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REFERENCES:

DATA DISAGGREGATION FOR INCLUSIVE QUALITY EDUCATION IN EMERGENCIES: THE COVID-19 EXPERIENCE IN GHANA

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ABSTRACT

Organizations that are implementing interventions in emergencies undoubtedly face some major challenges in analyzing the necessary data. This is primarily due to their lack of direct access to beneficiaries and the rapidly evolving nature of emergencies. In this paper, I outline how the Plan International project called Making Ghanaian Girls Great!—generally known as MGCubed—used phone-based surveys to assess the uptake of a Ghana Learning TV program that the project implemented in partnership with the government. Due to the need for real-time information to guide the implementation of this intervention in an emergency context, there was little time to undertake a major statistical analysis of survey data. In this paper, I discuss how the MGCubed project adopted a simple data disaggregation method that used a logic tree technique to gain valuable insights from a phone-survey data. The method enabled the project partners to explore the insights the dataset provided in real time without conducting a more complex and time-consuming analysis.

INTRODUCTION

One major feature of the COVID-19 pandemic in 2020 was the closure of all education institutions in most countries of the world. School closures were noted in a United Nations policy brief issued in August 2020, which stated that the COVID-19 pandemic had caused the largest disruption of education systems in modern history, affecting an estimated 1.6 billion learners in more than 190 countries on all continents. The brief also revealed that the COVID-19 crisis was exacerbating pre-existing education disparities by reducing the opportunities for

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many of the world's most vulnerable children to continue their learning, including those living in poor or rural areas, girls, and individuals with disabilities. This created a need for education program implementers to adapt to the principles of education in emergencies (EiE), including providing remote learning methods.

To address these challenges and the consequences thereof, several governments introduced remote learning methods to facilitate home learning while the schools were closed. Almost every country introduced some form of remote learning during the pandemic (UNESCO 2020). In Ghana, in April 2020, the ministry of education (MoE) and Ghana Education Service (GES), in collaboration with Plan International Ghana, introduced a TV teaching and learning program for all schoolchildren ages 6-15. The MoE (2020, 4) estimated that 9.2 million children at the basic level were affected by the school closures, and it planned to reach all these children, including the most vulnerable, through televised lessons. Making Ghanaian Girls Great!—generally known as MGCubed—was part of the MoE's national distance learning education program that was funded by UK Aid and implemented by Plan International Ghana as part of the Girls' Education Challenge. It supported the MoE and the GES in their broadcast of televised lessons through the Ghana Learning TV (GLTV) channel. MGCubed worked with GES to produce lessons in English, mathematics, science, and social studies that were broadcast to millions of children nationwide. The aim of the project was to ensure that the beneficiaries could access teaching and learn at home.

In Ghana, the rate of transition to higher education levels disproportionately favors boys. Although there is near gender parity in primary and junior high school enrollment, the national gender ratio for completing senior high school is two girls to every three boys (Camfed Ghana 2012, 8). Girls have been identified as being disadvantaged in transitioning to higher education levels due to several factors, including over-age enrollment, early marriage, teenage pregnancy, and gender-based violence. These factors are known to be exacerbated by school closures in times of crisis, which increases the risk to girls' continued education. World Vision (2020) estimates that teenage pregnancy during the COVID-19 lockdown may keep one million girls in Africa out of school. Aware of the increased risk of dropout among its female beneficiaries due to the pandemic, MGCubed considered the GLTV broadcasts to be key to ensuring that learning continued, especially among girls.

Data on the accessibility of the GLTV lessons was, therefore, crucial to ensuring inclusiveness and promoting access and participation among girls, in particular girls from vulnerable sub-groups. The problem of the availability of data was addressed with the launch of a phone-based survey to capture the rate of girls' participation in these GLTV lessons and whether they were making progress in their learning while at home. This discussion is important to EiE practices as a whole, given that the COVID-19 pandemic presented the world with a relatively unfamiliar kind of emergency. In this article, I present and discuss how a logic tree technique was used to gain insight into the data from these surveys to help improve the EiE program. The logic tree technique was critical in shortening the time needed to conduct data analysis to meet the real-time information needs of the EiE program in such a fast-evolving situation. With this simple but rapid data disaggregation method, the frequency of data analysis can be increased significantly in an otherwise challenging EiE context.

Before discussing the process of data analysis, I will take a short excursion into the broad meaning of the key concepts, which include inclusive education, data disaggregation, and the logic tree approach. I also provide an overview of MGCubed.

