Youth Progress Index

Methodology Note

SOCIAL
PROGRESS
IMPERATIVE

Acknowledgements

Structure of the Youth Progress Index

Basic Human Needs

Nutrition and Basic Medical care

- Infectious diseases
- Undernourishment
- Maternal mortality
- Child mortality
- Child stunting

Water and Sanitation

- Dissatisfaction with water quality
- Unsafe water, sanitation and hygiene
- Access to improved sanitation
- Access to improved water source

Shelter

- Dissatisfaction with housing affordability
- Household air pollution
- Usage of clean fuels and technology for cooking
- Access to electricity

Personal Safety

- Women not feeling safe to walk alone
- Money stolen
- Transportation related injuries
- Interpersonal violence
- Intimate partner violence

Foundations of Wellbeing

Access to basic Knowledge

- Women with no education
- Secondary school attainment
- Gender parity in secondary attainment
- Equal access to quality education
- Primary school enrollment

Access to Information and Communication

- Internet shutdown
- Access to online governance
- Internet users
- Mobile telephone subscriptions

Health & Wellness

- Depression
- Satisfaction with availability of quality healthcare
- Healthy life expectancy at 30
- Health problems preventing from activities
- Access to essential health services

Environmental Quality

- Lead exposure
- Outdoor air pollution
- Satisfaction with air quality
- Species protection
- Particulate matter pollution

Opportunity

Personal Rights

- Young members of parliament
- Freedom of peaceful assembly
- Freedom of expression
- Access to justice
- Freedom of religion
- Political rights

Personal Freedom & Choice

- Vulnerable employment
- Freedom over life choices
- Early marriage
- Young people not in education, employment or training
- Satisfied demand for contraception
- Perception of corruption

Inclusiveness

- Community safety net
- Openness towards immigrants
- Opportunity to make friends
- Acceptance of gays and lesbians
- Access to public services in urban and rural areas
- Discrimination and violence against minorities

Access to Advanced Education

- Women with advanced education
- Academic freedom
- Quality weighted universities
- Citable documents
- Expected years of tertiary schooling

153
Countries fully ranked

60
Social and Environmental Indicators

12
Years of Youth Progress mapped

The Youth Progress Index (YPI), produced biennially by the European Youth Forum in partnership with Social Progress Imperative, is the most comprehensive measurement of young people's wellbeing around the world. It examines essential aspects of youth wellbeing, such as access to sufficient food, housing, health services, opportunities to exercise socioeconomic and political rights, sense of inclusion, freedom from discrimination and the safeguarding of their future from environmental threats.

The third edition of the Youth Progress Index brings added value, inspiring young activists to embrace data for their advocacy. An interactive online dashboard allows for easy comparisons between countries and tracks progress over 12 years.

The Youth Progress Index fuels young people's impactful engagement.

Visit www.youthprogressindex.org

Introduction

The Youth Progress Index (YPI) measures factors that matter to and can impact the daily lives of young people, using the Social Progress Index methodology. Do young people have sufficient food to eat? Do they have access to housing, the labour market and quality jobs? Can they read and write? Can they exercise their socio-economic and political rights? Do they live in a community where they feel included and are not discriminated against? Is their future and the future of their children protected from the dangers of environmental destruction? Can they influence politics and hold their political representatives to account, and are they represented in parliament? Do they have the opportunities to live up to their potential, contribute to thriving societies, and shape their future?

The Youth Progress Index 2023 combines 60 social and environmental outcome indicators, and it covers a time series of 12 years (2011-2022). The Index fully ranks 153 countries, and it also partially covers additional 43 coun-tries, providing component and dimension scores when enough data are available. In all, the Youth Progress Index measures at least some aspects of youth progress across more than 99.9% of the world's young population.

This report describes the methodology used to calculate the Youth Progress Index 2023. Since the YPI is intended to measure social progress of the youth population, it is heavily based on the Social Progress Index principles and calculation methodology. Therefore, we start this report by describing the principles that establish the conceptual architecture of the Social Progress Index and provide an overview of the Social Progress Index framework used in the creation of the YPI. We then detail the steps taken to select data and calculate the YPI. Finally, we discuss the methodology behind assessing countries' strengths and weaknesses, relative to their economic prosperity. We conclude the report with an evaluation of the Index's structural integrity and with limitations of YPI.

Measuring Social Progress: Definition, Framework, Principles

The Social Progress Index is a well-established, robust, and holistic measure, published annually since 2013, that is meant to catalyse improvement and drive action by presenting social outcome data in a useful and reliable way. Composed of multiple dimensions, it can be used to benchmark success and provide a transparent, outcome-based measure of a country's well being based solely on social or environmental indicators.[1] Policymakers, busi-nesses, and countries' citizens alike can use it to compare their country against others on different facets of social progress, allowing the identification of specific areas of strength or weakness.

The Youth Progress Index is built on the framework and methodology of the Social Progress Index. The YPI can therefore be understood as a measure of social progress for young people, which is operationalised through the rigorous, multi-layered framework of the Social Progress Index, contextualised, and calibrated according to what matters to younger generations. This chapter defines social progress, and it describes the framework and principles of the Social Progress Index used also in the creation of the YPI.

A. Definition of social progress

The conceptual framework of the Social Progress Index is based on our working definition of social progress:

«Social progress is the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow citizens and communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential.»

This definition reflects an extensive and critical review and synthesis of both the academic literature and expert prac-titioner experience across a wide range of development topics. It was also influenced by prior contributions to the field by Amartya Sen and members of the Commission on the Measurement of Economic Performance and Social Progress. The Youth Progress Index uses the same definition of social progress applied to young people (see below).

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1   In addition to the Global Social Progress Index comparing countries, the Index has also been applied on various sub-national levels in almost 50 countries across the world.

B. Social Progress Index Framework

The Social Progress Index framework is directly derived from the above definition, as it focuses on three distinct (though related) questions:

- **Basic Human Needs:** Does a country provide for its people's most essential needs?
- **Foundations of Wellbeing:** Are the building blocks in place for individuals and communities to enhance and sustain wellbeing?
- **Opportunity:** Is there opportunity for all individuals to reach their full potential?

These three questions reflect the three broad dimensions of the Social Progress Index framework that is also applied in the creation of the Youth Progress Index. Each dimension is broken down further to elucidate the key elements that make up social progress in that area, forming the 12 components of the model. The concepts underlying these components, which relate to and are guided by questions we seek to answer with available data, have remained unchanged since the first publication of the Social Progress Index in 2013 (see Figure 1).

Social Progress Index

Basic Human Needs

Nutrition & Basic Medical Care

Do people have enough food to eat and are they receiving basic medical care?

Water & Sanitation

Can people drink water and keep themselves clean without getting sick?

Shelter

Do people have adequate housing with basic utilities?

Personal Safety

Are people safe?

Foundations of Wellbeing

Acces to Basic Knowledge

Do people have access to an educational foundation?

Acces to Information & Communications

Can people freely access ideas and information from anywhere in the world?

Health & Wellness

Do people live long and healthy lives?

Environmental Quality

Does the environment support societal well-being?

Opportunity

Personal Rights

Are people's rights as individuals protected?

Personal Freedom & Choice

Are people free to make their own life choices?

Inclusiveness

Is no one excluded from the opportunity to be a contributing member of society?

Access to Advanced Education

Do people have access to the world's most advanced knowledge?
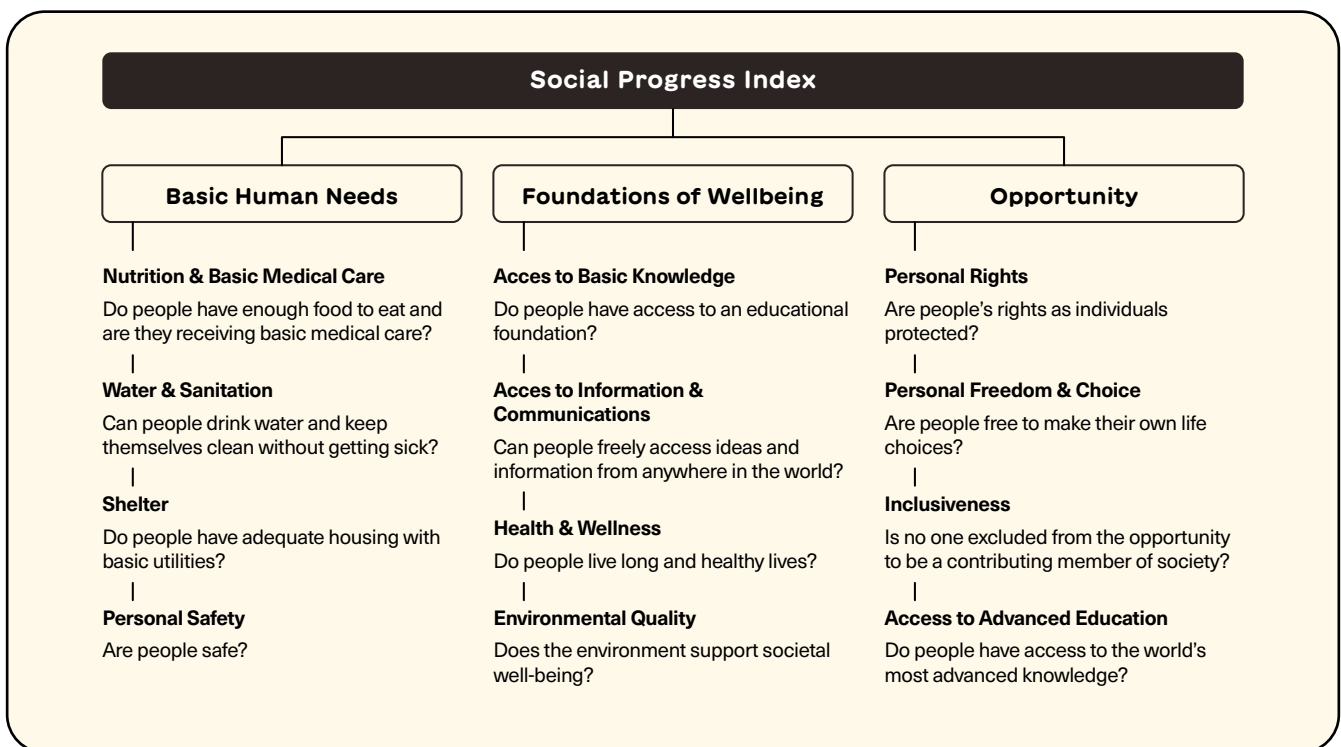
Figure 1 / Social Progress Index Component-Level Framework

Each component is further defined by a set of outcome indicators that respond to the conceptual questions posed. Together, these interrelated elements combine to produce a given level of social progress. The methodology allows measurement of each component and each dimension, yielding an overall score and ranking.

