A4AI ALLIANCE FOR AFFORDABLE INTERNET

A global coalition working to make broadband affordable for all

Advancing Meaningful Connectivity

Towards Active and Participatory Digital Societies

ACKNOWLEDGEMENTS

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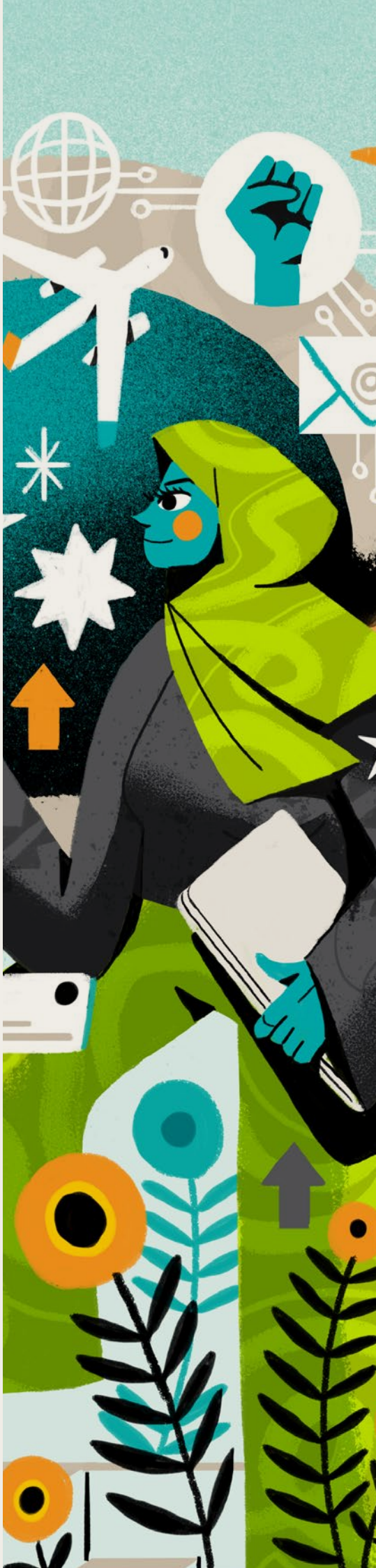
A4AI ALLIANCE FOR AFFORDABLE INTERNET

The **Alliance for Affordable Internet (A4AI)** is a global coalition working to drive down the cost of internet access in low- and middle-income countries through policy and regulatory reform. We bring together businesses, governments, and civil society actors from across the globe to deliver the policies needed to reduce the cost to connect and make universal, affordable internet access a reality for all.



Executive Summary

There is no doubt that internet access is a crucial way to learn, to bank, to access healthcare, and to stay informed. But people need more than basic internet access.

To benefit from digital technologies, people need regular access with fast speeds, enough data and sufficient devices. The Alliance for Affordable Internet (A4AI) estimates that, while two in three people are now online according to the current definition of internet access,[1] billions lack the meaningful connectivity they need to make the most of the internet.

For an individual, meaningful connectivity can mean the difference between access to education, banking, and healthcare — or none of them. For a society, it can determine how realistic and how impactful digitalisation programs will be.

Furthermore, many of current and future innovations will remain out of reach for the vast majority of the population in each of these countries who remain unconnected or have only basic access.

This report advances the Meaningful Connectivity framework as a way to support more inclusive societies and strengthen digital economies. It measures the gap in the number of people with just basic internet access and those with meaningful connectivity and examines what this digital divide means for people's online experiences.

The framework focuses on four pillars: 4G-like speeds, smartphone ownership, daily use, and unlimited access at a regular location, like home, work, or a place of study.

This report looks at nine low and middle income countries (Colombia, Ghana, India, Indonesia, Kenya, Mozambique, Nigeria, Rwanda, and South Africa), using mobile phone surveys to estimate the number of people with meaningful connectivity in each.

We found that, on average, only one in ten people in these countries have meaningful connectivity. This compares with just under half who have basic internet access, by latest official figures.

- Across all nine surveyed countries, estimates of meaningful connectivity remain far behind national figures on internet use, underlining that there are large inequalities among those who are online, as well as between those with and without internet access.
- There were large variations in the number of people with meaningful connectivity in the countries we studied, ranging from one in four people in Colombia to fewer than one in 160 Rwandans.
- Consistently in all nine countries, urban internet users were more likely to have meaningful connectivity than rural internet users. The rural meaningful connectivity gap in Rwanda is 267% – meaning that Rwanda's digital economy would need to grow another 2.5 times over exclusively in meaningfully connecting rural communities to close the urban/rural divide.
- Men who are online are more likely to have meaningful connectivity than women who are online. These disparities exist even in countries that have closed the gender gap in basic access, such as South Africa and Colombia.

1 The commonly accepted definition, from the International Telecommunication Union (ITU), is any use of the internet at any time within the past three months.

Meaningful connectivity offers enormous benefits to those who have it. The survey asked respondents about their experiences online and found:

- Internet users in our surveys generally report high levels of informational confidence, suggesting that internet access, even basic access, has huge potential to share essential information and create more informed populations.
- On average, eight of ten internet users in our surveys felt confident to look up the symptoms of Covid-19 online. Over half could look up how to book a medical appointment, report a crime, and book a ticket on public transportation.
- Users with meaningful connectivity were **around a third more likely** to do essential activities online like access healthcare, take a class, look for a job, or participate in the digital economy.
- Users with meaningful connectivity were more socially active (12% more likely to post on social media) and politically aware (13% more likely to know when the next elections are) than those with only basic access.

As governments develop their broadband policies and national digital agendas with the lessons from the Covid-19 pandemic, meaningful connectivity offers a framework to set targets and ambitions for internet access that has an impact on individuals' lives.

Governments must prioritise reliable, affordable, and meaningful connectivity for their citizens if they are serious about securing the benefits of a digital society for everyone.

Internet access defined the pandemic

As the world grappled with the public health demands of Covid-19 stay at home orders, huge parts of human life moved online. Around 170 countries around the world adopted remote education policies (Unicef, 2020). In Indonesia, various social welfare programs transitioned to automated payments to reduce reliance on cash payments (Runkel, 2020). In South Africa, a WhatsApp bot answered questions about the pandemic and public health guidance (Matiashe, 2020). Across Brazil, people turned to online streaming services in record numbers for entertainment (Silva, 2021). In Lagos, Nigeria, the State Executive transitioned its meetings to Zoom calls (Lagos State, 2020).

From education and finance to health and governance, the internet's value to these activities expanded to new heights. This makes being connected to the internet more important than ever before. **Whereas it was once an optional luxury, internet access became a crucial way to learn, to bank, to access healthcare, and to stay informed.**

However, this experience has not been equal: just as many people and activities have moved online over the past two years, millions have been excluded. By the latest ITU estimates, 4.9 billion people around the world use the internet: at the other end, nearly 3 billion people have never used the internet (ITU, 2021).[2] Within this, people living in countries with lower average incomes are less likely to use the internet, just as the digital gender gap and urban-rural digital divide also mean that women and those in rural and remote areas are also less likely to use the internet (ITU, 2021; GSMA, 2021).

These inequalities in access compound offline and online to further exclude those already marginalised. The Covid-19 pandemic accelerated this negative side just as it accelerated the positives.

