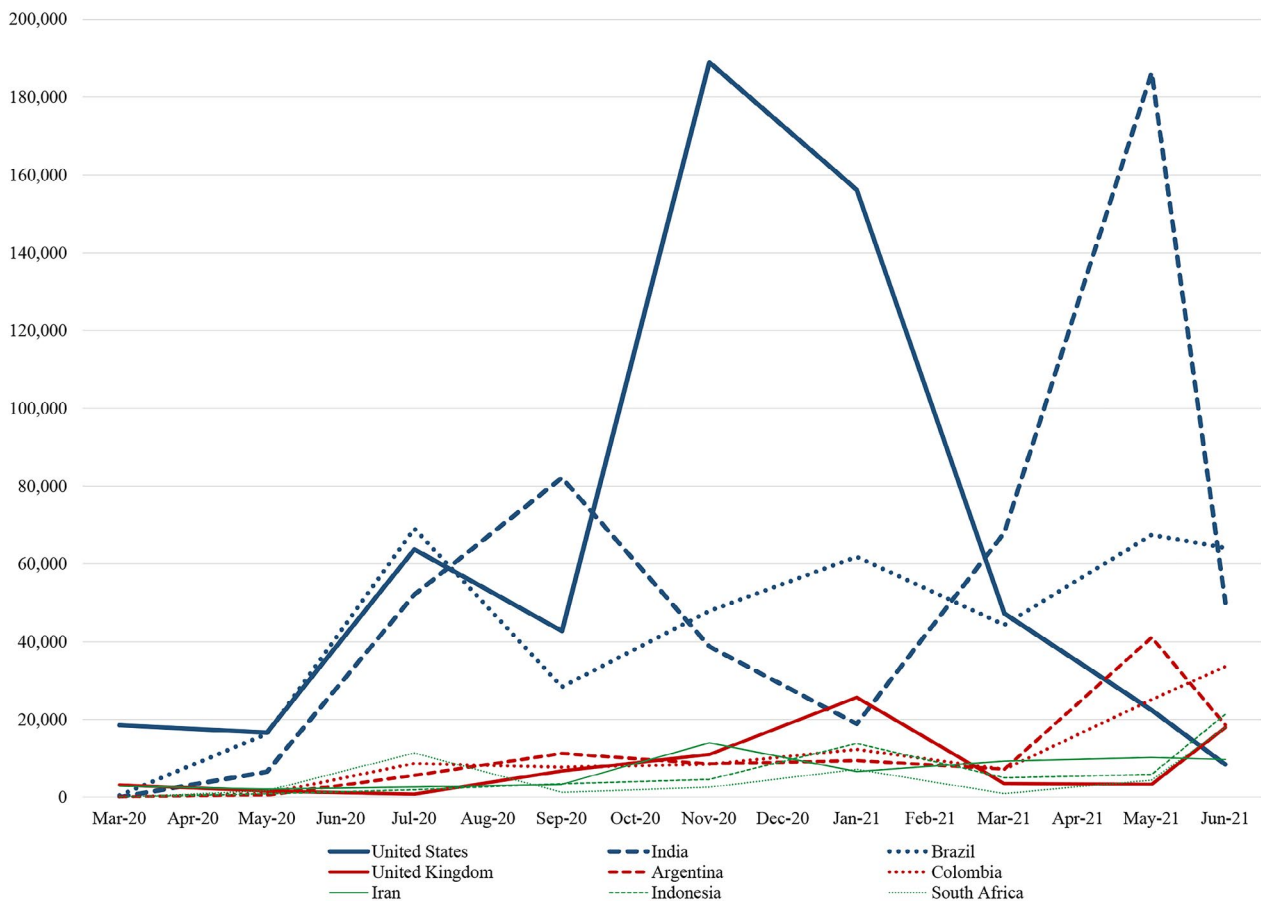


FIGURE 1 COVID-19 cases in high-incidence countries

the aforementioned politicization of the pandemic has introduced some complexity into these associations.

