Report of the EGH subgroup on measuring ICT skills using household surveys

August 2023

Summary of proposed recommendations

- Countries should assess each individual's skill level by skill area (see Table 1 for indicators by skill area)
    - Individuals should be assessed on the number of activities within a skill area they report having done in the last three months using the following categories:

None	Basic	Above basic
0 activities	1 activity	More than 1 activity

    - Skill levels should not be assessed in skill areas where fewer than two indicators are collected (2 core indicators per skill area to be selected in the future as data availability increases)
    - Indicators should be weighted equally within each skill area.
    - Skill areas with different numbers of components should be treated equally.
- Given differences in data availability by countries, overall skills aggregates are not yet comparable across many countries – countries still may wish to pilot and calculate overall ICT skill levels for their own analyses.
- Countries should make efforts to collect as many ICT skills indicators as possible to improve comparability.
- The subgroup should investigate how the set of ICT skills indicators could be made more robust and resilient to technological changes.
    - Wording and scope of indicators may be outdated in some cases.
    - Some indicators have lost relevance since they were originally identified as key indicators of ICT skills.

1. Background

In 2013, the Expert Group on ICT Household Indicators (EGH) added indicator HH15 to the Core list of ICT Indicators. This indicator examines the activities individuals carry out on digital devices as a proxy for digital skills to help link ICT usage and impact. These data may be used to inform targeted policies to improve ICT skills, and thus contribute to an inclusive information society. The UN Sustainable Development Goals (SDGs) also reference ICT Skills through SDG Indicator 4.4.1 (*Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill*).

At its 2017 meeting, EGH agreed to create a subgroup to improve the measurement of ICT skills based on ICT household data and make proposals for a conceptual framework and dimensions of digital skills to be monitored through ICT household data. The subgroup operated from 2018-2020 amending the response categories of HH15, reducing redundancy and filling data gaps in the skills that are currently measured.

At its 2021 meeting, EGH decided to revive the subgroup on ICT skills to reconsider ways to aggregate indicators on skills in a meaningful way given the additional skills indicators that were added. The revived subgroup proposed several key recommendations that were accepted by EGH at its 2022 meeting.

- To discontinue the grouping of indicators by levels (basic/intermediate/advanced)
- To include component indicators from HH9 to complement and rebalance the data aligned with the DigComp 2.0 areas (see Table 1)
- Preference to aggregate ICT skills data **at the individual level** rather than as a composite of the average share of indicators.

EGH prolonged the mandate of the subgroup for 2023 to investigate the feasibility of aggregating skills data at the individual level by examining further country examples and considering the impact of differences in data availability on the comparability of aggregates. Other conceptual and practical issues were also to be considered by the subgroup, including how distinct levels similar to those in Eurostat's Digital Skills Indicator (DSI 2.0) could be established [1].

Table 1.
ICT skills indicators, by ICT skill area as approved by EGH in 2022.

Information / data literacy	Communication / collaboration	Digital content creation	Safety	Problem solving
1. Verifying the reliability of information 2. Getting information about goods or services 3. Reading or downloading newspapers, etc 4. Seeking health-related information	1. Sending messages (e.g. email, messaging service, SMS) with attached files 2. Making calls (Telephoning over the Internet) 3. Participating in social networks 4. Taking part in consultation or voting via Internet	1. Using copy and paste tools 2. Creating electronic presentations 3. Using basic arithmetic formula in a spreadsheet 4. Writing a computer program 5. Editing online text, spreadsheets, presentations 6. Uploading self/user-created content	1. Changing privacy settings 2. Setting up effective security measures	1. Finding, downloading, installing and configuring software 2. Connecting and installing new devices 3. Transferring files or applications between devices 4. Electronic financial transactions 5. Doing an online course 6. Purchasing or ordering goods or services

2. Reflections from the sub-group on ICT skills

The subgroup met four times in 2023 through videoconference. The focus was two-fold: to run national data pilots and to discuss the issue of aggregating indicators on skills in a meaningful way. Participants also communicated through email to provide additional insight outside of the meetings. The subgroup agreed on recommendations through its discussion of several important and interlinking questions on ICT skills.

Feasibility for countries to aggregate ICT skills data at the individual level

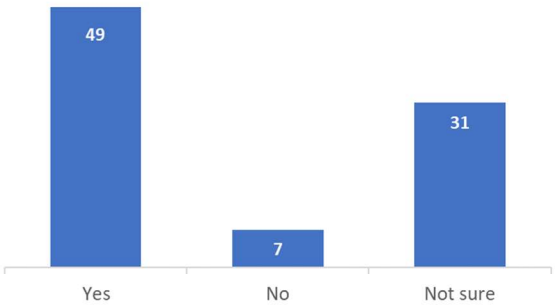
The primary point of discussion for the subgroup was whether countries were capable of aggregating ICT skills data at the individual level due to a different method of calculation. Brazil provided a worked example at the 2022 EGH meeting and indicated that it was not technically difficult to calculate in this way. Inspired by this finding, the subgroup welcomed additional data pilots from countries as more evidence was needed before the subgroup was confident in recommending this new method.

Two additional countries piloted this methodology in 2023: Canada and the Philippines. For both countries, those implementing the pilots noted the low technical difficulty of calculating ICT skills aggregates at the individual level - detailed results are shown in Annex 2.

This positive finding was reinforced by results from a survey sent to countries in spring 2023 on their capacity to implement the possible recommendation of the subgroup to aggregate ICT skills at the individual level. Of the 91 countries responding to the survey, a clear majority stated that they would be able to do so (Figure 1). While many others responded

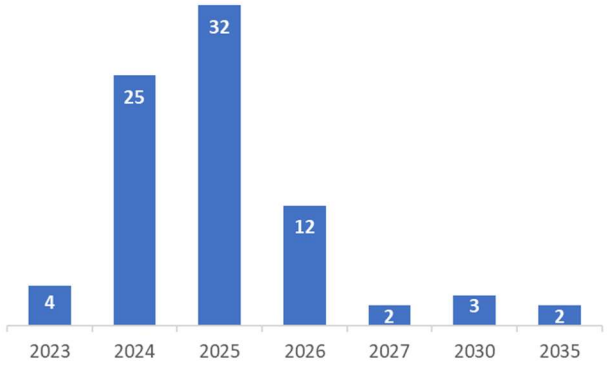
that they were not sure of their capabilities, very few countries reported that they could not implement such a recommendation. Those that responded positively generally also noted that they could implement this relatively quickly (most by 2025, see Figure 2). Further detail on the survey results is available in Annex 3.

Figure 1
Does your country have the capacity to implement this recommendation?



Note: Question asked to the 87 countries indicating that they collect or could collect in the future ICT skills indicators

Figure 2
What is your estimate of the earliest year that such a recommendation could be implemented if a clear methodology was provided in September 2023?



Note: Question asked to the 80 countries indicating that they could or possibly could implement the recommended approach to aggregate ICT skills indicators at the individual level

The second point of discussion for the subgroup was data availability that may limit comparability across countries. The primary obstacle to aggregating data from the five areas into an overall ICT skill level of an individual is that many countries do not collect data for indicators in all areas. The subgroup examined data from five countries in detail (see Table 2). For example, Brazil, Ghana, and the Philippines did not collect data on the *Safety* area in the survey reviewed. More on the issue is discussed below and in Annex 1.

