INEQUALITY OF OPPORTUNITY
WHO ARE THOSE LEFT BEHIND?
TUVALU
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1. EXECUTIVE SUMMARY

Through two new methodological tools, it is possible to identify the furthest behind in a range of development areas. The groups which are furthest behind are defined by common circumstances over which the individual has little or no direct control, such as their household’s wealth, their sex or their place of residence. The analysis in Tuvalu focuses on 12 indicators (8 opportunities and 4 barriers), aligned to SDG indicators, where significant inequality prevents people from fulfilling their potential, namely: access to clean fuel, basic sanitation, Internet usage, COVID-19 preparedness, early childhood education, completion of secondary and tertiary education, family planning, violence against women justified, sexual or physical violence against women, stunting in children under 5 years of age, and overweight in children under 5 years of age.¹

1.1 Which opportunities are most unequally distributed?

The first step is to measure inequality of opportunity, by reviewing how different groups fare in terms of access to a certain opportunity. This is measured through the dissimilarity index (D-Index), which, like the Gini coefficient, ranges from 0 to 1, where 0 indicates no inequality, and 1 indicates that the entire access to a service is reserved to a specific group of people with shared circumstances (e.g., men from urban areas). In Tuvalu, the D-Index – and therefore inequality - is highest in family planning and tertiary education.

When aggregating the Dissimilarity Index (D-Index), a measure of inequality, across all opportunities, Tuvalu is faring better than most other Asia-Pacific developing countries. On aggregate, inequality across all indicators is estimated at 0.08, compared with 0.04 in Kazakhstan and 0.27 in Papua New Guinea, the region’s highest.

1.2 Who are the furthest behind?

The analysis further zooms into a new methodological approach to identify those furthest behind in access to opportunities or those who face disproportionately higher barriers. An algorithm, following the classification and regression tree (CART) methodology, looks at several circumstances (descriptive features) and separates households or individuals into different groups based on significantly different access levels. The result is distinct groups, with intersecting circumstances or disadvantages that have distinctly different levels of access to an opportunity (or prevalence of a barrier).

Among all indicators considered (8 opportunities and 4 barriers), the highest gaps between the furthest behind and the furthest ahead groups can be seen in Internet usage and in the completion of secondary and tertiary education. The furthest behind groups differ for each indicator. For example, the furthest behind group in Internet usage are individuals with lower education. Only half of them use the Internet. The furthest behind groups in completion of secondary and tertiary education are poorer men. About 22 per cent have completed secondary education, while 16 per cent have completed tertiary education. Section 5 summarizes which are the common circumstances that make the furthest behind groups.²

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¹ The indicators considered follow related SDG indicator definitions, except COVID-19 preparedness, which is an index developed by the United Nations ESCAP. See Annex.

² The set of circumstances considered is different for each indicator. For example, for indicators with “households” as the reference group, the following circumstances are considered: wealth, residence, and education (highest in the household). For indicators with “individuals” (women, or children) as the reference group, an additional set is considered: sex, age group, as well as mother’s education and number of children under 5 years of age.
1.3 What about minorities?

For only one indicator, stunting in children under 5 years of age, analysis finds that, after including ethnicity and religion as circumstances, the composition of the furthest behind group changes. About 12 per cent of children whose mother has lower or secondary education and who belong to a minor religion are stunted, when compared to 6 per cent of stunted children in the population.

1.4 The intersecting circumstances that shape the furthest behind groups in Tuvalu

Source: ESCAP elaboration using data from the latest MICS (2019).

Note 1: Access to basic drinking water, electricity, bank account ownership, and skilled birth attendance during childbirth are not shown because average access of the population is above 98 per cent. Similarly, wasting in children under 5 years of age is not shown as the average rate is below 3 per cent.

Note 2: “n/a” means that the circumstance was not included in the analysis because it was either not relevant or not available. The “Standard analysis” rows reflect the analysis based on a basic set of circumstances, different for each indicator (as shown in the top row). The “Analysis with additional variables” rows reflect the analysis that has been repeated adding the circumstance of “ethnicity” and/or “religion”, and where these circumstances appear to matter in shaping the furthest behind groups.

Note 3: B40 refers to households belonging to the bottom 40 of the wealth distribution.