Psychological impact

To the best of our knowledge, no published studies to date have focused on the psychological impact of contracting COVID-19 on children and adolescents. Furthermore, it is very difficult to disentangle the impact of having COVID-19 per se from the measures taken to contain transmission, that is, the impact of hospitalization, quarantine or home confinement because of exposure to, or contracting the virus. This is an important area for future research, and it is likely that ongoing prospective longitudinal research will begin to shed light on this topic.

IMPACT OF EFFORTS UNDERTAKEN TO CONTAIN COVID-19

Home confinement

Globally, the majority of countries instituted lockdowns/curfews or issued stay at home directives. Governments have varied in the severity and policing of the home confinement measures that they mandated. These measures have ranged from stringent lockdowns with only one member of the household being allowed out to pick up food and other supplies at designated times of the day to more lenient policies. Not all the effects of home confinement may be negative. For example, a US-based survey conducted during the pandemic indicated that although family conflict increased, high levels of parental warmth for children as well as increased parent-reported quality time also increased, both of which appeared to mitigate some of the adverse effects of hardship during the pandemic (Center for Translational Neuroscience, 2021).

Positive effects of lockdown notwithstanding, during home confinement, parents may also experience increased stress because of job loss, income insecurity, and be less patient with their children (Cluver et al., 2020). In addition, in contexts in which parents have been able to work remotely, challenges exist with balancing work and children's learning/education. Needless to say, children and adolescents from dysfunctional households, who were isolated in their homes for extended periods, may have been subject to neglect and abuse, and typical methods for identifying maltreatment (e.g., school settings, routine health care visits) were drastically curtailed in the context of lockdowns. This has meant that children and families in need of support were often not identified, and unable to receive services.

Nurturing care in early childhood

The importance of the early years of development is no longer a matter of debate. The *Nurturing Care* framework outlines the conditions necessary for children to both survive and thrive developmentally (WHO et al., 2018) and is centered on the following five components: Good Health, Adequate Nutrition, Responsive Caregiving, Security and Safety, and Opportunities for Early Learning. “Nurturing care” thus refers to the environment parents and caregivers provide children, through emotionally supportive and responsive interactions, that ensures good health and nutrition, protection from harm, and opportunities for early learning. Policies and services are essential to creating environments facilitative of nurturing care. COVID-19's impact on policies and services mean that all components of nurturing care were likely to be adversely impacted by COVID. Notably, the world's second (India—1.4 B), third (United States—332 M), and sixth (Brazil—214 M) most populous countries have had the largest number of COVID-19 cases affecting a sizable portion of the world's young children. Thus, interruptions in nurturing care may produce long-term impacts on the world's population—an important focus for future investigations.

Restricted social contact in middle childhood and adolescence

Face-to-face contact has also been limited during the pandemic because of physical distancing requirements. Nuclear families are more common in high-income countries and the use of information and communication technology may have lessened the impact of children's isolation from in-person contact with peers in these contexts. It has been argued that the impact of social distancing may be more prominent in adolescents than other age groups but that the use of social media may mitigate the adverse impact of social distancing (Orben et al., 2020).

School closures and child development

School closures were instituted in order to reduce the risk of transmission of infection on school premises and on the commute to and from school. The extent of school closures is unparalleled in modern history. At the peak of school closures, over 1.6 billion learners residing in over 190 countries did not attend school for extended periods of time. As shown in Table 1, among these 1.6 billion students, 58% live in Asia, 26% in Africa, 11% in Latin America and the Caribbean, and 8% in Europe and Northern America (Committee for the Coordination of Statistical Activities, 2020). In

TABLE 1 The impact of school closures on learners around the world: Number of learners not in school by Sustainable Development Goals (SDG) region and level of education on April 10, 2020

SDG region	Pre-primary	Primary	Secondary	Tertiary	Total
Europe and North America	17.3	32.8	47.2	22.6	119.9
Central and Southern Asia	26.4	208.5	183.9	45.7	464.5
Eastern and South-Eastern Asia	63.6	175	139.1	68.2	445.8
Northern Africa and Western Asia	7.6	52.3	46.6	19.2	125.9
Sub-Saharan Africa	19.7	160.4	56.2	7.8	244.2
Latin America and the Caribbean	20	59.9	62.9	27.1	169.8
Oceania (includes Australia and New Zealand)	0.6	2	1.2	0.3	4.1
World	155.2	690.9	537.2	190.9	11,574.3

Source: Committee for the Coordination of Statistical Activities (2020). How COVID-19 is changing the world: A Statistical Perspective. https://unstats.un.org/unsd/ccsa/documents/covid19-report-ccsa_vol3.pdf.

