



**African Population and  
Health Research Center**



# **Keeping class in session: A case study of Edtech and the COVID-19 response in Kenya**



**African Population and  
Health Research Center**

**Keeping class in session: A case study of Edtech and the  
COVID-19 response in Kenya**

©APHRC 2021

**About the African Population and Health Research Center**

The African Population and Health Research Center is the continent's premier research institution and think tank, generating evidence to drive policy action to improve the health and wellbeing of African people.

**Contact details**

Tel: +254733410102/0722205933

Fax: + 254 (20) 400 1101

Email: [info@aphrc.org](mailto:info@aphrc.org)

APHRC website: [www.aphrc.org](http://www.aphrc.org)

**Authors**

Moses Ngware and Vollan Ochieng'

---

# Contents

Acknowledgements	ii
Abbreviations and Acronyms	iii
Introduction	1
Key decisions during COVID-19 and timelines	1
Accessible EdTechs during COVID-19	3
Education stakeholders and the use of EdTechs	3
Disadvantaged children and youth's access to EdTechs	4
Political economy and key decisions	11
Education system recovery and the future of EdTech	13
Conclusions and way forward	14
References	16

# Abbreviations

<b>CEMASTE</b>	Centre for Mathematics, Science and Technology Education in Africa
<b>COVID-19</b>	Coronavirus Disease 2019
<b>EdTech</b>	Education Technology
<b>ICT</b>	Information and Communication Technology
<b>KBC</b>	Kenya Broadcasting Corporation
<b>KICD</b>	Kenya Institute of Curriculum Development
<b>KNEC</b>	Kenya National Examinations Council
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>MoE</b>	Ministry of Education
<b>MoH</b>	Ministry of Health
<b>MVS</b>	Marginalized and Vulnerable Students
<b>TSC</b>	Teachers' Service Commission
<b>WHO</b>	World Health Organization

# Acknowledgements

This study was conducted by researchers from the African Population and Health Research Center's Education and Youth Empowerment Unit. It would not have been actualised without the buy-ins and support from the mentioned institutions/offices. In particular, we would like to thank Maurice Mutisya and Francis Kiroro for supporting access to secondary datasets. Specifically, our gratitude goes to the education key informants for their time and voluntary participation in the study. Our gratitude also goes to organisers of several webinars that held discussions on COVID-19 pandemic's impacts on education and related interventions employed by education stakeholders from which this case study benefited in terms of sought insights and information. We also thank the reviewers of this case study report for their constructive inputs and engagement in fine-tuning it to meet high standards. APHRC would also like to thank the Overseas Development Institute for the financial support, and its staff, in particular Moizza Binat Sarwar, for her support during this study. The views presented in this case study remain those of the authors and are not necessarily shared by those mentioned.

# 1. Introduction

Kenya's National Education Sector Strategic Plan for 2018–2022 dwells much on ICT and its infusion into the mode of instruction [1]. Among the activities in place as well as those in the pipeline include curriculum digitisation, national laptop program (though not rolled out comprehensively), and ICT training provided by the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA), with the overall goal of improving learning outcomes [2, 3]. While such initiatives contribute to improved learning outcomes, they are however limited by the fact that they are to a large extent introduced at the school level than at households' level. This means that utilisation of such initiatives is limited during times when schools are closed.

In this study we synthesise existing evidence, examine stakeholder responses, with regards to use of distance learning solutions during COVID-19 period and beyond; ensuring a cross-cutting focus on marginalised and vulnerable children are incorporated in policy responses. The study, therefore, focused on distance learning EdTech solutions, the effectiveness of the EdTech in terms of their reach and use, and the decision making and policy responses.

The overall methodology was desk review to synthesise existing evidence, secondary data analyses to understand the reach and use, and limited qualitative primary data to understand the perceptions of stakeholders.

## The Kenya Case Study

- Radio broadcasting hours for local radios for educational programs have been increased from the previous 4.5 hours to 8 hours per day to provide more coverage of learning contents;
- Real-time learning through Google classrooms and Zoom have also been adopted by education stakeholders, especially in the private sector, to continue learning remotely;
- About 7% and 22% of primary school age children without disability and with a disability, respectively, were out of school by 2017; girls in both categories were disproportionately affected;
- Enrolment data show that among the nomadic communities, mainly occupying marginalised areas, overall net enrolment range between 27% and 77%, compared to the national average of 91.1%;
- About 41% of the 6.1 million school learners at-risk of not learning while at home, are spread across 19 of the 47 counties in Kenya that are described as marginalised areas;
- Ministry of Education and the Ministry of ICT, through Kenya Institute of Curriculum Development, is training 150,000 headteachers their deputies, and teachers, and 100,000 curriculum support personnel on interactive remote learning;
- Marginalised areas with high poverty levels adopt a communal way of life that is not supportive of education, particularly for girls;
- Most vulnerable boys and girls have little chance of access to distance digital solutions because they belong to very poor households.

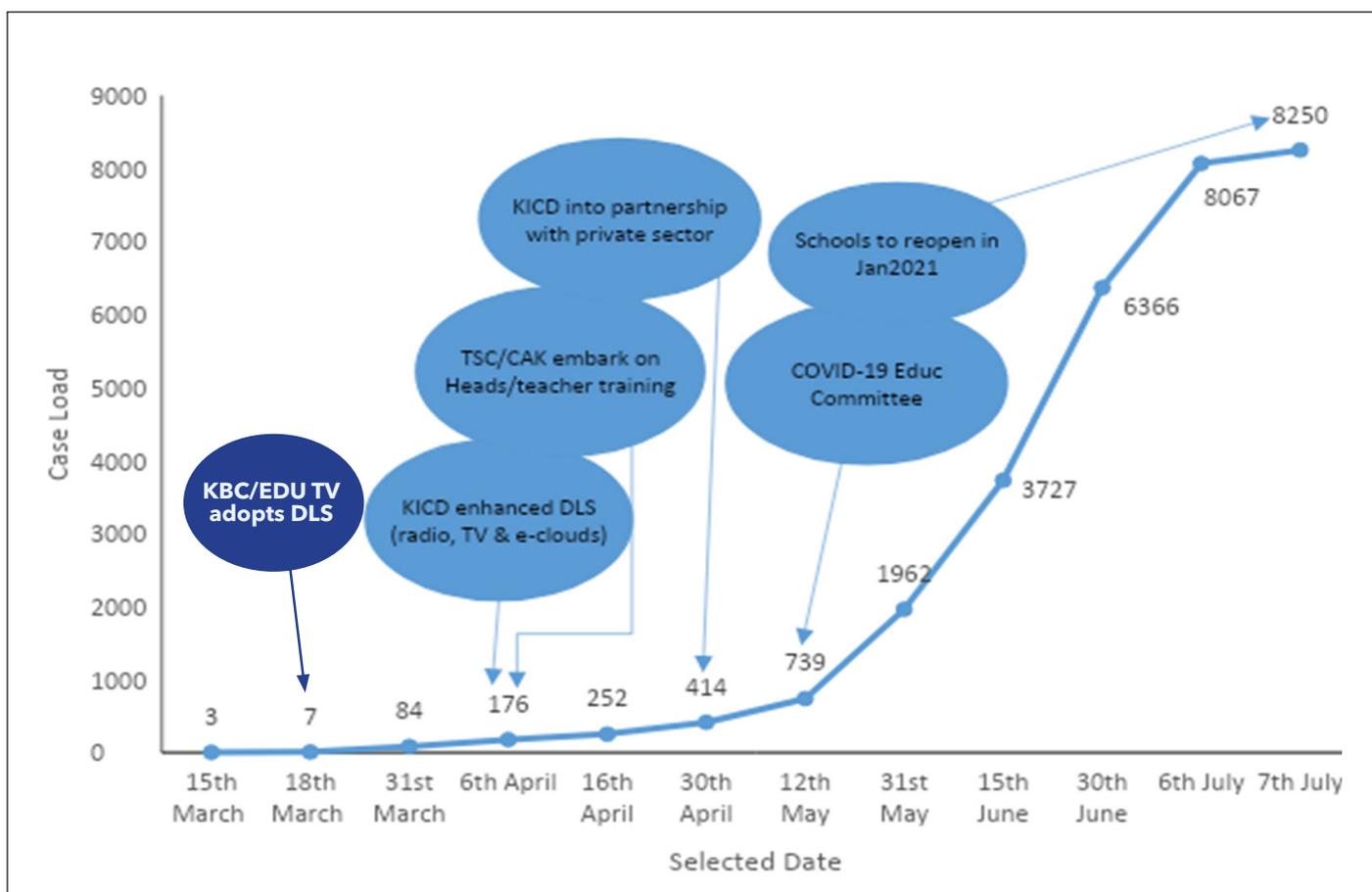
## 2. Key decisions during COVID-19 and timelines

In Kenya, the first COVID-19 case was reported on 13th March 2020 [4], which led to a number of education policy decisions as well as decisions to contain the spread of the disease [5].