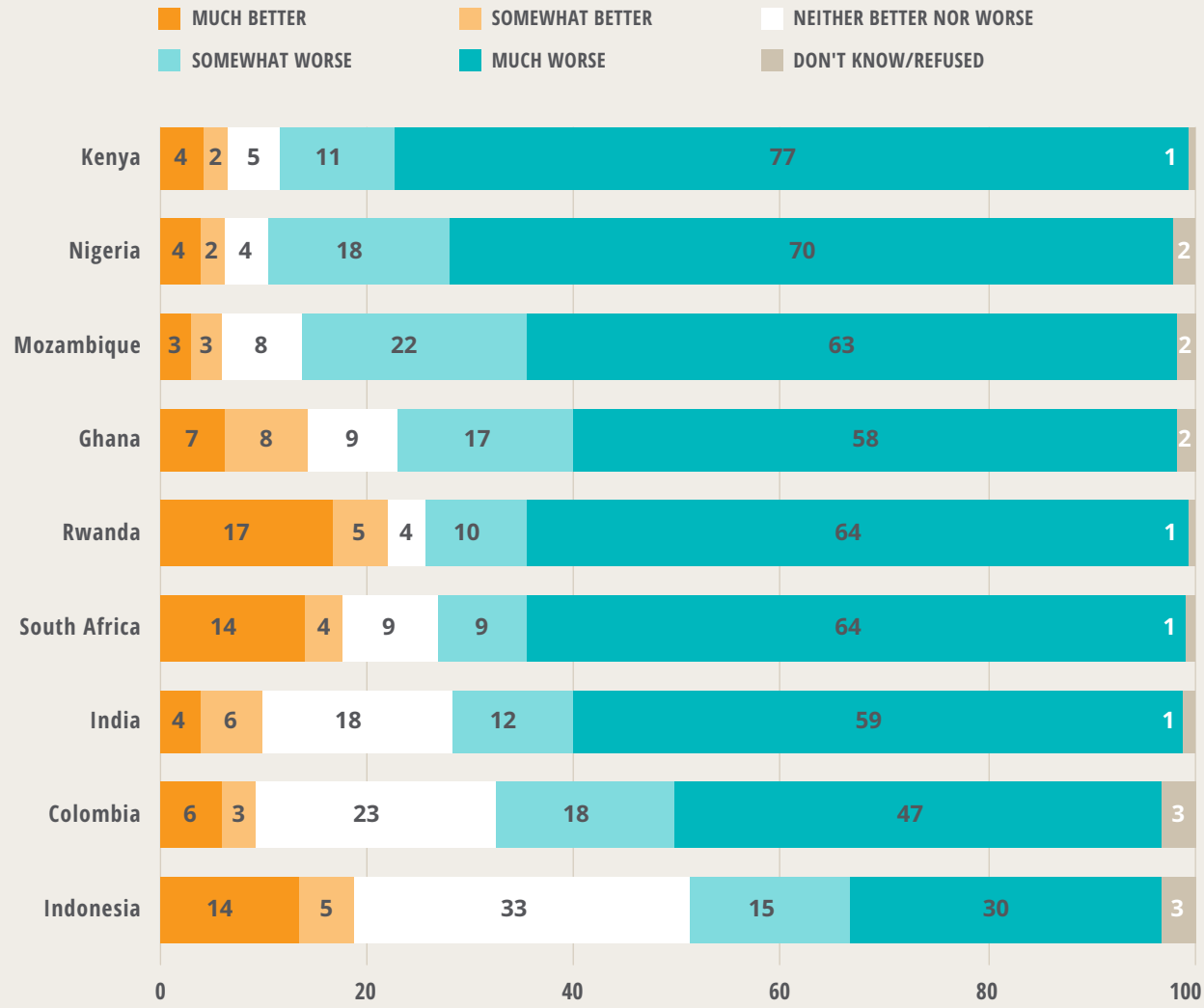
For example, in education, despite widespread policy efforts towards remote education, these technologies remained inaccessible to an estimated 463 million children (Unicef, 2020). The consequential missed schooling poses long-term risks for their education, psychological development, and economic prospects — that millions of other children did not face because of their access to the internet (Unesco, 2021).

In the context of gender, the Women's Rights Online programme has tracked this development over time. In 2015, it reported that women with internet access were less likely to look for a job or post their political views (Web Foundation, 2015). In expanded national surveys in 2020, women online were once again less likely than men to post their views or to sell/advertise a product/service online (Web Foundation, 2020).

Internet users themselves recognise the value of their access through the pandemic. In a survey of 1,000 mobile internet users in each of nine low and middle income countries in 2021, vast majorities in many countries said their experiences of the Covid-19 pandemic would be worse without internet access. In Kenya, Mozambique, and Nigeria, for each person that said their life would have been better without the internet, another thirteen projected their life would have been worse.

2 Details on how this indicator is collected and its limitations are discussed on page 8.

Figure 1. Internet users' perceived lockdown experience if they had no internet access (as % of respondents).



Source: Alliance for Affordable Internet, 2021

As governments think about their post-pandemic policy agendas, they must prioritise reliable and quality connectivity for their citizens if they are serious about securing the benefits of a digital society to all their people. For an individual, it can mean the difference between access to education, banking, and healthcare — or none of them. For a society, internet access can determine how realistic and how impactful digitalisation programs will be. The Meaningful Connectivity framework offers a means to do this.

The post-Covid broadband policy agenda: aiming for meaningful connectivity

A4AI launched the Meaningful Connectivity framework in 2019 to address shortcomings in how internet access has been measured and defined in recent years (A4AI, 2019). The framework focuses on four pillars: 4G-like speeds, smartphone ownership, daily use, and unlimited access at a regular location, like home, work, or a place of study. This allows for a deeper understanding of access compared to the ITU's definition of connectivity, which includes cases of limited connectivity such as the one experienced when using a feature phone, with limited functionality, on a low-speed bandwidth connection (ITU, 2021).

This depth of the Meaningful Connectivity framework enables policymakers to more readily identify connectivity bottlenecks and prioritise key investments to increase the internet's potential impact.

In the initial design of the framework, each pillar of the framework relates to additional capacities and user behaviours we found through our research (A4AI, 2020). For speed, this connects to the expanded use of video and users' preferences for audiovisual material. Smartphones come with the added functionality of a camera, a tactile screen, and mobility. Many users rely on an 'oasis' point in their daily lives — for example at home, work, or school — to conduct data-heavy activities that they couldn't necessarily do anywhere. Finally, daily use reflects the capacity of this technology to transform and become a meaningful part of someone's life.

Our first application of the Meaningful Connectivity framework took place in 2020 with the Women's Rights Online report, and the indicators within that report exposed a wide gap between the simple binary of internet use and the deeper measures of meaningful connectivity. In household surveys of Colombia, Ghana, and Indonesia, no more than two-thirds of internet users had meaningful connectivity (Web Foundation, 2020). In addition, in contexts where digital gender gaps in internet use were nearly non-existent, gender gaps as large as 16% emerged for meaningful connectivity (ibid). This helps indicate that what has worked to date has left deep inequalities under superficial measurements and that a new generation of policy interventions is required to achieve universal access.

