




Global Justice Index Report

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Abstract

The Global Justice Index is a multiyear research project conducted at the Fudan-IAS to conceptualize and measure each country's contribution to achieve greater global justice. In this study, we intend to provide our first-year achievements with the ranking of nation states at the global level from 2010 to 2017. This study comprises four main sections. In the introduction, we discuss the development of the conceptual framework and evaluative principles to justify our selection of dimensions and indicators for measurement. Next, in the section of methodology, we discuss the production, normalization, and aggregation of the raw data and the generation of the final results. The following section is the main findings, and we present the results through various visualization tools and provide regional comparisons for further analysis. In the last section, we discuss the applications and limitations of the index, and its potential further research trajectories.

Keywords Global Justice Index · Indicators · Measurements · Methods · Country's global ranking

1 Introduction

The Global Justice Index is a multiyear research project conducted at the Fudan-IAS to conceptualize and measure each country's contribution to achieve greater global justice. In this study, we intend to provide our first-year achievements with the ranking of nation states at the global level from 2010 to 2017. This study comprises four main sections. In the introduction, we discuss the development of the conceptual framework to justify our selection of dimensions and indicators for measurement. Next, in the section of methodology, we discuss the production, normalization, and aggregation of the raw data and the generation of the final results. The following section is the main findings, and we present the results through various visualization tools and provide

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regional comparisons for further analysis. In the last section, we discuss the applications and limitations of the index, and its potential further research trajectories.

Global justice is a broad concept composed of multilevel and multidimensional aspects belonging to both normative and empirical realities. A coherent, integrated theoretical framework that covers the normative basis and various empirical dimensions is, therefore, necessary to address some of the basic and important questions under study. Our study began with the conceptualization of global justice and was completed based on a theoretical paper on “Conceptualizing and Measuring Global Justice: Theories, Concepts, Principles and Indicators,” coauthored by the project leader, Sujian Guo, et al., published in *Fudan Journal of the Humanities and Social Sciences* (Vol. 12, No. 4, 2019). The paper discusses theories, concepts, evaluative principles, and methodologies related to the study of global justice.

In the paper above, we attempt to clarify how to conceptualize global justice, how indicators can be selected and theoretically justified, and how those indicators can be conceptually consistent with the concept of global justice. Through the synthesis of multiple theories and intellectual traditions in various cultural and political contexts, we conceptualize global justice from three main approaches—rights-based, goods-based, and virtue-based—to develop a theoretical framework with a normative basis for the following measurement. Rights-based conceptualization focuses on the basic principles, rules, and sources of legitimacy of justice (Universal Declaration of Human Rights 1948; Rawls 1971, 1999). Goods-based conceptualization concentrates on the material and institutional supports that the governments or institutions are obliged to provide (Arneson 1989; Freeman 2006; Nussbaum 2006, 2011; Richardson 2006). And virtue-based conceptualization regards justice as a virtue that an individual is willing to pursue rather than a regulation an individual is forced to comply with Mo (2003). The relationship between the three approaches of conceptualization is interdependent rather than separate, which indicates three interrelated components of a holistic whole. Additionally, the three approaches are complementary rather than competing, with the rights-based conceptualization forming the basic structure as the “bones”, the goods-based conceptualization providing substantial material supports as the “muscles”, and the virtue-based conceptualization emphasizing personal motivation and internalized willingness as the “heart” (Guo et al. 2019).

Based on the aforementioned theoretical framework, we propose two evaluative principles to further bridge the gap between theories and practice to determine and justify our selection of issue areas for evaluation. We call the two principles Common but Differentiated and Respective Capabilities (CBDR-RC) and Cosmopolitan but Due-diligent Responsibilities (CDDR). CBDR-RC addresses the issues “for which no single nation state can be held directly accountable or responsible, matters that can only be tackled through the globally concerted efforts of all stakeholders” (Guo et al. 2019). For example, it is the responsibility of all to protect the climate system and ecological balance, and environmental protection is a task that cannot be handled by one country on its own. The principle of CBDR-RC, first adopted by the United Nations Framework Convention on Climate Change and reaffirmed in the Rio Declaration on Environment and Development, combines normative legitimacy and historical rationality. Although it was a principle that first aimed to determine the responsibilities of each country for climate change, it

has been expanded to the other global justice areas such as combating transnational crime and global peacekeeping.

The second principle, CDDR, addresses that “all-nation-states are morally obligated to provide cosmopolitan aid, in which context the least advantaged will have a due-diligent responsibility” (Guo et al. 2019). This principle is based on the concept of “mutual accountability” proposed in the Paris Declaration on Aid Effectiveness, adopted in 2005 at the Second High-Level Forum on Aid Effectiveness to promote a better cooperation between different actors in aid and development. This principle views such obligations as part of domestic affairs, such as anti-poverty and education policy, in the context of which the nation states are expected to provide material and institutional assistance to their citizenry within their territories.

According to the principles of CBDR-RC and CDDR, we determine two clusters of global justice issue areas for practical measurement. Those issue areas that follow the principle of CBDR-RC are (1) climate change (global warming), (2) peacekeeping, (3) humanitarian aid, (4) terrorism and armed conflicts, and (5) cross-national criminal police cooperation, and those belonging to the principle of CDDR are (6) anti-poverty, (7) education, (8) public health, and (9) the protection of women and children. In the following sections, we present the more practical part of operationalization and measurement to assess the performance and contribution of each nation state to promote justice at the global level.

2 Methodology: Construction of the Global Justice Index

In this study, we classify our data into four levels: indicators, dimensions, categories, and issues. The first and the bottom levels of our data provide the information on indicators, which is our raw data. The second level is named dimensions, which usually comprises several related indicators. The third level is categories and comprises several related dimensions. And the last level is the issue index, usually calculated based on two categories: contribution and performance.

The global justice index is calculated as follows.

2.1 First Step: Convert Indicator Indices

To ensure comparability between indicators, we use the following two formulas to convert the raw data into comparable indicators:

$$ii_{ij} = \frac{\text{actual value}_{ij} - \min(\text{actual value}_j)}{\max(\text{actual value}_j) - \min(\text{actual value}_j)} + 1 \quad (1)$$

$$ii_{ij} = \frac{\max(\text{actual value}_j) - \text{actual value}_{ij}}{\max(\text{actual value}_j) - \min(\text{actual value}_j)} + 1 \quad (2)$$

$$i \in \{1, 2, \dots, 192\}, j \in \{2010, 2011, \dots, 2017\},$$

where actual value i_{ij} indicates the actual value of an indicator in country i in year j . $\min(\text{actual value}_j)$ is the minimum value of an indicator among all countries in year j , and $\max(\text{actual value}_j)$ is the maximum value of an indicator among all countries in year j . If an indicator positively relates to global justice, the first formula is used to convert the raw data; if not, the second formula is used.

2.2 Second Step: Population-Based Weighting

Consciously, countries with various populations should make different efforts to raise the welfare of their people to the same level. If one compares with the efforts that countries make to raise the welfare of their people; therefore, we weight indicators based on population size. Proceed as follows:

First, calculate the weighted average of an indicator as per the following formula:

$$ii_{mj} = \frac{\sum ii_{ij} \times \text{population}_{ij}}{\sum \text{population}_{ij}} \tag{3}$$

ii_{mj} is the weighted average of an indicator. ii_{ij} is the actual value of an indicator in country i in year j . population_{ij} is the population size of country i in year j .

Second, calculate the weight of each country on an indicator as follows:

$$ss_{ij} = (ii_{ij} - ii_m) \times \text{population}_{ij} \tag{4}$$

ss_{ij} is the weight of country i in year j .

Third, calculate the score for an indicator in country i in year j as follows:

$$\Pi_{ij} = \frac{ss_{ij} - \min(ss_j)}{\max(ss_j) - \min(ss_j)} + 1 \tag{5}$$

where Π_{ij} is the score of an indicator in country i in year j . We use Π_{ij} to further calculate the dimension global justice.

2.3 Third Step: Calculate the Scores of Both Dimension Indices and Category Indices

For each variable, we calculate the score of the variable index as follows:

$$VI_{ij} = \sqrt[n]{\prod_k \Pi_{ijk}} \tag{6}$$

where VI_{ij} is the score of the variable index.

Similarly, we use VI_{ij} to further calculate the score of dimension indices as follows:

$$DI_{ij} = \sqrt[n]{\prod_k VI_{ijk}} \tag{7}$$

2.4 Fourth Step: Calculate the Score of the Issue Index

We use DI_{ij} to further calculate the score of each issue in county i in year j as follows:

$$ISI_{ij} = \sqrt[n]{\prod_k DI_{ijk}}. \quad (8)$$

2.5 Last Step: Calculate Global Justice Index

We use the following formula to calculate the score of the global justice index in country i in year j :

$$GJ_{ij} = \sqrt[n]{\prod_k ISI_{ijk}}, \quad (9)$$

where GJ_{ij} is the score of global justice in country i and year j . ISI_{ijk} is the score of issue k in country i in year j .

3 Findings

In this section, we will report the results of the measurement and country ranking in the identified nine issue areas related to global justice based on available data sources. We will present dimensions, variables, indicators, and data sources, and evaluate and rank the countries in terms of performance and contribution. We then present the results through various visualization tools and provide regional comparisons for further analysis.

3.1 Issue 1: Climate Change

This report studies countries' efforts to promote global justice from the perspectives of climate change, peacekeeping, and other issues. Climate change and peacekeeping are issues for which no single actor can be held directly accountable or responsible. They are issue areas that can only be addressed through the globally concerted efforts of all stakeholders. Global warming is a real, disastrous phenomenon, with many destructive effects. Scientists have concluded that human influence is most likely the dominant cause of the observed warming since the mid-twentieth century. If all countries remain passive about climate change, the situation will worsen, with dramatic consequences globally. Alternately, if countries cooperate and coordinate to combat global warming, the negative impacts of climate change on this plane would be significantly alleviated.

3.1.1 Dimensions and Indicators

Today, countries attempt to resolve climate change problems by, for example, reducing CO₂ emission, planting more trees, and supporting clean and renewable energy. Thus, our dimensions of climate change include CO₂ emission, energy use, forestry, and electricity (Table 1). We have selected more than ten indicators derived from four dimensions. In the energy use dimension, our indicators include energy use per capita, energy use per 1000 dollars of gross domestic product, and fossil fuel energy consumption. In the CO₂ emission dimension, four indicators are used: CO₂ emissions from gas, liquid, solid, and fuel consumption per capita and CO₂ intensity per capita. The forestry dimension has two indicators. The electricity dimension has four indicators: electricity production from hydroelectric sources, oil, gas and coal sources, renewable sources, and nuclear sources. These data are all available for 195 countries from the World Bank. However, the time span is from 2000 to 2014 (2010–2014 is more important for our research purpose). We understand that these four dimensions and the indicators selected for this study may be not the most ideal, but they can to a large extent measure countries' efforts to solve climate change problems.

3.1.2 Results

In this section, we present the ranking results of the countries' contributions to global justice from a climate change perspective (Table 2). Table 2 shows 5 years of results from 2010 to 2014 in 195 countries.