1. Formation of the National Emergency Response Committee on Coronavirus to among other duties coordinate the country's preparedness, prevention and response to the threat of the coronavirus disease and to capacity build health personnel on how to cope with the disease (28th February 2020).
2. Closure of all learning institutions (week of 16th March) as well as all forms of public gatherings [6], a decision that disrupted learning for over 19 million learners (3.2 million pre-primary, 15 million primary and secondary [7,8], and over 1 million in post-secondary institutions [9] in Kenya.

- Continuation of off-campus (week of 23rd March) learning through various platforms including televisions, local radios, and internet platforms (smartphones through WhatsApp, YouTube and zoom interactions). The week saw the adoption of alternative distance learning solutions (EdTech) through television (e.g. Kenya Broadcasting Corporation, Edu TV etc.), internet and local radios.
- Nationwide curfew starting from 7 pm to 5 am, followed by a decision on cessation of movement into and out of Nairobi Metropolitan Area, Kilifi and Kwale Counties was imposed on the 8th April 2020 to contain the spread of Covid-19, considering that these counties had the highest incidence of COVID-19 [10].
- Ministry of Education and the Ministry of ICT, through Kenya Institute of Curriculum Development (KICD), proposed (4/2020) to train a total of 150,000 headteachers (and/or their deputies), teachers and 100,000 curriculum support personnel on interactive remote learning approaches for adoption in remote teaching and learning during the schools' closure period.
- The Ministry of Education established (4/2020) partnerships with faith-based, privately-owned and community TV providers to air teaching and learning programs to learners and other education stakeholders.
- The Ministry of Education launched (12th May) the COVID-19 National Education Response Committee to strategise and explore the best possible ways for the resumption of normal/onsite learning and teaching.
- Ministry of Education announces (7/7/2020) schools will reopen in January 2021, and encourages the stakeholder to keep learners engaged through distance learning solutions.

**Fig 1: Cumulative case versus selected decision points**



Source of data: <https://www.health.go.ke/press-releases/>

### 3. Accessible EdTechs during COVID-19

The leading EdTech technologies rolled out in Kenya include (i) Radio, (ii) TV, (iii) Kenya Education Clouds, (iv) YouTube; (v) Web-based Apps such as WhatsApp, Google Classroom, Zoom among others.

**Edu Channel TV:** This is airing education programs from 8:00 am to 8:10 pm every day of the week and has lessons for primary and secondary schools, with lessons duration ranging from 10 to 30 minutes. Lessons for core subjects, such as maths, sciences and languages, for both primary and secondary schools take a maximum duration of 30 minutes while set books (storybooks' narration) for secondary take 10 minutes. Learners are given 5-10 minutes breaks after sitting for one or two lessons, and all lessons are offered in English, except Kiswahili language lessons.

**Kenya Education Cloud:** To boost the coverage and offer more interactive contents, the government is using the Kenya Education Cloud (e-Cloud) platform to offer comprehensive coverage of core subjects in all levels (early education, upper primary, and secondary). e-Cloud make learning more efficient as the learning materials can be accessed through smartphones, YouTube, computers and internet-enabled televisions with an aim to reach about 15 million learners [11]. However, only those with access to these devices can be reached. Learning and teaching materials are also available for free download, and an arrangement made possible by a partnership between KICD and publishers.

**Radio:** Radio lessons take 20 minutes, and the programme covers all primary and secondary school grades, and runs from Monday to Friday [12]. All radio and TV transmissions are enhanced with recording capabilities to record classroom teachings and are delivered by qualified teachers trained to offer distance learning lessons. Broadcasting hours for local radios for educational programs have also been increased from the current 4.5 hours to 8 hours per day to provide more coverage of learning time similar to that of regular school hours.

**Mobile Phones (Smartphones):** KICD together with private partners provide learning materials that can be accessed through mobile phones like PDF documents, which can then be shared via WhatsApp to increase the use and reach to learners. Messaging applications for phones is also used to reach learners unable to access learning resources due the inability to access smartphones. This includes promoting messages to parents and guardians to encourage learners and/or offer tips to parents for home-schooling support.

**Google and Zoom classrooms:** Real-time learning through google classrooms and Zoom have also been adopted by education stakeholders to continue learning remotely. Through these media, educators/teachers develop lessons, and schedule classes for learners that run from 8 am to 5 pm, similar to physical class learning [11]. The duration of the lessons is determined by the organiser, usually private schools, and some run for up to 45 minutes. Online assignments are given and marked, and feedback provided through google classrooms and/or emails.

**Other distance learning:** There exist several other distance solutions that are being used in the private sector including the Eneza Education, a phone-based platform where learners and teachers access educational programs, including learner-teacher interactions, with an estimate scale/reach of over five million learners (according to the service providers); Ubongo, which provides local education contents for early childhood learners, pre-primary, and primary school learners. It is estimated to reach over two million learners on TV and another two million over YouTube; and, e-Limu, which is a mobile-app learning platform with games and videos for learners' literacy development. It is estimated to reach over 500,000 KCPE learners and refugees through its English and Swahili literacy apps. Similarly, eKitabu, M-Shule, Tunapanda, Longhorn Publishers e-Learning Platform, one-billion, Worldreader, and Kytabu are distance learning solutions gaining traction in Kenya with ongoing implementation [12].

### 4. Education stakeholders and the use of EdTechs

It is evident that educators and education stakeholders use distance learning solutions to continue learning, albeit virtually. Teachers from various institutions, for instance, have adopted digital platforms like zoom and google classrooms to teach learners like in normal classroom learning. To private or well-endowed schools with adequate infrastructural systems which have embraced this medium prefer it to onsite learning because it has fewer disruptions and distractions associated with onsite/classroom learning. For example, a principal of a high-end private school

explained that distance learning solutions are even more effective than regular classroom lessons:

*'Online platform work and personally, they are even more effective than ordinary classrooms...I have managed to finish revising one of the set-books called 'A Doll's House'. I have marked six compositions and returned for a whole class and moved the class average from 40% in set books to 73%...' [#R3]*

The limitations of EdTech include unreliable electricity supply because most if not all of the technologies rely on devices that are powered by electricity. However a significant a significant number of learners come from homes in rural, remote and marginalised areas with no electricity connection. Households may not own nor have access to electronic devices. Such households are those in the bottom quintile, where ss than 12% do not own a functional television [13]. The other limitation is the cost implications, especially for learners from low households who may prioritise the purchase of meals over the purchase of the internet data bundles for learning. Based on child poverty indices [14] in Kenya, about 6.1 million primary and secondary school learners experience food poverty, out of which 2.5 million come from the poorest nine counties.

In some cases, even where there is the capability and will to buy internet or electricity, households do not have access to internet infrastructure such as internet-enabled electronic devices and internet services. This makes the initiative of distance learning not to reach many children as we shall see in the next section. Equally, there is a need to strengthen the capacity of teachers and educators on how to navigate digital technology platforms for efficient learning and teaching. While teachers are willing and able to teach, the use of EdTech hinders their involvement. The excerpt below from a key informant sheds light on this:

*'It made learning difficult for some of the learners who were taught by teachers who were not conversant with ICT.' [#R1]*

However, this is being mitigated by e-Limu, which is an ongoing mobile-app that supports games and videos learning - targeting refugees and primary school learners - to enhance their literacy learning whilst also providing teacher training as well as the proposed initiative by TSC and the ministry responsible for ICT to train over 150,000 head teachers, their deputies and teachers on use of distance learning technologies. The latter (training of 150,000 head teachers and their deputies) is proposed to start on the 1st July 2020 through to 31st December 2021 [15].