June 2021, close to half of the world's students (800 million) were still affected by partial or full school closures (UNESCO, 2021). It was estimated that worldwide in 2020, one in seven children and youth had experienced home confinement policies, 94% were affected by closure at some point and about 33% were not able to access remote learning (UNICEF, 2021). Also noteworthy were delays in planned enrollment in primary school. For example, in the United States, as many as 16% of all children who were due to begin kindergarten in 2020 were held out of school by their parents, due to safety concerns, practical issues, or concerns about the quality of remote learning (Bassok & Shapiro, 2021). These trends continue in spite of re-opening and vaccinations: a recent survey found that 11% of US parents whose children were to start kindergarten in the fall of 2021 are planning to wait until 2022 to enroll their child (Center for Translational Neuroscience, 2021).

Learning losses

School closures were widespread during the pandemic. Engzell et al. (2021) estimated the learning loss from school closures during the COVID-19 among 8- to 11-year-olds in the Netherlands, a country with high internet access, relatively short school closure of 8 weeks, and with average to above average performance in the cross-national studies of achievement. They found that students made little or no progress in learning during the closure in this high income context and that children from socially disadvantaged backgrounds made less progress than their advantaged peers. Children in less fortunate circumstances, such as those who qualify for free/subsidized school meals, who do not have access to the internet and a large-screen device, have poorly educated parents and who do not have a quiet space to study are more markedly affected by school closures than their more advantaged peers. Prior to the pandemic, it was estimated that 53% of children in LMIC could not read a story at the end of elementary

school (UNICEF, 2021; World Bank, 2019). As a result of the pandemic, it is estimated that over 100 million more children will fall below the minimum proficiency level in reading (UNESCO, 2021) and that 23.8 million children and adolescents will drop out of school (UNICEF, 2021). Montoya and Gustafsson (2021) contend that the learning losses that have occurred because of COVID-19 have wiped out the progress in learning made in the past two decades. Furthermore, school closures in all countries are likely to have actually sharpened existing disparities as the socioeconomic status is positively associated with children's ability to adjust to remote learning (OECD, 2021).

Digital divide across and within countries

Wide variations in access to information and communication technology across and within world regions affected the extent of school learning possible during school closures. High-income countries relied on online learning during the pandemic, whereas LMIC tended to use online, television and/or radio to broadcast lessons. The extent to which socioeconomic factors affected access to a computer for school work and the internet varied across upper middle-income and high-income countries. For example, on the one hand, about 95% of 15-year-olds in Denmark, Slovenia, Norway, Poland, and Iceland had access to a computer and internet in 2018 (100% in top quartile and over 90% in lowest quartile). On the other hand, only about 50% of 15-year-olds in Mexico had access to a computer and internet for remote learning (7% in the lowest quartile; OECD, 2021).

It should be noted that on-line learning is not recommended for preschool and young children. Instead, on-line instruction has typically focused on supporting parents in home schooling. Children with special learning needs are more likely to be affected than other children to changes to their routine and/or the move to an on-line learning environment (Di Pietro et al., 2020).

Food insecurity and hunger

Subsidized or free school meals are a poverty alleviation strategy implemented in high- and low-income countries alike. COVID-19-related school closures have led to food insecurity for millions of children because of the absence of school meals. For example, in the United States, the National School Lunch Program supplied free or subsidized lunches to about 29 million children in 2019 (a total of 5 billion lunches; U.S. Department of Agriculture, 2021) and the Mid-Day Meal Scheme provides about 116 million free meals in schools in India (Government of India, 2021). The World Food Programme estimated that 369 million children missed school meals because of school closures at the peak of school closures in April 2020. Governments did attempt to compensate for the loss of school meals through the provision of take-home rations and cash transfers to the families of school children (World Food Programme, 2021). School meals are particularly important to ensure proper nutrition and development in underprivileged children but are also an incentive to get poor children and those from marginalized communities into school.