C. Principles of the Social Progress Index

The Youth Progress Index, following the Social Progress Index, is based on four key design principles.

1. **Exclusively social and environmental indicators**: The aim is to measure social progress directly, rather than use economic proxies or outcomes. By excluding economic indicators, we can, rigorously and systematically analyse the relationship between economic development (measured for example by GDP per capita) and social development. Prior efforts to move "beyond GDP" have commingled social and economic indicators, making it difficult to disentangle cause and effect.

2. **Outcomes not inputs**: The purpose of the Index is to measure the outcomes that matter to the lives of real young people, not the inputs. For example, we measure the health and wellness achieved by a country's people, not how much a country spends on healthcare or the effort expended.

3. **Holistic and relevant to all countries**: The Index creates a holistic measure of social progress that encompasses a comprehensive view of the health of societies. Most previous efforts have focused on the poorest countries, for understandable reasons. But even prosperous countries face social challenges, and knowing what constitutes a successful society, including at higher income levels, is indispensable for charting a course for every country.

4. **Actionable**: The Index is a practical tool that helps leaders and practitioners in government and civil society implement policies and programmes that drive faster social progress. To do so, we measure outcomes in a granular way that focuses on specific areas that can be addressed directly.

Indicator Selection

At the most granular level of the framework, we identify multiple independent outcome measures – indicators – related to each component. Each set of indicators, grouped by component, defines and measures the same aspect of social progress.

A. General Rules for Selecting Indicators

We only include indicators that are measured with consistent methodology, by the same organisation and across all (or essentially all) countries in our sample. We evaluate each indicator to ensure that the procedures used to produce the measure are sound and that it captures what it purports to capture. Data for each indicator must come from the same source to ensure consistency in measurement across countries.

Data sources range from large international institutions like the United Nations or the World Bank to non-governmental organisations such as Freedom House or academia-based institutions such as Varieties of Democracy or Institute of Health Metrics and Evaluation. We also include data collected via global surveys, such as Gallup's World Poll (a summary of indicators used in the framework and their definitions and sources are available in Appendix A).

For each indicator, we evaluate the data sources available and consider tradeoffs between the quality and precision of a social indicator and the comprehensiveness of its country coverage. Figure 2 below depicts our decision tree for indicator selection. Geographic coverage tends to exclude many high-quality indicators from consideration because they only cover a subset of countries, such as OECD countries, or a particular region, such as the European Union.

Included indicators   Eliminated indicators

Does the indicator measure an economic, social or environmental concept?

✓ A social or environmental indicator   ✗ An economic concept indicator

Does this indicator measure an input or an outcome?

✓ A concept that we are interested in because it is good or bad for its own sake   ✗ Important mainly because its signals something else and is therefore an input indicator

What is the source of this indicator?

✓ Widely reputable and the methods it uses are sound   ✗ Unknown, uses biased methods, or lacks rigorous data collection

How old are the data points?

✓ Reasonably current   ✗ Most data points are more than 5-10 years old

How many geographic regions dos this indicator cover?

✓ 95-100% of geographic regions   ✗ Fewer than 95% of the geographic regions in the index
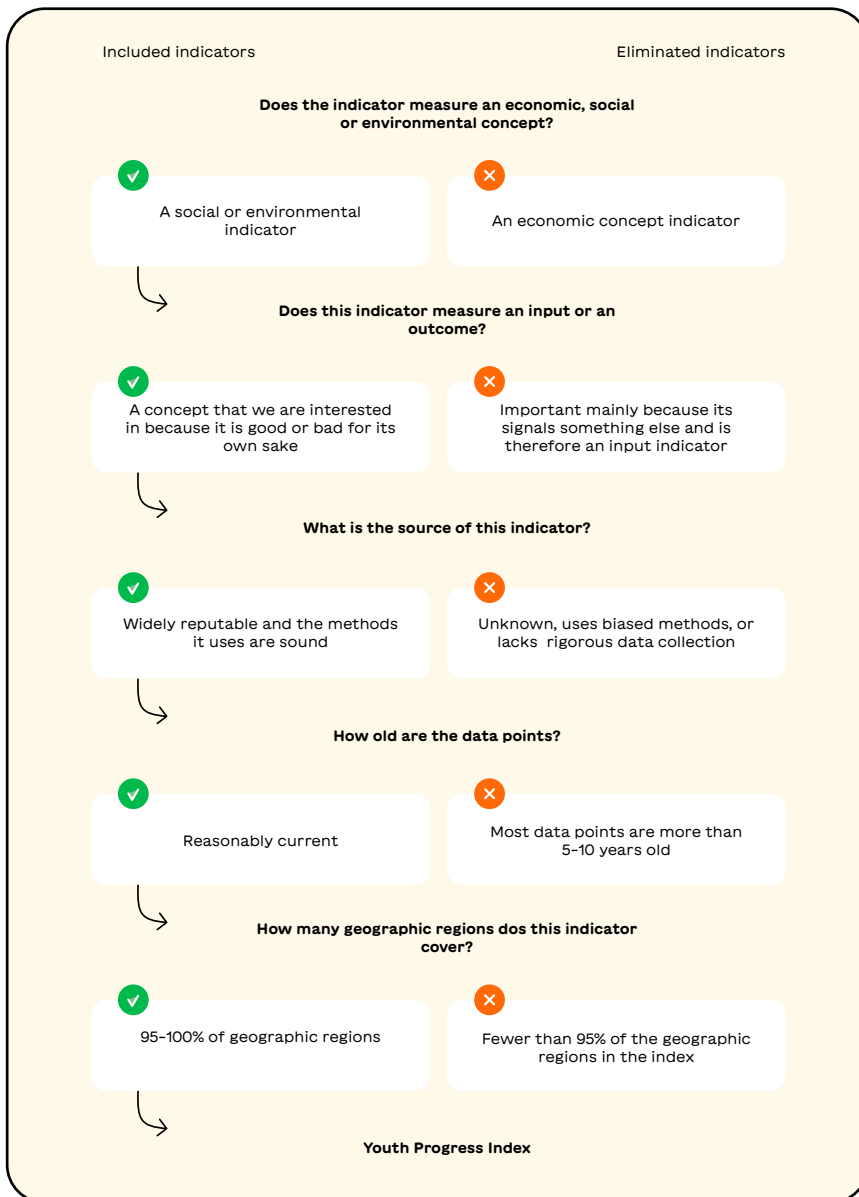
Youth Progress Index

Figure 2 / Indicator Selection Tree

A final important criterion for indicator data is that they are publicly available. We strive for transparency both in terms of the data we use to inform the Youth Progress Index, as well as our calculation methodology. All the raw indicator data we use to calculate the Youth Progress Index can be accessed at www.youthprogressindex.org.

B. Indicators Selection for the Youth Progress Index 2023

The Youth Progress Index is the first Social Progress Index to look at a subgroup of the population defined by its age, rather than a population defined by its geographical location. It therefore asks the same universally applicable questions as the Social Progress Index, but the answers to these questions focus as much as possible on the lived experience of young people.

When building the Youth Progress Index, we therefore followed the following principles:

- When possible, indicators were disaggregated by age.
- Specific indicators relevant to youth were added.
- The remaining indicators relevant for all age groups were based on the Global Social Progress Index.

The Youth Progress Index includes 60 social and environmental indicators, with 4-6 indicators per component (see Figure 2).

Basic Human Needs

Nutrition and Basic Medical care

- Infectious diseases
- Undernourishment
- Maternal mortality
- Child mortality
- Child stunting

Water and Sanitation

- Dissatisfaction with water quality
- Unsafe water, sanitation and hygiene
- Access to improved sanitation
- Access to improved water source

Shelter

- Dissatisfaction with housing affordability
- Household air pollution
- Usage of clean fuels and technology for cooking
- Access to electricity

Personal Safety

- Women not feeling safe to walk alone
- Money stolen
- Transportation related injuries
- Interpersonal violence
- Intimate partner violence

● youth-relevant indicators

Foundations of Wellbeing

Access to basic Knowledge

- Women with no education
- Secondary school attainment
- Gender parity in secondary attainment
- Equal access to quality education
- Primary school enrollment

Access to Information and Communication

- Internet shutdown
- Access to online governance
- Internet users
- Mobile telephone subscriptions

Health & Wellness

- Depression
- Satisfaction with availability of quality healthcare
- Healthy life expectancy at 30
- Health problems preventing from activities
- Access to essential health services

Environmental Quality

- Lead exposure
- Outdoor air pollution
- Satisfaction with air quality
- Species protection
- Particulate matter pollution

Opportunity

Personal Rights

- Young members of parliament
- Freedom of peaceful assembly
- Freedom of expression
- Access to justice
- Freedom of religion
- Political rights

Personal Freedom & Choice

- Vulnerable employment
- Freedom over life choices
- Early marriage
- Young people not in education, employment or training
- Satisfied demand for contraception
- Perception of corruption

Inclusiveness

- Community safety net
- Openness towards immigrants
- Opportunity to make friends
- Acceptance of gays and lesbians
- Access to public services in urban and rural areas
- Discrimination and violence against minorities