1.5 Uses and limitations

The findings are of direct use for generating discussions on transformations needed to “leave no one behind” and reach the “furthest behind first” as pledged in the 2030 Agenda for Sustainable Development. Considering the grave impacts of the evolving COVID-19 pandemic, the groups that are furthest behind need to be brought into focus more urgently than ever.

There are many circumstances shaping access to opportunities or the experience of a certain barrier by different groups. This analysis is restricted to those circumstances (variables) available in the Multiple Indicator Cluster Survey (MICS) for Tuvalu. The classification and regression tree (CART) analysis used in this study only presents circumstances if they are found to significantly explain gaps in access between groups.3 Ultimately, these circumstances define the composition of the groups, but should not be interpreted as causes of a lower access.

2. INTRODUCTION

The ESCAP *Inequality of Opportunity* analysis uses two new methodological tools to measure inequality in the distribution of basic services and to identify the furthest behind in the same development areas. In both methods, population groups are defined by common circumstances over which the individual has little or no direct control.

The analysis explores inequality in key areas affecting a person’s life prospects: access to clean energy, access to basic sanitation, access to information and communication technologies (ICTs), COVID-19 preparedness, education, women’s access to sexual and reproductive health, violence against women, and children’s nutrition. These opportunities and barriers are covered by specific commitments outlined in the 2030 Agenda for Sustainable Development (except for COVID-19 preparedness).

This report starts by reviewing overall inequality of opportunity levels, situating Tuvalu among other countries in the Asia-Pacific region (Section 3). It then zooms into Tuvalu to identify the shared circumstances of population groups that are left furthest behind in areas with significant inequality (Section 4).

2.1 Scope of the analysis

In Tuvalu, 8 opportunities and 4 barriers are identified where significant inequality prevents people from fulfilling their potential, namely: access to clean fuel, basic sanitation, Internet usage, COVID-19 preparedness, early childhood education, completion of secondary and tertiary education, family planning, violence against women justified, sexual or physical violence against women, stunting in children under 5 years of age, and overweight in children under 5 years of age.

**Access to clean fuel:** Reliable and affordable energy services are fundamental to everyday life. Equality in access to clean energy increases productivity, reduces health disparities, and bolsters gender equality.

**Basic sanitation:** The use of improved facilities that are not shared with other households and where excreta are safely disposed helps to maintain health and increase lifespans. Inequality in basic sanitation threatens human dignity and constitutes a major economic and health burden.

**Internet usage:** ICTs are indispensable in boosting productivity and economic activity, enabling knowledge and information sharing, and broadening the delivery of services. Inequality in Internet usage creates deep divides that are expected to amplify as technology reshapes lives.

**COVID-19 preparedness:** An index constructed by the United Nations ESCAP defined as follows: The household has access to the Internet, TV, phone, mobile phone or radio; the household has water pipes into the dwelling or yard or other private water source; the household has a handwashing facility on premises with soap and water available; there are no more than 2 people per sleeping room in the household (excluding children under 2 years of age); the household has a toilet which is not shared with other households.

**Early childhood education:** Early childhood development is multidimensional and involves an ordered progression of motor, cognitive, language, socio-emotional and regulatory skills and capacities across the first few years of life. Inequality in early childhood education persist into adulthood and perpetuates intergenerational poverty as well as educational and health inequalities.

**Completion of secondary and attendance of tertiary education:** Inequality in education matters because more education often results in a better job with higher incomes and a chance to break patterns of poverty and vulnerability. Inequality in child nutrition, access to basic sanitation and clean fuels are also all associated with inequality in educational attainment.
**Family planning:** Use of modern contraceptive methods remains the first step towards positive sexual and reproductive health outcomes for all women. Inequality in the use of modern contraceptives renders some women more likely to experience unintended pregnancies, which can result in disability and even death. Tightly spaced births also have significant cognitive and nutritional consequences for children.

**Violence against women justified:** The acceptance of the use of violence to uphold certain gender roles in society can signal a broader acceptance of violence against women in intimate relationships. These gender roles include whether a woman goes out without telling her husband, whether she neglects the children, she argues with him, she refuses sex with him, or she burns the food.

