1. Global Trends in E-Government

1.1 Introduction

Digital technologies played an indispensable role in holding civil society together as the COVID-19 pandemic emerged, supporting the provision of basic public services and fundamental services in the health, education, and safety and security sectors as in-person access to such services grew increasingly limited. The pandemic has amplified the importance of e-government and digital technologies as essential tools for communication and collaboration between policy makers, the private sector and societies across the globe. Digital technologies contribute to national and local development, facilitate the sharing of knowledge and guidance, and enable the provision of online services and solutions in both ordinary and extraordinary circumstances, making the transition towards digital transformation inevitable. E-government has become the cornerstone for building effective, accountable, resilient and inclusive institutions at all levels, as called for in Sustainable Development Goal (SDG) 16, and for strengthening the implementation of Goal 17.

This chapter presents a data-driven analysis of key trends in e-government development in 2022 based on the assessment of the E-Government Development Index (EGDI). It also describes and analyses global trends in electronic and mobile services delivery and sheds light on the distribution of online services based on country income levels and on the provision of services in specific sectors that are particularly important for sustainable development.

The chapter begins with a brief presentation of the e-government rankings of 193 United Nations Member States and their placement and relative position within four EGDI value groups (very high, high, middle and low). In 2022, for the first time, the Online Services Index component of the EGDI is broken down into five subcategories. This added specificity allows a more detailed and nuanced assessment of online services provision and enables Member States to better target their efforts to improve overall e-government development.

The analysis is further supplemented by the findings of a pilot study UN DESA conducted in 2021 with a complex network analysis methodology (see annex A) that uses more than 500 development indicators, including SDG indicators and EGDI data, to establish digital development patterns and the clustering of countries around similar characteristics.

EGDI methodology: continuous improvement

The EGDI is a composite benchmark of e-government development consisting of the weighted average of three independent component indices: the Online Services Index (OSI), the Telecommunications Infrastructure Index (TII), and the Human Capital Index (HCI). The

Photo credit: pixabay.com

methodologies used for data collection and for the computation of the EGDI and its subcomponent values are detailed in annex A of the Survey. The OSI component has been refined to allow government portals to be assessed on the basis of five subindices—institutional framework (IF), services provision (SP), content provision (CP), technology (TEC) and e-participation (EPI)—with the OSI as a whole calculated based on the normalized values for each subindex (see annex A). This new approach further aligns the OSI with the LOSI formula, introduces the concept of a composite Online Service Index (similar to the TII and HCI), and supports a more nuanced analysis of advancements in e-government development. For the 2022 edition of the Survey, the OSI has been calculated based on 180 questions (up from 148 in 2020).

1.2   E-government rankings in 2022

The first United Nations E-Government Survey was published in 2001. The 2022 Survey is the eleventh edition of a biennial publication dedicated to tracking the global development of e-government in all United Nations Member States. Recent trends in e-government development are presented based on the assessment of values reflected in the EGDI, a normalized composite index comprising the OSI, TII and HCI. Each of the latter three indices is a composite measure that can be extracted and analysed independently. The composite value of each component index is normalized to fall within the range of 0 to 1, and the overall EGDI is derived from taking the arithmetic average of the three component indices.

This biennial assessment of e-government development as reflected in the EGDI allows Member States to follow up on the Survey results and initiate improvements after each measurement. For every edition of the Survey, the EGDI has been subject to constructive improvements in the methodology to take into account the lessons learned from previous editions, the inputs and feedback received from the Member States, the recommendations of external evaluations, the outcomes of expert group meetings, and the advancement of the latest technological and policy developments in digital government. The changes introduced for the 2022 Survey are elaborated in annex A. While the overarching methodological framework has not changed, these improvements may nonetheless impede full-scale comparisons with the previous editions, though for the majority of indicators this remains possible, and historical comparisons are provided where relevant.

This report reviews the recent progress made by Member States in e-government development. A country's relative position in the e-government development rankings may fluctuate over time owing to global changes and to changes to the rankings of other countries in the same field. While individual country performance still matters, it might be more useful to interpret the values and rankings based on the movement of countries between the four EGDI groups and to evaluate a Member State's individual performance based upon its rating class (quartile position) within its EGDI group.

The sections below present the 2022 Survey findings by EGDI rankings at the global level. Where relevant, additional insights are provided based on comparisons of data from the 2018 and 2020 Surveys. The analysis focuses on relevant correlations between the EGDI and its components, country income group classifications, advancements in e-services provision, and trends in electronic and mobile services delivery in various sectors, as well as the differences in e-government advancement among vulnerable groups such as older people, women, youth, persons with disabilities and migrants. The analysis is further enriched by the comparison of EGDI groups and respective clusters of countries grouped through complex network analysis (see annex B), drawing on over 500 indicators. Where warranted, the Survey highlights similarities and differences between the EGDI groups and country clusters, as well as within specific EGDI rating class/quartile subgroups.
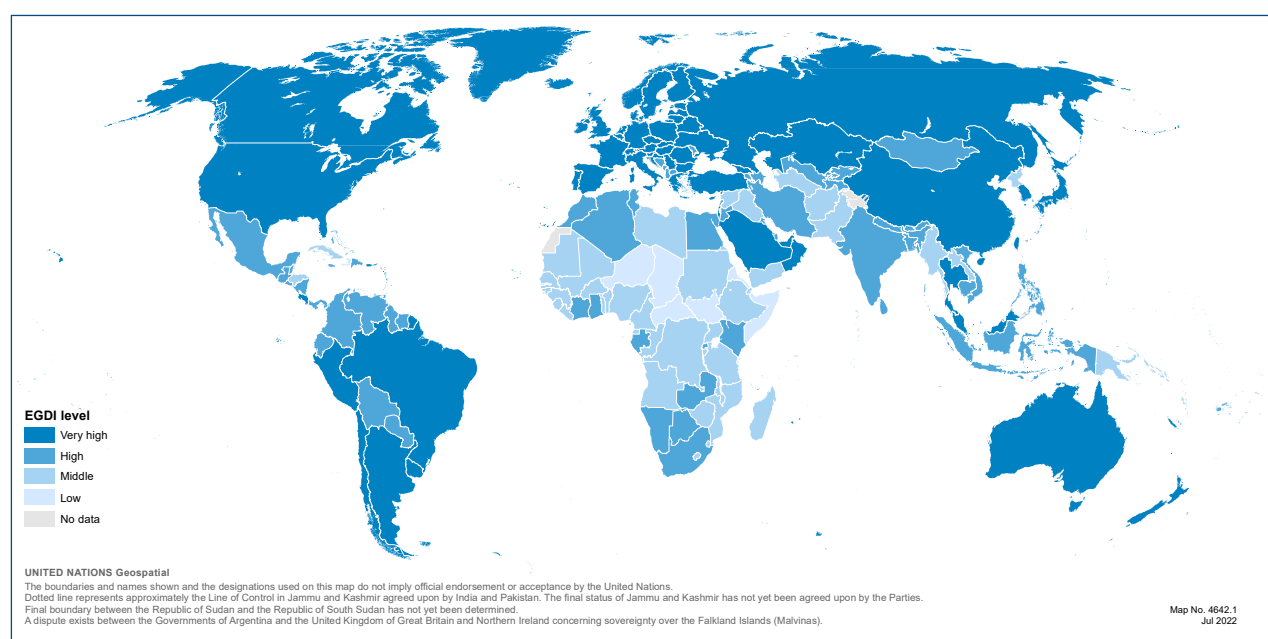
1.3   E-government development at a glance

1.3.1   Overall EGDI results

The 2022 Survey reflects further improvement in global trends in e-government development and the transitioning of many countries from lower to higher EGDI levels. In this edition, 60 countries have very high EGDI values ranging from 0.75 to 1.00,[1] in comparison with 57 countries in 2020—a 5.3 per cent increase for this group. A total of 73 countries have high EGDI values of 0.50 to 0.75, and 53 countries are part of the middle EGDI group with values between 0.25 and 0.50. Seven countries (one less than in 2020) have low EGDI values (0.00 to 0.25).

The map in figure 1.1 shows the geographical distribution of the four EGDI groups in 2022.

Figure 1.1   Geographical distribution of the four EGDI groups, 2022

EGDI level
Very high
High
Middle
Low
No data

UNITED NATIONS Geospatial
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the Parties.
Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.
A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

Map No. 4642.1
Jul 2022

Source: 2022 United Nations E-Government Survey.

Figure 1.2 shows the respective numbers and percentages of countries in different EGDI groups in 2020 and 2022 for comparative purposes. The results for 2022 indicate that Member States with high EGDI values make up the largest share (38 per cent), followed by those with very high EGDI values (31 per cent) and middle EGDI values (27 per cent). The share of countries with low EGDI values remains almost the same as in 2020 (4 per cent), though the actual number fell from eight to seven.

Figure 1.2　Number and proportion of countries within each EGDI grouping, 2020 and 2022
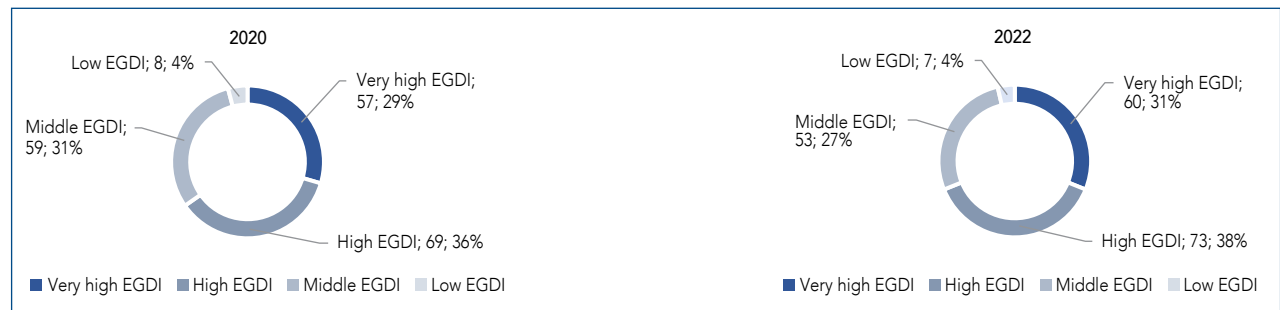
Source: 2022 United Nations E-Government Survey.

Between 2020 and 2022, the global average EGDI value rose from 0.5988 to 0.6102 and average HCI and TII values increased by 2 and 5 per cent, respectively, while the OSI average experienced a slight dip, declining from 0.5620 to 0.5554 (see figure 1.3). It is important to note that this change in the OSI could be attributed to the updated survey methodology.

Figure 1.3　Average values for the EGDI and its component indices, 2020 and 2022
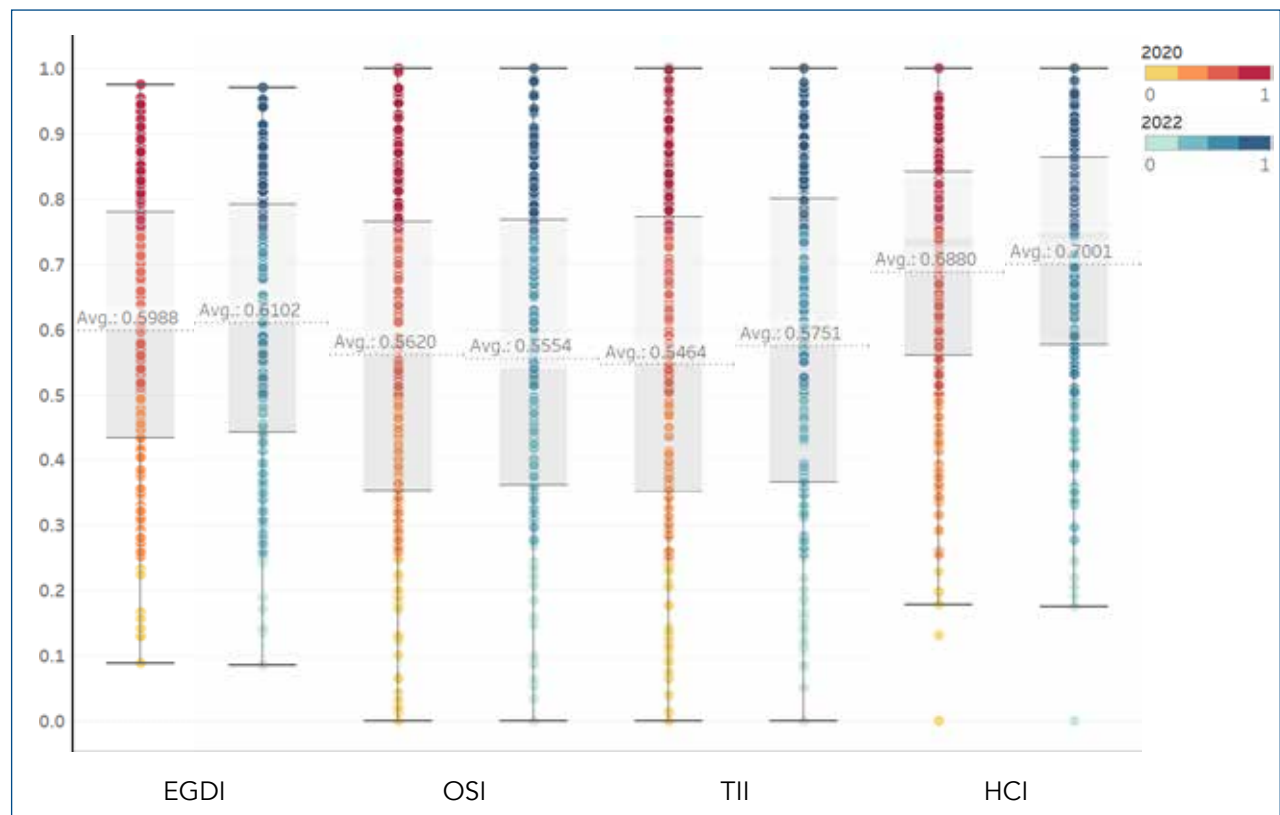
Sources: 2020 and 2022 United Nations E-Government Surveys.

In regional terms, Europe has the highest average EGDI value (0.8305), followed by Asia (0.6493), the Americas (0.6438), Oceania (0.5081), and Africa (0.4054) (see figure 1.4).

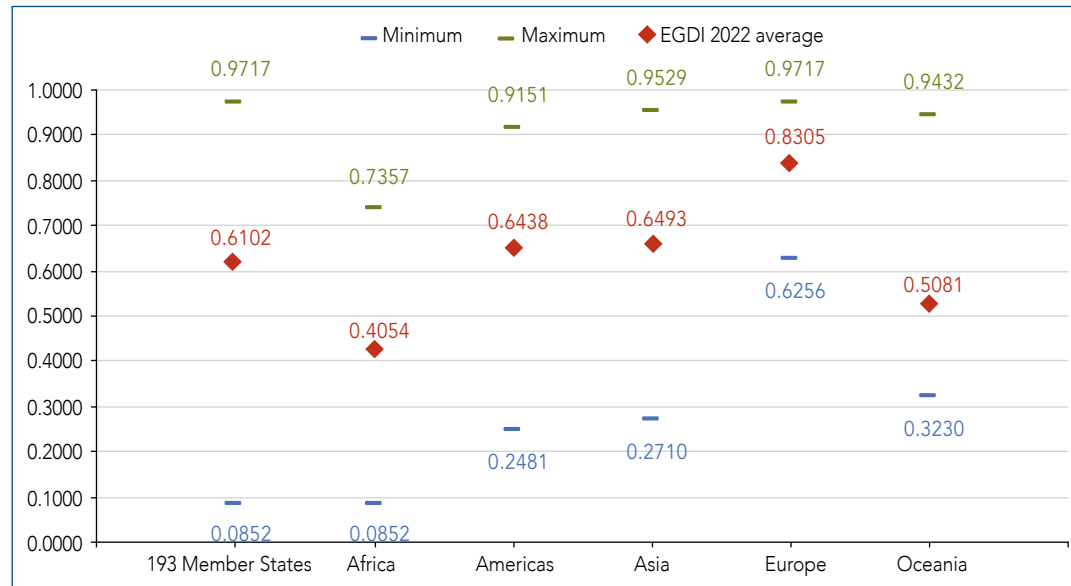**Figure 1.4   Global and regional EGDI averages, 2022**

Source: 2022 United Nations E-Government Survey.

1.3.2   Country EGDI levels and quartile classifications

The subsections below focus on the distribution of countries among the very high, high, middle and low EGDI groups and highlight any changes in levels or classifications since 2020. To gain better insight into the situation of subgroups of countries with similar levels of performance within their respective EGDI groups, each EGDI group is further divided into four equally defined rating classes, or quartiles.[2] The rating class breakdowns within the respective EGDI groups, in descending order, are as follows: VH, V3, V2 and V1 for the very high group; HV, H3, H2 and H1 for the high group; MH, M3, M2 and M1 for the middle group; and LM, L3, L2 and L1 for the low group.

Very high EGDI group

The number of Member States in the very high EGDI group (with values ranging from 0.75 to 1.00) rose from 57 to 60, representing a 5 per cent increase between 2020 and 2022. These 60 countries are equally distributed between the VH, V3, V2 and V1 rating classes.

Malta and the United Arab Emirates moved from the V3 to the VH rating class in the very high EGDI group. Four countries (Georgia, Peru, Serbia and Ukraine) moved from the high to the very high EGDI group, with Serbia jumping two intervals (HV to V2).

The 15 countries in the highest (VH) rating class within the very high EGDI group are the leading countries in terms of the 2022 Survey results, with values ranging between 0.8943 and 0.9717. Ranked from highest to lowest within the subgroup, these countries include Denmark, Finland, Republic of Korea, New Zealand, Sweden, Iceland, Australia, Estonia, Netherlands, United States of America (hereinafter referred to as the United States), United Kingdom of Great Britain and Northern Ireland (hereinafter referred to as the United Kingdom), Singapore, United Arab Emirates, Japan and Malta.

At the regional level, 35 of the 60 countries in the very high EGDI group are in Europe, 15 are in Asia, 8 are in the Americas, and 2 are in Oceania.

High EGDI group

The total number of countries in the high EGDI group rose from 69 to 73 between 2020 and 2022. Eight countries have joined the high EGDI group for the first time; three are in Africa (Côte d'Ivoire, Rwanda and Zambia), two are in the Americas (Belize and Guyana), and three are in Asia (Lebanon, Nepal and Tajikistan).

Six of the eight countries in the high EGDI group are in special situations and are classified by the United Nations as least developed countries (LDCs), landlocked developing countries (LLDCs) and/or small island developing States (SIDS), signifying the notable progress made in e-government development in countries with limited resources. The number of countries in special situations in the high and very high EGDI groups rose from 35 to 41 (or by 15 per cent) between 2020 and 2022; one of the latter is a low-income country (Rwanda) and twelve are lower-middle-income countries (Bangladesh, Belize, Bhutan, Plurinational State of Bolivia, Cabo Verde, Cambodia, Kyrgyzstan, Mongolia, Nepal, Tajikistan, Uzbekistan and Zambia). Groups of countries in special situations are further analysed in chapter 2.

At the regional level, 24 of the 73 countries in the high EGDI group are in the Americas, 22 are in Asia, 16 are in Africa, 8 are in Europe, and 3 are in Oceania. Eighteen of these countries are in the top HV rating class of the high EGDI subgroup, with 39 per cent of the 18 being countries in special situations (LLDCs or SIDS).

Middle EGDI group

The number of countries in the middle EGDI group (with values ranging from 0.25 to 0.50) decreased from 59 in 2020 to 53 in 2022; this decline is positive, given that eight countries moved up to the high EGDI group and two countries shifted from the low to the middle EGDI group during this period (see figure 1.5). Only one country moved down from the high to the middle EGDI group.

Africa has the largest share of countries in the middle EGDI group (60 per cent, or a total of 32 countries), followed by Asia (19 per cent, or 10 countries), Oceania (17 per cent, or 9 countries) and the Americas (4 per cent, or 2 countries).

The overwhelming majority of countries in the middle EGDI group—43 out of 53, or 81 per cent—are countries in special situations (LDCs, LLDCs and/or SIDS). Among these 53 countries, 20 (38 per cent) are low-income economies (16 in Africa and 4 in Asia), and another 25 (47 per cent) are lower-middle-income economies (14 in Africa, 6 in Oceania, 4 in Asia and 1 in the Americas). Seven countries (2 in Oceania, 2 in Africa, 2 in Asia and 1 in the Americas) are upper-middle-income economies, and one country, Nauru, is a high-income country in Oceania.

Low EGDI group

The number of countries with low EGDI values (below 0.25) dropped from eight in 2020 to seven in 2022. All of the countries in this group are LDCs and/or LLDCs; six are in Africa (Central African

Republic, Chad, Eritrea, Niger, Somalia and South Sudan) and were also in the low EGDI group in 2020, while one is an LDC in the Americas (Haiti). Guinea-Bissau and the Democratic People's Republic of Korea are the only two countries that moved up from the low to the middle EGDI group in 2022.
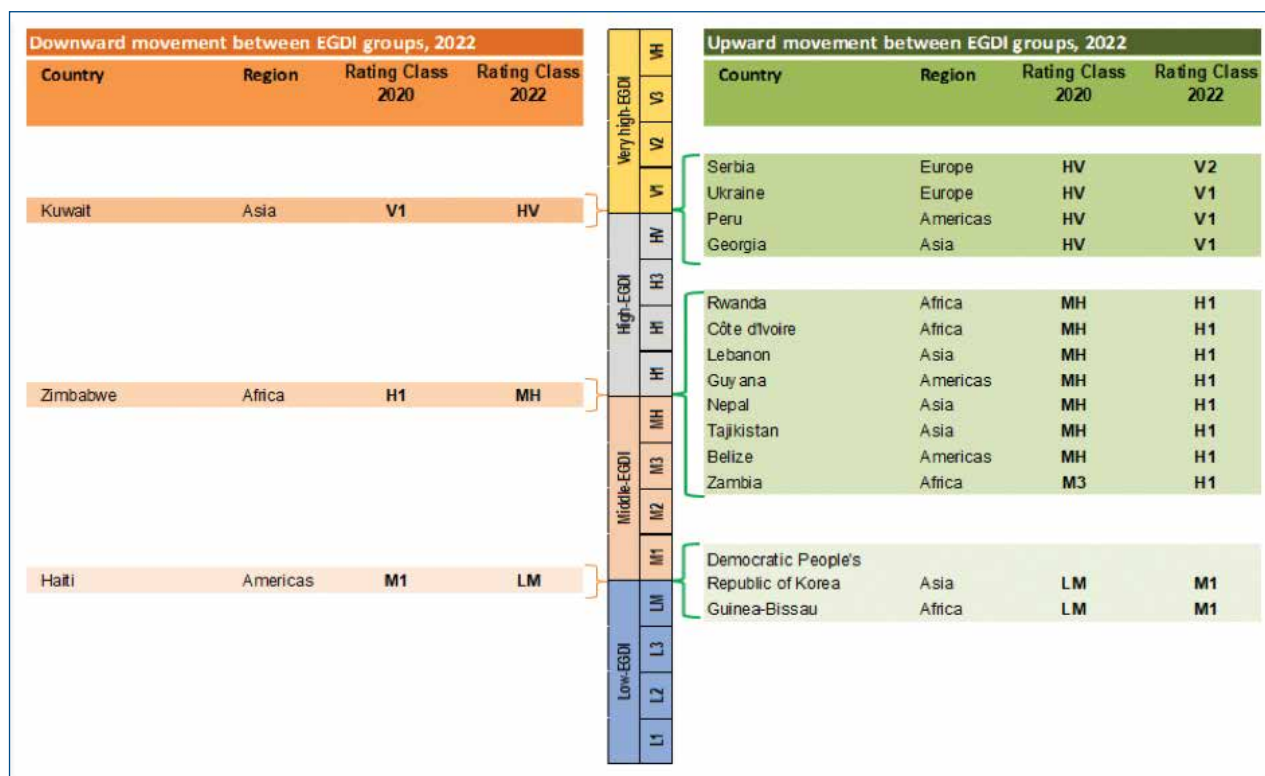
Regional trends and findings for all EGDI groups are explored in greater detail in chapter 2.