Access to Advanced Education

- Women with advanced education
- Academic freedom
- Quality weighted universities
- Citable documents
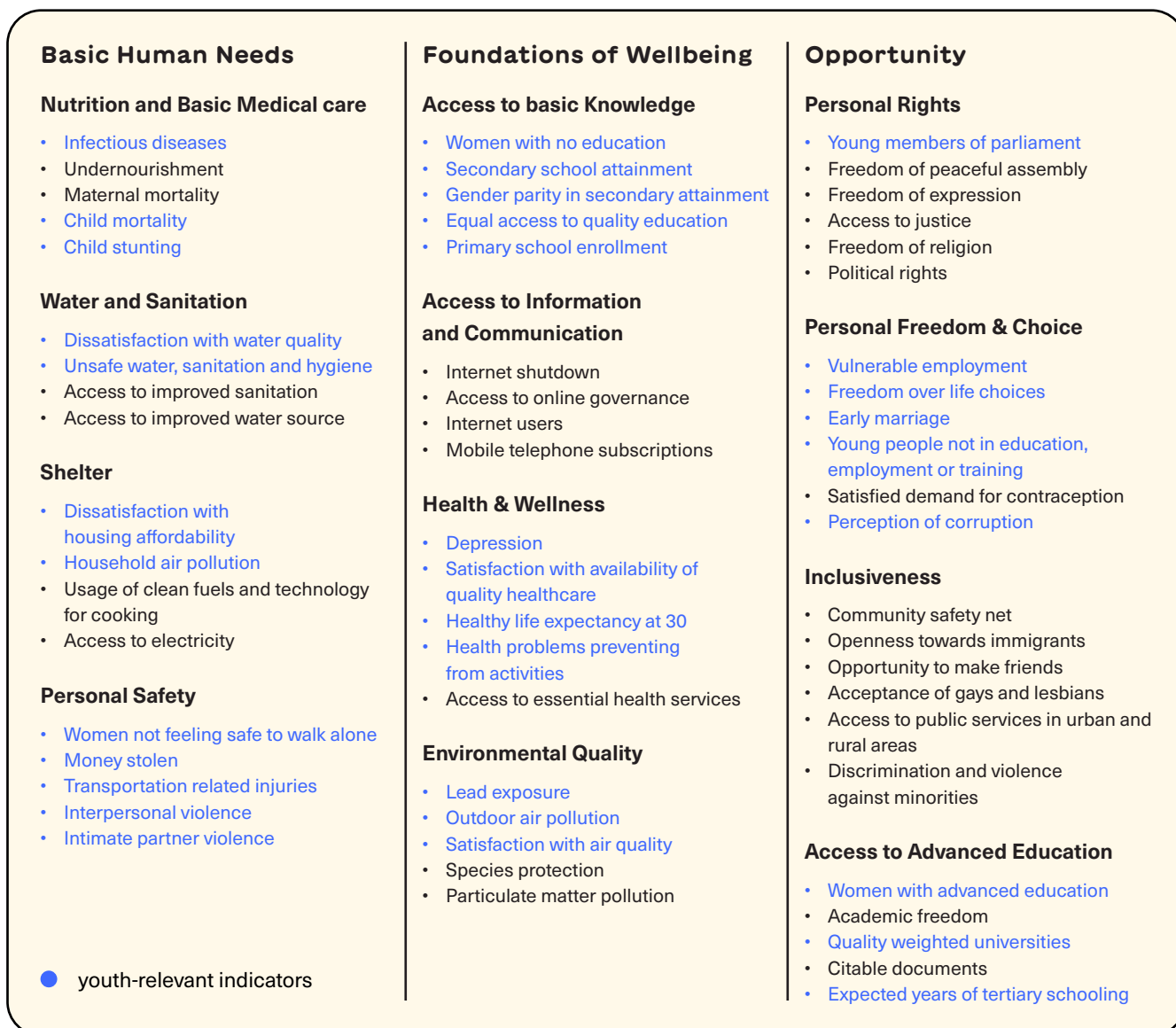- Expected years of tertiary schooling

Figure 3 / This figure shows the framework and full list of indicators of the Youth Progress Index 2023. Youth-specific or youth-relevant indicators are highlighted in blue.

Data for each selected indicator are collected on the basis of the above-mentioned criteria and are aligned (i.e., the entire time series for an indicator is shifted) so that the last available year corresponds to 2022. Across the 153 ranked countries, we have a total of 8,956 available data points to calculate the Youth Progress Index for 2022[2], most of which are reflective of 2022 (44.56%) and 2019 (26.75%).

C. Definition of Youth

For the purposes of the Youth Progress Index, "youth" is considered to be individuals in the transition period between childhood and adulthood. The specific age bracket might be longer or shorter depending on the specific social context.

No universal definition of "youth" exists in the international community, and various institutions, organisations, and youth practitioners define "youth" with varying parameters, such as: Under 24; 12–24; 10–29; and anything under 30 or 35. Despite the lack of a cohesive definition, it is generally acknowledged the transitional period extends until well-after an individual has achieved legal "adult" status;

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2   The rest to the total of 9,180 observations (60 variables for 153 ranked countries) for the latest available year (2022), i.e., 224 observations, were imputed using regression or moving-average techniques.

meaning that a society's obligation to educate and engage its young people does not end when they turn 18.

It should also be stressed that "youth" are not a coherent group, and that many subgroups of young people, such as young women, LGBTQI youth, or young people with disabilities, may face greater challenges. This transition phase between the dependency of childhood and the responsibility of adult life is crucial and often challenging. A young person may have difficulty finding a good quality job, accessing quality education or healthcare, and is at risk of multiple forms of discrimination based on different aspects of their identity.

Indicator Transformations

When comparing country-level data, we encounter issues[3] that require us to transform the data for certain indicators. Our main techniques are to either cap an indicator, setting a clear upper or lower boundary cut-off value, or to apply a square root transformation or a logarithmic transformation.

A. Capped Indicators

We impose a top and bottom boundary on a number of indicators. Undernourishment, Unsafe water, sanitation and hygiene, Transportation-related injuries, Women with no education, Outdoor air pollution, Particulate matter population and Early marriage are capped at the 99th percentile, while Primary school enrollment is capped at the 1st percentile (based on raw values for 2007-2022) to limit the influence of a few significant outliers and/or to limit the skew of the data. In addition, several indicators are capped to meet the boundaries set by the indicator definitions. We set a floor at 0.03 for Gender parity in secondary attainment based on the recommendations of UNESCO. The Mobile telephone subscriptions indicator is capped at 100 subscriptions and the Years of tertiary schooling is capped at five years to avoid the influence of a few near-outliers, and to reflect the Bologna system of tertiary education.

B. Transformed Indicators

Four indicators, namely Infectious diseases, Household air pollution, Interpersonal Violence, and Deaths from lead exposure are skewed more when compared to other similar indicators. Therefore, for these indicators, a square root transformation is applied to create a more sensible distribution. Additionally, two indicators with extremely high skewness and/or with significant outliers are transformed using a natural log-transformation. These indicators are Quality-weighted universities and Citable documents.

C. Calculation of indicators

Where possible, the Youth Progress Index uses indicators that can be disaggregated by age. The following indicators are calculated as population-weighted averages of values for four age groups (15-19, 20-24, 25-29, 30-34):

- Infectious diseases
    - This indicator is created as an aggregation of five groups of infectious diseases: HIV/AIDS and sexually transmitted infections; Respiratory infections and tuberculosis; Enteric infections; Neglected tropical diseases and malaria; and Other infectious diseases.
- Unsafe water, sanitation and hygiene
- Household air pollution
- Transportation-related injuries
- Interpersonal violence
- Depressive disorders
- Lead exposure
- Outdoor air pollution

Next, we also calculate the following indicators:

- Secondary school attainment, calculated as an average of females' and males' proportions of population (aged 25 and older) with at least some secondary education.

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3   Some indicators may be highly skewed or have some significant outlying values. If left untreated, this could distort the final 0-100 scores.

- Gender parity in secondary attainment, created from the above specified underlying indicators to reflect the absolute distance from 1, where 1 represents an equal number of girls and boys enrolled.[4]
- Citable documents, calculated as a ratio of the number of citable documents to 1,000 population.
- Quality-weighted universities, calculated in the following way: The number of universities in

a country weighted by the quality of universities, measured by university rankings on any of the three most widely used international assessments. Universities in the top 400 on any list are given double weight. Not ranked universities are given 5% weight of the top-ranked universities.

D. Limiting volatility of survey indicators

We transform some indicators to limit the annual volatilities of the measures. This method was applied to all

indicators from the Gallup World Poll. Indicator values are recalculated as floating 3-year averages.

Determining the Country Sample

The Youth Progress Index ranks 153 countries globally, and additional 43 countries are covered partially (having from nine to eleven components). We have selected these countries by collecting all data available across all indicators and determining for which countries we can impute data, and for which countries we will have incomplete information to calculate a Social Progress Index score. Generally, a country cannot have more than one missing indicator per component to be included in the final Social Progress Index score rankings. In cases of two indicators, we make exceptions to this rule (both exceptions pertain to the Access to Basic Knowledge component). These exceptions are discussed in the next section.

Alongside the 153 ranked countries, we also include in our country sample 17 'partial' countries. These countries have enough data to calculate between nine to eleven of the twelve components, but not enough data to calculate an overall Youth Progress Index score. As with ranked countries, within those nine to eleven components for which enough data are available, there cannot be more than one indicator missing per component.

Finally, we exclude from our original calculation sample countries with limited data, but we use the weights generated from the Principal Component Factor (PCF described below) to calculate scores for these countries when possible. These countries do not have enough data to calculate at least nine components, but they have enough data to calculate at least one component score. We include these countries in imputations prior to calculation and during calculation (see below). Raw indicator data and scores for these 26 countries are included in the published results.

The Youth Progress Index includes a full index score and rank for the Occupied Palestinian Territory (OPT). In order to do so, we implement an approach different to other countries, since some indicator sources provide data for the Occupied Palestinian Territory (OPT), while several others provide data separately for the Occupied Palestinian Territory (OPT). In these cases, we calculate a population-weighted average to obtain one data point for the whole entity, which is then used in the overall index calculation.

Index Calculation

The Youth Progress Index calculation procedure consists of the following core steps. We first address missing values, then invert and standardise indicators so that they are comparable in scale. We then use Principal Component Factor (PCF) to aggregate indicators into a component score. Finally, we calculate dimension and overall Youth

Progress Index scores by averaging components and dimensions, respectively. Each of these steps is described in more detail below.

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4   While in most countries, more boys are enrolled in education than girls, there are countries in which the opposite is true. We therefore use the absolute distance from 1 to acknowledge the lack of parity for both boys and girls across countries.

A. Missing Values

We ensure that indicators included in the Youth Progress Index have as few missing values as possible to avoid jeopardising the statistical quality of the Index. Missing values can stem from the lack of coverage by the data source, as well as incomplete reporting by the country to international organisations. In cases where an indicator is missing a country data point, we assess our imputation methodology both before and during calculation. Imputations used prior to calculation are included and marked in the published dataset on our website; imputations generated during calculation are not.

Imputations prior to calculation:

We impute missing data prior to calculation of the Index when a country lacks some, not all, indicator data within the examined period under three scenarii: when a country has missing data at the beginning or at the end of the 2011-2022 period; when there are gaps between observed values within indicators; when countries have observed data only either at the beginning, or at the end of the period. In the first case, a future or a historical value is carried back or forward if a data point is missing at the beginning, or at the end of the time series. In cases where more than five data points at the beginning or at the end of an indicator's time series are missing, we rely on regression imputations during calculation. Under the second scenario, we impute gaps between years by applying linear interpolation. We do so to ensure smooth year-to-year estimates based on current and historical observed data and by assuming linear change.

