



CHAPTER 1

DEVELOPMENT AND ACCESS TO INFORMATION 2019

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Chapter 1

Progress toward meaningful A2I, and emerging threats

This chapter provides an overview of the progress various countries have made toward achieving meaningful access to information between 2015 and 2018, in the context of the United Nations (UN) 2030 Agenda and the Sustainable Development Goals (SDGs). The baseline year, 2015, was chosen to correspond with the year the SDGs were established by the UN General Assembly.¹

Throughout this report, **meaningful access to information** is defined as “the rights and capabilities to use, create, and share information in ways that are meaningful to each individual, community, or organisation.”² This rights-based approach recognises how a combination of structural factors at the social, political, and economic levels manifest in local and global contexts to advance (or impede) the ability of meaningful access to information to contribute to more equitable and sustainable development.³

Why we measure progress on meaningful access to information

The UN 2030 Agenda “is a plan of action for people, planet and prosperity” with the pledge that “no one will be left behind.”⁴ Meaningful access to information can advance the types of progress envisioned across the 17 Goals included in the Agenda.

The rise of the internet and the social web have profoundly expanded the range of possible interactions between individuals, communities, organisations, and governments, providing growing opportunities to collaborate to combat poverty and inequality, produce and consume civic information, and participate in social and political action.⁵

Yet there is no guarantee that access to information and communication technologies (ICTs), or the opportunities they enable, will lead to equitable or inclusive social change. This is particularly true when considering the enabling conditions required for information access to address key societal challenges meaningfully – as outlined in the **Development and Access to Information Framework**:⁶ (1) the availability of physical connectivity infrastructure, (2) the capabilities to use ICTs, (3) the social context of information, and (4) the legal and political environment. Indeed, given the barriers many of the world’s most vulnerable and isolated populations continue to face in these areas, it is very possible that an inequitable distribution of information access will contribute to types of marginalisation that hinder development efforts.

Here are some of the reasons we measure progress:

Meaningful access to information enables bottom-up change that supports a broad range of the sustainable development goals as enshrined in the UN 2030 Agenda.

There is extensive evidence⁷ on how information and communication technologies, and the social dynamics they engender, have been leveraged to promote sustainable development in highly diverse contexts and across a wide variety of domains, such as workforce development, gender equality, social justice, and economic growth. In 2019, the High-

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Level Political Forum on Sustainable Development (HLPF) will focus its annual thematic reviews on SDGs related to education, employment, inequality, and good governance, so these domains are of particular interest in this chapter.

Meaningful access to information must be made more equitable and inclusive.

In a world increasingly driven by interconnectedness and ubiquitous communication, meaningful access to information is a necessity and a right. In the past two decades, we have made great strides toward increasing connectivity and digital literacy for billions of people. Yet for many communities around the world, progress has been thwarted by foundational social and economic inequalities that remain in place.⁸ We are still far from achieving a truly inclusive and equitable information society.

Technological advances will increasingly affect the progress of the SDGs, not only in terms of how people access and use information, but also the social, cultural, and political ramifications of related issues that emerge.

In today's evolving complex information ecosystem, achieving equitable, meaningful access to information is more important than ever. Emerging challenges such as disinformation, online security and data privacy, the monopolisation of information access and curation, and new restrictions on freedom of information further exacerbate deeply rooted social and economic inequalities, which impede progress across multiple fronts.

How we measure progress on meaningful access to information

To monitor the progress countries make toward meaningful access to information, we selected 17 indicators across the four dimensions of the *Development and Access to Information Framework*.⁹ This framework was developed by the authors in 2017 and reflects a general consensus among researchers, development practitioners, and informed policymakers that physical access to information technology on its own is not sufficient to build a more equitable and participatory society. The social, political, and cultural context of information creation and use is critical for unlocking the transformational nature of information resources and improving the well-being of people and their communities.

Measuring the contribution of meaningful access to information to sustainable development is a complex endeavour, determined in part by the availability of data across countries from year to year.¹⁰ Summarising the data also presents challenges; for instance, we group countries by region or income level to highlight trends, yet doing so can mask differences between countries within a region. Regional classifications reflect those used in the *Sustainable Development Goals Report 2016*.¹¹ Under this system, countries are divided into 10 distinct regions – nine geographic regions and one economic region, which is a group of 55 “developed” countries (out of 228 countries total). Income classifications apply four income categories established by the World Bank: low, lower-middle, upper-middle, and high.¹²

For a more comprehensive view of the progress toward meaningful access to information at a country level, we encourage readers to utilise other tools related to the DA2I initiative, including the DA2I Dashboards¹³ and IFLA's Library Map of the World and its SDG Stories (a monitoring tool that provides case studies of how libraries are advancing the SDGs with their work).

Looking ahead

This chapter is divided into three sections, with each corresponding to a dimension of the aforementioned *Development and Access to Information Framework*.