Various stakeholders in several parts of the world have started to embed the Meaningful Connectivity framework into the broadband policy dialogue. The framework offered the basis for measurements of urban-rural connectivity divides across Latin America (*see* IICA, 2020). Meaningful connectivity has been used to understand the landscape across Asia and the Pacific for broadband investment (*see* UNESCAP-A4AI, 2021). The framework has also become a key point for collaborations between A4AI and Smart Africa (Smart Africa, 2020). This represents a wide range of initial steps for the framework's potential inclusion at additional levels in the policy process.

Substantial work remains in developing the concept and embedding it across different aspects of broadband policy. A4AI, as initial advocates for meaningful connectivity, has also undertaken a range of activities to develop the framework, including a methodology guide and policy playbook (A4AI, 2021; A4AI, 2021). This report builds on the foundations of this work to expand the measurements of meaningful connectivity to new countries and to understand the impacts of this connectivity in everyday lives.

What is meaningful connectivity, and how do we measure it?

Meaningful connectivity is a proposed framework for measuring qualities of internet access in an area. It focuses on four pillars:

4G-LIKE INTERNET SPEEDS

SMARTPHONE OWNERSHIP

AN UNLIMITED BROADBAND CONNECTION AT HOME, WORK, OR PLACE OF STUDY

DAILY USE

It suggests replacing the existing top-level measure of internet use – defined as access on any device at least **once in the past three months** (*see* ITU, 2020) — as the lead indicator for connectivity within a country. Through the four, focused pillars, the framework offers guiding priorities for policymakers to focus their interventions through public investment, regulatory reform, and vision-setting to achieve universal, affordable, and meaningful internet access (A4AI, 2021).

	ITU DEFINITION OF INTERNET USE	MEANINGFUL CONNECTIVITY
Speed	No minimum speed	4G-like speed
Device	Any device	Smartphone ownership
Data Allowance	No minimum	An unlimited broadband connection
Frequency	At least once in the past three months	Daily use

The framework is built around two measures: the number of people within a country with meaningful connectivity and the National Assessment for Meaningful Connectivity.[3] This report focuses on the number of people within these countries that have meaningful connectivity: that is, that have all four of the elements mentioned above. The National Assessment is a policy tool to help a country measure progress over time and brings together an average of the four pillars for a net national score.

3 Details on the precise calculation of each are available in the Meaningful Connectivity Methodology Guide (A4AI, 2021)

Mobile surveys to measure meaningful connectivity

The first measurements of meaningful connectivity and the first edition of the methodology guide relied primarily on household surveys as the base method for measuring meaningful connectivity. This mirrors ITU's best practices for measuring other internet access-related indicators (ITU, 2020). However, this method is, first, very costly and, second, poses unique challenges in the context of the Covid-19 pandemic (UN DESA, 2020).

As such, this report is a first test for a new method to provide a lower cost intervention to estimate meaningful connectivity within a country: namely, mobile phone-based, computer-assisted telephone interviewing (CATI).

RESEARCH SCOPE

The Alliance worked in partnership with GeoPoll, a full-service research provider and mobile surveying platform, to conduct surveys in June-July 2021 in nine low and middle income countries.

Each survey included at least 1,000 respondents, each of whom was an internet user with a mobile phone. Each national sample had quotas set around first-level administrative districts (or clusters thereof), along with controls for gender and geographic diversity based on the latest available demographic data of internet users within the country.[4]

4 Details and sources for the sampling plan are available in Annex 1.

Table 1. Sampling Plan for A4AI Meaningful Connectivity Surveys

COUNTRY	RANGE FOR NON-MALE RESPONDENTS[5]	ACTUAL NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS	ACTUAL RURAL RESPONDENTS	TOTAL RESPONDENTS
Colombia	498–500	500	83–125	110	1000
Ghana	425–500	500	194–292	207	1000
India	266–500	499	428–642	509	1008
Indonesia	467–500	499	284–426	357	1000
Kenya	411–500	477	497–745	594	1000
Mozambique	401–500	487	339–509	355	1000
Nigeria	393–500	478	258–386	291	1000
Rwanda	348–500	482	488–732	638	1000
South Africa	435–500	500	202–304	258	1000

This sampling plan ensures a voice for historically underrepresented groups: namely, women and people living in rural areas. However, it does limit some of the possible uses of the data. For example, this survey gives us no indication about changes in internet use in a country or within particular parts of a country. Those numbers are assumed as parts of the sampling plan.

From this method of mobile-based surveys, we can make well-informed projections about the extent of meaningful connectivity in a country. By ensuring a cross-representative sample of users and their access patterns across the country, this survey can tell us about the kind of access that a specific subset within the country — mobile internet users — has. If we apply our understanding from the survey exclusively to that population, the survey can give us some estimates on the availability of meaningful connectivity in that country.

ASSUMPTIONS AND LIMITATIONS

This method of mobile phone surveys relies on a few assumptions and has some limitations.

It logically assumes that someone that does not use the internet does not have meaningful connectivity. Given that meaningful connectivity measures a specific quality of internet access, this assumption poses no problem. As long as the references for the assumed sampling plan are accurate, the exclusion of this group from any measure of meaningful connectivity should still be accurate.

Given that this survey relied on mobile phone users, it omits a potential, small number of internet users who only connect using devices other than a mobile phone. This use case was exceedingly rare in the first round of household surveys for meaningful connectivity (Web Foundation, 2020). While it is a known omission and limitation of this survey, its potential impact is very limited in scope.

5 In the survey design, respondents were asked their gender, and enumerators were directed to identify the respondents' answers as Male, Female, or Any Other Answer. Due to insufficient responses that would prevent sampling bias to overwhelm averages for the third group, those with *Any Other Answer* have been excluded from gender-based disaggregations.

This survey set did not ask for respondents' level of education, economic class, ethnicity, or language spoken at home. These are factors that we know contribute to the odds that someone is using the internet (GSMA, 2021), and we estimate they may also contribute to the odds that someone has meaningful connectivity rather than basic access. As our survey does not ask for this information, we cannot be certain that these factors have not biased the sample in a particular way. Indeed, given our experience with similar datasets from similar surveys (A4AI, 2021), we anticipate that income levels are a hidden influence throughout much of our dataset: those with meaningful connectivity likely also have higher average incomes than the rest of our sample.

Other factors may apply to mobile phone surveys in general, including nonresponse rates and refusals (Ambel, et alia, 2021). Details of these numbers are available as Annex 2.

In short, this method is not a full replacement for household surveys and other methods that are typically employed to collect these indicators. However, in resource-constrained contexts and with an understanding of these limitations, mobile phone-based surveys can give us informed estimates of meaningful connectivity that can help guide policy decisions in the right direction through an understanding of general trends.