Table 2 shows the countries' climate-change ranking from 2010 to 2014. Due to the missing value problem, some countries (e.g., Afghanistan, Zambia, Zimbabwe, and Monaco) do not have full data for the year 2014. However, 116 countries in Table 2 have full data. In general, we observe that developed countries have performed relatively better than developing countries in terms of promoting global justice from a climate change perspective. In most cases, countries' rankings have been stable from 2010 to 2014.

Figure 1 shows that the top ten countries in 2014 are Sweden, Brazil, Gabon, Finland, Paraguay, Costa Rica, Congo, Democratic Republic of the Congo, Cambodia, and Cameroon. Sweden and Finland are developed countries and the remaining eight countries are developing countries. Brazil, Costa Rica, and Paraguay are South American countries. Cambodia is an Asian country. Gabon, Democratic Republic of the Congo, Cameroon, and Congo are African countries. China ranks 87th in 2014, and the United States ranks 73rd in 2014. This finding implies that the two largest economies must make more contributions despite the progress achieved prior to 2014.

Table 1 Data on climate change

Category	Dimension	Indicator	Data source	Coverage
Performance	Energy use	Energy use (kg of oil equivalent per capita)	World Bank	195 (2010–2014)
		Energy use (kg of oil equivalent) per \$1000GDP (constant 2011 PPP)		
		Fossil fuel energy consumption (% of total)		
	CO ₂ emission	CO ₂ emissions from gas fuel consumption (kt) per capita	World Bank	
		CO ₂ emissions from liquid fuel consumption (kt) per capita		
		CO ₂ emissions from solid fuel consumption (kt) per capita		
		CO ₂ intensity (kg per kg of oil equivalent energy use) per capita		
	Forestry	Forest area (% of land area)	World Bank	
		Forest area (km ²)		
	Electricity	Electricity production from hydroelectric sources (% of total)	World Bank	
Electricity production from oil, gas and coal sources (% of total)				
Electricity production from renewable sources, excluding hydroelectric (% of total)				
		Electricity production from nuclear sources (% of total)		

Table 2 Country ranking in the climate change aspect of promoting global justice

Country	2010	2011	2012	2013	2014
Sweden	2	2	2	2	1
Brazil	3	3	3	3	2
Gabon	8	9	5	4	3
Finland	15	12	8	7	4
Paraguay	5	7	6	5	5
Costa Rica	6	8	7	8	6
Congo	9	6	9	9	7
Democratic Republic of the Congo	7	4	10	10	8
Cambodia	29	26	15	11	9
Cameroon	11	10	11	12	10
United Republic of Tanzania	10	14	16	16	11
Nepal	12	13	13	14	12
Myanmar	4	5	4	6	13
France	20	17	17	17	14
Slovenia	26	24	24	23	15
Mozambique	16	11	12	13	16
Suriname	18	19	20	18	17
Switzerland	22	21	21	21	18
Guatemala	13	16	14	15	19
Ghana	17	18	19	20	20
Angola	14	15	18	19	21
Estonia	24	22	22	24	22
Colombia	23	20	23	26	23
Slovakia	34	32	31	29	24
Montenegro	21	27	25	22	25
Kenya	31	29	32	35	26
Austria	41	40	34	33	27
Albania	30	28	26	27	28
Peru	19	23	27	28	29
Latvia	40	39	28	31	30
Panama	32	35	30	32	31
Ethiopia	48	33	35	36	32
Honduras	27	25	29	30	33
Nicaragua	42	46	38	34	34
Sri Lanka	25	30	37	25	35
Norway	50	38	36	44	36
Spain	46	48	44	37	37
Uruguay	38	51	60	47	38
New Zealand	37	36	41	41	39
Cote d'Ivoire	35	34	40	45	40
Portugal	47	50	52	43	41
Georgia	28	41	45	39	42

Table 2 (continued)

Country	2010	2011	2012	2013	2014
Romania	53	58	57	48	43
Croatia	59	64	59	53	44
Hungary	60	60	55	52	45
Tajikistan	36	37	42	40	46
Indonesia	45	44	47	46	47
Senegal	44	43	43	50	48
Ecuador	49	47	46	55	49
El Salvador	39	45	48	49	50
Bulgaria	58	62	53	51	51
Namibia	54	52	50	56	52
Canada	64	61	54	58	53
Togo	77	53	51	57	54
Lithuania	76	71	69	61	55
Czechia	69	68	64	63	56
Philippines	56	55	56	59	57
Republic of Korea	62	59	62	66	58
Belgium	72	63	63	62	59
Bolivia (Plurinational State of)	52	54	58	60	60
Nigeria	55	56	61	64	61
Russian Federation	65	65	65	65	62
Germany	63	66	66	68	63
Italy	82	81	73	69	64
Denmark	86	80	71	74	65
Benin	66	67	67	67	66
Bosnia and Herzegovina	73	85	81	76	67
Chile	75	73	70	71	68
Japan	43	57	68	70	69
Republic of North Macedonia	68	75	79	73	70
Dominican Republic	78	76	74	75	71
India	70	70	72	72	72
United States of America	85	82	76	77	73
Malaysia	80	79	77	82	74
Pakistan	79	77	78	78	75
Serbia	87	91	86	88	76
Greece	90	92	90	83	77
Mexico	83	84	83	84	78
Kyrgyzstan	74	74	82	79	79
Armenia	61	72	80	80	80
Niger	81	83	84	85	81
United Kingdom of Great Britain and Northern Ireland	99	94	92	86	82
Haiti	71	78	75	81	83

Table 2 (continued)

Country	2010	2011	2012	2013	2014
Ukraine	96	89	91	89	84
Thailand	88	86	85	87	85
Jamaica	91	90	87	90	86
China	94	95	93	92	87
Mauritius	84	88	89	91	88
Poland	98	98	96	96	89
Bangladesh	92	93	95	95	90
Botswana	89	87	88	93	91
Turkey	93	96	94	94	92
Argentina	97	97	97	97	93
Ireland	103	102	100	100	94
Morocco	95	99	98	98	95
Belarus	100	100	99	99	96
Iceland	101	101	101	101	97
Cyprus	111	112	105	103	98
Australia	108	108	108	107	99
Netherlands	107	106	102	108	100
Brunei Darussalam		114	110	102	101
Tunisia	104	104	103	106	102
Iraq	106	107	107	109	103
Singapore	112	110	104	110	104
Republic of Moldova	110	109	111	104	105
Azerbaijan	102	103	109	111	106
Lebanon	105	105	106	105	107
Israel	115	116	116	114	108
South Africa	113	111	112	112	109
Egypt	109	113	113	113	110
Mongolia	117	118	115	116	111
Jordan	116	117	117	118	112
Luxembourg	126	127	124	121	113
Algeria	118	119	118	120	114
Iran (Islamic Republic of)	119	120	119	119	115
Kazakhstan	122	123	122	123	116
Libya	121	122	121	122	117
Malta	123	124	123	124	118
United Arab Emirates		126	126	126	119
Saudi Arabia	124	125	125	125	120
Oman	125	128		127	121
Kuwait		129	127	128	122
Bahrain		130			123
Trinidad and Tobago	127	131	128	129	124
Qatar				130	125

Table 2 (continued)

Country	2010	2011	2012	2013	2014
Eritrea	67	69			
Uzbekistan	120	121	120	117	
Venezuela (Bolivarian Republic of)	57	49	49	54	
Viet Nam	51	42	39	42	
Yemen	114	115	114	115	
Zambia	1	1	1	1	
Zimbabwe	33	31	33	38	

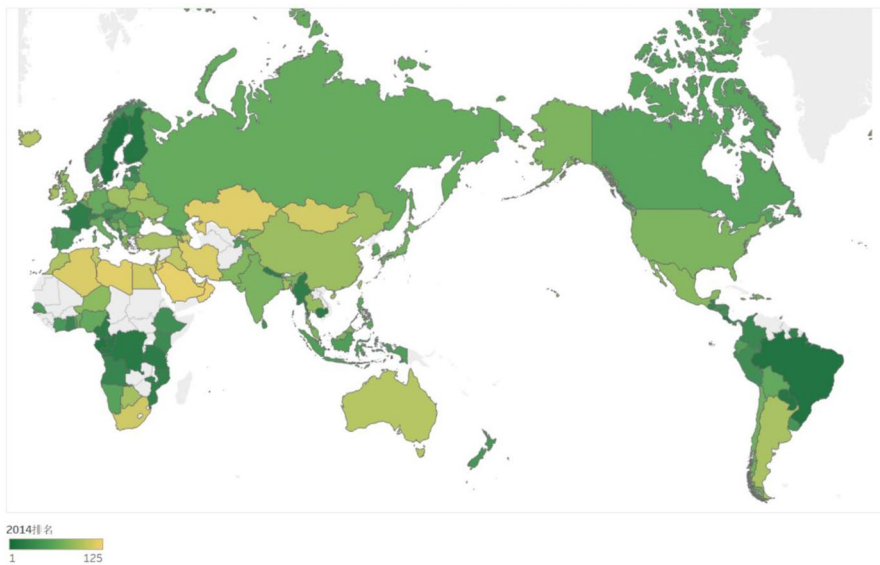


Fig. 1 2014 index ranking of climate change on a world map

3.2 Issue 2: Peacekeeping

Similar to climate change, peacekeeping has no single actor that can be held directly accountable or responsible. UN peacekeeping is an attempt, after peace has been negotiated or imposed by internal and external players, to address the causes of current hostility and to build local capacity for conflict resolution. A global effort is required to maintain international peace and security. All countries—big and small, developed and developing—can participate and make contributions.

Table 3 Data on peacekeeping

Category	Dimension	Indicator	Data source	Coverage
Contribution	Personnel contribution	Troops and police	UN Peacekeeping Website International Peace Institute	129 (2010–2017)
	Financial contribution	Donation	UN Peacekeeping Website International Peace Institute	120 (2010–2017)

3.3 Dimensions and Indicators

To measure a country's effort to promote global justice by contributing to UN peacekeeping, our dimensions include personnel contribution and financial contribution (Table 2). The personnel contribution dimension is measured by the troops and police contribution indicator. The financial contribution dimension is measured by the financial donation contribution. Our data source is the United Nations peacekeeping official website and International Peace Institute. Approximately 120 countries are studied in this research. The time span for our study is from 2010 to 2017 (Table 3).

3.3.1 Results

In this section, we present the ranking result of countries' contributions to global justice from the peacekeeping perspective (Table 4).

Table 4 shows countries' ranking in UN peacekeeping from 2010 to 2017. In general, Bangladesh, Ethiopia, India, Nepal, Pakistan, Rwanda, the United States, and China have made tremendous contributions to UN peacekeeping; among these countries, China and the United States are UN security council members. Although India is not a UN security council member, it is a regional and rising power. Bangladesh is a small country, but is a top five country in its contributions to UN peacekeeping. Based on these data, countries' willingness is more important than capacity in terms of determining how much contribution one country attempts to make toward peacekeeping (Fig. 2).

In 2017, the top five countries are the United States, Ethiopia, India, Bangladesh, and Pakistan. The United States provided most funding to UN peacekeeping, and Ethiopia provided most troops and police for UN peacekeeping activities. Most of the developed countries are among the top 100, and some developing countries, especially those in Africa, did not contribute much.

