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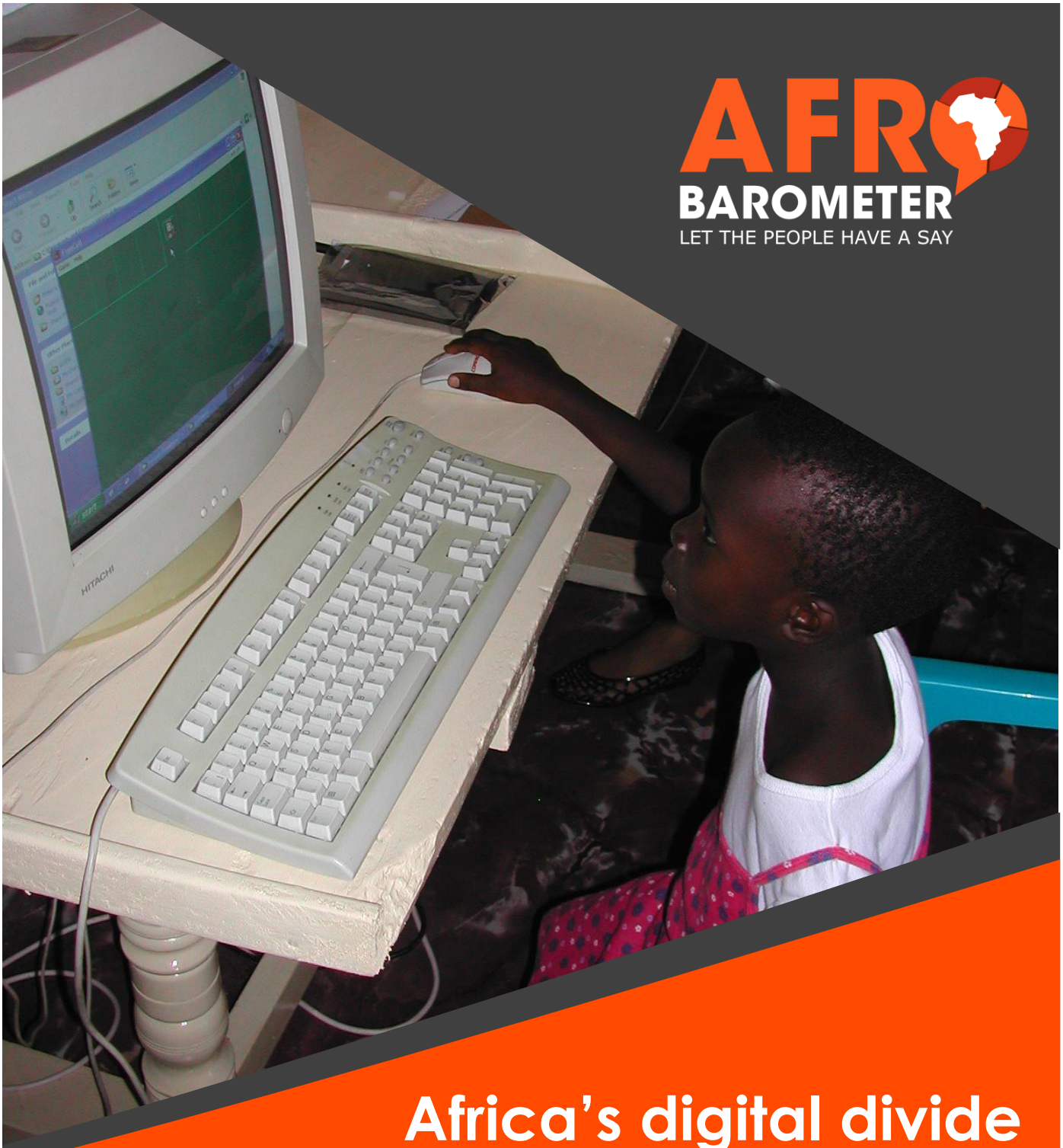

Africa's digital divide and the promise of e-learning

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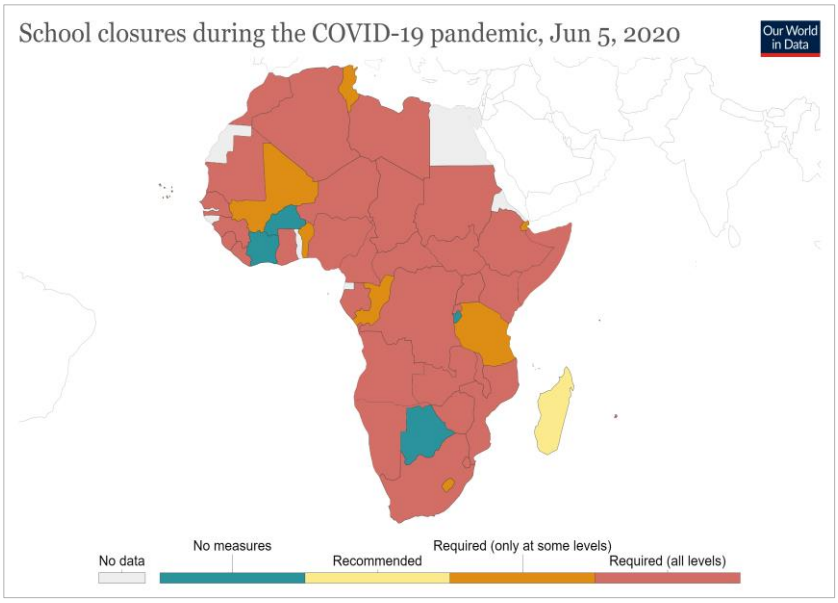
Introduction

According to UNESCO (2020), approximately 1.2 billion students and youth worldwide are affected by school and university closures because of the COVID-19 pandemic. To adjust to these new circumstances, governments must develop innovative solutions to ensure inclusive learning opportunities during this period of unprecedented educational disruption. This is especially true in African countries, where despite recent progress traditional education has faced infrastructural challenges and struggled to develop the human resources necessary to address students' educational needs (Krönke & Olan'g, 2020; United Nations, 2019; UNESCO Institute of Statistics, 2016).

As schools and universities across the continent close or move to remote teaching to mitigate the spread of COVID-19, many pupils, students, parents, and educators are trying to participate in this new learning environment. However, Africans' ability to make use of e-learning[1] varies drastically across the continent (Jantjies, 2020; J. Nyerere, 2020). For example, a study on open, distance, and e-learning in Kenya identified instructors' lack of skills to teach online, insufficient electronic content, limited access to computers and the Internet, and frequent electricity blackouts as common obstacles to distance and remote learning (Nyerere, Gravenir, & Mse, 2012). Moreover, approaches to technology-enhanced learning in higher education have been slow to change and often have to play catch-up with emerging technologies used by students, even in some of the continent's wealthiest nations such as South Africa (Ng'ambi, 2013; Ng'ambi, Brown, Bozalek, Gachago, & Wood, 2016).



Source: Hale et al. (2020) & Roser (2020)

This policy paper uses Afrobarometer survey data to look at digital infrastructure, the availability of digital devices at the household level, and digital literacy among African adults. While rates of digital literacy among children are likely to differ, it is important to understand these dynamics among adults for at least two reasons. First, adults are likely to shape children's access to and experience with technology. Second, understanding current levels of access to devices and levels of digital literacy among adults provides a baseline against which future assessments can measure progress over time.

Survey findings from Afrobarometer Round 7 (2016/2018) show a substantial digital divide both across and within countries, reflected in uneven access to resources such as electricity and unequal access to and use of smartphones and computers. The results suggest that government efforts to redress widespread inequalities need to be increased drastically to avoid the widening of an education gap among their citizens. The paper also discusses the potential benefits of providing smartphones and computers to those who currently do not have access to such devices.

[1] The term "e-learning" is used to describe several related processes such as online learning, computer-based learning (CBL), web-based training (WBT), online resource-based learning (ORBL), and computer-supported collaborative learning (CSCL) (Ng'ambi, 2006).

Afrobarometer survey

Afrobarometer is a pan-African, non-partisan survey research network that provides reliable data on Africans' experiences and evaluations of democracy, governance, and quality of life. Seven rounds of surveys have been completed since 1999. Afrobarometer conducts face-to-face interviews in the language of the respondent's choice. Nationally representative samples of 1,200 to 2,400 yield country-level results with margins of error of +/-3 to +/-2 percentage points at a 95% confidence level. The data are weighted to ensure nationally representative samples. When reporting multi-country findings, all countries are weighted equally (rather than in proportion to population size).