**Sexual or physical violence against women:** gender-based violence is a violation of women’s human rights and a major public health problem. It keeps women from contributing to social, economic, and political development in their communities while affecting their well-being. Ending violence against women is paramount to ensure women’s economic autonomy and security.

**Stunting and overweight in children under 5 years of age:** Inequality among children’s nutrition levels matters because proper nutrition provides the foundation upon which developmental progress is built. Children who receive poorer nutrition are more likely to be stunted or wasted and face cognitive and developmental consequences of malnutrition in the long-term. Similarly, overweight can lead to serious health consequences such as cardiovascular diseases and diabetes.

### 2.2 Relevance in the context of COVID-19

The results of this analysis are as timely as ever. The COVID-19 pandemic has highlighted the need to consider and address the vulnerabilities of the most marginalized segments of the population. While everyone can become infected, people living in poverty or who are otherwise disadvantaged may be less well equipped to cope with the socioeconomic impacts of this health crisis.

For example, the Internet has proved crucial for navigating the new realities brought about by the COVID-19 pandemic. Internet usage enables connections amidst social distancing measures and helps mitigate some of its economic effects, by allowing working from home, e-commerce and e-learning. Groups with limited Internet usage may therefore cope less well with the social and economic consequences of the pandemic.

Closures of universities and other educational institutions due to COVID-19 could exacerbate the gap in secondary and tertiary education completion. The socioeconomic disadvantages of the furthest behind groups may therefore hamper their ability to follow e-learning from their place of residence. Women might face added pressures to abandon their studies, while students in households without Internet access would likely fall further behind. Similarly, school and health clinic closures might also restrict access to sexual and reproductive health education or services among younger groups of women.

Inequality in these areas was already concerning before the pandemic. While Tuvalu has not yet experienced an outbreak within its borders, and hopefully never will, the consequences of the pandemic reverberate globally. Its lessons must also reach citizens of all countries. This analysis will help focus the attention of the UN Country Team and the Government of Tuvalu to reach the furthest behind.
3. MEASURING INEQUALITY OF OPPORTUNITY

What is the D-Index?

Rising inequality is a concern across the developed and developing world alike. Sustainable Development Goal 10 highlights the pressing need to reduce inequality in all its forms.

Inequality refers to the unequal distribution not only of income and wealth, but also of opportunities and services. *Inequality of opportunity undermines the realization of human rights and constitutes a barrier for social mobility.*

The dissimilarity index (D-Index) measures how different groups - such as women, poorer households, or rural residents - *fare in terms of access to a certain opportunity*, or how different groups disproportionately experience a certain barrier. Like the Gini coefficient, the D-Index ranges from 0 to 1, where 0 indicates no inequality, and 1 indicates that the entire access to a service is reserved to a specific group of people with shared circumstances (e.g., men from urban areas).

Building the D-Index

To obtain the D-Index, inequality in access to an opportunity (or in the prevalence of a barrier) is generated by the formula:

\[
D = \frac{1}{\bar{p}} \sum_{i=1}^{n} \beta_i |p_i - \bar{p}|
\]

- \( \beta_i \) is the proportion of the group \( i \) in the sample, (sum of \( \beta_i \) equals 1)
- \( \bar{p} \) is the average access rate in the country
- \( p_i \) is the level of access of population group \( i \), and takes values from 0 to 1
- \( n \) is the number of groups defined by different circumstances

Based on the interactions between circumstances, the entire sample is divided into distinct population groups. The D-Index is therefore the weighted average of the absolute difference between distinct population groups with shared circumstances and the average access rate in the country (\( \bar{p} \)). The analysis draws on data from latest available Demographic and Health Surveys (DHS) or Multiple Indicator Cluster Surveys (MICS).

Which opportunities or barriers is ESCAP measuring?

**Household opportunities**
- access to basic drinking water
- access to basic sanitation
- access to electricity
- access to clean fuel
- bank account ownership
- Internet usage

**Individual opportunities**
- completion of secondary education
- completion of tertiary education
- early childhood education
- family planning
- access to skilled birth attendance during childbirth
- COVID-19 preparedness

**Individual barriers**
- prevalence of stunting, wasting and overweight in children under 5 years of age
- prevalence and/or justification of violence against women
3.1 Average D-Index in Asia and the Pacific, by opportunity or barrier

Source: ESCAP calculations using data from the latest DHS and MICS for 27 countries in Asia and the Pacific.