## 5. Disadvantaged children and youth's access to EdTechs

In Kenya, girls and children with disabilities find themselves marginalised and/or vulnerable. For instance, girls from poor households and marginalised areas often contend with cultures that defy the tenets of their educational pursuit as they do not support girls' education - for instance early marriages and female genital mutilation [6,16, 17]. Communities who practice such traditions do not value girls' education and would rather, for example, marry them early in exchange for livestock [17, 18]. Other factors that contribute to girls and learners with disabilities' vulnerability include poor communication, poverty at the household level, long distances covered to school, limited or lacking basic education resources like teachers (especially for learners in need of sign interpretation), lack of societal and social role models from poor and/or marginalised areas, and low literacy rates within the communities [19, 20]. These barriers still exist even with the onset of COVID-19 and will remain like this for some sometimes as attention is now focused on public health efforts to fight COVID-19 [6]. Other vulnerable groups include nomadic communities, ethnic minorities, and some populations living in areas with high levels of poverty.

Before the onset of the Pandemic, there existed inequality in access to education such as the low levels seen in girls' net enrolment in secondary schools that is below 50% in urban slums [21]. We also know that about 7% and 22%<sup>1</sup> of primary school age children without disability and with disability were out of school by 2017, with girls in both categories being disproportionately affected [22]. Enrolment data also show that among the nomadic communities, mainly occupying northern and eastern parts of Kenya, overall net enrolment range between 27% and 77%, compared to the national average of 91.1%. These statistics depict existing inequalities that can be replicated and/or deepened during and post COVID-19 period.

---

<sup>1</sup>Both statistics are unweighted.

## What is the status of access to learning among MVS during COVID-19?

Using data from the 2019 Population and Housing Census, and the 2015/16 Kenya integrated Household Budget survey (KIHBS) we estimated the size of vulnerable school children using Child Poverty<sup>2</sup> Index computed by the Kenya National Bureau of Statistics. Table 1 shows data for boys and girls aged 6-18<sup>3</sup> years in 2020 in both primary and secondary schools in Kenya [13, 14, 23]. These vulnerable boys and girls have little chance of accessing distance learning solutions as they belong to very poor households (see Map 1). This is informed by our estimates on prevalence of child poverty at county level, considering that children in counties at the bottom 40% (quintiles 1 and 2) of poverty ranking would be the most affected ones. In such counties with high child poverty incidences, individual phones ownership ranged between 27% and 45%, whereas ownership of a functional radio and TV at the household level to be between 38% and 54%, and 13% and 33%, respectively. Key informants concurred that learners from poor and/or marginalised areas are experiencing severe learning difficulties during this COVID-19 period. In some rural villages, internet coverage is at minimal if not lacking in totality. This makes online learning through internet platforms a challenge or inexistent. This means that learners from such areas can only rely on television and radio, and this only applies when and where such learners have access to television and radios:

*R: 'It has been a challenge for learners from these areas because they are only able to rely only on television and radio programs/lessons provided by the KICD only but not the internet, so it is a challenge to marginalised learners.'* [#R1]

*R: 'Some of them have never heard that there is something like online learning so for marginalised families like those in very remote areas, it is zero, not debatable, it is zero...'* [#R2]

**Table 1: Number and proportion of primary and secondary school children aged 6-18 years at-risk of not being reached by distance learning solutions in Kenya**

Quintile using child poverty index	# of counties	Boys	As a proportion of boys enrolled within the quintile	Girls	As a proportion of girls enrolled within the quintile	Total	As a proportion of total enrollment within the quintile
1 <sup>st</sup> quintile (poorest)	9	497,414	74%	445,334	73%	942,851	73%
2 <sup>nd</sup> quintile	10	802,168	52%	777,028	52%	1,579,182	52%
3 <sup>rd</sup> quintile	10	820,405	42%	806,785	42%	1,627,183	42%
4 <sup>th</sup> quintile	9	500,667	37%	485,626	37%	986,289	37%
5 <sup>th</sup> quintile (Least poor)	9	489,387	27%	486,248	27%	975,631	27%
<b>Total</b>	<b>47</b>	<b>3,110,041</b>	<b>42%</b>	<b>3,001,019</b>	<b>42%</b>	<b>6,111,137</b>	<b>42%</b>

**Notes:** Estimate from the total number of children aged 5-17 in 2019, gross enrolment in primary and secondary in 2019, and the child-poverty index (headcount) from 2015/16 survey integrated household budgetary survey.

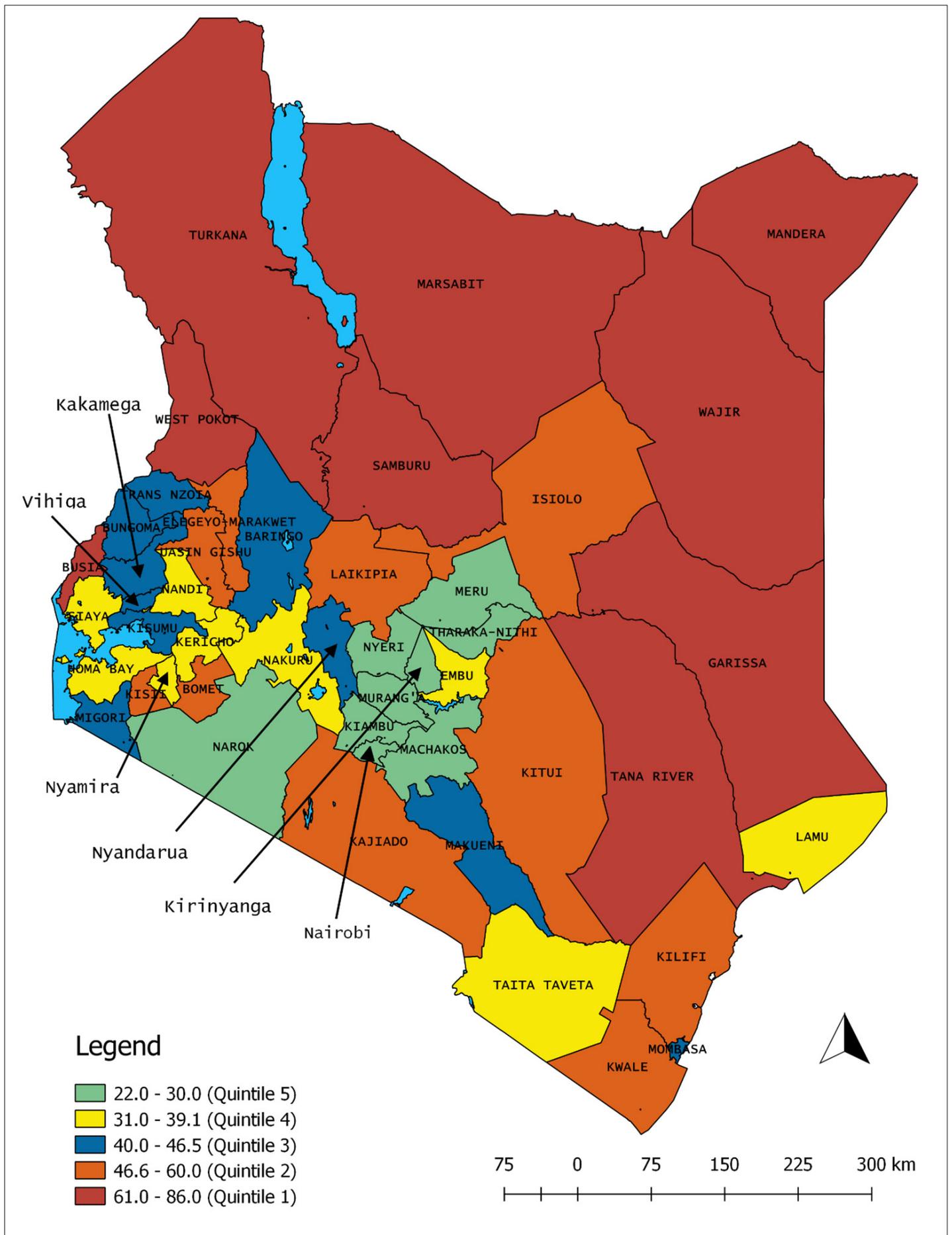
In the bottom poor 40% of counties in Kenya, there are 2.5 million (1.3 million boys and 1.2 million girls) primary and secondary school children that face the greatest risk of not learning due to limited access to distance learning solutions such as phones, radio and TV at the household level. This is supported by a 2020 survey on the social-economic impact of COVID-19 in Kenya, which showed that, nationally, learning was not taking place in 24.6% of households [24]. Counties in the upper quintiles, such the 4th and 5th, are well-off economically but there exist pockets of child poverty. A case in point is Nairobi county with a low child poverty index of 27.6%, but over 60% of its population live in low-resourced informal settlements [24].

