METHODOLOGICAL NOTE[1]

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Using anchored rank distribution to benchmark country level and performance on child-related SDGs

Anchored rank percentiles allow us to benchmark a country's performance by anchoring or fixing specific reference values and then identifying the percentile or average percentiles where a country or specific countries rank. This method provides a relative sense of how far each country is from the best-performing one measured in the group – e.g., income group, region – while retaining an absolute reference by anchoring the percentiles in historical data.

Looking at data in this way offers a clearer perspective of what is possible for different expected values – either target values or rates of change required to meet the target. Analysis based on anchored rank percentiles provides politicians, policymakers and advocates a common metric on the effort, ambition and actions required for countries to meet their targets. This enhanced picture helps stakeholders to manage and align expectations and work towards realistic goals.

Our analysis used this approach to benchmark the level and rates of change of countries on 48 child-related SDGs. To understand each country's performance on each indicator, a database of all episodes of annualized change – the degree to which countries have been progressing towards their targets, either positively or negatively – was created. This provided a total of approximately 80,000 episodes for 198 countries across 48 indicators. Details on capturing where individual countries stand today – their level – and how well they are progressing towards their child-related SDG targets compared to other groups of countries – their performance – are explained below.

Insightful analysis to guide progress

When looking at neonatal mortality, for instance, analysing recent data provides more than 4,000 observations of episodes (i.e., annualized changes of the indicator). The left panel of the figure below (see Figure A1) shows the empirical distribution of all episodes of changes (positive or negative) of this indicator in the last two decades. The observed episodes of annualized change ranged from -20 to +20 and approximately 80 per cent of the observed spells represented a spell in which a country improved this indicator (as a negative indicator, less is better). These episodes are ranked from worst to best performance, which is then translated into an equivalent percentile ranging from 0 to 100. This metric provides an average percentile for each country. This was carried out for all 48 indicators for which episodes of temporally comparable change of value were available and across all three groups (by income group, by region and globally).

The average percentile allows the systematic position of individual countries to be identified. For example, suppose we observe three episodes of performance of a country: one in the 15th percentile, one in the 50th percentile and another in the 65th percentile. In that case, the country's average percentile of performance in this indicator will be 43, and they will therefore fall in the 40th–60th cut-off. Using this standardization, the average position of all countries per indicator were

grouped as either 'very strong' (above 80th percentile), 'strong' (60th–80th percentile), 'moderate' (40th–60th percentile), 'weak' (20th–40th percentile) and 'very weak' (below 20th). This example illustrates that countries' performances can fluctuate across episodes – sometimes performing poorly and other times having strong performance – but the final score can be seen as the most probable value for the country. Due to this fluctuation across episodes and the use of fixed cut-offs, few countries exhibit average recent performance that lands in the bottom two categories (below 20th and 20th–40th, i.e., very weak and weak, respectively). To be in these categories, a country would have to either consistently underperform across all episodes or not achieve sufficiently strong results in some episodes to elevate its average above the 40th cut-off. Alternatively, countries can place in the bottom two categories if they have already achieved their SDG target, as can be seen in Figure A1 in the cases of Austria and France.

Average percentiles in practice: Monitoring health interventions

To illustrate the use of anchored rank percentiles and benchmarking, suppose that in a nationwide effort to combat malnutrition, a health ministry introduces a new dietary supplement programme for school-age children. To evaluate its success, the ministry decides to benchmark against data from two years prior, specifically the average rate of childhood malnutrition. With the programme in place, schools and health centres do not just assess the current nutritional status of children in isolation; instead, they compare the present data to the established benchmark from two years ago. This ensures that any fluctuations in nutritional levels — perhaps due to seasonal food availability or regional economic changes — are viewed in the context of a consistent past standard. If, over the subsequent years, a significant portion of children register better nutritional metrics than the benchmark, it serves as a positive indication that the dietary supplement programme is making a tangible difference.

