



User Guide: Health-related SDGs visualization

SDG, MDG, and non-MDG indices

Definitions

The **health-related SDG index** – often abbreviated to the “SDG index” – is a summary measure that reflects a given geography’s performance across health-related Sustainable Development Goal (SDG) indicators. For the Global Burden of Diseases, Risk Factors, and Injuries Study 2015 (GBD 2015), 33 individual indicators were included in the health-related SDG index.

The **MDG index** currently includes 14 health-related SDG indicators that have origins in the Millennium Development Goals (MDGs). The MDGs, which expired in 2015, sought to reduce extreme poverty and were primarily focused on indicators related to reproductive, maternal, and child health; infectious diseases like HIV/AIDS and malaria; and a subset of environmental risk factors such as unsafe water and sanitation.

The **non-MDG index** currently covers 19 health-related SDG indicators that do not have explicit links to the MDG agenda. These indicators reflect a much broader scope for improving health than the MDG indicators, including a number of behavioral risk factors (smoking, harmful alcohol consumption, childhood overweight); violence (mortality rates due to interpersonal violence and war, the prevalence of interpersonal violence among women); non-communicable diseases; and pollution.

Measurement approach

The SDG, MDG, and non-MDG indices summarize how well a country is doing across the health-related SDG indicators covered by each index relative to other places over time. Each index is measured along a scale of 0 to 100, with 0 capturing the worst levels across countries and over time, and 100 reflecting the best levels across countries and over time. For GBD 2015, the time period assessed was 1990 to 2015.

Each index was calculated in two steps: (1) taking the geometric mean by SDG target and (2) taking the geometric mean across targets. This approach was used to weigh the health-related SDG targets more equally; this was important since some SDG targets involved many indicators and others only included one or two indicators.

Additional detail on the SDG, MDG, and non-MDG index construction can be found here:

<http://www.healthdata.org/research-article/measuring-health-related-sustainable-development-goals-188-countries-baseline>

Index values and estimates

Definitions

The SDG, MDG, and non-MDG indices are all shown as “index values,” which are reported along a scale between 0 and 100. These indices are based on individual health-related SDG indicators that are scaled (see *Measurement approach* below). The SDG, MDG, and non-MDG indices are meant to provide an easy way to directly compare overall performance across geographies, over time, and by index type.

Individual health-related SDG indicators are reported in terms of both “index values” (scaled 0 to 100) and “estimates.” “Index values,” also known as “scaled values,” range from 0 to 100 and allow for a more standard way of comparing between very different types of health measures (e.g., mortality rates and intervention coverage). “Estimates” refer to the underlying indicator values – deaths per 100,000; proportion of children under 5 who are overweight; cases per 1,000; and so on. For this analysis, researchers also call these estimates “unscaled values” as they are not scaled relative to other places over time.

Measurement approach

To scale each indicator from 0 to 100, we grouped indicators by “positive indicators” (better performance is associated with higher values, such as skilled birth attendance) and “negative indicators” (better performance is associated with low values, such as mortality from road injuries). For the positive indicators, the value of 0 was assigned to the place with lowest level between 1990 and 2015, and a value of 100 was given to the place with the highest level during this time; for skilled birth attendance, this range was approximately 8% in 1990 to 99.7% in 2015. The remainder of indicator-specific estimates were then assigned values of 0 to 100 based on this range.

For the negative indicators, the value of 0 was assigned to the place with the highest level between 1990 and 2015, and a value of 100 was given to the place with the lowest level during this time; for mortality due to road injuries, this range was about 76 deaths per 100,000 in 1995 and 3.0 deaths per 100,000 in 2015. The remainder of indicator-specific estimates were then assigned values of 0 to 100 based on this range.

SDG indicator targets

Across the 17 SDGs, 169 targets were established by the United Nations with the aim of creating a way to measure progress for the SDGs. Some targets are very specific, identifying an exact level to be reached by 2030 (e.g., Target 3.1 “By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births”). Others are less defined and do not provide explicit thresholds for target attainment (e.g., Target 3.5: “Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol”).

For the Health-related SDGs data visualization, we display all defined SDG indicator targets under the **Country view** and as part of the **line graph**. For GBD 2015, “defined SDG indicator targets” are those that provide specific values associated with indicator attainment by 2030: full elimination of diseases, conditions, and risks; achievement of 100% coverage or access to a given service; and falling below designated levels for maternal and child mortality rates. These targets are shown as dotted lines on the line graphs, more detailed information can be seen by hovering over the corresponding wedge in aster plot to the left of the line graph.

Visualization tool views and functions

The Health-related SDGs data visualization has two main views: the **Country** and **Map** views

The **Country view** allows for a more in-depth view of a given country’s levels and trends for the health-related SDG index, MDG index, non-MDG index, and individual health-related SDG indicators, while the **Map view** allows for a broader comparison of country performance by indicator.

Country view

The Country view has two main components: the aster plot on the user’s left and the line graph on the user’s right. The top portion of this view provides a menu of this view’s visualization tool options.