INCLUSIVE EDUCATION

Inclusive education is generally viewed as a system that integrates learners with and without special educational needs into the same learning environment. In most cases, the emphasis is on the full participation of students with disabilities and on respect for their social, civil, and educational rights. However, inclusive education can focus on a wider range of student characteristics and target those with various kinds of ability, language, culture, gender, age, and other human differences (OCAD University 2015). Richard Wilkinson and Kate Pickett (2010, 113) wrote, "Student performance and behaviour in educational tasks can be profoundly affected by the way we feel we are seen and judged by others. When we expect to be viewed as inferior, our abilities seem to diminish." Therefore, any characteristic that can make a learner feel inferior is a potential issue or area to consider for inclusive education. Therefore, all human characteristics, such as the vulnerable sub-groups identified by MGCubed, can be considered for inclusive education initiatives as long as the children within these sub-groups have the potential to feel inferior to other learners. Matters of inclusiveness become even more critical in EiE contexts, where these factors can be worse for certain groups of vulnerable people.

DATA DISAGGREGATION

As noted by the US National Forum on Education Statistics (2016), disaggregation of student data refers to breaking down data on a student population into smaller groupings, often based on characteristics such as sex, race/ethnicity, or family income. The main aim of the data disaggregation in the context described here is to ensure that no one is left behind in the implementation of interventions due to marginalizing factors such as ethnicity, disability, or gender.

Data disaggregation in an EiE context can be used effectively when there is a clear mapping of the most vulnerable groups in terms of the emergency and the intervention. In the case of the COVID-19 pandemic, for instance, UNICEF identified the most vulnerable children in terms of home learning support as those with disabilities, already struggling learners, children from ethnic minorities, children on the move (migrants, refugees, and internally displaced children), children in the most hard-to-reach rural and poor communities, and girls tasked with caring for ill family members (UNICEF 2020, 1). The risks associated with the closure of schools are disproportionate among these vulnerable groups, and governments must ensure that they all are considered during any intervention (United Nations 2020). Any study relating to home learning during the pandemic that identifies these groups will provide more insights into equal access to and participation in educational activities. Data disaggregation strategies allow these vulnerable groups to be further divided into sub-groups. For instance, MGCubed's vulnerable sub-groups include young mothers, pregnant girls, girls with disabilities, and girls with minority first languages, among others.

LOGIC TREE

A logic tree is a graphic breakdown of a question that dissects its different components vertically and progresses into details as it reads to the right (Chevallier 2016). Logic trees are important in problem-solving, as they can help to identify the root causes of a problem and identify potential solutions. Logic trees also provide a reference point to see how each issue fits into a bigger problem.

There are two types of logic trees, diagnostic and solution (Chevallier 2010). Diagnostic trees break down a "why" key question and identify all the possible root causes of the problem. Solution trees break down a "how" key question and identify all possible ways to fix the problem (Culmsee and Awati 2013). A diagnostic problem tree allows for an efficient resolution of a problem by first

clearly outlining what the problem is and then showing the structure of the problem. The solution tree uses the same methodology to outline possible solutions to the identified problem.

The logic tree has been used historically during the design of programs and projects to explain the problems they are meant to solve. The project discussed here adopted the logic tree idea during the pandemic to allow for easy diagnoses of any intersectional barriers to education during the school closures. Another reason for adopting a logic tree approach is that it can be updated easily on a daily basis, which enables practitioners to follow a fast-evolving situation in real time. Note that, even though the logic tree discussed here was set up in detail only for girls in this specific situation, it can be expanded to include all beneficiaries to ensure a more comprehensive data analysis.

I now describe how MGCubed adopted a diagnostic logic tree model to fast-track the data analysis process in order to address the quickly evolving situation created by the COVID-19 pandemic.

THE MGCUBED APPROACH

MGCubed was designed to support vulnerable boys and girls in selected rural Ghanaian communities to improve their learning outcomes in school and to support their transition to higher education levels. The project uses satellite technology to broadcast live literacy and numeracy lessons to 72 selected rural schools across two regions of Ghana. UK Aid funds MGCubed through the Girls' Education Challenge-Transition fund, currently implemented by Plan International Ghana.[1]

At the start of the COVID-19 pandemic, the MoE in Ghana approached the project management with a proposal to pivot the MGCubed intervention into a TV-based one in order to reach a wider audience than the original project had planned. This proposal was made against a backdrop of school closures in March 2020, due to the first confirmed case of COVID-19 in Ghana. The proposal and its subsequent acceptance culminated in the creation of GLTV, which provided continuous education to millions of Ghanaian children at the primary and secondary level who were out of school due to the pandemic. When the pandemic started, the

1 The Girls' Education Challenge for Transition is a flagship program of the UK Foreign Commonwealth and Development Office.

project had 16,932 (F=9,109, M=7,823) active beneficiaries, all children attending junior high school in the Oti and Greater Accra regions of Ghana.