Although the proportion of schoolboys and girls at-risk of not being reached by the distance learning solution seem similar within a quintile, the literature on girls' education posits that they will be more affected due to household chores [25,26]. When at home, girls more often than not adjust their time to respond to the absence of female adults at home, such as when the female adults go to attend to other households' needs such as food [25,26]. Table 1 also shows a slightly higher number of boys because there are more boys than girls enrolled in school, especially secondary schools.

<sup>2</sup> Lack of access to or lack of availability of more than one basic need, service, or right necessary for child's survival and development; Also referred to as multidimensional deprivation [18, p.5]

<sup>3</sup> We include 18 year olds to cater for over-age as a result of late school entry and grade repetition.

**Map 1: Map of Kenya showing counties and their child poverty index**



Of the school children at risk of missing out on distance learning solutions, about 41% of the 6.1 million such school children, are spread across 19 of the 47 counties in Kenya that can be described as marginalised areas either due to high levels of poverty, and/or being in an arid, semi-arid environment and/or in a community way of life that is not always supportive to education, especially for girls. Over 942,000 of such children are in the nine counties with highest levels of child poverty, where putting food on the table is a much more urgent need than learning. These nine counties have the lowest (27.2%) prevalence of phone ownership by individuals; and, computer/laptop/tablet ownership is at 3.6%. At household level, radio, TV and internet possession are at 38.8%, 13.4% and 5.1%, respectively. These low prevalence of digital devices makes it challenging for learners to access learning materials when away from school. Our primary data confirmed that parents from poor households would rather prioritise providing food over purchase/acquisition of education-aiding gadgets like television and radios or their accessories:

*R: 'My problem is how learners from poor, remote or marginalised areas are accessing these EdTech lessons. Majority of Kenyans and learners are in rural areas where poverty is very high and such media are not there... for learners from families with high poverty or marginalisation levels, will a parent buy food or TV or radio or even internet?' [#R2]*

## Children living with disabilities

Using data from the 2019 Population and Housing Census, and survey done by the Kenya Institute for Special Education, we estimated the number of children with visual and hearing impairment who could be at-risk of not accessing learning during COVID-19 school closures in Kenya (Table 2). Overall, about 90,000 children with visual or hearing impairment are at-risk of missing out on distance learning solutions either due to distance solutions not being inclusive and/or limitations within the households to access the distance solutions.

While there are many types of disability, we chose hearing and visual disability due to data availability and the fact that in Kenya, the main tools used for distance learning are audio (as in radio) and visual (as in TV, and Kenya Education Cloud). Other forms of disability that could be affecting the children, and whose data is not readily available, include deafblind<sup>4</sup>, physically challenged, self-care, cognition and communication challenges [26].

In Kenya, children with disability are usually enrolled in special schools, or integrated schools and special units [22,27,28,29]. While special schools are standalone institutions, integrated schools and special units are found within the usual primary and/or secondary schools. Most of these schools require assistive technology, for instance, group hearing aids and radiofrequency systems for the hearing impaired. They also use personnel who offer sign language interpretation. For the visually impaired assistive technology such as braille is critical. These equipment and personnel, while available in some schools, are not always available at household level for children with disability to use during school closures. For instance, children with hearing impairment from hearing parents lack translation language assistance usually found in school, though some parents use some gestures acquired naturally; while other specialised equipment such as braille used by the visually impaired have cost implications that are prohibitive to poor households [22,27,28,29]. The TV EDU Channel and its YouTube broadcasts are accompanied by sign language interpretation which enables hearing impaired children, who can access these tools, and usually follow the curriculum for non-special education, to participate in learning while away from school.

For the visually impaired, who have to rely on auditory learning, the July 2020 radio programme does not have a scheduled lesson for children with special needs; equally, the Kenya Education Cloud online materials focus on early years, primary and secondary schools for children that may not require special education. Hence visually impaired learners are disadvantaged by current adaptations in distance learning.

**Table 2: School children with disability**

Type of Disability	Boys	Girls	Total	Enrolment rate among CWD*	Prevalence of disability within the population
Visual impairment	26,130	34,293	60,423	88.9%	0.71%
Hearing impairment	13,475	16,046	29,521	85.8%	0.32%
<b>Total</b>	<b>39,605</b>	<b>50,339</b>	<b>89,944</b>	<b>87.9%</b>	<b>1.03%</b>

**Notes:** We estimate the numbers of school boys and girls with visual and hearing impairment based on disability and enrolment prevalence rates at the national levels. CWD\*=Children with Disability.

<sup>4</sup>Deaf-blindness is a combination of sight and hearing impairment. Physically challenged child is one with a disability of locomotor and neurological origin which constitutes a disadvantage or restriction [30,31]

## How do learners access EdTech? (if any) and if excluded from EdTech, why?

Kenyan's 2019 data on population and housing reports the proportions of households and individuals who have own and/or use computers, laptops and tablets, TVs, radio, phone (not necessarily a smartphone) and internet. To shed more light on the reach of distance learning solutions, in Tables 3, 4 and 5, we present the prevalence of these technologies within the population and/or school children, based on the 2019 data.

Although phone ownership at household level in Kenya for individuals aged 3 years and above ownership is relatively low (Table 3) compared to phone penetration (at 98%<sup>5</sup>), the high rates of phone penetration could be due to phone sharing and/or ownership of more than 1 Sim card by same individual - common practices among household members. Anecdotal information show that for smartphones that can be used as a versatile EdTech device due to their ability to receive, process and send online learning material, ownership is low compared to cheaper ordinary phones that do not have internet and Apps capabilities. The following KII responses offer insight:

*'Another challenge is few households have all the needed gadgets like smartphones, tablets or computers to online learning and this makes them look for alternative means, which is sharing with neighbours. As you are aware, this is discouraged due to social distance guidelines and is a consequent limitation. Rural or very remote areas lack smartphones because internet connectivity is poor and this makes even parents who are able to buy such phones to just use cheap phones.'* [#R6]

*'For marginalised families like those in very remote areas, it is zero, not debatable, it is zero...some of them I can tell you don't even know there is online or digital learning going on why? Because they have no access to information, no phones, smartphones are even non-existent, no TVs, maybe radios...yah, very impractical to say.'* [#R2]

*'Students have been persevering and enduring through very difficult times... where teachers are not accessible and even smartphones we use are not accessible to parents let alone themselves...more so those who come from rural or poor areas/families.'* [#R7]

Our qualitative data also indicates that smartphones are to a large extent owned by parents/guardians who allow their children/dependents to use them for learning, which limits learners in terms of time and access:

*R: 'I have a daughter who is now in her Form Four [Final year in secondary school] and she relies on my phone to get learning and revision materials that are sent to her through WhatsApp from their school as well as from her friends in other schools like those in Nairobi...'* [#R5]

For households with at least two school going children, ownership of above 50% is good as it increases the opportunity of more learners using their parents' mobile device for learning. For individuals in the poorest quintile, phone ownership is below 50% and this means a small proportion of school children would hypothetically have access to learning via a phone. From our interviews, one of the participants had this to say:

*'She finds it difficult when I am not at home and she wants to revise/read papers sent through my phone on WhatsApp but if all of us in the house have phones or tablets with WhatsApp she [daughter] would not have problems when am away'* [#R5]

**Table 3: Prevalence of phone ownership among individuals aged 3 years and above<sup>6</sup>**

Quintile using child poverty index	Male %	Female %	All individuals %
1 <sup>st</sup> quintile (poorest)	27.9	26.5	27.2
2 <sup>nd</sup> quintile	45.0	43.5	44.3
3 <sup>rd</sup> quintile	44.7	44.2	44.4
4 <sup>th</sup> quintile	47.5	47.3	47.4
5 <sup>th</sup> quintile (Least poor)	60.4	60.0	60.2
<b>All quintiles</b>	<b>47.6</b>	<b>47.0</b>	<b>47.3</b>

<sup>5</sup> Mobile Phone Penetration refers to the number of SIM cards or mobile phone number in a certain country, it does not refer to the number of mobile phone devices (source: <https://www.infobip.com/glossary/mobile-phone-penetration#:~:text=Mobile%20Phone%20Penetration%20refers%20to,number%20of%20mobile%20phone%20devices.&text=The%20data%20is%20presented%20as,than%20the%20actual%20population%20number>).