Early learning losses

As noted above, school closures because of COVID-19 will have an impact on children's learning, health, and safety (World Bank, 2020). There will be an impact on school learning for all learners but children in the foundational stages of learning (early childhood education and early grades) and those from economically disadvantaged backgrounds will experience the most losses. Furthermore, children's nutrition and mental health may be adversely affected and adolescents may engage in risky behavior. For example, school closures during the Ebola outbreak were associated with increases in adolescent pregnancy (World Bank, 2020). The economic crises which have emerged because of COVID-19 will also affect learning and education in other ways. Students may be forced to drop out of school and parents may shift children from higher quality private schools to lower quality fee-free public schools. The latter will likely

affect teaching and learning quality. Girls are likely to be more affected than boys by school closures and the economic impact of school closures will be felt for a long time unless effective remedial policy action is taken in a timely manner (World Bank, 2020).

IMPACT OF COVID-19 ON VULNERABLE SUBPOPULATIONS

COVID-19 has impacted people's livelihoods, incomes, social relations, and their levels of anxiety. COVID-19 has also disproportionately affected families that are financially insecure and/or living in overcrowded housing. In addition, it has affected vulnerable populations' ability to meet children's basic needs, regardless of whether they live in high- or low-resource environments.

Vulnerable subpopulations in low- and middle-income countries

Health, sanitation, income, and housing-related factors have disproportionately affected poor families in LMIC. Job losses for daily wage earners and migrant workers have meant lack of access to money to purchase food. UNICEF and the World Food Programme estimated, in January 2021, that a total of 39 billion in-school meals were missed since the start of the pandemic (Borkowski et al., 2021; UNICEF & WFP, 2021).

Estimates from UNICEF (2021) and UNESCO (2021) highlight the devastating sequel of COVID-19 on vulnerable populations in LMIC (Table 2). These include impacts on survival, health and nutrition, and child protection. Globally, under-5 mortality is expected to increase by 1.2 million in a 12-month period, millions of children may not receive immunizations and nearly 6.7 million children under 5 years may experience malnutrition. There is concern about child protection and early marriage related to poverty and school dropouts as a consequence of COVID 19. Montoya and Gustafsson (2021) contend that the learning losses that have occurred because of COVID have wiped out the progress in learning made in the past two decades.

TABLE 2 Impact of COVID-19 on vulnerable populations in low- and middle-income countries

- *Under-5 mortality*—An additional 1.2 million children under 5 years could die over a 12-month period, because of malnutrition and lack of access to health facilities and services
- *Vaccination coverage*—About 80 million children below 1 year may not receive critical BCG, DPT, polio, and measles vaccinations
- *Malnutrition*—An additional 6.7 million children under age 5 (mostly in sub-Saharan Africa and South Asia) may suffer from malnutrition
- *Child Protection*—Poverty, stress, and home confinement may result in serious child protection risks on account of disruption of violence prevention and support services due to COVID-19
- *Early Marriage*—An additional 10 million child marriages may occur by 2030
- *Learning Loss*—About 100 million more children will fall below the minimum proficiency level in reading
- *School Dropout*—23.8 million children and adolescents are predicted to drop out of school because of the pandemic

Source: UNICEF (2021).

Vulnerable subpopulations in high-income countries

Although data on this topic are still beginning to emerge, there is growing evidence that in high-income countries, subgroups of families, who have historically been exposed to structural inequalities based on race and ethnicity, family structure, and other demographic variables, have had higher rates of infection and mortality, diminished access to health care, and have been adversely affected in numerous other ways by the pandemic. In many ways, these data show that pre-existing differences in population subgroups grew wider during the pandemic.

Among the early evidence of these effects, research in the United States has found higher rates of economic hardship and job loss in Black and Latinx families (Gassman-Pines & Gennetian, 2020), and more children of color receiving online learning only (Smith & Reeves, 2020). Similarly, a survey of households with young children in the United States found that single parent households have had higher rates of material hardship and elevated levels of both parent and child emotional distress throughout the pandemic (Center for Translational Neuroscience, 2020). We anticipate that further evidence of the widening in the disparities of historically disadvantaged groups in high-income countries will continue to be published in the future, and that it may take years or even decades to reverse the impact of these events.