This policy paper relies primarily on data from 45,823 interviews completed in 34 countries between September 2016 and September 2018 (see Appendix Table A.1 for a list of countries and fieldwork dates). It also makes comparisons to data collected in Round 3 (2005/2006), Round 4 (2008/2009), Round 5 (2011/2013), and Round 6 (2014/2015).

Key findings

- On average across 34 countries, one in five adults (20%) have access to both a smartphone and a computer, while 43% only have access to a basic cell phone. In 15 out of 34 countries, at least half of adults have access to a smartphone or a computer or both.
- About three in 10 respondents (31%) use their cell phones and the Internet at least several times a week. This form of basic digital literacy is widespread (at least 50% of adults) in Mauritius, Gabon, Tunisia, Sudan, South Africa, and Morocco but rare (10% or less) in Mali, Niger, and Madagascar.
- One-fifth of adults (20%) are well prepared to participate in or assist members of their household with a transition to an online learning environment. In contrast, 55% are likely to be ill prepared for remote learning, while 25% of respondents form a middle category representing those who could participate in e-learning given sufficient resources such as devices and/or training.
- Citizens' readiness to engage in remote learning is primarily shaped by their level of formal education and access to electricity, rather than by their overall level of wealth or geographic location.

Ownership of technological devices

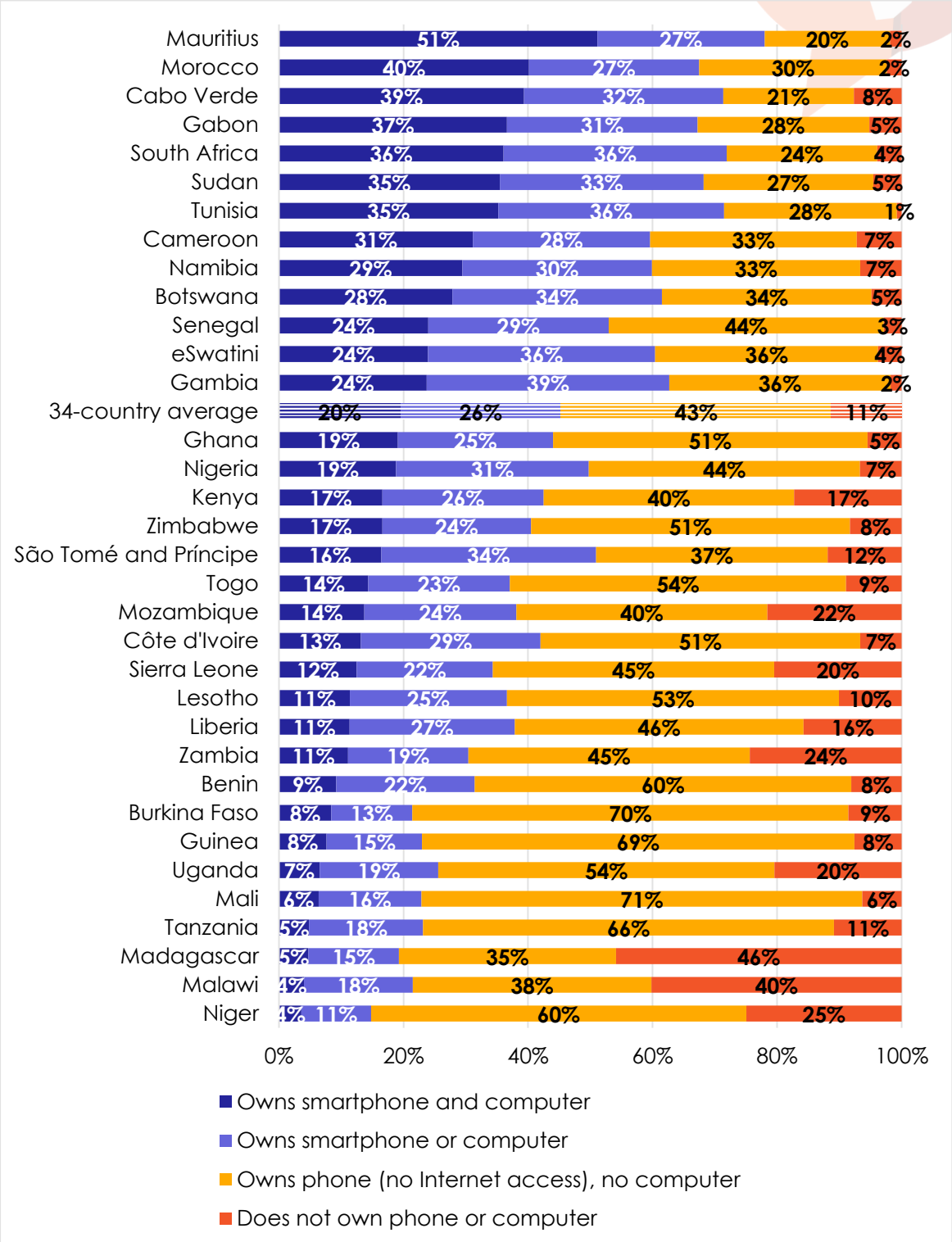
A basic prerequisite for most forms of remote learning are technological devices such as mobile phones and computers. While there are several collaborative platforms for remote learning that do not require an Internet connection (UNESCO, 2020), Internet access vastly increases the range of tools that schools, educators, and students can use to study and share knowledge. Previous research has shown that Africans see increasing levels of Internet connectivity as beneficial to education (Pew Research Center, 2018).

Unfortunately, access to such devices remains limited. Across the 34 countries sampled by Afrobarometer in 2016/2018, one in 10 households (11%) owned neither a mobile phone nor a computer (Figure 1). An additional 43% had access only to a mobile phone that can't connect to the Internet. More encouragingly, one in five (20%) households had a cell phone with Internet access (smartphone) or a computer, and an additional 20% had both.

But the 34-country averages hide large differences across countries in device ownership. In only seven countries did more than one-third of surveyed households have both a smartphone and a computer, led by Mauritius (51%). By contrast, in nine countries, fewer than one in 10 respondents had access to an Internet-enabled mobile phone and a

computer, and in 20 countries, more than half of households lacked Internet access via either a mobile phone or a computer.

Figure 1: Household ownership of technological devices | 34 countries | 2016/2018



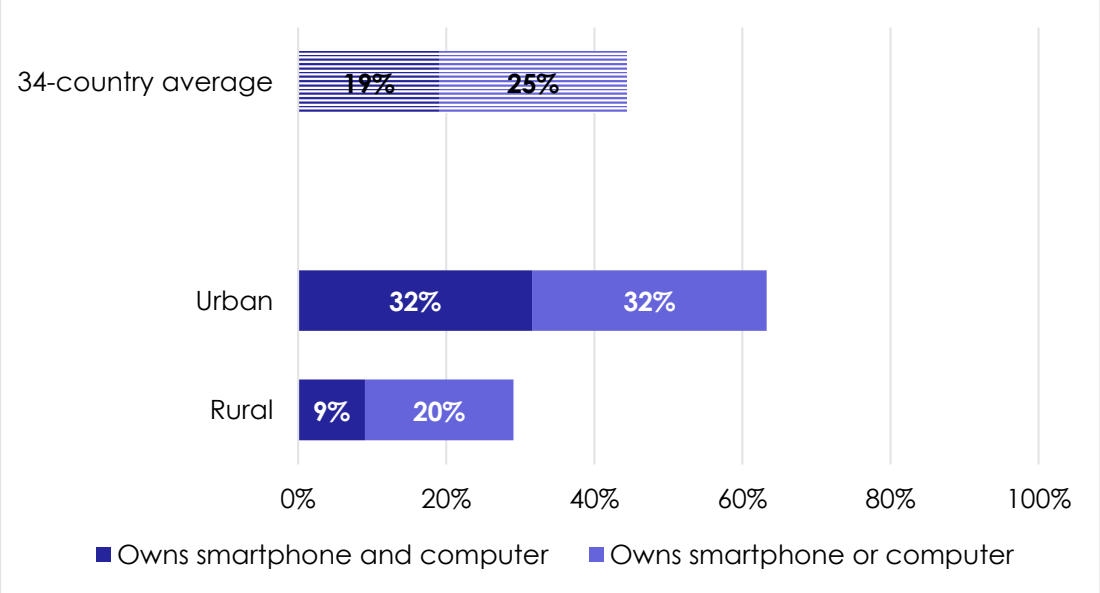
Respondents were asked: *Which of these things do you personally own: Mobile phone? Computer? [If no:] Does anyone else in your household own one? (% combines personal and household ownership)*
Respondents who said they personally own a mobile phone were asked: *Does your phone have access to the Internet?*
Note: *The "Owns smartphone or computer" category includes households that own a computer and a phone that does not connect to the Internet.*

One immediate consequence of these differences is that the full interactive potential of these devices cannot be utilized to the same degree by all countries. In countries where smartphones and computers are not widespread, governments need to focus on less interactive and versatile technology platforms. For example, in Malawi, where in 2017 40% of households had neither a cell phone nor a computer and a further 38% had a phone that couldn't access the Internet, e-learning is not feasible during the current pandemic for a significant part of the population. Thus, in early May the government announced that it would complement existing e-learning efforts with a television- and radio-based teaching model (Nyasa Times, 2020). Only a few weeks later, however, a government task force said that it was considering the reopening of schools, colleges, and universities in mid-July "in an attempt to ensure a proper balance between the right to education and the right to life" (Mzungu, 2020).