Table 2
Missing indicators by skill area for selected countries

Country	Information/ data literacy	Communication/ collaboration	Digital content creation	Safety	Problem solving
Brazil	*Verifying information**			**Not collected***	
Canada	*Verifying information**	*Sending messages w/attached files*	*Using online SW for editing*		(1) *Finding SW* (2) *Connecting new devices* (3) *Transferring files*
Ghana	**Not collected**	**(1) *Making calls*** **(2) *Social networks*** **(3) *Online consultation or voting***	(1) *Using online SW for editing* (2) *Uploading content*	**Not collected**	(1) *Online banking* (2) *Online course* (3) *Purchasing*
Philippines	**(1) *Verifying information*** **(2) *Goods/ services info*** **(3) *Health info***	*Online consultation or voting*	*Using online SW for editing*	**Not collected**	*Connecting new devices*

United Kingdom	*Verifying information*	(1) *Sending messages w/attached files* (2) *Online consultation or voting*	**Not collected**		*Finding SW*

* Planned for future surveys
Note: Cells highlighted in red have fewer than 2 indicators collected for this skill area. Brazil data from their 2021 survey. Canada data from their 2020 survey, Ghana and Philippines from their 2019 surveys.

Based on these findings and further discussion, the subgroup determined that aggregating ICT skills data at the individual level is possible and should be recommended. To support the process, the subgroup noted that sample R code from Brazil on calculating ICT skills aggregates is available on the ITU's Microsoft Azure repository. Those processing data for Canada and the Philippines found the sample code useful and informative when doing their own calculations.

A final reason for recommending this methodology is the lack of a coherent alternative. There was brief discussion on using an index approach. This approach would require averaging the overall population shares partaking in activities in each of the five skill areas. This would be like the previous methodology though using the newly established skill areas instead of the previous skill levels. The subgroup noted that conceptually, the precise meaning of such an aggregate is much less clear and that aggregating at the individual level is much more preferable. Additionally, it allows for a more powerful way of using demographic data to support monitoring of the progress in the long run.

Technical challenges when implementing recommendations to aggregate at the individual level

In its discussions, the subgroup identified several technical challenges that arise when calculating ICT skills aggregates at the individual level. They are described in detail below and should be monitored when implementing such calculations and presenting results. However, none of these challenges present major obstacles to implementing the recommendations of the subgroup.

The subgroup noted existing differences in how indicators from HH15 and HH9 are collected in surveys. HH9 is directly related to activities using the Internet and questions are asked only to individuals reporting having used the Internet. This is not the case for HH15 as it was originally conceived as computer-based skills with no filtering. This leads to some discrepancies when non-Internet users are presented as a distinct category when showing the share of individuals with various skill levels. However, as ICT skills are more and more linked with Internet use, this does not seem to be a notable limitation to aggregating data in this way. The example of the Philippines shows that fewer than one percent of individuals fall into the category of reporting no to Internet use, but yes to an ICT skill – far fewer in most cases.

In some countries, item nonresponse may be an obstacle when an individual does not respond to all questions in the survey. This may be a more frequent issue when questions on ICT skills are asked in different modules of the survey. In these instances, decisions must be taken on whether an individual should be included in the sample. If the individual is excluded this can create mismatches with weighting schemes used throughout the survey. While this is a common problem in household surveys and not specific to ICT skills, countries sometimes address this in different ways. In countries where item nonresponse is addressed for each question, inconsistencies in weighting may create challenges when aggregating across questions for an individual.

In addition, different countries may collect different indicators within each skill area. Relatedly, due to the underlying conceptual model for ICT skills [1], the skill areas do not contain a balanced number of component indicators. In general, if the same number and content of items are not collected, comparability of ICT indicators through taking the average will remain poor. Therefore, the choice of aggregating at the individual level following the new methodology may somewhat mitigate the issue when compared to taking the average of component indicators (see detail in Annex 1). However, counting the number of activities that an individual undertakes for each skill area when data availability differs will still result in less comparable data across countries. To lessen these inconsistencies, the subgroup suggests the identification of two core indicators per skill area in the future.

Despite the above-mentioned challenges, the subgroup expressed the hope and expectation that the situation will improve in the future for two reasons.

The first reason is that three of the HH15 skills indicators (Verifying the reliability of information, Changing privacy settings and Setting up effective security measures) were only recommended by EGH in 2020. As a result, some countries are only now beginning to implement these into their surveys – Brazil as an example implemented these questions in their 2022 survey for the first time.

The second reason is that EGH only recommended additional HH9 indicators on activities using the Internet into ICT skills in 2022. They will be implemented into the UN's recommendations for Sustainable Development Goal (SDG) 4.4.1 (*Proportion of youth and adults with ICT skills, by type of skills*) this year following the EGH meeting in September. Many countries follow closely the SDG recommendations as evidenced by the data availability for Ghana shown in Table 2. Including these indicators in the SDG recommendations will provide an incentive for countries not currently collecting these indicators to begin doing so. In the longer term, all new recommendations of the subgroup will be ultimately added to the updated version of the Manual for Measuring ICT Access and Use by Households and Individuals. This should provide further guidance and incentive for countries to collect these indicators.

Transition from current reporting to reporting individual level aggregates

Due to data availability and above-mentioned technical challenges, the subgroup suggests an interim step of aggregating individuals' skills by skill area only. It was deemed that until overall data availability improves, aggregation for each skill area is a more feasible option and allows for a smooth transition to a new method calculating at the individual method. It is recommended that EGH assesses progress after two or three years to determine if sufficient countries are implementing the recommendations and if data availability for these indicators is improving.

The subgroup recommends the following two conditions for aggregation by skill area:

- Equal weighting of indicators within skill areas;
- At least two indicators in each skill area are collected to calculate an aggregate measure for individuals.

Remaining issues and future work

It is recommended that the subgroup should continue next year to address remaining issues that are outlined below.

- Increasing robustness and resilience of ICT skills indicators to global technological changes
    - Wording and scope of indicators may be outdated in some cases
    - Some indicators may have lost relevance since they were originally identified as key indicators of computer-based skills
- Further analyzing pilot results
    - Assessing comparability when different indicators are used within the DSI method
    - Comparability of the data using the DSI method across income groupings
- Consideration of mandatory indicators for each skill area within the data model (Table 1)
- Conceptual considerations for compiling an overall ICT skills aggregate
    - To ensure comparability across countries, should all five skill areas be used for calculating aggregates (e.g. as a pilot phase, could a simple version be calculated excluding Safety)?
    - Should skill areas be equally weighted as none are assumed to have more importance?
    - To help monitoring progress at country level, should levels below basic for overall skills be computed? E.g.
        - No Internet use, None – no skills in any area;
        - 1 of 5 – At least basic skills in one area;
        - 2 of 5 – At least basic skills in two areas;
        - 3/4 of 5 – At least basic skills in three or four areas

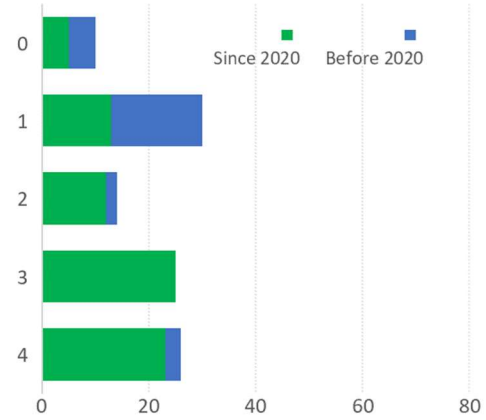
Annex 1: Data availability.

Data availability within ICT skill areas

A first important indication of comparability is the data availability within ICT skill areas for countries providing these data. If one country has only a subset of sub-indicators while another country has all sub-indicators, it may not be appropriate to directly compare an aggregated indicator between the two countries. As the two countries would not be using the same set of sub-indicators, different weights would be implicitly given to different aspects of the skill area.

The following charts show the number of countries providing different numbers of sub-indicators within each of the five skill areas. Data are shown for the 105 countries providing at least one skills sub-indicator from the full list in Table 1 since 2015 (78 countries since 2020).