In another initiative, the health ministry introduces a new outreach campaign to increase immunization rates in remote areas. Recognizing the challenges and variability in reaching distant communities, they opt to benchmark the success of this campaign against the average immunization coverage from the previous year in these areas. As health workers roll out the campaign, they constantly compare the current immunization rates to this set benchmark. This approach ensures that the effectiveness of the outreach is not merely judged by raw numbers but is instead measured against a well-defined standard from the past. For instance, if, in a particular remote region, the immunization rate exceeds the benchmark consistently over several months, it signals that the outreach efforts are indeed breaking barriers and achieving their intended goals.

Figure A1 Benchmark of the rate of change using a single indicator: Neonatal mortality (SDG 3.2.2)
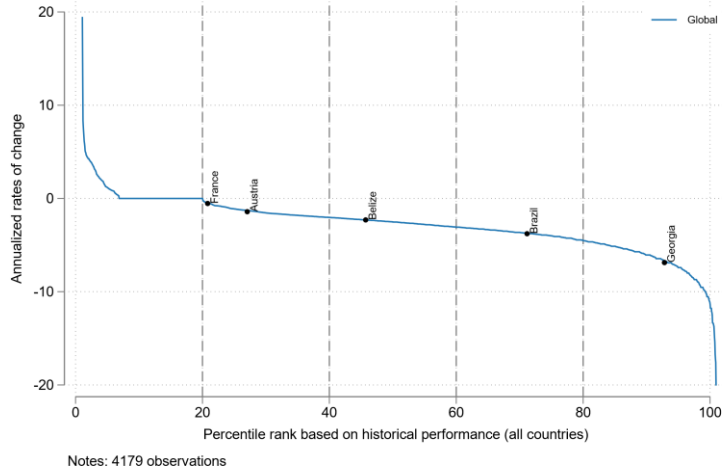
Notes: 4179 observations

Figure A2 Benchmark of the rate of change using a single indicator: Neonatal mortality (SDG 3.2.2) by income grouping level