In the third case, which relates only to some indicators from the Gallup World Poll, we apply a moving average imputation technique. We do this to reduce the number of values imputed during calculation by regression predictions and to increase the number of ranked countries in our sample. The moving average imputations are calculated only for countries with at least four observed values either at the beginning of the period (then missing data points are calculated as the average of the four preceding values in the time series), or the end of the period (then missing data points are calculated as the average of the four following values in the time series). If countries have less than four observed values for the Gallup World Poll variables either at the beginning or at the end of the time period, then regression imputations during calculation are used.

Additionally, there is an exception to the above specified three rules applied on the Young members of Parliament indicator, for which – in cases of missing data – we keep the historical observed value until it changes. This is because the values depend mostly on and change with elections, and it therefore does not make sense to assume a linear change between two observed values to apply the linear interpolation.

Imputations during calculation:

After constructing the dataset with pre-calculation imputations as noted above, we assess the number of indicators each country is missing within a component. Using regression imputation, we generally impute data only for those countries for which there is no more than one missing data point per component in each of the twelve components (considered 'ranked countries') and for countries that have no more than one missing indicator data point in nine to eleven components (considered 'partial countries'). We use our country›s sample data of ranked and partial countries (including both current and historical Youth Progress Index years, i.e., 2011-2022) to regress each indicator on the other indicators within a component. By constraining the regression to within-component indicators, we can preserve the signal that the indicator provides to PCF.

However, as much as we want to strictly adhere to only one missing indicator per component, we allow for an exception to this rule particularly within the Access to Basic Knowledge component where data availability poses a significant limitation. Therefore, for two indicators within this component, we apply a pre-imputation regression methodology: we use indicators not directly included in the index which have a more complete global coverage and are highly correlated with the indicators we need to predict. We use the Institute for Health Metrics and Evaluation indicators Education in years per capita (males, females) and UNDP indicator Mean years of schooling to predict males', and females' secondary attainment for approximately 15 countries with missing data. These two variables are then used to calculate the Secondary school attainment, and Gender parity in secondary attainment indicators. The pre-imputed indicators are then used again as predictors in the standard regression imputations described above.

We review each imputation to ensure accuracy. In some cases, we combine the regression trend with observed data. For example, when the last observed value for a country is in 2012, we have ten missing values that we impute by regression predictions. If the predicted data do

not match the observed values, we take the regression trend from the predictions and apply it to the observed data. If there are no observed values for a country, we apply standard regression imputations as described above. In cases where these imputations do not match expectations or qualitative research, we use regional cohort estimates or carry values consistently across time to minimise bias. For example, for many Middle Eastern countries where Gallup does not ask its survey question on gays and lesbians due to cultural sensitivities, we consider assessments of countries set by the Human Dignity Trust based on LGBT criminalisation laws.[5] If a country is not assessed by the survey and criminalization includes the death penalty, we assign the country zero value for the indicator.

The estimation of missing values is necessary prior to undertaking PCF, which requires a complete dataset for the results to be sound. We do not impute values for countries that do not meet the criteria of ranked or partial countries noted above; these countries are excluded from the main calculation process by which PCF weights are determined.

B. Standardisation

We convert indicators to the same scale in a three-step process. First, we set best- and worst-case scenarii to provide concrete boundaries on both ends of the scale that are based on theoretical or historical values. We then invert indicators when increasing values reflect lower social progress. Finally, and prior to applying PCF, we standardise all indicators into z-scores with a mean of zero and standard deviation of one so that the indicators are comparable in scale (see below).

While the best- and worst-case scenarii are defined at the indicator level, we strive to follow the same method for similar metrics. For indicators with pre-defined boundaries, we use these to establish the upper and lower scenarii. We use natural boundaries for indicators that have a natural best-case scenario. For indicators that do not have a clear worst case or where the probability of reaching the worst-case scenario is extremely unlikely, the boundary is based on the worst observed value over 2007-2022. Caps constitute the boundaries for capped indicators. Best- and worst-case data indicator values are included into the country dataset as two additional observation before the PCF is applied (see Appendix C for best- and worst-case scenarii).

Once we establish a full dataset with indicator values for 2011 through 2022 and the best- and worst-case scenarii, we invert indicators for which a higher value denotes lower youth progress. There are 25 inverted indicators in the Youth Progress Index: Infectious diseases, Undernourishment, Maternal mortality, Child mortality, Child stunting, Dissatisfaction with water quality, Unsafe water, sanitation and hygiene, Dissatisfaction with housing affordability, Household air pollution, Intimate partner violence, Women not feeling safe to walk alone, Money stolen, Transportation-related injuries, Interpersonal violence, Gender parity in secondary attainment, Women with no education, Depressive disorders, Health problems preventing from activities, Lead exposure, Outdoor air pollution, Particulate matter pollution, Vulnerable employment, Young people not in education, employment or training, Early marriage, and Discrimination and violence against minorities.

As a final step prior to applying PCF, we standardise the indicators into z-scores. Doing so produces scores with a mean of 0 and standard deviation of 1, ensuring the comparability of the indicators across the dataset in measurement.

5   Map of countries that criminalise LGBT people can be found here: https://www.humandignitytrust.org/lgbt-the-law/map-of-criminalisation/

C. Component Scores

To calculate component scores, we aggregate the set of indicators within each component into a factor using PCF and all 12 years of data.[6] PCF combines indicators in a way that captures the maximum amount of variance in the data while reducing redundancy between indicators. It essentially assigns each indicator a weight, a method we select over equal weighting to ensure that indicators are meaningfully contributing to a component score, while accounting for similarities between them.

Within many of the twelve components, PCF generates similar weights for the indicators we include because we ensure a fair level of correlation between them (e.g., not too high or low) prior to finalising our framework. However, for those cases in which indicators are less correlated with other indicators within their component, we consider PCF a good statistical approach for determining these indicators' contribution to the component scores while remaining objective.

The formula below reflects indicator aggregation into a principal component, where c=Youth Progress Index component and i=indicator.

Formula 1

$$Component\ value_c = \sum_i (w_i * indicator_i)$$

Our choice of PCF as the basis for aggregation at the component level was also influenced by the quality and quantity of data available on youth progress. For PCF to be valid, each indicator must be relatively free of measurement error (Dunteman, 1989). Thus, it should precisely measure what it was intended to measure and do so consistently across countries and over time. Our design principles and the data we use fulfil this requirement.

To convert each principal component into a component score on a scale of 0 to 100, we use a simple min-max formula, where X=component value and j=country.

Formula 2

$$Component\ score_c = \frac{(X_j - Worst\ Case)}{(Best\ Case - Worst\ Case)} * 100$$

As noted in the previous section, only countries that are ranked or qualify as 'partial' are included in the country sample that determines PCF-generated weights. For countries that do not have enough data to calculate at least nine components, we use the weights generated by the original country sample to calculate component scores when possible. If a country outside the ranked and partial country sample has enough data to calculate all four components within a dimension, we proceed to calculate dimension scores as well.

D. Dimension Scores

Each dimension is the arithmetic average of the four components that make up that dimension. Countries that do not have scores in all four components of a given dimension do not have a dimension score. The formula for calculating a dimension score is below, where d=dimension and c=component.

Formula 3

$$Dimension_d = \frac{1}{4} \sum_c Component\ score_c$$

E. Index Scores

The overall Youth Progress Index score is calculated as the arithmetic average of the three dimensions. Countries that do not have scores in all three dimensions do not have a Youth Progress Index score. The formula for calculating a Youth Progress Index score is below, where d=dimension.

Formula 4

$$Youth\ Progress\ Index\ score = \frac{1}{3} \sum_d Dimension_d$$

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6   Each statistical programme has several ways to calculate PCF, leading to slight differences in estimations depending on both the command and programme used. We use the following command in Stata: *factor [standardised indicator names], factor(1) pcf*

F. World Score Calculation, Regional Aggregations

In order to provide the most accurate assessment of world performance on youth progress, we account for countries' populations as well as the statistical interaction between indicators. Therefore, to calculate the world Youth Progress Index score, we first aggregate indicators into population-weighted values using data of all ranked and partial countries. We then apply the PCF weights generated by the original ranked and partial country sample to derive component scores and proceed as noted above to calculate dimension and the overall Youth Progress Index scores.

It is important to note that the above-described method is different from calculating population-weighted scores, and in essence treats the world as a country. The regional scores, on the other hand, are calculated as population-weighted mean scores of all countries belonging to the respective regions. The Social Progress Index regional classification is shown in Figure 4.
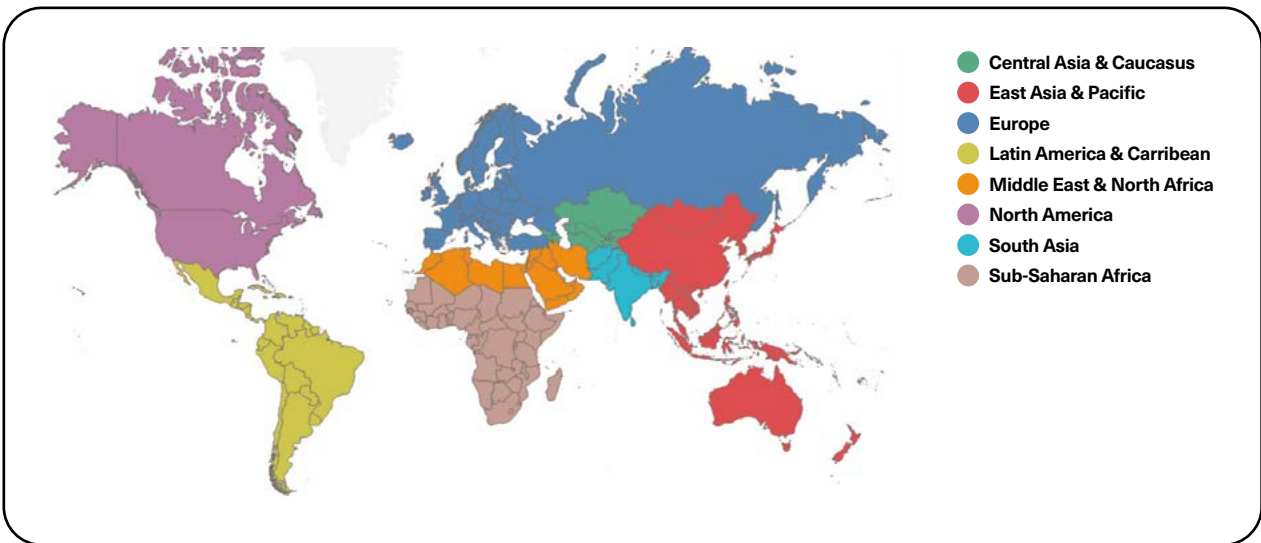
Figure 4 / Regional classification

Tiers

For the Youth Progress Index 2023, performance tiers are calculated as quintiles (independently for each of the 12 years covered). This is in line with what has been done previously, in terms of the YPI performance tiers calculation.