By contrast, South Africa's Department of Basic Education (2020), in cooperation with other government structures and private businesses, was able to roll out a broader range of online and broadcast support resources. Given that more South Africans have the necessary devices, the government and individual schools have been able to provide a wider range of interactive platforms to students while they are unable to physically attend school.

Ownership patterns of mobile phones and computers also vary depending on where people live. Before the COVID-19 pandemic, students in rural areas often had to walk or commute longer distances to get to school than their peers in urban areas. This disadvantage in terms of access to education persists in the remote-teaching environment as well. While almost two-thirds (64%) of households in urban areas had a smartphone or a computer or both, fewer than half as many rural households (29%) had the same access to devices (Figure 2).

Figure 2: Household ownership of devices | by urban-rural location | 34 countries | 2016/2018



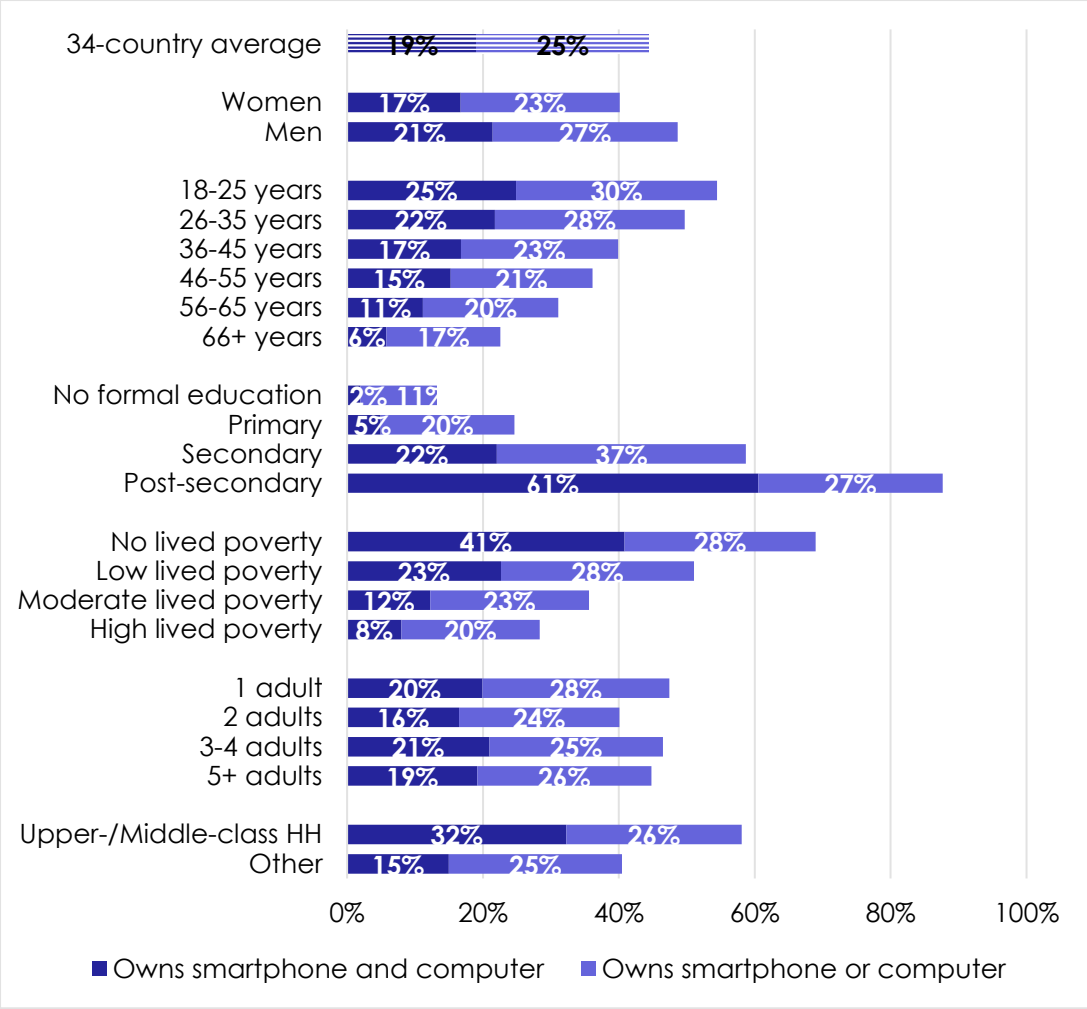
Respondents were asked: *Which of these things do you personally own: Mobile phone? Computer? [If no]: Does anyone else in your household own one? (% combines personal and household ownership)* ***Respondents who said they personally own a mobile phone were asked:*** *Does your phone have access to the Internet?*

Even though prices for mobile phones have dropped over the years (Dahir, 2016), buying a phone /smartphone or a computer is still a considerable investment. Therefore, poorer households run the risk of being severely disadvantaged in a new learning environment where having easy access to such devices is essential. Indeed, across the 34-country sample, only 8% of households with high levels of lived poverty owned both a smartphone and a

computer, compared to 41% of households that experienced no lived poverty (Figure 3).[2] In other words, while 31% of the best-off households are not connected to the Internet, the same is true of 72% of the poorest households. Similarly, upper- and middle-class households[3] are twice as likely to have both a smartphone and a computer as are households of less than middle-class standing (32% vs. 15%).

Access to both types of devices is also more common among younger respondents, men, and those who have secondary or post-secondary education. The presence of multiple adults in the household might also be expected to make it more likely for its members to have access to such devices, as the adults could pool incomes, but we find no meaningful differences across four categories.

Figure 3: Household ownership of devices | by socio-demographic group | 34 countries | 2016/2018



Respondents were asked: *Which of these things do you personally own: Mobile phone? Computer? [If no]: Does anyone else in your household own one? (% combines personal and household ownership)* ***Respondents who said they personally own a mobile phone were asked:*** *Does your phone have access to the Internet?*

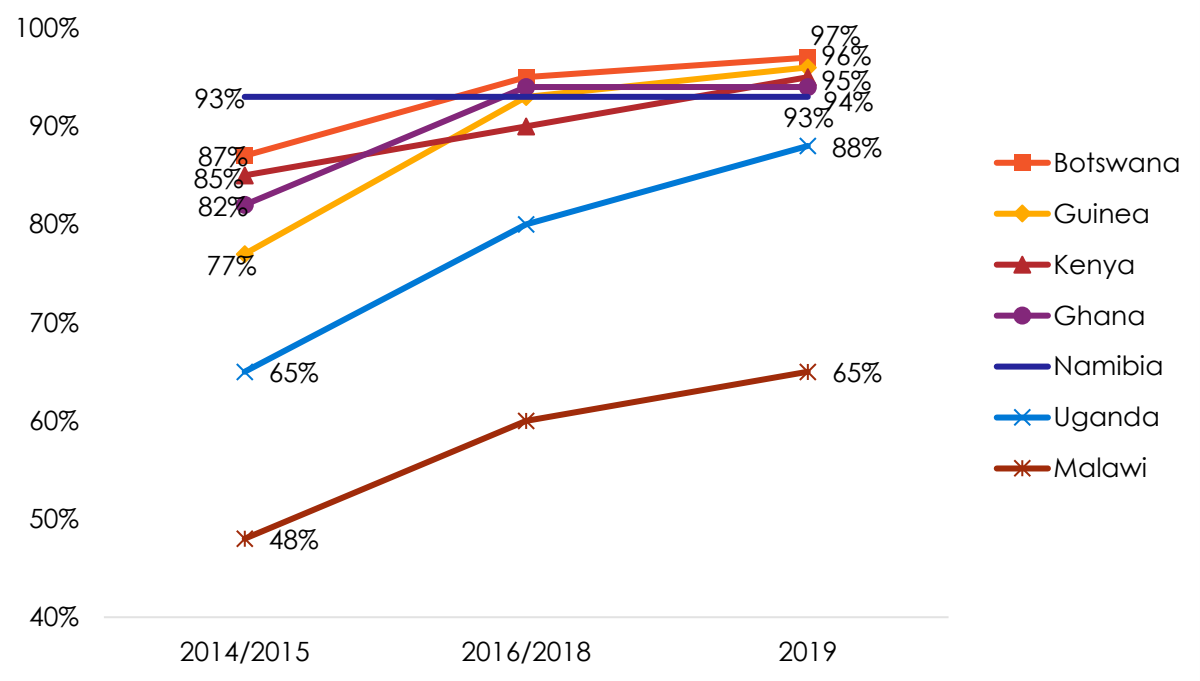
[2] Afrobarometer's Lived Poverty Index (LPI) measures respondents' levels of material deprivation by asking how often they or their families went without basic necessities (enough food, enough water, medical care, enough cooking fuel, and a cash income) during the preceding year. For more on lived poverty, see Mattes, Dulani, & Gyimah-Boadi (2016) and Mattes (2020).