1.3.3   Movement between EGDI groups

The 2022 Survey results affirm the continuation of the positive global trend towards higher levels of e-government development. Figure 1.5 shows the number of countries that have moved from one EGDI group to another since 2020. Fourteen countries moved to higher EGDI groups (2 from the low to the middle group, 8 from the middle to the high group, and 4 from the high to the very high group), and three countries moved to lower EGDI groups (1 from the very high to the high group, 1 from the high to the middle group, and 1 from the middle to the low group). While these changes are positive overall, the net number of countries in each EGDI group is comparable to the numbers in 2020.

As noted earlier, each EGDI group is also divided into four equally defined quartile subgroups or rating classes. As figure 1.5 illustrates, the upward movement of countries between EGDI groups usually involves a shift from the top rating class of one EGDI group to the lowest rating class of the next highest group; with downward movement, countries typically move from the lowest rating class of one EGDI group to the highest rating class of the next lower group. This single-interval shift occurred for 15 of the 17 countries that moved to another EGDI group in 2022; Serbia and Zambia, however, were able to move up by two rating classes in their advancement to a higher EGDI level.

Figure 1.5   Movement between EGDI groups from 2020 to 2022

Downward movement between EGDI groups, 2022

Country	Region	Rating Class 2020	Rating Class 2022
Kuwait	Asia	V1	HV
Zimbabwe	Africa	H1	MH
Haiti	Americas	M1	LM

Upward movement between EGDI groups, 2022

Country	Region	Rating Class 2020	Rating Class 2022
Serbia	Europe	HV	V2
Ukraine	Europe	HV	V1
Peru	Americas	HV	V1
Georgia	Asia	HV	V1
Rwanda	Africa	MH	H1
Côte d'Ivoire	Africa	MH	H1
Lebanon	Asia	MH	H1
Guyana	Americas	MH	H1
Nepal	Asia	MH	H1
Tajikistan	Asia	MH	H1
Belize	Americas	MH	H1
Zambia	Africa	M3	H1
Democratic People's Republic of Korea	Asia	LM	M1
Guinea-Bissau	Africa	LM	M1

Source: 2020 and 2022 United Nations E-Government Surveys.

1.4   The countries leading in e-government development

In reviewing and analysing the 2022 Survey results, it is important to bear in mind that the EGDI is a normalized relative index, and slight differences in EGDI values between countries do not necessarily imply that a country with a lower EGDI value has underperformed during the specific two-year Survey period. Nor does a higher EGDI value signify better performance, especially among countries within the same subgroup. Hence, analysts and policymakers should be cautioned against misinterpreting slight changes in rankings among countries within the same rating class. Every country should determine the level and extent of its digital government objectives based on its specific national development context, capacity, strategy and programmes rather than on an arbitrary assumption of its future position in the ranking. The EGDI is a benchmarking tool for e-government development to be used as a proxy performance indicator.

The 15 countries in the highest (VH) rating class of the very high EGDI group are listed in table 1.1, which also provides the corresponding OSI, TII, HCI and overall EGDI values.

Table 1.1   Leading countries in e-government development, 2022

Country name	Rating class	Region	OSI	HCI	TII	EGDI (2022)	EGDI (2020)
Denmark	VH	Europe	0.9797	0.9559	0.9795	0.9717	0.9758
Finland	VH	Europe	0.9833	0.9640	0.9127	0.9533	0.9452
Republic of Korea	VH	Asia	0.9826	0.9087	0.9674	0.9529	0.9560
New Zealand	VH	Oceania	0.9579	0.9823	0.8896	0.9432	0.9339
Sweden	VH	Europe	0.9002	0.9649	0.9580	0.9410	0.9365
Iceland	VH	Europe	0.8867	0.9657	0.9705	0.9410	0.9101
Australia	VH	Oceania	0.9380	1.0000	0.8836	0.9405	0.9432
Estonia	VH	Europe	1.0000	0.9231	0.8949	0.9393	0.9473
Netherlands	VH	Europe	0.9026	0.9506	0.9620	0.9384	0.9228
United States of America	VH	Americas	0.9304	0.9276	0.8874	0.9151	0.9297
United Kingdom of Great Britain and Northern Ireland	VH	Europe	0.8859	0.9369	0.9186	0.9138	0.9358
Singapore	VH	Asia	0.9620	0.9021	0.8758	0.9133	0.9150
United Arab Emirates	VH	Asia	0.9014	0.8711	0.9306	0.9010	0.8555
Japan	VH	Asia	0.9094	0.8765	0.9147	0.9002	0.8989
Malta	VH	Europe	0.8849	0.8734	0.9245	0.8943	0.8547

Sources: 2020 and 2022 United Nations E-Government Surveys.

The group of countries in the highest (VH) rating class of the very high EGDI group is almost identical to the corresponding group in the previous edition of the Survey; there has been a slight net increase (from 14 to 15 countries), with Malta and the United Arab Emirates joining this group and Norway moving down to the V3 rating class. The top 15 countries are exclusively high-income countries.

Denmark has the highest EGDI value globally for the third consecutive Survey and is one of eight countries in Europe and one of six countries in the European Union that are part of the highest (VH) rating class. Malta is the only country in Southern Europe joining this subgroup in 2022, having improved in all three subindices (OSI, TII and HCI) by an average of 4.6 per cent since 2020. The most significant increases in subindex values were achieved by Sweden (a 10 per cent increase for the OSI), the Netherlands (a 4.4 per cent increase for the TII), and the United Arab Emirates (a 19 per cent increase for the HCI).

Europe accounts for 53 per cent of the VH rating class (Denmark, Estonia, Finland, Iceland, Malta, Netherlands, Sweden and United Kingdom), Asia accounts for 27 per cent (Japan, Republic of Korea, Singapore and United Arab Emirates), Oceania accounts for 13 per cent (Australia and New Zealand), and the Americas, with one country (United States), accounts for the remaining 7 per cent.

As in the past three editions of the Survey, Australia and New Zealand lead e-government development in Oceania, the United States leads in the Americas, and the Republic of Korea is the top EGDI performer in Asia, followed by Singapore and Japan. None of the countries in Africa are included in the VH rating class.

The remainder of this subsection reviews key findings on e-government development in the leading countries based on their responses to the United Nations Member States Questionnaires (MSQs), EGDI disaggregated data analysis, desk research and literature review. With outreach to 193 United Nations Member States and a global response rate of nearly 70 per cent, the MSQ remains one of the most robust measures of self-assessed e-government development worldwide. It focuses on strategic areas of digital policies aimed at developing effective, accountable and inclusive public institutions and collects information on countries' institutional, legal and strategic frameworks.

All of the leading countries responded to the MSQ (see figure 1.6), with the exception of the United States, for which additional desk research was undertaken by the Survey data team. The 2022 findings confirm those highlighted in the 2020 Survey, indicating consistency and steady progress in the digital transformation journey and the ability of Governments to do more than just manage external ICT vendors. These countries have built the capacity to create products and develop platforms; guided by strategic digital policies, they have established a core infrastructure of shared digital systems, technologies, processes and organizational models that have provided a strong but flexible framework for the development and delivery of data-driven user-centric government services.

For these countries, the whole-of-government approach has been strongly institutionalized through a central body such as a department, ministry or agency led by a high-ranking government officer—such as a national chief information officer (CIO) or chief digital technology officer—that is in charge of a multi-year digital agenda and reports to the cabinet of the president or the prime minister. This central body contributes to policy formulation and coordinates policy implementation for the Government and has wide-ranging responsibilities relating to digital services for e-government applications, data science and artificial intelligence, traditional and cloud infrastructure, cybersecurity, the Internet of things, and much more. The leading Governments engage in policy, regulatory and technology experimentation and sandboxing to test, develop and adapt cutting-edge technologies for use in e-services provision and smart city development.

This group leads the pack in providing specialized portals for e-services, e-participation, open government data and public procurement.

The MSQ responses indicate that the leading countries have specialized legislation or regulations pertaining to digital procurement, digital identity and digital signatures; the legal framework also addresses data sharing, interoperability across public agencies, and access to information such as government expenditures. All of the countries have pending or active strategic initiatives to promote the use of emerging technologies in e-government.

Figure 1.6   Member States Questionnaires: key findings for the top EGDI performers* (number of countries responding positively to the questions)
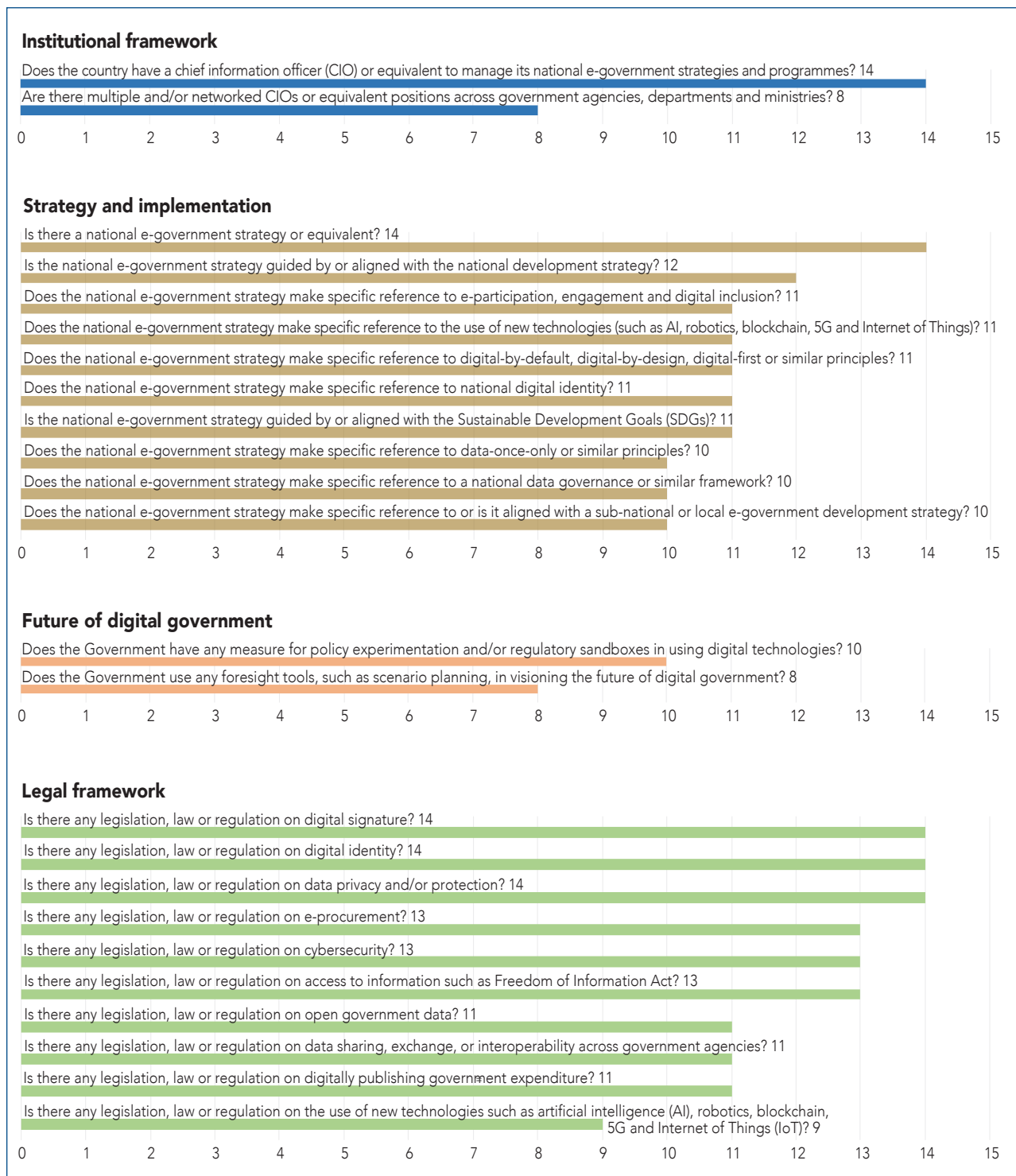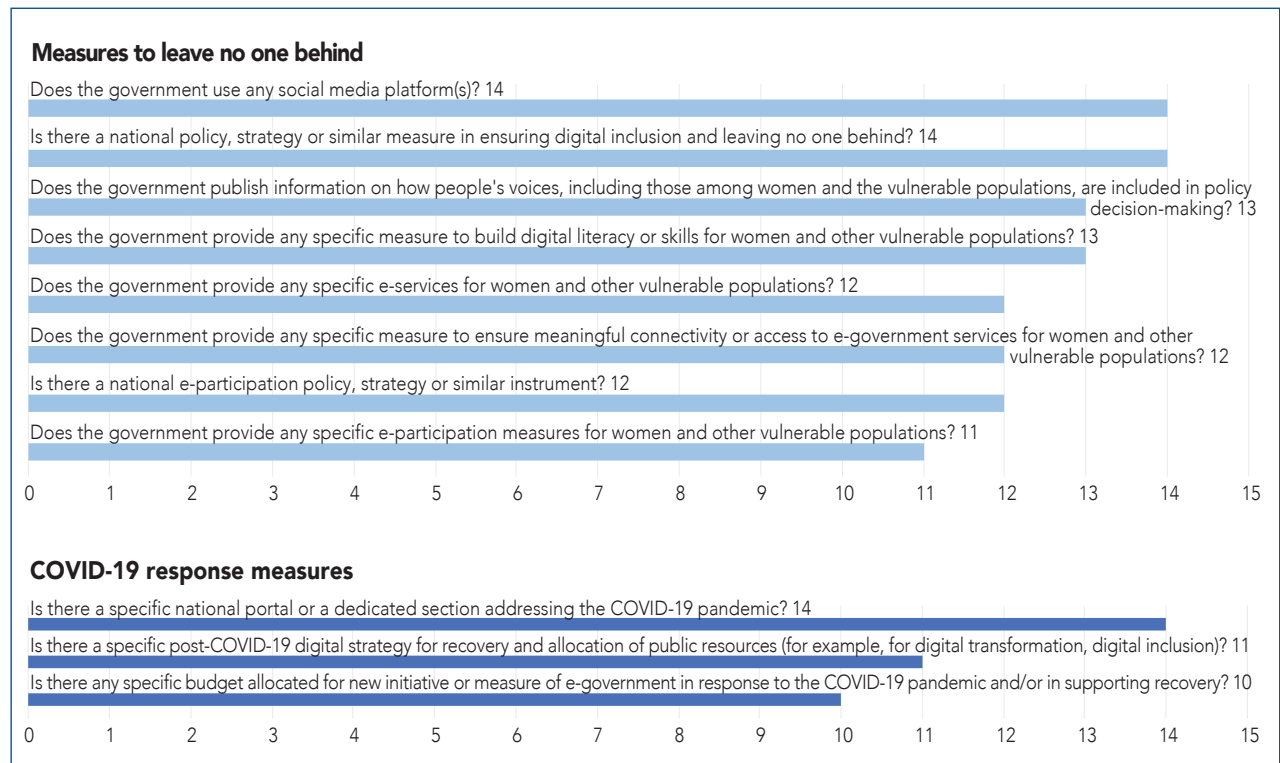
Institutional framework

Does the country have a chief information officer (CIO) or equivalent to manage its national e-government strategies and programmes? 14

Are there multiple and/or networked CIOs or equivalent positions across government agencies, departments and ministries? 8

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Strategy and implementation

Is there a national e-government strategy or equivalent? 14

Is the national e-government strategy guided by or aligned with the national development strategy? 12

Does the national e-government strategy make specific reference to e-participation, engagement and digital inclusion? 11

Does the national e-government strategy make specific reference to the use of new technologies (such as AI, robotics, blockchain, 5G and Internet of Things)? 11

Does the national e-government strategy make specific reference to digital-by-default, digital-by-design, digital-first or similar principles? 11

Does the national e-government strategy make specific reference to national digital identity? 11

Is the national e-government strategy guided by or aligned with the Sustainable Development Goals (SDGs)? 11

Does the national e-government strategy make specific reference to data-once-only or similar principles? 10

Does the national e-government strategy make specific reference to a national data governance or similar framework? 10

Does the national e-government strategy make specific reference to or is it aligned with a sub-national or local e-government development strategy? 10

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Future of digital government

Does the Government have any measure for policy experimentation and/or regulatory sandboxes in using digital technologies? 10

Does the Government use any foresight tools, such as scenario planning, in visioning the future of digital government? 8

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Legal framework

Is there any legislation, law or regulation on digital signature? 14

Is there any legislation, law or regulation on digital identity? 14

Is there any legislation, law or regulation on data privacy and/or protection? 14

Is there any legislation, law or regulation on e-procurement? 13

Is there any legislation, law or regulation on cybersecurity? 13

Is there any legislation, law or regulation on access to information such as Freedom of Information Act? 13

Is there any legislation, law or regulation on open government data? 11

Is there any legislation, law or regulation on data sharing, exchange, or interoperability across government agencies? 11

Is there any legislation, law or regulation on digitally publishing government expenditure? 11

Is there any legislation, law or regulation on the use of new technologies such as artificial intelligence (AI), robotics, blockchain, 5G and Internet of Things (IoT)? 9

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Figure 1.6 *(continued)*

Measures to leave no one behind

Does the government use any social media platform(s)? 14

Is there a national policy, strategy or similar measure in ensuring digital inclusion and leaving no one behind? 14

Does the government publish information on how people's voices, including those among women and the vulnerable populations, are included in policy decision-making? 13

Does the government provide any specific measure to build digital literacy or skills for women and other vulnerable populations? 13

Does the government provide any specific e-services for women and other vulnerable populations? 12

Does the government provide any specific measure to ensure meaningful connectivity or access to e-government services for women and other vulnerable populations? 12

Is there a national e-participation policy, strategy or similar instrument? 12

Does the government provide any specific e-participation measures for women and other vulnerable populations? 11

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

COVID-19 response measures

Is there a specific national portal or a dedicated section addressing the COVID-19 pandemic? 14

Is there a specific post-COVID-19 digital strategy for recovery and allocation of public resources (for example, for digital transformation, digital inclusion)? 11

Is there any specific budget allocated for new initiative or measure of e-government in response to the COVID-19 pandemic and/or in supporting recovery? 10

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

Sources: 2022 Member States Questionnaires.

* The MSQs were submitted by 14 of the 15 leading countries; the United States is not included in this analysis.

The MSQ responses reveal considerable variation between regions in the enactment of legislation on open government data, with European countries reporting the highest rate of adoption of such legislation, followed by Asian countries.

The 2022 Survey data indicate that all 15 countries in the VH rating class have a national development strategy that incorporates SDG objectives. These countries have a national policy or strategy to ensure digital inclusion and leaving no one behind. Governments are publishing information about people's voices being included in policymaking, with specific e-participation measures implemented for vulnerable groups.

The countries in the top rating class either empower their citizens through investment in strengthening digital literacy and competency or stimulate the activation of inclusive practices by setting out standards on how the Government and partners from the public, private and voluntary sectors should maximize accessibility to digital services.

1.5   OSI, TII and HCI performance for each EGDI group

As indicated in table 1.1 and figures 1.3 and 1.7, OSI, TII and HCI subindex values for countries in the very high EGDI group are significantly higher than the corresponding world averages, especially for those in the top two rating classes (VH and V3). For countries in the top (HV) rating class of the high EGDI group, OSI, TII and HCI values are still above, albeit closer to, the world averages. For countries in the H3 and H2 rating classes of the high EGDI group, the subindex values start to decline, and values drop below the world averages for countries in the H1 rating class. For countries in the middle and low EGDI groups, all three subindices have values below the respective world averages, with rare exceptions; those with HCI values that are well above the world average of 0.700 include Cuba (0.8384), Turkmenistan (0.7892), Libya (0.7534) and Samoa (0.7470), and the TII value for Myanmar (0.6082) is higher than the global average of 0.5750.

Figure 1.7   OSI, TII and HCI subindex values for each EGDI group, 2022
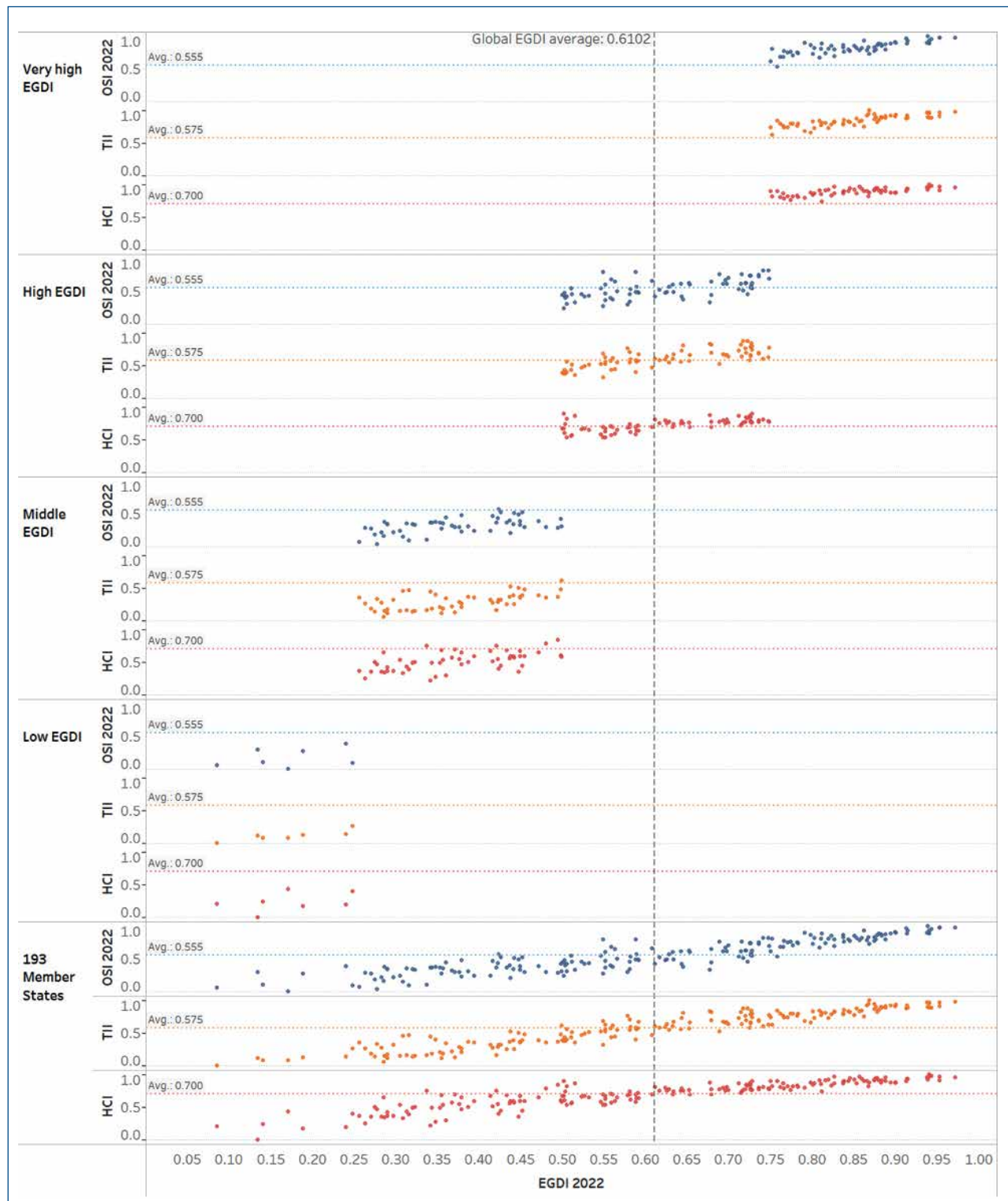
Sources: 2020 and 2022 United Nations E-Government Surveys.

Understanding the contribution of each of the three subindices to the overall EGDI value helps countries formulate targeted policies and ensure the optimal allocation of resources for e-government development. Figure 1.8 highlights countries that have achieved high or very high levels of e-government development by improving online services provision (expressed as an OSI value) despite limited resources. Twelve upper-middle-income countries (Albania, Argentina, Brazil, China, Ecuador, Kazakhstan, Malaysia, Mexico, Peru, Serbia, Thailand and Turkey) have achieved very high OSI levels by capitalizing on very high levels of human capital development and moderate to very high levels of infrastructure development (see top horizontal green box and arrows pointing at respective OSI, TII and HCI values for this group of countries). India, Indonesia, Rwanda and Ukraine have very high OSI values even though they are low-income or lower-middle-income countries (see vertical green boxes and arrows on Figure 1.8). India and Rwanda have achieved very high OSI levels (0.7934 and 0.7935, respectively) despite having a poorly developed telecommunications infrastructure (the respective TII values for India and Rwanda are 0.3954 and 0.3209).