3.4 Issue 3: Humanitarian Aid

Humanitarian aid is short-term assistance, including material and logistic assistance, delivered to individuals in need. Usually, humanitarian aid is provided in response to natural disasters and emergencies. In these cases, providing help to save lives, reduce

Table 4 Country ranking in the peacekeeping aspect of promoting global justice

Country	2010	2011	2012	2013	2014	2015	2016	2017
United States of America	1	1	1	1	1	1	1	1
Ethiopia	19	15	5	5	5	3	2	2
India	4	4	4	4	3	5	3	3
Bangladesh	3	2	2	2	2	2	5	4
Pakistan	2	3	3	3	4	4	4	5
China	11	12	7	9	8	7	6	6
Rwanda	13	13	8	7	6	6	7	7
Nepal	9	9	11	8	7	8	8	8
Senegal	20	21	19	16	13	11	9	9
Egypt	6	7	10	14	15	20	14	10
Japan	7	6	9	10	10	9	10	11
France	8	8	12	12	11	10	13	12
Indonesia	23	23	23	23	26	15	15	13
Ghana	14	17	14	13	12	12	11	14
Germany	16	16	16	17	17	16	19	15
Burkina Faso	34	30	32	27	22	19	12	16
United Kingdom of Great Britain and Northern Ireland	15	14	17	18	18	17	20	17
United Republic of Tanzania	32	27	26	21	19	22	18	18
Italy	10	11	15	15	14	14	17	19
Morocco	24	24	24	24	21	21	22	20
Nigeria	5	5	6	6	9	13	16	21
Spain	18	18	22	25	28	27	28	22
Chad	89	89	88	40	33	34	26	23
Togo	38	41	40	28	27	25	23	24
South Africa	22	22	21	20	20	23	24	25
Russian Federation	28	32	29	32	34	35	30	26
Republic of Korea	25	25	25	29	30	31	31	27
Uruguay	17	20	20	19	24	29	27	28
Niger	45	38	30	26	25	24	21	29
Brazil	21	19	18	22	23	28	25	30
Cameroon	76	76	72	80	29	18	32	31
Zambia	37	45	63	70	75	50	39	32
Mauritania	157	158	138	136	93	74	40	33
Mongolia	50	80	45	35	36	39	38	34
Canada	26	26	28	33	79	86	36	35
Benin	27	33	34	30	31	30	29	36
Malawi	68	42	35	41	40	40	37	37
Guinea	86	87	90	73	67	46	42	38
Jordan	12	10	13	11	16	26	33	39
Malaysia	30	29	27	34	37	41	43	40
Burundi	88	79	77	69	47	32	35	41
Cambodia	80	61	57	52	43	42	44	42

Table 4 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Netherlands	39	40	42	46	35	33	41	43
Australia	36	35	39	39	42	44	46	44
Fiji	60	59	58	48	41	45	47	45
Ireland	52	48	43	45	49	52	52	46
Sweden	46	49	52	54	53	47	48	47
Uganda	66	88	94	93	96	100	49	48
Sri Lanka	29	28	31	31	32	43	51	49
Argentina	33	31	33	36	38	48	55	50
Congo	145	153	153	156	58	38	45	51
Gabon	143	142	144	143	69	53	56	52
Ukraine	53	56	46	43	44	49	50	53
Finland	59	62	59	51	46	51	54	54
Austria	40	39	38	42	50	54	57	55
Switzerland	47	50	54	55	55	57	60	56
Gambia	51	52	50	53	54	61	61	57
Norway	49	55	56	57	56	56	59	58
Portugal	44	47	53	71	73	71	77	59
Serbia	94	91	82	72	66	60	62	60
Saudi Arabia	64	65	68	68	74	73	66	61
Peru	54	54	49	50	51	62	58	62
Belgium	41	44	47	49	52	59	63	63
Denmark	48	51	62	62	63	63	67	64
Tunisia	58	95	92	67	76	69	65	65
Kenya	35	36	37	37	39	36	34	66
Chile	43	43	44	47	48	55	53	67
El Salvador	79	82	83	79	83	72	69	68
Slovakia	62	64	66	64	68	67	71	69
Guatemala	57	57	60	58	59	64	68	70
Greece	56	58	61	59	64	65	72	71
Turkey	42	46	41	44	60	66	70	72
United Arab Emirates	71	70	67	66	71	70	74	73
Djibouti	98	96	95	74	72	75	75	74
Cote d'Ivoire	69	68	69	60	62	76	124	75
Israel	67	69	71	76	78	78	78	76
Singapore	70	71	73	78	82	84	79	77
Paraguay	83	66	65	63	70	77	76	78
Yemen	63	60	55	56	61	58	64	79
Mexico	65	67	75	77	81	81	83	80
Hungary	73	73	74	75	77	79	81	81
Czechia	90	84	76	81	84	85	82	82
Romania	78	81	80	83	86	82	80	83
Sierra Leone	61	53	51	65	80	89	88	84

Table 4 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Zimbabwe	75	75	85	82	89	92	85	85
Philippines	31	34	36	38	45	68	73	86
New Zealand	74	74	79	85	87	90	86	87
Poland	77	78	78	84	85	87	87	88
Kuwait	84	83	84	88	91	93	89	89
Qatar	93	93	87	90	94	94	91	90
Liberia	157	158	155	103	97	97	95	91
Estonia	111	108	108	108	110	98	94	92
Mali	81	77	81	87	90	88	90	93
Bolivia (Plurinational State of)	55	63	64	61	65	83	107	94
Colombia	95	99	98	97	101	107	96	95
Namibia	87	86	89	94	88	91	92	96
Slovenia	92	90	91	95	98	96	98	97
Bosnia and Herzegovina	101	100	96	92	95	99	99	98
Thailand	82	37	48	96	99	80	97	99
Bhutan	158	159	162	163	149	112	103	100
Brunei Darussalam	105	97	99	99	105	102	102	101
Honduras	115	113	112	113	100	95	93	102
Armenia	151	150	140	142	125	103	101	103
Venezuela (Bolivarian Republic of)	102	104	97	98	103	101	104	104
Oman	114	112	100	100	106	106	106	105
Iran (Islamic Republic of)	106	106	103	104	109	110	105	106
Madagascar	91	92	93	89	102	108	100	107
Croatia	72	72	70	91	104	104	108	108
Kyrgyzstan	104	107	105	101	107	111	110	109
Luxembourg	96	98	102	102	108	109	109	110
Samoa	112	117	110	112	112	116	113	111
Kazakhstan	118	120	116	121	124	115	111	112
Cyprus	107	105	106	107	111	113	112	113
Algeria	116	110	111	110	114	118	115	114
Dominican Republic	129	127	132	130	131	136	132	115
Lithuania	119	116	119	117	116	121	120	116
Cuba	125	124	128	127	133	131	131	117
Bahrain	113	111	113	114	118	119	116	118
Ecuador	85	85	86	86	92	105	114	119
Libya	99	101	109	111	115	114	117	120
Viet Nam	132	133	133	133	136	127	121	121
Belarus	129	125	120	116	122	124	122	122
Latvia	126	126	127	126	132	130	126	123
Republic of Moldova	121	118	118	115	119	120	118	124
Democratic Republic of the Congo	109	102	104	109	57	37	84	125
Bulgaria	124	122	121	122	126	126	127	126

Table 4 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Iraq	139	138	129	128	134	132	123	127
Iceland	108	109	115	118	121	123	125	128
Montenegro	128	123	122	123	127	133	129	129
Costa Rica	131	132	136	135	141	140	137	130
Malta	122	119	124	124	129	128	128	131
Solomon Islands	157	158	161	163	166	164	141	132
Central African Republic	100	94	101	106	117	135	163	133
Trinidad and Tobago	120	115	117	119	123	125	130	134
Bahamas	123	121	125	125	130	129	131	135
Azerbaijan	144	141	134	134	140	138	134	136
Papua New Guinea	154	151	143	138	150	143	129	137
Monaco	144	141	130	129	135	134	136	138
Lebanon	132	133	133	133	138	137	138	139
Georgia	150	149	151	154	157	154	135	140
Panama	138	137	139	140	146	147	139	141
Andorra	130	131	134	134	140	138	140	142
Myanmar	153	153	153	156	159	146	133	143
Turkmenistan	134	134	145	144	151	149	143	144
Syrian Arab Republic	136	135	137	137	144	142	144	145
Uzbekistan	148	147	147	147	154	153	145	146
Republic of North Macedonia	140	139	141	141	148	148	146	147
Guinea-Bissau	127	129	161	151	147	151	147	148
San Marino	144	141	147	147	154	153	149	149
Barbados	137	136	146	146	153	152	150	150
Botswana	141	140	123	145	152	150	150	150
Jamaica	103	103	107	120	113	117	142	151
Mauritius	146	146	148	149	156	155	151	152
Albania	97	130	150	152	142	141	153	153
Suriname	153	153	154	157	160	158	154	154
Cabo Verde	156	157	160	162	163	161	162	155
Mozambique	135	144	142	150	155	162	148	156
Angola	151	150	153	156	159	157	155	157
Democratic People's Republic of Korea	149	148	152	155	158	156	155	157
Equatorial Guinea	152	152	153	156	159	157	155	157
Sudan	151	150	153	156	159	157	155	157
Timor-Leste	157	154	126	139	137	139	152	158
Nicaragua	153	153	156	158	161	159	156	159
Tajikistan	117	114	114	105	120	159	156	159
Afghanistan	154	155	157	159	162	160	158	160
Antigua and Barbuda	152	152	154	157	160	158	158	160
Vanuatu	110	158	161	148	128	122	119	161
Eswatini	153	153	156	158	161	159	160	162

Table 4 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Guyana	156	157	160	162	165	163	160	162
Maldives	157	158	160	162	165	163	160	162
Haiti	155	156	159	161	164	162	161	163
Lao People's Democratic Republic	157	158	160	162	165	163	161	163
Saint Kitts and Nevis	156	157	159	161	163	161	161	163
South Sudan	158	159	158	160	163	161	161	163
Belize	156	157	160	162	165	163	162	164
Dominica	156	157	160	162	165	163	162	164
Grenada	133	128	149	153	145	144	159	164
Marshall Islands	156	157	160	162	165	163	162	164
Micronesia (Federated States of)	156	157	160	162	165	163	162	164
Nauru	156	157	160	162	165	163	162	164
Palau	142	143	135	132	143	163	162	164
Saint Lucia	156	157	160	162	165	163	162	164
Saint Vincent and the Grenadines	156	157	160	162	165	163	162	164
Seychelles	152	152	159	161	164	162	162	164
Tonga	156	157	160	162	165	163	162	164
Comoros	157	158	161	163	166	164	163	165
Eritrea	157	158	161	163	166	164	163	165
Kiribati	157	158	161	163	166	164	163	165
Lesotho	147	145	131	131	139	145	157	165
Sao Tome and Principe	157	158	161	163	166	164	163	165
Somalia	157	158	161	163	166	164	163	165
Tuvalu	157	158	161	163	166	164	163	165

suffering, and maintain human dignity is a vital aspect of the global justice agenda. As a result, we include this humanitarian aid in our global justice index and measure each country's efforts to provide humanitarian aid by evaluating their financial contribution to global humanitarian affairs.