[3] A household is considered to be upper or middle class if the survey respondent is a shop owner or if the respondent or the head of the household works in a supervisory or mid- or upper-level professional job.

Analyses in this paper are based mainly on the most recent completed round of Afrobarometer surveys, Round 7 (2016/2018). However, it is also instructive to examine how mobile-phone ownership has changed over recent years. Figure 4 shows the proportions of households that owned a cell phone between 2014 and 2019. While cell phone penetration was already high in several countries in 2014 (e.g. Botswana and Namibia), phones have become more commonplace even in poorer countries such as Malawi (+17 percentage points) and Uganda (+23 points).

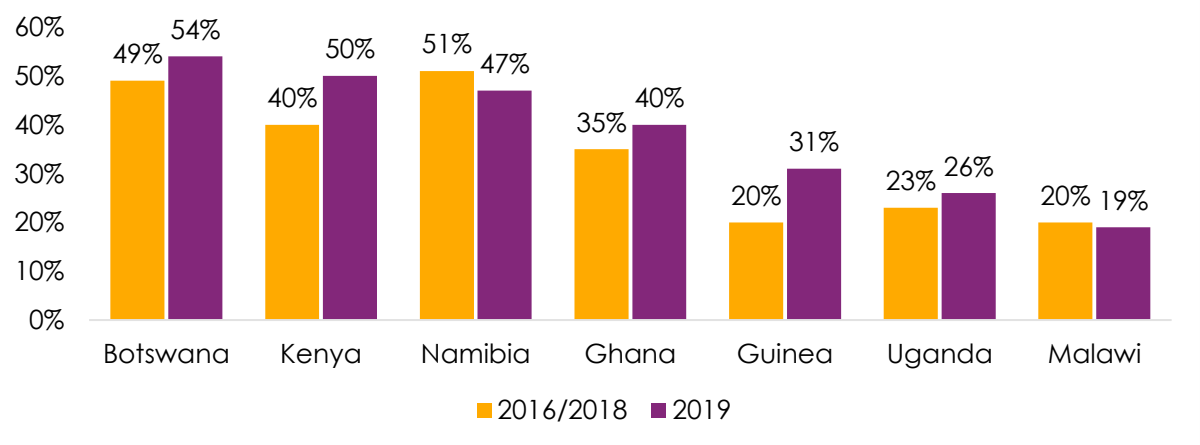
Meanwhile, the expansion of smartphones has also been substantial in some countries (e.g. Guinea and Kenya) though variable in others (Figure 5). The rapid increase in ownership of basic phones even in poorer countries is an important sign that remote teaching, albeit in basic forms, could become a reality for most citizens in the foreseeable future.

Figure 4: Ownership of cell phones (% of households) | 7 countries | 2014-2019



Respondents were asked: *Which of these things do you personally own: Mobile phone? [If no]: Does anyone else in your household own one? (% combines personal and household ownership)*

Figure 5: Ownership of cell phones with Internet access (% of respondents) | 7 countries | 2016-2019

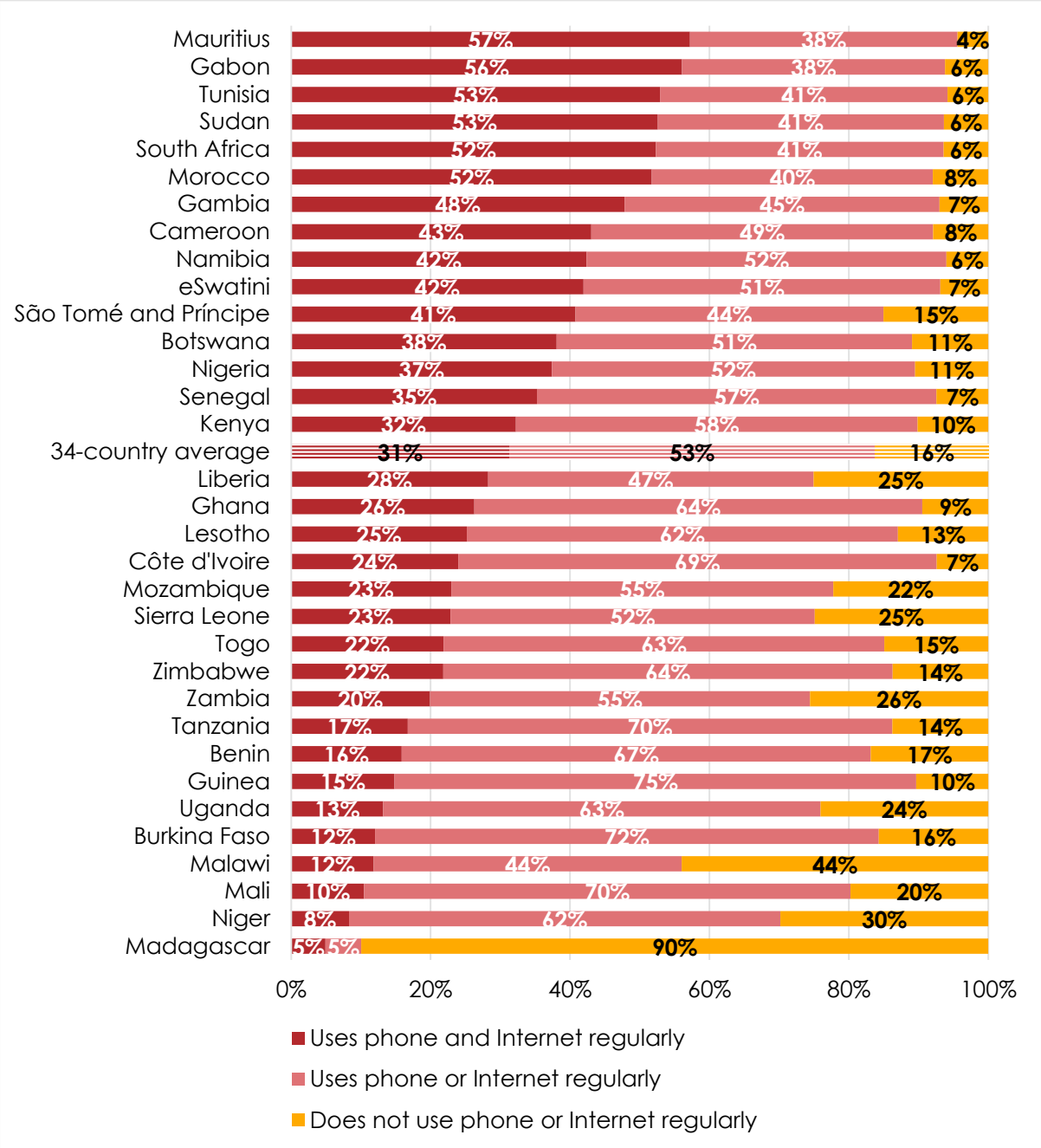


Respondents were asked: *Which of these things do you personally own: Mobile phone? [If yes to personally owning a mobile phone:] Does your phone have access to the Internet? (% who said "yes")*

Digital literacy

Remote learning requires students, parents, and teachers to engage in new types of online platforms. Depending on the kind of application and the devices that are available, participants might encounter a steep learning curve. Thus, being familiar with the devices and frequently browsing the Internet could be considered an important foundation of digital literacy. This has implications for the immediate goal of developing various forms of e-learning, as well as for citizens' employability (Kandri, 2019). One way of measuring Africans' digital literacy is by combining two questions from Round 7 of the Afrobarometer survey: *"How often do you use a mobile phone?"* and *"How often do you use the Internet?"* On average, three in 10 respondents (31%) said they use both a phone and the Internet at least a few times a week, while half (53%) use one of the two on a regular basis (Figure 6).