Figure 1.8   OSI, TII and HCI subindex values for each EGDI level, by income group, 2022
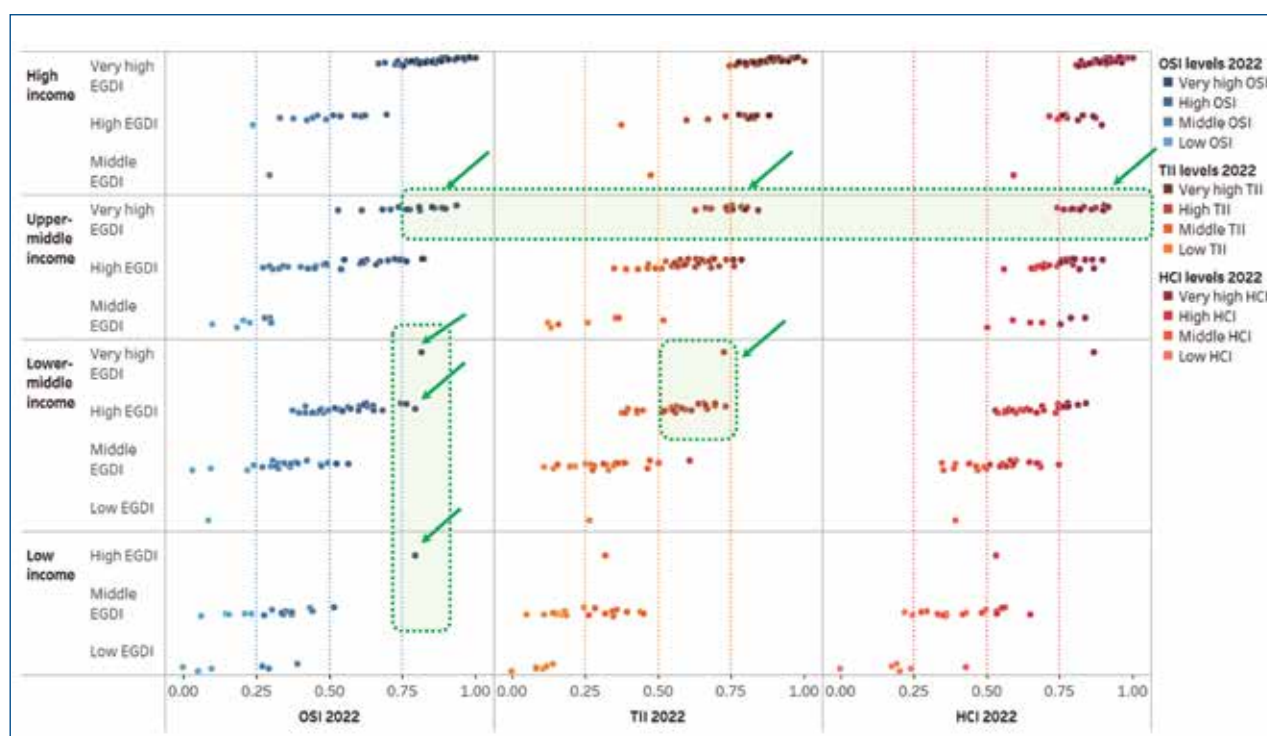
Sources: 2020 and 2022 United Nations E-Government Surveys.

1.6   National income and e-government development

The 2022 e-government assessment shows a generally positive relationship between income levels (as measured by gross domestic product per capita) and EGDI values (see figure 1.8 and table 1.2). Higher-income countries tend to have higher EGDI values than do lower-income countries. Given the technological advancements in higher-income countries, this trend is in line with the findings of all previous Surveys. As shown in figure 1.9, the most dramatic changes in EGDI and subcomponent values have occurred in the upper-middle-income group. TII values have risen for all income groups, with the greatest increase registered by the upper-middle-income group (12.3 per cent), followed by the lower-middle-income group (7.3 per cent), the low-income group (6.4 per cent), and the high-income group (1 per cent). For all but the upper-middle-income group, average OSI values

have declined, in part due to changes in the Survey methodology (see annex A for details). The sharp increase in the average OSI value for the upper-middle-income group suggests that the countries in this group have prioritized the allocation of resources towards improving online services provision. High-income countries have already reached a rather high level of services provision, whereas low-income and lower-middle-income countries lack sufficient resources for investment in the development of online services. Low-income countries struggle with investing in human capital development and are the only group to have registered a decline in the average HCI index value between 2020 and 2022.

With the higher OSI, TII and HCI values, the upper-middle-income group will likely make rapid progress in e-government ecosystem development in the coming years, while the decline in OSI or HCI values for low-income and lower-middle-income countries may signify deepening digital divides.

While all low-income countries have EGDI values below the global average of 0.6102, some have done exceedingly well in online services provision. Rwanda, for example, has a very high OSI value (0.7935)—well above the OSI average of 0.5554 for 2022.

Table 1.2   Average EGDI and subindex values, by income group, 2022

Country grouping by income	EGDI average	OSI average	TII average	HCI average
Low income	0.2963	0.3024	0.2139	0.3726
Lower-middle income	0.5032	0.4562	0.4441	0.6092
Upper-middle income*	0.6470	0.5725	0.6040	0.7645
High income	0.8241	0.7542	0.8420	0.8762
Average for all income groups	0.6102	0.5554	0.5751	0.7001

Source: 2022 United Nations E-Government Survey.

Note: The Bolivarian Republic of Venezuela is no longer classified as an upper-middle-income country and at the time of publication had not yet been reclassified.

Figure 1.9   Percentage change in average EGDI and subindex values between 2020 and 2022, by income group
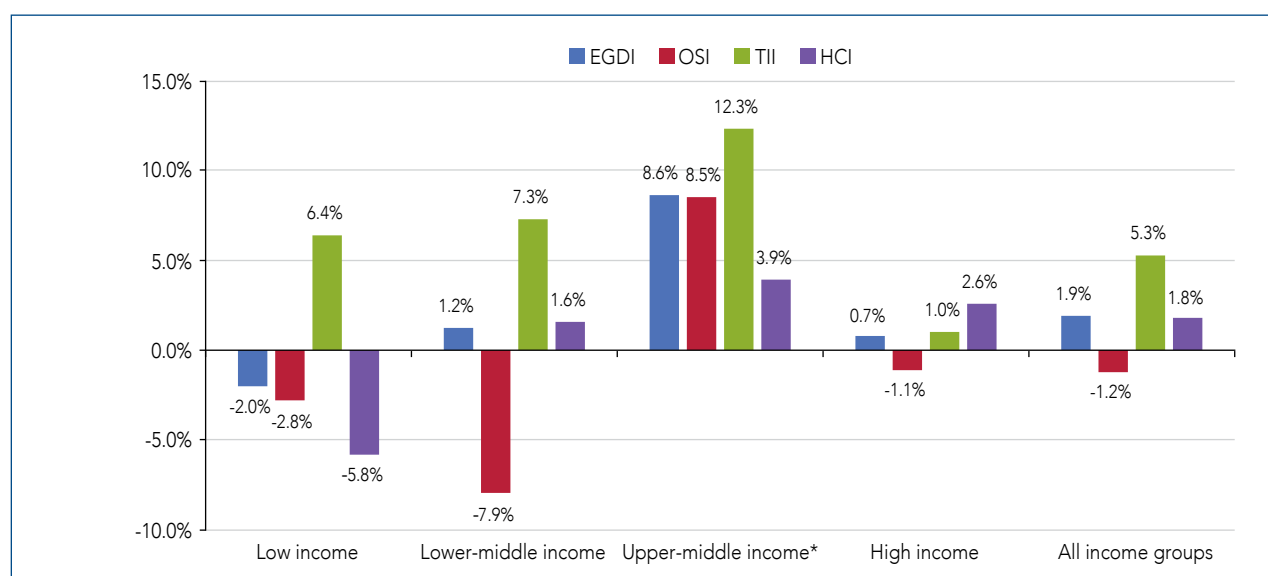
Source: 2022 United Nations E-Government Survey.

Note: The Bolivarian Republic of Venezuela is no longer classified as an upper-middle-income country and at the time of publication had not yet been reclassified.

Figure 1.10   Average EGDI values for 2020 and 2022, by income group
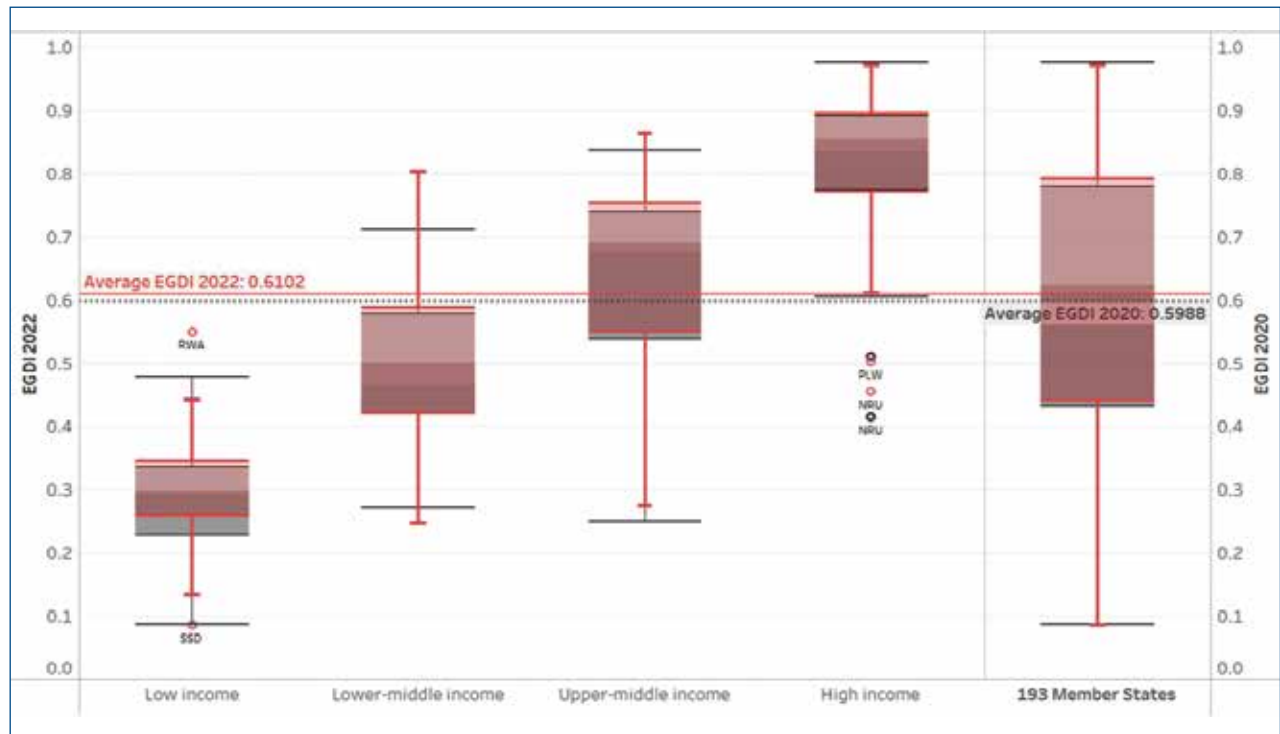
Sources: 2020 and 2022 United Nations E-Government Surveys.

Note: The internationally recognized three-letter country codes can be found here and in Survey annex table 12.

Close to 90 per cent of the 99 Member States that have above-average EGDI values are in the high-income or upper-middle-income group, but the remaining 10 per cent are lower-middle-income countries (Plurinational State of Bolivia, Indonesia, Islamic Republic of Iran, Kyrgyzstan, Mongolia, Philippines, Sri Lanka, Tunisia, Ukraine, Uzbekistan and Viet Nam); 10 of these countries (all but the Plurinational State of Bolivia) also have above-average OSI values. Five other countries in the lower-middle-income group have below-average EGDI values but above-average OSI values: Bangladesh (0.6521), Egypt (0.5730), India (0.7934), Kenya (0.6821) and Pakistan (0.5658). These examples suggest that while the income level of a country matters, it is not the only factor determining EGDI or OSI values. As figure 1.10 illustrates, there are also high-income countries that have below-average EGDI values, such as Palau (0.5018) and Nauru (0.4548), whose underdeveloped infrastructure (typical for SIDS) is reflected in low TII values of 0.3735 and 0.4768, respectively.

Almost all high-income countries (97 per cent) have EGDI values above the global average; the same is true for 62 per cent of upper-middle-income countries but only 20 per cent of lower-middle-income countries.

1.7 Complex network analysis: a different perspective on e-government development

In 2022, UN DESA conducted a pilot study using the science of complex systems to expand the analysis of factors affecting countries' e-government development beyond income level and test a complex network analysis model to address possible inequalities and biases adherent to rankings and find as yet unidentified similarities and differences between the Member States.

Identifying external biases that affect assessment of the digital development performance of countries is a complicated task, since classifications based on proxy parameters are subject to discretionality and are not always able to capture the interrelationships between different countries. With due consideration given to the complexity of these connections, a model of a digital government ecosystem was created as a network in which countries represent nodes, with similarities in their development indicators determining the strength of the links between the nodes.

The data set used for the analysis, intended to help identify hidden similarities and differences between the countries, consisted of 305 World Development Indicators (WDIs) relating to health, economy, society and environment and 214 SDG indicators characterizing the general development level of each Member State.

The analysis resulted in the classification of countries in four clusters. The details of the pilot study and its key findings are presented in annex B. This section highlights some important findings relevant to interpreting the achievements of Member States in e-government development (as reflected in EGDI values) based on the assessment of development data covering an extended period and targeted similarities and differences between countries.

This advanced approach has a dual advantage over traditional statistical methods: first, the similarities between countries are determined by more than 500 indicators, providing a multifaceted representation of development in the clusters to which these countries are referred; second, the tool of network cluster detection offers a data-driven way to categorize different development ecosystems in which e-government development (expressed in EGDI values) can be interpreted and assessed.

Based on comparisons of EGDI values within and between clusters, the pilot study identifies "top-of-the-class" countries, whose performance surpasses expectations based on their development status, and "room-for-improvement" countries, which have the potential to reach the EGDI levels of their cluster peers by intensifying their development efforts. The study classifies as top-of-the-class countries those whose EGDI values fall above the 75th percentile for their own cluster and above the 25th percentile for at least one more developed cluster. Using similar criteria, the study classifies as room-for-improvement countries those whose index values are below the 25th percentile of their own cluster and below the 75th percentile of at least one less developed cluster.

As reflected in figure 1.11, all but one of the leading countries in the VH rating class in the very high EGDI group belong to cluster I. The United Arab Emirates, also from the VH rating class, is among the top-of-the-class countries in cluster II, reflecting a level of performance that surpasses the expectations associated with the country's cluster; Argentina, Chile, Kazakhstan, Saudi Arabia and Uruguay also perform exceptionally well in terms of e-government development in comparison with other countries in cluster II. This experimental analysis also highlights a certain level of overperformance that is partially obscured in the EGDI groupings of countries such as Uzbekistan, Indonesia, Kyrgyzstan, Philippines, Paraguay, Fiji and the Plurinational State of Bolivia (from cluster III) and Ghana and Kenya (from cluster IV). Many countries in cluster III have achieved levels of e-government development that are similar to or higher than those of some of the countries in clusters I and II.

Figure 1.11   Distribution of countries by cluster based on complex network analysis pilot study findings and EGDI values, 2022
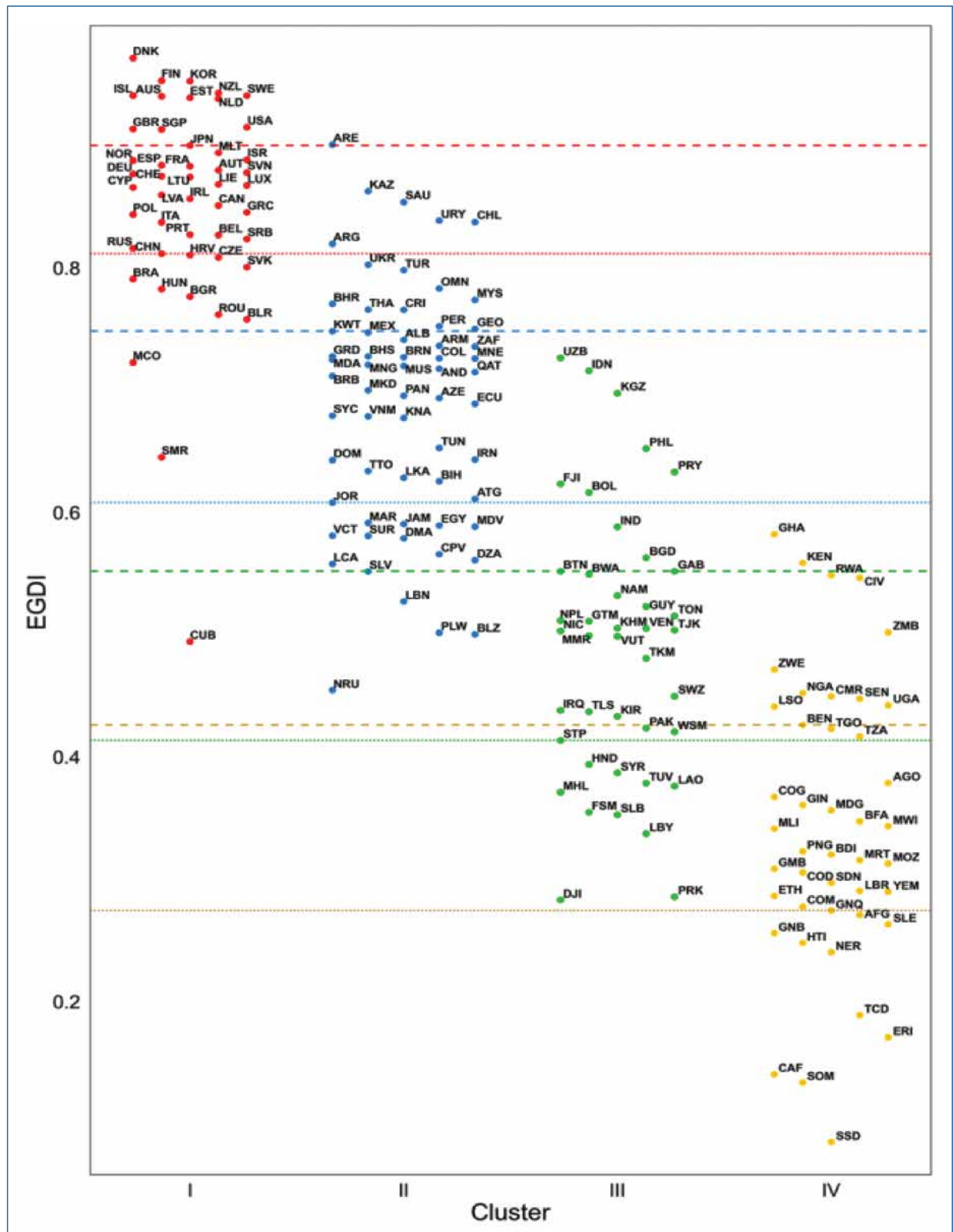
Source: Complex Network Analysis Pilot Study for the 2022 United Nations E-Government Survey (see annex B for details).

Note: The internationally recognized three-letter country codes can be found here and in Survey annex table 12.

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The cluster groupings are as follows:

- **Cluster I**
  - o *Benchmark*: Australia, Denmark, Estonia, Finland, Iceland, Netherlands, New Zealand, Republic of Korea, Singapore, Sweden, United Kingdom, United States
  - o *Room for improvement*: Cuba, Monaco, San Marino
- **Cluster II**
  - o *Top of the class*: Argentina, Chile, Kazakhstan, Saudi Arabia, United Arab Emirates, Uruguay
  - o *Room for improvement*: Belize, El Salvador, Lebanon, Nauru, Palau
- **Cluster III**
  - o *Top of the class*: Fiji, Indonesia, Kyrgyzstan, Paraguay, Philippines, Plurinational State of Bolivia, Uzbekistan
  - o *Room for improvement*: Democratic People's Republic of Korea, Djibouti, Federated States of Micronesia, Honduras, Lao People's Democratic Republic, Libya, Marshall Islands, Solomon Islands, Syrian Arab Republic, Tuvalu
- **Cluster IV**
  - o *Top of the class*: Cameroon, Cote d'Ivoire, Ghana, Kenya, Lesotho, Nigeria, Rwanda, Senegal, Uganda, Zambia, Zimbabwe
  - o *Trailing*: Afghanistan, Central African Republic, Chad, Eritrea, Guinea-Bissau, Haiti, Niger, Sierra Leone, Somalia, South Sudan

These findings indicate that individual countries are capable of advancing their e-government development beyond the constraints imposed by their cluster characteristics and that top-of-the-class countries in e-government development are found in each EGDI group. Considering these results, it will be interesting to engage in further exploration and investigation of new indicators that may contribute to providing an even more accurate assessment of e-government development.

1.8   Online Services Index

The OSI component of the EGDI is a composite indicator measuring the use of information and communications technology (ICT) by Governments for the delivery of public services at the national level. OSI values are based on the results of a comprehensive survey covering multiple aspects of the online presence of all 193 Member States. The survey assesses the technical features of national websites, as well as e-government policies and strategies applied in general and by special sectors in delivering services.

In the 2022 edition, for the first time, the OSI is calculated based on five weighted subindices. Specifically, Member States are assessed for services provision (45 per cent), technology (5 per cent), the institutional framework supporting e-government development (10 per cent), content provision (5 per cent), and e-participation (35 per cent). The overall composite OSI (hereinafter referred to as the OSI to ensure consistency with previous surveys) is calculated based on the normalized values for each OSI subindex (see annex A for details on the methodology used).

The results are tabulated and presented as a set of standardized index values on a scale of 0 to 1, with 1 corresponding to the highest-rated online services provision and 0 to the lowest. OSI values, like EGDI values, are not intended as absolute measurements; rather, they capture the online performance of countries relative to each other at a particular point in time. Because the OSI is a composite tool, a high value is an indication of current best practices rather than perfection. Similarly, a lower value, or a value that has not changed since the Survey's last edition, does not mean there has been no progress in e-government development.

Survey results relating to the OSI and its five subindices are presented below.

1.8.1 Country groupings by OSI and EGDI levels

A country's level of online services development does not always coincide with its overall EGDI level because the latter also comprises the TII and HCI subcomponents. It is important to identify cases in which the OSI level is higher or lower than the overall EGDI level so that targeted policies can be adopted and sufficient resources allocated for the improvement of online services provision. Table 6 in annex A groups the 193 United Nations Member States according to OSI level and also provides a corresponding EGDI level for each country. Figure 1.12 represents a snapshot distribution of OSI and EGDI levels, highlighting the positive correlation between progress in online services provision and overall improvement in e-government development (as reflected in OSI and EGDI values).

As indicated in table 1.3, OSI and EGDI levels coincide for 121 of the 193 Member States (63 per cent). However, 72 countries have OSI levels that are higher or lower than their respective EGDI levels, suggesting that their online services provision is at a more or less advanced stage than the development of their telecommunications infrastructure and/or human capital (as reflected in TII and HCI values and levels). Annex A provides a snapshot of divergences in OSI levels from respective HCI and TII levels for all of the Member States.