<sup>6</sup>. Data collected was available for distribution of population aged 3 years and above owning a mobile phone by area of residence sex (KNBS, 2020a).

Ownership of computer/laptop/tablet at household level in Kenya by individuals aged 3 years and above in the bottom two quintiles is very low (Table 4) – below 5% and 10% for the 5th and 4th quintiles, respectively. Even for counties with a low prevalence of child poverty, the proportion of individuals with these devices remains low, making them less suitable for accessing digital contents for the majority of learners. By implication, any learning officially delivered through these devices will exacerbate inequalities of opportunity to learner among primary and secondary school learners and should be discouraged for now and/or until such a time there exist alternative channels to reach those with no access to these devices.

**Table 4: Prevalence (%) of computer/laptop/tablet use for 3 years and above<sup>7</sup> among individuals**

Quintile using child poverty index	Male%	Female%	All individuals%
1 <sup>st</sup> quintile (poorest)	4.3	2.8	3.6
2 <sup>nd</sup> quintile	9.8	7.2	8.5
3 <sup>rd</sup> quintile	9.6	6.9	8.2
4 <sup>th</sup> quintile	10.1	7.3	8.7
5 <sup>th</sup> quintile (Least poor)	18.9	15.4	17.1
<b>All quintiles</b>	<b>11.7</b>	<b>9.0</b>	<b>10.3</b>

About 57% of households in Kenya own a radio (Table 5). This makes it the most accessible digital tool for learning during school closures. This influenced the government through KICD to scale up the time allocated for radio broadcasting of lessons from 4.5 to 8 hours. The excerpts below from a key informant suffice:

*R: 'We know television, radios, and internet have been used for many uses over the years, including airing of learning resources because they reach a huge population, and that is why television and radios are collectively called mass media. They have proved to work very well because most Kenyan households have access to televisions and radios and so as an institution mandated to provide and certify educational contents, we leveraged on the past successes of this platforms to reach learners across the country...'* [#R4]

*R: 'I can say they are very effective because radios and TVs reach a huge population of households and so many learners are reached compared to those on YouTube or internet platforms.'* [#R4]

However, the prevalence rates of radio and TV vary across counties with a low of about 39% in the counties at the bottom quintile to about 59% for the counties with lowest child poverty index. This shows that counties with more households that experience insufficient food (this is largely used as a key measure of child poverty) are the same ones with a low prevalence of radio and TV. Given that radio and TV are the principal and/or official channels of delivering learning during school closures, learners from a majority of households in such counties are not participating in learning due to low access to distance learning solutions.

**Table 5: Prevalence (%) of technology that could be used for distance learning among households**

Quintile using child poverty index	Stand - alone Radio (%)	Functional Television (%) <sup>8</sup>	Internet (%)
1 <sup>st</sup> quintile (poorest)	38.8	13.4	5.1
2 <sup>nd</sup> quintile	53.5	32.6	14.0
3 <sup>rd</sup> quintile	59.9	35.5	13.1
4 <sup>th</sup> quintile	61.4	37.3	13.4
5 <sup>th</sup> quintile (Least poor)	59.4	56.4	28.4
All quintiles	56.9	40.7	17.9

<sup>7</sup>. Data was available for population aged 3 years and above using desktop computer, laptop and/or tablet, (KNBS, 202020a).

<sup>8</sup>. Functional TV refers to Television that can receive the signals. They include TV with free to air set top box/ digital TV, TV with Pay TV decoder, and Internet Protocol television (KNBS, 2020a).

The other commonly used channel for broadcasting school lessons through mass media is the TV. KICD uses EDU Channel though other local TV stations also broadcast the school lesson contents. TV school programs, such as the EDU Channel, that are accompanied with a sign language interpreter enhance inclusivity, especially for the hearing impaired children.

*'Also you see there is use of sign language in our lessons on KBC or EDU TVs on side box of the screen and this is meant to include learners with hearing difficulties, ... yeah it is there because it should be there for inclusivity reach'*

*[#R4]*

The 2019 Population and Housing Census show that only about 41% of households own a functional TV, with less than 12% of households in the bottom quintile owning a functional TV. This implies that many children from households with no TV are at-risk of missing out on digital contents aired through the TV channels. Similarly, household ownership of internet is equally low, at below 18%, overall. Internet works well with smartphones, computers, laptops, tablets and Internet Protocol TVs, which also have low prevalence within households. The low access to digital infrastructure is of concern as it creates inequality of opportunity of access to digital contents, including school lessons.

## Why are learners excluded from EdTech?

- ***Nature of the EdTech device, e.g. radio and computers excludes those with hearing impairment.***  
Students with a hearing impairment rely on visual senses to follow instructions, and/or use hearing aids which usually have a limited range. These learners also use sign language interpreters, lip-reading, and/or rely on visual clues, hence use of distance learning solutions such as radio is not the ideal tool as it excludes such learners [32]. Like other learners, availability of technology at home for children with disability is critical for continuation of learning. Such children suffer a double tragedy in that the distance learning solutions such as radio excludes them, and the low prevalence of EdTech at household level reduce their chance of being reached by the EdTech.
- ***Belonging to a household or county with inadequate resources, e.g. households and/or counties with high prevalence of child poverty experience challenges in ownership of EdTech tools***  
Education and inadequate resources are inextricably linked because people living with inadequate resources have diminished resources to invest in education. Households with inadequate resources imply that their incomes are low. Families with low income spend less on education-related items compared to other household needs such as food and are more sensitive to income changes with respect to resources allocated for education [33,34]. Many (over 6.1 million) school children from poor households in Kenya lack access to more than one basic need or service necessary for a child's survival and development. For these children, basic needs such as food, shelter and clothing are more urgent than spending on EdTech.
- ***Gender roles that disadvantage girls***  
As seen from the literature [25], a girl's time at home is shared among many roles, such as stepping in to fill a gap created by a female adult who has to work away from the household. Pandemics such as COVID-19, just like the loss of income, develop shocks at the household level. Available literature posits that families respond differently to adverse shocks. For instance, households respond to financial shocks by varying education resources allocated to girls [35,36,37], implying that girls value is seen in other chores as opposed to education.
- ***Disability predisposes children to learning exclusion***  
Within households, disability does not exist independently as it interacts with contexts and barriers that exist within communities such as presence or absence of books that are translated into Braille, poverty, gender roles, access to food among others [38,39]. This means reduced access to distance learning solutions among children with disability. The Global Partnership for Education echoes this when they allude that innovative EdTech solutions including computers, tablets, and mobile phones lack the basic and necessary accessibility features to make them usable for children with disabilities [40]. The use of radio and TV in Kenya has gone a long way to close the accessibility gap though the accessibility features for children with disability are not effective for children with various disabilities, for example, audio radio instructions are not accessible to the deafblind children and the hearing impaired children.