The **aster** plot shows each of the 33 health-related SDG indicators as individual arms, color-coded by SDG target, and the default number in the middle of this diagram is the health-related SDG index value for Iceland in 2015. Hovering over each arm of the sunburst provides both the “index value” (on scale of 0 to 100) and estimate (unscaled value) for a given health-related SDG indicator, country, and year. Alternatively, switching the Labels button from “Off” to “On” provides index values and abbreviated descriptions of each health-related SDG indicator. The relative length of each sunburst arm represents a given indicator’s “index value” (scaled 0 to 100), such that a longer arm reflects a value closer to 100 (best performance) and a shorter arm reflects a value closer to 0 (worst performance). Uncertainty associated with each value can be viewed by switching the “Uncertainty” button from “Off” to “On.”

To explore results for the MDG index and non-MDG index, click on the corresponding buttons following “Health-related index” on the visualization tool menu. The indicators not included in the MDG or non-MDG index are shaded out, leaving behind the individual health-related SDG indicators that comprise the MDG or non-MDG index. The value in the center of the sunburst diagram updates to the MDG or non-MDG index.

To visualize change between different countries or years, go to the Location drop-down button and Year slider respectively. Pushing the play button to the left of “Years” will move between 1990 and 2015 in five-year increments.

The **line graph** illustrates trends for the health-related SDG index, MDG index, non-MDG index, and individual health-related SDG indicators. The country selected for the sunburst diagram also populates to the line graph and vice versa; the same applies if a particular indicator is selected from the drop-down menu or clicked on the sunburst diagram. Individual indicators can be viewed in terms of their “index value” (scaled 0 to 100) or “estimate” (unscaled values) by turning the “Index value” button “Off” and “On”; the y-axis label will change to “Index value” whenever this button is “On.” Uncertainty associated with each value can be viewed by switching the “Uncertainty” button from “Off” to “On.”

Below the line graph are more detailed descriptions for individual SDG indicators and their corresponding SDG targets and goals; descriptions of the SDG, MDG, and non-MDG indices are also provided. Indicator descriptions align with definitions used in Lim et al. 2016 “Measuring the health-related Sustainable Development Goals in 188 countries: a baseline analysis from the Global Burden of Disease Study 2015,” whereas the target and goal descriptions align with those established by the United Nations.

For a subset of health-related SDG indicators, their corresponding SDG targets are represented by a dotted line under the Index value “Off” view. While these dotted lines indicate the levels to be achieved by 2030, some countries have already met these targets by 2015.

When the Index value is at the “Off” position, the “Lock scale” button appears. When “Lock scale” is switched to the “On” position, the y-axis of the line graph shifts to capture the highest levels observed across countries and over time; this feature allows for more direct comparisons across countries for a given indicator.

Map view

The Map view supports comparisons across regions and countries for the health-related SDG index, MDG index, non-MDG index, and individual health-related SDG indicators over time. The visualization tool menu is very similar to that of the Country view, with options for turning the Index value “On” (scaled 0 to 100) or “Off” (estimates), a “Lock scale” button, drop-down menu for the health-related indices and individual indicators, and a sliding year button. The primary difference is the option to “Show change,” which allows users to see absolute change for “index values” and percent change for “estimates” (unscaled values) at different year intervals.

Within the map, hovering over a country provides both the “index value” (scaled 0 to 100) and “estimate” (unscaled) value for that country and year; estimates of uncertainty are given within parentheses. To view different indicators or one of the summary indices, go to the “Indicator” drop-down menu and make a selection.

The scale provided at the bottom of the map is color-coded such that red represents the “worst,” which are generally the highest levels (e.g., deaths per 100,000 or proportion of children who are overweight), and dark blue signals the “best,” which are typically the lowest levels (e.g., cases per 1,000 or prevalence of daily smoking). Exceptions are the summary indices and indicators that involve intervention coverage (skilled birth attendance, met need for family planning with modern contraception, and universal health coverage); for these measures, being close to 100 is considered the “best” and being closer to 0 is viewed as the “worst.”

Small, semi-translucent dots can be found along the color-coded scale, with each dot representing a country and its value for a given index or indicator. Hovering over the dot provides both the “index value” (scaled 0 to 100) and “estimate” (unscaled) value for that country and year; estimates of uncertainty are given within parentheses. Clicking on the dot highlights the country within the overall map view.

A unique feature of the Map view is its “Set scale” function, which is located to the far right of the color-coded scale. This function allows users to focus on sub-groups of countries and investigate differences with greater granularity. For instance, to hone in on countries with a health-related SDG index between 50 and 80 for a given year, drag the green markers at each end of the scale to 50 and 80, respectively. Countries with a health-related SDG index below 50 and above 80 are then grayed out. By pressing “Set scale,” the color-coding scheme originally used for a scale of 0 (red) to 100 (dark blue) is then set from 50 (red) to 80 (dark blue). To return to the original scale (0 [red] to 100 [dark blue]), push the “Reset” button directly below “Set scale.”