3.4.1 Indicators

We use ten indicators to measure each country's efforts toward humanitarian aid. These ten indicators are food, health, water, emergency response, early recovery, coordination, education, protection, agriculture, and others, and indicate the sectors that receive the humanitarian donation of each country. The last indicator, "others," denotes the part of the donation without a designated use. We count the humanitarian donation from each country to UN departments, nongovernmental organizations, and other relevant organizations such as the World Food Program, the World Health

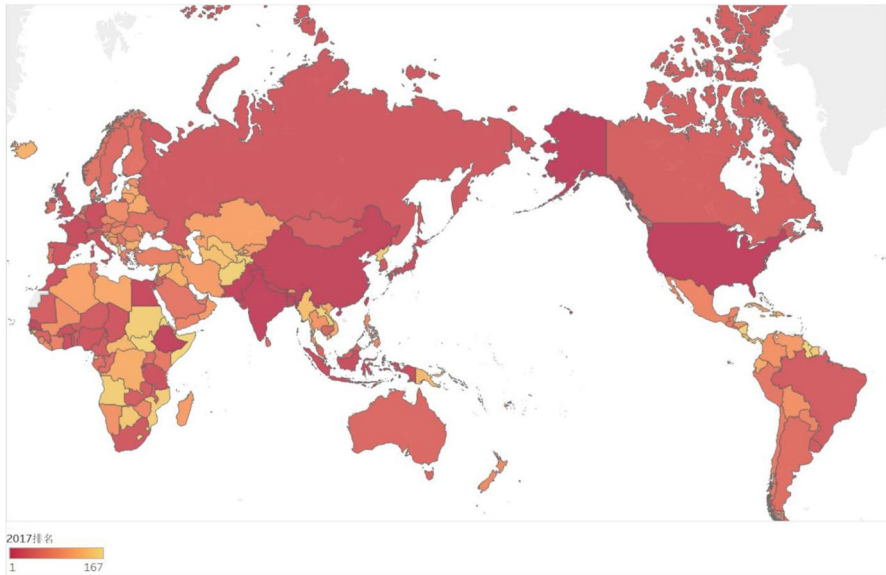


Fig. 2 2017 index ranking of peacekeeping on a world map

Table 5 Data on humanitarian aid

Issue area	Indicator	Source	Coverage
Humanitarian aid	Food	Financial Tracking Service	181 (2010–2017)
	Health		
	Water		
	Emergency Response		
	Early Recovery		
	Coordination		
	Education		
	Protection		
	Agriculture		
	Other		

Organization (WHO), and the International Federation of Red Cross and Red Crescent Societies. Data are obtained from the Financial Tracking Service database, managed by the UN Office for the Coordination of Humanitarian Affairs. It “aims to present a complete picture of all international humanitarian funding flows”, such that it “supports the transparency and accountability of the humanitarian system and facilitates resource mobilization”¹ (Table 5).

¹ Please check <https://fts.unocha.org/content/about-fts-1> for more information about FTS.

3.4.2 Results

Data of the past 10 years show that the US has always been the nation who contributes the most. The traditional liberal democracies, such as Britain, Germany, Canada, The Netherlands, France, and Australia, have a dominantly high proportion of being one of the top 20 contributors. Kuwait and Saudi Arabia, high-income economies with the world's largest oil reserves, have been in the top 20 contributors as well. China is the nation who contributes the most in Asia and ranks 16 in 2017, followed by Japan, Russia, and India, who have been among the top 50 contributors in the past 10 years. African and Central Asian countries with poor economies rank relatively low (Table 6).

This regional difference is more obvious on a map. Figure 3 presents a map of the humanitarian assistance contribution from each country in 2017. A darker color denotes a higher rank. On the map, the countries in East Europe, North America, and Australia are covered with a darker color and contributed the most, and countries in Africa, Central Asia, and Southeast Asia are covered with a relatively lighter color.

3.5 Issue 4: Terrorism and Armed Conflicts

Terrorism and armed conflicts are major challenges to global justice. The efforts by global partners to combat terrorist violence and conflict threats are a significant aspect of the global justice agenda. Global justice can improve if nation states increase their efforts to manage cross-national conflicts and domestic terrorist threats. In the past decade, the number of violent conflicts and terrorist attacks worldwide has increased. Thus, the international community and individual countries have a duty to prioritize conflict management and terrorism governance on their agenda and act to resolve the problems identified.

3.5.1 Dimensions and Indicators

Using data from highly respected sources, our project measures each country's influence on global justice in the issue area of terrorism and armed conflicts by focusing on two categories: performance and contribution. Performance refers to the extent to which a country is involved in armed conflicts and terrorism attacks. This category is measured using five thematic indicators: (1) number of conflicts, (2) number of wars, (3) number of conflict deaths, (4) number of terrorism events, and (5) number of deaths from terrorism events. By contribution, it means how much a country has done to reduce armed violence and to improve global peace. This category is measured on the basis of two thematic indicators: (1) number of agreements and (2) achievements of agreements.

Data on armed conflicts are collected and recoded from the UCDP Armed Conflict Dataset and UCDP Battle-related Deaths Dataset. Data on peace agreements are based on the UCDP Peace-agreement Dataset. Data on terrorism are from the Global Terrorism Database (GTD). Because these data sources are widely used and respected, we adopt the concepts of "conflict" and "terrorism" defined in the datasets. Admittedly,

Table 6 Country ranking in the humanitarian aspect of promoting global justice

Country	2010	2011	2012	2013	2014	2015	2016	2017
America	1	1	1	1	1	1	1	1
United Kingdom	2	2	2	2	2	2	3	3
Netherlands	7	6	6	8	7	5	6	8
Germany	5	3	3	4	3	4	2	2
Italy	12	14	18	16	11	12	11	7
Canada	6	5	4	5	5	6	5	5
Saudi Arabia	14	15	8	11	6	8	8	9
Kuwait	22	20	20	3	4	3	4	4
Spain	4	4	13	13	16	15	19	17
Ireland	16	16	15	14	15	16	15	15
France	9	9	10	15	8	10	7	6
Finland	15	13	12	10	10	13	13	14
Belgium	10	8	7	6	14	7	9	12
Afghanistan	36	85	82	68	89	75	82	73
Australia	8	10	11	9	12	14	14	13
Switzerland	13	11	9	7	9	9	12	10
Sweden	17	17	17	17	18	17	18	19
Norway	21	23	19	18	22	21	17	23
Denmark	23	25	24	19	20	19	20	21
New Zealand	32	24	27	26	27	26	26	24
Nepal	31	22	94	79	89	25	82	73
Greece	44	32	46	38	40	67	37	47
Luxembourg	27	29	22	21	24	23	23	26
United Arab Emirates	24	19	29	22	19	11	10	18
Turkey	11	12	23	24	25	28	29	22
Austria	26	28	26	23	28	24	21	20
Venezuela	105	36	94	79	17	84	82	73
China	20	18	21	29	23	22	24	16
Tajikistan	39	31	60	79	89	84	82	73
Azerbaijan	19	27	25	33	31	20	82	36
Thailand	47	72	84	60	55	35	73	53
Slovakia	49	105	43	41	60	45	33	35
Brazil	18	21	14	31	26	27	30	31
Romania	66	53	42	39	50	38	45	52
Estonia	42	37	35	28	32	30	25	27
Singapore	85	75	72	62	61	60	62	55
Poland	43	34	31	30	39	34	28	25
Japan	33	33	30	27	35	31	27	32
India	30	30	39	36	36	36	48	50
Belarus	34	40	33	32	42	33	32	38
Russian Federation	51	43	36	34	44	42	43	42
Bulgaria	62	55	41	37	56	43	38	39

Table 6 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Portugal	45	57	45	40	38	39	47	51
Kenya	57	48	40	48	89	84	82	66
Slovenia	53	41	56	44	59	46	44	41
Malaysia	61	69	70	79	48	49	65	45
Lithuania	55	58	59	50	52	37	34	44
Kyrgyzstan	67	54	94	79	89	84	82	73
Latvia	81	52	54	45	47	48	57	73
Morocco	41	88	44	65	37	41	82	73
South Africa	68	50	47	49	49	51	54	46
Brunei Darussalam	99	73	63	79	53	84	82	73
Israel	98	78	69	79	43	84	82	73
Kazakhstan	59	56	76	61	64	54	61	64
Iraq	103	68	94	58	89	74	82	73
Czechia	73	62	50	43	57	44	48	49
Samoa	130	63	94	79	89	84	82	73
Monaco	79	67	64	54	63	55	58	73
Argentina	88	66	51	46	58	84	51	33
Malawi	130	105	37	79	89	40	82	73
Mozambique	112	105	52	69	89	84	82	73
Qatar	83	45	28	25	29	29	31	30
Malta	69	39	62	52	51	53	40	40
Tonga	130	60	94	79	89	84	82	73
Uzbekistan	89	71	94	79	89	84	82	73
Botswana	80	70	66	79	71	84	69	57
Philippines	97	44	34	35	45	71	60	29
Namibia	123	47	94	73	54	84	82	73
Ecuador	130	80	94	79	33	84	68	73
Cyprus	70	51	53	57	70	61	72	57
Sri Lanka	118	96	48	70	68	84	82	65
Andorra	72	65	65	53	65	63	66	59
Burkina Faso	102	105	94	79	89	84	82	73
Peru	60	105	79	59	77	71	77	61
Mauritius	86	105	81	79	83	58	82	73
Ghana	25	105	61	79	89	84	82	73
Republic of Korea	105	82	73	63	69	65	67	60
Montenegro	91	42	68	55	66	84	75	73
Croatia	77	61	57	51	62	68	70	73
Tunisia	37	105	94	79	89	84	82	73
Egypt	46	79	74	79	89	84	39	73
San Marino	92	76	77	79	78	76	82	68
Senegal	93	105	94	79	89	84	82	73
Mexico	50	64	55	56	46	64	42	56

Table 6 (continued)