Note: The D-Index for Internet usage, prevalence of violence against women, and prevalence of stunting, wasting and overweight among children under 5 years of age reflect data from fewer than 27 countries, because some surveys did not ask these questions. The analysis has been adapted so that the D-Index of a barrier (e.g., prevalence of stunting) still has the same interpretation as that of an opportunity: the lower the D-index the lower the inequality.
3.2 Average D-Index in Asia and the Pacific, by country

Source: ESCAP calculations using data from the latest DHS and MICS for 27 countries in Asia and the Pacific.

Note: Average D-Index for all countries includes access to clean fuel, basic sanitation, basic drinking water, electricity, bank account ownership, secondary education completion, tertiary education completion, family planning, COVID-19 preparedness, and skilled birth attendance during childbirth. The variables Internet usage, prevalence of violence against women, and prevalence of stunting, wasting and overweight among children under 5 years of age were considered only for those countries with available data, where surveys asked the questions.
3.3 D-Index in Tuvalu, by opportunity or barrier

Source: ESCAP elaboration using data from the latest MICS (2019).

Note 1: Access to basic drinking water, electricity, bank account ownership, and skilled birth attendance during childbirth are not shown because average access of the population is above 98 per cent. Similarly, wasting in children under 5 years of age is not shown as the average rate is below 3 per cent.

Note 2: In general, the D-Index measures the distribution of a positive outcome. Prevalence and/or justification of violence against women and prevalence of stunting and overweight in children 5 years of age are not positive outcomes, but rather a barrier for women’s and children’s fulfilment in life. To calculate the D-Index for these barriers, while keeping the same interpretation as for other positively defined indicators (opportunities), the absence of prevalence and/or justification violence against women and prevalence of stunting and overweight in children under 5 years of age is first calculated. The remaining calculations follow the same formula as for standard positively defined indicators.
4. IDENTIFYING THE FURTHEST BEHIND

The classification and regression tree (CART) methodology

The commitment to “leave no one behind” is enshrined in the 2030 Agenda for Sustainable Development. A methodological approach to identify those furthest behind in access to opportunities or those who face disproportionately higher barriers is a first step towards guaranteeing that no one is left behind.

The classification and regression tree (CART) methodology is an analytical structure that identifies population groups with distinct access levels to opportunities or occurrence of barriers. A total of 8 opportunities and 4 barriers are considered. The analysis draws on Tuvalu’s MICS 2019. This questionnaire also includes questions on ethnicity and religion, thereby opening a small, but unique window to understanding how these identities interact with other circumstances to create groups that are left behind in access to these opportunities or the prevalence of barriers. Behind the classification and regression tree methodology is an algorithm that looks at each circumstance and separates the sample in two groups, so that it best satisfies a certain “splitting criterion”. This splitting criterion can be defined in a few ways, while the one used here is the Analysis of Variance, or “ANOVA”.

4.1 Who are the furthest behind in Tuvalu?
The classification tree shows that the average access to clean fuel is 84 per cent. The lower red box shows the furthest behind group: households belonging to the bottom 40 of the wealth distribution in rural areas and with lower or secondary education, among which 55 per cent have access to clean fuel (compared to 100 per cent of households in the best-off group).
The classification tree shows that, on average, 82 per cent of households have access to basic sanitation. The red box shows the furthest behind group: households belonging to the bottom 40 per cent of the wealth distribution in urban areas, among which 60 per cent have access to basic sanitation (compared to 92 per cent in the best-off group).
The classification tree shows that, on average, 84 per cent of individuals use the Internet. The red box shows the furthest behind group: individuals with lower education, among which 51 per cent use the Internet (compared to 95 per cent in the best-off group).
The classification tree shows that, on average, 23 per cent of individuals have a home environment which is fit to protect them from COVID-19. The red box shows the furthest behind group: poorer individuals in urban areas, having a rate of 8 per cent (compared to 37 per cent of individuals in the best-off group).