Assessing Countries' Relative Strengths and Weaknesses

The component, dimension, and overall Youth Progress Index scores are scaled from 0 to 100 to provide an intuitive scale for the interpretation of absolute performance, benchmarking a country against the best and worst-possible scenarios in terms of social progress performance. However, it is also useful to consider relative performance, comparing the level of social progress for youth among countries of similar levels of economic development. For example, a lower-income country may have a low score on a certain component but could greatly exceed typical scores for countries with similar GDP per capita incomes. Conversely, a high-income country may have a high absolute score on a component, but still fall short of what is typical for comparably wealthy countries. For this reason, we have developed a methodology to present a country's strengths and weaknesses on a relative basis, comparing a country's performance to that of its economic peers. The results of this analysis are the basis of our country scorecards, which can be found at www.youthprogressindex.org.

We define the group of a country's economic peers as the 15 countries closest in GDP PPP per capita. Standard groupings of countries, such as the World Bank's country income classifications, are not appropriate for relative comparison of countries for two reasons. First, the groupings are too large, representing excessively wide ranges of social performance and therefore few relative strengths and weaknesses. Second, using these groups, countries at the top or bottom of a group may appear to have a misleadingly large number of strengths or weaknesses simply because the group the country is being compared to is at a much lower or higher level of economic development.

Each country's GDP per capita is compared to every other country for which there is full Index data, and the 15 countries with the smallest difference on an absolute value basis are selected for the comparator group. We have found that groupings larger than 15 resulted in a wider range of typical scores and showed too few relative strengths and weaknesses, while smaller groupings become too sensitive to outliers. Additionally, to reduce the influence of year-to-year fluctuations in GDP data, we use a four-year average (2018-2021).

Once the group of comparator countries is established, the country's performance is compared to the median performance of countries in the group. The median is used rather than the mean to minimise the influence of outliers. If the country's score is greater than (or less than) the average absolute deviation from the median of the comparator group, it is considered a strength (or weakness). Scores that are within one average absolute deviation are within the range of expected scores and are considered neither strengths nor weaknesses. A floor is established so the thresholds are no less than those for poorer countries and the minimum distance from median to strength or median to weakness is 1 point.

We define comparator groups for all countries, regardless of whether they have complete Youth Progress Index data or sufficient data for only some indicators, components, and dimensions. However, to maintain stability in comparisons, only countries with full data across all components of the index are included in comparator groups for other countries. Among ranked and partial countries, we cannot calculate strengths and weaknesses for countries with missing GDP data (these are Cuba, Eritrea, South Sudan, Syria, Venezuela, and Yemen).

Structural Integrity of the Index

Throughout the indicator assessment and calculation process, we conduct statistical tests to ensure the structural integrity of the Youth Progress Index. Our goal is that no single indicator majorly affects a country's component, dimension, or overall score, and that the indicators within each component are statistically related and compatible. To achieve this, we look at correlations between indicators and between indicators and aggregated scores, Cronbach's alpha, and the Kaiser-Meyer-Olkin measure of sampling adequacy.

In understanding the correlations between indicators, we strive for indicators within components to show correlations of between r=0.25 to r=0.92 (absolute values). Indicators with correlations below 0.25 generally show little statistical relation to other indicators. Likewise, if two indicators are too highly correlated (i.e., r>0.92), we find that the indicators overlap too much in concept and become statistically redundant, which would place too much weight on the concepts they are capturing within the component; we generally remove one of these indicators as well. For the Youth Progress Index, correlation coefficients range from 0.13 to 0.93. However, all correlations are statistically significant at the 1% level.

To evaluate the fit between indicators within each component, we calculate Cronbach's alpha after we transform the indicators and impute missing values. Cronbach's alpha provides a measure of internal consistency across indicators. An applied practitioner's rule of thumb is that the alpha value should be above 0.7 for any valid grouping of variables (Bland and Altman, 1997). As shown in Figure 5, eleven of the twelve components meet the 0.7 threshold safely, while only the Environmental Quality is slightly below it. The difference from the limit is however very small and therefore it is still acceptable.

		Cronbach's Alpha
Basic Human Needs	Nutrition and Basic Medical Care	0.94
	Water and Sanitation	0.91
	Shelter	0.83
	Personal Safety	0.75
Foundations of Wellbeing	Access to Basic Knowledge	0.89
	Access to Information and Communications	0.80
	Health and Wellness	0.79
	Environmental Quality	0.68
Opportunity	Personal Rights	0.89
	Personal Freedom and Choice	0.85
	Inclusiveness	0.83
	Access to Advanced Education	0.86

Figure 5 / Cronbach's Alpha for Each Component

Cronbach's alpha is a good preliminary screen for conceptual fit; however, it does not provide a direct measure of the goodness of fit of a factor analysis (Manly, 2004). Therefore, we assess goodness of fit using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Generally, KMO scores should be above 0.5. In our data, as shown in Figure 6, the mean KMO score is above 0.5 for all components, suggesting that the grouping of indicators chosen for the components of the Youth Progress Index provides a good measure of the underlying construct.

		Mean KMO
Basic Human Needs	Nutrition and Basic Medical Care	0.89
	Water and Sanitation	0.81
	Shelter	0.71
	Personal Safety	0.69
Foundations of Wellbeing	Access to Basic Knowledge	0.83
	Access to Information and Communications	0.73
	Health and Wellness	0.74
	Environmental Quality	0.66
Opportunity	Personal Rights	0.86
	Personal Freedom and Choice	0.83
	Inclusiveness	0.77
	Access to Advanced Education	0.81

Figure 6 / KMO for Each Component

Limitations

The Youth Progress Index measures how countries at the national level perform on a certain set of indicators that meet the standards and concepts represented by the Index framework. It is used to compare countries and assess both absolute and relative levels of performance on social progress for youth to find best practices and to target areas that need improvement or from which other countries can learn. While the Youth Progress Index framework captures the multi-dimensional concepts underlying social progress for youth, we are limited in how we measure these concepts by the data available from public sources. Country performance is dependent upon the data published by other sources, and we defer to these sources to respond to country inquiries about the different aspects of social progress (a full list of indicators used in the framework, including their sources, is available in Appendix A).

We also recognize that the indicators in many of the topics we measure are not perfect. We strive to ensure each indicator meets our standards of quality; however, some issues are much more complex than the numbers we use to communicate them. For example, there is a serious lack of data on the particular issues faced by subgroups of the young population. Data on minority groups, people with disabilities, LGBTQI, women and girls – are either non-inclusive or not collected at all, or at least not in a standardised format covering a sufficient number of countries. That is the reason why few of these indicators are present in the framework. For example, the Gallup World poll survey asks respondents whether "…the city or area where you live [is] a good place or not a good place to live for gay or lesbian people?" This question essentially omits the particular discrimination faced by young transgender and intersex people. It is however the best proxy that is available to understand the challenges faced

by young LGBTQI communities. Unfortunately, there is no such proxy available for people with disabilities. This lack of data makes any intersectional analysis challenging to include within the Youth Progress Index.

We view the indicators used in the YPI framework as a starting point for measurement and conversation, and we continue to refine the Index to accommodate more recent data with greater geographic coverage that cover important aspects of social progress for youth still not captured by the current indicators available, including national environmental degradation, freshwater withdrawals, and more.

Furthermore, the Youth Progress Index provides a view into how a country performs on average, which helps inform the many policies and investments that affect social progress of youth at the national level. However, it is only a starting point: aggregate data can obscure substantial regional and state differences in performance that are equally important to a country's policy considerations, especially in geographically large regions.

It is also important to note that the Youth Progress Index 2023 is slightly different from the previous version published in 2021. This is mainly due to the fact that some new indicators have been added into (and some have been removed from) the framework, and some others have been updated with fresh data. These modifications must have been subsequently reflected also in slightly modified data treatments, and in indicators calibration (best-case and worst-case scenario). Therefore, the results of these two indexes are not directly comparable in terms of scores and rankings.

Conclusion

The Youth Progress Index provides a benchmark by which countries can compare themselves to others and can identify specific areas of current strength or weakness on social progress for young people. Additionally, scoring on a 0–100 scale gives countries a realistic benchmark rather than an abstract measure. This scale allows us to track absolute, not just relative, performance of countries over time on each component, dimension, and the overall model. The 2023 Youth Progress Index results are a starting point for many different avenues of research into the ways a country manages to achieve progress for young people.

Appendix A: Indicator Used in the Framework: Definitions and Sources

Dimension/ Component	Indicator	Unit of measurement	Definition
			BASIC HUMA...
Nutrition and Basic Medical Care	Infectious diseases	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust... tions, respiratory... measles, varicell... asis, cysticercos... fever, rabies, inte... worm disease, s... 100,000 youth ag...
	Undernourishment	(% of pop.)	The prevalence ... the population c... an active and he... dietary energy c... based on the no...
	Maternal mortality	(deaths/100,000 live births)	Maternal deaths...
	Child mortality	(deaths/1,000 live births)	Probability of dy...
	Child stunting	(0=low risk; 100=high risk)	Risk-weighted pr... (SEV) for child st...
Water and Sanitation	Access to improved sanitation	(proportion of pop.)	Proportion of po... Programme (JMI...
	Access to improved water source	(proportion of pop.)	Proportion of po... Programme (JMI...
	Dissatisfaction with water quality	(proportion of youth aged 15-29)	The proportion ... where you live, a...
	Unsafe water, sanitation and hygiene	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust... youth aged 15-3...

