



THE DIGITAL DIVIDE How Rich and Poor Countries Have Very Different Access to the Internet

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ABSTRACT

The "digital divide" is the gap between people who have good internet access and people who don't. For a long time, people thought about this as a simple yes-or-no question: either you have internet, or you don't. But it's way more complicated than that. It includes things like whether the infrastructure even exists, whether people can afford it, whether they know how to use it, and whether they can benefit from it economically. This paper looks at the digital divide between developed and developing countries through four angles: the infrastructure gap, the cost of getting online, who controls the rules of the internet, and what happens to people who get left out. Using data from the International Telecommunication Union (ITU), the World Bank, and other research, this paper argues that the digital divide isn't just a tech problem. It's a symptom of bigger inequalities and fixing it will take a lot more than laying cables and handing out phones.

KEYWORDS: Digital Divide, Internet Access, Digital Inequality, Developing Countries, Information and Communication Technology

1. INTRODUCTION

In 2023, the International Telecommunication Union estimated that about 2.6 billion people around the world still weren't online, most of them in Sub-Saharan Africa, South Asia, and parts of Latin America and Southeast Asia.¹ Meanwhile, in countries like South Korea, Denmark, and the United Kingdom, over 95% of people have internet access, and the conversation there has moved on to how fast their connections are. This huge gap, where you live, how much money you have, and your country's politics decide whether you get to be part of the digital world at all, is what people call the digital divide.

The term was first used in the mid-1990s by the U.S. National Telecommunications and Information Administration, which used it to describe the gap in internet access between different races and income levels within the United States. Since then, the idea has grown into something studied around the world. Researcher Jan van Dijk came up with a model that breaks access down into four barriers: motivation, materials, skills, and

usage.² Pippa Norris made a similar distinction, separating a "global divide" between industrialized and developing countries from a "social divide" within a single country.³ Both of these ideas point to the same thing: the digital divide isn't just one gap. It's a bunch of smaller gaps stacked on top of each other.

This paper is organized into four main parts. Section 2 looks at the infrastructure side of the divide. Section 3 looks at cost and affordability, since even where infrastructure exists, not everyone can afford it. Section 4 looks at who actually controls the internet, who sets the rules, who owns the infrastructure, and how global power struggles affect who gets included. Section 5 looks at what happens to people who are left out, especially in education, healthcare, and jobs. The paper ends with a look at what's already being tried to fix the problem, and some recommendations for what should change.

2. THE INFRASTRUCTURE GAP

2.1 Cables and Fiber

The physical stuff that makes the internet work (underwater cables, fiber networks, cell towers, data centers) is spread incredibly unevenly across the world. Wealthy countries have spent decades and trillions of dollars building dense, reliable fiber networks. As of 2022, the European Union reported that more than 70% of households had access to very high speed internet, meaning connections of at least 100 Mbps.⁴ The U.S., South Korea, and Japan have similarly strong networks, and they're now adding 5G on top of that.

Compare that to Sub-Saharan Africa, home to about 1.2 billion people, where fixed broadband reached only about 1% of the population in 2022.⁵ Part of this is just geography (huge distances, tough terrain), part of it is economics (it's not very profitable for companies to build networks in low-income areas), and part of it is history: colonial-era infrastructure was built to extract resources, not to connect people. Landlocked countries in central Africa have it even worse, since their internet has to travel through fiber lines in neighboring countries just to reach them.

Undersea cables tell a similar story. Most of the world's underwater internet cable capacity connects North America and Europe, with a good amount also serving East Asia. West Africa, the Pacific Islands, and much of South Asia are left with much less. In 2022, a volcanic eruption near Tonga cut the country's only undersea cable and knocked it almost completely offline for five weeks. That one event showed just how fragile internet access can be for places on the outside of the network.

2.2 Mobile Phones Help, But Only So Much

Mobile internet has done more than anything else in the last ten years to close the gap. The fast growth of 3G and 4G networks across Sub-Saharan Africa, South Asia, and Southeast Asia has brought internet access to hundreds of millions of people who will probably never get traditional broadband. Mobile payment systems like M-Pesa in Kenya and bKash in Bangladesh show that mobile technology alone can make a real difference in people's lives.