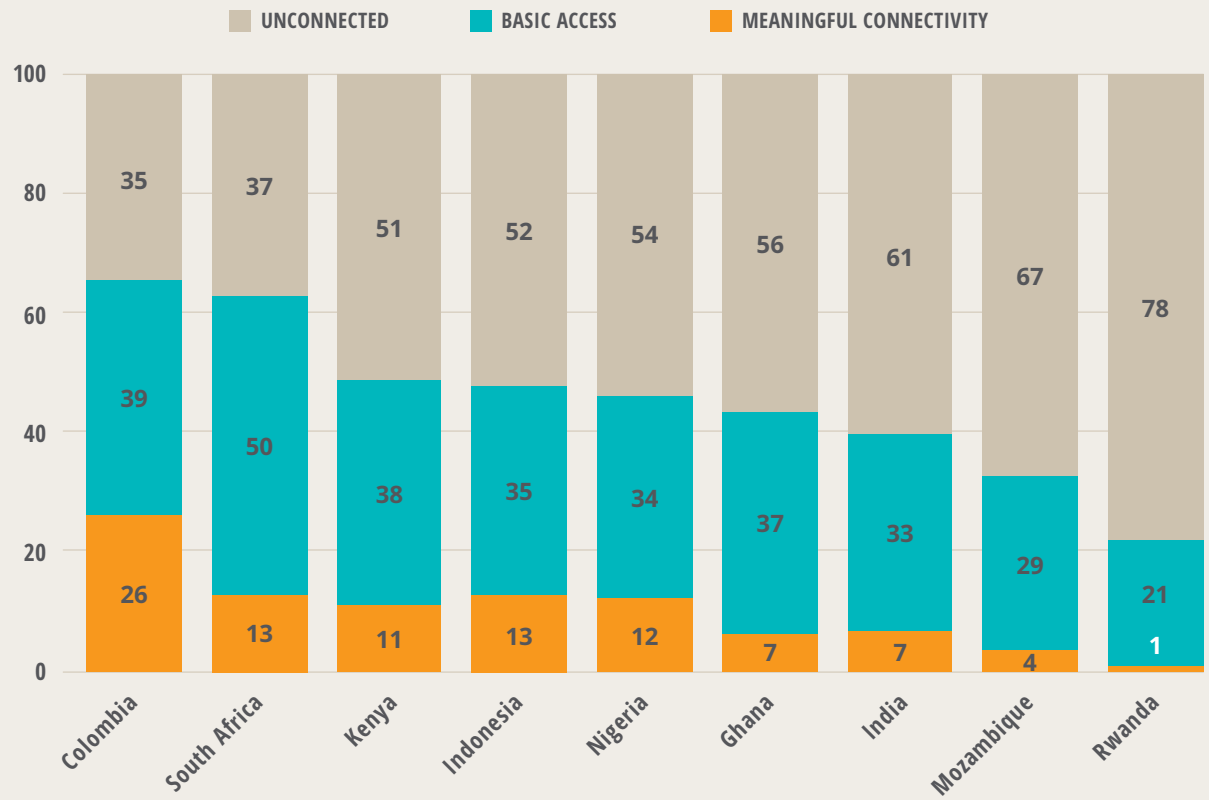
Results: meaningful connectivity remains beyond the means of many

Across all nine surveyed countries, estimates of meaningful connectivity remain far behind national figures on internet use. The method used to create these estimates assume that the meaningfully connected will represent only a fraction of all internet users: however, these surveys reveal the depth of the disparities between basic access and meaningful connectivity in a country.

Meaningful connectivity ranges from being the experience of around one in every four Colombians to less than one of every 160 Rwandans.

This reveals a deeper inequality of access that runs within South Africa compared to Colombia and in Ghana compared to Nigeria. Despite both country pairs having similar levels of internet use at the national level, only an estimated 13% of South Africans (one of every five internet users) have meaningful connectivity compared to 26% of Colombians (two of every five internet users). In Ghana, only 7% of Ghanaians have meaningful connectivity compared to 12% of Nigerians.

Figure 2. Estimated meaningful connectivity, per survey country (as projected % of population)



Source: Alliance for Affordable Internet, 2021; based on various sources, see Annex 1

WHAT GENDER AND GEOGRAPHY MEAN FOR CONNECTIVITY

Consistently in all nine countries, urban internet users were more likely to have meaningful connectivity than rural internet users, and men online were more likely to have meaningful connectivity than women online.

Of the four pillars of meaningful connectivity — 4G-like speeds, smartphone ownership, unlimited internet access point, and daily use — 4G access and an unlimited access point were the least common features of meaningful connectivity in these nine countries. In turn, these two pillars are controlling factors in the gaps between men and women and urban and rural internet users.

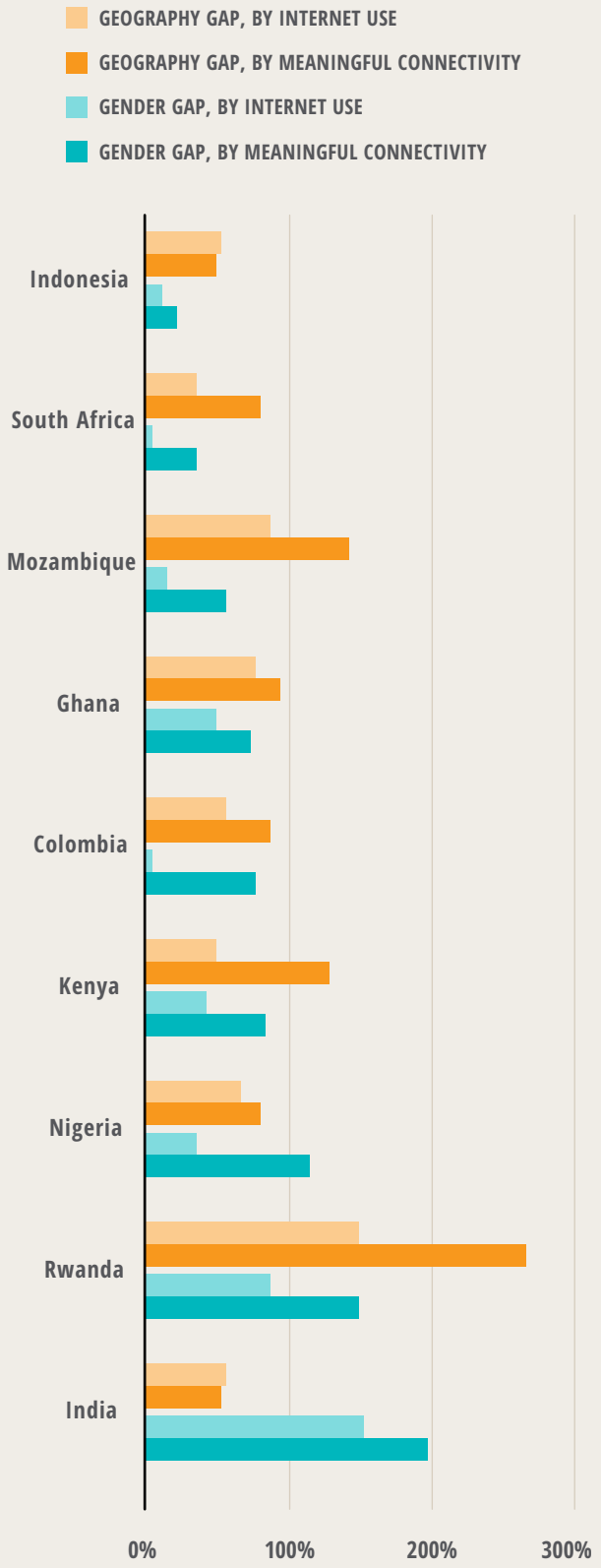
These inequalities not only mirror internet use but also expose the depth of inequality well beyond them. Just as economic and social barriers discourage women's internet use in certain parts of the world (A4AI, 2021), these barriers would apply even more acutely on a woman's use of her disposable income on more expensive, higher-quality internet access. In addition, where geography and return on investment may discourage adequate internet infrastructure in a rural or remote community (A4AI, 2020), these communities may lag behind the national average in access and use of newer, faster technologies. The meaningful connectivity framework helps to evidence this inequality.