AN NEEDS

	Source
ed Life Years (DALYs) rate, caused by HIV/AIDS, tuberculosis, diarrhoea, intestinal infec- y infections, otitis media, meningitis, encephalitis, diphtheria, whooping cough, tetanus, a, herpes zoster, malaria, Chagas disease, leishmaniasis, trypanosomiasis, schistosomi- is, cystic echinococcosis, lymphatic filariasis, onchocerciasis, trachoma, dengue, yellow estinal nematode infections, food-borne trematodiases, leprosy, ebola, zika virus, guinea exually transmitted diseases (excluding HIV), hepatitis, and other infectious diseases per ged 15-34.	Institute for Health Metrics and Evaluation, Global Burden of Disease
of undernourishment expresses the probability that a randomly selected individual from onsumes an amount of calories that is insufficient to cover her/his energy requirement for althy life. The indicator is computed by comparing a probability distribution of habitual daily onsumption with a threshold level called the minimum dietary energy requirement. Both are tion of an average individual in the reference population.	Food and Agriculture Organization of the United Nations
per 100,000 live births in women aged 10-54 years.	Institute for Health Metrics and Evaluation, SDGs
ing between birth and exactly 5 years of age, expressed per 1,000 live births.	UN Inter-agency Group for Child Mortality Estimation
revalence of stunting in children under 5 as measured by the summary exposure value tunting.	Institute for Health Metrics and Evaluation, Global Burden of Disease
pulation with access to improved toilet types as defined by the Joint Monitoring P).	Institute for Health Metrics and Evaluation, Global Burden of Disease Covariates
pulation with access to improved water sources as defined by the Joint Monitoring P).	Institute for Health Metrics and Evaluation, Global Burden of Disease Covariates
of respondents aged 15-29, answering 'dissatisfied' to the question, "In the city or area re you satisfied or dissatisfied with the quality of water?"	Gallup World Poll
ed Life Years (DALYs) rate attributable to unsafe water, sanitation and hygiene per 100,000 4.	Institute for Health Metrics and Evaluation, Global Burden of Disease

Dimension/ Component	Indicator	Unit of measurement	Definition
Shelter	Dissatisfaction with housing affordability	(proportion of youth aged 15-29)	The proportion o where you live, a
	Household air pollution	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust youth aged 15-3 in diameter (PM residue, and anir
	Usage of clean fuels and technology for cooking	(% of pop.)	The proportion o
	Access to electricity	(% of pop.)	The percentage
Personal Safety	Intimate partner violence	(% of women aged 15+)	Age-standardise or sexual violenc
	Women not feeling safe to walk alone	(proportion of females aged 15-29)	The proportion o alone at night in
	Money stolen	(proportion of youth aged 15-29)	The proportion o have you had mo
	Transportation related injuries	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust 15-34. These inju mobile, motorcy
	Interpersonal violence	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust personal violenc ened or actual, fr

	Source
of respondents aged 15-29, answering 'dissatisfied' to the question, "In the city or area re you satisfied or dissatisfied with the availability of good, affordable housing?"	Gallup World Poll
ed Life Years (DALYs) rate, caused by household air pollution from solid fuels per 100,000 4. Household air pollution includes exposure to particulate matter less than 2.5 microns 2.5) due to the use of solid fuels for cooking, including coal, charcoal, wood, agricultural mal dung.	Institute for Health Metrics and Evaluation, Global Burden of Disease
of the population primarily using clean cooking fuels and technologies for cooking.	World Health Organization
of the population with access to electricity.	World Bank World Development Indicators
ed prevalence of ever-partnered women aged 15 years and older who experienced physical ce by a current or former intimate partner in the last 12 months (%).	Institute for Health Metrics and Evaluation, SDGs (2019 update)
of female respondents aged 15-29, answering 'no' to the question, "Do you feel safe walking the city or area where you live?"	Gallup World Poll
of respondents aged 15-29, answering 'yes' to the question, "Within the last 12 months, oney or property stolen from you or another household member?"	Gallup World Poll
ed Life Years (DALYs) rate due to injuries related to transportation per 100,000 youth aged uries include road injuries (death or disability due to unintentional interaction with an auto- cle, pedal cycle, or other vehicles) as well as other transport injuries.	Institute for Health Metrics and Evaluation, Global Burden of Disease
ed Life Years (DALYs) rate from interpersonal violence per 100,000 youth aged 15-34. Inter- e is defined as death or disability from intentional use of physical force or power, threat- rom another person or group not including military or police forces.	Institute for Health Metrics and Evaluation, Global Burden of Disease

Dimension/ Component	Indicator	Unit of measurement	Definition
Access to Basic Knowledge	Secondary school attainment	(% of pop. aged 25+)	Population with a
	Gender parity in secondary attainment	(distance from parity)	The absolute dev
	Equal access to quality education	(0=unequal; 4=equal)	Country experts' guaranteed to al
	Primary school enrollment	(% of children)	Total number of expressed as a p primary enrollme
	Women with no education	(proportion of females aged 25-29)	Proportion of fer
Access to Information and Communications	Internet shutdown	(0=extremely often; 4=never/ almost never)	Country experts' domestic access
	Access to online governance	(0=low; 1=high)	The availability o – provision of inf cision-making – engaging citizen it participatory, ir
	Internet users	(% of pop.)	The estimated n (including mobile
	Mobile telephone subscriptions	(subscriptions/100 people)	Subscriptions to pre-paid SIM car subscriptions pe

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F WELLBEING

at least some secondary education (% ages 25 and older).	United Nations Development Programme (UNDP) Human Development Data
viation from parity (=1) in secondary education attainment of women and men.	United Nations Development Programme (UNDP) Human Development Data
' aggregated evaluation of the question, "To what extent is high quality basic education I, sufficient to enable them to exercise their basic rights as adult citizens?"	Varieties of Democracy (V-Dem), Dataset Version 13
students of official primary school age who are enrolled in any level of education, percentage of the total population of official primary school age. Statistic is termed 'total net ent rate.'	UN Educational, Scientific, and Cultural Organization Institute for Statistics
males aged 25–29 with no schooling.	Institute for Health Metrics and Evaluation, Educational Attainment Distributions
' aggregated evaluation of the question, "How often does the government shut down s to the Internet?"	Varieties of Democracy (V-Dem), Dataset Version 13
of e-participation tools on national government portals for the following uses: e-information ormation on the Internet; e-consultation – organising public consultations online; and e-de-involving citizens directly in decision processes. E-participation is defined as the process of s through ICTs in policy, decision-making, and service design and delivery in order to make nclusive, and deliberative.	UN Department of Economic and Social Affairs E-Government Survey
umber of Internet users out of the total population, using the Internet from any device e phones) in the last 12 months.	International Telecommunications Union
a public mobile telephone service using cellular technology, including the number of rds active during the past three months, expressed as the number of mobile telephone er 100 inhabitants.	International Telecommunications Union

Dimension/Component	Indicator	Unit of measurement	Definition
Health and Wellness	Depressive disorders	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust... incorporates dis... of depressed mo... toms are less sev...
	Satisfaction with availability of quality healthcare	(proportion of youth aged 15-29)	The proportion o... you live, are you ...
	Healthy life expectancy at 30	(years)	The number of y... mortality and dis... the same concep... of health loss a p... fore more affecte... younger people.
	Health problems preventing from activities	(proportion of youth aged 15-29)	The proportion o... lems that preven...
	Access to essential health services	(0=none; 100=full coverage)	The universal he... ised death rates ... (e.g., diphtheria, ... diseases, diabet...
Environmental Quality	Lead exposure	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust... exposure is defin... exposure, measu...
	Outdoor air pollution	(DALYs/100,000 for youth aged 15-34)	Disability-Adjust... emissions from i...
	Species protection	(0=low; 100=high)	An index of how ... tebrate, and plan... biodiversity infor... high resolutions. ... and a score of 0 ...
	Satisfaction with air quality	(proportion of youth aged 15-29)	The proportion o... you live, are you ...
	Particulate matter pollution	(mean annual exposure, µg/m3)	Population-weig... in aerodynamic ... causing severe h...

ed Life Years (DALYs) rate due to depressive disorders per 100,000 youth aged 15-34. This
ability from major depressive disorder (MDD) and dysthymia. MDD involves the experience
ood or loss of interest or pleasure almost all day, every day, for two weeks. Dysthymia symp-
vere but chronic.

Institute for Health Metrics
and Evaluation, Global Burden
of Disease

of respondents aged 15-29, answering 'satisfied' to the question, In the city or area where
satisfied or dissatisfied with the availability of quality healthcare?

Gallup World Poll

ears that a person of age 30-34 can expect to live in good health, taking into account
sability. While life expectancy summarises a population's mortality experience, HALE uses
pt, but adjusts years lived at each age by the probability of health loss. The average amount
person experiences rises with age. For people at older ages, remaining years are there-
ed by disability, so HALE adjusts downwards those remaining years of life more than for

Institute for Health Metrics
and Evaluation, Global Burden
of Disease

of respondents aged 15-29, answering 'yes' to the question, Do you have any health prob-
t you from doing any of the things people your age can normally do?

Gallup World Poll

ealth coverage (UHC) measures the coverage of 9 tracer interventions and risk-standard-
from 32 causes amenable to personal healthcare, including vaccine-preventable diseases
tetanus, measles), respiratory infections, cancer (breast, cervical, uterine, testicular), heart
es, kidney disease), and the adverse effects of medical treatment.

Institute for Health Metrics and
Evaluation, SDGs

ed Life Years (DALYs) rate attributable to lead exposure per 100,000 youth aged 15-34. Lead
hed as acute exposure, measured by micrograms of lead per decilitre of blood, and chronic
ured by micrograms of lead per gram of bone.

Institute for Health Metrics
and Evaluation, Global Burden
of Disease

ed Life Years (DALYs) rate, resulting from ambient particulate matter pollution, including
industrial activity, households, cars and trucks per 100,000 youth aged 15-34.

Institute for Health Metrics
and Evaluation, Global Burden
of Disease

well a country's terrestrial protected areas overlap with the ranges of its vertebrate, inver-
t species. The Species Protection Index is calculated using remote sensing data, global
rmatics, and integrative models to map suitable habitat for over 30,000 terrestrial species at
. A score of 100 indicates full coverage of all species' ranges by a country's protected areas,
indicates no overlap.

Environmental Performance Index

of respondents aged 15-29, answering 'satisfied' to the question, In the city or area where
satisfied or dissatisfied with the availability of quality healthcare?

Gallup World Poll

hted mean levels of annual exposure to suspended particles smaller than 2.5 microns
diameter (PM2.5), which are capable of penetrating deep into the respiratory tract and
health damage.