But mobile data isn't a real substitute for broadband. It's usually more expensive per gigabyte in poorer countries than in richer ones, especially outside of big cities. The ITU makes a helpful distinction between "basic connectivity" (being able to send a text or load a webpage) and "meaningful connectivity" (having a connection

fast and cheap enough to actually participate in the digital economy). Once you use that second definition, way more people count as digitally excluded as the raw access numbers suggest.¹

3. THE COST OF GETTING ONLINE

3.1 The Weird Truth About Affordability

Here's something that doesn't seem to make sense at first: internet access is often more expensive, relative to income, in the places that need it most. The Alliance for Affordable Internet suggests that internet should cost no more than 2% of monthly income for 1 GB of mobile data. By that standard, internet is basically unaffordable for most people in Chad, the Democratic Republic of the Congo, and Ethiopia, where 1 GB can cost more than 10% of someone's monthly income.⁶

This happens because building internet networks costs a lot upfront, but costs less per person once you have enough customers using it. In wealthy, dense markets, companies hit that scale quickly, so prices drop. In poor, spread-out markets, that scale is hard to reach, so prices stay high and few companies want to compete there. That's basically a recipe for monopolies, or no service at all.

3.2 Not Everyone Has a Device

Having internet access doesn't help much if you don't have a device to use it on. Smartphone prices have dropped a lot over the past ten years, but owning one is still a real barrier for many people. In low-income countries, a smartphone can still cost one to three months of the average person's income. COVID-19 made this problem impossible to ignore. When schools shut down and moved online, UNESCO estimated that about 463 million kids around the world didn't have the devices, internet, or even electricity needed for remote learning.⁷ In Sub-Saharan Africa, only around 11% of households had internet at home, and often the only device in the house was a basic phone shared by the adults.

3.3 A Few Big Companies Control Everything

The global digital economy is dominated by a small number of huge tech companies, mostly based in the U.S. and, to a smaller degree, China. These companies control the platforms, app stores, cloud services, and advertising systems that most internet activity runs through.

Facebook's "Free Basics" program, which gave people in developing countries free access to a limited set of websites, is a good example of how messy corporate solutions can be. Critics, including India's telecom regulator, said it created a "walled garden" version of the internet that made people dependent on Facebook and broke the principle of net neutrality. India banned the service in 2016. This whole episode showed that just giving people internet access, without real openness or choice, can end up creating a two-tier internet where rich people get the real thing and poor people get a limited version.

4. WHO CONTROLS THE INTERNET

4.1 Setting the Rules

The basic technology behind the internet, its protocols, its addressing system, its governing bodies, was mostly built by engineers and institutions in the U.S. and Europe. Things like the Domain Name System, the TCP/IP protocol, and organizations like ICANN (which was originally overseen by the U.S. government) reflect the priorities of the people who created them. Developing countries had very little say in these early decisions, and that has locked in a kind of imbalance that's hard to undo now.

More recently, Chinese tech companies like Huawei, ByteDance, and Alibaba have started offering developing countries an alternative to Western tech, in terms of both infrastructure and ways of running things. But this puts a lot of developing nations in an awkward spot. They're basically being asked to pick between Western and Chinese tech systems, and both of them extract data and create dependence, while developing countries get little actual say in either one.

4.2 Data Colonialism

Researchers Nick Couldry and Ulises Mejias came up with the idea of "data colonialism," which argues that big tech companies collecting data from people's everyday lives is a new form of colonial exploitation.⁹ People in developing countries generate huge amounts of data (about their habits, health, relationships) that gets turned into profit by companies headquartered somewhere else entirely, without much of that value ever coming back to the people it came from.

For example, farming apps that collect soil and weather data from African farmers, health apps that gather patient information from South Asian hospitals, and ride-sharing apps that track detailed location data in cities like Lagos or Jakarta are all creating valuable data. But the rights to that data, and the profits from it, mostly stay outside the countries where the data actually came from.

4.3 Who's Paying for Infrastructure

International groups like the World Bank, the African Development Bank, and various government aid programs have started treating internet infrastructure as a real development priority. The European Union's Global Gateway program has set aside a lot of money for internet connectivity in Africa and Central Asia, partly to compete with China's own infrastructure investments there.

These programs reflect a growing idea that internet access matters just as much to development as roads, electricity, or clean water. But they run into the same problems that a lot of foreign aid does: the money often comes with strings attached, tied to buying from companies in the donor country, and it tends to go toward big projects that don't always reach the people who need it most.