CONSTRUCTING THE LOGIC TREE

Constructing a logic tree of survey data involves two steps. The first step in designing an insightful logic tree is to understand the population's demographics, which in most cases become the building blocks of the logic tree analysis.

The second step is to break down the data into branches based on marginalization characteristics, starting with larger sub-groups and then creating smaller sub-groups; for instance, disaggregating by gender first and then disaggregating each gender sub-group by disability, and so on. In so doing, the logic tree enables its users to understand how each sub-group is affected. A branch or sub-group is not disaggregated further when the sub-group records 100 percent affected or close to 0 percent affected by the subject under focus at any level, as no further information can be gained from a further disaggregation. For instance, when boys score 100 percent or 0 percent in GLTV participation, there is no need to do further disaggregation by, say, disability.

ANALYSIS OF DATA THROUGH THE LOGIC TREE APPROACH

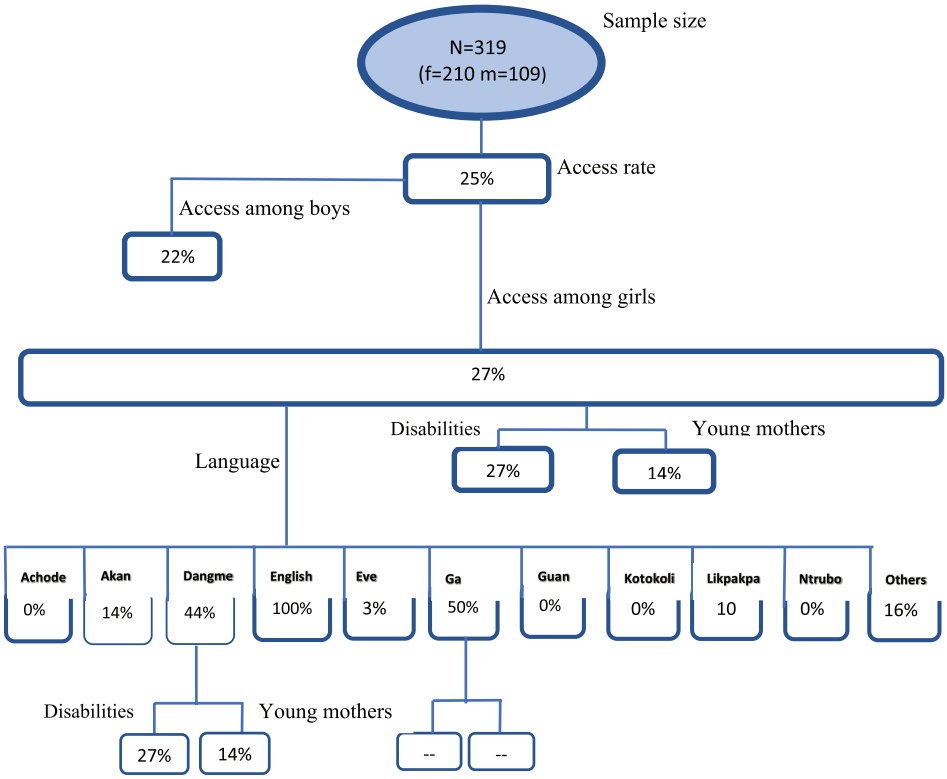
MGCubed conducted a phone-based survey to capture girls' rate of participation in the GLTV lessons and to understand whether they were making progress in their learning while at home. In this section, I discuss the survey data analyzed through the data disaggregation approach proposed in this field note. The total number of children who participated in the survey was 319, 210 females and 109 males. The phone-based survey collected data on participants' characteristics, including gender, young mother status, disability status, and ethnicity.[2] It was conducted from May to September 2020, during the peak of the COVID-19-related restrictions in Ghana.