- Section 1 – Connectivity Infrastructure and Use – shows the strides the world has made toward establishing more inclusive connectivity infrastructure, as evidenced by expanded mobile broadband network coverage and a growing proportion of internet users.
- Section 2 – The Social Context of Adoption and Use – shows how educational attainment for youth has changed in recent years, including an upward trend in completion of upper secondary education and an ongoing decrease in the gender gap between men and women across four educational levels.
- Section 3 – The Legal and Policy Environment – shows how online and offline freedoms are declining in many countries.

1. Connectivity infrastructure and use

In the context of the SDGs, physical connectivity infrastructure (specifically for mobile and landline internet) plays a substantial role in supporting economic inclusion and providing a route to a more equitable distribution of knowledge and resources. For this dimension, we include indicators in two connectivity areas: 1) Availability and reach of the technical infrastructure; and 2) Use of that infrastructure. The indicators used (and their sources) include:

1. *Population covered by at least a 3G mobile network (ITU)*
2. *Percentage of households with internet access (ITU)*
3. *Active mobile broadband subscriptions per 100 inhabitants (ITU)*
4. *Fixed broadband subscriptions per 100 inhabitants (ITU)*
5. *Percentage of individuals using the internet (ITU)*

Looking at the changes in connectivity from 2015 to 2016, we see a clear pattern of improved connectivity across all regions, and on nearly every indicator, continuing a trend of sustained growth. Lower-middle-income and low-income countries achieved some of the most significant progress.

1.1 Coverage of 3G wireless networks reached 82% of the world's population

Between 2015 and 2016, the coverage of 3G wireless networks expanded to reach almost 82% of the population in the world, or more than 6 billion people. At a regional level,¹⁴ Southeastern Asia, Northern Africa, the Caucasus and Central Asia, Southern Asia, and Sub-Saharan Africa showed the greatest progress in terms of coverage. Although low-income countries reached nearly 50% 3G coverage (by population) in 2016, they still lagged far behind the world average. At a country level, connectivity infrastructure in Bolivia, Ukraine, Greenland, Sierra Leone, Algeria, and Nepal showed the highest percentage increase of 3G network coverage in 2016 compared with 2015.

1.2 Almost half of households worldwide have access to the internet

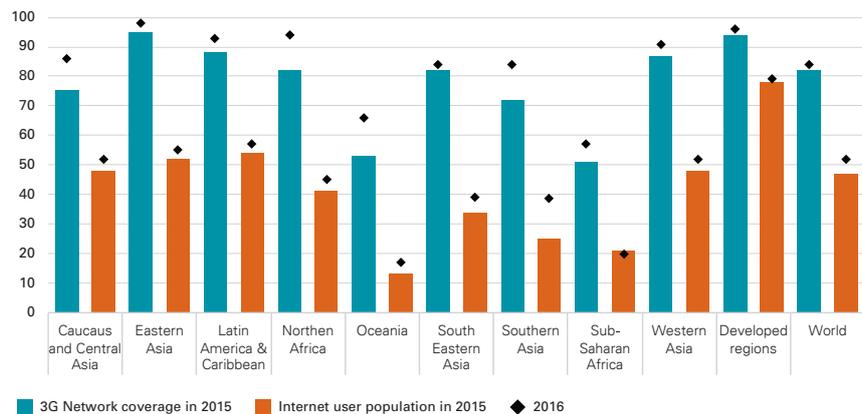
The number of households with internet access at home through fixed or mobile networks increased from 45% (2015) to 48% (2016) worldwide. Despite this modest improvement, there are very significant differences across the regions. While in Latin America and the Caribbean 46% of the population had home internet access, in Sub-Saharan Africa and Oceania only 16% and 14%, respectively, had this connectivity resource in place. According to the ITU (2018), the increase in households with internet access may be partly driven by an increase in the use of mobile devices for accessing the internet at home rather than by any change in fixed broadband connections.¹⁵ While indicators on home internet access, mobile-broadband subscriptions, and 3G coverage increased from 2015 to 2016, fixed broadband showed a negligible drop (0.3 percentage point) in the number of subscriptions. A possible explanation for the larger increase in mobile broadband than fixed broadband subscriptions may be that fixed broadband continues to be relatively expensive in low-income countries, where, as the Broadband Commission has found, fixed broadband costs more than twice as much as mobile broadband on average.¹⁶

1.3 More than half of the population in the world is using the internet

Compared with other indicators on connectivity infrastructure, internet use showed the most dramatic change, going from 47.1% (2015) to 51.6% (2016) of the population, a 9.6% increase. Between 2015 and 2016, the highest percentage increase of internet users was in low-income (24.9%) and lower-middle-income (11.2%) countries. At a regional level, Oceania, Southeastern Asia, and Southern Asia experienced the highest percentage increase of internet users compared to 2015. Although many of the countries in these regions are still below the world average, they continue to make positive strides toward universal physical access to information in some of the most economically challenged areas worldwide. (See Figure 1: Regional progress in connectivity infrastructure and use from 2015-2016).