COVID-19 preparedness is an index constructed by the United Nations ESCAP defined as follows: the household has access to the Internet, TV, phone, mobile phone or radio; the household has water pipes into the dwelling or yard or other private water source; the household has a handwashing facility on premises with soap and water available; there are no more than two people per sleeping room in the household (excluding children under 2 years of age); the household has a toilet which is not shared with other households.
The classification tree shows that the average early childhood education rate is 73 per cent. The red box shows the furthest behind group: children in households with <2 children (only child), among whom 63 per cent have early childhood education (compared to 81 per cent in the best-off group).
The classification tree shows that the average secondary education completion rate is 49 per cent. The red box shows the furthest behind group: poorer males, among whom only 22 per cent have completed secondary education (compared to 69 per cent in the best-off group).
The classification tree shows that the average tertiary education completion rate is 40 per cent. The red box shows the furthest behind group: poorer males, among whom only 16 per cent have completed tertiary education (compared to 65 per cent in the best-off group).
The classification tree shows that on average 46 per cent of women have their need family planning needs satisfied with modern methods. The red box shows the furthest behind group: women with <2 birthed children, among which 28 per cent use modern contraception (compared to 57 per cent in the best-off group).

This indicator mirrors exactly the definition of SDG indicator 3.7.1 “Proportion of women aged 15-49 years who have their need for family planning satisfied with modern methods.” It shows the percentage of women of reproductive age (15-49 years) who desire either to have no (additional) children or to postpone the next child and who are currently using a modern method of contraception. The indicator is also referred to as the demand for family planning satisfied with modern methods.
The classification tree shows that, on average, 43 per cent of women consider violence against women justifiable under certain circumstances. The red box shows the characteristics of those women most likely to justify this practice: women 25-34 years of age and with lower or secondary education, among which 52 per cent consider violence against women justified (compared to 32 per cent in the best-off group).

This indicator refers to the prevalence of attitudes considering violence against women justified, as the attitudes or beliefs of respondents can be used as a proxy indicator of the level of tolerance for the use of violence against women in an intimate relationship. The indicator is constructed by analyzing the proportion of women who consider their partner is justified in beating them if: 1) she goes out without telling him; 2) she neglects the children; 3) she argues with him; 4) she refuses sex with him; 5) she burns the food.
The classification tree shows that, on average, 27 per cent of women have been victims of sexual or physical violence. The red box shows the characteristics of those women with higher prevalence to being a victim of sexual or physical violence: women 15-24 years of age, among which 39 per cent have been victims of sexual or physical violence (compared to 13 per cent in the best-off group).

For additional analysis on other types of violence against women (psychological, any, sexual only, physical only) in Tuvalu, please visit: lnob.unescap.org.
The classification tree shows that the average stunting rate for children under 5 years of age is 6 per cent. The red box shows the furthest behind group: children whose mother has lower education, among which 10 per cent are stunted (compared to 3 per cent in the best-off group).
The classification tree shows that the average overweight rate for children under 5 years of age is 4 per cent. The red box shows the furthest behind group: children whose mother has lower or secondary education, belonging to richer households and with <3 children under 5 years of age, among which 8 per cent are overweight (compared to 2 per cent in the best-off group).
4.2 Does ethnicity or religion matter for determining the furthest behind?

In Tuvalu, the MICS 2019 included questions on ethnicity and religion. Replicating the classification and regression tree (CART) methodology to include these identities alters the composition of the furthest behind groups in stunting in children under 5 years of age. The tree is included in this section if the ethnic composition / religious identity of the household contributes to forming identities of the furthest behind group, and the sample size of the group is over 5 per cent of the population.

The classification tree shows that, after including religion and ethnicity as an additional variable, the new furthest behind groups consists of children whose mother has lower or secondary education and professes a minor religion, 12 per cent of which are stunted. That compares to 6 per cent of stunted children in Tuvalu. The best-off group consists of children whose mother has higher education, 3 per cent of whom are stunted.
5. CONCLUSION

There are many circumstances shaping access to different opportunities or the experience of a certain barrier by different groups. This analysis is restricted to those circumstances (variables) available in the Multiple Indicator Cluster Survey for Tuvalu. The classification and regression tree (CART) analysis used in this study only presents circumstances if they are found to significantly explain gaps in access between groups. Ultimately, these circumstances define the composition of the groups, but should not be interpreted as causes of a lower access.