Notes: 4179 observations
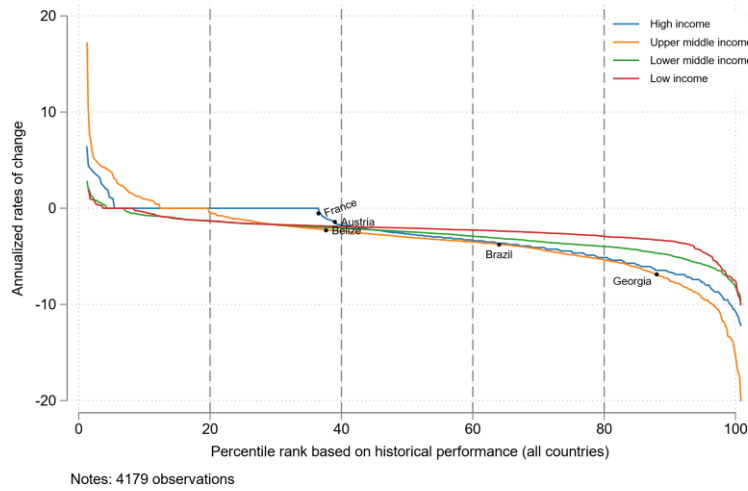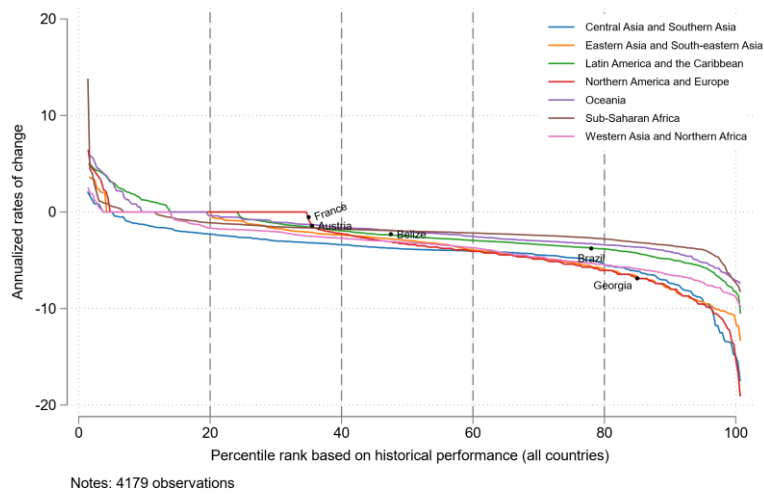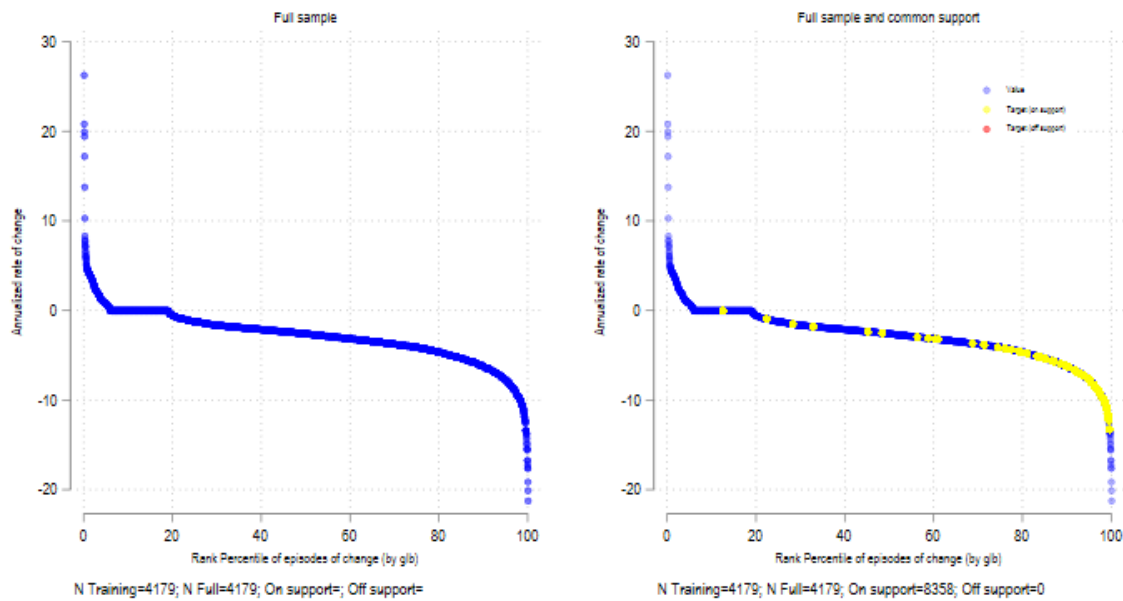
Figure A3 Benchmark of the rate of change using a single indicator: Neonatal mortality (SDG 3.2.2) by regions

Notes: 4179 observations