Table 2. Estimates of meaningful connectivity, by country, geography, and gender

COUNTRY	NATIONAL	URBAN	RURAL	MEN	WOMEN
Colombia	26.2%	30.5%	7.6%	33.8%	19.2%
Ghana	6.5%	9.0%	2.8%	8.3%	4.8%
India	6.8%	9.0%	5.3%	9.8%	3.3%
Indonesia	12.7%	15.3%	9.1%	12.8%	10.4%
Kenya	10.9%	20.7%	6.5%	14.3%	7.7%
Mozambique	3.6%	6.7%	1.5%	4.2%	2.7%
Nigeria	12.1%	16.4%	6.6%	15.5%	7.2%
Rwanda	0.6%	1.9%	0.3%	0.5%	0.2%
South Africa	12.8%	15.9%	5.7%	16.4%	12.1%

Source: Alliance for Affordable Internet, 2021; based on various sources, see Annex 1

Figure 3. Geography and gender gaps, by internet use and meaningful connectivity



Source: Alliance for Affordable Internet, 2021; from sources in Annex 1

These estimates of meaningful connectivity demonstrate the value of this framework: adding detail to understand the digital divide and the risks of continued inequality and inaction. This method has limitations that do not suggest a perfect capture of the state of connectivity in a country: however, it can give a more affordable evidence base to understand the general trends of internet access, where inequalities lie, and how they manifest within a country. This information, while not perfect, helps inform the context in which broadband policy decisions are made.[6]

6 Detailed gap information and gap calculation methods are discussed in Annex 3.

The meaningfully connected experience a range of social and personal benefits

Meaningful connectivity offers enormous benefits to those who have it. In addition to estimating the pillars of meaningful connectivity in each of the nine countries, the survey asked respondents about their comparative experiences online. The survey focused on measuring confidence in two clusters: the types of information that someone could find online and a range of activities that someone could do online.

Across various aspects of modern life, people with meaningful connectivity reported greater confidence in finding information than their less-well connected peers. On average across the nine countries and the nine prompts for information seeking our survey asked, users with meaningful connectivity were 14% more likely to be confident in finding the relevant piece of information.

Table 3. Prompts for online experiences within A4AI survey

As part of our research into meaningful connectivity and what it means for users, we asked all respondents...

Information Prompts:
Do you think you could find... on the internet on your own?

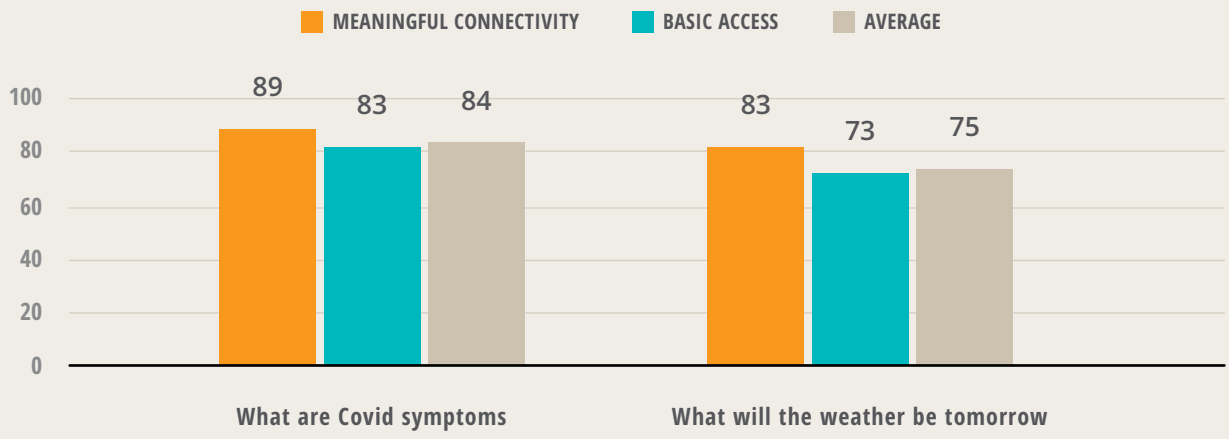
- What the weather will be like tomorrow
- When the next election will be
- What are some of the symptoms of coronavirus
- How to report a crime
- Where to buy a book
- How to open a mobile money or bank account
- How to buy a ticket for a bus or a train
- Where you could find someone to do a job for you, for example, cut your hair or deliver a package
- How to book a medical appointment online

Activity Prompts:
Have you used the internet in the past three months to... ?

- Seek information about government services
- Make or receive a payment
- Contact a family member or a friend who does not live in your household
- Post something on social media
- Take a class
- Buy something
- Sell something
- Look for a job
- Access healthcare services

Users were overall confident in finding general information. Our two general indicators — what are the symptoms of Covid-19 and what the weather will be tomorrow — had the highest average for positive responses: 84% and 75% respectively. Among users with meaningful connectivity, this confidence increased to 89% and 83% respectively.

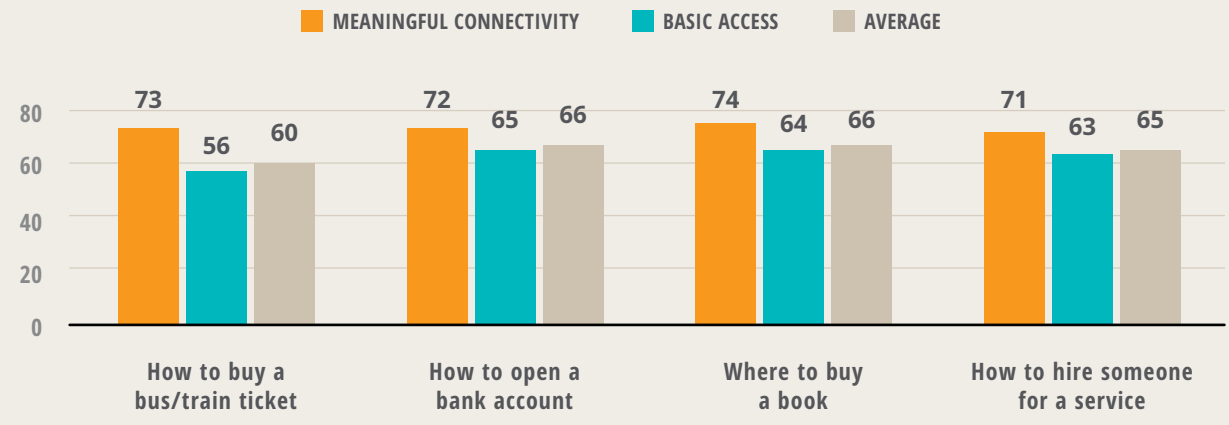
Figure 4. User confidence in seeking general information (as % of respondents)