The rate of access to and participation in the GLTV lessons was 25 percent among all children in the survey. At 27 percent, the rate of access and participation was slightly higher among girls than among boys, at 22 percent. As shown in Figure 1, the logic tree further disaggregated the data for girls by sub-groups, as

2 Young mothers are girls under 18 years old who have children of their own and are project beneficiaries.

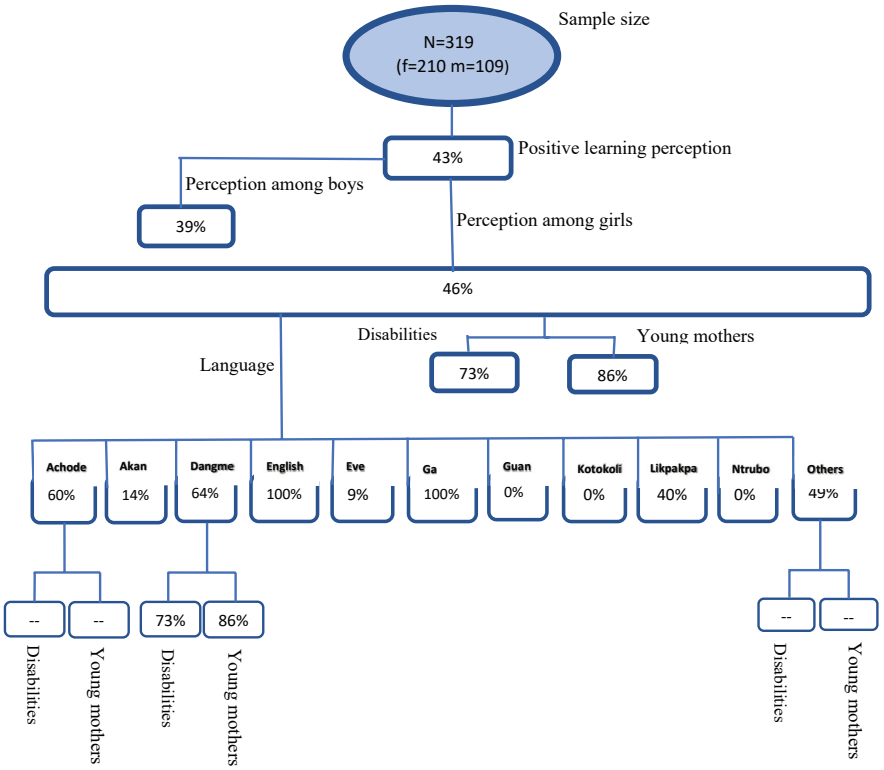
identified by MGCubed. Even though 27 percent of girls reported participating in the GLTV lessons, only 14 percent of the girls who identified themselves as young mothers were able to access and participate in the TV lessons. However, girls identified with physical disabilities had a similar participation rate as that recorded among all girls, 27 percent. A vast disparity was detected in accordance with participants' ethnicity or language (mother tongue). As shown in Figure 1, the 27 percent participation in the GLTV lessons among girls primarily includes those who speak one of the three out of eleven languages identified in the survey. Furthermore, no girls who spoke one of four particular languages participated in the TV lessons (0% participation).

Figure 1: Rate of Participation in TV Lessons among Vulnerable Children



Participants' positive perceptions of learning were generally higher than the rate of participation in the GLTV lessons. On average, approximately 48 percent of the participants said they felt they were making progress in learning while the schools remained closed, which took into account all sources of learning support, including the GLTV lessons. Like the indicator on access to GLTV lessons, positive perceptions of learning progress were 47 percent among girls, lower than the 50 percent recorded among boys. The rates for girls with disabilities and young mothers were as high as 73 percent and 86 percent, respectively. The disparities among different language speakers are also visible under this indicator. As shown in Figure 2, 46 percent of girls' positive perceptions of learning came from girls in six of the eleven identified language groups. Finally, girls from three language groups did not report making any progress in learning during the school closures; 0 percent of these girls said they felt they were making any progress.

Figure 2: Perceptions of Learning among Vulnerable Children



These kinds of analyses were instrumental in improving the uptake and inclusivity of the GLTV program. Due to the analyses presented above and the subsequent adaptations based on them, girls' participation in GLTV grew from 32 percent in May 2020 to 72 percent in January 2021. This indicates the effectiveness of the data analysis procedure discussed above, and the subsequent adaptations made based on the analysis, in increasing the participation rate and inclusiveness of the GLTV lessons.