THE DELETERIOUS CONSEQUENCE OF UNPREDICTABILITY ON HUMAN FUNCTIONING

Perhaps one of the hallmarks of the pandemic has been the extent to which it has impacted the predictability of daily life. This is true at the individual level and also at the level of families. The reason that this is cause for concern is that there is an extensive scientific literature drawing on both animal and human studies showing that lack of predictability and control can have long-term effects on biological stress response systems, with consequences for neurobiological development as well as cognitive, behavioral, and social-emotional functioning (Koolhaas et al., 2011). Indeed, some researchers have argued that one of the primary influences of the pandemic on children's development may be associated with their perceptions of unpredictability (Smith & Pollak, 2021).

It is important to elucidate the mechanisms by which unpredictability might operate to disrupt well-being and development. Some insight into these processes can be derived from a highly innovative rodent paradigm developed by Baram et al. (2012) in which

limited access to nesting material is provided. In this context, the rodent dame provides highly fragmented care to her offspring, producing the biological and behavioral sequelae described above. Such care is analogous to parental neglect observed in the context of human maltreatment. In this way, we may similarly posit that increases in parents' uncertainty about their ability to obtain basic needs such as food, housing, and other necessities during the pandemic may reduce their capacity for providing responsive and nurturing care for their children. The absence of such care may, in turn, limit the role that parents play in helping buffer their children from stress. These connections have been proposed as a general mechanism to explain the impact of poverty on child well-being (Walker et al., 2017), and such processes may have accelerated during the pandemic.

PROTECTIVE FACTORS MITIGATING ADVERSE IMPACTS OF COVID-19 ON CHILDREN

It is noteworthy that as much as the pandemic has increased financial and emotional difficulties in families, some evidence of protective factors has also begun to appear in the literature. For example, the negative influences of unpredictability appear to be counterbalanced by the extent to which families were able to maintain routines. In addition, among adolescents, one study found that social connectedness appears to have served a protective function during the pandemic (Magson et al., 2021). It will be important to determine, as more research on protective factors is published in the scientific literature, whether the same processes that were identified in pre-pandemic research as promoting well-being in the face of adversity continue to apply during the pandemic, and/or whether novel protective factors that are specific to this time are identified. It will also be important to understand variations in these processes across LMIC and high-income countries.

THE SPECIAL SECTION

Against the emerging body of research that has carefully documented the impact of COVID-19 on child and adolescent development, the nine papers selected for this Special Section examine the impact of COVID-19 on a large age range of children and youth from diverse contexts. The studies consider diverse areas of development with most focusing on the psychological aspect of the pandemic on children and/or their caregivers. Notably, the majority of papers espouse systems theory to discuss the impact of COVID-19 on children. The topics include perinatal depression, food insecurity,

stress and coping, developmental change, adolescent development, cultural factors, media use, and school closures and learning loss. Gunnar (2021) provides an excellent in-depth analysis of the contributions of the papers.

Perinatal depression

Because we endeavored to include papers that span the entire period of child and adolescent development, we selected a paper documenting the effects of the pandemic on maternal perinatal depression (Gustafsson et al., 2021). Prior research has documented high rates of perinatal depression and the impact of these symptoms on child developmental outcomes (Dagher et al., 2021). Gustafsson and colleagues document somewhat elevated prevalence rates of perinatal depression in a pandemic sample, as well as the heterogeneity of depressive symptoms that were observed. These findings suggest that enhanced screening and detection of the effects of perinatal depression in health care and educational settings may be warranted in the post-pandemic period.

Food insecurity

Regardless of whether you live in Bangladesh or the United States, food insecurity has a deleterious impact on caregivers' mental health. Pitchik et al. (2021) reported that increases in food insecurity and financial insecurity during the pandemic were associated with increases in depressive symptoms among caregivers in rural Bangladesh. Steimle et al. (2021) report on a longitudinal study of food insecurity in families participating in a local food assistance program in a rural area in the United States. Caregivers reported on food insecurity and their own and their children's mood on a daily basis for several months during the pandemic. Children's and caregivers' negative moods increased with school suspension. Receipt of supplementary nutrition was associated with decreases in child and caregiver food insecurity and a decrease in indicators of parental depression.