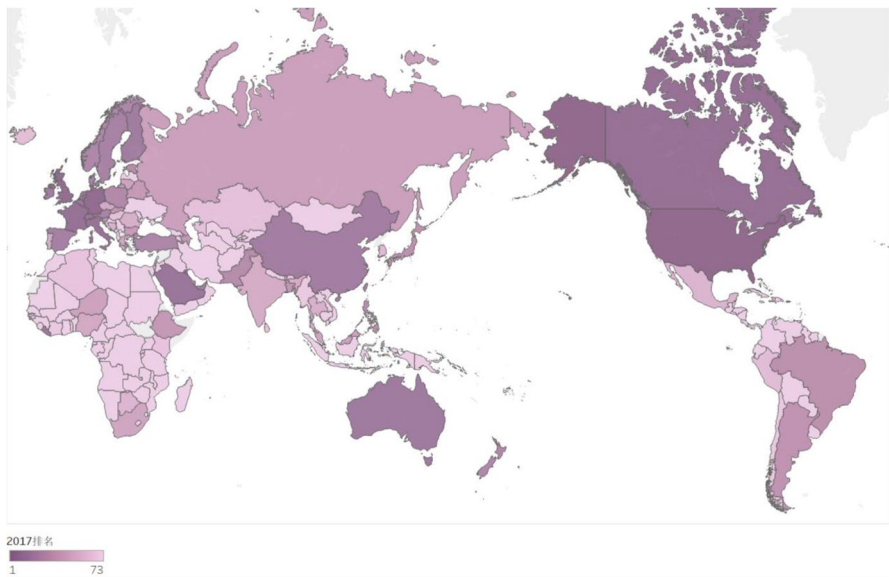
Country	2010	2011	2012	2013	2014	2015	2016	2017
Guatemala	130	105	94	79	89	84	82	73
Bosnia and Herzegovina	74	105	94	79	89	84	82	54
Hungary	110	90	78	64	75	69	64	63
Iceland	122	92	88	67	80	70	76	62
Pakistan	111	49	32	66	30	18	22	28
Nicaragua	130	94	94	79	89	84	82	73
Gabon	109	105	94	79	89	84	82	73
Trinidad and Tobago	76	105	94	79	80	62	82	73
Cambodia	124	105	94	79	89	84	82	73
Antigua and Barbuda	94	105	94	79	89	59	82	73
Bangladesh	56	87	75	79	89	50	79	34
United Republic of Tanzania	130	105	85	79	89	84	82	73
Algeria	52	38	94	42	83	84	59	66
Indonesia	116	95	86	71	83	84	82	73
Bhutan	125	97	90	79	89	52	82	69
Albania	130	100	82	79	89	84	82	73
Chile	126	97	91	75	82	76	80	69
Guyana	90	88	94	77	79	84	82	73
Laos	130	101	94	79	89	84	82	73
Mongolia	126	86	94	79	89	84	82	73
Viet Nam	126	101	94	79	89	84	82	73
Angola	130	46	94	79	89	84	82	73
Armenia	121	105	87	79	83	84	82	73
Bahamas	107	105	94	79	89	84	82	73
Bahrain	29	105	94	20	21	56	82	73
Barbados	130	105	94	79	89	84	82	73
Belize	130	105	94	79	89	84	82	73
Benin	107	105	94	79	89	84	82	73
Bolivia	130	105	94	79	34	84	82	73
Burundi	101	105	94	79	89	84	82	73
Cameroon	130	105	94	79	89	73	82	73
Central African Republic	100	105	94	79	41	84	63	73
Chad	96	92	94	79	89	47	82	73
Colombia	95	105	91	72	87	80	82	73
Comoros	130	105	94	79	89	84	82	73
Congo	87	74	94	79	89	84	82	73
Costa Rica	130	105	94	79	89	84	82	73
Cuba	40	105	38	79	89	84	82	73
Côte d'Ivoire	130	101	71	79	89	80	82	69
Democratic Republic of the Congo	65	83	67	79	74	84	52	73
Dominica	130	105	94	79	89	84	56	73
Dominican Republic	130	105	94	79	89	84	82	73

Table 6 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
El Salvador	130	105	94	79	89	84	82	73
Equatorial Guinea	113	105	94	79	89	84	82	73
Ethiopia	130	26	94	79	89	84	35	37
Fiji	130	105	94	79	89	84	82	73
Gambia	63	105	94	79	89	84	82	73
Georgia	64	59	94	47	67	57	50	73
Grenada	84	105	94	79	89	84	82	73
Guinea	130	105	94	79	89	84	82	73
Guinea-Bissau	130	105	94	79	89	84	82	73
Haiti	130	105	94	79	89	84	82	73
Honduras	130	105	94	79	89	84	82	73
Iran	117	105	94	79	89	78	82	73
Jamaica	130	105	94	79	89	84	82	73
Jordan	130	105	94	79	89	32	82	73
Lebanon	130	105	94	79	89	84	82	73
Lesotho	130	105	94	79	89	84	36	73
Liberia	35	105	94	79	89	84	82	11
Libya	130	105	94	79	89	84	82	73
Madagascar	114	105	94	79	89	84	41	73
Maldives	130	81	94	79	89	84	82	73
Mali	130	105	94	79	76	84	82	73
Marshall Islands	130	105	94	79	89	84	82	73
Mauritania	130	105	94	79	89	84	82	73
Micronesia	130	105	94	79	89	84	82	73
Myanmar	126	91	91	77	88	80	80	69
Nauru	130	105	94	79	89	84	53	73
Niger	130	105	94	79	89	84	55	43
Nigeria	78	84	94	79	72	66	78	48
Oman	28	105	16	12	13	84	82	73
Palau	130	105	94	79	89	84	82	73
Panama	103	105	94	79	89	84	82	73
Papua New Guinea	130	105	94	79	89	84	46	73
Paraguay	130	105	94	79	89	84	82	73
Republic of Moldova	71	77	80	79	89	84	82	73
Rwanda	130	105	94	79	89	84	82	73
Sao Tome and Principe	130	105	94	79	89	84	82	73
Serbia	114	101	94	75	89	80	71	73
Seychelles	130	105	94	79	89	84	82	73
Sierra Leone	119	105	94	79	89	84	74	73
Solomon Islands	130	105	94	79	89	84	82	73
Saint Kitts and Nevis	130	105	94	79	89	84	82	73
Saint Lucia	75	97	94	79	89	84	82	73

Table 6 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Saint Vincent and the Grenadines	82	105	94	79	89	84	82	73
Sudan	3	7	94	79	89	84	82	73
Suriname	54	105	94	79	89	84	82	73
Timor-Leste	38	35	94	79	89	84	82	73
Togo	130	105	94	79	89	84	82	73
Turkmenistan	48	105	94	79	89	84	82	73
Tuvalu	130	105	94	79	89	84	82	73
Uganda	120	105	94	79	89	84	82	73
Ukraine	58	105	58	79	89	84	82	73
Uruguay	130	105	88	73	72	79	82	73
Yemen	130	105	94	79	89	84	82	73
Zambia	130	105	49	79	89	84	82	73
Zimbabwe	130	105	5	79	89	84	16	73

**Fig. 3** 2017 index ranking of humanitarian aid on a world map

the current methods of measurement and index construction in this issue area are imperfect; for example, several countries experienced sharp ups and downs in certain years, which call for a closer assessment of the methodological process. Based on the starting point of this project, we are open to insights and suggestions from all sides to further improve our ongoing research (Table 7).

All the indicators are calculated in an accumulated count. For example, an observation in the UCDP Armed Conflict Dataset indicates that there was a conflict between

Table 7 Data on terrorism and armed conflicts

Category	Dimension	Indicator	Data source	Coverage
Performance	Terrorism and conflicts	Number of conflicts	UCDP Armed Conflict Dataset; UCDP Battle-related Deaths Dataset	192 (2010–2017)
		Number of wars		
		Number of conflict deaths		
		Number of terrorism events		
Contribution	Conflict agreement	Number of deaths from terrorism events	GTD	
		Number of agreements		
		Achievements of agreements		

Table 8 Variable code

Indicator	Value	Meaning
mil_prov	0–1	Whether a military agreement is reached
pol_prov	0–1	Whether a political agreement is reached
terr_prov	0–1	Whether an agreement on the territory is reached
justice_prov	0–1	Whether a judicial agreement is reached
outlin	0–1	Whether a negotiation agenda is set
pko	0–1	Whether the agreement specify peace keeping measures
pa_type	1, 2, 3	Agreement quality: 1 = all, 2 = partial, 3 = preliminary

Afghanistan, Pakistan, and the United States in 2016 that reached the scale of the war (more than 1000 deaths). According to UCDP Battle-related Deaths Dataset, the estimate of the number of deaths caused by this conflict in 2016 was 2141. Thus, for these three countries, the number of conflicts and the number of wars all increased by 1 in 2016, and the total number of deaths involved in the conflict (number of conflict deaths) increased by 2141 in 2016.

The indicator of agreements is measured according to the specific content of an agreement. More specifically, the UCDP Peace-agreement Dataset includes a series of variables that define the characteristics of an agreement (Table 8). Because countries with different population sizes experience different levels of governance challenges in managing conflicts and terrorism, the following indicators are weighted by population size in the corresponding year: (1) number of conflicts, (2) number of wars, (3) number of conflict deaths, (4) number of terrorism events, and (5) number of deaths from terrorism events.

The function to measure “achievements of agreements” is as follows:

$$\begin{aligned}
 \text{Achievements of agreements} = & \text{mil_prov} + \text{pol_prov} \\
 & + \text{terr_prov} + \text{justice_prov} \\
 & + \text{outlin} + \text{pko} \\
 & + (3 - \text{pa_type})/2.
 \end{aligned}$$

3.5.2 Results

Using index construction methods (see the methodological section), this sub-index ranks 192 countries from 2010 to 2017 according to their level of performance of and contribution to global justice (Table 9).

The results demonstrate that the problems of conflicts, tensions, and terrorist threats remain alarming from 2010 to 2017, creating a substantial challenge to global justice. According to the rank in 2017, China becomes the number one country and has the best performance best in controlling conflicts and terrorism and participating in peace agreements. China is followed by Japan, Brazil, Vietnam, the Republic of Korea, Uzbekistan, and Poland. Countries in Europe and North America are ranked

Table 9 Country ranking in the terrorism and conflict aspect of promoting global justice

Country	2010	2011	2012	2013	2014	2015	2016	2017
China	5	2	6	6	11	5	1	1
Japan	7	4	8	7	6	12	4	2
Brazil	6	3	7	9	5	6	2	3
Viet Nam	9	5	9	8	4	4	3	4
South Korea	29	28	29	24	29	8	6	5
Uzbekistan	17	12	12	12	10	14	7	6
Poland	42	35	37	28	37	7	13	7
Madagascar	26	27	26	27	19	23	23	8
North Korea	23	18	16	14	14	13	10	9
Argentina	33	10	17	15	9	10	8	10
Indonesia	8	21	30	21	17	15	9	11
Kazakhstan	28	78	62	49	16	18	49	12
Morocco	15	42	11	11	8	17	17	13
Guatemala	32	30	44	70	21	21	18	14
Cote d'Ivoire	27	23	19	20	15	24	14	15
Tanzania	14	8	10	30	36	45	12	16
Italy	54	36	48	33	39	16	26	17
Malawi	34	29	28	23	18	20	15	18
Romania	72	63	63	58	62	29	21	19
Mexico	13	6	33	26	7	25	5	20
Ghana	22	17	36	22	31	31	29	21
Cuba	39	38	39	29	30	32	27	22
Bolivia	46	45	55	31	32	35	28	23
Haiti	47	46	41	32	33	36	55	24
Spain	40	31	35	38	41	9	11	25
Cambodia	35	37	31	45	27	39	24	26
Malaysia	52	51	60	76	72	37	70	27
Zambia	38	32	32	25	22	22	19	28
Senegal	62	94	108	68	57	51	25	29
Belarus	75	85	72	35	35	40	32	30
Netherlands	82	77	69	65	94	86	83	31
Bangladesh	36	22	22	90	78	121	67	32
Ecuador	31	39	38	40	20	30	33	33
Angola	41	19	15	13	13	11	16	34
Germany	10	25	13	10	24	83	64	35
Guinea	45	43	40	62	38	65	42	36
America	20	9	14	16	23	34	38	37
Benin	51	50	46	43	42	48	34	38
Bulgaria	104	108	117	109	102	71	54	39
Zimbabwe	56	49	34	54	34	27	22	40
Dominican	49	48	43	46	44	38	30	41
Peru	16	13	58	60	56	56	31	42