VULNERABILITY INTERSECTIONALITY

Beyond its simplicity, a major benefit of the logic tree approach is the potential to detect intersecting vulnerability factors among the target beneficiaries. Although the project mainly targets vulnerable girls, a sample of boys is included in all activities to allow for a proper gender equality and social inclusion analysis. In this section, I present the intersections across boys, girls, and other vulnerabilities and how they affected access to and participation in the televised lessons.

A comparison of access to TV lessons among children with disabilities shows that 56 percent of boys had access to TV lessons, but just 27 percent of girls. This means that boys with disabilities were twice as likely to have access to TV lessons than girls with disabilities, even though general access among girls was almost twice the general access among boys. These comparisons are shown in Figure 1 and Table 1. Despite this disparity in access to TV lessons, however, 73 percent of girls with disabilities said they were positive about their learning progress, which is higher than the 67 percent among boys with disabilities.

Table 1: Access to TV Lessons and Positive Perceptions of Learning among Boys with Disabilities

	Yes	No
Access to TV lessons	56	44%
Positive perceptions of learning	67	33%

The second intersectionality to be considered is ethnicity, defined as the language beneficiaries predominantly speak at home. For this survey, boys were sampled from eight language groups, as shown in Table 2. Male and female speakers of two languages, Achode and Guan, still recorded 0 percent access to TV lessons. Also, male speakers of three language groups, Akan, Dangme, and Likpakpa, recorded better percentages in access and participation than the female speakers.

Finally, speakers in three language groups, Eve, English, and other languages, recorded higher access and participation among girls than boys. Overall, of the eight language groups for which respondents were sampled, boys and girls had equal access for two groups, boys had more access than girls for three groups, and girls had more access than boys for three groups. The results can be seen in Figure 1 and Table 2.

In terms of positive perceptions of learning, note that Guan speakers still reported that 0 percent of boys think they are improving, a percentage that is similar among girls. The language groups in which boys performed better than girls include Akan, Likpakpa, Dangme, and other languages. Eve and Achode are the language groups where girls' percentages are higher than boys'. Overall, the rate of positive perceptions of learning is better for boys than for girls in four language groups, equal to the rate for girls in two language groups, and lower than the rate for girls in two language groups. The results can be seen in Figure 2 and Table 2.

Table 2: Access to TV Lessons and Positive Perceptions of Learning among Boys, by Ethnicity

	Achode	Akan	Dangme	English	Eve	Guan	Likpakpa	Other
Access to TV lessons	0%	25%	5%	0%	0%	0%	1%	7%
Positive perceptions of learning	50%	25%	8%	100%	5%	0%	75%	53%

CRITICAL REFLECTION

In this paper, I have discussed a functional approach to the data analysis challenges of the "new" EiE context created by the COVID-19 pandemic. I used the MGCubed-supported GLTV lessons as a case study. This kind of analysis can be a major source of information for implementers and decisionmakers as they assess the effectiveness of their interventions and adjust them accordingly during an emergency.

In the paper, I have shown how a simple data disaggregation method can provide valuable insights into the reach, inclusiveness, and participation of the most vulnerable sub-groups in education interventions implemented during crises such as the COVID-19 pandemic. This method can enable a weekly analysis, which is essential to informing implementers how to adapt programming strategies during emergencies when it is hard to obtain data.

For MGCubed specifically, this kind of analysis has been helpful in reaching the most vulnerable sub-groups of girls. For instance, the data showing that general participation in the GLTV lessons was lower than the positive perceptions of learning helped the project adapt its programming and monitoring approach. It did so by launching surveys to help identify suitable ways to support learning for specific vulnerable female sub-groups, such as phone-based home learning support, the distribution of grade-specific learning packs, providing more guidance on home learning, and supporting caregivers. The analysis also has helped to amplify the voices of marginalized girls by identifying the most vulnerable and hard-to-reach sub-groups.

The MGCubed case study shows that proper data disaggregation techniques can be a suitable and efficient alternative to time-consuming statistical analysis during an emergency like the COVID-19 pandemic. It also showcases how this method informed transformative programming for a girls' education project. The logic tree can be applied to assist in the interpretation of complex situations at the regional, national, and global levels.

LIMITATIONS

The COVID-19 pandemic created a unique emergency that is different from the emergencies the world is used to, including conflicts and natural disasters, such as earthquakes. Therefore, EiE can learn a lot about this unique emergency, its characteristics, and how the wider EiE sector can prepare for similar emergencies in the future. This section discusses the limitations and challenges of the data analysis method discussed here.