- **National infrastructure for technology, for instance, fibre cable for internet**

In addition to the low prevalence of radio, functional TV and internet at the household level, the infrastructure for communication technology is still expanding and has not reached all corners. For instance, the National Optic Fibre Backbone have covered metropolitan areas of 35 of the 47 counties in Kenya<sup>9</sup>, while TV transmission signals cover about 84% of Kenya population<sup>10</sup>. We also know that recently the government of Kenya launched loon balloons to boost internet connectivity in areas hitherto not reached by national internet infrastructure<sup>11</sup>. These are commendable efforts but with a low prevalence of ownership of gadgets needed to connect and/or receive signals, then technology utilisation for learning during school closures limited.

- **Costs of service that goes with EdTech such as smartphones and digital TVs, and use of mobile technology is out of reach of many households who live below the poverty line.**

In Kenya, over 41% of children below 18 years live in poor households. The overall poverty lines are estimated at USD 33 and USD 60 in monthly (or USD 1.1 and USD 2 daily) adult equivalent for rural and urban areas, respectively [23]. Even if we were to assume that EdTech such as the internet has no related infrastructural limitations, usage-related costs would inhibit utilisation among poor households. High-quality video instruction delivery consumes about 270MB per hour, which translates to over 2.4GB per day.<sup>12</sup> Currently, with USD 10 in Kenya, one can purchase 5GB or data bundles for about 2 days (USD 5). But for families that live below the poverty lines (USD 1.1 and USD 2 daily) in both rural and urban areas, this is out of reach.

## 6. Political economy and key decisions

In this section we attempt to understand how Kenya has managed the education sector, especially learning during school closures in the context of COVID-19. We also shed light on the relationships between processes, policies, and institutions that govern the education sector. Using a political economy lens, and borrowing from political economy frameworks (see for example ODI 2009; Independent Evaluation Group, 2016) we look at policy decisions made to manage learning during school closures. These frameworks focus on the actors and their powers at different levels, in particular national, sector and issues.

While there are many decisions on learning during COVID-19 period that have been made, our attention is drawn to three key groups of decisions that have the most influence on how learning takes place. They include (i) school closures; (ii) deployment and enhancement of distance learning solutions, capacity strengthening for head teachers and teachers on school reopening and remote learning methodologies; and (iii) School reopening decisions.

### National level

Closures were staggered within one week and the President, Minister for Health, and Minister for Interior and Coordination issued a raft of measures such as social distancing and no gathering of more than 15 individuals, to contain the spread of COVID-19, and the move was welcomed by national leaders including teachers' unions. The institutions of the Presidency, Ministry of Health, Ministry of Interior and Coordination had the most powers on the decisions. They also acted on the advice of the National Steering Committee on COVID-19 response, through which evidence is/was gathered. The committee explored various options on how schools could be reopened. However, its findings have not been made public. Its Terms of Reference were to '... advise the CS on the reopening of the basic education institutions; pre-primary, primary and secondary schools, Teacher Training Colleges and Adult Education Institutions'.

What we see in the raft of actions are different power dynamics, driven by the need to sustain the economy, respond to public concerns and allow more access to digital infrastructure among other needs at the household level. The government had the opportunity to use the 2019 Population and Housing Census as

<sup>9</sup> <http://icta.go.ke/national-optic-fibre-backbone-nofbi/>

<sup>10</sup> <https://ict.go.ke/government-constructs-10-digital-tv-transmission-sites/#:~:text=Mr%20Ochieng%20noted%20that%2C%20despite,cent%20of%20the%20Kenyan%20population.>

<sup>11</sup> <https://www.dezeen.com/2020/07/09/loon-balloon-powered-internet-service-kenya/>

<sup>12</sup> <https://www.quora.com/How-much-data-will-I-consume-if-I-attend-a-three-hour-online-class>

well results of a rapid study on the social economic implications of COVID-19 in Kenya that also examined whether learning was taking place at household level [22]. This informed the Ministry of Education's decision to focus and scale up radio and TV broadcasting of lessons as they had the widest reach within the population. One of the study participants had this to say about the deployment of EdTech:

*'But...I can also talk about the decision to step up digital or virtual learning at home. The Ministry of Education decided to improve on curriculum delivery through TV, radio, the Kenya Education Cloud and YouTube, and I bet you heard the Minister for Education stressing on that recently. It is an opportunity even for parents to get involved and manage their children's learning and ensure that they actually learn and keep them from trouble. ... Well...it was decided on it's adoption to enhance digital learning but COVID-19 has given it more importance because it is used to offer wider digital materials like PDF documents, videos, electronic text books, from publishers, and even audio. Not forgetting that some of these resources are also aired in YouTube and Edu Channel...yah!' [#R5]*

## Sectoral level

Staggering closures within a week allowed other stakeholders such as school managers, parents, heads associations to prepare to close the institutions and/or receive children at home. This is an indication of formal and/or informal communications between the presidency and education stakeholders, including the Ministry of Education. For instance, during the Madaraka Day speech, the President directed that:

*'The Ministry of Education fast-tracks and finalises the ongoing consultations with the stakeholders that will provide an appropriate calendar for gradual resumption of education in the country.'*

The Ministry of Education constituted a COVID-19 National Education Response Committee to explore the possibility of school reopening as well as respond to public pressure to provide technical guidance and/or protocols for reopening. Such pressure was through social media. School heads, teachers and their unions, learners and parents are key stakeholders and can tilt the powers and decide if they feel their concerns have not been addressed. For instance, the Ministry of Education was under pressure to include more education stakeholders in the responsible committee. Ideally, such stakeholders, especially teacher unions, wanted to be sure their interests and membership are well represented.

The formation of a committee allowed more comprehensive consultation with the education stakeholders and collation of evidence as the committee received presentations and opinions from the general public, including CSO and research/Higher Education Institutions. Key stakeholders, such as primary and secondary school heads' associations, parents' associations and private schools' association, were represented in the committee. The committee acted as a source of evidence, as research institutions, and the Civil Society Organisations made presentations to the committee. That said, the committee report has not been made public.

At the sectoral levels, the agencies under the umbrella of the Ministry of Education steal the show. Though important, it is too early to start talking about the effectiveness of the deployed EdTech as education managers and decision-makers grapple with issues of low access to such EdTechs. For instance, KICD has always owned a school radio programme, and to complement the radio and Edu TV learning programs, it partnered with StarTimes, a private company that broadcasts paid contents, to enable more learners access free digital contents through StarTimes ON mobile application available on Google Play or Apple App Store. Additionally, the radio program enhanced broadcasting time from 4.5 hours to 8 hours. Furthermore, EdTech alone will not close the learning gap caused by the COVID-19 pandemic. It is the key stakeholders, including teachers, parents and resilient educators that will ensure learning continues, with EdTech complementing their efforts [41].

## The Issues

Anecdotal information shows that most high-end private schools were able to transition to internet-based learning solutions such as google classrooms and zoom Apps. The power dynamics here are driven by socioeconomic status, with a risk that digital solutions could exacerbate learning inequalities. To mitigate this, the Ministry of Education has directed that once schools reopen, learning will resume from where it was stopped. Two of the key informants had this to say:

*'For now...what you call it EdTech or digital media, is working well for the rich homes and rich counties because they have good ICT and technology like internet, electricity, and TVs, radios and smartphones but in counties like Lodwar, Turkana or North Horr, children from these places are marginalised and not enjoying EdTech...if I was in charge, these nomadic children I will put clusters at the grassroots and provide solar systems because the sun is in plenty in these areas to improve on access to the internet and electricity for EdTech or what-have-you...the clusters can be used to provide centralised digital learning in remote areas, but now it is not happening so the system is only benefiting the rich or rich families now...'* (#R5)

*'... What I have come to learn is that yes, digital learning is expensive because of resources needed like regular and consistent internet, laptops/computers or tablets and space and can be seen to be a system for the rich but I can say that money is not the most important thing when it comes to online learning but the attitude to use it for learning purposes. For us, what has kept us going is the positive attitude among stakeholders as well as mutual communication among the same stakeholders.'* (#R8)

## 7. Education system recovery and the future of EdTech

In an effort to recover lost teaching and learning time, the government through the Ministry of Education has decided that once schools reopen in January 2021, all learners will remain in their current grades/ levels to enable them to cover the learning lost. The reopening is subject to COVID-19 infection rates coming down. For instance, a consistent drop in daily confirmed cases of infection over a two weeks' period. Reopening is also subject to strict compliance with COVID-19 regulations issues by both ministries of health and education.