Neonatal mortality rate
Benchmark Change (with common support)
CM - Global

Full sample

N Training=4179; N Full=4179; On support=; Off support=

Full sample and common support
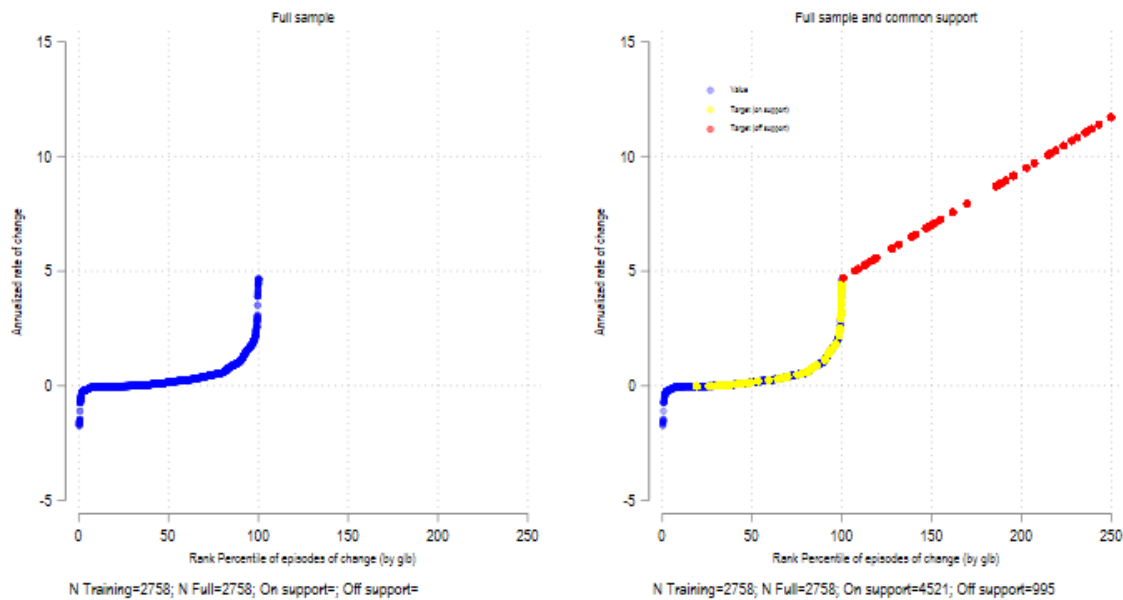
N Training=4179; N Full=4179; On support=8358; Off support=0