Table 9 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Portugal	91	97	84	84	86	49	36	43
Nicaragua	74	65	64	55	80	52	43	44
Rwanda	108	72	101	94	54	44	40	45
Hungary	96	90	88	87	92	46	46	46
Kyrgyzstan	77	66	66	61	51	55	45	47
Canada	58	40	53	47	66	53	44	48
Honduras	57	68	49	73	48	41	47	49
Russian	127	112	106	102	55	50	68	50
Turkmenistan	79	71	67	64	76	58	50	51
Algeria	143	79	107	105	63	68	37	52
Singapore	119	116	115	111	53	59	51	53
Ethiopia	19	15	27	19	12	33	80	54
Iran	85	47	21	41	25	72	57	55
Slovakia	114	111	114	110	109	60	52	56
Uganda	99	16	54	18	85	54	86	57
Switzerland	61	81	52	67	40	61	56	58
Serbia	78	58	83	48	45	47	41	59
Congo	83	75	73	89	61	63	143	60
Costa Rica	80	73	71	66	59	64	59	61
Togo	64	60	61	63	52	66	48	62
Tajikistan	84	55	96	52	60	95	61	63
New Zealand	124	122	119	115	118	67	73	64
Lao	68	62	70	51	47	76	87	65
Oman	97	88	79	75	64	69	62	66
United Arab Emirates	105	96	91	97	116	100	100	67
Australia	66	59	59	53	90	93	72	68
South Africa	11	7	23	37	50	19	63	69
Croatia	125	123	121	123	117	70	65	70
Austria	102	100	95	99	97	57	69	71
Panama	88	82	76	74	65	75	78	72
El Salvador	70	107	109	107	104	73	58	73
Kuwait	98	101	82	78	67	127	113	74
Czechia	92	92	85	95	100	80	53	75
Mozambique	24	20	24	100	87	62	129	76
Azerbaijan	100	93	93	93	101	43	60	77
Venezuela	18	14	18	17	28	26	39	78
Eritrea	1	131	80	79	69	78	79	79
Denmark	121	110	112	112	128	119	114	80
Moldova	89	84	94	77	70	79	85	81
Chile	71	67	42	59	83	28	88	82
Uruguay	93	87	81	81	73	81	90	83
India	87	74	68	71	68	77	76	84

Table 9 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
France	37	44	99	50	58	101	81	85
Tunisia	43	76	74	130	123	133	125	86
Mongolia	140	141	134	129	129	87	77	87
Georgia	152	143	135	127	127	91	109	88
Norway	123	157	116	114	114	84	66	89
Mauritania	109	115	78	86	77	92	75	90
Liberia	86	80	87	82	82	90	71	91
Namibia	107	102	103	101	89	97	89	92
Finland	115	113	113	113	111	115	91	93
Botswana	111	105	104	103	93	98	94	94
Papua New Guinea	63	57	56	44	43	42	35	95
Bosnia and Herzegovina	132	133	124	124	131	126	74	96
Albania	138	139	131	132	135	112	103	97
Lesotho	110	106	105	104	95	105	96	98
Sierra Leone	65	61	86	72	74	85	84	99
Slovenia	151	150	144	142	140	99	97	100
Belgium	90	86	89	85	110	96	119	101
Lithuania	135	137	130	126	130	88	92	102
Jamaica	101	95	90	91	91	89	82	103
Ukraine	48	41	57	39	2	3	104	104
Armenia	139	140	137	131	132	114	123	105
Republic of North Macedonia	150	148	150	141	146	123	95	106
Chad	55	34	47	57	71	156	93	107
Gambia	113	109	110	106	96	106	101	108
Trinidad and Tobago	136	124	120	138	106	118	112	109
Paraguay	94	99	97	120	121	132	124	110
Qatar	112	103	102	98	84	107	116	111
Sri Lanka	53	24	50	80	79	74	20	112
Mauritius	126	125	122	117	108	110	115	113
Equatorial Guinea	137	135	128	122	113	113	118	114
United Kingdom	103	89	92	118	105	104	106	115
Timor-Leste	130	128	123	119	112	111	117	116
Saudi Arabia	21	33	51	36	81	141	144	117
Cyprus	129	127	136	158	143	139	131	118
Sweden	106	98	98	96	103	131	110	119
Guinea-Bissau	122	117	125	116	107	116	111	120
Jordan	117	64	75	69	119	108	127	121
Eswatini	131	130	126	121	115	117	120	122
Burkina Faso	30	26	25	34	26	82	102	123
Latvia	148	149	145	143	142	109	99	124
Niger	76	54	45	88	75	162	133	125
Kenya	73	104	127	125	133	124	108	126

Table 9 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Thailand	153	145	147	155	145	134	142	127
Colombia	142	126	139	137	141	128	121	128
Turkey	67	91	138	92	99	147	163	129
Burundi	149	132	100	83	88	168	164	130
Fiji	141	142	133	128	122	122	126	131
Gabon	120	114	111	108	98	102	98	132
Sudan	4	134	1	3	151	142	145	133
Estonia	158	160	154	152	154	136	122	134
Myanmar	59	11	65	56	49	94	107	135
Comoros	146	147	142	134	126	129	128	136
Guyana	144	146	141	133	125	130	139	137
Democratic Republic of the Congo	95	69	4	4	120	125	132	138
Israel	128	161	159	145	174	150	153	139
Ireland	134	136	158	153	153	145	130	140
Greece	156	118	129	149	124	120	138	141
Solomon Islands	155	152	146	144	134	135	135	142
Montenegro	168	168	166	167	163	144	134	143
Lebanon	118	129	140	174	175	161	157	144
Luxembourg	172	172	169	166	164	137	136	145
Suriname	154	153	148	146	137	138	140	146
Egypt	12	53	77	140	136	157	147	147
Pakistan	159	163	164	165	160	155	148	148
Cabo Verde	157	155	149	148	139	140	141	149
Nigeria	81	119	151	147	162	163	151	150
Bhutan	147	154	143	135	138	143	137	151
Brunei	161	158	155	151	144	146	152	152
Cameroon	60	52	20	42	157	166	146	153
Djibouti	2	144	153	139	150	151	149	154
Bahamas	163	162	156	157	148	148	155	155
Belize	164	164	157	160	149	149	156	156
Philippines	133	121	132	154	147	152	154	157
Iceland	180	179	179	173	176	153	159	158
Nepal	116	120	118	136	46	103	105	159
Barbados	166	165	161	156	155	158	161	160
Vanuatu	167	167	163	159	156	159	162	161
Maldives	162	159	160	161	169	160	158	162
Malta	160	156	152	150	152	154	150	163
Mali	44	70	3	2	3	2	160	164
Sao Tome and Principe	170	170	167	162	158	164	166	165
Samoa	169	169	165	163	159	165	167	166
Saint Lucia	171	171	168	164	161	167	168	167
Yemen	165	166	171	168	178	181	178	168

Table 9 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Bahrain	145	138	176	181	177	170	165	169
South Sudan	50	56	2	1	1	1	170	170
Kiribati	178	177	174	171	165	171	171	171
Micronesia	179	178	175	172	168	174	173	172
Grenada	175	176	173	170	166	172	172	173
Saint Vincent and the Grenadines	174	175	172	169	167	173	174	174
Tonga	177	189	189	188	187	175	175	175
Seychelles	181	181	178	176	171	177	176	176
Antigua and Barbuda	182	180	177	175	170	176	177	177
Andorra	183	182	180	177	172	178	179	178
Dominica	184	183	181	179	173	179	180	179
Libya	69	83	162	184	189	188	188	180
Marshall Islands	185	184	183	182	179	180	181	181
Central African	3	1	5	5	182	169	169	182
Syrian	25	151	170	178	181	186	185	183
Saint Kitts and Nevis	186	185	184	183	180	182	182	184
Monaco	188	187	186	185	183	184	183	185
Somalia	173	173	182	180	186	183	184	186
San Marino	189	188	188	187	184	185	186	187
Afghanistan	176	174	187	186	185	187	187	188
Iraq	187	186	185	189	191	189	190	189
Palau	190	190	190	190	188	190	189	190
Nauru	192	192	192	192	190	191	191	191
Tuvalu	191	191	191	191	192	192	192	192

in the middle, for example, Germany is ranked 35th and the United States is ranked 37th. The reason for these two rankings is mainly because European countries and the United States have participated in international peace affairs, but have been involved in international and regional conflicts. Tuvalu and Nauru remain the two countries with the least impact on global justice in the issue area of terrorism and armed conflicts, a position it has held since 2014. Other countries on the bottom include Syria, Somalia, Afghanistan, Iraq, Palau, and Nauru. Although the ranks fluctuated during the observation period, we observe that the 10-year trend is relatively stable and reflects the general situation on the ground.

Figure 4, a world map of the 2017 index ranking, reveals that countries in the Middle East and North Africa (the MENA region), Central Africa, and South Asia must do more to decrease conflicts and terrorist threats. Most countries in East Asia and Southeast Asia contribute to global justice in a sense that they made progress in governing conflicts and terrorism (except for the Philippines). Many countries in Europe and North America have room to improve in managing terrorism and reducing involvement in global or regional conflicts.

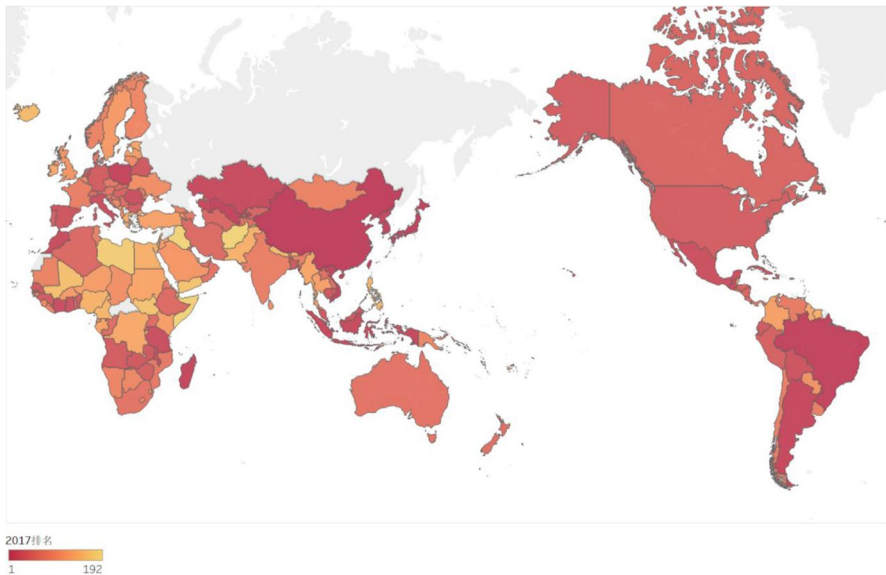


Fig. 4 2017 index ranking of conflicts and terrorism on a world map

3.6 Issue 5: Cross-National Criminal Police Cooperation

Transnational crimes are crimes that involve more than one country in their planning and organization and are always accompanied by effects across national borders. Transnational crimes, because of their suggested cross-national harm on citizens, pose serious challenges to global justice. As a result, fighting transnational crimes has been a major domain of global cooperation to improve global justice. We involved this issue into our global justice index and measure each country's contributions to fighting transnational crimes, by evaluating their financial contribution to Interpol and their promises to the relevant UN conventions.