Source: Alliance for Affordable Internet, 2021

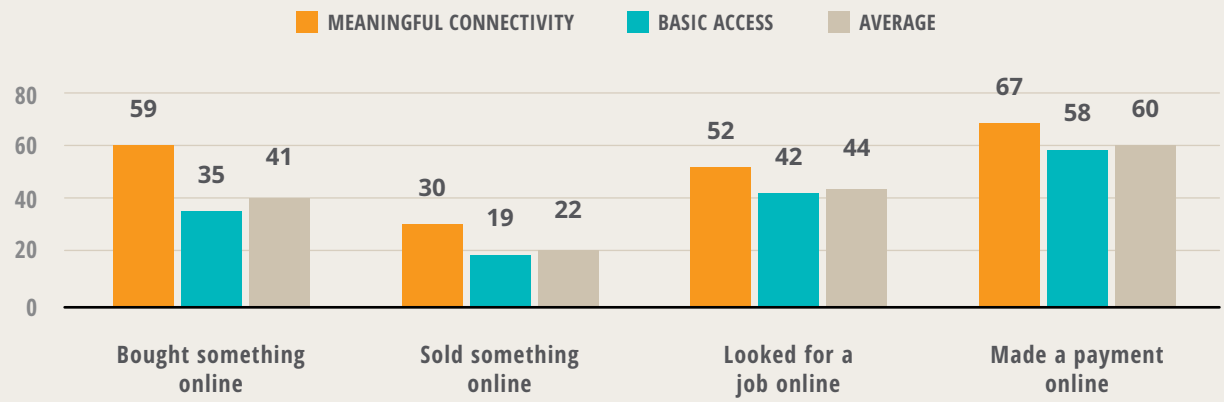
Internet users with meaningful connectivity were more likely to be economically active. In terms of finding how to buy a book or a transportation ticket, hire someone to do a service, or open a mobile money or bank account, users with meaningful connectivity were 17% more confident than those without. Such users were also more likely to have used the internet to buy something, sell something, look for a job, or make a payment.

Figure 5. User confidence in seeking economic information (as % of respondents)



Source: Alliance for Affordable Internet, 2021

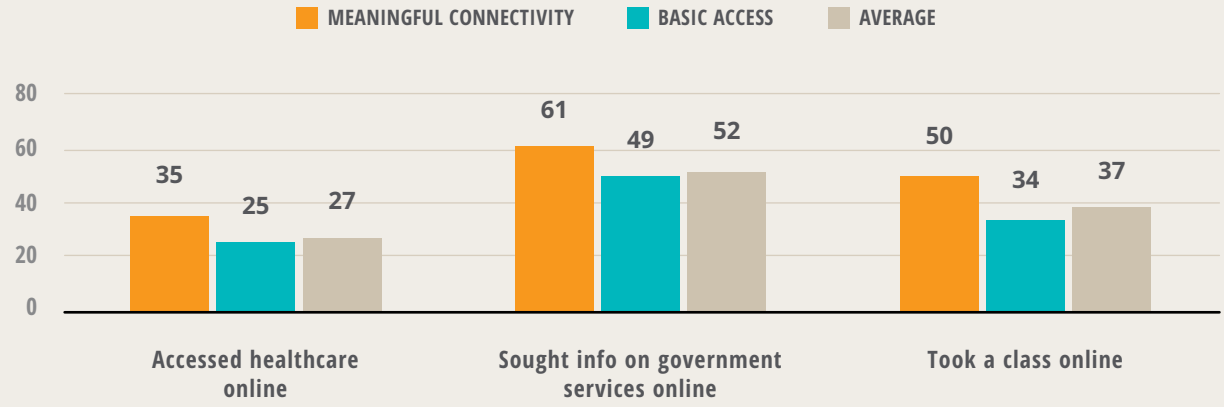
Figure 6. User participation in the digital economy (as % of respondents)



Source: Alliance for Affordable Internet, 2021

People with meaningful connectivity were also more likely to take a class, access healthcare services, or other developmental activities. Within healthcare, users with meaningful connectivity were 17% more confident in how to book an appointment and 44% more likely to have obtained healthcare through the internet in the past three months. They were also 24% more likely to have looked up information online about government services and 46% more likely to have taken a class online.

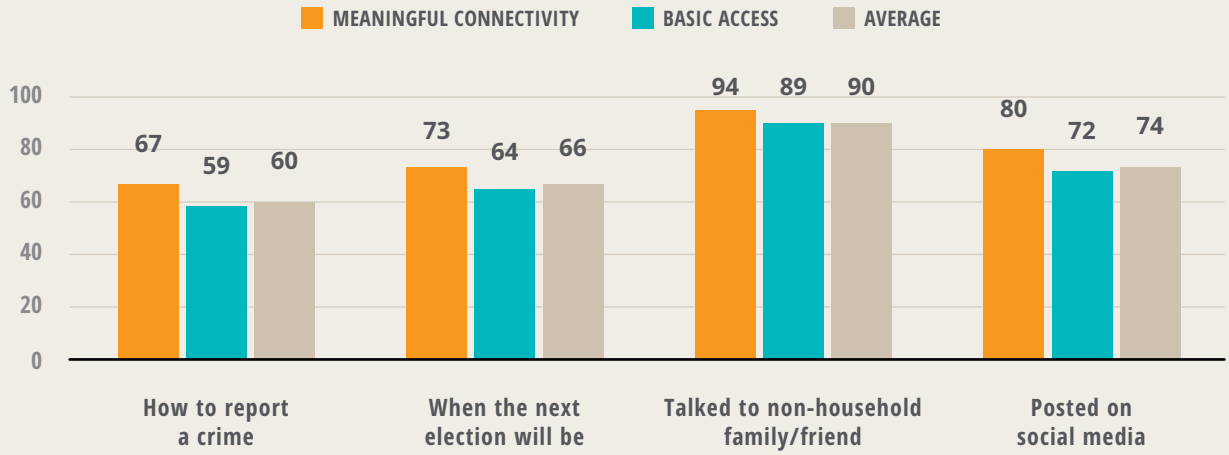
Figure 7. User personal development through the internet (as % of respondents)



Source: Alliance for Affordable Internet, 2021

In addition, users with meaningful connectivity were more socially active and politically aware. They were 14% more likely to be confident in how to report a crime and 13% more likely to know when the next election would be. Users with meaningful connectivity were more likely to have used the internet to stay in contact with a family member or friend outside their household and more likely to have posted something on social media.

Figure 8. Social and political participation and knowledge among internet users (as % of respondents)

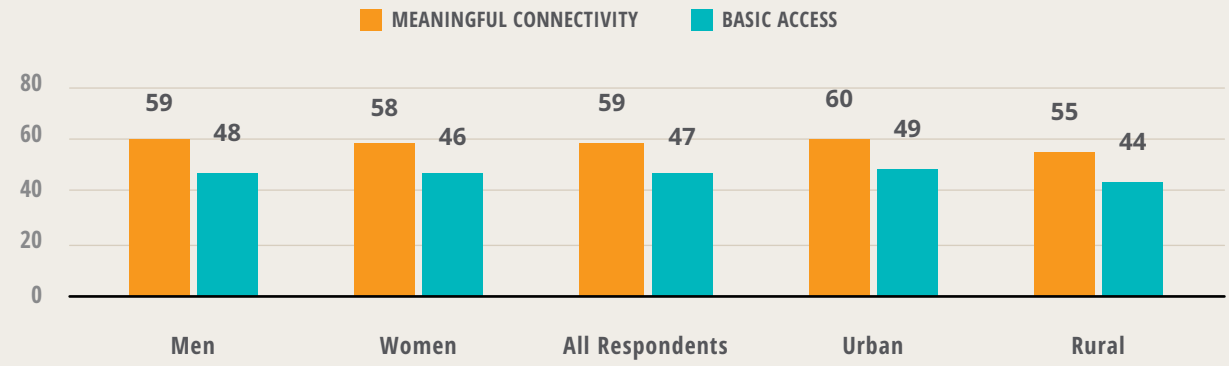


Source: Alliance for Affordable Internet, 2021

This positive trend extended across geographic and gender differences. Men and women alike, in both urban and rural areas, were more confident in finding information and more likely to use the internet socially, economically, professionally, and otherwise. Other potential factors – such as economic status or education level – are unknown limitations and potential biases within this dataset.