Notes: Mu Diff: 10.271 (pval: 0.000); KSmirnov D:0.503 (pval:0.000); Indicator code: CME_MRM0; Aggregation: glb; Indicator Direction: Negative

Proportion of population using safely managed drinking water services
Benchmark Change (with common support)
WASH - Global

Full sample

N Training=2758; N Full=2758; On support=; Off support=

Full sample and common support

N Training=2758; N Full=2758; On support=4521; Off support=995

Notes: Mu Diff: -56.442 (pval: 0.000); KSmirnov D:0.526 (pval:0.000); Indicator code: WS_PPL_W-SM; Aggregation: glb; Indicator Direction: Positive

Neonatal mortality rate
Benchmark Level and Target (with common support)
CM - Global

Full sample

Full sample and common support

Note: Depvar: glb_hist_perc_lvl; N Training=199; N Full=199;
On support=; Off support=

Note: Depvar: glb_trgt_perc_lvl; N Training=199; N Full=199;
On support=398; Off support=0

Notes: Mu Diff: -11.579 (pval: 0.000); KSmirnov D:0.372 (pval:0.000); Indicator code: CME_MRM0; Aggregation: glb; Indicator Direction: Negative

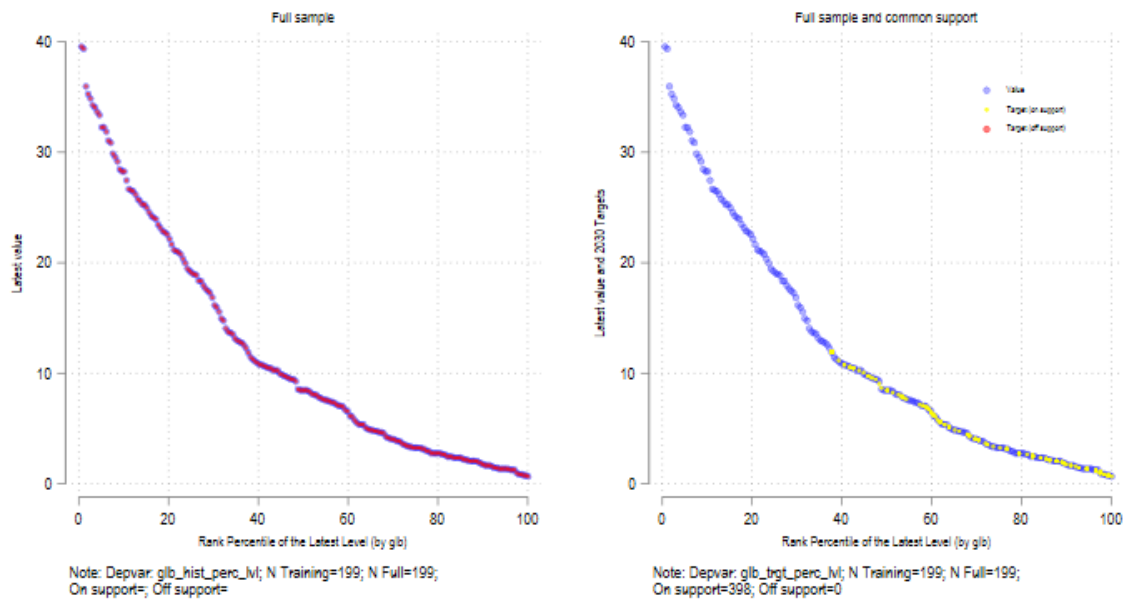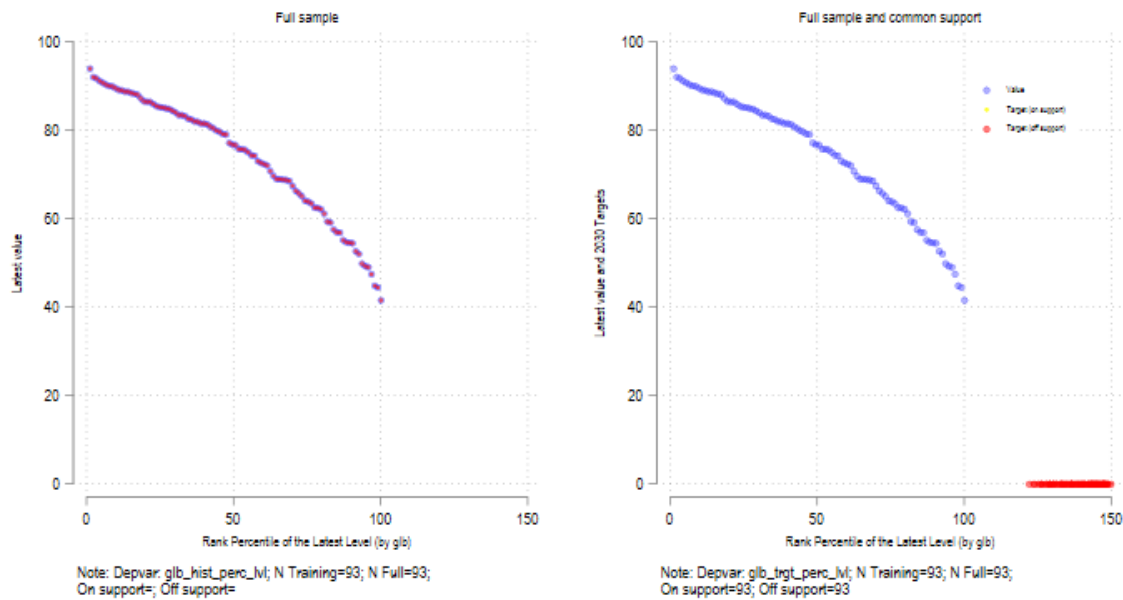# years who experienced physical punishment and/or psychological aggression by caregivers in last month
Benchmark Level and Target (with common support)
CPD - Global

Full sample

Full sample and common support

Note: Depvar: glb_hist_perc_lvl; N Training=93; N Full=93;
On support=; Off support=

Note: Depvar: glb_trgt_perc_lvl; N Training=93; N Full=93;
On support=93; Off support=93

Notes: Mu Diff: -88.614 (pval: 0.000); KSmirnov D:1.000 (pval:0.000); Indicator code: PT_CHLD_1-14_PS-PSY-V_CGVR; Aggregation: glb; Indicator Direction: Negative