Figure 1.12 Snapshot distribution of OSI and EGDI levels for United Nations Member States, 2022
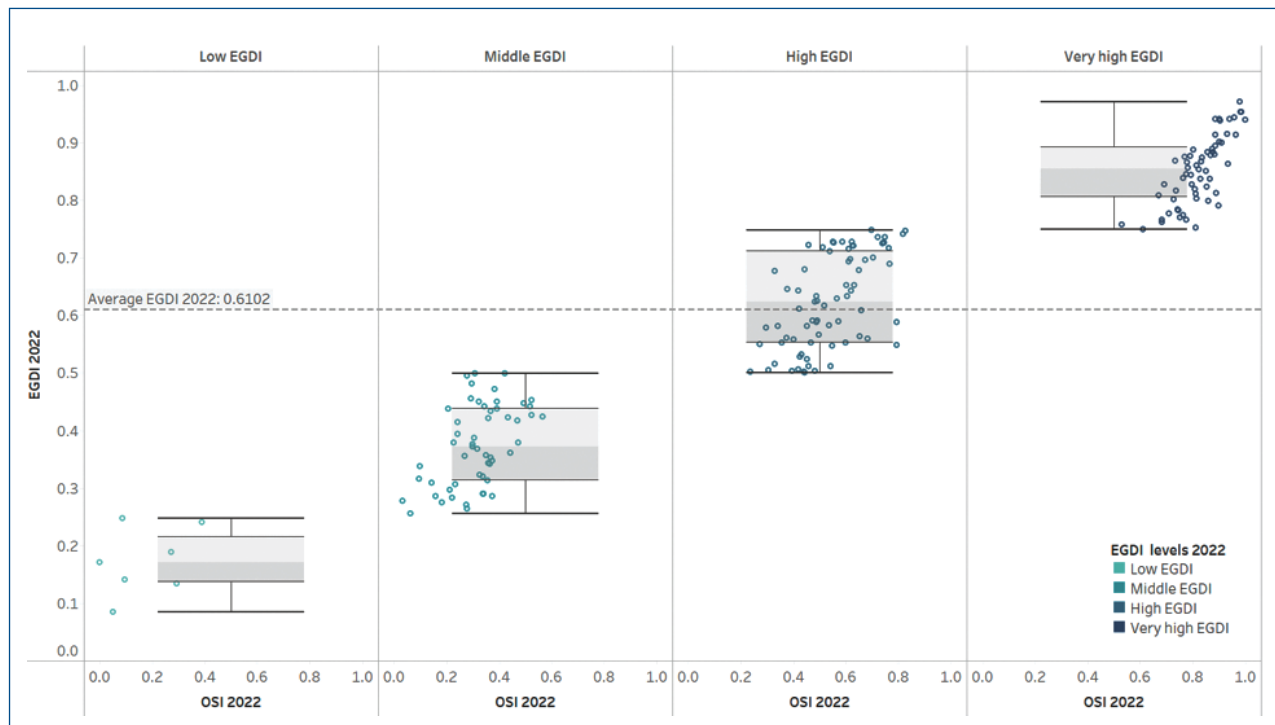
Source: 2022 United Nations E-Government Survey.

Table 1.3   Convergence and divergence of OSI levels relative to EGDI levels, 2022

Member States		Very high EGDI		High EGDI		Middle EGDI		Low EGDI	
Total	193	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Very high OSI	54	48	88.9	6	11.1	-	-	-	-
High OSI	50	12	24.0	34	68.0	4	8.0	-	-
Middle OSI	70	-	-	32	45.7	35	50.0	3	4.0
Low OSI	19	-	-	1	5.3	14	73.7	4	21.1

Source: 2022 United Nations E-Government Survey.

Note: The cells shaded in blue indicate convergence between OSI and EGDI levels. The cells shaded in green and red represent divergence (green = EGDI level > OSI level; red = OSI level > EGDI level).

The implications for improvement in e-government overall (expressed in EGDI values) for countries with divergences may differ from a policymaking perspective, which is addressed in the analysis of key divergences below.

Countries with OSI levels that are higher than their respective TII and HCI levels are relatively well situated in terms of online services provision and are in a good position to progress fairly rapidly in e-government development if infrastructure and human capital development permit. For this group of countries, online services provision should be coupled with investments in improving the telecommunications infrastructure and/or strengthening digital literacy.

Very high OSI group

Among the 54 countries with very high OSI values (ranging from 0.75 to 1.00), 48 have similarly high TII and HCI values. The remaining six countries have combinations of TII and HCI levels that diverge in some way from their respective OSI levels (see table 1.4).

Table 1.4   TII and HCI subcomponent convergence and divergence for the very high OSI group, 2022

Very high OSI			
High TII + Very high HCI	High TII + High HCI	Middle TII + Very high HCI	Middle TII + High HCI
Mexico Albania	Indonesia	Ecuador	India Rwanda

Source: 2022 United Nations E-Government Survey.

Albania, Mexico and Indonesia have highly developed infrastructure and human capital and are well on track to move up to the very high EGDI level. Rwanda, India and Ecuador are at a fairly high level in terms of human capital development and online services provision, but these countries are held back by relatively lower levels of infrastructure development (TII values are 0.3209, 0.3954 and 0.5269, respectively).

Box 1.1   Rwanda, India and Ecuador

Three countries with poorly developed telecommunications infrastructure—Rwanda, India and Ecuador—have stood out for their efficacy in strengthening the provision of inclusive, user-centric online services.

In **Rwanda**, public institutions offer 98 online services. The significant increase in national investment in online services provision has allowed the country to become a leader among the LDCs and to compete with the world's leading countries in e-government development. Aiming to address challenges and improve user-centricity in services provision, Rwanda is focusing on collecting real-time information for internal and strategic public planning, to guide decision-making processes, and to inform the development of targeted solutions. The country uses real-time specific, measurable, attainable, relevant and time-bound (SMART) analytics to track services delivery performance, including through heat maps and location-referenced quick performance reviews of public entities such as schools, hospitals and farming areas. The Government is strengthening inter-agency data sharing to facilitate problem solving and policy alignment and is taking steps to reduce costs, to improve the quality of existing services or develop new ones, to prevent, detect and mitigate errors, to decrease corruption, and to foster innovation with an eye to anticipating future trends. With financing from the World Bank Group and through collaboration with the private sector, Rwanda has launched several digital inclusion initiatives to help 250,000 households acquire digital devices and to provide 3 million people with the opportunity to improve their digital literacy. As part of its ICT for Governance Cluster Strategy 2020-2024, Rwanda is planning to further expand inclusive digital services and ICT-enabled empowerment.

The Government of **India** is implementing the Digital India initiative to build people-centric services for marginalized groups. The following are among the most recent initiatives:

- The Accessible India Campaign and mobile application has become a nationwide flagship initiative for achieving universal accessibility—one that enables people with disabilities to have access to equal opportunities, live independently, and participate fully in all aspects of life in an inclusive society. The campaign focuses specifically on enhancing the accessibility of the built environment, transport system and information and communication ecosystem. The mobile app is a crowdsourcing platform that allows administrators to obtain comprehensive information on inaccessible places across the country and to respond to relevant needs. Through this programme, 1,250 sign language interpreters have been trained, and 588 State government and 95 central government websites have become accessible for persons with disabilities.

- The AgriMarket app keeps farmers abreast of crop prices and discourages them from carrying out distress sales. Farmers can obtain crop price information for markets within a 50-kilometre radius using mobile GPS. To date, more than 80 million farm families have been reached through this app.

- MyGov is a platform created to promote and support public engagement in decision-making processes. The platform has 24.5 million registered users and offers many e-participation tools to facilitate the formation of online groups and thematic discussions, polls, surveys, blogs and talks. During 2021 and 2022, the Government has shared its plan for digital transformation with 9.5 million participants.

Box 1.1   *(continued)*

In **Ecuador**, the political commitment to reducing inequalities through investment in digital transformation is articulated in the 2021-2025 Opportunity Plan. Particular attention is given to bridging existing gaps in Internet access. The country has signed an agreement with the International Telecommunication Union (ITU) to move forward with plans to expand the 4G network and guarantee the connectivity of schools and health-care facilities that have been excluded until now, including in rural areas.

Sources: Member States Questionnaires; World Bank, "World Bank provides $100 million to accelerate Rwanda's digital transformation", press release, 30 November 2021 (Washington, D.C.), available at https://www.worldbank.org/en/news/press-release/2021/12/01/world-bank-provides-100-million-to-accelerate-rwanda-s-digital-transformation; Digital India website, available at https://www.digitalindia.gov.in/; BNamericas, "Ecuador's plans to promote digital transformation and industry 4.0", 21 October 2021, available at https://www.bnamericas.com/en/interviews/ecuadors-plans-to-promote-digital-transformation-and-industry-40.

High OSI group

Among the 50 countries with high OSI values (0.50 to 0.75), 16 have divergent HCI and/or TII levels (see table 1.5).

Table 1.5   TII and HCI subcomponent convergence and divergence for the high OSI group, 2022

High OSI			
Very high TII + Very high HCI	**High TII + Very high HCI**	**Middle TII + Middle HCI**	**Low TII + High HCI**
Belarus, Belgium, Bulgaria, Costa Rica, Czech Republic, Hungary, Liechtenstein, Oman, Romania, Russian Federation, Slovakia	Georgia	Pakistan, Nigeria, Benin	Uganda

Source: 2022 United Nations E-Government Survey.

Twelve of the sixteen countries listed in the table—Belarus, Belgium, Bulgaria, Costa Rica, Czech Republic, Georgia, Hungary, Liechtenstein, Oman, Romania, the Russian Federation and Slovakia—have a very high EGDI level that largely derives from high or very high HCI and TII levels, but more attention needs to be directed towards improving online services provision. The remaining four countries (Uganda, Pakistan, Nigeria and Benin) would benefit from investment in both TII and HCI development.

Middle OSI group

Divergences in EGDI and OSI levels are most pronounced for the group of countries with middle OSI values (0.25 to 0.50); among these 70 countries, 32 have high EDGI levels, and 3 have low EGDI levels. Table 1.6 identifies the variations in TII and/or HCI levels that are responsible for this divergence.

Well over half of the countries in the middle OSI group have high or very high TII values and high or very high HCI values; relatively advanced human capital and infrastructure development may constitute a solid foundation for efforts to improve online services provision in these countries. Underdeveloped or unevenly developed infrastructure constrains e-government development in Belize, Guyana, Lebanon, Namibia, Nepal, Nicaragua, Tajikistan and Zambia. Middle OSI levels have been achieved by Niger (0.3904), Somalia (0.2944) and Chad (0.2726), signifying that low levels of infrastructure and human capital development have not been an impediment to investment in online services delivery.

Table 1.6   TII and HCI subcomponent convergence and divergence for the middle OSI group, 2022

Middle OSI						
Very high TII + Very high HCI	Very high TII + High HCI	High TII + Very high HCI	High TII + High HCI	Middle TII + Very high HCI	Middle TII + High HCI	Low HCI + Low TII
Monaco, Seychelles, Saint Kitts and Nevis	San Marino	Fiji, Antigua and Barbuda, Iran (Islamic Republic of)	Algeria, Bosnia and Herzegovina, Botswana, Cabo Verde, Cambodia, Dominica, El Salvador, Gabon, Jamaica, Maldives, Morocco, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago	Tonga, Venezuela (Bolivarian Republic of)	Belize, Guyana, Lebanon, Namibia, Nepal, Nicaragua, Tajikistan, Zambia	Niger, Somalia, Chad

Source: 2022 United Nations E-Government Survey.

Low OSI group

Of the 19 countries with low OSI values (0.00 to 0.25), 14 are in the middle EDGI group and one is in the high EGDI group. Divergences resulting from TII and/or HCI levels for these countries are presented in table 1.7.

Table 1.7   TII and HCI subcomponent convergence and divergence for the low OSI group, 2022

Low OSI				
Middle TII + Very high HCI	Middle TII + High HCI	Middle TII + Middle HCI	Low TII + High HCI	Low TII + Middle HCI
Libya, Palau	Honduras, Iraq, Sao Tome and Principe	Djibouti, Gambia, Guinea-Bissau, Mauritania, Sudan	Democratic People's Republic of Korea, Democratic Republic of Congo, Equatorial Guinea, Tuvalu	Comoros

Source: 2022 United Nations E-Government Survey.

Online services provision lags behind infrastructure and human capital development in Libya, Palau, Honduras, Iraq, Sao Tome and Principe, Djibouti, Gambia, Guinea-Bissau, Mauritania and Sudan. At the same time, due to poor telecommunications infrastructure, the Democratic People's Republic of Korea, Democratic Republic of the Congo, Equatorial Guinea, Tuvalu and Comoros are falling behind, despite having high or middle levels of human capital development.

Movement between OSI groups

A total of 24 countries have moved from a lower to a higher OSI level since 2020; 7 moved from the low to the middle OSI group, 9 moved from the middle to the high OSI group, and 8 moved from the high to the very high OSI group. For 18 countries, however, the OSI level has declined; 8 moved from the very high to the high OSI group, 5 moved from the high to the middle OSI group, and 5 moved from the middle to the low OSI group. Although more countries have moved upward than downward, the volatility surrounding this EGDI subindex is concerning.

1.8.2　Country OSI levels by income group

As expected, the countries with higher income levels generally have higher OSI values, and they are also more homogeneous in terms of their e-government development (see figure 1.13). Most countries in the high-income bracket (64 per cent) have OSI values higher than the group average of 0.7542 and well above the global OSI average of 0.5554.

Figure 1.13　OSI averages by income group, 2022
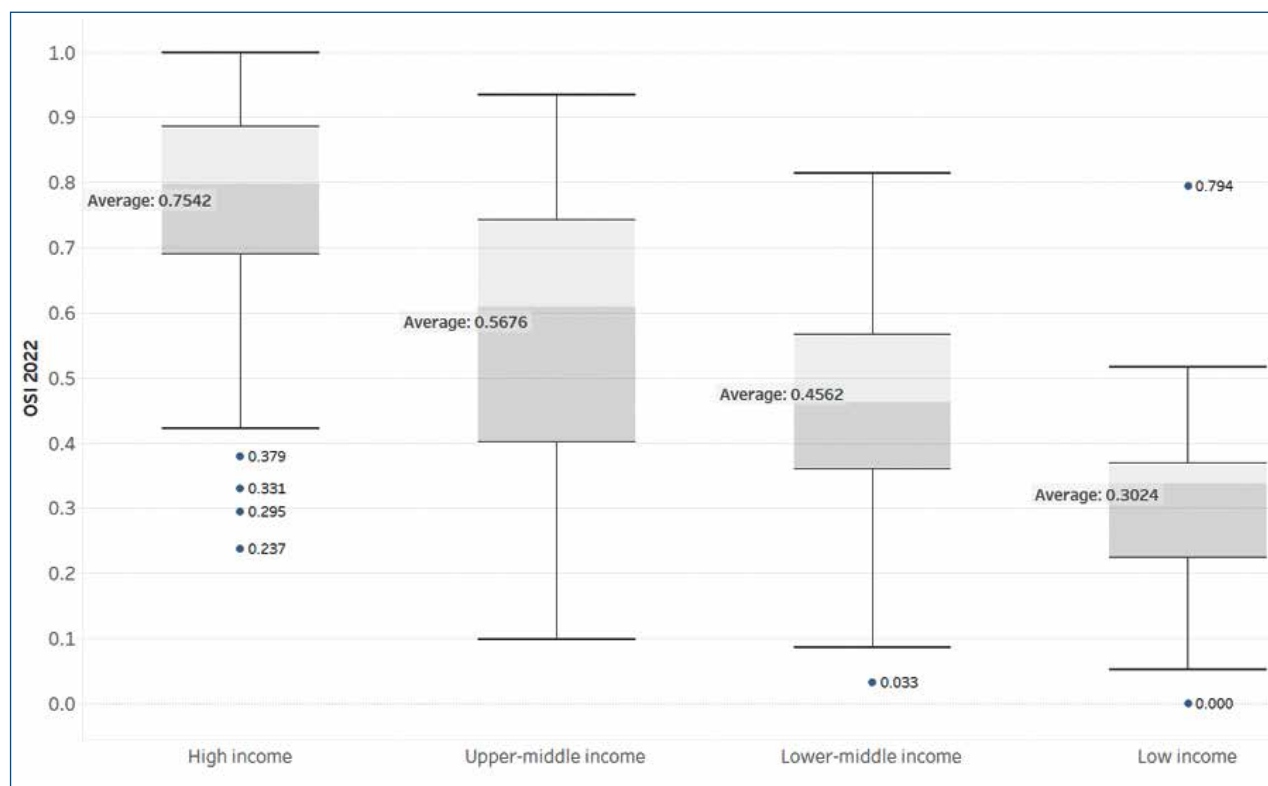
High-income countries also have a denser distribution of OSI values around the median value, suggesting a more even provision of online services. Upper-middle-income countries have greater variance in their OSI values; slightly over 51 per cent have average OSI values that are higher than the global average. The OSI averages for the low-income group (0.3024) and the lower-middle-income group (0.4562) are below the global OSI average of 0.5554.

1.8.3   Services provision subindex: progress in online services delivery

The services provision subindex of the OSI assesses a wide range of features, including the availability of various online transactional services, how government services are accessed (through one main portal or multiple dedicated portals), the existence and functionality of e-procurement platforms, the integration of GIS or geospatial data and technologies in online services provision, and the availability of sector-specific services and services for people in vulnerable situations. The data analysis and key findings are presented below.

Almost three quarters of the Member States (138 countries) use "one-stop-shop" portals for the online provision of different government services. The number of countries offering at least 1 of the 22 online transactional services assessed increased from 162 in 2020 to 189 in 2022, or by 16.7 per cent. The provision of 16 types of services is the global average, but 115 of the Member States (61 per cent) offer more (see figure 1.14).

Figure 1.14   Numbers of Member States offering specified numbers of online transactional services, 2022
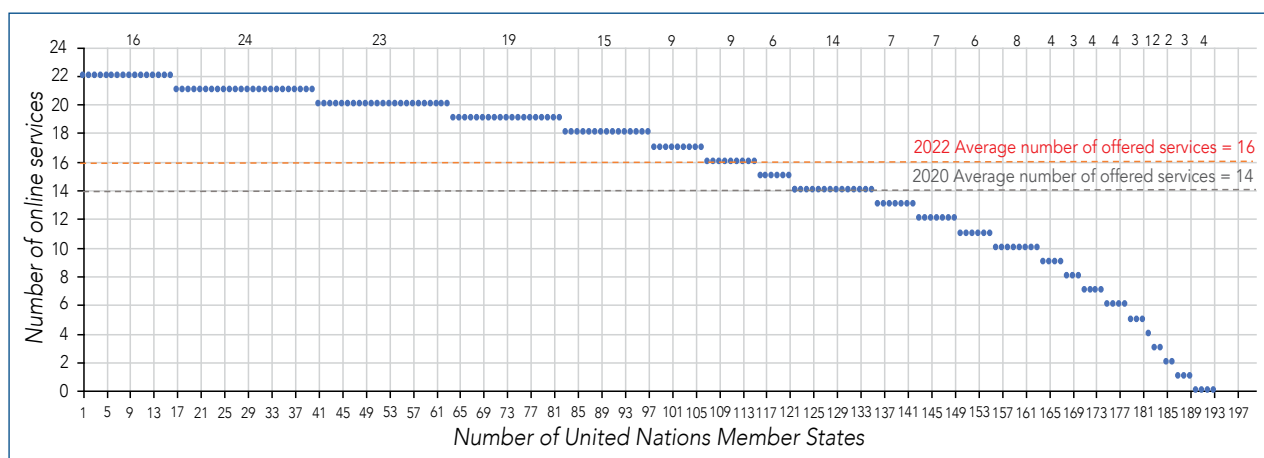
Source: 2022 United Nations E-Government Survey.

The number of countries providing the online services assessed has risen by an average of 5 per cent since 2020, with increases registered for all but one type of service. The number of countries offering services that allow users to apply for social protection programmes (such as maternity care, child subsidies, pensions, housing and food allowances) has seen the most significant increase (17 per cent), which may have occurred in response to the COVID-19 pandemic (see figure 1.15 and table 1.8). The only service being offered by fewer countries this year is the registration of motor vehicles, though there has been only a slight decline (6.1 per cent).

Globally, the most prevalent online transactional service is the registration of a new business; the number of countries providing this service has risen from 162 to 177 (or by 9.2 per cent) since 2020. Overall, business-related services such as registration, licensing and filing company taxes are among the five most frequently offered government services. The submission of business tax forms and payments online, similar to the services offered for income tax and Value Added Tax (VAT) submissions, is a new indicator added in 2022. The data suggest that tax filing services are offered more frequently to businesses (153 countries) than to individuals (151 countries for income tax and 142 countries for VAT).

**Figure 1.15   Trends in the provision of online transactional services, 2020-2022
(Number of countries and percentage change)**
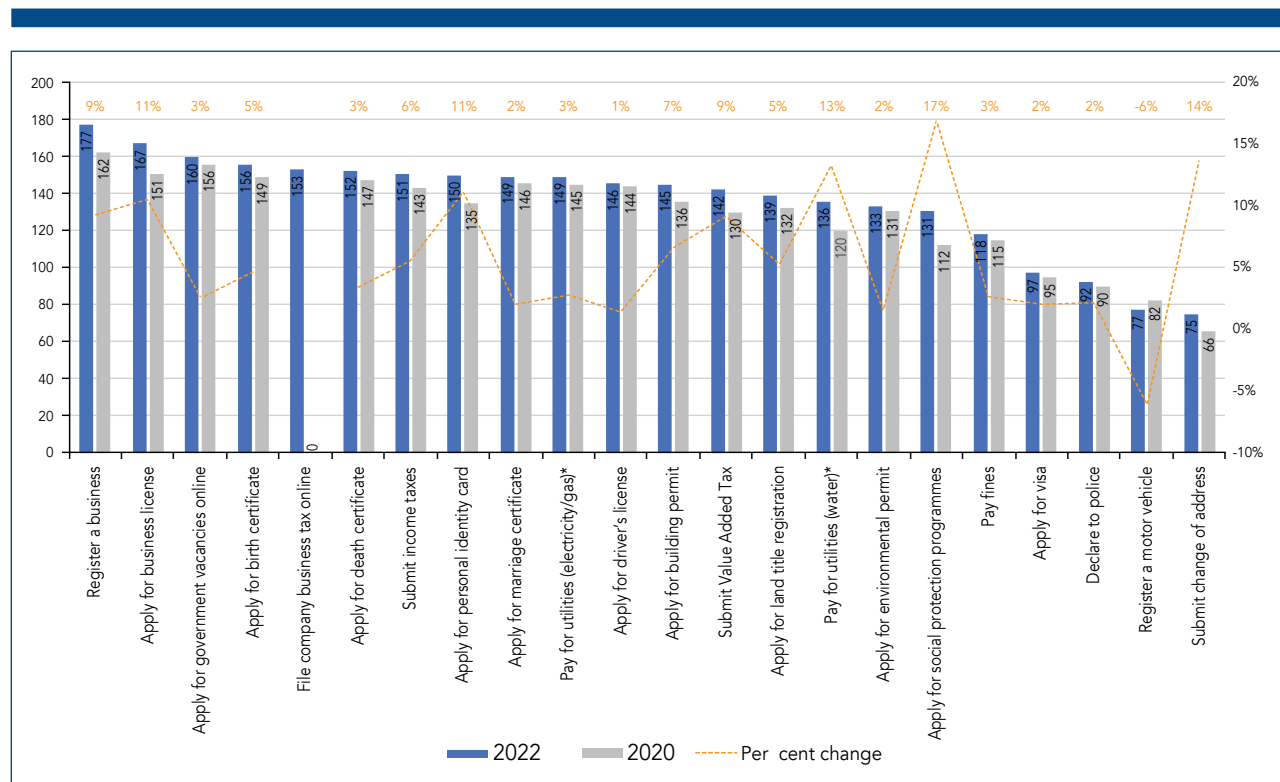
Source: 2022 United Nations E-Government Survey.

The next most commonly offered online services include applying for government vacancies and business licences, requesting birth, death, and marriage certificates, and paying utility bills. Among the least offered online services are paying fines (118 countries), applying for a visa (97 countries), making declarations to the police (92 countries), registering motor vehicles (77 countries) and submitting a change of address (75 countries).

The global coverage rate—the combined average of the proportion of Member States providing each type of online transactional service—rose from 66 per cent in 2020 to 71 per cent in 2022. The corresponding percentages for the different OSI groups vary widely. As shown in table 1.8 and figure 1.16, among countries with very high OSI values, coverage of the 22 services assessed is nearly universal (averaging 93 per cent for the 54 countries in this group). Countries with high OSI values also have strong online services coverage (averaging 83 per cent for the 50 countries in this group). The proportions are significantly lower for the remaining OSI groups, with coverage averaging 58 per cent for the 70 countries in the middle OSI group and 20 per cent for the 19 countries in the low OSI group. Around three quarters of the countries in the low OSI group (14 of the 19) are LDCs, LLDCs and/or SIDS.