However, while issuing reopening guidance, the Ministry of Education explicitly recognises the role of EdTech in learning and keeping the learners engaged. In view of this, the Ministry 'will enhance remote learning (online, distance and e-learning) and explore innovative approaches to promote equity'. This is a clear demonstration of the ministries committing to strengthen EdTech as well as reduce possible learning gaps being created by the unequal distribution of access to EdTech, and to promote innovations.

In an effort to sustain and guarantee the future of distance learning solutions, the government plans to adopt and/or strengthen the following measures [3, 12]:

- I. Establishment of more virtual learning centres in underserved counties such as those in the bottom quintile on child poverty index;
- II. Enhancement of the Kenya Education Cloud (e-cloud) to contain more learning materials that can be downloaded and addresses various learning needs;
- III. Enhancing cyber safety to safeguard children. This will ensure that even as learners learn through EdTech, parents, teachers and learners do not have to worry about learners being exposed to cyber-crimes or bullies;
- IV. Improving digital infrastructure, for instance, acquisition of essential ICT equipment to support the recording of lessons for the advancement of the e-cloud; and,
- V. Scaling up EdTech through increasing distance learning resources, and co-creating innovative lesson delivery, including learning resources for learners with special needs.

## 8. Conclusions and way forward

### Conclusions

- Much as EdTech has always been used as a distance learning solution in Kenya, it has been scaled up to close the learning gap created by impromptu school closures as a result of the COVID-19 pandemic.
- Education stakeholders in Kenya, led by the Ministry of Education, have made tremendous efforts to provide distance learning solutions with Radio, TV, Kenya Education Cloud (e-Cloud), YouTube, and other internet-based solutions such as Google Classroom leading the field.
- About 6.1 million marginalised and vulnerable students, including girls, are at risk of not accessing the distance learning solutions of which 2.5million come from nine counties at the bottom of the child poverty index.
- Contrary to what is widely believed to be high phone and internet access in Kenya (especially using measures such as Sim card registration), we find low access of digital devices as ownership at both individual and household levels; phone ownership by individuals is below 50%; computer/laptop/tablet ownership by individuals is below 12%; and possessions of internet services at the household level is below 20%. However, this does not rule out sharing of technology among individuals and/or households.
- Low access to digital devices is inhibiting access to learning during school closures.
- Poverty could be a determining factor for reach and use of EdTech learning devices during school closures.
- Some children with disabilities are benefiting from the sign language interpretation that accompanies TC broadcasting. However, the majority remain underserved EdTech distance learning solutions due to the inappropriateness of the majority of EdTech to their unique learning needs.

### Way forward for education stakeholders

- Establishment of a robust and an all-inclusive monitoring and evaluation system for distance learning solutions to enhance effective and efficient feedback transmission on the effectiveness of the distance learning solutions with a view to widen the reach and use, especially among marginalised and vulnerable learners.
- Consider setting up cluster teaching and learning centres that are equipped with adequate infrastructure for distance learning solutions like free internet, television, computers etc. for learners in poor, remote and marginalised areas to have access to teaching and learning offered through such media. Such clusters could serve as learning resource centres for students, and could also be used for continued school feeding programs now and in future to serve both in and out of school children.
- The internet service providers (ISPs) in partnership with the government [agencies] should craft mechanisms for availing subsidised internet bundles for teachers to enable them play active roles in distance learning solutions, especially when accessing and using EdTech distance learning solutions such as the Kenya Education Cloud. This should go hand in hand with strategies for making electronic devices used for distance learning, such as smartphones and tablets, affordable to poor households.
- The government should comprehensively actualise its digital program by scaling up the internet to all schools in the country, similar to its successful scaling up of electricity coverage and connectivity to public schools.
- The Ministry of Education through its agencies like KICD, TSC and KNEC should offer tailor-made psychosocial support services to learners, parents, and teachers especially due to possible stress that could have been created by anxiety and/or anticipation to be in school soon, proceed to the next grade, and/or sit their national examinations. This will help maintain a focus on learning.

# References

1. Ministry of Education (2019). *National Education Sector Strategic Plan, 2018 – 2022*. Nairobi: Ministry of Education. Available from <https://www.education.go.ke/images/NESSP/MOE-NESSP.pdf>
2. Piper, B., Jepkemei, E., Kwayumba, D., & Kibukho, K. (2015). Kenya's ICT Policy in Practice: The Effectiveness of Tablets and E-readers in Improving Student Outcomes. *FIRE: Forum for International Research in Education*, 2(1), 3-18. <http://dx.doi.org/10.18275/fire201502011025/> <http://preserve.lehigh.edu/fire/vol2/iss1/2/>
3. Ministry of Education (2020). *Kenya GPE Covid-19 Learning Continuity in Basic Education: Stakeholder Engagement Plan (SEP)*. Nairobi: Ministry of Education. Available from [https://www.education.go.ke/images/GPE\\_PRIEDE/Stakeholder\\_Engagement\\_Plan\\_SEP\\_KENYA\\_GPE\\_COVID\\_19\\_LEARNING\\_CONTINUITY\\_IN\\_BASIC\\_EDUCATION\\_PROJECT\\_P174059\\_Disclose.pdf](https://www.education.go.ke/images/GPE_PRIEDE/Stakeholder_Engagement_Plan_SEP_KENYA_GPE_COVID_19_LEARNING_CONTINUITY_IN_BASIC_EDUCATION_PROJECT_P174059_Disclose.pdf)
4. Tyce, M. (2020). *Kenya's response to Covid-19*. Available from <http://www.effective-states.org/kenyas-response-to-covid-19/>
5. Kenya Human Rights Commission – KHRC. (2020). *Responses to the COVID-19 situation in Kenya*. Kenya Human Rights Commission (KHRC). Available from <https://www.khrc.or.ke/2015-03-04-10-37-01/press-releases/711-reponses-to-the-covid-19-situation-in-kenya.html>
6. Parsitau, D. S., & Jepkemei, E. (2020). *How school closures during COVID-19 further marginalise vulnerable children in Kenya*. Available from <https://www.brookings.edu/blog/education-plus-development/2020/05/06/how-school-closures-during-covid-19-further-marginalize-vulnerable-children-in-kenya/>
7. Ministry of Education (2020). *Kenya Basic Education COVID-19 Emergency Response Plan*. Nairobi: Ministry of Education
8. Kenya National Bureau of Statistics (2020). *Economic Survey 2020*. Kenya National Bureau of Statistics (KNBS). Available from [https://www.education.go.ke/images/Kenya\\_basic\\_Education\\_COVID-19\\_Emergency\\_Response\\_Plan-compressed.pdf](https://www.education.go.ke/images/Kenya_basic_Education_COVID-19_Emergency_Response_Plan-compressed.pdf)
9. UNESCO (2020). *Global Monitoring of School Closures caused by COVID-19*. UNESCO. Available from <https://en.unesco.org/covid19/educationresponse>
10. Ogila, J (2020, April 6). Nairobi, Mombasa, Kilifi and Kwale counties declared Covid-19 hotspots, put on partial lockdown. Available from <https://www.standardmedia.co.ke/article/2001367102/uhuru-declares-partial-lockdown-of-four-counties#>
11. Kenya Institute of Curriculum Development (KICD). (2020). *Radio Timetable for June 2020*. KICD. Available from <https://kicd.ac.ke/wp-content/uploads/2020/07/RADIO-TIMETABLE-FOR-JULY-2020-1.pdf>
12. Otieno, J., & Taddese, A. (2020). *EdTech in Kenya: A Rapid Scan. (EdTech Hub Country Scan)*. Overseas Development Institute (ODI). DOI: 10.5281/zenodo.3909977. <https://docs.edtechhub.org/lib/CQ5E3ESF>.
13. Kenya National Bureau of Statistics (2020a). *2019 Population and Housing Census: Volume III Distribution of Population by Age, Sex and Administrative Units*. Kenya National Bureau of Statistics (KNBS). Available from [https://www.knbs.or.ke/?page\\_id=3142](https://www.knbs.or.ke/?page_id=3142)
14. Kenya National Bureau of Statistics (2017). *Child Poverty in Kenya: A Multidimensional Approach*. Kenya National Bureau of Statistics (KNBS). Available from <https://www.unicef.org/esaro/2017-UNICEF-Kenya-Child-Poverty.pdf>
15. Charo, R. K. (2020). *Stakeholder Engagement Plan (SEP) - Kenya GPE Covid 19 Learning Continuity in Basic Education Project - P174059 (English)*. Washington, D.C.: World Bank Group. Available from <http://documents.worldbank.org/curated/en/446931592941221907/Stakeholder-Engagement-Plan-SEP-KENYA-GPE-COVID-19-LEARNING-CONTINUITY-IN-BASIC-EDUCATION-PROJECT-P174059>
16. Ministry of Education (2017). *The Kenya Primary Education Development (PRIEDE) Project: Report on the Vulnerable and Marginalised Groups*. Nairobi: Ministry of Education Available from <https://s3-eu-west-1.amazonaws.com/s3.sourceafrica.net/documents/119794/REPORT-on-VULNERABLE-and-MARGINALISED-GROUPS-in.pdf>
17. Di-Marco, A. (2016). *Disadvantaged girls in Kenyan schools*. Education Development Trust. Available from <http://files.eric.ed.gov/fulltext/ED586977.pdf>