At a country level, nine out of the 10 countries that experienced the largest growth in the internet-using population are in Sub-Saharan Africa. Of these nine countries, Sierra Leone, Tanzania, Guinea, Gabon, and Mozambique saw the largest increase in individuals using the internet compared with the previous year. Gabon, for example, increased the share of its population using the internet from 7% in 2010 to almost 50% in 2016. According to the World Bank (2018), through a combination of investments in broadband infrastructure and the design of a digital strategy that established a regulatory environment more conducive to investment and competition in the country, the cost of internet access in Gabon has fallen from an average of US\$18 to US\$2.80 per month.¹⁷

Figure 1: Regional progress in connectivity infrastructure and use from 2015 to 2016 (percent of the population)



Source: ITU Technology & Social Change Group, University of Washington

1.4 The percentage of internet users has steadily increased, but challenges related to gender disparities and internet affordability still remain

The gender internet gap increased from 11% in 2015 to 12% in 2016

When aiming for truly inclusive and equitable participation, it is important to look at connectivity in relation to different populations, especially historically excluded groups such as women and girls. Research has shown women and girls frequently face particularly difficult challenges related to social and cultural norms that make them less likely than men and boys to access, use, own, and create digital technology and further develop their digital skills.¹⁸ For example, a recently published comprehensive study on the state of gender equality in ICT access, skills, and leadership challenged the commonly held assumption that high levels of mobile phone adoption had shrunk the digital gender gap. It showed, rather, that the gap persists across all three domains in several countries,¹⁹ and this situation is further exacerbated for women living in rural areas.²⁰

According to the ITU (2016), the proportion of men using the internet continues to be higher than the proportion of women in two-thirds of countries where data is available, yet it is unclear to what extent the situation has improved in recent years. ITU estimates indicate a growing divide over a one-year period, with the internet gender gap increasing from 11% in 2015 to 12% in 2016 (ITU, 2016). At a regional level, ITU estimates showed that the gender gap was largest in Africa (23%), and the Arab States (18%) and smallest in the Americas (2%) for the reporting countries.²¹

Affordability is an important determinant of people's access to information

Analysis by the Alliance for Affordable Internet (A4AI) suggests considerable progress in the past 10 years on issues related to internet affordability, especially with price reductions for mobile services.²² Yet the inability of people to afford a basic internet connection remains one of the biggest barriers to access.²³ A4AI defines affordability as 1GB of mobile data costing 2% or less of the average person's monthly income, calculated based on GNI per capita.²⁴ A4AI's latest report shows that in 2017 more than 2 billion people around the world still lived in countries where mobile data was unaffordable. A4AI found considerable price differences across regions. For instance, mobile data was the most affordable in Asia (1.54% of income) versus, for example, Latin America and the Caribbean (3.58% of income) and Africa (8.76% of income). Only four African countries met the affordability target (Tunisia, Nigeria, Mauritius, and Egypt).²⁵

2. The social context of adoption and use: educational opportunities for youth

Whereas physical connectivity infrastructure provides communities with the technological foundations for information access, the social context of adoption and use shapes how individuals engage with this infrastructure. A multiplicity of factors – including social dynamics around poverty, race, ethnicity, gender inequality, and a variety of social and cultural norms – influence people's ability to access and use information meaningfully in their everyday lives.

In many countries in the world, young people experience higher levels of poverty, unemployment, underemployment, and overall marginalisation than older adults,²⁶ justifying the UN 2030 Agenda's targetting of youth in SDGs 4 (education for all) and 8 (decent employment). The following analysis focuses on youth to illustrate how the social context affects meaningful access to information. Specifically, we consider educational attainment and its effect on opportunities for youth.

Education is key to improving the livelihood of individuals, families, and communities, and it is a critical vehicle through which children and youth can feasibly aspire to improve their livelihoods. Yet education can manifest the inequities that exist in many countries, hampering the prospects of young people.

Meaningful access to information is closely intertwined with education. Clearly the possibility to connect to the internet can open up exciting new possibilities to access materials and tools for learning. However – crucially – the relationship also runs in the other direction, with a range of skills, from basic literacy to higher order critical information literacy necessary in order to make optimal use of access to information.

In this way, we see that some youth – those with the skills to use technology and information in a meaningful way – may find resources and opportunities online to supplement their livelihoods or job prospects, while others miss out. Physical connectivity alone cannot overcome the barriers imposed to meaningful access to information if opportunities

for education and training, do not exist or are only available to the few.