Let's first look broadly at the challenges and limitations the program faced in conducting phone-based surveys. Respondents' different socioeconomic status meant that only those with access to mobile phone infrastructure could participate. There also was an increased risk of safeguarding issues, especially among women and girls. An article in the *American Journal of Emergency Medicine* (Boserup, McKenney, and Elkbuli 2020) estimated a 25 percent to 33 percent increase in global domestic violence in 2020, mostly related to the pandemic. Engaging people, especially girls, in lengthy phone conversations could further increase these risks. Due to some of these limitations, phone-based data collection during emergencies should be seen as a complementary method to traditional face-to-face methods.

It's important to highlight the fact that the logic tree approach presented in this article generates quick insights to support program adaptation in a fast-changing EiE context. This approach cannot be a substitute for rigorous statistical methods aimed at drawing major conclusions. The logic tree model can be a tool for monitoring progress and adaptation but it certainly is not an evaluative one, especially for those aiming to draw conclusions on a program's performance. In most cases, traditional statistical evaluation methods create counterfactuals by comparing treatment and control groups. The logic model approach, as presented above, cannot do that. The results of different groups using the logic model approach cannot be compared because the method cannot determine the statistical significance of the results obtained. Confidence interval and standard error are other statistical quantities needed when drawing conclusions and they cannot be determined reliably using the logic tree.

Finally, due to the volatile situation created by the pandemic, and by extension any other emergency, increasing the frequency of data analysis is key to ensuring that projects keep track of what is happening among their beneficiaries. For instance, during the first month of broadcasting TV lessons in Ghana, 30 percent of all children contacted were participating. However, this declined to about 25 percent by the next month, mainly due to the displacements caused as pandemic restrictions began affecting the economic situation of households. It's also important to note that contacting the same beneficiaries frequently can lead to respondent fatigue and increase potential data unreliability. Therefore, program managers should attempt to collect and analyze data from a different sample each time. This approach also ensures that the program gets information from as many beneficiaries as possible to help adapt activities.

REFERENCES

Boserup, Brad, Mark McKenney, and Adel Elkbuli. 2020. "Alarming Trends in US Domestic Violence during the COVID-19 Pandemic." *The American Journal of Emergency Medicine* 38 (12): 2753–55. https://doi.org/10.1016/j.ajem.2020.04.077.

Camfed Ghana. 2012. *What Works in Girls' Education in Ghana: A Critical Review of the Ghanaian and International Literature.* Accra: Ministry of Education and Girls' Education Unit.

Chevallier, Arnaud. 2010. "Diverge Effectively in Your Thinking." *Powerful Problem Solving* (website). Last modified July 6, 2010. https://powerful-problem-solving.com/diverge-effectively-in-your-thinking/.

Culmsee, Paul, and Kailash Awati. 2013. *"Visualising Complexity": The Heretic's Guide to Best Practices: The Reality of Managing Complex Problems in Organisations.* Bloomington, IN: iUniverse.

Ministry of Education. 2020. *Covid-19 Coordinated Education Response Plan for Ghana.* Accra: Ministry of Education. https://ges.gov.gh/wp-content/uploads/2020/04/EDUCATION-RESPONSE-PLAN-TO-COVID-19-IN-GHANA-APRIL-2020-1.pdf.

National Forum on Education Statistics. 2016. *Forum Guide to Collecting and Using Disaggregated Data on Racial/Ethnic Subgroups.* NFES 2017-017. Washington, DC: US Department of Education, National Center for Education Statistics.

OCAD University. 2015. *What Is Inclusive Design?* Toronto: OCAD University, Inclusive Design Research Centre.

UNESCO. 2020. *A Global Analysis of the Potential Reach of Remote Learning Policies.* Paris: UNESCO. https://data.unicef.org/resources/remote-learning-reachability-factsheet/.

UNICEF. 2020. *All Means All: How to Support learning for the Most Vulnerable Children in Areas of School Closures.* Paris: UNESCO. https://www.unicef.org/disabilities/files/All_means_All_-_Equity_and_Inclusion_in_COVID-19_EiE_Response.pdf.

United Nations. 2020. *Policy Brief: Education during COVID-19 and Beyond.* New York: United Nations. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf.

Wilkinson, Richard, and Kate Pickett. 2010. *The Spirit Level: Why Equity Is Better for Everyone.* London: Penguin Books.

World Vision. 2020. *COVID-19 Aftershocks: Access Denied.* London: World Vision. https://www.wvi.org/publications/report/coronavirus-health-crisis/covid-19-aftershocks-access-denied.