The study has shed light on the layers of descriptive features (circumstances) shared by the furthest behind group in access to clean fuel, basic sanitation, Internet usage, COVID-19 preparedness, early childhood education, completion of secondary and tertiary education, family planning, violence against women justified, sexual or physical violence against women, stunting in children under 5 years of age, and overweight in children under 5 years of age. The figure below summarizes the information obtained from the trees presented above, highlighting the average rate, the rate of the best-off group, as well as the rate of the furthest behind group.

The findings are of direct use for generating discussions on transformations needed to “leave no one behind” and reach the “furthest behind first” as pledged in the 2030 Agenda for Sustainable Development. Considering the evolving COVID-19 pandemic, the groups that are furthest behind need to be brought into focus more urgently than ever.
5.1 How large are the gaps in access to opportunities or prevalence of barriers?

5.2 Summary of gaps between the best off and the furthest behind groups

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Indicator</th>
<th>Sample size of reference population</th>
<th>Average rate</th>
<th>Size of best-off group</th>
<th>Rate of best-off group</th>
<th>Size of the furthest behind group</th>
<th>Rate of the furthest behind group</th>
<th>Gap in rate between the best-off and the furthest behind group</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICS 2019</td>
<td>Basic sanitation</td>
<td>695</td>
<td>82%</td>
<td>39%</td>
<td>92%</td>
<td>16%</td>
<td>60%</td>
<td>32 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Clean fuel</td>
<td>695</td>
<td>84%</td>
<td>39%</td>
<td>100%</td>
<td>24%</td>
<td>55%</td>
<td>44 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>COVID-19 preparedness</td>
<td>4204</td>
<td>23%</td>
<td>9%</td>
<td>37%</td>
<td>17%</td>
<td>8%</td>
<td>29 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Family planning</td>
<td>273</td>
<td>46%</td>
<td>22%</td>
<td>57%</td>
<td>19%</td>
<td>28%</td>
<td>29 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Early childhood education</td>
<td>182</td>
<td>73%</td>
<td>54%</td>
<td>81%</td>
<td>46%</td>
<td>63%</td>
<td>19 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Secondary education</td>
<td>1158</td>
<td>49%</td>
<td>29%</td>
<td>69%</td>
<td>18%</td>
<td>22%</td>
<td>47 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Tertiary education</td>
<td>781</td>
<td>40%</td>
<td>23%</td>
<td>65%</td>
<td>18%</td>
<td>16%</td>
<td>49 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Internet usage</td>
<td>1108</td>
<td>84%</td>
<td>38%</td>
<td>95%</td>
<td>11%</td>
<td>51%</td>
<td>44 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Violence against women justified</td>
<td>573</td>
<td>27%</td>
<td>24%</td>
<td>13%</td>
<td>18%</td>
<td>39%</td>
<td>26 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Overweight in children under 5 years of age</td>
<td>479</td>
<td>4%</td>
<td>26%</td>
<td>2%</td>
<td>21%</td>
<td>8%</td>
<td>6 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Stunting in children under 5 years of age</td>
<td>485</td>
<td>6%</td>
<td>38%</td>
<td>3%</td>
<td>14%</td>
<td>10%</td>
<td>8 pp</td>
<td></td>
</tr>
<tr>
<td>MICS 2019</td>
<td>Violence against women justified</td>
<td>817</td>
<td>43%</td>
<td>14%</td>
<td>32%</td>
<td>18%</td>
<td>52%</td>
<td>20 pp</td>
<td></td>
</tr>
</tbody>
</table>

Source: ESCAP elaboration using data from the latest MICS (2019).