It is important to note that progress is being made in online services delivery even in countries with low OSI levels, where the average number of online services offered rose from 1 in 2018 to 4.5 in 2022. Within the low OSI group, Equatorial Guinea offers the highest number of online services (14), followed by Djibouti, Honduras, Sao Tome and Principe, and Tuvalu (8-10); in 2020, the maximum number of services offered by any country in the low OSI group was nine. The five services most commonly provided by countries in this group are registering a business, applying for a building permit, and applying for a birth, death or marriage certificate.

Table 1.8   Trends in the provision of online transactional services and breakdown by OSI level, 2020-2022 (Number of countries and percentage change)

Trends in online transactional services, 2022	2022	2020	Per cent change	Very high OSI (total 54)		High OSI (total 50)		Middle OSI (total 70)		Low OSI (total 19)		UN Member States (193 countries)	
				Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Register a business	177	162	9%	54	100%	49	98%	64	91%	10	53%	177	92%
Apply for business license	167	151	11%	52	96%	47	94%	64	91%	4	21%	167	87%
Apply for government vacancies	160	156	3%	52	96%	49	98%	56	80%	3	16%	160	83%
Apply for birth certificate	156	149	5%	53	98%	45	90%	52	74%	6	32%	156	81%
File company/business taxes online	153	-		54	100%	48	96%	47	67%	4	21%	153	79%
Apply for death certificate	152	147	3%	52	96%	44	88%	50	71%	6	32%	152	79%
Submit income taxes	151	143	6%	54	100%	49	98%	45	64%	3	16%	151	78%
Apply for personal identity card	150	135	11%	52	96%	47	94%	45	64%	6	32%	150	78%
Apply for marriage certificate	149	146	2%	52	96%	42	84%	49	70%	6	32%	149	77%
Pay for utilities (electricity/gas)*	149	145	3%	51	94%	45	90%	50	71%	3	16%	149	77%
Apply for driver's license	146	144	1%	52	96%	43	86%	48	69%	3	16%	146	76%
Apply for building permit	145	136	7%	50	93%	42	84%	46	66%	7	37%	145	75%
Submit Value Added Tax	142	130	9%	53	98%	46	92%	40	57%	3	16%	142	74%
Apply for land title registration	139	132	5%	49	91%	43	86%	41	59%	6	32%	139	72%
Pay for utilities (water)*	136	120	13%	50	93%	39	78%	45	64%	2	11%	136	70%
Apply for environmental permit	133	131	2%	51	94%	47	94%	34	49%	1	5%	133	69%
Apply for social protection programmes	131	112	17%	54	100%	43	86%	33	47%	1	5%	131	68%
Pay fines	118	115	3%	51	94%	42	84%	21	30%	4	21%	118	61%
Apply for visa	97	95	2%	36	67%	32	64%	26	37%	3	16%	97	50%
Declare to police	92	90	2%	49	91%	22	44%	19	27%	2	11%	92	48%
Register motor vehicle	77	82	-6%	39	72%	26	52%	11	16%	1	5%	77	40%
Submit change of address	75	66	14%	44	81%	28	56%	3	4%	0	0%	75	39%

Sources: 2020 and 2022 United Nations E-Government Surveys.

Figure 1.16   Percentage of countries offering each type of online transactional service, by OSI level, 2022
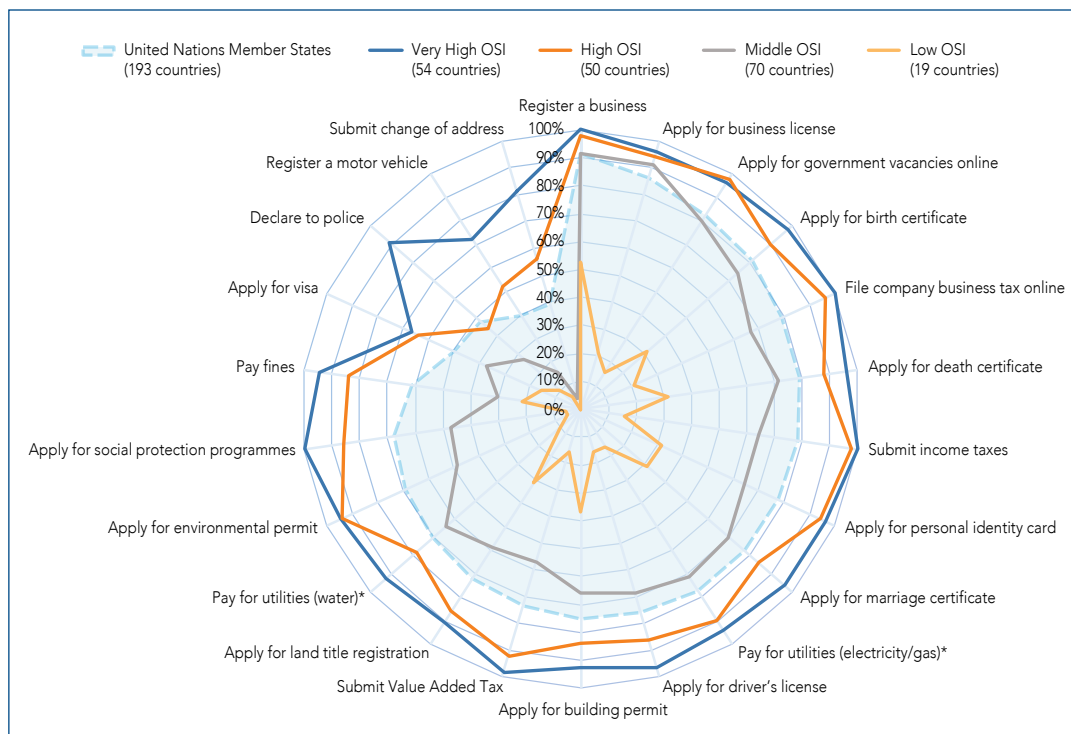
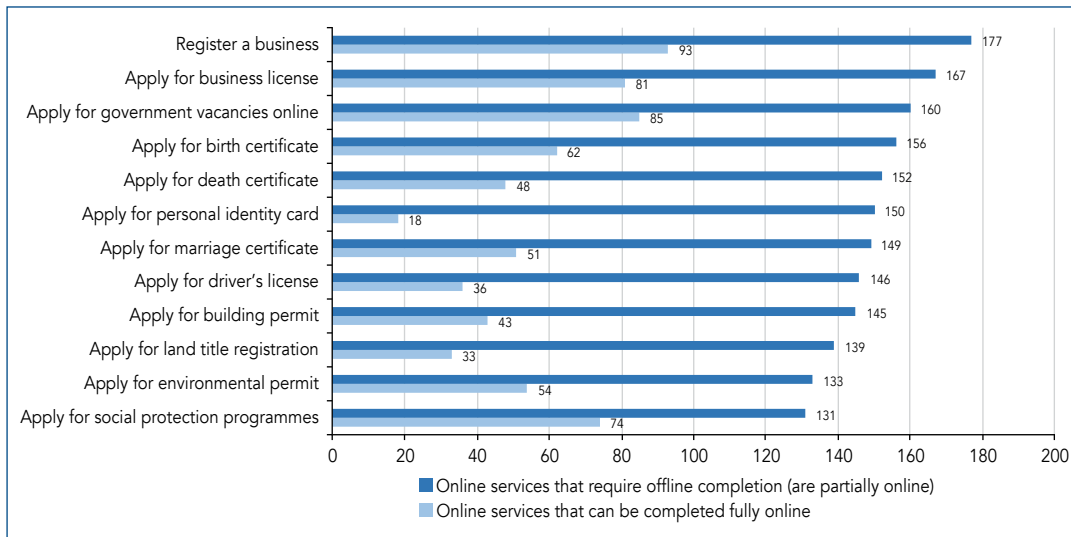*Source*: 2022 United Nations E-Government Survey.

*In previous Surveys, utilities were assessed together. Since 2020, the E-Government Survey has collected disaggregated data on utility payments for (a) electricity/gas and (b) water to allow more accurate tracking of services provision in all countries.

The 2022 Survey assessed not only the availability of the listed services, but also the level of digitalization—or in other words, whether users could complete transactions digitally. The assessment focused on applying for government vacancies, business licenses and registration, social protection programmes, environmental and building permits, land title registration, personal identity cards, driver's licenses, and birth, marriage and death certificates.

The findings indicate that the majority of countries use their portals to provide information, and the process of services delivery is partially digitalized, but one still needs to appear in person to complete most transactions (see figure 1.17). There is, however, a clear push towards higher levels of digitalization whereby users will no longer have to download or print forms but can complete their transactions fully online.

The data collected suggest that countries tend to assign priority to digitalizing the registration and licensing of businesses and the process of applying for government vacancies; more than half of the countries offering such services have them fully digitalized. The number of countries publishing government vacancies online rose from 156 in 2020 to 160 in 2022, and in 85 of those countries people can apply for government positions directly online. At the regional level, Europe has the highest proportion of countries recruiting for public positions online (41 of 43 countries), while Africa has the lowest (36 of 54 countries). It is encouraging to see that of the 131 countries allowing users to apply for social protection programmes online, 74 (56 per cent) have systems in place that allow all relevant transactions to be fully completed online.

Figure 1.17   Numbers of countries offering selected services that can be completed partially or fully online, 2022
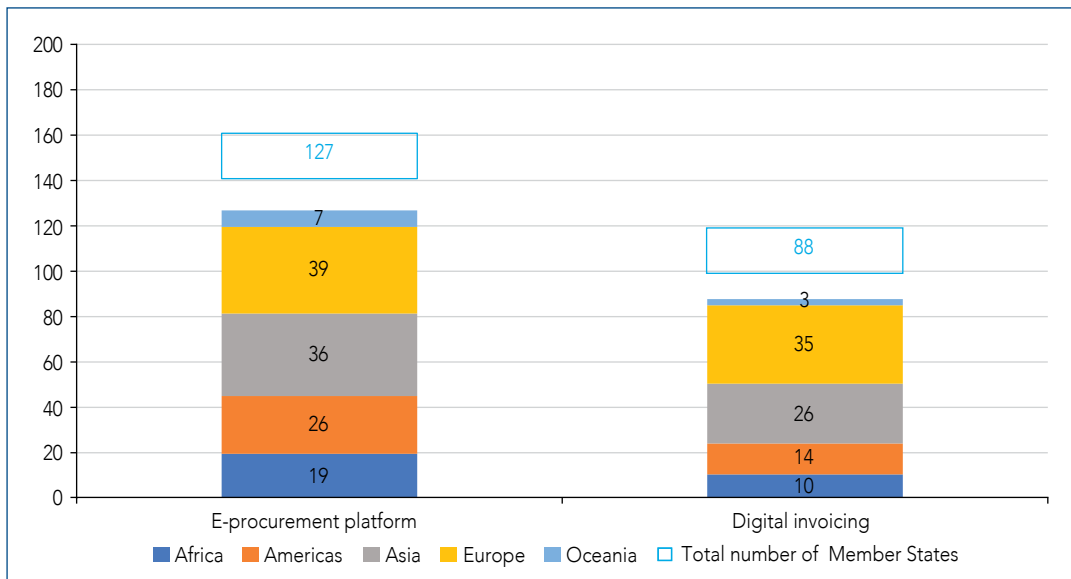

Register a business — 177 / 93
Apply for business license — 167 / 81
Apply for government vacancies online — 160 / 85
Apply for birth certificate — 156 / 62
Apply for death certificate — 152 / 48
Apply for personal identity card — 150 / 18
Apply for marriage certificate — 149 / 51
Apply for driver's license — 146 / 36
Apply for building permit — 145 / 43
Apply for land title registration — 139 / 33
Apply for environmental permit — 133 / 54
Apply for social protection programmes — 131 / 74

■ Online services that require offline completion (are partially online)
□ Online services that can be completed fully online

Source: 2022 United Nations E-Government Survey.

Public procurement services

As shown in figure 1.18, 127 countries have dedicated e-procurement portals, and 88 of them (69 per cent) use digital invoicing. While the number of countries with e-procurement portals has increased by only 2 since 2020, the number of countries with the ability to issue digital invoices has increased by 21 (17 per cent) over the past two years. The highest regional concentration of e-procurement portals is in Europe (39 of 43 countries, or 91 per cent), followed by Asia (36 of 47 countries, or 77 per cent), the Americas (26 of 35 countries, or 74.3 per cent), Oceania (7 of 14 countries, or 50 per cent), and Africa (19 of 54 countries, or 35.2 per cent). In Europe and Asia, most countries with e-procurement portals also use digital invoices (the respective proportions are 90 and 72 per cent). In other regions, the use of digital invoicing is less prevalent.

Figure 1.18   Number of countries with e-procurement platforms and digital invoicing capabilities, by region, 2022

E-procurement platform: Oceania 7, Europe 39, Asia 36, Americas 26, Africa 19 — Total number of Member States 127
Digital invoicing: Oceania 3, Europe 35, Asia 26, Americas 14, Africa 10 — Total number of Member States 88

■ Africa ■ Americas ■ Asia ■ Europe ■ Oceania □ Total number of Member States

Source: 2022 United Nations E-Government Survey.

E-procurement portals and digital invoices are far more common in high-income and upper-middle-income countries than in lower-middle-income countries, and these features are much less prevalent in low-income countries (see figure 1.19). For comparison, 8 out of 10 high-income countries are likely to have both a dedicated platform and a reliable system for digital invoicing, while the same is true for only 4 out of 10 lower-middle-income countries and 1 out of 10 low-income countries.

Figure 1.19   Percentage of countries with e-procurement platforms and digital invoicing, by income level, 2022
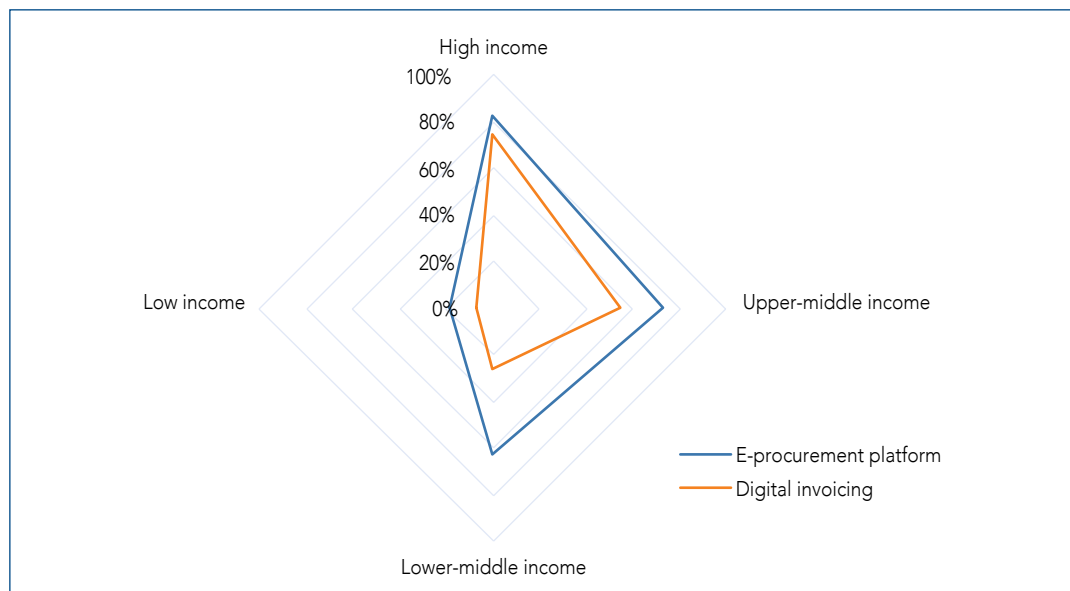
Source: 2022 United Nations E-Government Survey.

The use of geographic information systems and geospatial technologies in online services provision

The 2022 Survey assessed the availability of government services that integrate or are supported by GIS or other geospatial technologies (see figure 1.20). The results indicate that 119 of the Member States (about 62 per cent) offer such services, though the corresponding proportions vary widely among the different OSI and regional groups. All 54 of the countries in the very high OSI group offer services supported by GIS or other geospatial technologies; the same is true for 34 of the 50 countries in the high OSI group and 30 of the 70 countries in the middle OSI group. Europe is the region with the highest proportion of countries using geospatial technologies in services provision (91 per cent), followed by the Americas (69 per cent), Asia (60 per cent), Oceania (50 per cent) and Africa (39 per cent).

Figure 1.20   Number of countries that offer services integrating or supported by GIS or other geospatial technologies, by OSI level and region, 2022
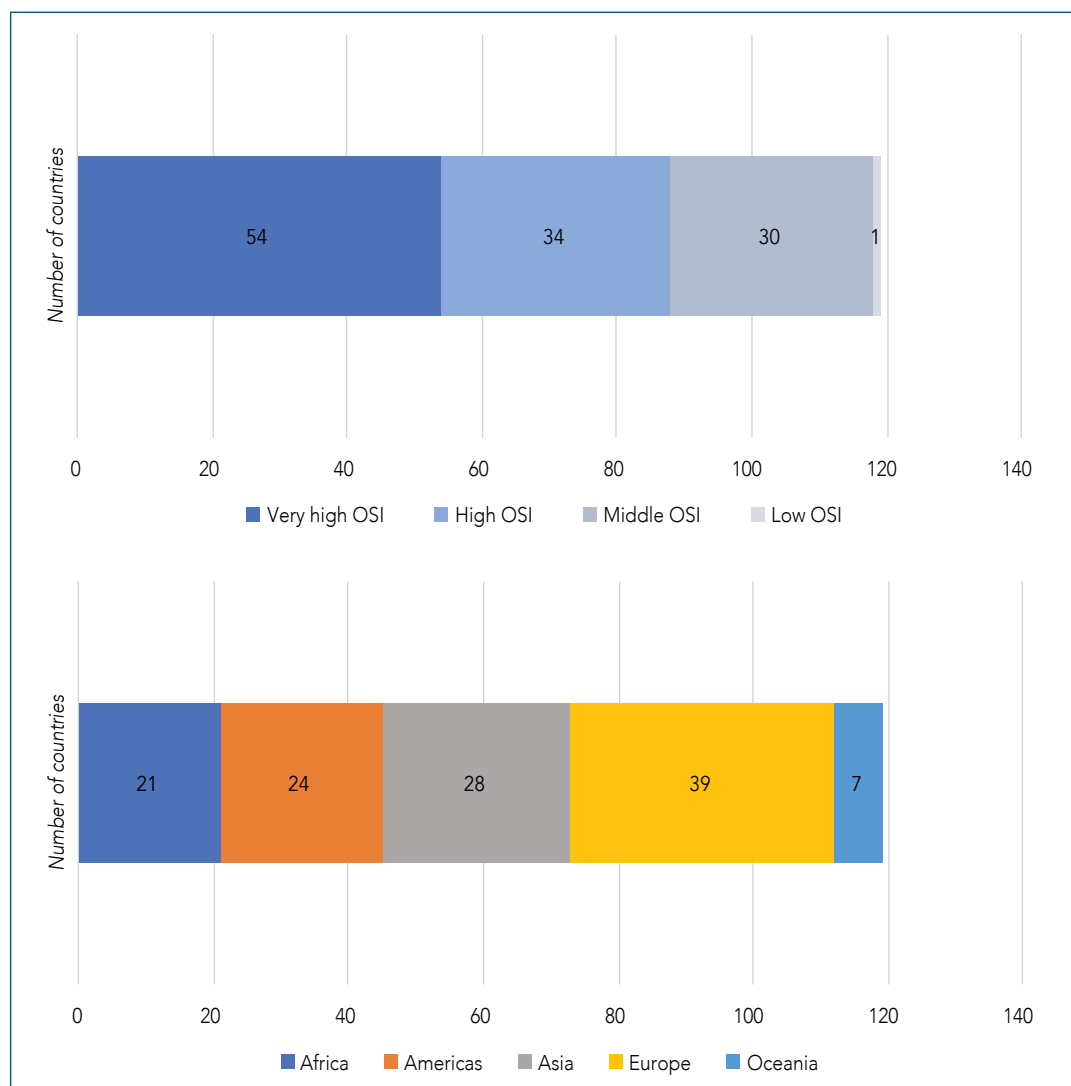
Source: 2022 United Nations E-Government Survey.

Targeted services for people in vulnerable situations

The 2022 Survey has assessed the availability of a wider range of services for vulnerable groups, covering not only services specifically targeting populations that are traditionally identified as vulnerable (including persons with disabilities, women, older persons, immigrants, youth, and people living in poverty), but also frequently offered government services that support different vulnerable groups or multiple underserved populations at the same time. This subsection shares the Survey findings and, where possible, assesses progress made since the previous Survey.

The number of countries providing information and services that target specific vulnerable populations increased by 6 per cent between 2020 and 2022, compared with 11 per cent for the previous two-year period (see figure 1.21). Services aimed at supporting immigrants are provided by the highest number of countries (163), followed by services for women (162 countries), persons with disabilities (157 countries), young people (155 countries), and people living in poverty and older

people (144 countries each). The highest rates of growth in online services provision (as reflected in the increase in the number of countries providing the service) have been for immigrants (19 per cent) and people living in poverty (11 per cent); the number of countries providing services targeting women and persons with disabilities rose by approximately 6 per cent each, while the number of countries offering services for older persons and young people declined by 5 and 1 per cent, respectively. Between 23 and 31 per cent of those services are fully digitalized, allowing people to complete their transactions online.

Figure 1.21   Numbers of countries offering services for people in vulnerable situations that can be completed partially or fully online, 2020 and 2022 (Percentage change)
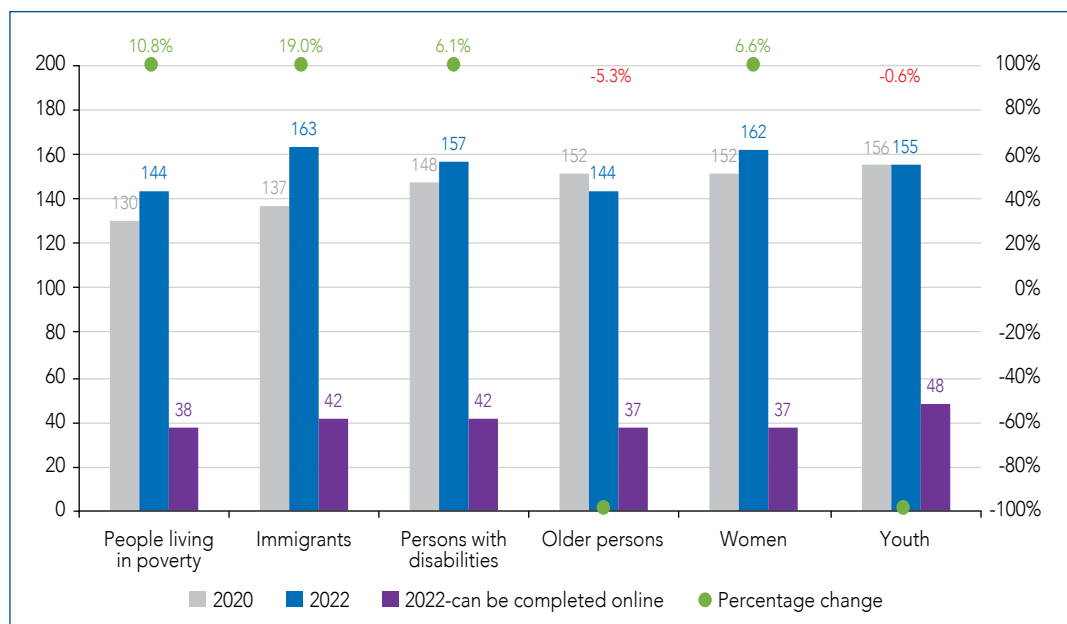
Source: 2022 United Nations E-Government Survey.