Figure 6: Digital literacy index | 34 countries | 2016/2018



Respondents were asked: *How often do you use: A mobile phone? The Internet? (% who said "every day" or "a few times a week")*

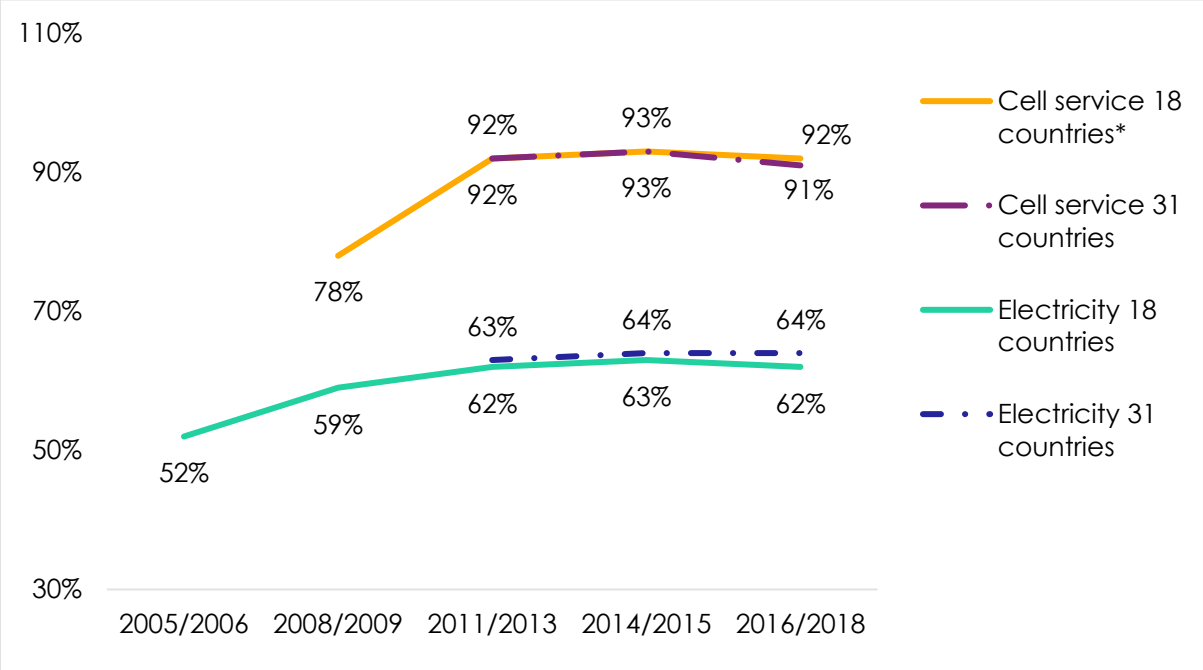
While this demonstrates a basic level of digital literacy, there are again substantial differences across countries. In Mauritius, Gabon, Tunisia, Sudan, South Africa, and Morocco, more than half of respondents frequently use cell phones and the Internet. By contrast, the same is true for no more than one in 10 citizens in Mali, Niger, and Madagascar.

Of course, several factors can affect digital literacy. First, for people to use phones and computers regularly requires cell phone network coverage and a functioning electricity grid. These conditions are not met everywhere on the continent.

Over a 10-year period, the availability of electricity has increased: On average across 18 countries surveyed consistently by Afrobarometer since 2005, the proportion of respondents living in zones served by an electric grid has risen by 10 percentage points (Figure 7). However, progress in this regard has stalled since 2011. Similarly, there has been little progress on average across the larger 31-country sample surveyed consistently since 2011.4

The availability of cell phone networks follows a similar pattern, though at a higher level of coverage. Since 2011, nine out of 10 neighbourhoods surveyed by Afrobarometer have had network coverage.

Figure 7: Technology infrastructure at neighbourhood level | selected country samples | 2005-2018

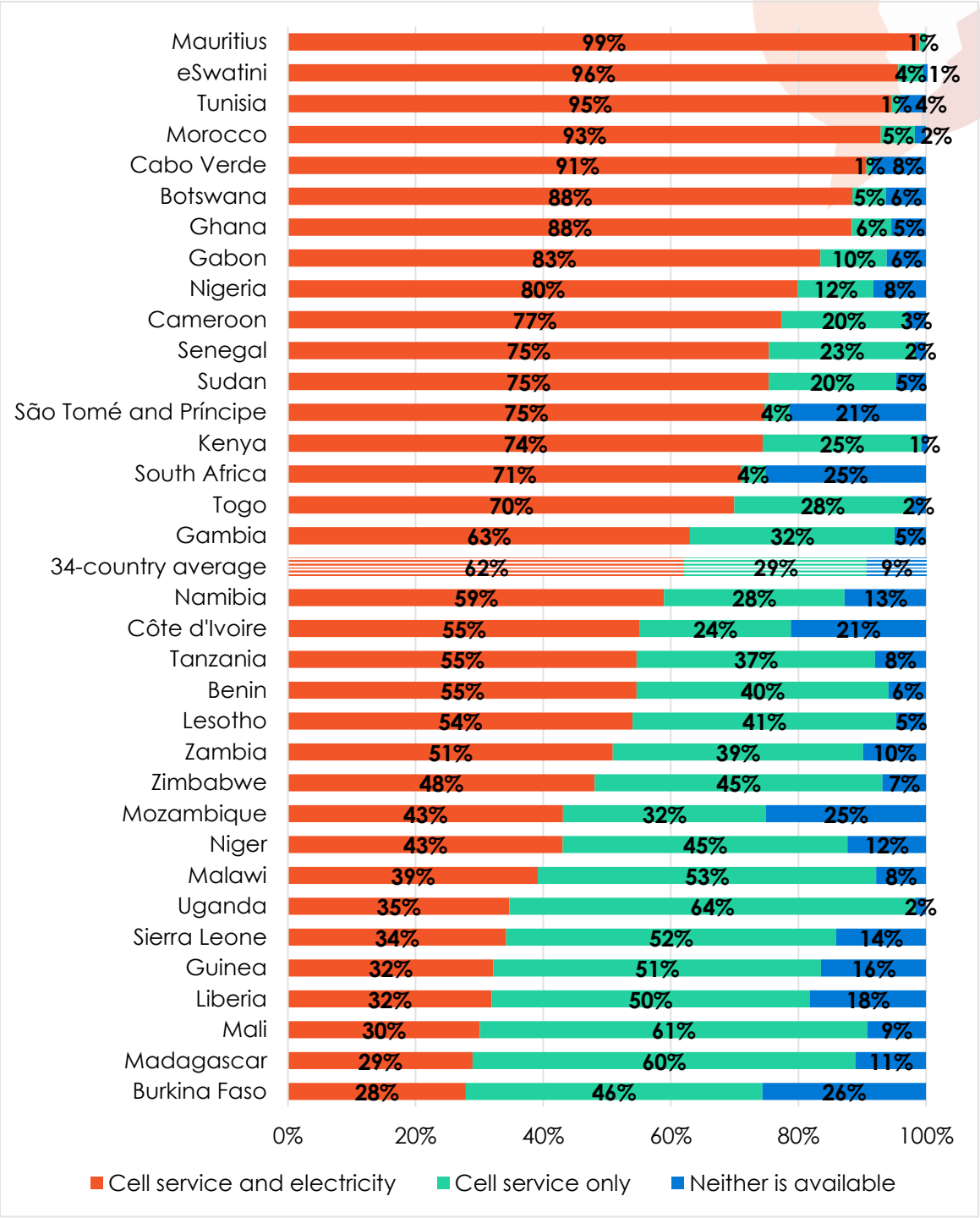


Interviewer observation: *Are the following services present in the primary sampling unit/enumeration area: Electricity grid that most houses can access? Mobile phone service?*
Note: *2008/2009 data on cell service includes only 16 countries; data for Lesotho and Madagascar are not available.*

What proportion of Africans have access to both an electricity grid and cell phone service? On average, only six out of 10 households surveyed by Afrobarometer (62%) had both services available to them in their neighbourhood (Figure 8). The availability of these basic services is virtually universal in Mauritius (99%), while only 28% of households in Burkina Faso can rely on both services being present in their neighbourhood. These different levels of available infrastructure need to be taken into account when designing policy recommendations to increase digital literacy.

[4] For more information on the availability of electricity in Africa, see Chingwete, Felton, & Logan (2019).