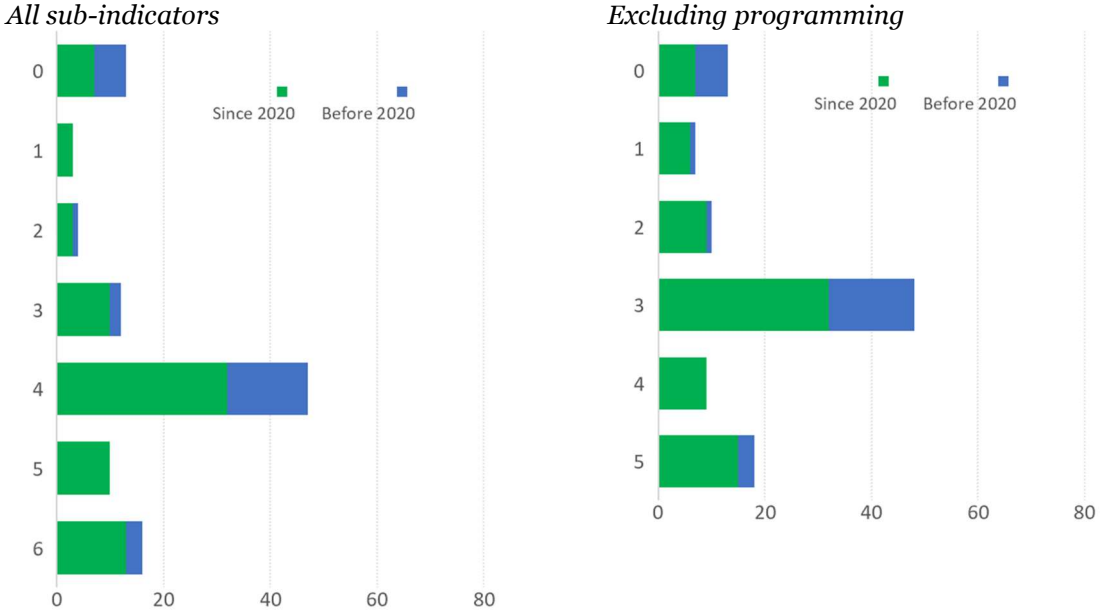
Figure 3
Number of distinct countries with available *Communication/collaboration* skills data, by number of sub-indicators with data available



Note: Maximum four sub-indicators in the *Communications/collaboration* area. Data availability shown for the 105 countries providing at least one sub-indicator for any digital skill since 2015 (78 countries since 2020). Indicator availability is shown for the most recent year or the recent year (2020 or later) with the highest indicator availability.

Data availability for communications and collaboration skills is mixed, with poor data availability for countries not providing data in recent years. For those providing data since 2020, over half provide 3 or 4 of the maximum four sub-indicators.

Figure 4
Number of countries with available *Digital content creation* skills data, by number of sub-indicators with data available

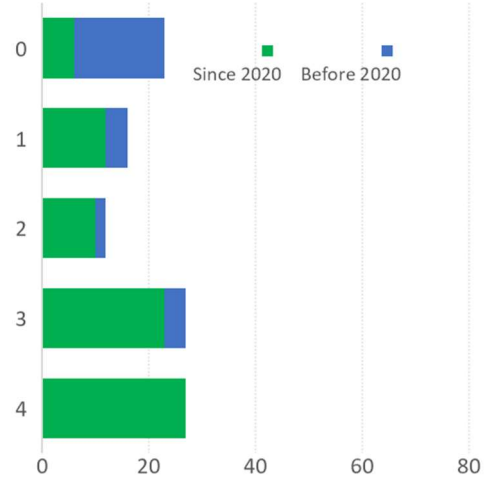


Note: Maximum six sub-indicators in the *Digital content creation* area. Data availability shown for the 105 countries providing at least one sub-indicator for any digital skill since 2015 (78 countries since 2020). Indicator availability is shown for the most recent year or the recent year (2020 or later) with the highest indicator availability.

Data availability for digital content creation skills shows a clear trend toward collection of most but not all sub-indicators, with four sub-indicators being the most frequent number collected. In this case, data availability has not improved greatly. Countries that may no longer collect data (not collected since 2020) have a similar distribution of numbers of sub-

indicators collected. Excluding programming from the group of sub-indicators also does not change the distribution much.

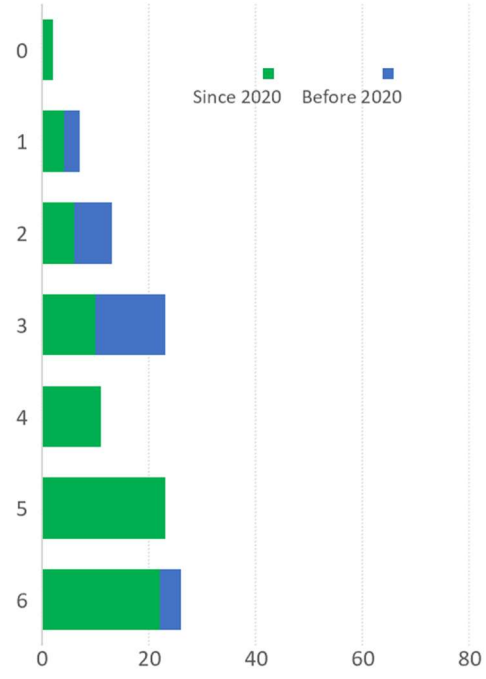
Figure 5
Number of countries with available *Information/data literacy* skills data, by number of sub-indicators with data available



Note: Maximum four sub-indicators in the *Information/data literacy* area. Data availability shown for the 105 countries providing at least one sub-indicator for any digital skill since 2015 (78 countries since 2020). Indicator availability is shown for the most recent year or the recent year (2020 or later) with the highest indicator availability.

Data availability for Information and data literacy skills is similar to that of Communication and collaboration skills with clear improvement in data collection for countries providing data more recently. Over half of countries providing data since 2020 have providing data for at least three of the four sub-indicators in this skill area.

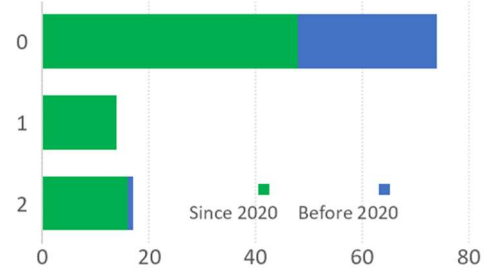
Figure 6
Number of countries with available *Problem solving* skills data, by number of sub-indicators with data available



Note: Maximum four sub-indicators in the *Problem solving* area. Data availability shown for the 105 countries providing at least one sub-indicator for any digital skill since 2015 (78 countries since 2020). Indicator availability is shown for the most recent year or the recent year (2020 or later) with the highest indicator availability.

Data availability for Problem solving skills also shows clear improvement in data collection for countries providing data more recently. Despite its large number of sub-indicators, again over half of countries providing data since 2020 have provided data for at least five of the six sub-indicators in this skill area.

Figure 7
Number of countries with available *Safety* skills data, by number of sub-indicators with data available



Note: Maximum four sub-indicators in the *Safety* area. Data availability shown for the 105 countries providing at least one sub-indicator for any digital skill since 2015 (78 countries since 2020). Indicator availability is shown for the most recent year or the recent year (2020 or later) with the highest indicator availability.

Lastly, the safety skill area is the poorest in terms of data availability. Most countries have not collected either of these sub-indicators. This is largely due to the more recent inclusion of these indicators in ITU's data collection. Data for these sub-indicators has only been collected since 2018. Given the lag in including new indicators in household surveys, it is hoped that data availability for these sub-indicators will increase in future years.