As noted above, the Survey has traditionally assessed a range of services targeting specific people in vulnerable situations. For those living in poverty, for instance, Survey indicators have focused on people's ability to apply for government support. For older persons, the Survey has explored the provision of information and services relating to retirement, housing facilities, long-term-care programmes, and options for receiving care and support at home. For young people, the availability of information and services linked to employment programmes, scholarships and government funding has been the focus. In 2022, a number of new areas are being assessed, including services for people retiring from a job and for those applying for unemployment benefits, child benefits, maternal or newborn benefits, disability compensation, or other benefits due to illness or injury. As shown in figure 1.22, services linked to job retirement are offered by the highest number of countries (152), followed by services that allow users to apply for disability compensation (134), benefits due to illness or injury (131), child benefits (126), and maternal or newborn benefits (124). In just over half of the Member States (106 countries), individuals can file for unemployment benefits online.

As illustrated in figure 1.23, Europe is the region with the highest proportion of countries providing online services for people in vulnerable situations (95 per cent), followed by the Americas (72 per cent), Asia (69 per cent), Oceania (45 per cent), and Africa (44 per cent).

Figure 1.22   Number of countries providing newly assessed online services for people living in vulnerable situations, and number and percentage of countries in which such services can be fully completed online, 2022
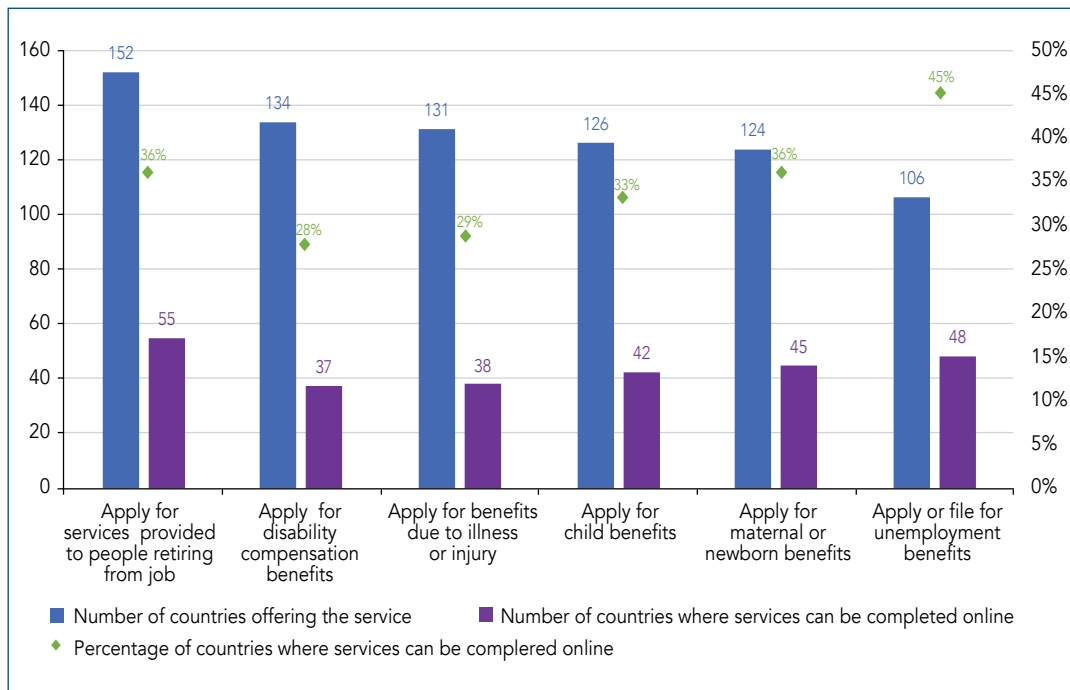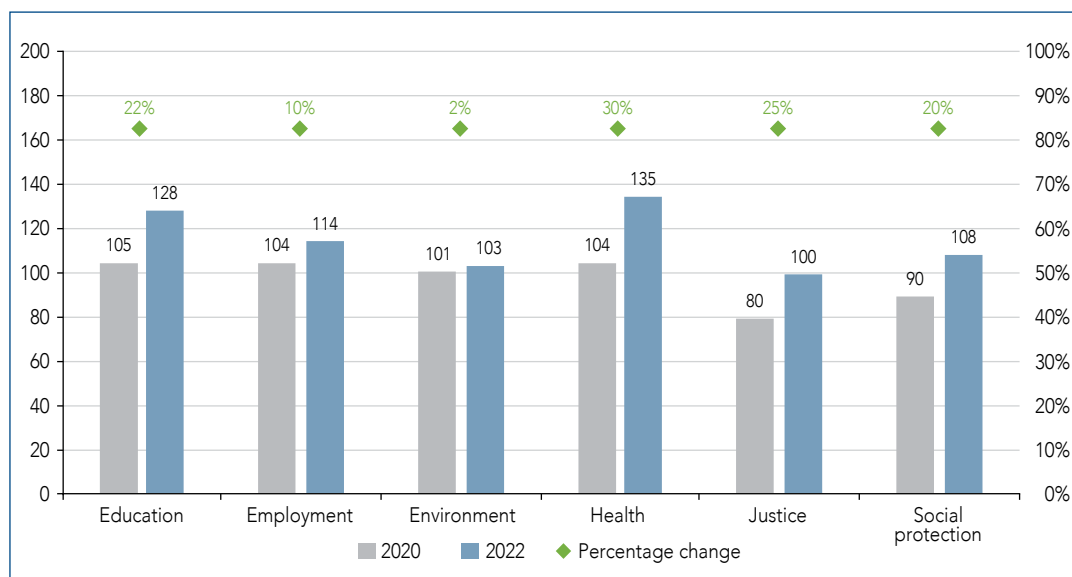

Source: 2022 United Nations E-Government Survey.

Figure 1.23   Percentage of countries providing newly assessed online services to people in vulnerable situations, by region, 2022d number and percentage of countries in which such services can be fully completed online, 2022
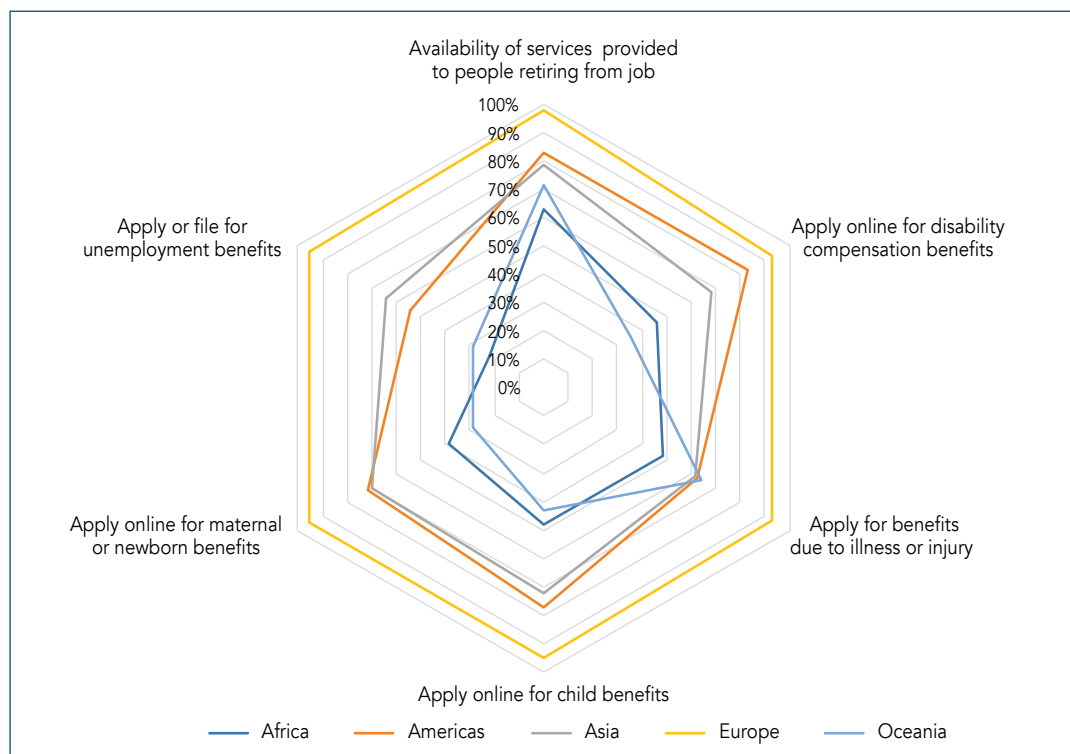
Source: 2022 United Nations E-Government Survey.

Sector-specific online information and services: sharing via mobile technologies

The Survey has been tracking the development of online services relating to health, education, employment, environment and social protection since 2016; since 2020, the Survey has also been tracking e-services linked to the justice sector, assessing the ability of users to file or open court cases online, manage or retrieve information on their cases, or apply online to receive an affidavit of criminal history or background clearance.

The Survey assesses whether countries proactively utilize short message service (SMS) and mobile applications to share sector-specific public information and provide online services. As shown in figure 1.24, the number of countries providing information and services through smartphone applications, SMS and/or mobile browsers increased for all sectors by an average of 18 per cent between 2020 and 2022. The health sector saw the most significant increase (30 per cent), largely owing the widespread adoption of digital solutions in response to the COVID-19 pandemic, but growth was also evident for the justice sector (25 per cent), the education sector (22 per cent), and the social protection sector (20 per cent). The number of countries offering mobile services linked to specific sectors may be summarized as follows, in descending order of prevalence: health (135), education (128), employment (114), social protection (108), environment (103), and justice (100).

Figure 1.24 Number of countries using SMS and/or mobile applications for public information updates and services provision, by sector, 2020 and 2022
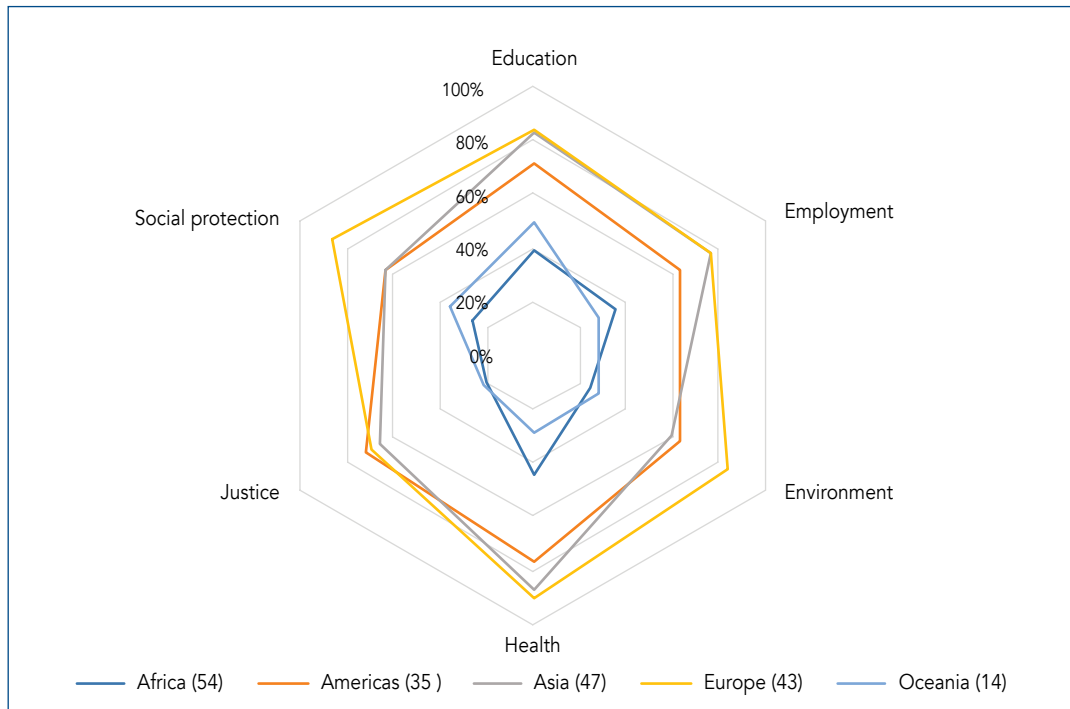

Sources: 2020 and 2022 United Nations E-Government Surveys.

At the regional level, Europe has the highest proportion of countries offering sector-specific mobile services (82 per cent), followed by Asia (73 per cent), the Americas (68 per cent), Oceania (32 per cent) and Africa (31 per cent) (see figure 1.25).

The continued expansion of mobile services delivery is linked to improved access to fixed (wired) broadband and a global average increase of almost 14 per cent in subscriptions for this service, a global average increase of 13 per cent in active mobile subscriptions, and a higher percentage of individuals using the Internet (see figure 1.26).

Figure 1.25 Percentage of countries offering sector-specific mobile services, by region, 2022

Source: 2022 United Nations E-Government Survey.

Figure 1.26 Share of the population using the Internet (2022) and percentage change in fixed (wired) broadband, active mobile broadband and mobile cellular subscriptions per 100 inhabitants (2020-2022), by region
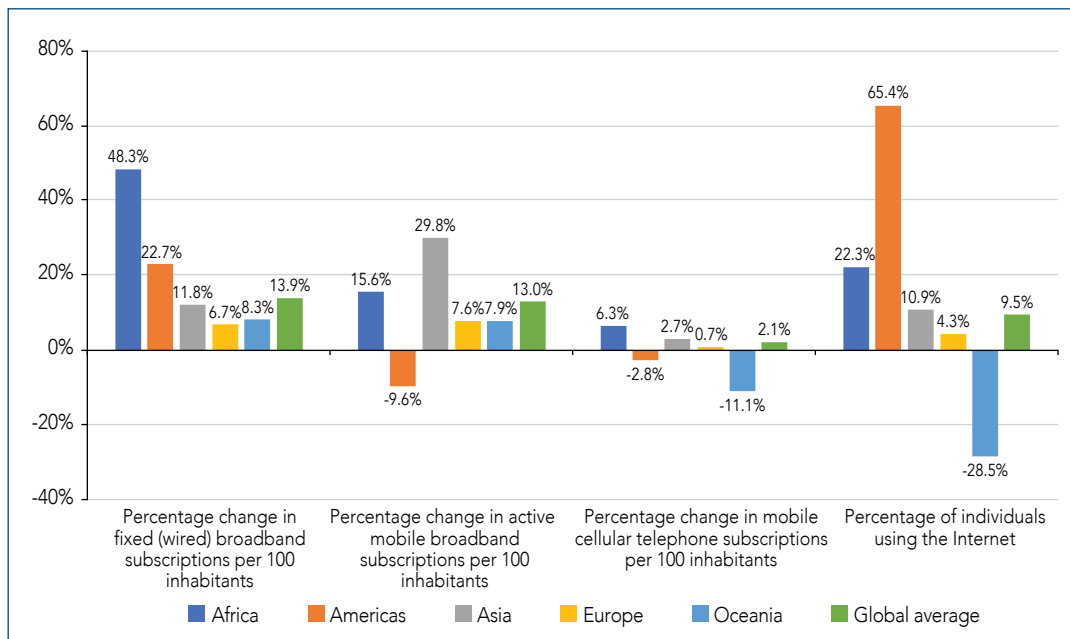
Source: 2022 United Nations E-Government Survey.

There has been an increase in fixed (wired) broadband subscriptions in all regions since 2020; the 48 per cent jump in Africa is noteworthy, though the subscription rate in this region remains the lowest by far at 2.7 subscriptions per 100 inhabitants (see table 1.9). Europe has the highest rate of fixed broadband use, at around 34.4 per 100 inhabitants, a slight increase from 32.2 in 2020. Over the past two years, the proportion of the population using the Internet has also risen in most regions, increasing by 65 per cent in the Americas, 22 per cent in Africa, 11 per cent in Asia, and 4 per cent in Europe. Oceania has registered a decline of 29 per cent in Internet usage and 11 per cent in mobile cellular telephone subscriptions. Europe is the leader in terms of active mobile broadband subscriptions per 100 inhabitants (98), followed by Asia (80) and the Americas (66).

Table 1.9 Percentage of the population using the Internet and fixed (wired) broadband, active mobile broadband, and mobile cellular telephone subscriptions per 100 inhabitants, by region, 2022

	Fixed (wired) broadband subscriptions per 100 inhabitants		Active mobile broadband subscriptions per 100 inhabitants		Mobile cellular telephone subscriptions per 100 inhabitants		Percentage of individuals using the Internet	
	2020	2022	2020	2022	2020	2022	2020	2022
Africa	1.8	2.67	37	42.77	78.7	83.68	27	33.01
Americas	14.2	17.43	73	65.96	104.9	101.92	41	67.81
Asia	10.9	12.19	62	80.50	103.1	105.93	57	63.21
Europe	32.2	34.37	91	97.90	113.1	113.86	82	85.52
Oceania	7.2	7.80	40	43.15	81.6	72.53	61	43.59
Global average	13.26	15.10	60.6	68.47	96.28	98.32	54	59.14

Source: International Telecommunication Union, Statistics (2020 and 2022), available at https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx.

As indicated in figure 1.27, the cost of mobile broadband subscriptions as a percentage of gross national income per capita remains significantly higher in Africa than in other parts of the world, contributing to the digital divide.

Figure 1.27 The cost of active mobile broadband subscriptions as a percentage of gross national income per capita, by region, 2022

Source: International Telecommunication Union, Statistics (2022), available at https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx.
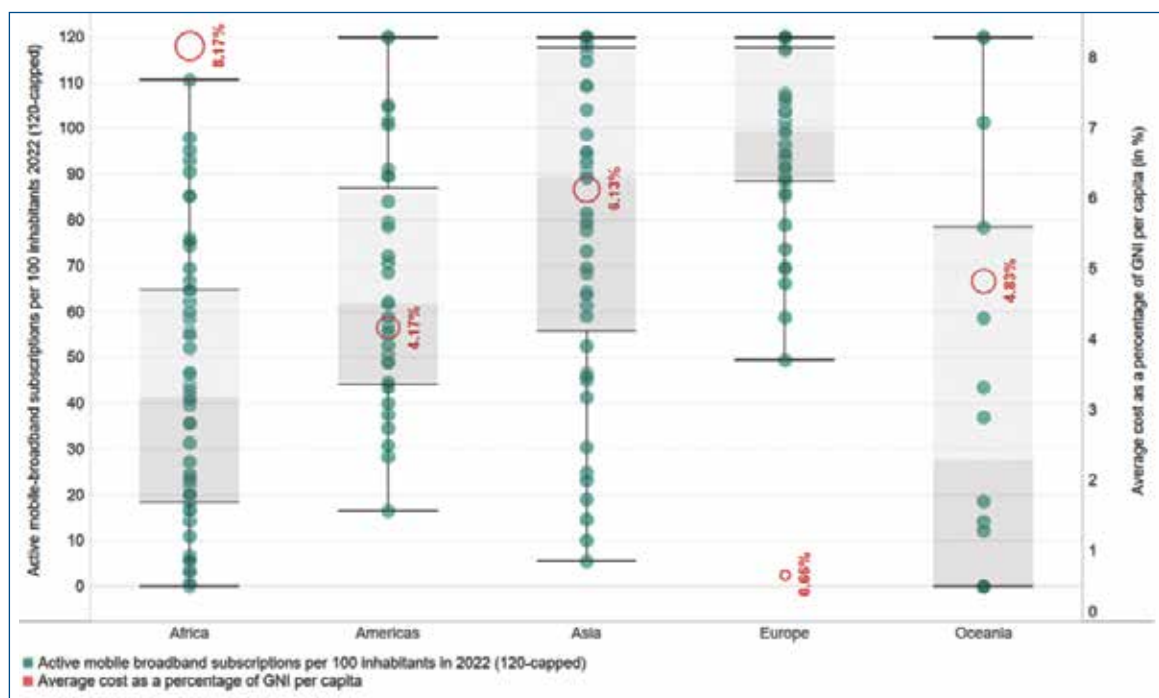
1.8.4   Technology subindex

At the time the countries were assessed for the 2022 Survey, all but three (Belize, Eritrea and Mauritania) had national portals.[3] Most of the government portals (98 per cent) can be found by search engines, have a "contact us" page, and utilize Hypertext Transfer Protocol Secure (HTTPS) to provide a safe experience for users (see figure 1.28). In 94 per cent of the countries assessed, the portals have a basic search feature on the homepage; only 58 per cent offer "advanced search" options. Most portals are developed using responsive web design (88 per cent), are updated at least once a month (82 per cent), have a sitemap (71 per cent), and include a section that provides help or addresses frequently asked questions (71 per cent); fewer countries (58 per cent) have portals that offer tutorials or guidance to ensure that people understand how use the services offered.

In 2022, for the first time, the Survey has assessed whether individuals and businesses are able to use the national portal to access or modify any data the government has on record that pertains to them. The findings indicate that 65 per cent of the countries surveyed allow businesses to access their data online, with 64 per cent giving individuals the same right. Modifying data is possible for business entities in 58 per cent of the countries and for individuals in 50 per cent of the countries surveyed.

In 112 countries (58 per cent of the Member States), users can save specific service transactions initiated on the portal and access them later, and in 109 countries (57 per cent), they can also access a list of previous transactions. Users can customize or personalize the national portal or bookmark their favourite or most frequently used online services in only 31 countries (16 per cent). In 51 countries (26 per cent), portals have begun to feature AI-enabled chatbot functionality.

Figure 1.28   Number of Member States with the assessed portal features, 2022
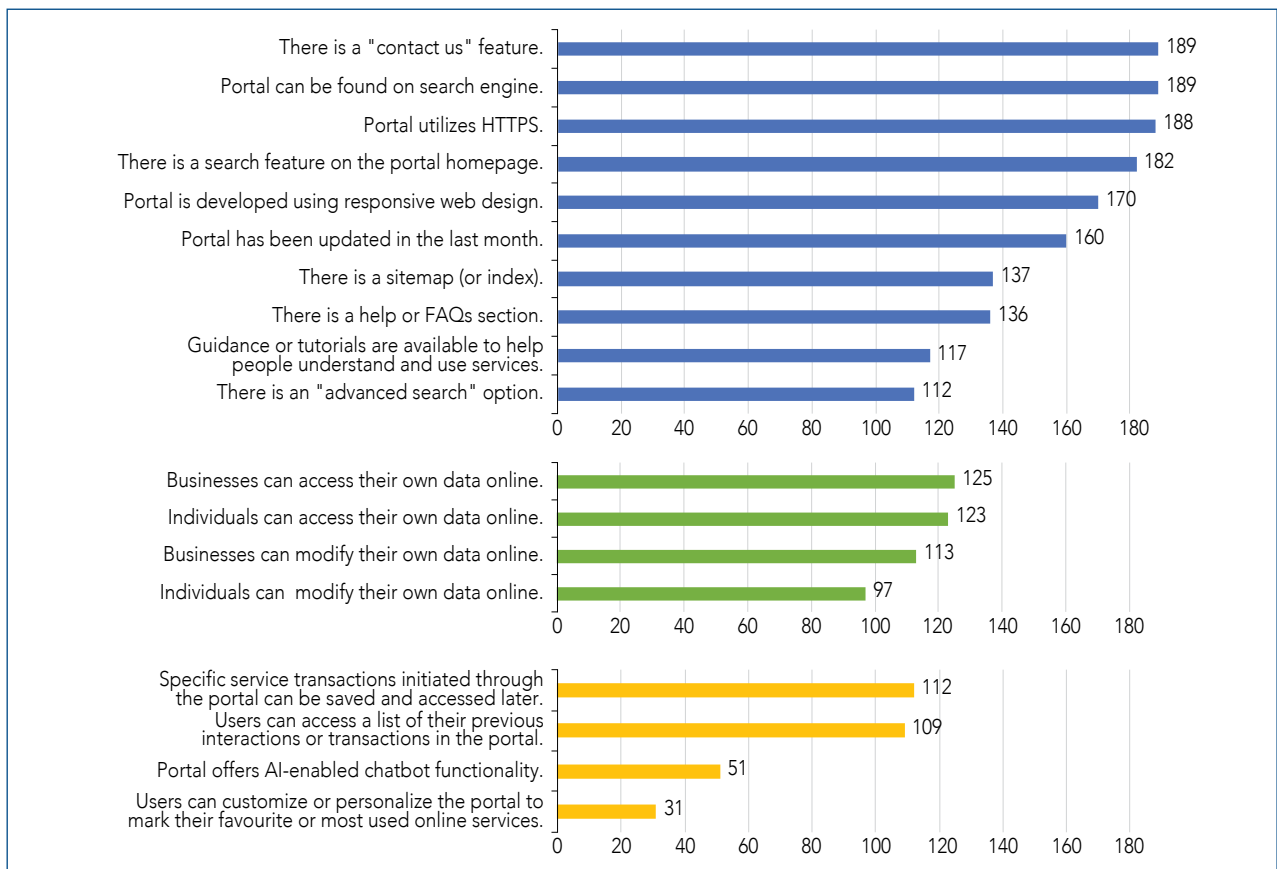
Source: 2022 United Nations E-Government Survey.