3.6.1 Dimensions and Indicators

We used two major categories to measure transnational criminal cooperation, and each comprises several indicators. The first category is the financial contribution to Interpol (the International Criminal Police Organization). Because transnational crime involves more than one country, an international organization with a well-established communication system is necessary to connect all of the countries, which is what Interpol does. Interpol is the biggest organization worldwide that provides technical and operational supports to combat transnational crime.² Financial donations to Interpol reflect the determination and contribution of a country to cross-national criminal cooperation. Thus, in addition, we measure the ratification status of each country to the UN

² Please check <https://www.interpol.int/en> for more information about Interpol.

treaties in regards to transnational crime cooperation. These treaties include the United Nations Convention against Transnational Organized Crime and its three supplementing protocols.³ Ratification of the treaties denotes compliance with the related requirements and the promise to offer relevant assistance. As a result, the ratification status of each country also shows their contribution to the cross-national criminal cooperation (Table 10).

Data for the past 8 years show that the US has always been the highest contributor. Traditional liberal democracies, such as Germany, Italy, France, Britain, the Netherlands, Canada, Spain, and Belgium, have almost dominated the top ten lists. Countries in Latin America with serious problems of transnational crimes, such as Brazil and Mexico, have made substantial contributions to combat transnational crime and are within the top 15 contributors. China is the top contributor in Asia and ranks 10th in 2007. Additionally, China has been one of the top 20 contributors for the past 8 years. Increases in ranking are observed in Japan in 2017 and in the Republic of Korea in 2015, which is after they began to ratify the UN treaties that they had not signed (Table 11).

The map shows each country's contribution in 2017. The darker color denotes a higher rank. We observe that countries in North America, South America, Europe, and Australia made relatively greater contributions compared with nations in Africa and Southeast Asia. In Africa, Algeria, Libya, and South Africa contributed relatively more than did the other countries (Fig. 5).

3.7 Issue 6: Anti-poverty

The problem of global poverty constitutes a substantial challenge to maintaining global justice. A widespread concern is that the world becomes increasingly unjust when economic growth is not equitably distributed, and in the past decade, the gap widened between the rich and poor. According to estimates from the World Bank, at least 10% of the world's population lives on less than US\$1.90 a day. Poverty alleviation is of substantial importance to improving global justice. Although global poverty rates have been largely decreased over the past decades, the performance of reducing poverty has been uneven in different regions and countries. Hence, this anti-poverty index helps to evaluate individual countries' efforts and performance in poverty reduction, as a means to improve global justice.

3.7.1 Dimensions and Indicators

Based on the goods-based conception of global justice and the principle of CDDR (as elaborated in our concept paper), we assume that efforts to combat global poverty

³ These three protocols include the Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children; Protocol against the Smuggling of Migrants by Land, Sea and Air; and Protocol against the Illicit Manufacturing of and Trafficking in Firearms, their Parts and Components and Ammunition.

Table 10 Data on cross-national criminal police cooperation

Issue area	Category	Indicator	Source	Coverage
Cross-national Criminal Police Cooperation	Performance (treaty ratification)	United Nations Convention against Transnational Organized Crime (2000) Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime (2003) Protocol against the Smuggling of Migrants by Land, Sea and Air, supplementing the United Nations Convention against Transnational Organized Crime (2004) Protocol against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition, supplementing the United Nations Convention against Transnational Organized Crime (2005)	United Nations Office on Drugs and Crime (UNODC)	184 (2010–2017)
	Contribution	Donation to Interpol	Interpol	

Table 11 Country ranking in the cross-national criminal police cooperation

Country	2010	2011	2012	2013	2014	2015	2016	2017
United States of America	1	1	1	1	1	1	1	1
Germany	2	2	2	2	2	2	2	3
Italy	3	3	3	3	3	3	3	5
France	4	4	4	4	4	4	4	4
United Kingdom	5	5	5	5	5	5	5	6
Netherlands	6	6	7	8	8	8	8	11
Canada	7	8	8	7	7	7	7	8
Spain	8	6	6	6	6	6	6	7
Belgium	9	10	11	11	11	13	15	16
Switzerland	10	11	9	9	9	10	12	14
Sweden	11	9	10	10	10	11	14	15
Australia	12	12	12	14	14	16	16	17
Brazil	13	13	14	15	15	14	10	9
Austria	14	15	17	12	13	15	17	18
Mexico	15	14	13	13	12	12	11	13
Norway	16	16	15	16	16	18	18	21
Denmark	17	17	16	17	17	19	20	24
Poland	18	20	20	20	20	20	19	22
China	19	19	18	18	18	17	13	10
Argentina	20	21	22	23	23	26	26	28
Saudi Arabia	21	23	21	21	21	21	22	23
Turkey	22	24	24	24	25	24	21	20
Russian Federation	23	26	27	27	28	25	23	19
Finland	24	18	19	19	19	22	24	25
Slovakia	25	28	28	29	31	33	34	36
South Africa	26	29	29	28	29	30	31	32
Chile	27	31	31	31	32	34	33	34
Kuwait	28	32	32	33	34	35	35	35
Libya	29	33	33	34	35	36	37	38
Peru	30	34	34	36	37	39	39	40
Slovenia	31	35	35	35	36	38	40	41
Algeria	32	36	36	37	38	39	38	39
Oman	33	37	37	38	39	41	41	42
Romania	34	38	38	39	40	37	36	37
Uruguay	35	39	39	45	46	48	49	50
Croatia	36	40	40	41	42	42	42	43
Nigeria	36	41	40	42	43	44	45	46
Cyprus	38	42	42	44	45	47	48	51
Dominican Republic	39	43	43	46	47	50	52	53
Kazakhstan	40	44	44	47	48	46	43	44
Lithuania	40	44	44	47	48	62	47	48
Belarus	40	44	44	47	48	50	51	52

Table 11 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Bulgaria	40	44	44	47	48	52	52	53
Latvia	40	44	44	47	48	52	52	53
Trinidad and Tobago	40	44	44	47	48	54	55	56
Lebanon	40	44	44	47	48	54	55	58
Serbia	40	44	44	47	48	54	55	59
Estonia	40	44	44	47	48	54	55	59
Azerbaijan	40	44	44	47	48	54	55	59
Costa Rica	40	44	44	47	48	60	61	62
Tunisia	40	44	44	47	48	60	61	63
Honduras	40	44	44	47	48	62	63	64
Zambia	40	44	44	47	48	62	63	64
Montenegro	40	44	44	47	48	62	63	64
Mongolia	40	44	44	47	48	62	63	64
Nicaragua	40	44	44	47	48	62	63	64
Laos	40	44	44	47	48	62	63	64
Burkina Faso	40	44	44	47	48	62	63	64
Saint Vincent and the Grenadines	40	44	44	47	48	62	63	64
Republic of Moldova	40	44	44	47	48	62	63	64
Senegal	40	44	44	47	48	62	63	64
Paraguay	40	44	44	47	48	62	63	64
Kenya	40	44	44	47	48	62	63	64
Guyana	40	44	44	47	48	62	63	64
Panama	40	44	44	47	48	62	63	64
Cambodia	40	44	44	47	48	62	63	64
Liberia	40	44	44	47	48	62	63	64
Madagascar	40	44	44	47	48	62	63	64
Rwanda	40	44	44	47	48	62	63	64
Mali	40	44	44	47	48	62	63	64
Jamaica	40	44	44	47	48	62	63	64
Mauritius	40	44	44	47	48	62	63	64
El Salvador	40	44	44	47	48	62	63	64
Guatemala	40	44	44	47	48	62	63	64
Central African Republic	40	44	44	47	48	62	63	64
Albania	40	44	44	47	48	62	63	64
Sao Tome and Principe	40	44	44	47	48	62	63	64
Malawi	40	44	44	47	48	62	63	64
Turkmenistan	40	44	44	47	48	62	63	64
Antigua and Barbuda	40	44	44	47	48	62	63	64
Bahamas	40	44	44	47	48	62	63	64
Mauritania	40	44	44	47	48	62	63	64
Saint Kitts and Nevis	40	44	44	47	48	62	63	64
Benin	40	44	44	47	48	62	63	64

Table 11 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Democratic Republic of the Congo	40	44	44	47	48	62	63	64
Bosnia and Herzegovina	40	44	44	47	48	62	63	64
United Republic of Tanzania	40	44	44	47	48	62	63	64
Mozambique	40	44	44	47	48	62	63	64
Lesotho	40	44	44	47	48	62	63	64
Grenada	40	44	44	47	48	62	63	64
Portugal	91	25	25	25	26	28	28	29
New Zealand	92	96	101	108	112	113	113	116
Hungary	93	30	30	30	30	31	32	33
Venezuela	94	97	103	32	33	32	30	31
Indonesia	95	98	104	110	114	114	114	117
Egypt	96	99	105	111	115	116	116	119
Philippines	97	100	106	112	116	117	117	119
Ukraine	98	102	108	42	44	43	43	45
Iraq	99	103	109	47	48	49	49	49
Ecuador	99	103	109	47	48	54	55	56
Togo	99	103	44	47	48	62	63	64
Armenia	99	103	44	47	48	62	63	64
Bahrain	99	103	109	114	118	119	119	122
Niger	99	103	109	114	118	120	120	123
Gambia	99	103	109	114	118	120	120	123
Namibia	99	103	109	114	118	120	120	123
Tajikistan	99	103	109	114	118	120	120	123
Cameroon	99	103	109	114	118	120	120	123
Gabon	99	103	109	114	118	120	120	123
Botswana	99	103	109	114	118	120	120	123
Malta	99	103	109	114	118	120	120	123
Georgia	99	103	109	114	118	120	120	123
Timor-Leste	99	103	109	114	118	120	120	123
Belize	99	103	109	114	118	120	120	123
Djibouti	99	103	109	114	118	120	120	123
Kyrgyzstan	99	103	109	114	118	120	120	123
Monaco	99	103	109	114	118	120	120	123
Myanmar	99	103	109	114	118	120	120	123
San Marino	99	103	109	114	118	120	120	123
Guinea	99	103	109	114	118	120	120	123
Suriname	99	103	109	114	118	120	120	123
Seychelles	99	103	109	114	118	120	120	123
Ireland	123	127	133	137	140	141	141	144
Israel	124	128	134	138	141	142	142	146
Luxembourg	125	130	102	109	113	115	115	118
United Arab Emirates	126	129	135	139	142	144	143	145