5. WHAT HAPPENS TO PEOPLE WHO GET LEFT OUT

5.1 Education

In wealthy countries, technology has completely changed how kids learn and what skills they're expected to have. Things like coding, data analysis, and basic digital communication are now considered essential skills. In poorer countries, not having access to these tools makes it even harder for young people to compete for jobs in a global economy that increasingly runs on tech. The World Economic Forum has estimated that by 2025, 85 million jobs

worldwide will be lost to automation, and retraining workers for new jobs depends heavily on whether they have digital access in the first place.⁸

5.2 Healthcare

Digital health tools like telemedicine, electronic health records, and health apps have real potential to bring healthcare to places that don't have much of it. Studies in Kenya, Bangladesh, and Rwanda have shown that community health workers using smartphones can improve maternal health, catch disease outbreaks earlier, and help patients stick to their treatment plans, all for a lot less money than building new hospitals.

But there's a catch: most of the advanced medical AI tools out there were trained mostly on data from patients in Western countries. That raises a real concern that these tools might not work as well for people whose health conditions or backgrounds weren't well represented in the data used to build them.

5.3 Jobs and the Economy

The digital economy has created a lot of new kinds of jobs: software development, content creation, online business services, e-commerce, and gig work through apps. Platforms like Upwork and Fiverr let skilled workers in developing countries reach clients all over the world. But these platforms also take a cut of every payment and control workers through algorithms, often without much transparency. The World Bank has found that more mobile and internet access is generally linked to economic growth, especially through better productivity in farming, finance, and services, though this only really works when it's paired with good education and strong institutions.¹⁰

5.4 Democracy and Civic Life

The internet has become a major tool for political organizing and public discussion. Social media has helped power movements like the Arab Spring, the Sudanese Revolution, and climate activism. People without internet access have a much harder time using government services online, joining public discussions, or organizing with others. This matters even more now that governments everywhere are moving more of their services online, which can accidentally shut out the people who can least afford to be shut out.

6. WHAT'S ALREADY BEING TRIED

Universal Service Funds, used in over 100 countries, work by charging telecom companies a fee and using that money to help pay for internet access in underserved areas. When these funds are managed well and kept away from political interference, they've made a real difference. Colombia and Rwanda are often held up as success stories. But in a lot of other countries, this money gets mismanaged, taken advantage of by big companies, or just never spent at all.

Community networks, which are small, locally owned wireless networks built with open-source tools, have become a promising way to bring internet to places that big companies won't bother serving. Projects like Zenzeleni Networks in South Africa and Rhizomatica in Mexico show that this can actually work, both technically and as something a community can run itself. But growing these projects needs supportive laws and steady funding.

Satellite internet has real potential, especially with new low-orbit satellite systems like SpaceX's Starlink and OneWeb. The problem is the price: over \$500 for the equipment and \$50 to \$100 a month for service puts it way out of reach for most people in low-income countries. There are also unresolved questions about satellite orbits and airspace that make it hard for developing countries to launch their own systems.

National broadband plans in countries like Rwanda, Estonia, and Singapore show that when a government actually commits to building internet infrastructure, it can change everything pretty fast. Rwanda's fiber network, built with major government investment, helped create a real digital economy and digital health system that probably wouldn't exist if it had been left up to the free market.

7. CONCLUSION AND RECOMMENDATIONS

The digital divide between rich and poor countries isn't some unavoidable fact of life. It comes from specific historical, economic, and political decisions: neglected infrastructure left over from colonialism, the fact that private companies don't want to invest where there's no profit, unequal power in how the internet is governed, and the compounding disadvantages faced by poor communities trying to keep up in a digital world. Understanding this as a structural problem, not just a technical one, is the first step toward actually solving it.

This paper suggests four things that need to change:

First, international development organizations need to treat internet infrastructure as a real public good, the same way they treat health and education, and fund it that way. That includes supporting community-owned, open-access networks that build up local skills instead of just making people dependent on outside companies.

Second, the way the internet is governed globally needs to change so developing countries actually get a real voice in decisions about technical standards, who gets what spectrum, how platforms are regulated, and how data is handled.

Third, affordability needs to be treated as its own goal, not an afterthought. Universal service programs, spectrum fees that fund subsidized access, and tax breaks to make devices cheaper can all help. The idea that 1 GB of data shouldn't cost more than 2% of someone's monthly income is a good, realistic target to aim for.⁶

Fourth, digital literacy and skills training need to be a core part of any plan to close the gap, not something added on at the end. Giving someone a connection without teaching them how to use it just moves the problem instead of solving it.

The digital world is already where most of the economic, political, and social life of this century is going to happen. A world where 2.6 billion people are locked out of that isn't just less efficient, it's deeply unfair. The circumstances someone is born into shouldn't decide whether they get access to something this basic. Closing the digital divide is really just part of the bigger fight for a more equal world.

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