Calibrating the 2018 Social Progress Index to the Sustainable Development Goals

Methodology Note

Social Progress Imperative is supporting implementation of the Sustainable Development Goals (SDGs) around the world. The Social Progress Index represents the first comprehensive framework for measuring social progress that is independent of, and complimentary to, traditional economic indicators. It is a proven tool that helps countries, regions, cities, and communities assess their progress against one another and in relation to policy targets. Sitting alongside economic indicators as a core benchmark for national performance, the Index provides a systematic, empirical foundation that can inform the 2030 Agenda.

Social Progress Index is already being used by countries, cities and communities as a practical tool to support local SDG implementation. In this report, for the first time, we have calibrated the global Social Progress Index to the SDGs in order to better understand the global SDG challenge.

The Social Progress Index is composed of three dimensions and 12 components, with each component defined by a set of three to five indicators. The underlying concepts of the Social Progress Index and its twelve-component structure strongly relate to the concepts of all 17 SDGs, so the Social Progress Index can be used as a proxy measure to track countries' progress on the SDGs across time, as well as help predict their performance in 2030 based on current trends. Using the methodology detailed in this note, Social Progress Imperative has calculated a unique version of its 2018 Social Progress Index that is calibrated to the targets of the SDGs. We welcome your feedback.

Basic Human Needs

Nutrition & Basic Medical Care

Water & Sanitation

Shelter

Personal Safety

Foundations of Wellbeing

Access to Basic Knowledge

Access to Information & Communications

Health & Wellness

Environmental Quality

Opportunity

Personal Rights

Personal Freedom & Choice

Inclusiveness

Access to Advanced Education

SOCIAL
PROGRESS
IMPERATIVE

Design Principles of the Social Progress Index

The Social Progress Index is an outcome-based measure that encompasses issues of health, education, rights, freedoms, and inclusion. Its focus is on the lived experiences of people across the world as measured by social and environmental indicators; it purposely excludes economic measures in order to evaluate social progress as a complement to economic progress, rather than conflating the two tracks of inclusive development. However, some indicators, such as vulnerable employment (see Figure 2 below) still capture the social aspects of an economic concept, and many indicators reflect the social outcomes of living in poverty.
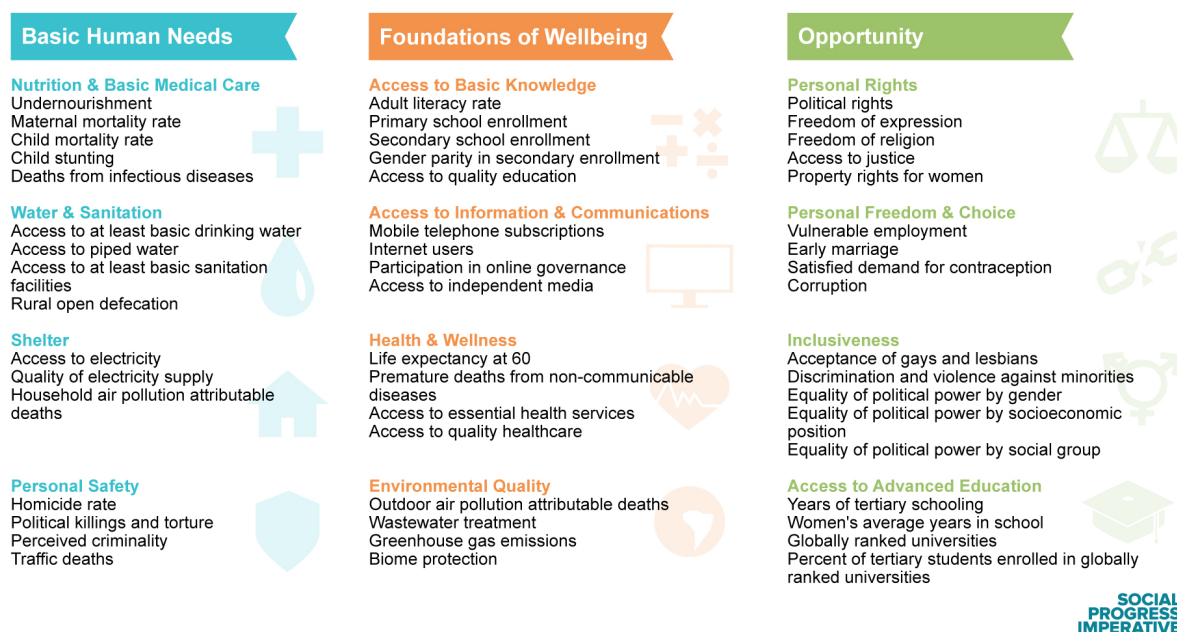
The indicators that comprise the global Social Progress Index are selected based on their reliability, timeliness, and relevance to most, if not all, countries in the world. The 2018 Social Progress Index ranks 146 countries, covering 98% of the world population, and draws on the best data available. As data providers continue to develop indicators that align with the 17 SDG goals and their associated targets, the Social Progress Index has included these measures in its framework to help define and benchmark the SDGs.