Institute for Health Metrics and
Evaluation, SDGs

Dimension/Component	Indicator	Unit of measurement	Definition
			OPPORTU
Personal Rights	Young members of parliament	(% of members of parliament)	Percentage of m the unicameral p
	Freedom of peaceful assembly	(0=no freedom; 4=full freedom)	Country experts' protect the right
	Freedom of discussion	(0=low; 1=high)	Country experts' in private homes
	Access to justice	(0=nonexistent; 1=observed)	Country experts' justice?"
	Freedom of religion	(0=no freedom; 4=full freedom)	Country experts'
	Political rights	(0 and lower=no rights; 40=full rights)	An evaluation of tion, and functio countries and te
Personal Freedom and Choice	Vulnerable employment	(% of total employment of youth aged 15-24)	Contributing you ment. Youth are modelled estima
	Young people not in education, employment or training	(% of youth aged 15-24)	The percentage persons betwee
	Freedom over life choices	(proportion of youth aged 15-29)	The proportion o satisfied or dissa
	Early marriage	(% of married women aged 15-19)	The percentage
	Satisfied demand for contraception	(% satisfied demand of women aged 15-49)	The percentage satisfied with mo
	Perception of corruption	(0=high corruption; 100=low corruption)	The perceived le corrupt) to 100 (v

UNITY

	Source
embers of parliament 30 years or younger in the lower chambers and parliaments	Interparliamentary Union
' aggregated evaluation of the question, "To what extent do state authorities respect and of peaceful assembly?"	Varieties of Democracy (V-Dem), Dataset Version 13
' aggregated evaluation of the question, "Are citizens able to openly discuss political issues and in public spaces?"	Varieties of Democracy (V-Dem), Dataset Version 13
' aggregated evaluation of the question, "Do citizens enjoy secure and effective access to	Varieties of Democracy (V-Dem), Dataset Version 13
' aggregated evaluation of the question, "Is there freedom of religion?"	Varieties of Democracy (V-Dem), Dataset Version 13
three subcategories of political rights: electoral process, political pluralism and participa- ning of government on a scale from 0 (no political rights) to 40 (full political rights). Some rritories score below zero on the questions used to compose the indicator.	Freedom House
uth family workers and own-account workers as a percentage of total youth employ- defined as persons between the ages of 15 and 24 years. The series is part of the ILO tes.	International Labour Organization
of youth who are not in employment and not in education or training. Youth are defined as n the ages of 15 and 24 years. The series is part of the ILO modelled estimates.	International Labour Organization
of respondents aged 15-29, answering 'satisfied' to the question, In this country are you atisfied with your freedom to choose what you do with your life?	Gallup World Poll
of women aged 15-19 years who are married or in-union.	United Nations Population Division
of total demand for family planning among married or in-union women aged 15 to 49 that is odern methods.	United Nations Population Division
evel of public sector corruption based on expert opinion, measured on a scale from 0 (highly very clean).	Transparency International

Dimension/ Component	Indicator	Unit of measurement	Definition
Inclusiveness	Access to public services in urban and rural areas	(0=extreme; 4=equal)	Country experts' public services, s equally across u
	Community safety net	(proportion of youth aged 15-29)	The proportion c have relatives or
	Openness towards immigrants	(proportion of youth aged 15-29)	The proportion c you live a good p
	Opportunity to make friends	(proportion of youth aged 15-29)	The proportion c you live, are you
	Acceptance of gays and lesbians	(proportion of youth aged 15-29)	The proportion c a good place or r
	Discrimination and violence against minorities	(0=low; 10=high)	Group Grievance violence, and rel
Access to Advanced Education	Academic freedom	(0=low; 1=high)	Country experts'
	Quality weighted universities	(points)	The number of u ings on any of th are given double
	Citable documents	(documents/1,000 people)	Citable documen
	Women with advanced education	(proportion of females aged 25-29)	Proportion of fen
	Expected years of tertiary schooling	(years)	Number of years a child of a certa rates for the leve by the school-ag of that level of ec cator seeks to sh number of years who never enter

	Source
' aggregated evaluation of the question, " Is access to basic public se Is access to basic such as order and security, primary education, clean water, and healthcare, distributed rban and rural areas?"	Varieties of Democracy (V-Dem), Dataset Version 13
of respondents aged 15-29, answering 'yes' to the question, If you were in trouble, do you friends you can count on to help you, whenever you need them or not?	Gallup World Poll
of respondents aged 15-29, answering 'good place' to the question, Is the city or area where lace or not a good place to live for immigrants from other countries?	Gallup World Poll
of respondents aged 15-29, answering 'satisfied' to the question, In the city or area where satisfied or dissatisfied with the opportunities to meet people and make friends?	Gallup World Poll
of respondents aged 15-29, answering yes to the question, "Is the city or area where you live not a good place to live for gay or lesbian people?"	Gallup World Poll
e indicator: discrimination, powerlessness, ethnic violence, communal violence, sectarian igious violence.	Fund for Peace Fragile States Index
' aggregated evaluation of the question, "To what extent is academic freedom respected?"	Varieties of Democracy (V-Dem), Dataset Version 13
niversities in a country weighted by the quality of universities, measured by university rank- e three most widely used international assessments. Universities in the top 400 on any list e weight. Not ranked universities are given 5% weight of the top ranked universities.	Times Higher Education World University Rankings;
nts - articles, reviews and conference papers - per 1,000 population.	Scimago Journal & Country Rank
males aged 25-29 with 12-18 years of education.	Institute for Health Metrics and Evaluation, Educational Attainment Distributions
s a person of tertiary school entrance age can expect to spend within tertiary education. For in age a, the school life expectancy is calculated as the sum of the age specific enrolment ls of education specified. The part of the enrolment that is not distributed by age is divided e population for the level of education they are enrolled in, and multiplied by the duration ducation. The result is then added to the sum of the age-specific enrolment rates. The indi- how the overall level of development of an educational system in terms of the average of schooling that the education system offers to the eligible population, including those school.	UN Educational, Scientific, and Cultural Organization Institute for Statistics

Appendix B: Indicators Excluded from the Final Framework

Dimension/Component	Indicator	Unit of measurement
		BASIC HUMA
Water and Sanitation	Satisfaction with water quality	(proportion of youth aged 15-29)
Shelter	Satisfaction with housing affordability	(proportion of youth aged 15-29)
Personal Safety	Homicide rate	(homicides per 100,000 population)
	Assaulted/Mugged youth	(proportion of youth aged 15-29)
	Perceived Criminality	(1=very low; 5=very high)
		FOUNDATIONS OI
Access to Basic Knowledge	Illiterate youth	(proportion of youth aged 15-24)
Access to Information and Communications	Alternative sources of information	(0=low; 1=high)
	Government Internet filtering capacity	(0=no capacity; 3=full capacity to bloc
	Government Internet filtering in practice	(0=extremely often; 4=never or almost
	Government Internet shutdown capacity	(0=no capacity; 4=full capacity to shut
	Government social media shut down in practice	(0=extremely often; 4=never or almost
	Government social media alternatives	(0=all controlled by state; 4=no one us state-controlled platforms)

	Source	Reasons for exclusion
N NEEDS		
	Gallup World Poll	poor statistical fit
	Gallup World Poll	poor statistical fit
	United Nations Office on Drugs and Crime	poor data coverage
	Gallup World Poll	poor statistical fit, poor data coverage
	Global Peace Index	poor statistical fit
F WELLBEING		
	UN Educational, Scientific, and Cultural Organization Institute for Statistics	poor data coverage
	Varieties of Democracy (V-Dem), Dataset Version 13	poor statistical fit
k all)	Varieties of Democracy (V-Dem), Dataset Version 13	poor conceptual fit
t never)	Varieties of Democracy (V-Dem), Dataset Version 13	conceptual overlap (similar indicator selected)
t down all)	Varieties of Democracy (V-Dem), Dataset Version 13	poor conceptual fit
t never)	Varieties of Democracy (V-Dem), Dataset Version 13	conceptual overlap (similar indicator selected)
es	Varieties of Democracy (V-Dem), Dataset Version 13	poor statistical fit, poor conceptual fit

Dimension/ Component	Indicator	Unit of measurement
Health and Wellness	Premature deaths from non-communicable diseases	(deaths/100,000 population)
	Youth life expectancy at 30 to 34	(years)
	Equal access to quality healthcare	(0=unequal; 4=equal)
	Suicide rates per 100,000 population	(suicides/100,000 population)
	Anxiety	(DALYs/100,000 for youth aged 15-34)
	Drug use	(DALYs/100,000 for youth aged 15-34)
	Self-harm	(DALYs/100,000 for youth aged 15-34)
Environmental Quality	Greenhouse gas emissions	(total CO2 equivalents, MtCO2e)
	Satisfaction with environment preservation	(proportion of youth aged 15-29)
OPPORTU		
Personal Rights	Property rights for women	(0=no rights; 5=full rights)
	Use of social media to organize offline action	(0=never or almost never; 4=regularly)
	Freedom of expression	(0=low; 1=high)
Personal Freedom and Choice	Perception of corruption	(proportion of youth aged 15-29)
	Volunteered time	(proportion of youth aged 15-29)
Inclusiveness	Equal protection index	(0=low; 1=high)
	Equal access index	(0=low; 1=high)
	Equality of political power by social group	(0=unequal; 4=equal)
	Equality of political power by socioeconomic position	(0=unequal; 4=equal)
	Access to public services distributed by social group	(0=unequal; 4=equal)
	Minorities satisfied with treatment	(proportion of youth aged 15-29)
	Equality of political power by gender	(0=unequal; 4=equal)
	Power distributed by sexual orientation	(0=unequal; 3=equal)

	Source	Reasons for exclusion
	Institute for Health Metrics and Evaluation, SDGs	poor statistical fit
	Institute for Health Metrics and Evaluation, Global Burden of Disease	poor statistical fit
	Varieties of Democracy (V-Dem), Dataset Version 13	poor statistical fit
	World Health Organization	poor statistical fit, poor conceptual fit
)	Institute for Health Metrics and Evaluation, Global Burden of Disease	poor statistical fit
)	Institute for Health Metrics and Evaluation, Global Burden of Disease	poor statistical fit
)	Institute for Health Metrics and Evaluation, Global Burden of Disease	poor statistical fit
	World Resource Institute	poor statistical fit
	Gallup World Poll	poor statistical fi

	Source	Reasons for exclusion
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
)	Varieties of Democracy (V-Dem), Dataset Version 13	poor statistical fit
	Varieties of Democracy (V-Dem), Dataset Version 13	conceptual overlap (similar indicator selected)
	Gallup World Poll	conceptual overlap (similar indicator selected)
	Gallup World Poll	poor statistical fit
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
	Gallup World Poll	poor statistical fit, poor data coverage
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators
	Varieties of Democracy (V-Dem), Dataset Version 13	lower relevance compared to the selected indicators