For this report, our analysis draws on data from one indicator:

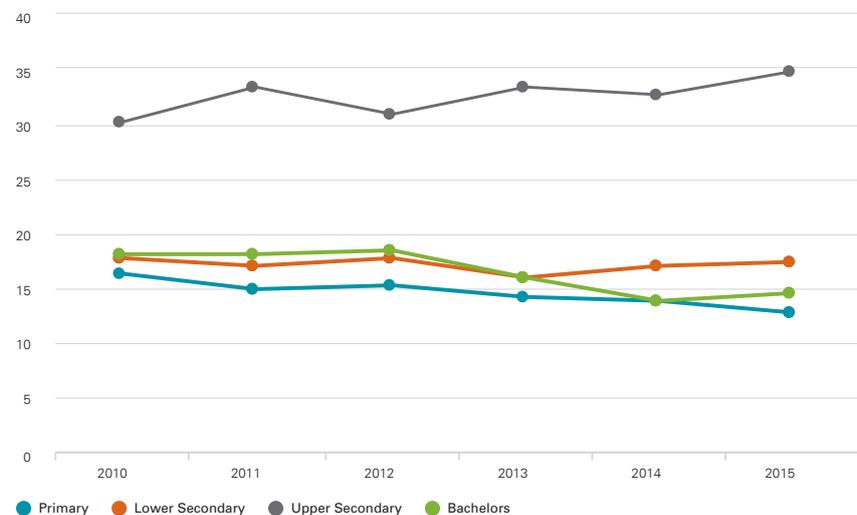
1. *Educational attainment, i.e., the highest level of education obtained by individuals aged 25 years and above – secondary school and college (UNESCO)*

Overall, looking at the changes in the social context from 2006 to 2015,²⁷ we see an upward trend in completion of upper secondary education for the reporting countries, and are closer to achieving gender parity in primary and lower secondary education, with the share of women obtaining a bachelor’s degree actually surpassing that of men.

2.1 Completion of upper secondary education for individuals 25 years and above increased to 34% worldwide

Measures of educational attainment – the highest level of education an individual has completed – provide a picture of the opportunities children and youth have to progress along the education pathway. Our analysis shows an increased upward trend in attainment of upper secondary education at a world level. Between 2006 and 2015 (the latest year with available data), the educational attainment rates for upper secondary education as the highest level obtained increased from 25.5% to 34.4%. Meanwhile, levels of attainment of lower secondary education as the highest level obtained slightly fluctuated from 15.6% to 16.9%. Attainment of a bachelor’s degree as the highest level obtained, however, decreased from 17.8% in 2011 to 14.2% in 2015. (See Figure 2: Trends in educational attainment by level of education, 2010-2015.)

Figure 2: Trends in educational attainment by level of education, 2010-2015 (percent of the population)



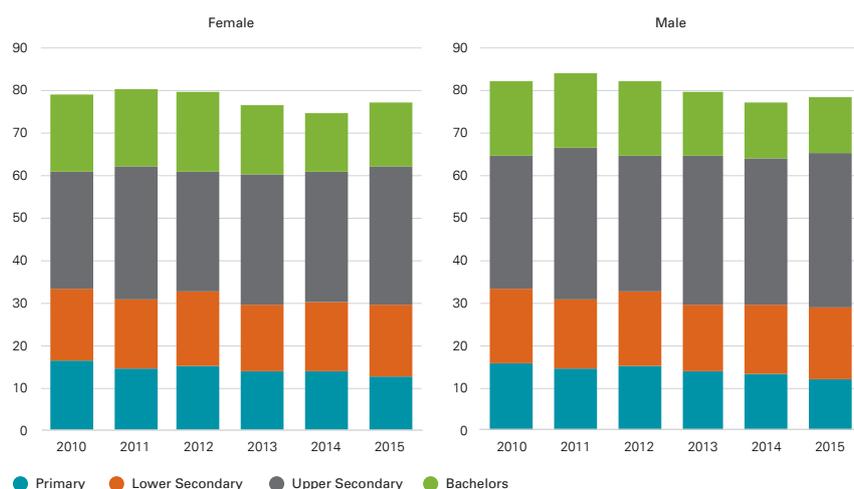
Source: UNESCO

Note: Number of reporting countries varies year by year

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An important trend observed in the past 10 years in the reporting countries is that gender parity for educational attainment rates has been achieved at the primary and lower secondary educational levels.²⁸ There remains a gap at the upper secondary level, but women have surpassed men in the proportion completing bachelor’s degrees (as the highest degree obtained) since 2006. (See Figure 3: Trends in educational attainment by gender, 2010-2015.)

Figure 3: Trends in educational attainment by gender, 2010-2015
(percent of the population)



Source: UNESCO

Note: Number of reporting countries varies year by year
Technology & Social Change Group, University of Washington

Studies show that national income levels are directly correlated with the level of educational attainment²⁹ and recent trends show positive progress, particularly in low-middle-income countries. From 2014 to 2015, the highest level of educational attainment for low-middle-income countries increased both when it came to the upper secondary level (from 22% to 36%) and at the bachelor’s level (from 9% to 14%).