Comparison of sub-indicator averages

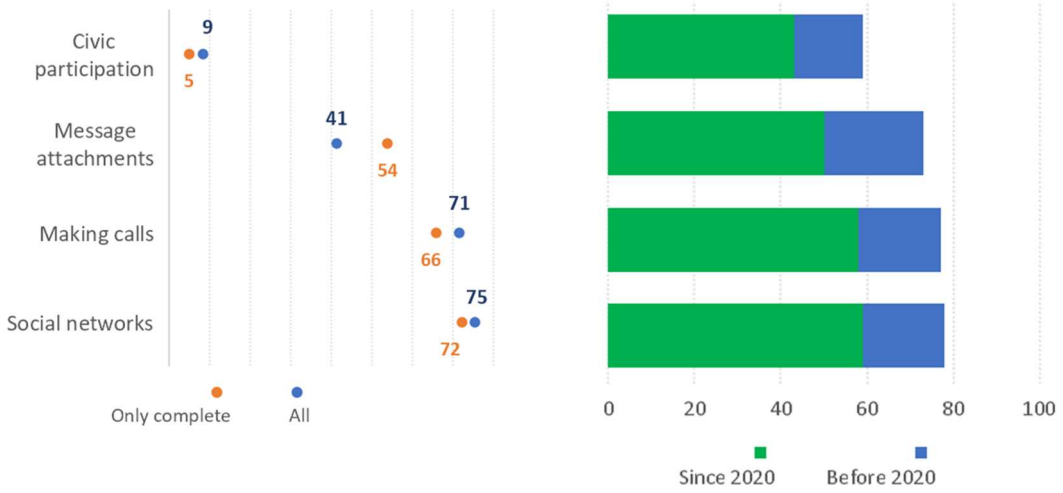
The difference in the shares of individuals reporting various activities between the activities comprising each skill area is important regardless of the approach chosen for aggregation. If aggregated at the individual level, there would be a notable drop in comparability if one country collects more data on sub-indicators with a lower likelihood of being reported by individuals and another collects more data on sub-indicators that are frequently reported by individuals. For a simplified example, there could exist two countries with equal overall skill levels in a particular area and an overall population likelihood of 25% partaking in activities X_1 and X_2 and 75% for activities Y_1 and Y_2 - the only other activities in the same area. Country A collects data on only activities X_1 and X_2 while country B collects on only activities Y_1 and Y_2. If individual participation in each activity is independent, then 44% of individuals in country A would be considered at a basic level (1 or more activities within a skill area) against 94% in country B despite no underlying differences in their overall skill levels[1].

If population averages of sub-indicators are calculated, the inclusion of a sub-indicator with a low share would bring down the overall average when compared against a country which does not collect data on this sub-indicator. Using the same example from above, the average for country A would be 25% against 75% for country B – again despite no difference in the skill levels of their population.

[1] Calculated as 1 minus the combined probability of not participating in a given activity. Country A: 44% = 1 – (75% * 75%). Country B: 94% = 1 – (25% * 25%)

The charts below show the situation for each skill area. For each the average percentage share across countries for individuals reporting having partaken in various activities is shown and paired with the data availability for that activity.

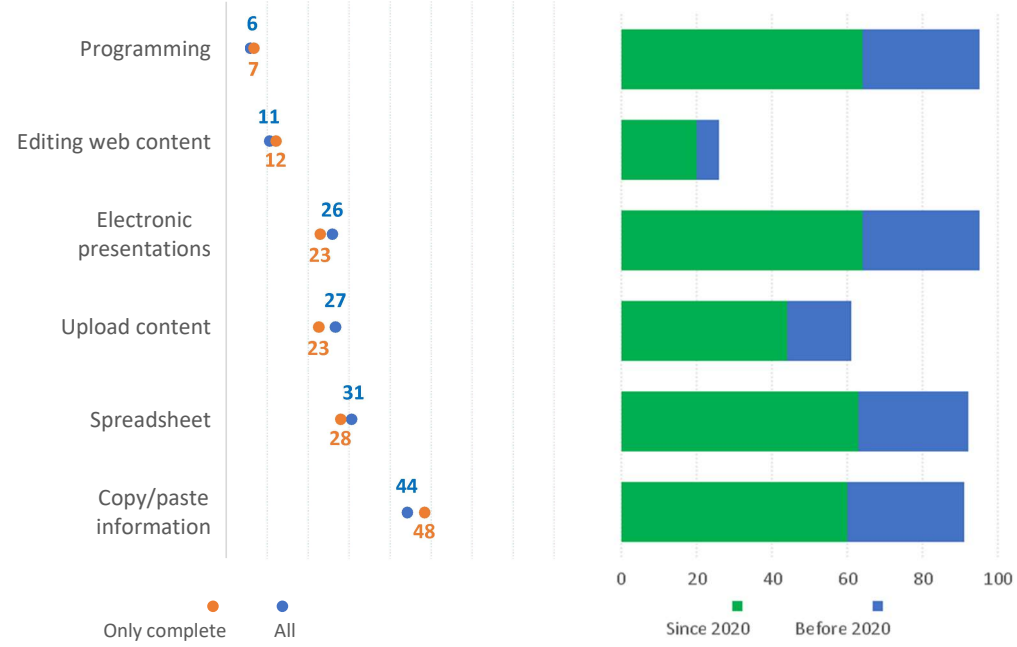
Figure 8
Average percentage share of individuals reporting *Communications/collaboration* skills (left) and number of countries providing data for each skill (right)



Note: *All* = average in the most recent data year for countries providing any digital skill data. *Only complete* = average of only countries with complete or nearly complete data (Bahrain, Egypt, Iran, Kazakhstan, Republic of Korea, Morocco, Russian Federation, Singapore, Zimbabwe).

For communication and collaboration skills there is a clear difference between reported shares of individuals partaking in these activities. This area has the widest spread of any skill area - most notably, there is a very low share of those reporting civic participation via the Internet and very high average share of those reporting making calls or participating in social networks. Civic participation is also the least reported sub-indicator of those in this skill area. This will create a clear downward shift in any aggregate for countries collecting data on this sub-indicator.

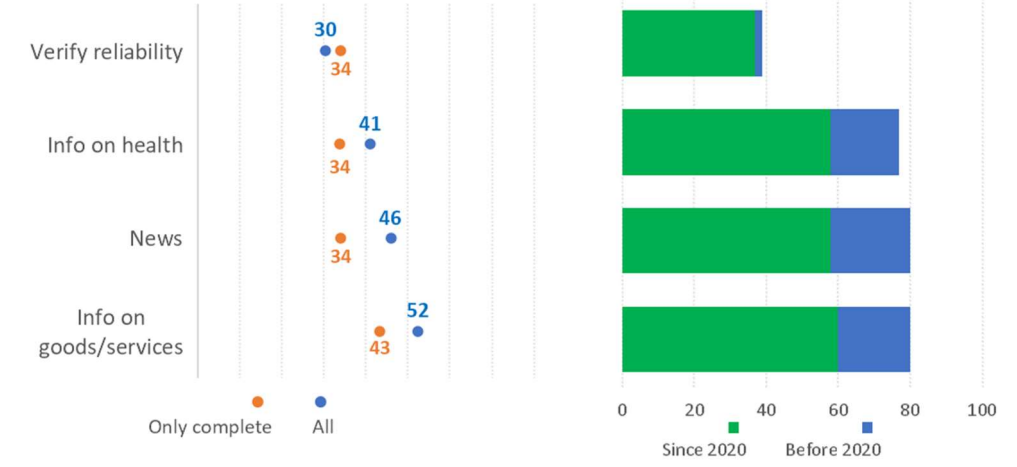
Figure 9
Average percentage share of individuals reporting *Digital content creation* skills (left) and number of countries providing data for each skill (right)



Note: *All* = average in the most recent data year for countries providing any digital skill data. *Only complete* = average of only countries with complete or nearly complete data (Bahrain, Egypt, Iran, Kazakhstan, Republic of Korea, Morocco, Russian Federation, Singapore, Zimbabwe).