1.8.5   Institutional framework subindex

Many aspects of the institutional framework supporting e-government development have always been assessed in the Survey, generally as part of the broader analysis, but the 2022 edition features a new OSI subindex that focuses exclusively on the institutional framework. Some relevant analytical findings are presented below.

Almost all of the Member States have national portals that are fully operational. The vast majority of countries (93 per cent) make the government organizational chart and information on the government structure available on their portals, 90 per cent provide the names and titles of the heads of government agencies, departments and ministries, 77 per cent furnish information on the national CIO or the equivalent, and 74 per cent share links to subnational or local government agencies. Such information helps orient users and allows them to engage effectively with government agencies through online platforms.

An average of 90 per cent of the countries surveyed have national portals that provide links to ministerial websites and offer sources of information on sector-specific policies (see figure 1.29).
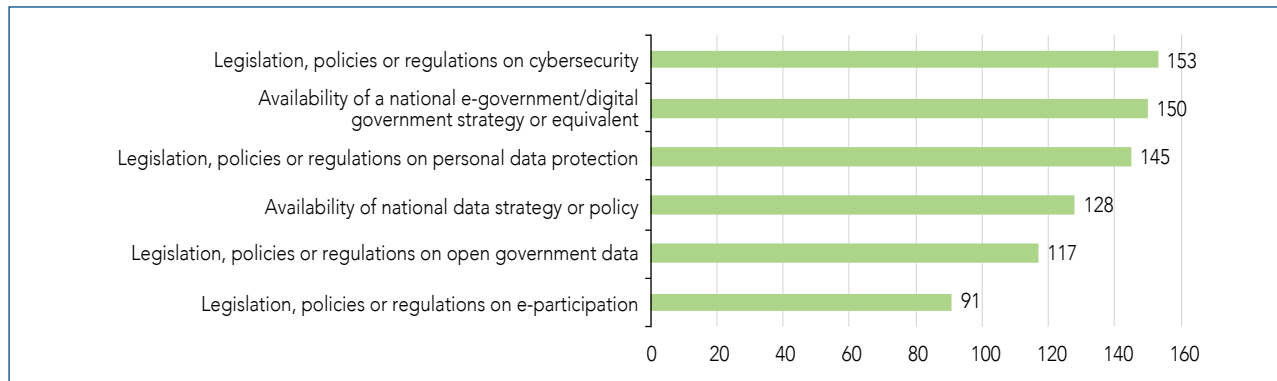
Figure 1.29   Number of countries with links to sectoral ministries and policies on their national portals, 2022
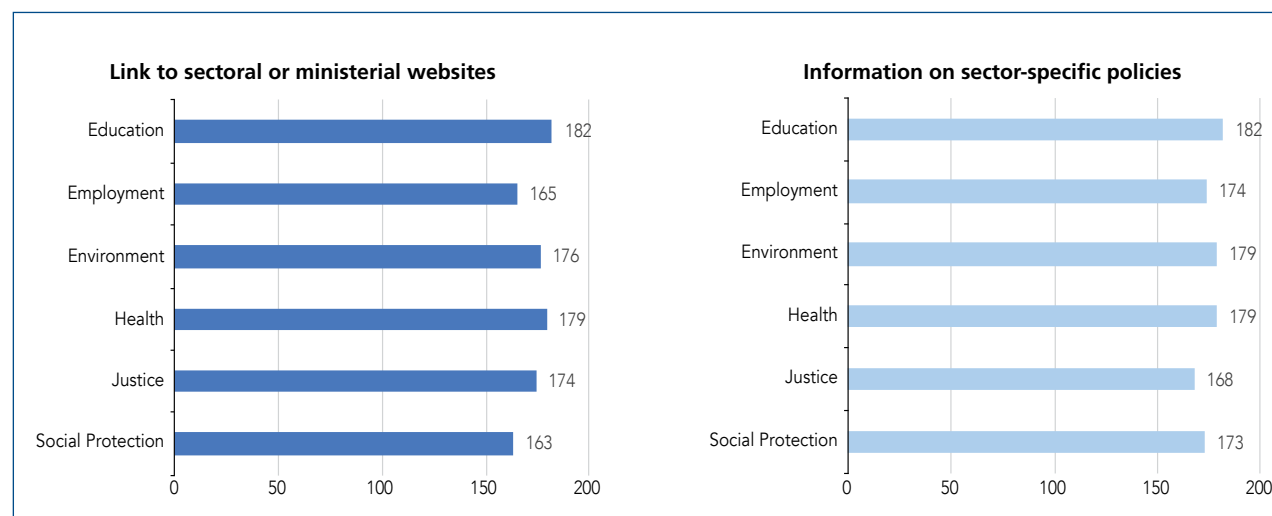
Source: 2022 United Nations E-Government Survey.

Among the key elements of a conducive e-government ecosystem are a legislative framework that regulates digital transformation and legal mechanisms that ensure access to public information and compliance with online privacy protocols. According to 2022 Survey data, 132 countries (68 per cent) have legislation guaranteeing freedom of information and access to information, and 127 countries (66 per cent) have privacy statements available on their government portals. As illustrated in figure 1.30, most countries have a national electronic or digital government strategy (155), a national data policy or strategy (128), and legislation on cybersecurity (153), personal data protection (145), and open government data (117); 91 countries, or almost half of those surveyed, have laws relating to e-participation.

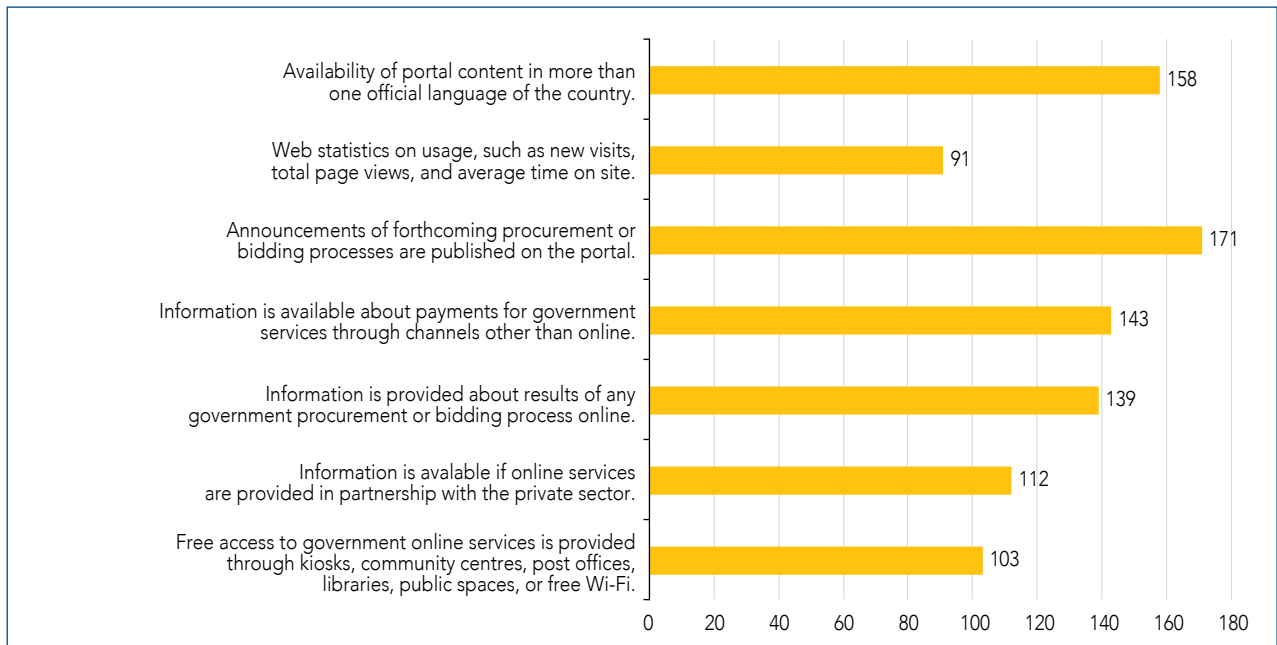Figure 1.30 Legislative framework for e-government development, 2022

Category	Value
Legislation, policies or regulations on cybersecurity	153
Availability of a national e-government/digital government strategy or equivalent	150
Legislation, policies or regulations on personal data protection	145
Availability of national data strategy or policy	128
Legislation, policies or regulations on open government data	117
Legislation, policies or regulations on e-participation	91

Source: 2022 United Nations E-Government Survey.

1.8.6   Content provision subindex: sharing public information

The availability of government information and services in multiple languages or through multiple channels facilitates access and inclusiveness. As shown in figure 1.31, more than 80 per cent of the Member States (158) have portals with content available in more than one official language. Fewer than half of the countries assessed (91) proactively share web statistics on usage such as the number of new visits, total page views, or average time spent on site on their national portals.

Figure 1.31   Content provision on national portals, 2022 (Number of countries)

Category	Value
Availability of portal content in more than one official language of the country.	158
Web statistics on usage, such as new visits, total page views, and average time on site.	91
Announcements of forthcoming procurement or bidding processes are published on the portal.	171
Information is available about payments for government services through channels other than online.	143
Information is provided about results of any government procurement or bidding process online.	139
Information is avalable if online services are provided in partnership with the private sector.	112
Free access to government online services is provided through kiosks, community centres, post offices, libraries, public spaces, or free Wi-Fi.	103

Source: 2022 United Nations E-Government Survey.

The majority of countries (171) publish announcements of forthcoming procurement or bidding processes on their national portals, but only 139 countries provide online information about the results of those processes.

In 143 countries, Governments inform portal users about alternatives to paying for government services online, but only 103 countries (53 per cent) provide information about and/or free access to online government services via kiosks, community centres, post offices, libraries, public spaces or free Wi-Fi. Most countries (112) inform people about partnership arrangements with the private sector for the online delivery of public services.

1.8.7   E-participation subindex

Public participation is a key dimension of governance, and its importance is highlighted in a number of SDG indicators and targets, including target 16.7, which calls for ensuring "responsive, inclusive, participatory and representative decision-making at all levels". The use of information and telecommunications technology to engage people in public decision-making and services delivery is an essential part of e-government, and since 2001 the Survey has regularly tracked developments in e-participation as reflected in the relevant features of national e-government portals and websites. The E-Participation Index (EPI) assesses online participation utilizing a three-point scale that distinguishes between the provision of information (whereby the Government provides information to people), consultation (whereby the Government consults on policy or on services delivery at different stages of the process and possibly provides feedback), and decision-making (whereby the Government involves people in decision-making).[4]

For the 2022 Survey, the methodology for measuring e-participation has been improved to better assess engagement between the Government and the people in consultation and decision-making processes. More specifically, government portals and websites have been assessed for the integration of participatory budgeting or similar mechanisms; the availability of open government data (OGD) in general and in six key sectors linked closely to SDG implementation (education employment, environment, health, justice and social protection); evidence of co-creation or co-production mechanisms for collaborative services provision; evidence that people's voices are heard in discussions and decision-making processes linked to the formulation and adoption of policies on issues relating to vulnerable populations; and evidence of online consultations (via e-forums, e-polls, e-questionnaires, or other e-participation tools) that are designed to facilitate the engagement of people in vulnerable situations.

This subsection assesses e-participation as reflected in EPI levels and rankings, highlighting quantitative findings, changes over time, and differences between countries and regions. The correspondence between EPI and EGDI levels is also explored.

The eight countries with the highest EPI rankings are listed in table 1.10. Top-ranked Japan has an EPI value of 1.0, signifying that all e-participation features assessed in the Survey are present in the country's portal. Australia is ranked second, Estonia and Singapore are tied for third, and the Netherlands is ranked fifth. Finland, New Zealand and the United Kingdom are all ranked sixth in the 2022 EPI. Table 1A in annex A shows the EPI levels for all 193 Member States and indicates any movement that has occurred between EPI groups since 2020.

Table 1.10   Countries ranked highest in the 2022 E-Participation Index

EPI rank in 2022	Country	EPI value in 2022	EPI rank in 2020	Change in EPI rank from 2020 to 2022
1	Japan	1.0000	4	+3
2	Australia	0.9886	9	+7
3	Estonia	0.9773	1	- 2
3	Singapore	0.9773	6	+3
5	Netherlands	0.9659	9	+4
6	Finland	0.9545	14	+8
6	New Zealand	0.9545	4	-2
6	United Kingdom of Great Britain and Northern Ireland	0.9545	6	0

Source: 2022 United Nations E-Government Survey.

Generally, countries with higher EGDI values also have higher EPI values; the 27 countries with very high EPI values have EGDI values ranging from 0.7524 to 0.9717 (see figure 1.32). It is possible, however, for countries to have disparate EGDI and EPI values. For instance, Belgium, Slovakia, Bahrain and Belarus have very high EGDI values (above 0.75), yet their EPI values average 0.4488. There is a sizeable group of countries (Andorra, Antigua and Barbuda, Azerbaijan, Bahamas, Barbados, Bhutan, Plurinational State of Bolivia, Brunei Darussalam, Cabo Verde, Cambodia, Côte d'Ivoire, Dominican Republic, Egypt, El Salvador, Ghana, Guatemala, Jamaica, Lebanon, Maldives, Mauritius, Montenegro, Morocco, Namibia, Nicaragua, Philippines, Qatar, Saint Lucia, Saint Vincent and the Grenadines, Sri Lanka, Tajikistan, Tonga and Zambia) that have high EGDI values (0.50-0.75) but an average EPI value of 0.3636. Another 18 countries with high EGDI values (Algeria, Belize, Botswana, Dominica, Fiji, Gabon, Grenada, Guyana, Islamic Republic of Iran, Monaco, Nepal, Palau, Saint Kitts and Nevis, San Marino, Seychelles, Suriname, Trinidad and Tobago, and Bolivarian Republic of Venezuela) have low EPI levels ranging between 0.0909 and 0.2386, suggesting that government efforts to actively engage people in collaborative governance is limited.

Figure 1.32   Distribution of 193 Member States based on EGDI and EPI values, 2022
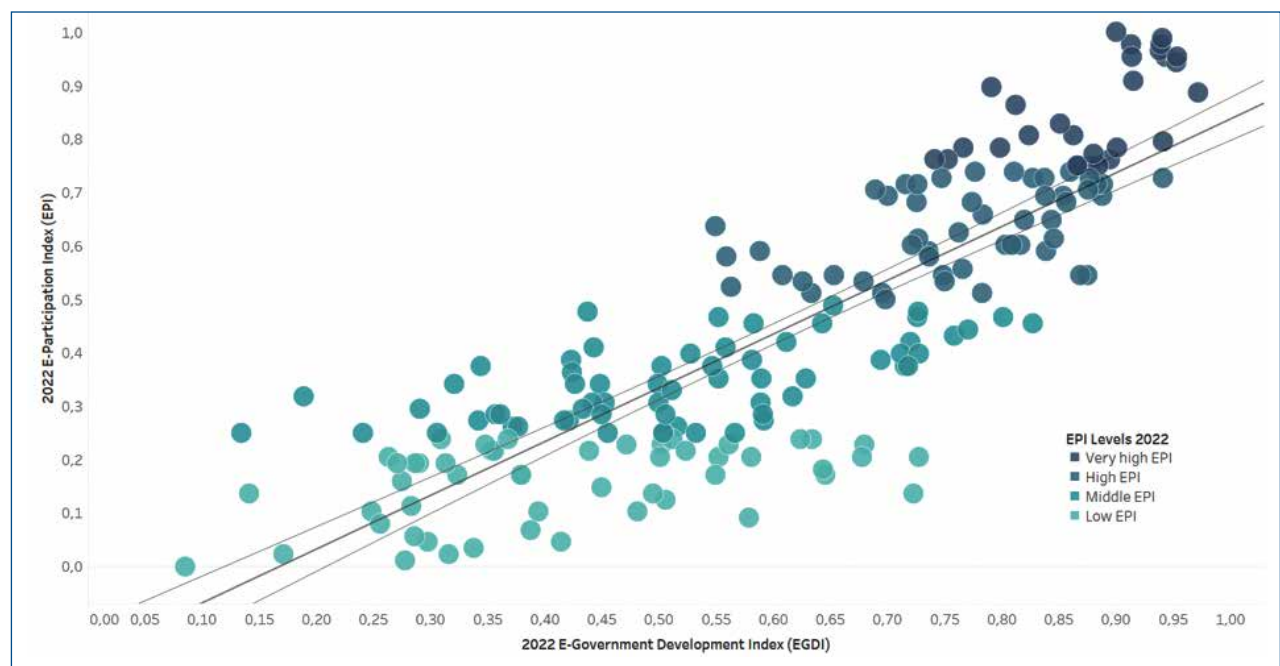
Source: 2022 United Nations E-Government Survey.

While most countries are committed to improving the provision of online services and user experiences, government efforts to actively engage the public in e-consultations and other forms of e-participation remain somewhat limited. As shown in figure 1.33, the proportions of countries offering options for users to provide feedback about the government website, to file a complaint, or to report corruption by public servants or institutions have steadily increased since 2018, reaching 66, 63 and 74 per cent, respectively, in 2022.

Figure 1.33 Percentage of countries offering e-participation tools for leaving feedback, reporting public corruption, and filing a complaint, 2018, 2020 and 2022
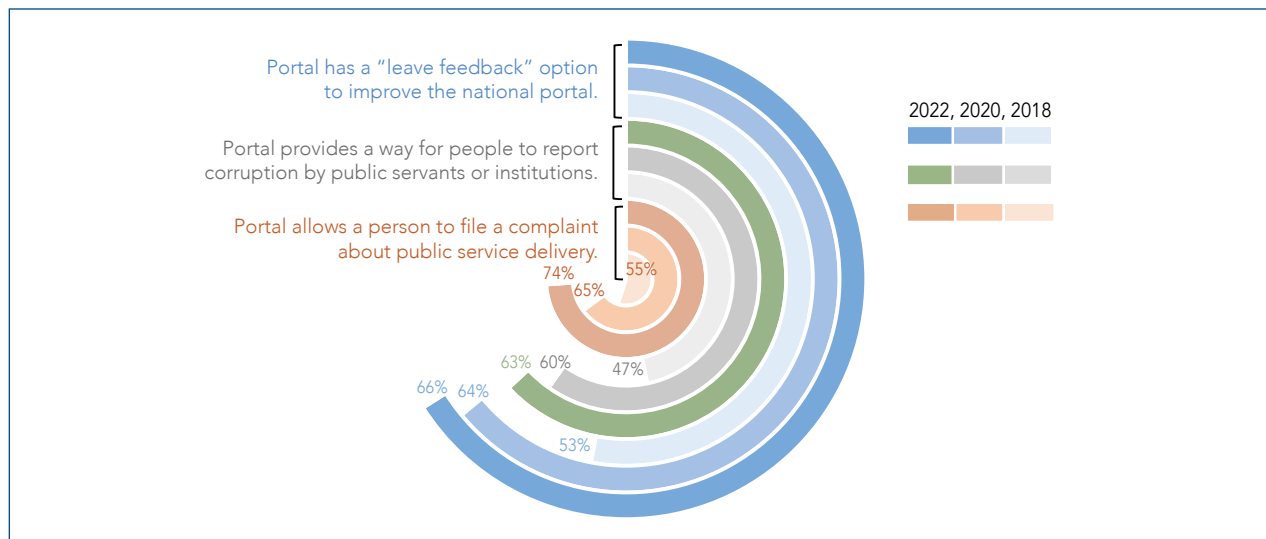
Source: 2022 United Nations E-Government Survey.

Social networking tools are offered on government portals in 89 per cent of the Member States, but significantly lower proportions of countries announce e-participation activities (49 per cent) and integrate mechanisms for e-consultations (52 per cent); as figure 1.34 illustrates, the numbers of countries offering these three options increased for one indicator but declined for the other two.

Figure 1.34   Number of countries with portals that integrate calendar announcements, consultation mechanisms and social networking tools, 2020 and 2022
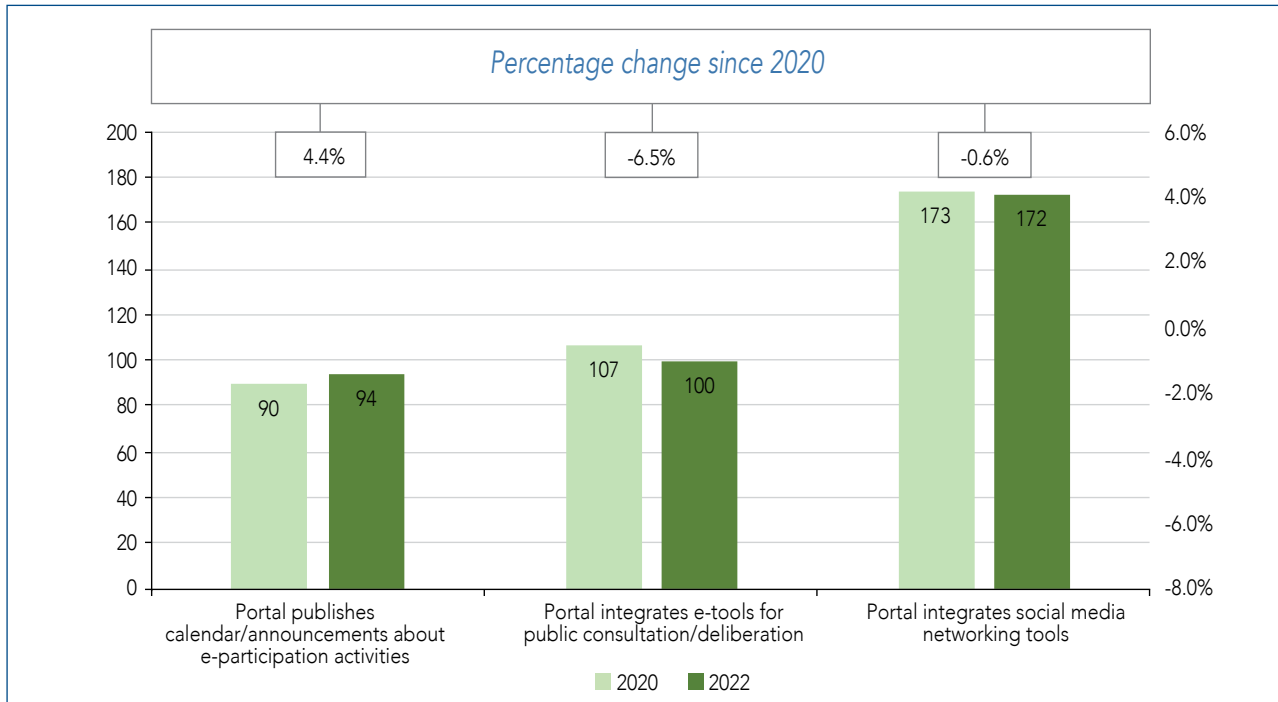
Source: 2022 United Nations E-Government Survey.

At the regional level, Europe has the highest proportion of countries that provided evidence of having conducted at least one e-consultation in the 12 months preceding the administration of the Survey (91 per cent), followed by Asia (70 per cent), the Americas (60 per cent), Africa (24 per cent) and Oceania (14 per cent) (see figure 1.35).