At a regional level, countries in Sub-Saharan Africa made the most significant progress in increasing educational attainment rates at the upper secondary level between 2014 and 2015 (from 12% to 26%). The share of people obtaining a bachelor’s degree as the highest level of educational attainment in the region dropped from 5% to 3% over the same period. Bachelor’s degree attainment also decreased from 17% to 11% in Western Asia but grew slightly from 2014 to 2015 in the Caucasus and Central Asia, “developed” regions, Eastern Asia, Latin America and the Caribbean, and Southeastern Asia. However, looking at “developed” countries over a two-year period shows a downward trend in bachelor’s degree attainment from 20% in 2013 to 15% in 2015.

3. The legal and policy environment: political rights, civil rights, and freedom on the net

The legal and policy environment pillar of the DA2I Framework relates to the extent to which countries have implemented the kinds of rights-based goals and equitable and participatory practices that support meaningful access to information. This includes guaranteeing the rights of people to freedom of expression, association, political participation, civic action, and online privacy and safety.

The relationship between freedoms and information access is enshrined in the Universal Declaration of Human Rights and Goal 16 of the SDGs, and particularly Target 16.10, which seeks to “ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.”³⁰

When these freedoms are restricted, people are unable to make full use of access to information, not only to participate in civic life, but also to

communicate and create relevant content for the benefit of others. Such strict controls can have a chilling effect on journalism, research, and readiness to seek personal information.

This section presents the state of the world as it relates to political rights, civil liberties, and online freedoms. It relies on indices from Freedom House, whose comprehensive data collection efforts evaluate the state of the world (and trends over time) on a range of issues, including the right to information.³¹

The two indices used are:

1. *Freedom in the World*
2. *Freedom on the Net*.

3.1 Freedom in the world continues to decline

Freedom House's Freedom in the World index is composed of two separate ratings on political rights and civil liberties.

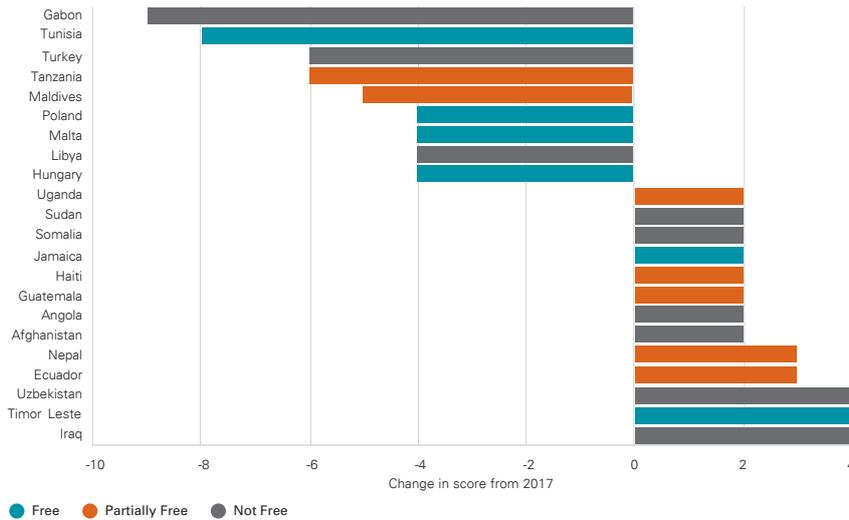
- **Political Rights Rating:** Assesses people's ability to participate in the electoral process, ensure political pluralism, and hold government accountable.
- **Civil Liberties Rating:** Assesses the extent to which people can exercise freedom of expression and belief, whether they can freely associate and assemble, and whether there exists an equitable rule of law that protects social and economic freedoms.

The combined Freedom in the World index paints a bleak picture of the state of the world regarding the right to information for all people, with glaring implications for the future of democracy. According to Freedom House,³² 2018 marks the 12th consecutive year with falling ratings in political rights and civil liberties around the world. Today, almost 40% of people in the world live in countries that are rated as not free and a quarter live in countries that are rated only partially free.³³

Our analysis shows that between 2010 and 2018, freedom declined across most regions in the world and almost all country income levels. Between 2017 and 2018, high-income and upper-middle-income countries experienced the greatest declines in their combined freedom score – including mature democracies where many might expect freedoms would not falter. At a regional level, of the 10 UN subregions, only three (Eastern Asia, the Caucasus and Central Asia, and Oceania) experienced an increase in freedom in the past two years, and yet even these slight regional increases were driven by just a handful of countries, and almost all of the countries within these regions remain partially free or not free.³⁴

Countries experiencing improvements in political rights and civil liberties often saw only minor improvements in their scores, although several countries – such as in Angola, Ethiopia, and Ecuador³⁵ – had significantly improved scores due to major developments that resulted in expansions of freedoms. (See Figure 4 for the countries that experienced the biggest gains and losses in freedom in 2018.)

Figure 4: Countries with biggest gains and declines in overall freedom score, 2017-2018.