For digital content creation skills there are again clear differences between average reported shares of individuals partaking in these activities though not as sharp of a difference as for communication skills. Maybe surprisingly, programming does not seem to be an outlier in this group – the average share for editing content is nearly as low. Another important observation is that editing content and uploading content are less collected than the other sub-indicators. As these are the only sub-indicators of the group that were not previously collected as part of HH15 there is some hope that data availability could increase for these – as noted earlier, they will be a part of the ITU's short questionnaire going forward.

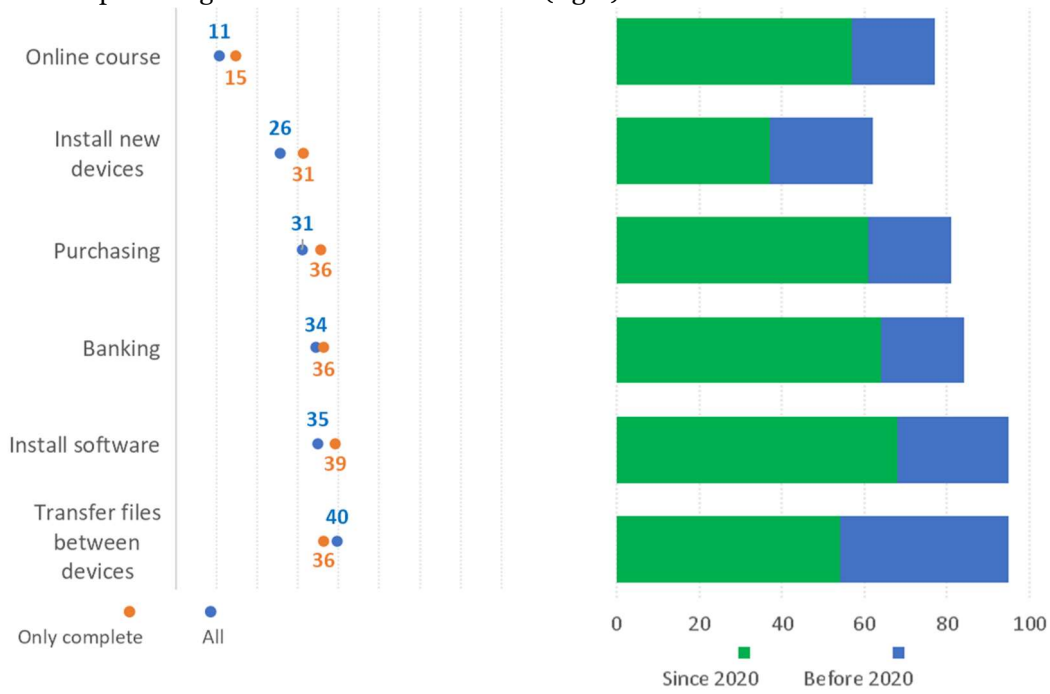
Figure 10
Average percentage share of individuals reporting *Information/data literacy* skills (left) and number of countries providing data for each sub-indicator (right)



Note: *All* = average in the most recent data year for countries providing any digital skill data. *Only complete* = average of only countries with complete or nearly complete data (Bahrain, Egypt, Iran, Kazakhstan, Republic of Korea, Morocco, Russian Federation, Singapore, Zimbabwe).

For Information and data literacy skills differences between average shares of individuals are less wide. For the nine countries reporting all skills indicators only information on goods/services is slightly higher than the others. For this area, verifying reliability of information is much less collected than others. This is another of the newer indicators added – similar to changing privacy settings and security measures it has only been collected by the ITU since 2018. Here also there is an expectation that data availability could increase.

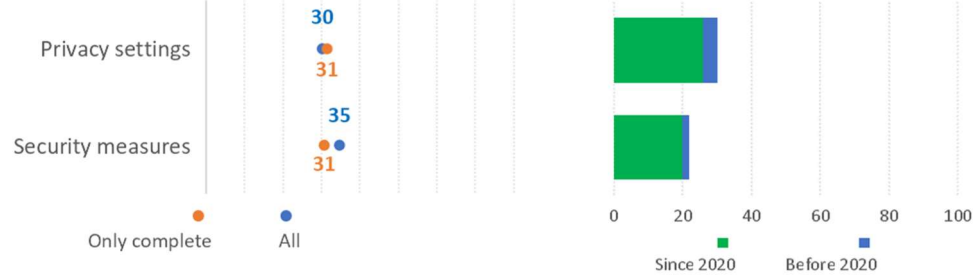
Figure 11
Average percentage share of individuals reporting *Problem solving* skills (left) and number of countries providing data for each sub-indicator (right)



Note: *All* = average in the most recent data year for countries providing any digital skill data. *Only complete* = average of only countries with complete or nearly complete data (Bahrain, Egypt, Iran, Kazakhstan, Republic of Korea, Morocco, Russian Federation, Singapore, Zimbabwe).

For problem solving skills differences are also less notable with the exception of participation in an online course. For this activity the average share is notably lower than the others. Regarding data availability, installing new devices is somewhat lower than for other sub-indicators. In addition, fewer countries provided data in recent years on transferring files between devices.

Figure 12
Average percentage share of individuals reporting *Safety* skills (left) and number of countries providing data for each sub-indicator (right)



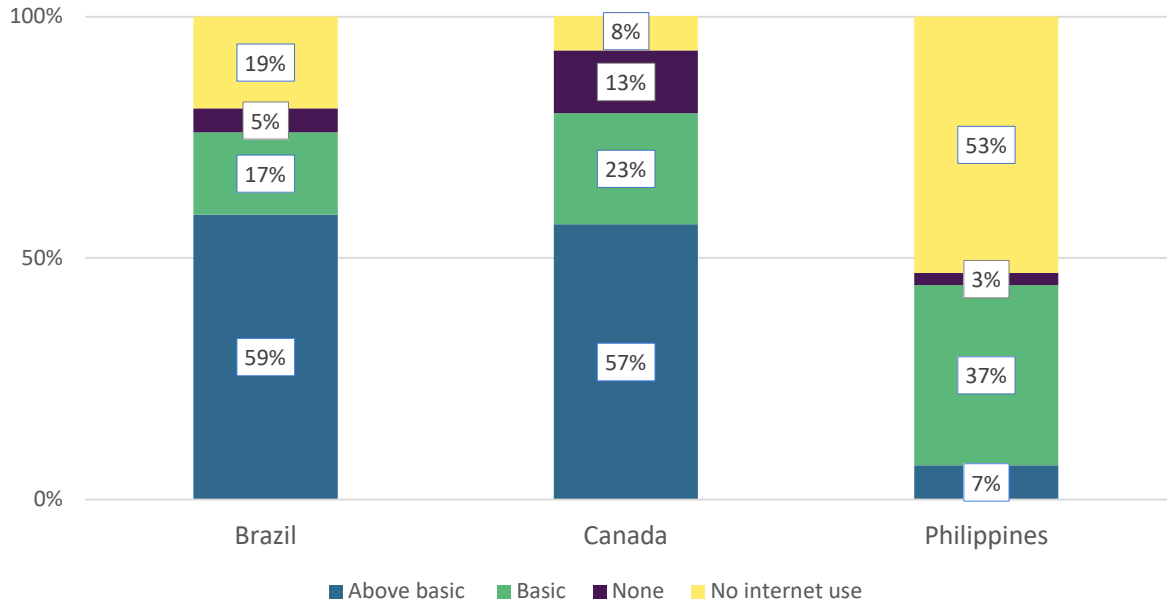
Note: *All* = average in the most recent data year for countries providing any digital skill data. *Only complete* = average of only countries with complete or nearly complete data (Bahrain, Egypt, Iran, Kazakhstan, Republic of Korea, Morocco, Russian Federation, Singapore, Zimbabwe).