Figure 1.35   Percentage of countries with evidence of at least one e-consultation held within the past 12 months, by region, 2020 and 2022
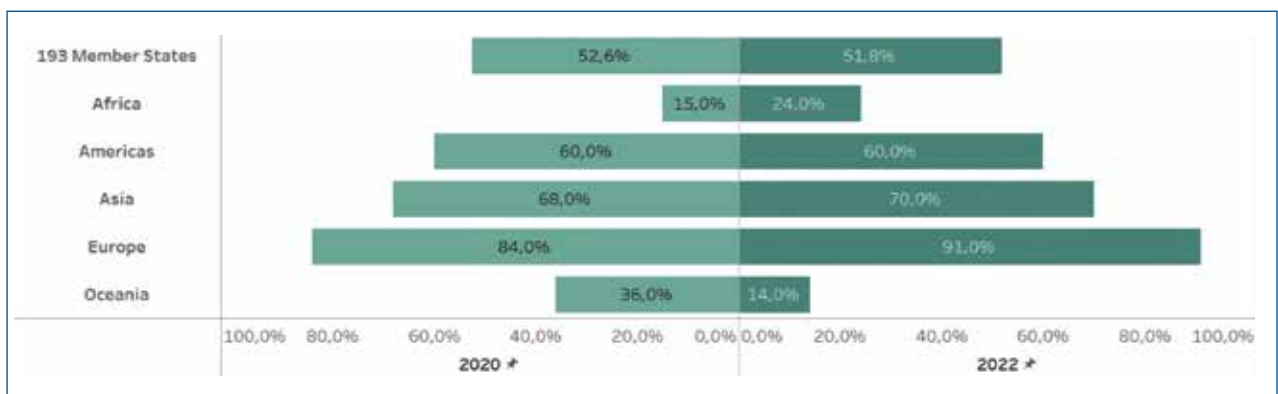
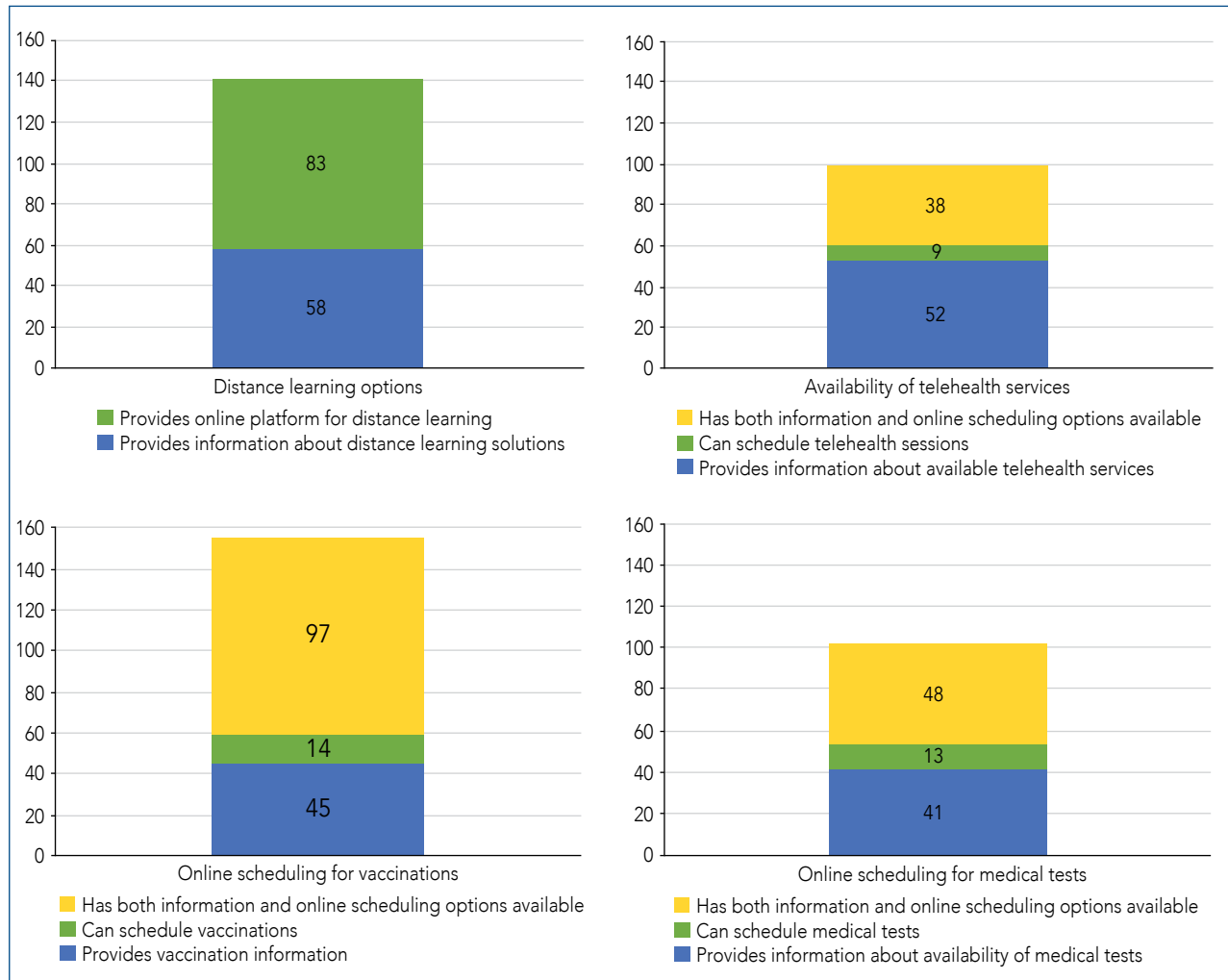*Source*: 2022 United Nations E-Government Survey.

1.9   E-government during COVID-19: ad hoc services

Since the COVID-19 pandemic began unfolding in early 2020, digital technologies have allowed Governments to play a key role in addressing the challenges surrounding the global health crisis and have created or reinforced essential connections during a period of growing isolation. Specifically, digital technologies have been used to facilitate collaborative research, the sharing of knowledge, and the provision of transparent guidance to a wide range of public and private stakeholders. Governments have connected with members of the public online by sharing information, providing services, and developing applications to track the evolution of the pandemic and coordinate the logistics surrounding remediation-focused activities such as lockdowns and vaccine administration. E-government has become an essential tool for communication and collaboration between policy makers and society during the COVID-19 pandemic. Digital technologies have enabled Governments to make rapid policy decisions based on real-time data and analytics, enhancing the capacities of national and local authorities to better coordinate and deploy evidence-based services for those who need them the most (see chapter 5 for more detailed information).

Given the impossibility of evaluating all measures taken by Governments to address COVID-19-related challenges, the present Survey has assessed the provision of selected online services aimed at mitigating the effects of the pandemic in key areas of health and education, with a focus on leaving no one behind. The Survey has captured the efforts of Governments to ensure that systems have been put in place to provide information and services relating to a number of priority areas, including distance learning, telehealth services, and scheduling for vaccinations and medical tests (see figure 1.36).

The findings indicate that over the past two years, 90 per cent of the Member States have established dedicated portals or created space in their national portals to address the COVID-19 pandemic. Governments in 141 countries currently offer distance learning platforms or related information. In 99 of the countries surveyed, residents can learn about telehealth services and can often schedule sessions through government portals. In 156 countries Governments provide COVID-19 vaccine information and scheduling services, and in 102 countries the platform can also be used to obtain information on or schedule medical tests.

Figure 1.36   Number of countries that have implemented assessed COVID-19 response measures, 2022

Distance learning options
- 83 — Provides online platform for distance learning
- 58 — Provides information about distance learning solutions

Availability of telehealth services
- 38 — Has both information and online scheduling options available
- 9 — Can schedule telehealth sessions
- 52 — Provides information about available telehealth services

Online scheduling for vaccinations
- 97 — Has both information and online scheduling options available
- 14 — Can schedule vaccinations
- 45 — Provides vaccination information

Online scheduling for medical tests
- 48 — Has both information and online scheduling options available
- 13 — Can schedule medical tests
- 41 — Provides information about availability of medical tests

Source: 2022 United Nations E-Government Survey.

More than 90 per cent of the countries in Europe have implemented all four of the measures assessed, offering the public distance learning support, telehealth services, and online scheduling for vaccinations and other medical tests (see figure 1.37). Over 70 per cent of the countries in Asia and the Americas provide such services, and the corresponding proportions for Africa and Oceania are 41 and 40 per cent, respectively.

Figure 1.37   The implementation of COVID-19 response measures, by region, 2022 (Percentage of countries)
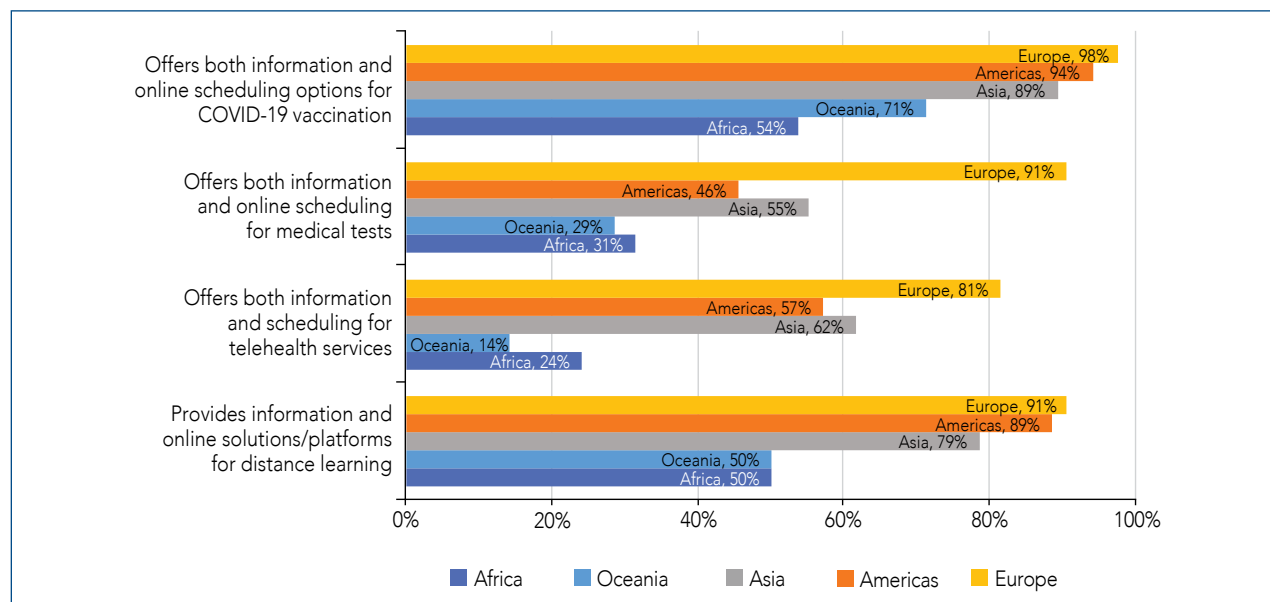
Source: 2022 United Nations E-Government Survey.

1.10   Summary and conclusion

The slight increase in the average EGDI value for 2022 is largely attributable to the progress made in strengthening telecommunications infrastructure and developing human capital. Countries in Africa have made significant improvements in their telecommunications infrastructure, building a solid foundation for accelerating the transition to digital government. Challenges remain, however, as the cost of mobile broadband subscriptions as a percentage of per capita gross national income remains significantly higher in Africa than in other parts of the world. Digital divides persist and may widen without the adoption of targeted and systematic measures to assist low-income and lower-middle-income countries and countries in special situations (including LDCs, LLDCs and SIDS). Presently, all seven countries in the low EGDI group are LDCs and/or LLDCs in Africa.

While advancement in e-government development remains strongly correlated with national income, there are some notable exceptions. Of the 99 Member States that have EDGI values above the 2022 average, nearly 90 per cent are in the high-income or upper-middle-income group; however, the remaining 10 per cent (11 countries) are in the lower-middle-income group and often have underdeveloped telecommunications infrastructure. The Survey data confirm that income level matters but is not the sole factor determining the level of e-government development.

The number of countries providing at least 1 of the 22 online services assessed has increased by 16.7 per cent globally, with 61 per cent of the Member States offering more than 16 services. There is a clear trend towards the full digitalization of government services, giving users the ability to complete virtually all types of transactions entirely online. More than a quarter of the Member States have integrated AI-enabled chatbot functionality in their portals.

Driven by the COVID-19 pandemic, government priorities in online services provision have centred on health, education and social protection. At the regional level, 90 per cent of the countries in Europe and 70 per cent of the countries in Asia and the Americas are providing a wide range of online services to address the COVID-19 pandemic, offering information and tools that facilitate distance learning, telehealth services, and the scheduling of vaccines and medical tests. The sharpest increase in online services provision has been in the area of social protection; the number of countries with national portals that allow users to apply for benefits such as maternity care, child subsidies, pensions, housing, and food allowances has grown by 17 per cent since 2020.

A growing number of countries have strengthened their institutional and legal frameworks for e-government development. Most countries have a national electronic or digital government strategy, as well as legislation on cybersecurity (153 countries), personal data protection (145 countries), national data policy (128 countries), open government data (117 countries), and e-participation (91 countries). Individuals and businesses are increasingly able to interact with public institutions through online platforms, obtain information on legislation relating to freedom of information, and access public content and data (including open government data). More Governments are seeking and responding to user feedback and are working to tailor services to people's needs. However, proactive engagement in public e-consultations on important policy issues remains limited; Survey results show that only about half of the Member States meet this indicator, though regional averages vary. The region with the highest number of countries engaging in online public consultations is Europe (90 per cent), followed by Asia (70 per cent) and the Americas (60 per cent). Only 24 per cent of countries in Africa and 14 per cent of countries in Oceania conduct e-consultations.

The key takeaways from the chapter are provided below.

General observations

- The global EGDI average has increased slightly, largely owing to improvements in telecommunications infrastructure and human capital development.

- Among the four EGDI subgroups, the Member States with high EGDI values make up the largest share (38 per cent), followed by those with very high EGDI values (31 per cent) and those with middle EGDI values (27 per cent). The proportion of countries with low EGDI values remains the same as in 2020 (4 per cent), though the number of countries at this level dropped from eight to seven. All countries with low EGDI values (below 0.25) are LDCs and/or LLDCs in Africa.

- The movement of countries between EGDI groups over the past two years has mainly been between the top quartile of one EGDI group and the lowest quartile of the next higher group. Fourteen countries have moved to a higher EGDI group, and three countries have moved to a lower EGDI group.

- EGDI values tend to be higher for higher-income countries than for lower-income countries. Nevertheless, many countries have achieved high and very high levels of e-government development by improving their online services provision (expressed as an OSI value) despite limited resources. For example, India and Rwanda have very high OSI levels (0.7934 and 0.7935, respectively) even though their telecommunications infrastructure is relatively underdeveloped.

- Almost 90 per cent of the 99 Member States with above-average EDGI values are in the high-income or upper-middle-income group; the remaining 10 per cent (11 countries) are in the lower-middle-income group.

- The most dramatic increase in the average EGDI value (8.6 per cent) and subindex values has occurred in the upper-middle-income group.

- TII values have risen for all income groups, with the greatest increase registered by the upper-middle-income group (12.3 per cent), followed by the lower-middle-income group (7.3 per cent), the low-income group (6.4 per cent), and the high-income group (1 per cent).

- While national income levels are generally consistent with EGDI and OSI values, there are some notable exceptions. Palau and Nauru are high-income countries with below-average EGDI values because their underdeveloped infrastructure (typical of SIDS) translates into relatively low TII subindex values. Conversely, some low-income countries (such as Rwanda) have done exceedingly well in online services development.

- High-income countries have already reached a relatively high level of services provision, whereas low-income and lower-middle-income countries lack sufficient resources for investment in the development of online services. Low-income countries struggle with investing in human capital development and are the only group to have registered a decline in the average HCI index value between 2020 and 2022.

- With their higher OSI, TII and HCI values, upper-middle-income countries will likely make rapid progress in e-government ecosystem development in the coming years, while the decline in OSI or HCI values for low-income and lower-middle-income countries may signify deepening digital divides.

Online services provision

- The number of countries providing the online services assessed in the Survey has risen by an average of 5 per cent since 2020. The number of countries offering services that allow users to apply for social protection programmes such as maternity care, child subsidies, pensions, and housing and food allowances has seen the most significant increase (17 per cent), which may have occurred in response to the COVID-19 pandemic.

- The number of countries offering at least 1 of the 22 online transactional services assessed increased from 162 in 2020 to 189 in 2022, or by 16.7 per cent. The provision of 16 types of services is the global average, but 115 of the Member States (61 per cent) offer more.

- Almost three quarters of the Member States (138 countries) use "one-stop-shop" portals for the online provision of different government services.

- Business-related services such as registration, licensing and filing company taxes are among the five government services offered most frequently.

- The 2022 Survey includes a new indicator assessing whether national portals are set up for the submission of business tax forms and payments online, similar to the services offered to individuals for income tax and Value Added Tax (VAT) submissions. The data suggest that tax filing services are offered more frequently to businesses (153 countries) than to individuals (151 countries for income tax and 142 countries for VAT).

- The next most commonly offered online services include applying for government vacancies and business licences, requesting birth, death, and marriage certificates, and paying utility bills.

- Among the least offered online services are paying fines (118 countries), applying for a visa (97 countries), making declarations to the police (92 countries), registering motor vehicles (77 countries), and submitting a change of address (75 countries).

- Among the countries with very high OSI values, coverage of the 22 services assessed is nearly universal (averaging 93 per cent for the 54 countries in this group).

- Countries with high OSI values have strong online services coverage as well (averaging 83 per cent for the 50 countries in this group).

- The proportions are significantly lower for the remaining OSI groups, with coverage averaging 58 per cent for the 70 countries in the middle OSI group and 20 per cent for the 19 countries in the low OSI group. Around three quarters of the countries in the low OSI group (14 of the 19) are LDCs, LLDCs and/or SIDS.

- Progress is being made in online services delivery even in countries with low OSI levels, where the average number of online services offered rose from 1 in 2018 to 4.5 in 2022. Within the low OSI group, Equatorial Guinea offers the highest number of online services (14).

- The Survey findings indicate that the majority of countries use their portals just to provide information or offer only partially digitalized services, with users still needing to appear at government offices in person to complete most transactions. There is, however, a clear push towards higher levels of digitalization whereby users will no longer have to download or print forms but can complete their transactions fully online.

- Countries tend to assign priority to digitalizing the registration and licensing of businesses and the process of applying for government vacancies; more than half of the countries offering such services have them fully digitalized.

- Of the 131 countries allowing users to apply for social protection programmes online, 74 (56 per cent) have systems in place that allow all relevant transactions to be fully completed online.

- E-procurement portals and digital invoices are far more common in high-income and upper-middle-income countries than in lower-middle-income countries, and these features are much less prevalent in low-income countries. For comparison, 8 out of 10 high-income countries are likely to have both a dedicated platform and a reliable system for digital invoicing, while the same is true for only 4 out of 10 lower-income countries.

- The number of countries providing information and services through smartphone applications, SMS and/or mobile browsers increased for all sectors by an average of 18 per cent between 2020 and 2022. The health sector saw the most significant increase (30 per cent), largely owing the widespread adoption of digital solutions in response to the COVID-19 pandemic, but growth was also evident for the justice sector (25 per cent), the education sector (22 per cent) and the social protection sector (20 per cent).

- There has been an increase in fixed (wired) broadband subscriptions in all regions since 2020; the 48 per cent jump in Africa has been accompanied by a 22 per cent increase in Internet use, offering a solid foundation for accelerating the transition to digital government in that region.

- The cost of mobile broadband subscriptions as a percentage of gross national income per capita remains significantly higher in Africa than in other parts of the world, contributing to the digital divide.

- The findings indicate that 65 per cent of the countries surveyed allow businesses to access their data online, with 64 per cent giving individuals the same right. Modifying data is possible for business entities in 58 per cent of the countries and for individuals in 50 per cent of the countries surveyed.

- In 112 countries (58 per cent of the Member States), users can save specific service transactions initiated on the portal and access them later, and in 109 countries (57 per cent), they can also access a list of previous transactions. Users can customize or personalize the national portal or bookmark their favourite or most frequently used online services in only 31 countries (16 per cent).

- In 51 countries (26 per cent), portals have begun to feature AI-enabled chatbot functionality.

Institutional framework

- Almost all of the Member States have national portals that are fully operational. The vast majority of countries (93 per cent) make the government organizational chart and information on the government structure available on their portals, 90 per cent provide the names and titles of the heads of government agencies, departments and ministries, 77 per cent furnish information on the national CIO or the equivalent, and 74 per cent share links to subnational or local government agencies. Such information helps orient users and allows them to engage effectively with government agencies through online platforms.

- An average of 90 per cent of the countries surveyed have national portals that provide links to ministerial websites and offer sources of information on sector-specific policies.

- According to 2022 Survey data, 132 countries (68 per cent) have legislation guaranteeing freedom of information and access to information, and 127 countries (66 per cent) have privacy statements available on their government portals.

- Most countries have a national electronic or digital government strategy (155), a national data policy or strategy (128), and legislation on cybersecurity (153), personal data protection (145), and open government data (117); 91 countries, or almost half of those surveyed, have laws relating to e-participation.

E-Participation

- Generally, countries with higher EGDI values also have higher EPI values; the 28 countries with very high EPI values have EGDI values ranging from 0.7409 to 0.9712.

- It is possible for countries to have disparate EGDI and EPI values. For instance, Belgium, Slovakia, Bahrain and Belarus have very high EGDI values (above 0.75), yet their EPI values average 0.4488.

- The majority of countries are committed to improving the provision of online services and user experiences; presently, between 63 and 73 of the Member States offer options for users to provide feedback about the government website, file a complaint, or report corruption by public servants or institutions.

- Government efforts to actively engage the public in e-consultations and other forms of e-participation remain somewhat limited. Only 48 per cent of the countries surveyed announce e-participation activities, and just 52 per cent integrate mechanisms for e-consultations.

- At the regional level, Europe has the highest proportion of countries that provided evidence of having conducted at least one e-consultation in the 12 months preceding the administration of the Survey (91 per cent), followed by Asia (70 per cent), the Americas (60 per cent), Africa (24 per cent) and Oceania (14 per cent).

COVID-19 measures and responses

- Over the past two years, 90 per cent of the Member States have established dedicated portals or created space in their national portals to address the COVID-19 pandemic. Governments have worked to ensure that systems are in place to provide information and services relating to a number of priority areas, including distance learning, telehealth services, and scheduling for vaccinations and medical tests.

- More than 90 per cent of the countries in Europe have implemented all four of the measures assessed, offering the public distance learning support, telehealth services, and online scheduling for vaccinations and other medical tests. Over 70 per cent of the countries in Asia and the Americas provide such services, and the corresponding proportions for Africa and Oceania are 41 and 40 per cent, respectively.

Overall, the Survey findings indicate that progress is being made in e-government development globally but at a slower pace than anticipated. The COVID-19 pandemic has heightened the importance of digital transformation, not least because Governments must be able to deliver public services despite restrictions on physical interaction and to reach remote, marginalized, vulnerable and other underserved populations so that no one is left behind. Countries that are already at a more advanced stage of e-government development tend to perform better in public services delivery than those with resource limitations or underdeveloped telecommunications infrastructure and human capital development. Without the adoption of targeted, systematic measures to assist low-income and lower-middle-income countries and countries in special situations (including LDCs, LLDCs and SIDS), digital divides may continue to widen.

Endnotes

[1]   The range of EGDI group values for each level are mathematically defined as follows: very high EGDI values range from 0.75 to 1.00 inclusive, high EGDI group values range from 0.50 to 0.7499 inclusive, middle EGDI values range from 0.25 to 0.4999 inclusive, and low EGDI values range from 0.0 to 0.2499 inclusive. In all references to these ranges in text and graphic elements, the respective values are rounded for clarity and are expressed as follows: 0.75 to 1.00, 0.50 to 0.75, 0.25 to 0.50, and 0.00 to 0.25.

[2]   A quartile is a statistical term describing a division of data into four defined intervals. The quartile measures the spread of values above and below the mean by dividing the distribution of data into four groups. A quartile divides data into three points—a lower quartile, median, and upper quartile—to form four groups of the data set. In the 2022 United Nations E-Government Survey, the lower (or first) quartile in each EGDI group is denoted as L1, M1, H1 or V1 and is the middle number that falls between the smallest value of the data set and the median. The second quartile (L2, M2, H2 or V2) is also the median. The upper (or third) quartile, denoted as L3, M3, H3 or V3, is the central point that lies between the median and the highest number of the distribution. LM, MH, HV and VH are the highest data points in each EGDI group.

[3]   During the assessment period (June-September 2021), the Government of Belize was in the process of redesigning its national portal; however, many ministerial websites were functional, and the Survey assessed e-government features based on those available government websites.

[4]   The description of the three-point scale is extracted from United Nations, *E-Government Survey 2020: Digital Government in the Decade of Action for Sustainable Development* (Sales No. E.20.II.H.1), pp. 117-118.