Stress and coping

Hastings et al. (2021) leveraged data from an ongoing study on low-income families in Jordan to investigate stress physiology and family functioning during the first 9 months of the pandemic. Researchers guided mothers on how to obtain hair samples from themselves and their children. These samples were later collected by the researchers. Negative changes to family life were associated with indicators of stress in children and poorer coping was associated with poorer child and mother psychosocial well-being.

Developmental change

DeJesus et al. (2021) compared young children's understanding of disease transmission before or during the pandemic. They found clear developmental differences in the understanding of disease transmission but no differences before or during the pandemic. Children predicted that close interactions with a sick child would be more likely than limited interaction to result in disease transmission. Notably, the authors used videoconferencing (Webex and Zoom) to conduct the experiments during COVID-19.

Adolescent development

Grütter and Buchmann (2021) examined factors associated with adolescent peer-solidarity during the pandemic. This is an important topic inasmuch as the domain of peer relations is critical to determining adolescent adjustment. The authors conducted their research within a sample of Swiss adolescents. They found that the inter-related domains of sympathy, social acceptance, and social trust helped to delineate profiles of solidarity.

Cultural factors

Alcalá et al. (2021) demonstrate that cultural norms may support the development of resilience in the context of school closure and home isolation. Yucatec Maya mothers in Mexico felt that the pandemic created less disruption in their lives than mothers in the United States. Mayan children demonstrated more autonomy in their school work than children in the United States and their mothers expressed less concern about their social interactions than US mothers. During the pandemic, cultural beliefs and organization were protective factors for Mayan children.

Media use

In the context of lockdowns and widespread shifts to online learning, one area in need of data is how patterns of electronic media use have changed during the pandemic. Eales et al. (2021) collected data on sample that spanned a wide age range (2–13) and found that overall, media use increased for all children during this time. This may have implications for related domains of functioning, such as physical activity and weight gain. Notably, they disaggregated their data into problematic and non-problematic media use and found that problematic use increased more for older children. Although these results are not unexpected, it is important to provide data on a topic in which unsupported assumptions are often made.

School closures and learning loss

McCoy et al. (2021) address a topic that is similarly as prone to speculation as electronic media use during the pandemic—specifically understanding how closures in early childhood education settings are likely to have impacted learning, and what the economic consequences of the estimated learning loss are likely to be. The authors employ simulation analyses using pre-pandemic data from 196 countries that maintain national datasets on early childhood education. The extreme magnitudes of missed instructional days, the number of children likely to have fallen behind academically, and the overall economic cost of these effects in lifetime earnings provide stark evidence that the pandemic will have a lasting effect at a global level for many decades to come.

CONCLUDING COMMENTS

The COVID-19 pandemic is considered not only a health crisis but also a humanitarian crisis. Decades of progress made in human development indicators have been reversed (United Nations Conference on Trade and Development, 2021). Its effects on economic development and fertility will be felt for decades. UNICEF has deemed COVID-19 as a children's crisis (UNICEF, 2021) and the OECD has argued that children should be at the center of our efforts to recover from COVID-19 (OECD, 2021). The work of child development researchers is important to determine the impact of COVID-19 on children around the world and inform policy responses to hasten our recovery from this pandemic that is unprecedented in its influence on humankind. It is our hope that this Special Section will contribute to the scientific knowledge based on the effects of the pandemic on child development. Many areas of importance remain to be examined, such as the impact of the pandemic on gender equality, and whether related gender differences increase in educational opportunity, learning loss, and engagement in paid employment. It will also be important to document which effects that were observed during the pandemic persist and/or increase over time, which effects fade, and for whom. At present, there is an inadequate amount of published research in these and other areas, but we expect that the scientific record will continue to expand in coming years. Whether the COVID-19 pandemic is an isolated event or the beginning of a new era of global challenges to the health of humanity, the information that has been gathered by child development researchers will be an important contribution to science.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHOR CONTRIBUTION

Both authors contributed to the conception, analyses, drafting, and revision of the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable as no data were collected.

CONSENT FOR PUBLICATION

Both authors have read and approved the final manuscript.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article, as no datasets were generated or analyzed for this study.

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