For safety skills differences are less. As noted earlier, data availability for this area is the lowest of the skill areas. Availability may increase in future years as more countries add these newer indicators to their household surveys.

Annex 2: Examples of pilot projects to aggregate data on ICT skills at the individual level

At the 2022 EGH meeting, the ICT skills subgroup presented the first data pilot that aggregated ICT skills data at the individual level. Using Brazilian data, the share of individuals with ICT skills were aggregated by skill areas in addition to a composite aggregate. In 2023, two additional countries piloted this methodology: Canada and the Philippines. The figures below display comparable data for 3 countries across 3 skill area, namely *Communication and collaboration*, *Problem solving*, and *Digital content creation*.

Figure 13.
Share of individuals with ICT *Communication and collaboration* skills, by country



Note: Data for Brazil (2021), for Canada (2020) and Philippines (2019).

Figure 13 shows the share of individuals with ICT skills in the area of *Communication and collaboration*. Two distinct levels of skills can be observed: *basic level* and *above basic level*. For an individual to be at *basic level*, they need to have one skills indicator within the area, whereas for "above basic", two or more skills indicators are needed. Figure 13 shows that 76% of individuals in Brazil, 80% in Canada and 44% in Philippines have *at least basic level* of Communication and collaboration skills (combination of *basic* and *above basic*). Interestingly, Figure 13 shows a high level of individuals with *above basic skills* in this area both in Brazil and Canada, despite lower overall Internet use in Brazil.

Additionally, Figure 13 shows the category "*none*" which stands for those individuals who said to have used the internet in the last 3 months but did not score any skills indicators

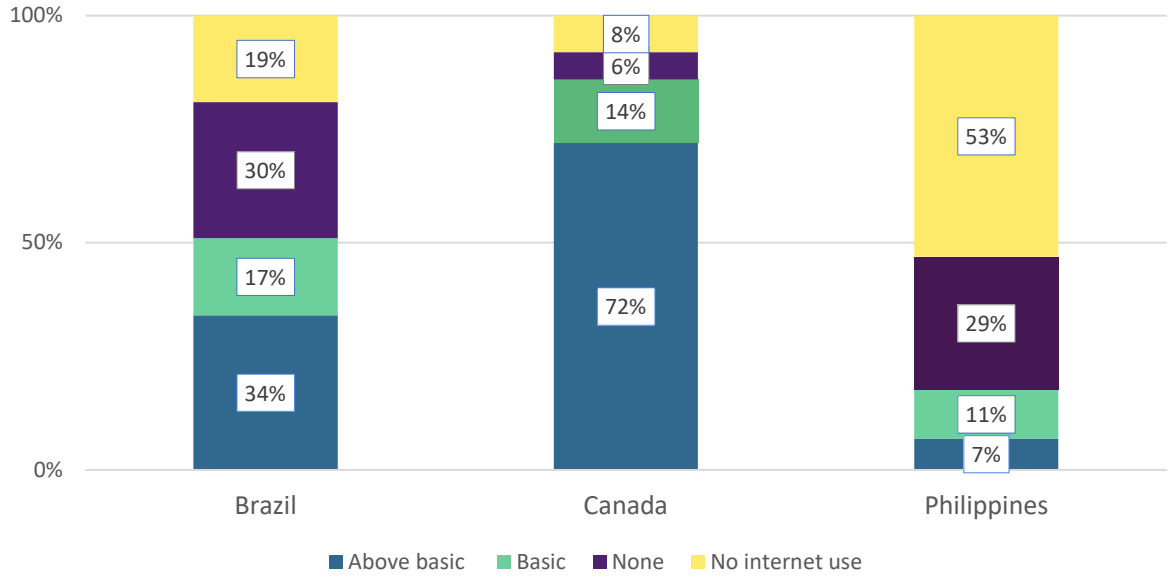
within this given area. "*No internet use*" displays those individuals who declared not having used the internet in the last 3 months at all.

Table 3.
ICT skills indicators pertaining to the skill areas of Communication and collaboration; and Problem solving. Table shows which indicators were collected by each of the pilot country.

	Communication & Collaboration (COM)				Problem solving (PROB)					
	Sending messages (e.g. email, messaging service, SMS)	Making calls (Telephoning over the Internet)	Participating in social networks	Taking part in consultation or voting via Internet	Finding, downloading, installing and configuring software	Connecting and installing new devices	Transferring files or applications between devices	Electronic financial transactions	Doing an online course	Purchasing or ordering goods or services
Brazil	1	1	1	1	1	1	1	1	1	1
Canada		1	1	1				1	1	1
Philippines	1	1	1		1		1	1	1	1

The first part of Table 3 details the skills indicators that were collected by pilot countries for Communication and collaboration.

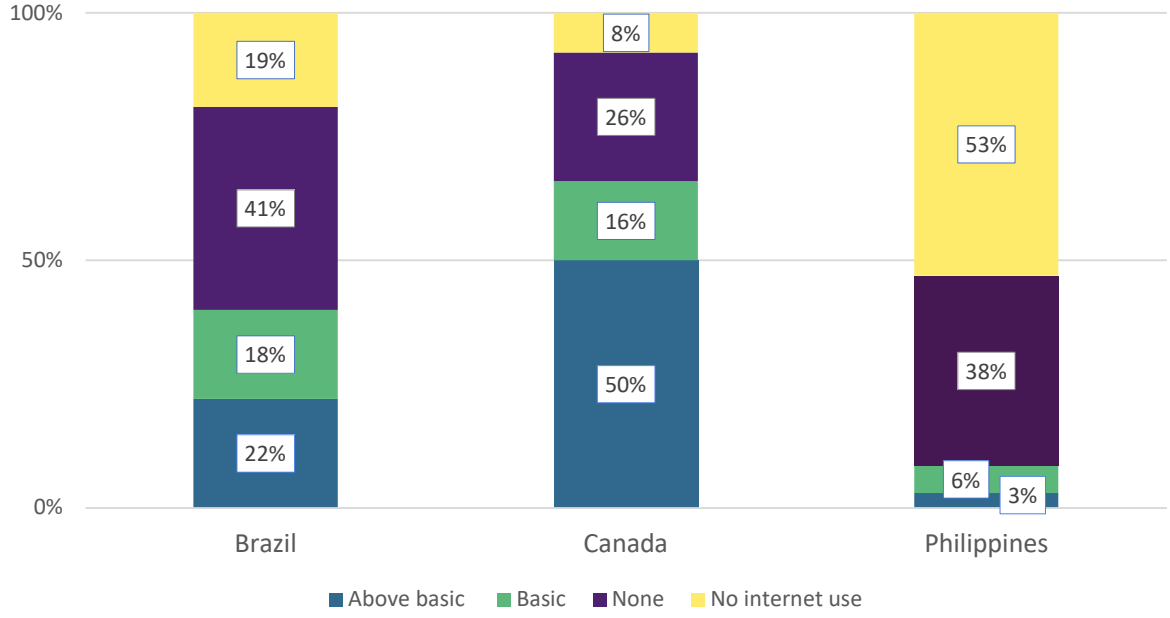
Figure 14.
Share of individuals with ICT *Problem solving* skills by skill area and country



Note: Data for Brazil (2021), for Canada (2020) and Philippines (2019).

Figure 14 shows the share of individuals in skill area of Problem solving (ICT skills indicators collected by pilot countries in this skill area are shown in the second part of Table 3). Similarly to the skills area of Communication and collaboration, which appear to be the most prevalent, this is an where individuals have skills, however more variation can be observed across countries. In Brazil, 51% of individuals have at least basic level of skills, whereas the share is 86% in Canada and 18% in Philippines.