Out-of-school rate for youth of upper secondary school age
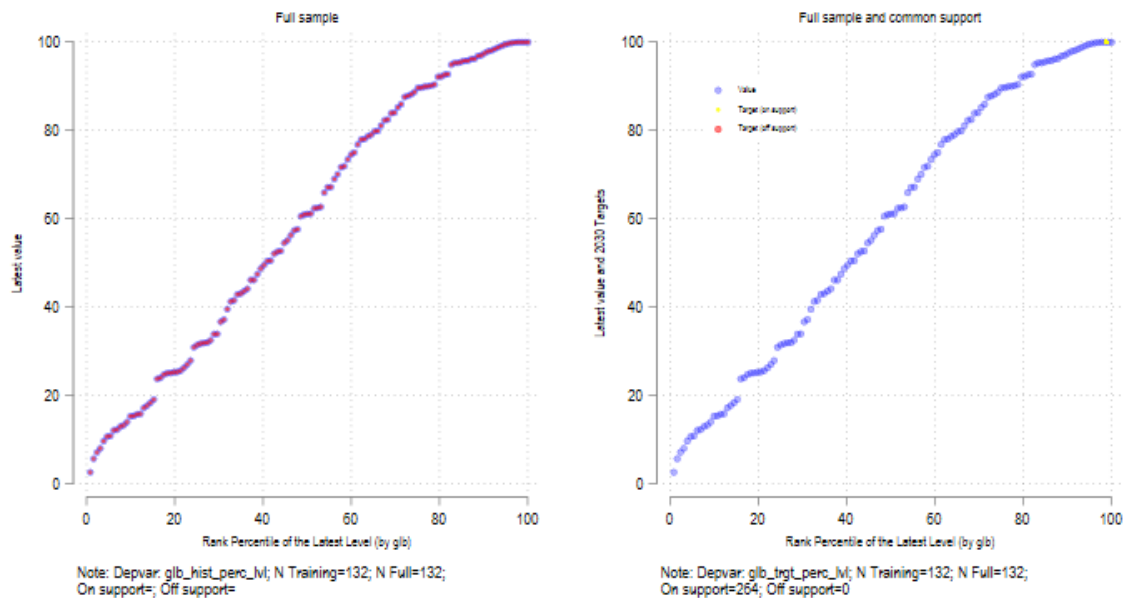### Benchmark Level and Target (with common support)
EDU - Global
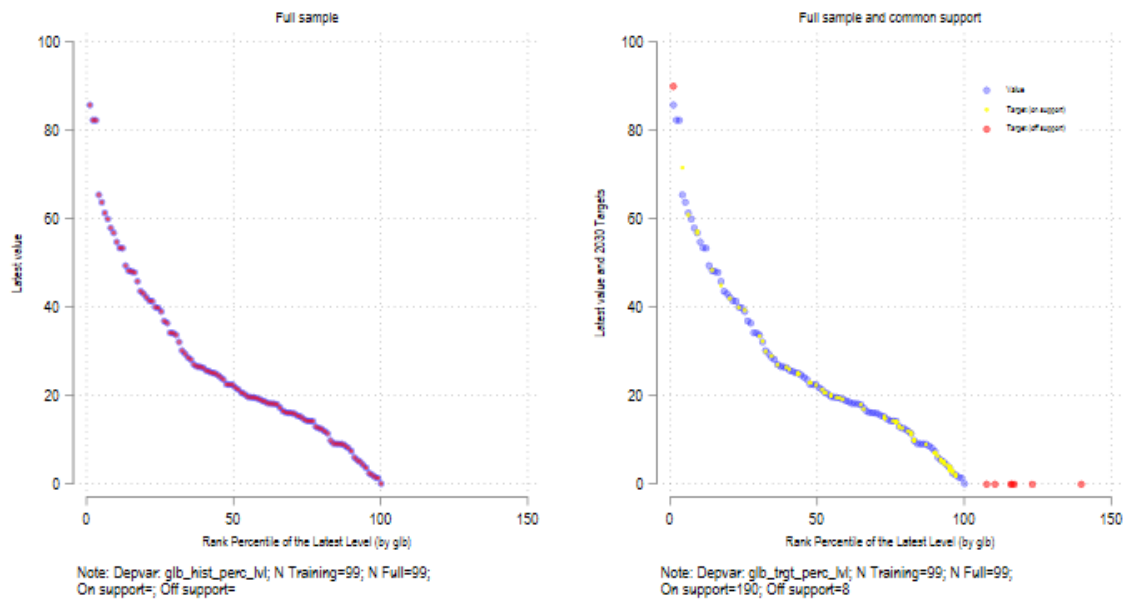
Notes: Mu Diff: -19.733 (pval: 0.000); KSmirnov D:0.343 (pval:0.000); Indicator code: ED_ROFST_L3; Aggregation: glb; Indicator Direction: Negative

Proportion of population using safely managed sanitation services
Benchmark Level and Target (with common support)
WASH - Global

Notes: Mu Diff: -48.485 (pval: 0.000); KSmirnov D:0.985 (pval:0.000); Indicator code: WS_PPL_S-SM; Aggregation: glb; Indicator Direction: Positive

Where countries are today: Charting levels
A country's **level** is based on the distribution of the latest value observed for each country to identify which rank percentile each country is in, and uses the same distribution to benchmark the value of the 2030 target of each country and indicator.