Appendix C: Indicator Boundaries

Indicator	Best case	Worst case
Child stunting (0=low risk; 100=high risk)	0	100
Child mortality (deaths/1,000 live births)	0	189.7113
Maternal mortality (deaths/100,000 live births)	0	717.239
Undernourishment (% of pop.)	0	47.4
Infectious diseases (DALYs/100,000 for youth aged 15-34)	0	59866.78
Unsafe water, sanitation and hygiene (DALYs/100,000 for youth aged 15-34)	0	1612.16
Dissatisfaction with water quality (proportion of youth aged 15-29)	0	0.78
Access to improved water sources (proportion of pop.)	1	0.303917
Access to improved sanitation (proportion of pop.)	1	0.099054
Access to electricity (% of pop.)	100	0.643132
Usage of clean fuels and technology for cooking (% of pop.)	100	0
Household air pollution (DALYs/100,000 for youth aged 15-34)	0	2470.439
Dissatisfaction with housing affordability (proportion of youth aged 15-29)	0	0.85
Interpersonal violence (DALYs/100,000 for youth aged 15-34)	0	12084.31
Transportation related injuries (DALYs/100,000 for youth aged 15-34)	0	3906.412
Money stolen (proportion of youth aged 15-29)	0	0.59
Women not feeling safe to walk alone (proportion of females aged 15-29)	0	0.9
Intimate partner violence (% of women aged 15+)	0	49.99464
Women with no education (proportion of females aged 25-29)	0	0.765937
Primary school enrollment (% of children)	100	57.74274
Gender parity in secondary attainment (distance from parity)	0.03	0.849129
Secondary school attainment (% of pop. aged 25+)	100	4.944704
Equal access to quality education (0=unequal; 4=equal)	4	0
Mobile telephone subscriptions (subscriptions/100 people)	100	0.262922

Indicator	Best case	Worst case
Internet users (% of pop.)	100	0
Access to online governance (0=low; 1=high)	1	0
Internet shutdown (0=extremely often; 4=never/almost never)	4	0
Access to essential health services (0=none; 100=full coverage)	100	21.361
Health problems preventing from activities (proportion of youth aged 15-29)	0	0.49
Satisfaction with availability of quality healthcare (proportion of youth aged 15-29)	1	0.1
Healthy life expectancy at 30 (years)	49.06183	19.77309
Depressive disorders (DALYs/100,000 for youth aged 15-34)	160.6957	1579.335
Particulate matter pollution (mean annual exposure, µg/m3)	0	92.956
Satisfaction with air quality (proportion of youth aged 15-29)	1	0.27
Species protection (0=low; 100=high)	100	0
Outdoor air pollution (DALYs/100,000 for youth aged 15-34)	0	381.0963
Lead exposure (DALYs/100,000 for youth aged 15-34)	0	289.8347
Political rights (0 and lower=no rights; 40=full rights)	40	0
Freedom of religion (0=no freedom; 4=full freedom)	4	0
Access to justice (0=nonexistent; 1=observed)	1	0
Freedom of discussion (0=low; 1=high)	1	0
Freedom of peaceful assembly (0=no freedom; 4=full freedom)	4	0
Young members of parliament (% of members of parliament)	15	0
Perception of corruption (0=high corruption; 100=low corruption)	100	8
Satisfied demand for contraception (% satisfied demand of women aged 15-49)	100	0.9
Early marriage (% of married women aged 15-19)	0	40.54901
Freedom over life choices (proportion of youth aged 15-29)	1	0.23
Young people not in education, employment or training (% of youth aged 15-24)	0	53.76

Indicator	Best case	Worst case
Vulnerable employment (% of total employment of youth aged 15-24)	0	0.959932
Discrimination and violence against minorities (0=low; 10=high)	1	10
Acceptance of gays and lesbians (proportion of youth aged 15-29)	1	0
Opportunity to make friends (proportion of youth aged 15-29)	1	0.32
Openness towards immigrants (proportion of youth aged 15-29)	1	0.14
Community safety net (proportion of youth aged 15-29)	1	0.21
Access to public services in urban and rural areas (0=extreme; 4=equal)	4	0
Expected years of tertiary schooling (years)	5	0.02509
Women with advanced education (proportion of females aged 25-29)	1	0.012646
Citable documents (documents/1,000 people)	7.005397	0
Quality weighted universities (points)	1043.4	0
Academic freedom (0=low; 1=high)	1	0

Appendix D: PCA-Derived Indicator Weights

Indicator	Unscaled	Scaled
Infectious diseases	0.2167	0.1937
Undernourishment	0.2169	0.1939
Maternal mortality	0.2296	0.2052
Child mortality	0.2337	0.2089
Child stunting	0.2217	0.1982
Access to improved sanitation	0.2971	0.2633
Access to improved water source	0.2856	0.2531
Dissatisfaction with water quality	0.2559	0.2268
Unsafe water, sanitation and hygiene	0.2898	0.2568
Dissatisfaction with housing affordability	0.1125	0.1001
Household air pollution	0.3342	0.2974
Usage of clean fuels and technology for cooking	0.3403	0.3028
Access to electricity	0.3368	0.2997
Intimate partner violence	0.2644	0.1909
Women not feeling safe to walk alone	0.3172	0.2290
Money stolen	0.3010	0.2173
Transportation related injuries	0.2461	0.1777
Interpersonal violence	0.2563	0.1851
Secondary school attainment	0.2574	0.2160
Gender parity in secondary attainment	0.2540	0.2132
Equal access to quality education	0.2049	0.1720
Primary school enrollment	0.2227	0.1869
Women with no education	0.2525	0.2119
Internet shutdown	0.2300	0.1849

Indicator	Unscaled	Scaled
Access to online governance	0.3356	0.2697
Internet users	0.3571	0.2870
Mobile telephone subscriptions	0.3214	0.2583
Depressive disorders	0.1161	0.0912
Satisfaction with availability of quality healthcare	0.2469	0.1941
Healthy life expectancy at 30	0.3119	0.2452
Health problems preventing from activities	0.2743	0.2156
Access to essential health services	0.3228	0.2538
Lead exposure	0.3262	0.2229
Outdoor air pollution	0.3364	0.2299
Species protection	0.2635	0.1800
Satisfaction with air quality	0.1861	0.1272
Particulate matter pollution	0.3514	0.2401
Young members of parliament	0.0831	0.0711
Freedom of peaceful assembly	0.2256	0.1929
Freedom of discussion	0.2276	0.1946
Access to justice	0.2109	0.1803
Freedom of religion	0.1950	0.1667
Political rights	0.2276	0.1946
Vulnerable employment	0.2380	0.1815
Young people not in education, employment or training	0.2008	0.1531
Freedom over life choices	0.1834	0.1398
Early marriage	0.2264	0.1727
Satisfied demand for contraception	0.2163	0.1650
Perception of corruption	0.2464	0.1879

Indicator	Unscaled	Scaled
Access to public services in urban and rural areas	0.2375	0.1758
Community safety net	0.2439	0.1805
Openness towards immigrants	0.1913	0.1416
Opportunity to make friends	0.1983	0.1468
Acceptance of gays and lesbians	0.2538	0.1878
Discrimination and violence against minorities	0.2263	0.1675
Academic freedom	0.1435	0.1194
Quality weighted universities	0.2311	0.1923
Citable documents	0.2789	0.2320
Women with advanced education	0.2699	0.2246
Expected years of tertiary schooling	0.2784	0.2317

Indicator	Unscaled	Scaled

Appendix E: Descriptive Statistics of 2022 Scores

The following descriptive statistics are based on the sample of 170 countries for which we can calculate at least 9 components for the most recent year (2022) of the Youth Progress Index 2023.

Index / Dimension / Component	Obs.	Mean	Standard Deviation	Min	Max
Youth Progress Index	153	68.77	14.39	32.68	90.51
Basic Human Needs	156	76.65	14.95	34.44	95.70
Foundations of Wellbeing	157	70.23	14.04	33.08	91.17
Opportunity	154	59.48	16.31	19.67	88.54
Nutrition and Basic Medical Care	170	84.67	12.48	43.04	97.44
Water and Sanitation	170	76.43	19.75	22.48	99.39
Shelter	170	75.13	19.84	25.76	97.46
Personal Safety	156	69.18	12.50	40.14	92.90
Access to Basic Knowledge	170	75.34	19.52	18.47	99.13
Access to Information and Communications	170	74.07	18.58	12.73	98.98
Health and Wellness	157	62.99	13.96	16.73	89.19
Environmental Quality	170	66.93	12.42	29.54	90.98
Personal Rights	168	60.01	23.47	7.04	95.28
Personal Freedom and Choice	170	61.16	15.89	20.12	90.48
Inclusiveness	156	59.72	14.91	18.68	91.63
Access to Advanced Education	169	55.28	19.14	17.28	91.13

Appendix F: Bibliography and Further Reading

- Bland, J. M., and D. G. Altman. "Cronbach's Alpha." BMJ (Clinical Research Ed.) 314, no. 7080 (1997): 572.
- Dunteman, George H. Principal Components Analysis. SAGE, 1989.
- Fleurbaey, M. and D. Blanchet. Beyond GDP: Measuring Welfare and Assessing Sustainability, Oxford University Press, 2013.
- Manly, Bryan F. J. Multivariate Statistical Methods: A Primer. CRC Press, 1994

For further reading on social progress, development, and composite indices, we recommend:

- Bishop, Matthew, and Michael Green. The Road from Ruin: How to Revive Capitalism and Put America Back on Top. New York: Crown Business, 2011.
- Delgado, Mercedes, Christian Ketels, Michael E. Porter, and Scott Stern. The Determinants of National Competitiveness. Working Paper. National Bureau of Economic Research, July 2012. http://www.nber.org/papers/w18249.
- Fehder, Daniel, Michael E. Porter, and Scott Stern. "The Empirics of Social Progress: The Interplay between Subjective Well-Being and Societal Performance." AEA Papers and Proceedings, 108 (2018): 477-482.
- Furman, Jeffrey L., Michael E. Porter, and Scott Stern. "The Determinants of National Innovative Capacity." Research Policy 31, no. 6 (2002): 899–933.
- Gehl, Katherine M., and Michael E. Porter. "Why Competition in the Politics Industry is Failing America." Harvard Business School, 2017. https://www.hbs.edu/competitiveness/Documents/why-competition-in-the-politics-industry-is-failing-america.pdf
- Joint Research Centre-European Commission. Handbook on constructing composite indicators: methodology and user guide. OECD Publishing, 2008.
- Kuznets, Simon. "Economic Growth and Income Inequality." The American Economic Review 45, no. 1 (1955): 1-28.
- Porter, Michael E. Competitive Advantage of Nations: Creating and Sustaining Superior Performance. Simon and Schuster, 2011.
- Porter, Michael E. Competition in Global Industries. Harvard Business Press, 1986.
- Sen, Amartya Kumar. Commodities and Capabilities. North-Holland Publ., 1985.
- Sen, Amartya Kumar. Development as Freedom. Oxford University Press, 1999.
- Stevenson, Betsey, and Justin Wolfers. Economic growth and subjective well-being: Reassessing the Easterlin paradox. No. w14282. National Bureau of Economic Research, 2008.
- Stiglitz, Joseph, Amartya Sen, and Jean-Paul Fitoussi. "The measurement of economic performance and social progress revisited." Reflections and overview. Commission on the Measurement of Economic Performance and Social Progress, Paris (2009).