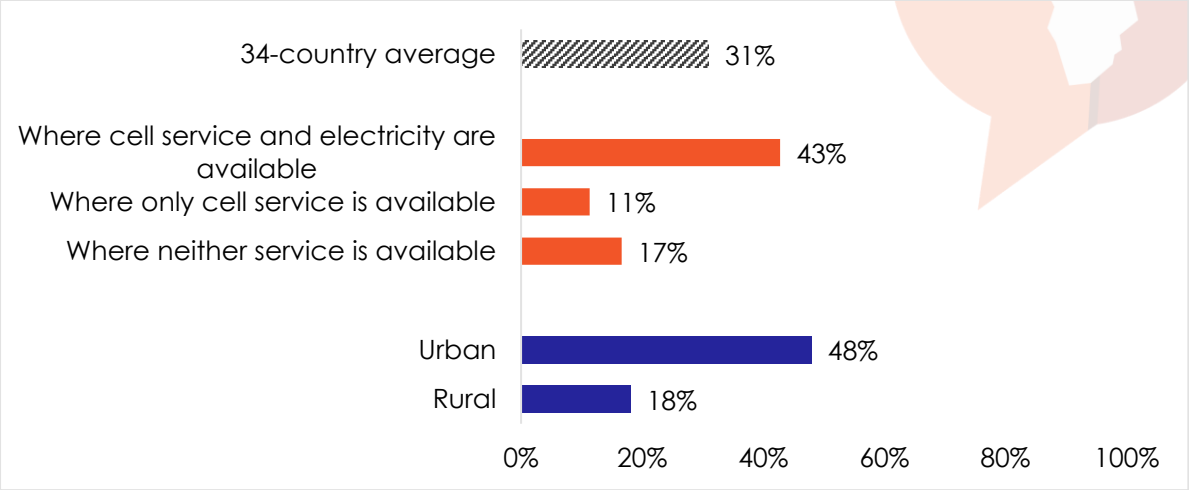
Figure 8: Technology infrastructure | 34 countries | 2016/2018



Interviewer observation: *Are the following services present in the primary sampling unit/enumeration area: Electricity grid that most houses can access? Mobile phone service?*

As Figure 9 shows, the availability of electricity and cell phone service is strongly associated with how frequently citizens use their phones and the Internet. The difference in digital literacy between areas in which electricity and mobile network are available (43%) and areas where only the latter is available (11%) is 32 percentage points. Since gaps in service provision often run along the urban-rural divide (Chingwete, Felton, & Logan, 2019), countries with larger proportions of the population living in rural areas may be less likely to make a successful transition to remote learning, thus reinforcing existing inequalities.

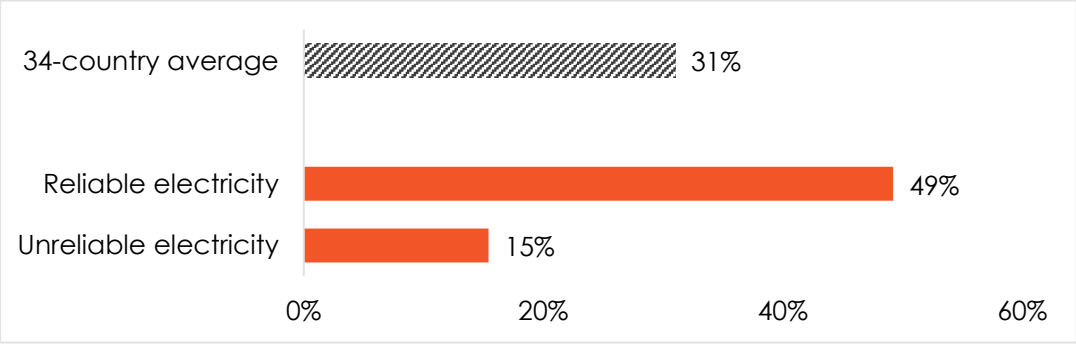
Figure 9: Digital literacy index | by neighbourhood infrastructure and location | 34 countries | 2016/2018



Respondents were asked: *How often do you use: A mobile phone? The Internet? (% who said "every day" or "a few times a week" to both)*

With several countries severely limiting citizens' ability to move freely and utilize public spaces during the COVID-19 pandemic, the availability of basic infrastructure and material resources at the household level becomes critically important. Here, several factors can affect when people use mobile phones and the Internet for educational purposes. First, accessing the Internet at the neighbourhood level (e.g. in a community center or Internet cafe) might be unfeasible due to lockdown regulations. Second, the electric grid might not provide electricity reliably at the household level due to rolling blackouts. To measure whether households have reliable access to electricity, we can use an additional question from the Afrobarometer survey, separating households into those that have access to electricity more than half the time (considered a "reliable" supply) and everyone else. Unsurprisingly, the reliability of the electricity supply correlates strongly with how often people use cell phones and the Internet (Figure 10).[5] In half (49%) of all households with a reliable supply of electricity, people also score high on the digital literacy index. In contrast, the same is true for just one in six households (15%) with less reliable, or no household-level electricity supply.

Figure 10: Digital literacy index | by reliability of electricity supply | 34 countries | 2016/2018

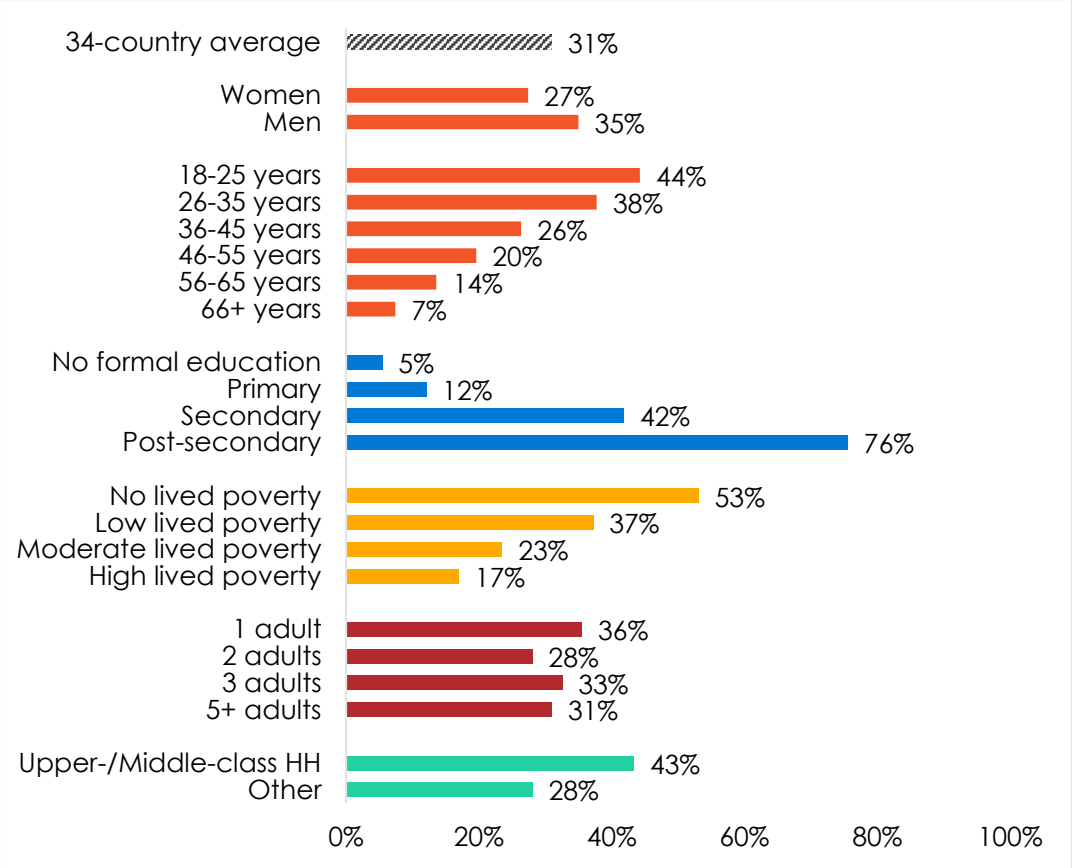


Respondents were asked: *How often do you use: A mobile phone? The Internet? (% who said "every day" or "a few times a week" to both)*

[5] The Pearson correlation coefficient for the reliable electricity dummy variable and the digital literacy index is .385, significant at the 0.01 level (2-tailed).

Other factors that can influence digital literacy include respondents' socio-demographic characteristics. Figure 11 clearly shows that male, younger, and more educated and wealthier respondents are all more likely to frequently use their cell phones and the Internet. This is not surprising, given that we have already observed a similar divide in terms of smartphone and computer ownership. Wealth and skills are likely to advantage households in the transition to remote learning.