Note 1: Access to basic drinking water, electricity, bank account ownership, and skilled birth attendance during childbirth are not shown because average access of the population is above 98 per cent. Similarly, wasting in children under 5 years of age is not shown as the average rate is below 3 per cent.
5.3 Summary of the characteristics of the furthest behind groups

<table>
<thead>
<tr>
<th>Opportunity or barrier/ Circumstances</th>
<th>Wealth</th>
<th>Residence</th>
<th>Education</th>
<th>Sex</th>
<th>Children under 5 years of age</th>
<th>Age group</th>
<th>Ethnicity</th>
<th>Religion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic sanitation</td>
<td>B40</td>
<td>Urban</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Clean fuel</td>
<td>B40</td>
<td>Rural</td>
<td>Lower or secondary education</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Internet usage</td>
<td>B40</td>
<td>Urban</td>
<td>Lower education</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>COVID-19 preparedness</td>
<td>B40</td>
<td>Urban</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Early childhood education</td>
<td>B40</td>
<td>Urban</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Family planning</td>
<td>B40</td>
<td>Rural</td>
<td>Lower or secondary education</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Sexuality education</td>
<td>B40</td>
<td>Rural</td>
<td>Lower or secondary education</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Violence against women justified</td>
<td>B40</td>
<td>Rural</td>
<td>Lower or secondary education</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Sexual or physical violence against women</td>
<td>B40</td>
<td>Rural</td>
<td>Lower or secondary education</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Overweight in children under 5 years of age</td>
<td>T60</td>
<td>Mother has lower or secondary education</td>
<td>&lt;3 children under 5 years of age</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Stunting in children under 5 years of age</td>
<td>T60</td>
<td>Mother has lower education</td>
<td>&lt;3 children under 5 years of age</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Source:** ESCAP elaboration using data from the latest MICS (2019).

Note 1: Access to basic drinking water, electricity, bank account ownership, and skilled birth attendance during childbirth are not shown because average access of the population is above 98 per cent. Similarly, wasting in children under 5 years of age is not shown as the average rate is below 3 per cent.

Note 2: “n/a” means that the circumstance was not included in the analysis because it was either not relevant or not available. The “Standard analysis” rows reflect the analysis based on a basic set of circumstances, different for each indicator (as shown in the top row). The “Analysis with additional variables” rows reflect the analysis that has been repeated adding the circumstance of “ethnicity” and/or “religion”, and where these circumstances appear to matter in shaping the furthest behind groups.

Note 3: B40 refers to households belonging to the bottom 40 of the wealth distribution.
## Opportunities and barriers and their links to the SDGs

<table>
<thead>
<tr>
<th>Opportunities/Barriers (response variable)</th>
<th>Circumstances used to determine the furthest behind/best-off groups (independent variables)</th>
<th>Closest SDG Indicator reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wealth</strong></td>
<td>Household member aged 25-35</td>
<td>1.1.1 Proportion of children and young people aged 5 to 19 years of age who are not in school, including those not in formal or non-formal education and working in the previous 12 months, by sex.</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td>Household member aged 25-35</td>
<td>1.1.1 Proportion of children and young people aged 5 to 19 years of age who are not in school, including those not in formal or non-formal education and working in the previous 12 months, by sex.</td>
</tr>
<tr>
<td><strong>Educational level</strong></td>
<td>Children aged 3-5 years old</td>
<td>2.2.1 Prevalence of stunting (height for age &lt; -2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age.</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Children aged 3-5 years old</td>
<td>2.2.1 Prevalence of stunting (height for age &lt; -2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age.</td>
</tr>
<tr>
<td><strong>Age of household access to electricity</strong></td>
<td>Household member aged 25-35</td>
<td>3.7.1 Proportion of women aged 15-49 years who have their need for family planning satisfied with modern methods.</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td>Household member aged 25-35</td>
<td>3.7.1 Proportion of women aged 15-49 years who have their need for family planning satisfied with modern methods.</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Household member aged 25-35</td>
<td>4.2.2 Participation rate in organized learning (one year before the official primary entry age) by sex.</td>
</tr>
<tr>
<td><strong>Birth registration</strong></td>
<td>Household member aged 25-35</td>
<td>4.2.2 Participation rate in organized learning (one year before the official primary entry age) by sex.</td>
</tr>
<tr>
<td><strong>Access to drinking water</strong></td>
<td>Household member aged 25-35</td>
<td>5.2.1 Proportion of ever-partnered women and girls aged 15 years and older who experienced physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by ever suffering violence against women.</td>
</tr>
<tr>
<td><strong>Access to electricity</strong></td>
<td>Household member aged 25-35</td>
<td>5.2.1 Proportion of ever-partnered women and girls aged 15 years and older who experienced physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by ever suffering violence against women.</td>
</tr>
<tr>
<td><strong>Access to clean fuel</strong></td>
<td>Household member aged 25-35</td>
<td>7.1.2 Proportion of population with primary reliance on clean fuels and technology.</td>
</tr>
<tr>
<td><strong>Internet usage</strong></td>
<td>Household member aged 25-35</td>
<td>7.1.2 Proportion of population with primary reliance on clean fuels and technology.</td>
</tr>
<tr>
<td><strong>Prevalence of violence against women</strong></td>
<td>Household member aged 25-35</td>
<td>7.1.2 Proportion of population with primary reliance on clean fuels and technology.</td>
</tr>
<tr>
<td><strong>Early childhood education</strong></td>
<td>Household member aged 25-35</td>
<td>8.10.2 Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile money-service provider.</td>
</tr>
<tr>
<td><strong>COVID-19 preparedness</strong></td>
<td>Household member aged 25-35</td>
<td>8.10.2 Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile money-service provider.</td>
</tr>
</tbody>
</table>