Calculating the Social Progress Index

The SDG-calibrated Social Progress Index is calculated using the same methodology as the recently published 2018 Social Progress Index. There are 51 indicators that comprise the 12 components, listed in Figure 2 below. Each of these indicators is reviewed and statistically treated for skew (as needed) to ensure the data retain their original between-country differences without introducing bias to the final results. Missing data are imputed using regression imputation within each component. Rarely, we rely on qualitative

research to fill in data gaps, particularly for education data. We further expand on our methods for treating indicators and imputing missing values in the 2018 Social Progress Index Methodology Summary, available on Social Progress Imperative's website: http://www.socialprogress.org/.

Figure 2 / 2018 Social Progress Index Framework

Basic Human Needs	Foundations of Wellbeing	Opportunity
Nutrition & Basic Medical Care Undernourishment Maternal mortality rate Child mortality rate Child stunting Deaths from infectious diseases	**Access to Basic Knowledge** Adult literacy rate Primary school enrollment Secondary school enrollment Gender parity in secondary enrollment Access to quality education	**Personal Rights** Political rights Freedom of expression Freedom of religion Access to justice Property rights for women
Water & Sanitation Access to at least basic drinking water Access to piped water Access to at least basic sanitation facilities Rural open defecation	**Access to Information & Communications** Mobile telephone subscriptions Internet users Participation in online governance Access to independent media	**Personal Freedom & Choice** Vulnerable employment Early marriage Satisfied demand for contraception Corruption
Shelter Access to electricity Quality of electricity supply Household air pollution attributable deaths	**Health & Wellness** Life expectancy at 60 Premature deaths from non-communicable diseases Access to essential health services Access to quality healthcare	**Inclusiveness** Acceptance of gays and lesbians Discrimination and violence against minorities Equality of political power by gender Equality of political power by socioeconomic position Equality of political power by social group
Personal Safety Homicide rate Political killings and torture Perceived criminality Traffic deaths	**Environmental Quality** Outdoor air pollution attributable deaths Wastewater treatment Greenhouse gas emissions Biome protection	**Access to Advanced Education** Years of tertiary schooling Women's average years in school Globally ranked universities Percent of tertiary students enrolled in globally ranked universities

Prior to aggregation, indicators are standardized and scaled from zero to 100 using selected benchmarks, detailed below as a step to calibrate the index to the SDGs. We then apply principal component analysis (PCA) to assign each indicator a weight and reduce each set of indicators into a component score. Only countries for which we can calculate at least nine component scores (meaning, they are not missing more than one indicator in each of nine components) are included in the country sample that determines the PCA weights. Dimensions are calculated as the simple average of the four components that comprise them, and the Social Progress Index score is the simple average of the three dimensions.

We also calculate a world Social Progress Index score. We do so by weighting each indicator by population and treating the world as a country in the aggregation process described above, assigning the same PCA weights to the indicators as generated by the original country sample and using simple averages to aggregate components into dimensions and dimensions into an overall Social Progress Index score.