Figure 11: Digital literacy index | by socio-demographic group | 34 countries | 2016/2018



Respondents were asked: *How often do you use: A mobile phone? The Internet? (% who said "every day" or "a few times a week" to both)*

The promise of e-learning and the contours of the digital divide

The analysis so far has revealed substantial differences in terms of device ownership and digital literacy across the continent. This section begins by demonstrating that these two aspects are two sides of the same coin. While it is expected that respondents who own a smartphone and a computer are also more likely to use the devices regularly,[6] describing this pattern is nevertheless an important step in determining the proportion of adult Africans who are likely to be prepared for remote learning – whether as a student in an institution of higher education, a teacher, or a guardian who could assist a child in navigating the e-learning landscape.[7] In a subsequent step, we investigate determinants of the digital divide and how it might be overcome.

[6] The Pearson correlation coefficient for the ownership and digital literacy indices is .733, significant at the 0.01 level (2-tailed).

[7] This categorization can work equally well, of course, to assess whether respondents are able to participate in the work environment by working remotely.

What proportion of Africans have the necessary prerequisites to easily transition to, or participate in, remote learning? That is, what percentage of respondents have access to a smartphone and a computer and use them regularly (i.e. are digitally literate)? And what proportion are moderately ready for e-learning, having access to some devices and being somewhat familiar with them? Lastly, how many adults are likely to be unable to participate in e-learning because the necessary devices are not available in the household and they do not regularly use them?

As can be seen in our remote-learning readiness index shown in Table 1, only 17% of respondents meet the most stringent criteria (see light-blue area). In other words, fewer than one in five Africans are likely to have the necessary level of digital literacy and both types of devices available to them in the household. A roughly equal share of respondents fall on the opposite end of the spectrum (17% in red area), having access to neither a smartphone nor a computer and showing low levels of digital literacy. For these respondents, it would be extremely difficult to participate in e-learning, or help minors in transitioning to remote learning (or work remotely from home).

An additional four out of 10 respondents (38%) score low on the index (green area), mostly because while they regularly use phones or the Internet, their household has neither a smartphone nor a computer. Taken together, 55% of respondents are likely to be unprepared or ill prepared for remote learning, while 28% of respondents form a middle category representing those who could participate in e-learning given enough resources such as devices and/or training (gray area).

Table 1: Composite index of remote-learning readiness | 34 countries | 2016/2018

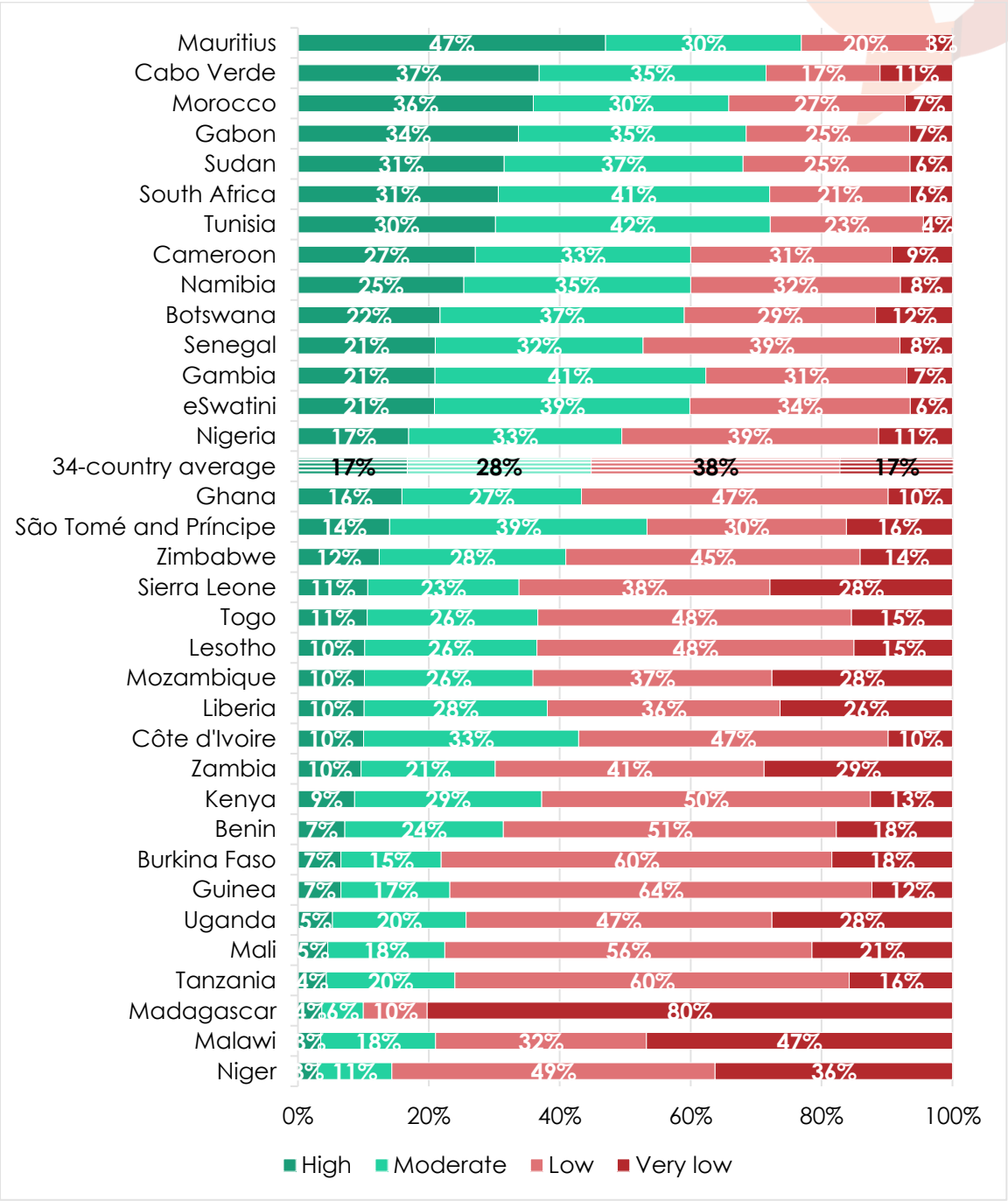
		Digital literacy index (respondent)		
		Does not use phone or Internet regularly	Uses phone or Internet regularly	Uses phone and Internet regularly
Technology ownership index (household)	Does not own phone or computer	9%	2%	0%
	Owns phone (no Internet access)	6%	37%	1%
	Owns smartphone or computer	1%	11%	13%
	Owns smartphone and computer	0%	2%	17%

***Note**: Percentages are rounded proportions of the total sample. The four colors represent different levels on the index of remote-learning readiness: red=very low, green=low, gray=medium, blue=high.*

Countries' ability to successfully roll out e-learning arguably depends, at least in part, on the proportion of citizens who score in the top two categories of the remote-learning readiness index (i.e. who are at least moderately digitally literate and have access to at least a smartphone or a computer in their household). If a majority of adults in a country fall short of meeting these criteria, the chances of a successful transition to e-learning would have been low even before COVID-19. Unfortunately, only in Mauritius are approximately half of adults in the top category, and only 15 countries have 50% or more of their population in the top two categories of the index (Figure 12). The contours of this digital divide within and across countries requires governments and international organizations alike to think carefully about

new policy initiatives and their potential to increase the share of citizens who are ready to participate in e-learning.

Figure 12: Composite index of remote-learning readiness | by country | 2016/2018



The index combines indicators of device ownership and digital literacy to measure the preparedness of respondents to participate in, or help with, remote learning. High = Respondent owns a smartphone and has access to a computer in the household (ownership) and uses the phone and Internet at least several times a week (digital literacy). Very low = Respondent does not own a smartphone and has no access to a computer in the household (ownership) and does not regularly use both a phone and the Internet (digital literacy).

Toward closing the digital divide

To better understand how countries could increase the proportion of citizens who can effectively participate in and possibly assist with e-learning, we use a linear regression. This

type of analysis allows us to compare potential contributing factors to see which are the best predictors of remote-learning readiness. The variables included in the analysis are those introduced in earlier sections: cell service in the neighbourhood, location (urban/rural), access to reliable electricity at the household level,[8] socio-demographic characteristics (age, gender, formal education, lived poverty), type of household (upper-/middle-class or other), and number of adults in the household.

Findings are shown in Table 2. In a first step, Model 1 shows results for all survey respondents. Thus, strictly speaking, Model 1 predicts the readiness of the general adult population to participate in or assist with remote learning or work. The results extend the descriptive findings discussed above. Respondents with higher levels of formal education (β=308) and access to a reliable supply of electricity at the household level (β=.284) score higher on the remote-learning index. In comparison, other infrastructure, household, and demographic characteristics are less predictive.