Source: Freedom House

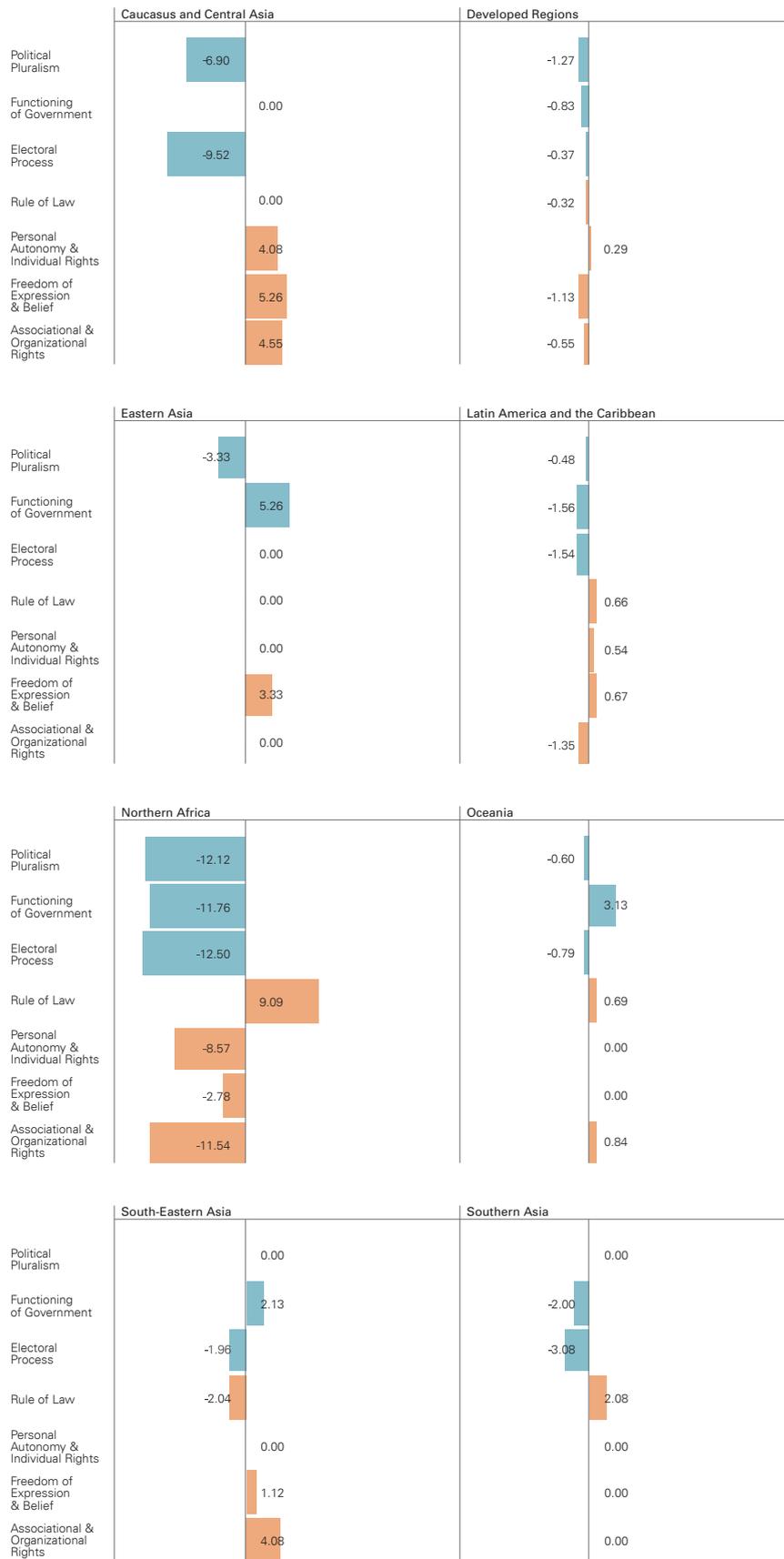
Note: Score reflects improvements or deterioration of political rights and civil liberties. Technology & Social Change Group, University of Washington.

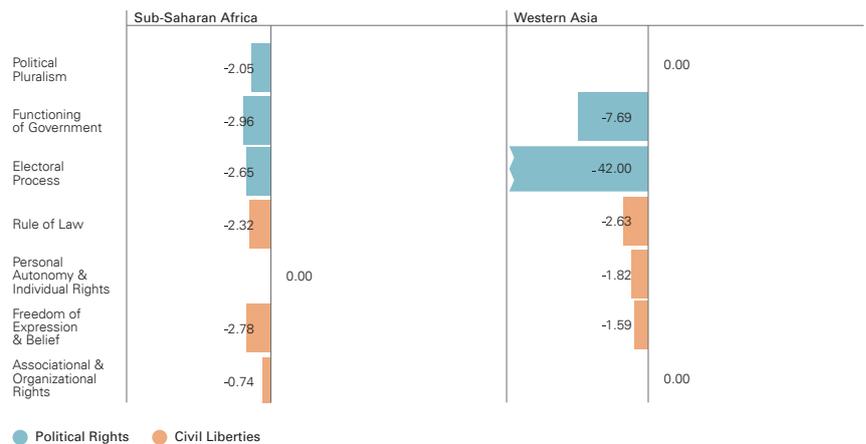
3.2 Freedom in the world: political rights and civil liberties