Benchmarking levels: Comparing child poverty rates

Suppose we are comparing child poverty rates across five countries. We choose the country with the lowest child poverty rate as our anchor because that represents the best performance.

Countries and their child poverty rates (based on latest available data): Country A: 1%; Country B: 4%; Country C: 7%; Country D: 10%; Country E: 15%

Choosing an anchor: Country A has the lowest child poverty rate at 1%. This is our anchor.

Ranking the other countries: Now, the performance of the other countries is ranked relative to Country A.

- Country B: Its rate is 3 percentage points higher than Country A. This might place it at, say, the 80th percentile, indicating it is doing relatively well but not as well as Country A.
- Country C: Its rate is 6 percentage points higher than Country A. This could place it at the 60th percentile.
- Country D: With a 9-percentage-point difference from Country A, it might be at the 40th percentile.
- Country E: Its rate is 14 percentage points higher than Country A, possibly putting it at the 20th percentile.

Country targets for child poverty rate: Country A: 0%; Country B: 2%; Country C: 2%; Country D: 2%; Country E: 5%

Ranking the targets of countries on the distribution of the latest value:

- Country A will continue at the top 80th percentile.
- Countries B, C and D all want to reach 2%, which implies also reaching the top 80th percentile.
- Country E's target would require moving from the bottom 20th percentile to the 60th percentile.

Interpreting the anchored rank percentile: By anchoring the data to the best performance (Country A in this case), stakeholders can easily see how other countries fare in comparison. The benchmarking of the target on the distribution of the latest values also gives a common metric of the effort a country will have to put in to reach a specific target.

Figure A2 shows the average percentile for each country across all 48 indicators, reflecting where countries aim to be by 2030 (represented by an orange dot) benchmarked against where they stand today (represented by a blue dot). The distance between these two dots can be interpreted as the average expected effort countries must make to reach their goal by 2030. The blue dot for the world will be at the median, as it represents the average of where countries are across all indicators. To reach the 2030 targets, countries would need, on average, to jump to the top 20 per cent (80th percentile) – i.e., countries will have to reach the level of the top performers of today.

This initial result is just a reference; it becomes more useful as we unpack this average by showing it across outcome areas (see Figure A2) and within outcome areas by income groups (see chapter 2)

Figure A2 Benchmarking where countries are and where they aim to be by 2030

How countries' progress compares to others: Charting performance

Performance uses the distribution of observed rates of change or speed at which countries have been progressing towards specific child-related SDG targets (both the historical rate of change and the expected rate of change needed to achieve to reach respective SDG target).

We built a database with 38 of the 48 indicators for which temporally comparable data are available. A total of 80,000 episodes of change were identified and close to 500,000 benchmark values were created for the historical performance and expected performance to reach the target by 2030, using the three different benchmark groups (by income group, by region and globally). Using the same approach that was used to determine levels, all exercises were conducted at the country level, but for simplicity aggregated patterns were summarized by thematic outcome area and income group. Country-specific results can be found in the accompanying online dashboards or by downloading our database.

The observed recent rate of progress provides a benchmark against which to compare the acceleration required for countries to reach their 2030 targets. Figure A3 shows this information for the world, with the red dot indicating the average percentile of performance required for countries to reach their 2030 targets and the green dot representing the benchmark value indicating the average recent rate of progress. This exercise shows that countries must accelerate from the 50th to the 65th percentile to reach their respective child-related SDG targets. This metric is useful as it indicates that 35 per cent of observed episodes have fallen at a higher percentile of performance (i.e., above the 65th percentile) (see Figure A3), suggesting that, while the acceleration required is significant, it is not outside recorded history.