Although Afrobarometer does not ask respondents whether they are caretakers of school-age children, the survey includes a question about whether respondents contacted a public school during the past 12 months. If we assume that respondents who had contact with a school are also likely to assist children in a remote-teaching environment, we can re-run the same analysis for this sub-set of respondents (Model 2) to get a more accurate picture of how ready caretakers are. To understand whether the same factors are more predictive for this smaller group of respondents compared to the broader population, we now need to compare the unstandardized B coefficients of Models 1 and 2. The results show that the effect sizes of the variables remain relatively stable.[9]

What does this mean for countries' plans to incorporate remote teaching during this pandemic? Households that have reliable access to electricity and include more educated occupants are more likely to have the necessary devices and know-how to participate in or help with remote learning and other forms of digital knowledge exchange. Put differently, the digital divide for both groups – the general population and caretakers – is shaped by available basic infrastructure and the educational attainment of citizens, rather than the wealth of the household, its geographic location, or a generational divide.

Moving beyond an analysis of who is currently able to engage in remote learning, what should African governments do to rapidly improve the current situation? An obvious though capital-intensive option to narrow the digital divide would be for governments to provide access to smartphones or computers. It is difficult to test the effectiveness of this policy option with the available data. However, we can re-run models 1 and 2, but this time use the infrastructure, household, and demographic factors to predict citizens' levels of digital literacy among two separate groups – those who do not have access to a smartphone or a computer (reference model, Model 3) and those who do (Model 4).[10] If the explanatory power of the variables changes between Model 3 and Model 4, we would have some suggestive evidence as to what the effects of distributing smartphones or computers among those who currently do not have access to such devices would be.

First, comparing the beta values in Model 3, we see that – similar to the previous results – a reliable supply of electricity is important for digital literacy (β=.156). However, we also see a clear gender divide. Among those who own at most a basic phone, women are significantly less likely than men to be digitally literate (β=-.123). This divide is more influential than the gap between less and more educated respondents as well as the extent of lived poverty a

[8] In contrast to the previous analysis, the variable in the regression is measured using the original six-point scale used in the survey (0=no connection to the grid to 5=electricity available all the time).

[9] The middle-class household variable could be considered a partial exception as it increased from .173 to .234. However, when considering the variable's explanatory power within Model 2, we can see that the respondent's level of formal education and reliable access to electricity are still better predictors.

[10] The results presented in Model 3 and Model 4 should only be seen as suggestive, as they are based on fewer observations than the previous models.

respondent experiences. When comparing the unstandardized coefficients between Model 3 and Model 4, we see that the gender divide for digital literacy narrows once respondents have access to a smartphone or a computer in the household (from B=-.122 in Model 3 to B=-.090 in Model 4). Moreover, the importance of age also increases (from B=-.019 to B=-.106), while a higher number of adults in the household now has a modest negative effect in Model 4. In short, providing smartphones or a computer to those who do not yet have access to such devices could be an effective albeit costly intervention to increase digital literacy, while at the same time reducing the impact of infrastructure and household characteristics and narrowing existing gender gaps.

Table 2: Factors explaining citizens' readiness for remote learning and digital literacy | 34 countries | 2016/2018

	Remote-learning readiness				Digital literacy			
	Full sample (Model 1)		Contact with school† (Model 2)		Owns basic phone or less (Model 3)		Owns smartphone or computer (Model 4)	
	B[1] (S.E)	Beta[2]	B[1] (S.E)	Beta[2]	B[1] (S.E)	Beta[2]	B[1] (S.E)	Beta[2]
(Constant)	1.077 (.025)		1.148 (.041)		.788 (.021)		1.630 (.037)	
Infrastructure								
Location (urban)	.238 (.009)	.123***	.226 (.014)	.118***	.084 (.008)	.078***	.075 (.012)	.066***
Cell service in neighborhood	.104 (.013)	.031***	.114 (.022)	.034***	.069 (.010)	.045***	.057 (.023)	.024*
Reliable electricity in household	.123 (.002)	.280***	.130 (.003)	.297***	.038 (.002)	.156***	.025 (.003)	.091***
Household characteristics								
Number of adults in household	.043 (.004)	.045***	.034 (.006)	.036***	.026 (.003)	.053***	.-.012 (.006)	-.022*
Upper-/Middle-class household	.161 (.009)	.073***	.215 (.015)	.100***	.029 (.009)	.024***	.006 (.013)	.005*
Demographic factors								
Age	-.077 (.003)	-.117***	-.073 (.005)	-.105***	-.019 (.002)	-.058***	-.106 (.004)	-.254***
Gender (female)	-.206 (.008)	-.107***	-.202 (.013)	-.105***	-.122 (.007)	-.123***	-.090 (.011)	-.079***
Education	.276 (.004)	.307***	.251 (.006)	.282***	.052 (.004)	.100***	.078 (.006)	.127***
Lived Poverty Index score	-.113 (.004)	-.111***	-.121 (.007)	-.117***	-.035 (.004)	-.063***	-.027 (.006)	-.043***
Adj. R^2	.423		.420		.093		.113	
Number of observations	38,646		13,801		21,185		9,890	

Note: **significance=<.05, **significance=<.01, ***significance=<.001; [1]=unstandardized coefficients; [2]=standardized coefficients; †=includes only respondents who had contact with a school during the previous 12 months*

Conclusion

The challenges that countries face as the COVID-19 pandemic unfolds are multiple and severe. Given that "business as usual" in education is unfeasible for the foreseeable future, governments, teachers, students, and parents must all adjust to the changing circumstances. The findings presented in this paper outline the extent to which alternative forms of teaching (and knowledge exchange more broadly) could be moved to online platforms. First, there are substantial differences in terms of the availability of technological devices such as smartphones and computers across the continent. Second, only in a few African countries do large proportions of the population reach minimal levels of digital literacy.

To fully realize the potential of e-learning, citizens need access to smart devices and high levels of digital literacy. An examination of who is most likely to be able to engage in or assist with remote learning points to more-educated adults with reliable access to electricity. By comparison, people's overall level of wealth and geographic location are less likely to shape their ability to participate in the transition to e-learning.

A preliminary analysis suggests that government provision of smartphones or computers could redraw the contours of the digital divide while also narrowing gender and other disparities among those who currently do not have access to digital devices.

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Appendix

Table A.1: Afrobarometer Round 7 fieldwork dates and previous survey rounds

Country	Months when Round 7 fieldwork was conducted	Previous survey rounds
Benin	Dec 2016-Jan 2017	2005, 2008, 2011, 2014
Botswana	June-July 2017	1999, 2003, 2005, 2008, 2012, 2014
Burkina Faso	Oct 2017	2008, 2012, 2015
Cameroon	May 2018	2013, 2015
Cape Verde	Nov-Dec 2017	2002, 2005, 2008, 2011, 2014
Côte d'Ivoire	Dec 2016-Jan 2017	2013, 2014
eSwatini	March 2018	2013, 2015
Gabon	Nov 2017	2015
Gambia	July-August 2018	N/A
Ghana	Sept 2017	1999, 2002, 2005, 2008, 2012, 2014
Guinea	May 2017	2013, 2015
Kenya	Sept-Oct 2016	2003, 2005, 2008, 2011, 2014
Lesotho	Nov-Dec 2017	2000, 2003, 2005, 2008, 2012, 2014
Liberia	June-July 2018	2008, 2012, 2015
Madagascar	Jan-Feb 2018	2005, 2008, 2013, 2015
Malawi	Dec 2016-Jan 2017	1999, 2003, 2005, 2008, 2012, 2014
Mali	Feb 2017	2001, 2002, 2005, 2008, 2013, 2014
Mauritius	Oct-Nov 2017	2012, 2014
Morocco	May 2018	2013, 2015
Mozambique	July-August 2018	2002, 2005, 2008, 2012, 2015
Namibia	Nov 2017	1999, 2003, 2006, 2008, 2012, 2014
Niger	April-May 2018	2013, 2015
Nigeria	April-May 2017	2000, 2003, 2005, 2008, 2013, 2015
São Tomé and Principe	July 2018	2015
Senegal	Dec 2017	2002, 2005, 2008, 2013, 2014
Sierra Leone	July 2018	2012, 2015
South Africa	August-Sept 2018	2000, 2002, 2006, 2008, 2011, 2015
Sudan	July-August 2018	2013, 2015
Tanzania	April-June 2017	2001, 2003, 2005, 2008, 2012, 2014
Togo	Nov 2017	2012, 2014
Tunisia	April-May 2018	2013, 2015
Uganda	Dec 2016-Jan2017	2000, 2002, 2005, 2008, 2012, 2015
Zambia	April 2017	1999, 2003, 2005, 2009, 2013, 2014
Zimbabwe	Jan-Feb 2017	1999, 2004, 2005, 2009, 2012, 2014

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