The trend remained particularly positive across all nine of the activities: across all four demographic groups, individuals were 30-33% more likely to have used the internet for these activities compared to their peers without meaningful connectivity.

Figure 9. Average participation across all nine activity prompts, by access profile (as % of respondents)

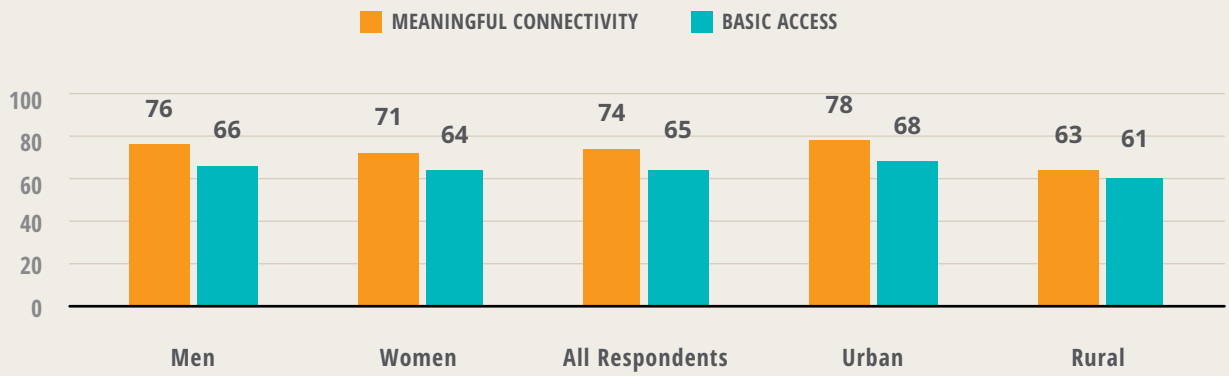


Source: Alliance for Affordable Internet, 2021

In comparison, meaningful connectivity did not confer the same consistent, transformational shifts for informational confidence. In general, internet users were all confident in finding information: across all nine prompts and within all four demographic groups, a majority always felt confident that they could find the information on their own. In comparison to the consistency of the trend of taking action online once meaningfully connected, women were on average only 12% more confident in finding information once meaningfully connected compared to a 17% increase among men.

Most starkly, while urban internet users reported a 16% increase in confidence with meaningful connectivity, rural internet users were only 5% more confident in finding information with better connectivity. On some prompts, including accessing healthcare, opening a financial account, and reporting a crime, confidence was actually lower among the meaningfully connected in rural areas. Further research is required to understand this specific dynamic.

Figure 10. Average informational confidence across all nine prompts, by access profile (as % of respondents)



Source: Alliance for Affordable Internet, 2021

These results offer important insights in the importance of internet access, patterns of behaviour, and where broadband policy interventions can have some of the greatest impact. Internet use itself expands access to information, and all internet users in these surveys report generally high levels of informational autonomy.

However, these initial surveys suggest that **meaningful connectivity represents the pivot point from simply consuming information to fully participating online**, with a consistent pattern among different countries and demographic groups to participate socially, economically, politically, and otherwise when better connectivity allows them to do so.

As policymakers plan their broadband policies for the next five years, the meaningful connectivity framework offers targets that connect infrastructural investment in high-capacity broadband networks and public access to the social and economic benefits that will improve an individual's quality of life. In spreading the availability of meaningful connectivity to the widest number possible, so too can governments spread the potential for those benefits to be realised by as many as possible.

Meaningful connectivity can help governments accelerate their achievement of the Sustainable Development Goals

The internet has enabled so much of human life to move online, but this transition has been inherently unequal. According to factors such as gender, geography, income, age, and education level, internet access has been an accelerant for economic and social progress for those who have been able to connect and stay connected. However, **too few have meaningful connectivity that enables them not only to access the world's information but act upon it. Our policies, our targets, and our methods need to change.**

This report provides the first demonstration of how to systematically measure meaningful connectivity and what are some of the benefits for those who have this kind of internet access. Only by collecting this data, at a level of granularity hidden underneath the top-level binary of internet access, are policymakers able to understand the relationship between investments in better access and the better social and economic outcomes it can produce.

This report focuses on measuring the individual benefits of meaningful connectivity. This evidence, from nine low and middle income countries, demonstrates the enormous potential to empower people to act once meaningfully connected. These actions relate to the Sustainable Development Goals: **with meaningful connectivity, people are more likely to access healthcare, look for employment, take a class, and participate in the digital economy.**

If the Covid-19 pandemic was the test of the importance of internet access to modern human life, the years after will be the test of governments to invest in expanding that potential.

The meaningful connectivity framework offers a model to do just that.

Annex 1: Sampling plan details

Each national sample had quotas set around first-level administrative districts (or clusters thereof), along with controls for gender and geographic diversity based on the latest available demographic data of internet users within the country.

COL

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
498–500	83–125

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, *and* DANE, 2019

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Amazonas, Caquetá, Cauca, Guainía, Guaviare, Huila, Meta, Nariño, Putumayo, Vaupés, Vichada	96–160
2	Atlántico, Bolívar, Cesar, Córdoba, La Guajira, Magdalena, San Andrés y Providencia, Sucre	170–284
3	Arauca, Bogotá, Boyacá, Casanare, Cundinamarca, Norte de Santander, Santander	251–418
4	Antioquia, Caldas, Chocó, Quindío, Risaralda, Tolima, Valle del Cauca	233–388

GHA

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
425–500	194–292

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, *and* Afrobarometer, 2019

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Eastern, Greater Accra, Volta	249–415
2	Central, Western, Western North	140–233
3	Ahafo, Ashanti, Bono, Bono East	214–357
4	North East, Northern, Oti, Savannah, Upper East, Upper West	147–245

IND

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
266–500	428–642

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and IAMAI, 2020

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Chandīgarh, Delhi, Haryāna, Himāchal Pradesh, Jammu & Kashmīr, Ladakh, Punjab, Rājasthān, Dādra & Nagar Haveli & Damān & Diu, Goa, Gujarāt, Mahārāshtra	202–337
2	Chhattīsgarh, Madhya Pradesh, Uttarākhand, Uttar Pradesh	199–332
3	Arunāchal Pradesh, Assam, Manipur, Meghālaya, Mizorām, Nāgāland, Tripura, Sikkim, Bihār, Jhārkhand, Odisha, West Bengal	198–329
4	Andhra Pradesh, Karnātaka, Kerala, Puducherry, Tamil Nādu, Telangana	151–251