Looking at the different components that make up the Freedom House political rights and civil liberties sub-indexes, we see that in Western Asia and the Caucasus and Central Asia, authoritarian regimes further limited the ability of people to have fair and free elections.³⁶ (See Figure 5: Regional declines and gains in civil liberties and political rights, 2017-2018). In 2018, compared with the previous year and relative to other regions, Northern Africa experienced the largest declines in multiple areas, including: rights of association and organisation; guarantees of people’s autonomy and individual rights; political pluralism and a proper functioning of government by implementing safeguards against corruption and cronyism; and openness and transparency in government.

Although the root cause of this decrease in freedoms varies by region and country, some emerging trends have affected countries across different levels of social, economic, and political development. Perhaps the most worrisome trend is the rise of authoritarianism and populist governments in many countries in the world, including in states with a long and established democratic tradition.³⁷ Fuelled by increasing social and economic inequality, people’s overall distrust of a political system they deem corrupt and inefficient, along with the current wave of disinformation and manipulation of information in social media, is setting the ground for authoritarian forces to gain political power at the expense of our political rights and civil liberties.³⁸

Figure 5: Regional declines and gains in civil liberties and political rights, 2017-2018, expressed as a percentage change





Source: Freedom House
Technology & Social Change Group, University of Washington.

3.3 Freedom on the net

The Freedom on the Net rating tracks obstacles to internet access, limits on internet content and violations of user rights in 65 countries. According to the latest Freedom House Freedom on the Net report (2018), 34% of the world’s population lived in countries rated as “not free” and 33% in countries rated as “partly free.” Only 20% of people lived in countries where their rights online were guaranteed.³⁹

Our freedoms online had already been declining for seven consecutive years, and in 2018, this trend continued for an eighth year. According to the latest Freedom on the Net report:

Of the 65 countries assessed, 26 have been on an overall decline since June 2017, compared with 19 that registered net improvements. [Overall], 17 governments approved or proposed laws restricting online media in the name of fighting “fake news” and online manipulation, and 18 countries increased surveillance, often eschewing independent oversight and weakening encryption to gain unfettered access to data. (Freedom House, FON 2018)

Our analysis suggests that low-income countries suffered the biggest losses in online freedoms from 2015 to 2016, followed by upper-middle-income countries. Countries in Northern Africa and the Caucasus/Central Asia experienced the greatest decrease in online freedoms in 2016. The Philippines, Turkey, and Saudi Arabia were among 30 countries where governments attempted to manipulate political and civic dialogue and spread disinformation by employing armies of “opinion shapers” to promote certain political agendas and curtail opposition on social media.⁴⁰ China, Iran, Syria, Ethiopia, Saudi Arabia, Bahrain, Pakistan, Cuba, Uzbekistan, and Vietnam were the 10 countries with the most restrictions on online freedoms in the world in 2016.

The road ahead

As we look at the progress regions and countries made toward achieving meaningful access to and use of information between 2015 and 2018, we see mixed results. Gains in connectivity and education are offset by losses in individual freedom. Rather than making serious inroads toward achieving meaningful access to information for everyone, our indicators show that, for the most part, we are running on the spot. Seemingly for every step forward, the world has taken a step backward. For example:

There was significant progress in building connectivity infrastructure, particularly in low-income and low-middle-income countries, but this infrastructure remains underutilised.

The existence of physical connectivity infrastructure is fundamental to guaranteeing the right to meaningful access to information. However, people's actual ability to access and use that infrastructure is determined by many social factors, including poverty, access to equitable educational opportunities and decent jobs for both women and men, and the presence of a legal and policy framework that protects the rights of all people. Despite significant strides in the availability of information and communications technologies, there has been negligible progress toward solving the significant gender gap that persists in their use. And while connectivity, particularly through mobile connections, has become cheaper in most countries, price remains a barrier that many people around the world cannot overcome.

On a positive note, educational attainment continues to increase across all regions of the world.

Education is key to improving the livelihoods of individuals, families and communities, and it is a critical vehicle through which children and youth can feasibly aspire to decent employment. Yet educational performance can reflect the inequities that exist in many countries, hampering the prospects of young people. In this way, we see that some youth – those with the physical access, financial means and digital skills to use technology and information in a meaningful way – may find resources and opportunities online to support their livelihoods or job prospects. However, when opportunities for education, training and employment are not equitably distributed, youth face obstacles that access to information alone cannot overcome.