Calibration to SDGs

The calibration of the Social Progress Index occurs at the indicator level, prior to aggregation to component, dimension, and Social Progress Index scores. As noted above, indicators are scaled from zero to 100 using benchmarks, which are typically defined by historical low and high achievements or by theoretical boundaries drawn from

indicator definitions. To calibrate the Social Progress Index to the SDGs, we instead rely on the text of the SDG targets as much as possible to help define achievable goals, as well as qualitative research using other sources related to the SDGs.

It is important to note the subjectivity that accompanies this endeavor. As we match indicators to SDG targets, we find that some targets are better defined than others. However, even those that include more specific numerical targets require us to consider the distribution of that target across countries. For example, target 3.1 states: "By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births," so we set a data value of 70 for maternal mortality rate (in Nutrition and Basic Medical Care) as equivalent to a score of 100, or the score that reflects a country has achieved this target. If all countries achieve this target, on average the global population would reflect this achievement as well. Likewise, target 3.6 states, "By 2020, halve the number of global deaths and injuries from road traffic accidents." In this case, we calculate the most current population-weighted average number of deaths from road traffic accidents globally and assign half that value as the country-level benchmark for achieving 100.

Other indicators, despite their relation to the SDG goals, have no set benchmark defined in the SDG targets. For example, the indicator household air pollution attributable deaths (in Shelter) directly relates to target 3.9, which states: "By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination." Since no associated numerical value is mentioned in this text, we rely on external guidance and ensure consistency among indicator benchmarks to determine that a score of 100 is achieved when a country has reached the low value of five deaths attributable to household air pollution per 100,000 people. Due to the general wording of many of the targets and the distribution of the numerical goals across countries, we never assign a benchmark that is representative of complete elimination or perfect achievement of an outcome.

A full list of upper and lower boundary values for each indicator is included at the end of this note. We consider these the minimum standards to achieving the SDGs. These standards are lower standards than the benchmarks used to scale indicators in the published 2018 Social Progress Index. For this reason, results of the two indexes – the 2018 Social Progress Index and the SDG-calibrated Social Progress Index – are not comparable. Country scores tend to be higher on the SDG-calibrated Social Progress Index, and the rankings of countries on the two indexes differ.

Predicting Progress by 2030

The prediction of country progress toward the SDGs in 2030 is calculated as a simple linear progression over time. Linear predictions are based on as much historical data available as possible at the component and overall Social Progress Index levels of aggregation and are determined by the average annual rate of change in points. Compounding this decrease or increase in points over time, we forecast results to 2030 and can determine when and if a country or the world will achieve a score of 100 on the SDG-calibrated Social Progress Index.

While we recognize there are several factors that influence a country's progression on social outcomes over time that are not included in this prediction methodology, we aspire to provide a transparent methodology that reflects what prior trends in social progress can tell us about the future. This method is in line with the current methodology adopted by the World Bank to generate poverty estimates. As data continue to develop and there is greater availability of historical data, and as we continue our research into the significant factors that impact social progress, we will continue to refine and improve our predictions of country progress.

The linear projection method is dependent on the amount of historical data available for each indicator used in the Social Progress Index. To predict countries' and the world's Social Progress Index scores in 2030, we are limited to using five years of Social Progress Index scores, 2014 to 2018, due to some of the 51 indicators having limited historical data. At the component level, we can extend historical data further back for certain components. There are four components for which there is enough consistently updated data to confidently predict future trends using the methodology described above: Nutrition and Basic Medical Care, Water and Sanitation, Personal Rights, and Inclusiveness. Other components faced challenging gaps in historical data for some or all of the indicators that compose them.

The data collection year for most indicators typically precedes the data publication year by one to two years. On average, most of the data points used in the 2018 Social Progress Index were collected in 2016. Below are listed the components for which we produce projections alongside the earliest year they would be included in a Social Progress Index. So, for example, we can calculate Nutrition and Basic Medical Care scores for 2003 to 2018 to predict progress in 2030, but most data were collected in 2001 to 2016, respectively.