Figure 15.
Share of individuals with *Digital content creation* skills by skill area and country



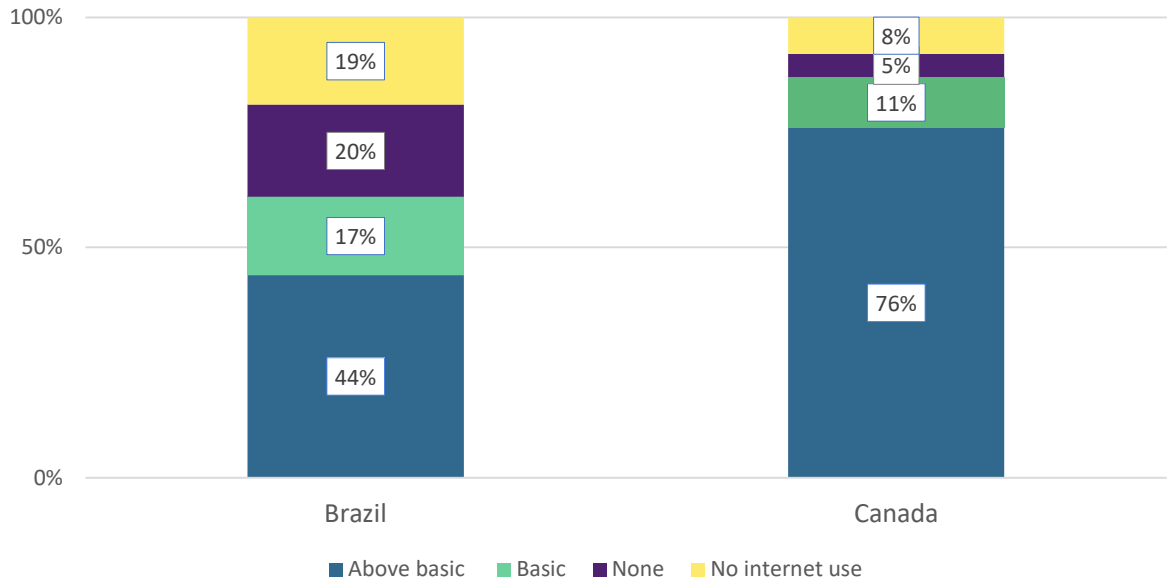
Note: Data for Brazil (2021), for Canada (2020) and Philippines (2019).

Finally, Figure 15 displays the share of individuals with skills in Digital content creation (ICT indicators collected by pilot countries are displayed in the second part of Table 4). In Brazil, 40% of individuals have at least basic level skills in this area, whereas the share is 66% of individuals in Canada and 9% in the Philippines. Out of the 3 skills areas compared for the pilot countries, this area seems to have the least number of activities and it shows the highest share of individuals who do not perform any digital content creation activities (41% in Brazil, 38% in the Philippines and 26% in Canada). In terms of upskilling population, digital content creation could be a potential target for policy actions and subsequent programs for digital upskilling (e.g. creating and manipulating digital documents and spreadsheets) as those are very employable skills in the labour market.

Table 4.
ICT skills indicators pertaining to the skill areas of Information literacy and Digital content creation. Table shows which indicators were collected by each of the pilot country.

	Information and Data (INFO)				Content creation (CONT)					
	Verifying the reliability of information	Getting information about goods or services	Reading or downloading newspapers, etc	Seeking health-related information	Using copy and paste tools	Creating electronic presentations	Using basic arithmetic formula in a spreadsheet	Writing a computer program	Editing online text, presentations	Uploading self/user-created content
Brazil		1	1	1	1	1	1	1	1	1
Canada		1	1	1	1	1	1	1		1
Philippines			1		1	1	1	1		1

Figure 16.
Share of individuals with ICT *Information literacy* skills by skill area and country

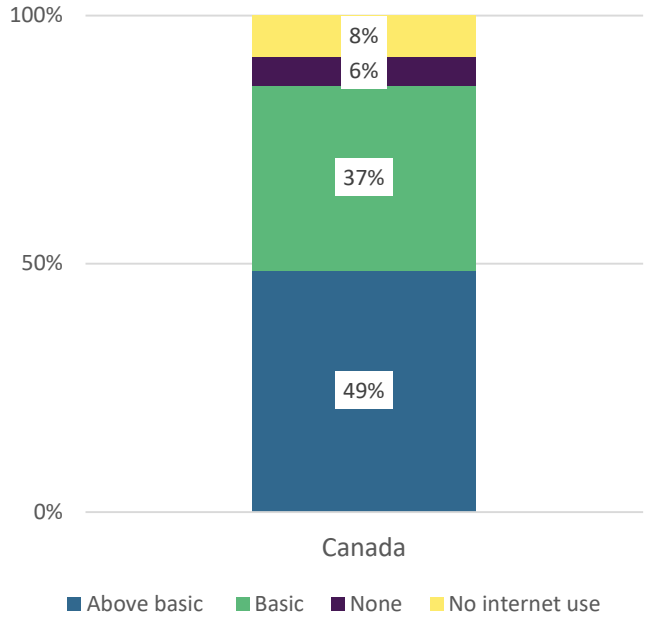


Data for Brazil (2021) and Canada (2020).

Additionally, apart from comparisons across all 3 pilot countries, insights are available for Brazil and Canada in the area of Information literacy. Figure 16 shows monitoring data for individuals' skills in these two countries. In Brazil, 61% of individuals have at least basic level in information literacy whereas the figure is 87% in Canada. Information literacy skill level was not computed for the Philippines where only one indicator in this area was collected (see first part of Table 4). This aligns with the recommendation by the subgroup that skill levels should not be assessed in skill areas where fewer than two indicators are collected.

To encourage countries to start using the newly proposed aggregate ICT skills indicators and to guarantee better data availability in the future, the sub-group will propose 2 core indicators per skill area to be selected as a part of future work. This will also guarantee better data comparability across countries on the long run.

Figure 17
Share of individuals with ICT *Safety* skills by skill area in Canada

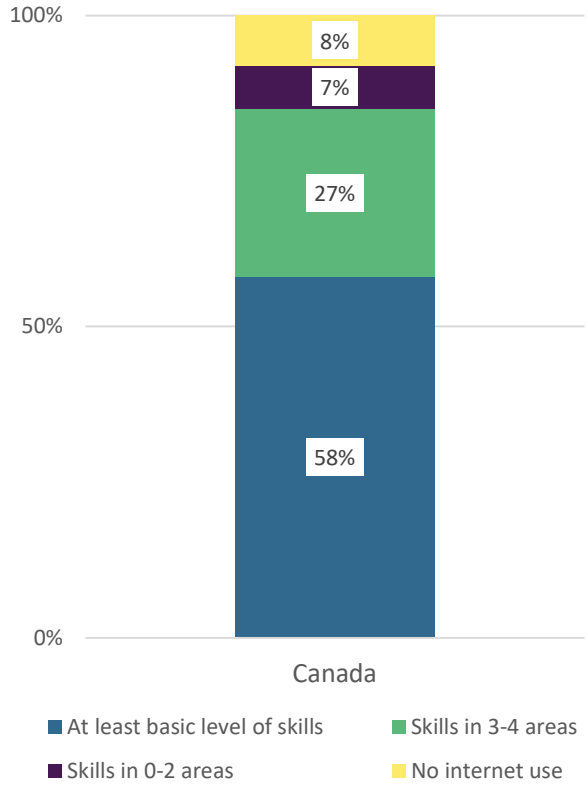


The area of Safety is the fifth and the newest area, two new ICT skills indicators were agreed upon in 2019. Out of the pilot countries, only Canada collected such data (Table 5). Figure 17 shows that 37% of Canadians have basic skills in is area whereas an additional 49% have above basic skills.