Meanwhile, a widespread decline in freedoms spells trouble for the future of democracy around the world.

Excessive limits on freedoms have glaring consequences for democracy as societies lose the power of people's voices to decide the political direction of their countries. Freedom of expression is the cornerstone of political participation and civil rights and embodies a set of democratic values that affect every aspect of meaningful access to information. A rights-based approach to access to information recognises that the right to information impacts all other rights as well. These rights are interdependent and indivisible.

As the lives of people become even more intertwined with our interactions online, guaranteeing the rights of people to freely and safely participate in different online spaces is more critical than ever. The notion of the internet as a liberation technology is dwindling as governments around the world are increasingly surveilling their citizens, using social media to spread disinformation and manipulate their constituents for political gains, and failing to protect their people against violations of privacy.

Scarcity of data on key indicators remains an obstacle to our efforts.

Our efforts to track the progress of countries and regions toward achieving meaningful access to and use of information are severely hampered by the lack of availability of relevant data. During the period between 2015 and 2018, data for many of the 17 indicators included in the DA2I framework was not updated or made publicly available. In a world that is supposedly overflowing with data, the reality is that there exist significant data gaps in key social and economic indicators. The scarcity of data not only limits our ability to assess the progress of countries but, perhaps most importantly, significantly constrains the design of evidence-based policies that truly address the needs of different communities in each country.

1. This chapter is the second installment, following the DA2I report released in 2017. See: Garrido, M. & Wyber, S. Eds. (2017)
2. See: Garrido & Fellows, 2017: 11
3. For a more thorough discussion on the importance of the rights-based approach in relationship with the UN 2030 Agenda, see for example: Nussbaum, (2001) Esterhuysen, A., (2016) and Souter, D., (2016)
4. <https://sustainabledevelopment.un.org/post2015/transformingourworld>
5. There is an extensive and well-established body of research committed to studying the contributions of access to information for the purpose of advancing social and economic goals. Numerous studies in the fields of communication, particularly development communication (for example, Castells, 1996; Melkote, 2000; Wilkins, 2000; Castells, Fernandez, & Sey, 2009; Toyama, 2011 Heeks, 2010; Sey et al., 2015; Donner, 2016) and information sciences (for example, Burnett & Jaeger, 2011), and more recently in the field of human-centered design and engineering (for example, Starbird, 2018) have shed light on different ways in which communities, civil society organizations, governments, and international bodies used a variety of information and communication resources to advance social change.
6. See Garrido & Fellows, (2017)
7. See footnote 5
8. See Pew Internet Research (2016); ITU, (2016 ,2017, 2018); Garrido & Fellows (2017); and EQUALS Research Group, (2019); among others.
9. See: Appendix 3 (Glossary of DA2I indicators) here: <https://da2i.ifla.org/>
10. For information on our methodology and a discussion of the challenges faced, see Appendix 1 (Research Process) and Appendix 2 (Data Curation, Processing, and Analysis Strategy) here: <https://da2i.ifla.org/node/50>
11. A list of countries and their regional classification is available in Appendix 2 (Data Curation, Processing, and Analysis Strategy) here: <https://da2i.ifla.org/node/51>
12. Information on the World Bank's income group classification can be found here: <https://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries>
13. The DA2i dashboards will be released in July 2019. Please see our website for updates: <http://tascha.uw.edu/>
14. Regional averages are weighted by country population.
15. See: ITU (2018)
16. See: Broadband Commission (2018)
17. For information on the World Bank's Central African Backbone Communications Project see: <http://projects.worldbank.org/P108368/central-african-backbone-apl1a?lang=en>
18. See for example: EQUALS Research Group (2019) and ITU (2016, 2017, and 2018)
19. For a comprehensive analysis on the state of the ICT gender gap please see: EQUALS Research Group (2019)
20. See: Web Foundation (2016)
21. See: ITU (2016)
22. See: Affordability Report (2018)
23. Ibid
24. More information on this definition of affordability, as well as a list of mobile broadband costs by country, is available at <https://a4ai.org/mobile-broadband-pricing-data/>.
25. Ibid
26. See for example: ILO (2017, 2018); UNESCO (2017, 2018); and UNDP (2016)
27. Data for 2016 was not included in the analysis due to the small number of countries reporting data for this indicator on that year (n=2)
28. UNESCO (2016 & 2017)
29. See for example: ILO (2017, 2018), UNDP (2016)
30. See Garrido, Fellows & Koepke (2017)
31. See Freedom House's Methodology: <https://freedomhouse.org/report/methodology-freedom-world-2019>
32. Freedom House (2018)
33. Ibid
34. Ibid
35. Ibid
36. Freedom House (2018)
37. Mozilla Foundation (2018)
38. See: Freedom House (2017 & 2018)
39. Freedom House (2018b)
40. Ibid

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