18. Ruto, S. J., Ongwenyi, Z. N., & Mugo, J. K. (2009). *Educational Marginalization in Northern Kenya*. UNESCO. Available from <https://unesdoc.unesco.org/ark:/48223/pf0000186617>
19. Government of Kenya (2012). *National Policy for the Sustainable Development of Northern Kenya and other Arid Lands 'Releasing Our Full Potential'*. Nairobi: Government of Kenya (GoK). Available from <https://reliefweb.int/sites/reliefweb.int/files/resources/Sessional%20Paper%20on%20National%20Policy%20for%20Development%20of%20ASALs.pdf>
20. Government of Kenya (2019). *Sessional Paper No. 02 of 2019 on National Policy on Gender and Development Towards creating a just, fair and transformed society free from gender based discrimination in all spheres of life practices*. Nairobi. Government of Kenya. Available from <http://psyg.go.ke/wp-content/uploads/2019/12/NATIONAL-POLICY-ON-GENDER-AND-DEVELOPMENT.pdf>
21. Ministry of Education (2016). *2016 Basic Education Statistical Booklet*. Nairobi, Ministry of Education. Nairobi: Ministry of Education. Available from <https://www.education.go.ke/images/REPORTS/Basic-Education-Statistical-Booklet---2016.pdf>
22. Kenya Institute of Special Education (2018). *National Survey on Children with Disabilities and Special Needs in Education*. Nairobi: Kenya Institute of Special Education (KISE). Available from [https://www.researchgate.net/publication/339830401\\_National\\_survey\\_on\\_children\\_with\\_disabilities\\_and\\_special\\_needs\\_in\\_education\\_2018](https://www.researchgate.net/publication/339830401_National_survey_on_children_with_disabilities_and_special_needs_in_education_2018)
23. Kenya National Bureau of Statistics (2018). *Basic Report on the Well-Being in Kenya: Based on the 2015/16 Kenya integrated Household Budget survey (KIHBS)*. Nairobi: Kenya National Bureau of Statistics (KNBS). Available from [https://www.knbs.or.ke/?page\\_id=3142](https://www.knbs.or.ke/?page_id=3142)
24. Kenya National Bureau of Statistic (2020b). *Survey on Socio Economic Impact of COVID-19 on Households Report*. Nairobi: Kenya National Bureau of Statistics (KNBS). Available from <https://www.knbs.or.ke/?wpdmpro=survey-report-on-socio-economic-impact-of-covid-19-on-households>
25. Ilahi, N. (2001). *Children's work and schooling: does gender matter? Evidence from the Peru LSMS*. The World Bank. Available from [http://documents1.worldbank.org/curated/en/925581468774891046/122522322\\_20041117161051/additional/multi0page.pdf](http://documents1.worldbank.org/curated/en/925581468774891046/122522322_20041117161051/additional/multi0page.pdf)
26. Sperling, G. B., & Winthrop, R. (2015). *What works in girls' education: Evidence for the world's best investment*. Brookings Institution Press. Available from <https://www.brookings.edu/wp-content/uploads/2016/07/What-Works-in-Girls-Educationlowres.pdf>
27. Government of Kenya. (2009). *The National Special Needs Education Policy Framework*. Government Printer. <http://www.gluk.ac.ke/down/specialneedseducationpolicy.pdf>
28. Adoyo, P.O. (2007). Educating deaf children in an inclusive setting in Kenya: Challenges and considerations. *Electronic Journal for Inclusive Education*, 2 (2) 1-14.
29. Moyi, P. (2017). School Enrolment and Attendance for Children with Disabilities in Kenya: An Examination of Household Survey Data. *FIRE: Forum for International Research in Education*, 4(2), 1-15.
30. Jaiswal, A., Aldersey, H., Wittich, W., Mirza, M., & Finlayson, M. (2018). Participation experiences of people with deafblindness or dual sensory loss: A scoping review of global deafblind literature. *PloS one*, 13(9), e0203772.
31. Abraham, B. K. (2018). The Study on The Physical and Psychosocial Issues of Physically Challenged Children. *International Journal of Current Advanced Research*, 7(5), 12731-12735.
32. Australian Disability Clearinghouse on Education and Training. (2015). *Hearing impairment and Deafness*. Australian Disability Clearinghouse on Education and Training (ADCET). Available from <http://www.adcet.edu.au/inclusive-teaching/specific-disabilities/deaf-hearingimpaired/>.
33. Bayar, A. A., & İlhan, B. Y. (2016). Determinants of Household Education Expenditures: Do Poor Spend Less on Education? *Topics in Middle Eastern and North African Economies*, 18(1), 83-111.
34. Huebler, F. & Mcgee, K. (2019). Family spending on education: a new guidebook on measurement. World Bank Blogs. Available from <https://blogs.worldbank.org/opendata/family-spending-education-new-guidebook-measurement>
35. Björkman-Nyqvist, M. (2013). Income shocks and gender gaps in education: Evidence from Uganda. *Journal of Development Economics*, 105(1), 237-253.
36. Syomwene, A., & Kindiki, J. N. (2015). Women education and economic development in Kenya: Implications for curriculum development and implementation processes. *Journal of Education and practice*, 6(15), 38-43.

37. Hine, H. (n.d). *Girls' Education In Kenya*. The Borgen Project Blogs. Available from <https://borgenproject.org/girls-education-in-kenya/>
38. Kindiki, K. (2011). Legal protection of persons with disabilities in Kenya: Human rights imperatives. In H. M. Rioux., L. M. Basser., & M, Jones (Eds.), *Critical perspectives on human rights and disability law* (pp. 309– 340). Leiden: Martinus Nijhoff.
39. Elder, B. C. (2015). Right to Inclusive Education for Students with Disabilities in Kenya. *Journal of International Special Needs Education*, 18(1), 18–28. Available from [https://www.udpkenya.or.ke/wp-content/uploads/2020/03/Kenya-Inclusive\\_Education\\_in\\_Kenya-Brent-Elder.pdf](https://www.udpkenya.or.ke/wp-content/uploads/2020/03/Kenya-Inclusive_Education_in_Kenya-Brent-Elder.pdf)
40. McClain-Nhlapo, C. (2020). *An inclusive response to COVID-19: Education for children with disabilities*. GPE. Available from <https://www.globalpartnership.org/blog/inclusive-response-covid-19-education-children-disabilities>.
41. World Bank (2020). *Remote Learning, EdTech & COVID-19*. Washington, D.C.: World Bank Available from <https://www.worldbank.org/en/topic/edutech/brief/edtech-covid-19>





APHRC CAMPUS, KITISIRU, NAIROBI, KENYA



INFO@APHRC.ORG



@APHRC



WWW.APHRC.ORG