Component	Earliest year of data
Nutrition and Basic Medical Care	2003
Water and Sanitation	2008
Personal Rights	2003
Inclusiveness	2008

At the component level, most projections to 2030 are based on at least ten years of data, and up to 15. We use the random walk model with drift in R statistical software to determine 95% confidence intervals around our estimates. For Nutrition and Basic Medical Care and Water and Sanitation, projections fall between +/- 2 points at the 95% confidence interval. For Personal Rights and Inclusiveness, projections are much more volatile, and we only present projections for the world's performance, for which confidence intervals are +/- 6 points and +/-4 points, respectively.

Indicator	Lower	Upper
Undernourishment (% of pop.)	58.6	2.5
Maternal mortality rate (deaths/100,000 live births)	940.33	70
Child mortality rate (deaths/1,000 live births)	179.1	25
Child stunting (% of children)	57.588	7.5
Deaths from infectious diseases (deaths/100,000)	1709.54	50
Access to at least basic drinking water (% of pop.)	17.8078	95
Access to piped water (% of pop.)	3.694	95
Access to at least basic sanitation facilities (% of pop.)	5.1412	95
Rural open defecation (% of pop.)	91.75	2
Access to electricity (% of pop.)	0	98
Quality of electricity supply (1=low; 7=high)	1	6
Household air pollution attributable deaths (deaths/100,000)	303.32	5
Homicide rate (deaths/100,000)	108.64	2
Political killings and torture (0=low freedom; 1=high freedom)	0	0.95
Perceived criminality (1=low; 5=high)	5	2
Traffic deaths (deaths/100,000)	64.4272	10.32
Adult literacy rate (% of pop. aged 15+)	15.456	90
Primary school enrollment (% of children)	34.3397	95
Secondary enrollment (% of children)	9.07298	95
Gender parity in secondary enrollment (girls/boys)	0.58739	0.01
Access to quality education (0=unequal; 4=equal)	0	3.8
Mobile telephone subscriptions (subscriptions/100 people)	0	95
Internet users (% of pop.)	0	90
Participation in online governance (0=low; 1=high)	0	0.75
Access to independent media (% of pop.)	0	90
Life expectancy at 60 (years)	11.102	22
Non-communicable disease deaths between the ages of 30 and 70 (deaths/100,000)	1266.1	277.97
Access to essential health services (0=none; 100=full coverage)	24.904	80
Access to quality healthcare (0=unequal; 4=equal)	0	3.8
Outdoor air pollution attributable deaths (deaths/100,000)	207.655	25.39
Wastewater treatment (0=no treatment; 100=fully treated)	0	81.08
Greenhouse gas emissions (CO2 equivalents per GDP)	1955.52	168.88
Biome protection (% of biomes)	0	17
Political rights (0=no rights; 40=full rights)	0	36
Freedom of expression (0=no freedom; 1=full freedom)	0	0.95
Freedom of religion (0=no freedom; 4=full freedom)	0	3.8
Access to justice (0=non-existent; 1=observed)	0	0.95
Property rights for women (0=no right; 5=full rights)	0	4.75
Vulnerable employment (% of employees)	94.501	10
Early marriage (% of women)	0.61	0.1
Satisfied demand for contraception (% of women)	7.9	80
Corruption (0=high; 100=low)	0	75
Acceptance of gays and lesbians (0=low; 100=high)	0	0.8
Discrimination and violence against minorities (1=low; 10=high)	10	4
Equality of political power by gender (0=unequal power; 4=equal power)	0	3.8
Equality of political power by socioeconomic position (0=unequal power; 4=equal power)	0	3.8
Equality of political power by social group (0=unequal power; 4=equal power)	0	3.8
Years of tertiary schooling	0	0.75
Women's average years in school	0	12
Number of globally ranked universities (points)	0	3
Percent of tertiary students enrolled in globally ranked universities	0	0.35