IDN

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
467–500	284–426

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and ITU WTID, 2021

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Banten, Jakarta, West Java	196–327
2	Central Java, East Java, Yogyakarta	224–374
3	Central Kalimantan, East Kalimantan, North Kalimantan, South Kalimantan, West Kalimantan, Maluku, North Maluku, Papua, West Papua	70–117
4	Bali, Central Sulawesi, East Nusa Tenggara, Gorontalo, North Sulawesi, South Sulawesi, Southeast Sulawesi, West Nusa Tenggara, West Sulawesi	97–161
5	Aceh, Bangka Belitung, Bengkulu, Jambi, Lampung, North Sumatra, Riau, Riau Islands, South Sumatra, West Sumatra	163–271

KEN

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
411–500	497–745

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and Afrobarometer, 2019

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Embu, Kirinyaga, Laikipia, Murang'a, Nyandarua, Nyeri, Kiambu, Nairobi, Kajiado, Kitui, Machakos, Makueni	247–412
2	Isiolo, Marsabit, Meru, Tharaka-Nithi, Garissa, Mandera, Wajir, Kilifi, Kwale, Lamu, Mombasa, Taita-Taveta, Tana River	150–249
3	Elgeyo-Marakwet, Nandi, Trans Nzoia, Turkana, Uasin Gishu, West Pokot, Baringo, Bomet, Kericho, Nakuru, Narok, Samburu	175–292
4	Bungoma, Busia, Kakamega, Vihiga, Homa Bay, Kisii, Kisumu, Migori, Nyamira, Siaya	178–297

MOZ

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
401–500	339–509

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and Afrobarometer, 2018

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Maputo, Maputo Cidade	83–138
2	Gaza, Inhambane	78–130
3	Manica, Sofala, Tete	184–307
4	Nampula, Zambézia	294–489
5	Cabo Delgado, Niassa	111–185

NGA

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
393–500	258–386

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and Afrobarometer, 2020

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Ekiti, Lagos, Ogun, Ondo, Osun, Oyo	148–247
2	Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Rivers	112–187
3	Abia, Anambra, Ebonyi, Enugu, Imo	88–146
4	Benue, Federal Capital Territory, Kogi, Kwara, Nasarawa, Niger, Plateau	109–181
5	Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, Zamfara	192–320
6	Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe	101–169

RWA

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
348–500	488–732

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and NISR, 2017

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Eastern	185–309
2	Kigali, Northern	204–340
3	Western	176–294
4	Southern	185–308

ZAF

RANGE FOR NON-MALE RESPONDENTS	RANGE FOR RURAL RESPONDENTS
435–500	202–304

Ranges calculated from Inclusive Internet Index, 2021, World Bank, 2021, and Afrobarometer, 2018

REGION	AREAS INCLUDED	RESPONDENTS RANGE
1	Eastern Cape, Western Cape	173–288
2	Free State, Northern Cape, North West	104–174
3	Gauteng	194–323
4	KwaZulu-Natal	144–240
5	Limpopo, Mpumalanga	135–225

Annex 2: Survey production statistics, by country

	COLOMBIA		GHANA		INDIA	
	Count	%	Count	%	Count	%
Surveys Sent	12936	100%	5048	100%	5322	100%
Opt ins	1474	11%	1173	23%	1282	24%
Completes	1000	8%	1000	20%	1008	19%
Dropoffs	406	3%	95	2%	144	3%
Refusals	1523	12%	486	10%	1067	20%
Ineligible	68	1%	78	2%	130	2%
Nonresponse	9939	77%	3389	67%	2973	56%

	INDONESIA		KENYA		MOZAMBIQUE	
	Count	%	Count	%	Count	%
Surveys Sent	6259	100%	5218	100%	11536	100%
Opt ins	1190	19%	1182	23%	1274	11%
Completes	1000	16%	1000	19%	1000	9%
Dropoffs	61	1%	64	1%	108	1%
Refusals	1368	22%	626	12%	1413	12%
Ineligible	129	2%	118	2%	166	1%
Nonresponse	3701	59%	3410	65%	8849	77%

	NIGERIA		RWANDA		SOUTH AFRICA	
	Count	%	Count	%	Count	%
Surveys Sent	3618	100%	10773	100%	6466	100%
Opt ins	1103	30%	1381	13%	1400	22%
Completes	1000	28%	1000	9%	1000	15%
Dropoffs	82	2%	107	1%	336	5%
Refusals	295	8%	683	6%	842	13%
Ineligible	21	1%	274	3%	64	1%
Nonresponse	2220	61%	8709	81%	4224	65%

Annex 3: Connectivity gaps and calculation methods

As part of this report, the Alliance is reporting the geography and gender gaps in internet use and in meaningful connectivity as follows.

Table 4. Geography and gender gaps, by internet use and meaningful connectivity

COUNTRY	GEOGRAPHY GAP, BY INTERNET USE	GEOGRAPHY GAP, BY MEANINGFUL CONNECTIVITY	GENDER GAP, BY INTERNET USE	GENDER GAP, BY MEANINGFUL CONNECTIVITY
Colombia	56%	87%	5%	76%
Ghana	76%	95%	31%	73%
India	56%	54%	155%	197%
Indonesia	52%	49%	12%	23%
Kenya	49%	130%	45%	86%
Mozambique	89%	144%	58%	56%
Nigeria	67%	81%	50%	115%
Rwanda	151%	267%	88%	150%
South Africa	35%	80%	33%	36%

Source: Alliance for Affordable Internet, 2021; from various sources (see below)

These gaps are calculated by the Alliance, based on data from a wide array of sources. The rates of meaningful connectivity are calculated by the Alliance for Affordable Internet, 2021, based on projections from our survey data in relation to mobile internet users. Internet use rates by gender were informed by the Inclusive Internet Index, 2021, for all countries. Rurality rates were from World Bank, 2021, and internet use in urban/rural areas were based on a variety of latest available reliable data sources, details individually by country in Annex 1.

We calculate geography gaps and gender gaps differently.

Since 2018, A4AI has used a women-centric calculation for gender gaps (A4AI, 2018). This is so that we can frame the size of the gap not in terms of what women must in relation to men's experiences, but what must change in women's experiences to reach gender equality. In, short, the equation we use is:

$$\frac{\text{\% women online} - \text{\% men online}}{\text{\% women online}}$$

Starting with this report, the Alliance will report geography gaps (that is, the difference between urban and rural access) as a percentage of the national average. This strategy is taken for two key reasons: national context and policy relevance.

$$\frac{\text{\% urban online} - \text{\% rural online}}{\text{\% national population online}}$$

Geography and gender affect the national policy context in unique ways. Across the globe, countries have much less variance in their gender ratio than in their degrees of rurality (*cf.* Our World in Data, 2019, and World Bank, 2021). Connected to this, high variance in the gender ratio from the average usually correlates with public policy and social norms that impose a preference for men over women and for boys over girls (Our World in Data, 2019; UNDP, 2020). We do not have evidence for the same explicit correlation between public policy and degrees of rurality. This variance means we expect these numbers — between gender and geography — to behave differently.

In line, this new calculation method for geography gaps guides policy relevance in relation to the degree of rurality in that country. Between two countries where the percentage point difference between urban and rural internet use is identical, a country with a larger rural population will have a larger reported geography gap than a highly urbanised country. This calculation method, then, nudges policymakers responsively towards the greatest good: where there are more rural people, the urgency of the geography gap becomes more pressing in the report statistics.

A global coalition working to make broadband affordable for all

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