Table 5.
ICT skills indicators pertaining to the skill area of Safety

	Safety (SAFE)	
	Changing privacy settings	Setting up effective security measures
Brazil		
Canada	1	1
Philippines		

Figure 18
Share of individuals with overall ICT skills in Canada

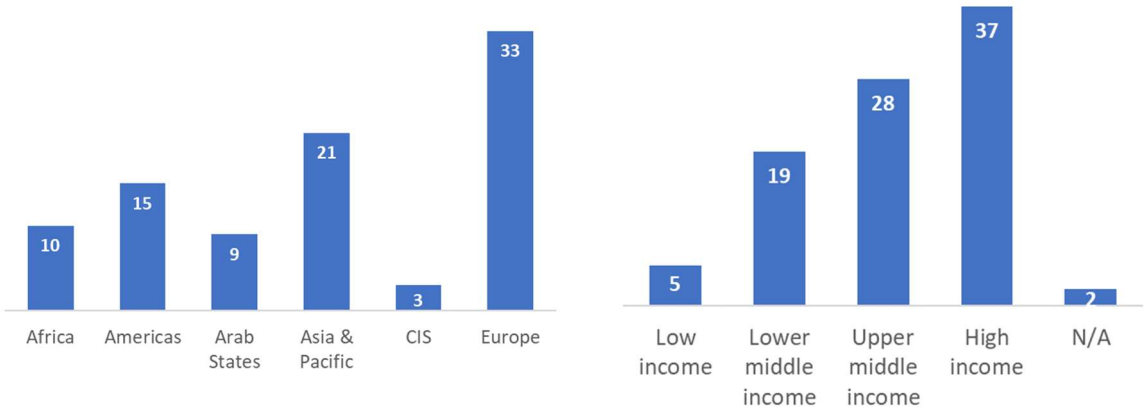


Last, out of the data pilot countries, only Canada collected a sufficient amount of data in order to compute the aggregate of the ICT skills across all 5 areas (meaning at least 2 ICT indicators in each of the 5 areas). Figure 18 shows that 58% of individuals in Canada have at least basic level of ICT skills using the new method of calculation. The ICT aggregate also reveals that 27% of individuals have skills in 3-4 areas of 5 that are required. For training and upskilling actions, they constitute a group that could reach the basic level of ICT skills with relatively simple upskilling efforts. There is 7% of individuals who only possess skills in 0-2 areas. This latter group requires much more training efforts and constitutes a vulnerable group of internet users.

Annex 3: Results of survey on ICT skills data collection/processing capacity

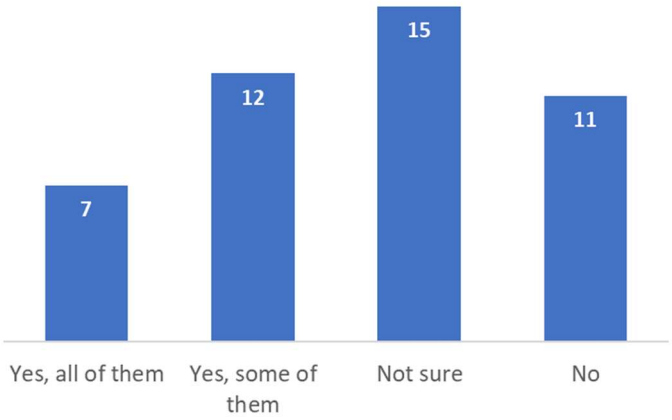
In June 2023 a short survey was sent to ICT statistics focal points in countries to assess the capacity of countries to collect the necessary data on ICT skills to implement the subgroup's recommendations. 91 countries responded with a skew toward wealthier countries and European countries (see Figure 19). Most countries responded that they collect all (28 countries) or some (45 countries) of the relevant ICT skills indicators.

Figure 19
Number of countries responding to the subgroup ICT skills data collection capacity survey, by region and income group



Of the 45 countries collecting only some of these indicators, almost half indicated that they were planning to add all or some of the remaining indicators. A third of respondents said they were not sure whether these indicators would be added and 11 countries said they would not be adding the remaining indicators (see Figure 20). Of the 18 countries not currently collecting data on ICT skills, one reported that they plan to begin to collect these data and 13 reported that they were not sure if they would collect these data in the future. Only 4 responded that they would not collect any ICT skills data in the future.

Figure 20
Does your country have plans to add the ICT skills questions not currently collected to your surveys in the future?

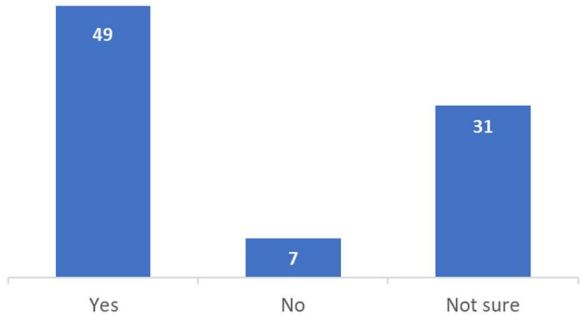


Note: Question asked to the 45 countries indicating that they collect some but not all ICT skills indicators

For the 87 countries collecting or possibly planning to collect ICT skills data further questions regarding ICT skills were asked. Most countries (52) reported that they were aware of the subgroup's work. As part of the survey a brief explanation of the recommended approach to aggregate ICT skills data was provided with reference to previous reports of the subgroup. Based on the information provided and previous awareness of the subgroup's work only 11 reported that the recommended approach was somewhat unclear or very unclear. Conversely over half (46 countries) reported that the approach was very clear.

Regarding their capacity to implement the subgroup's recommendations, most countries reported that they could do this (see Figure 21). Only seven countries reported that they do not have the capacity to implement the approach.

Figure 21
Does your country have the capacity to implement this recommendation?

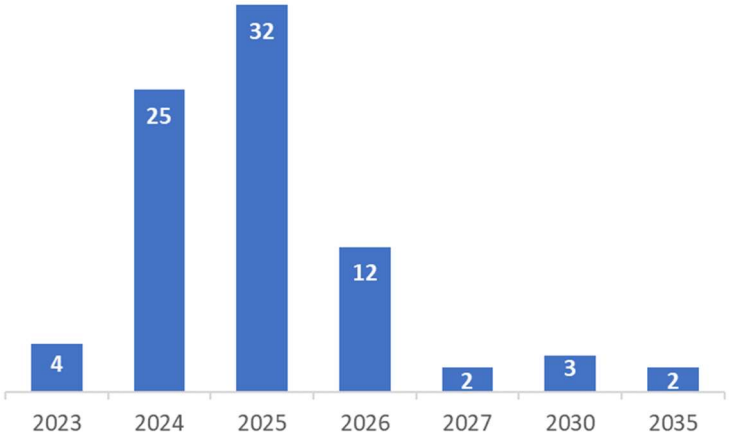


Note: Question asked to the 87 countries indicating that they collect or could collect in the future ICT skills indicators

Barriers to implementation varied among the 38 countries indicating they were not sure or could not implement the recommendations. About a quarter reported that more staff would be needed, while seven reported that more training was needed. Several EU countries pointed to the minor differences in wording and requirements from Eurostat.

When asked about the earliest year that such a recommendation could be implemented, most of the 80 countries who indicated they at least possibly could implement the recommendations reported that they could do this by 2025. Nearly all reported that they could implement the recommendation by 2026 (see Figure 22).

Figure 22
What is your estimate of the earliest year that such a recommendation could be implemented if a clear methodology was provided in September 2023?



Note: Question asked to the 80 countries indicating that they could or possibly could implement the recommended approach to aggregate ICT skills indicators at the individual level

References

[1] Vuorikari, R., J., N., Karpinski, Z., Pokropek, A. (2022). Measuring Digital Skills across the EU: Digital Skills Indicator 2.0. Publications Office of the European Union, Luxembourg. https://publications.jrc.ec.europa.eu/repository/handle/JRC130341