**Related SDG indicators**

- 1.1.1 Proportion of children and young people aged 5 to 19 years of age who are not in school, including those not in formal or non-formal education and working in the previous 12 months, by sex.
- 2.2.1 Prevalence of stunting (height for age < -2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age.
- 3.7.1 Proportion of women aged 15-49 years who have their need for family planning satisfied with modern methods.
- 4.2.2 Participation rate in organized learning (one year before the official primary entry age) by sex.
- 5.2.1 Proportion of ever-partnered women and girls aged 15 years and older who experienced physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by ever suffering violence against women.
- 7.1.2 Proportion of population with primary reliance on clean fuels and technology.
- 8.10.2 Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile money-service provider.

**ANNEX**
Gaps and limitations

The 12 indicators measuring access to household and individual opportunities or prevalence of barriers have been identified as areas where inequality jeopardizes a person's life prospects. Each of these opportunities or barriers are covered by specific commitments outlined in the Sustainable Development Goals. The findings are of direct use for generating discussions on transformations needed to "leave no one behind" and reach the “furthest behind first” as pledged in the 2030 Agenda.

There are many variables shaping access to different opportunities or the prevalence of barriers. For example, distance from a health-care provider is an important circumstance that might shape family planning. Many variables are not measured in existing DHS and MICS surveys, so results have to be understood with this caveat.

Other national surveys may enhance the scope of the analysis, for example by adding new indicators or circumstances to identify the furthest behind. Census data might as well be used for drawing conclusions on larger population groups.

Consistent with other similar studies on inequalities, this analysis does not consider inequality within groups or in households. Even with homogeneous groups, additional unobserved circumstances may affect outcomes.

The main reason for restricting age to 25-35 for tertiary education is to avoid: (1) skewing the results because of an older population with significantly lower education levels; and (2) including individuals that, because of their young age, could not have completed their education. Similarly, for secondary education the age range is 20-35 years old.

Wealth, as used in this report, is a composite index reflecting a household’s cumulative living standard, developed by the DHS and MICS researchers and combines a range of household circumstances including: a) ownership of household assets, such as TVs, radios and bicycles; b) materials used for housing; and c) type of water and sanitation facilities.

The classification and regression tree (CART) algorithm starts by searching for the first split (or “partition”) of the tree in each opportunity of the prevalence of a barrier. It does so by looking at each circumstance and separating the sample in two groups, so that it best satisfies a certain “splitting criterion”. This splitting criterion can be defined in a few ways, while the one used here is the Analysis of Variance, or “ANOVA”. Ultimately, these circumstances define the composition of the groups, but should not be interpreted as “causes” of a lower opportunity or of higher barriers.
CONTACT DETAILS

For further queries, please contact the Social Development Division of UN-ESCAP at escap-sdd@un.org

For thematic reports, please visit:
https://www.unescap.org/kp?f%5B0%5D=kp_programme_of_work_facet%3A310

For more information on the classification trees, please visit: https://lnob.unescap.org/

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