Table 11 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Malaysia	127	131	136	141	144	145	145	148
Iceland	128	133	138	143	146	149	149	152
Colombia	129	132	137	142	145	147	147	150
Qatar	130	134	139	144	147	148	148	151
Morocco	131	101	107	113	117	118	118	121
Cuba	132	135	140	40	41	45	46	47
Guinea-Bissau	133	136	141	114	118	120	120	123
Uzbekistan	133	136	141	145	148	151	151	154
Equatorial Guinea	133	136	141	145	148	151	151	154
Jordan	133	136	141	145	148	151	151	154
Bolivia	133	136	141	145	148	151	151	154
Uganda	133	136	141	145	148	151	151	154
Chad	133	136	141	145	148	151	151	154
Japan	140	145	151	156	162	176	176	2
Singapore	141	144	150	155	161	143	144	147
Pakistan	142	146	152	157	163	164	165	167
Ethiopia	143	147	44	47	48	62	63	64
Afghanistan	143	147	153	158	148	151	151	123
Zimbabwe	143	147	153	145	148	151	151	154
Sudan	143	147	153	158	148	151	151	154
Sri Lanka	143	147	153	158	164	151	151	154
Comoros	143	147	153	158	164	166	166	168
Congo	143	147	153	158	164	166	166	168
Brunei Darussalam	143	147	153	158	164	166	166	168
Yemen	143	147	153	158	164	166	166	168
Micronesia	152	143	149	154	160	163	164	166
Republic of Korea	153	160	165	171	176	9	9	12
Czechia	154	161	166	107	24	27	29	30
Greece	155	22	23	22	22	23	25	26
India	156	27	26	26	27	29	27	27
Thailand	157	162	167	140	143	146	146	149
Iran (Islamic Republic of)	158	163	168	172	177	177	177	178
Haiti	159	44	44	47	48	62	63	64
Burundi	159	164	44	47	48	62	63	64
Nauru	159	164	44	47	48	62	63	64
Dominica	159	164	169	47	48	62	63	64
Ghana	159	164	109	114	48	62	63	64
Angola	159	164	169	158	48	62	63	64
Barbados	159	164	169	173	48	62	63	64
Sierra Leone	159	164	169	173	48	62	63	64
Côte d'Ivoire	159	164	109	114	118	120	120	64
Fiji	159	164	169	173	178	178	178	64

Table 11 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Viet Nam	159	164	141	145	148	150	150	153
Saint Lucia	159	164	169	145	148	151	151	154
Eritrea	159	164	169	173	148	151	151	154
Maldives	159	164	169	158	164	165	151	154
Marshall Islands	159	147	153	158	164	166	166	168
Bangladesh	159	147	153	158	164	166	166	168
Andorra	159	147	153	158	164	166	166	168
Nepal	159	147	153	158	164	166	166	168
Tonga	159	164	169	173	164	166	166	168
Bhutan	159	164	169	173	178	178	178	179
Papua New Guinea	159	164	169	173	178	178	178	179
Samoa	180	164	169	173	164	166	166	168
South Sudan	180	181	169	173	178	178	178	179
Solomon Islands	180	181	182	182	182	182	182	182
Palau	180	181	182	182	182	182	182	182
Tuvalu	180	181	182	182	182	182	182	182

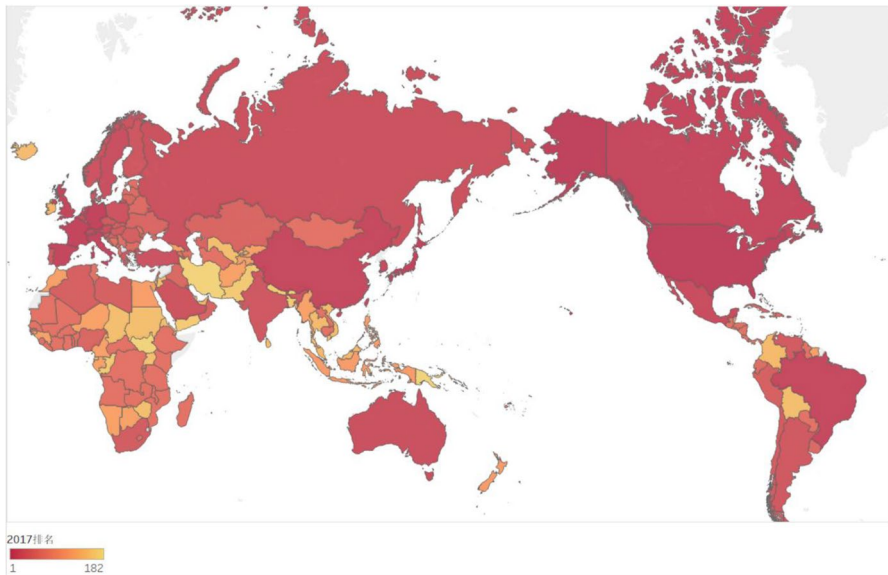


Fig. 5 2017 index ranking of cross-national criminal police cooperation on a world map

should respect the action of individual countries involved in improving the living conditions for the least advantaged within their respective jurisdictions. Therefore, to assess the contributions made by each country to global poverty eradication, we

Table 12 Data on anti-poverty

Category	Indicator	Data source	Coverage
Performance	Gini Index Poverty gap Poverty rate	World Bank; OECD Income Distribution Database	60–82 (2010–2017)

measure their progress in poverty reduction by focusing on three thematic indicators: (1) Gini index, (2) poverty gap, and (3) poverty rate.⁴

The World Bank is the main source of global information on extreme poverty. However, the global poverty data provided by the World Bank are primarily for developing countries. Moreover, the data of developing countries suffer severe problems of missing values, with data appearing in certain years and missing in other years. Later in this report, we explain the imputation methods which we used to compensate for missing data of this type. To include more observation cases of developed countries, we supplement the World Bank poverty data with related information from the OECD Income Distribution Database. However, substantial challenges remain, because the two datasets use different statistical benchmarks and scales to measure the three indicators we use. To make the data comparable, we calculate the ranking score by measuring the extent to which the country's performance in reducing poverty in a given year has improved compared with the year before. The data sources available limited our ability to rank all nation states (Table 12).

3.7.2 Results

Due to data limitations, this sub-index currently has ranked 60–82 countries over the period of 2010–2017 (Table 13).

The results reveal that except for the countries with missing data, the largest improvements in poverty relief were in developing countries, for example, Thailand and Argentina. There are a few clear patterns in the data. No country managed to improve on all three indicator domains—Gini index, poverty gap, and poverty rate. Moreover, the progress made by individual countries is unstable. Because this sub-index is calculated by measuring the improvement in poverty reduction performance compared with the last observation year, we easily understand that there are very rare cases that can make continuous rapid progress over 1 decade (Fig. 6).

A world map of the 2017 index ranking of poverty relief demonstrates that countries in Latin America made significant progress in addressing poverty problems compared with their performance in 2016. The countries of the Organisation for Economic

⁴ Individual countries' international commitment to reduce global poverty in other poor countries and regions is assessed by "humanitarian aid" in our project. Notably, many other aspects and indicators can be used to measure global poverty (e.g., living conditions). We excluded them from our measurement because of the severe problems in data quality and richness. We also provide statistical evidence that the omission of these indicators does not significantly affect the assessment and ranking.

Table 13 Country ranking in anti-poverty aspect of promoting global justice

Country	2010	2011	2012	2013	2014	2015	2016	2017
Ukraine	2	15	18	5	48	64	3	1
Kazakhstan	6	2	5	4	53	58	60	2
Argentina	5	6	32	33	47	7	56	3
Republic of Moldova	7	4	17	6	3	37	19	4
Uruguay	8	7	31	70	5	36	4	5
Paraguay	22	33	4	11	56	17	43	6
Romania	60	81	74	76	29	13	18	7
El Salvador	20	42	12	13	40	12	39	8
Dominican Republic	19	51	49	27	11	9	5	9
Thailand	9	2	55	2	17	2	59	10
Armenia	46	54	8	69	26	15	17	11
Cyprus	2	NA	NA	NA	34	1	NA	12
Bolivia (Plurinational State of)	34	10	68	19	20	41	53	13
Estonia	63	78	9	77	7	4	32	14
Ecuador	11	16	24	17	9	57	28	15
Indonesia	13	21	19	21	14	16	8	16
Colombia	14	19	34	26	16	19	30	17
Lithuania	16	63	72	47	61	56	52	18
Spain	43	69	47	80	33	45	25	19
Luxembourg	32	65	71	66	57	53	48	20
Mexico	10	31	51	63	63	10	58	21
Hungary	52	72	77	30	58	44	20	22
Canada	36	75	36	48	45	30	26	23
Republic of Korea	18	59	70	37	59	55	37	24
Switzerland	49	56	29	34	60	20	51	25
Ireland	55	35	53	18	64	18	50	26
Israel	53	34	61	60	36	46	12	27
Brazil	23	60	35	56	15	59	6	28
Denmark	26	66	42	68	31	31	42	29
Latvia	15	73	66	59	54	34	41	30
Czechia	33	49	22	74	46	49	27	31
Austria	28	67	60	29	27	52	44	32
Costa Rica	31	37	23	72	28	48	7	33
Belgium	38	61	62	44	22	51	23	34
Germany	27	39	25	67	51	50	45	35
Italy	57	41	58	58	38	54	11	36
Greece	59	79	67	38	52	29	9	37
Portugal	24	74	75	61	24	24	24	38
Panama	54	11	76	15	55	6	29	39
Sweden	51	48	16	75	21	32	46	40
United Kingdom of Great Britain and Northern Ireland	44	62	56	51	41	38	35	41
Serbia	65	5	79	78	10	5	61	42

Table 13 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Netherlands	35	58	64	62	44	40	40	43
Montenegro	25	82	81	35	3	62	54	44
Slovakia	47	64	57	65	30	27	36	45
Peru	12	25	15	25	18	22	16	46
Slovenia	50	68	21	71	32	43	15	47
Kyrgyzstan	62	14	80	73	4	61	2	48
Iceland	39	29	54	31	62	21	21	49
United States of America	45	55	59	57	37	25	49	50
Norway	40	70	63	50	43	35	34	51
Turkey	37	23	41	36	25	33	31	52
Finland	48	50	52	53	39	26	22	53
France	41	44	65	40	42	42	33	54
Russian Federation	30	8	48	10	49	23	55	55
Georgia	58	30	6	12	8	11	38	56
Poland	29	57	73	64	35	28	13	57
Honduras	56	80	78	24	19	39	14	58
Belarus	4	18	2	3	6	63	10	59
Malta	3	71	14	2	3	NA	1	60
Iran (Islamic Republic of)	NA	NA	NA	NA	66	60	47	NA
Croatia	61	17	69	54	50	8	NA	NA
China	NA	46	45	14	23	14	NA	NA
Republic of North Macedonia	42	27	13	16	12	47	NA	NA
Bulgaria	64	77	33	42	13	NA	NA	NA
Djibouti	NA	NA	NA	79	NA	NA	NA	NA
Mongolia	NA	9	3	NA	NA	NA	NA	NA
New Zealand	NA	NA	39	NA	NA	NA	NA	NA
Pakistan	NA	40	NA	NA	NA	NA	NA	NA

Co-operation and Development (OECD) in North America and Europe show very slight improvements in reducing poverty, because these countries have largely eliminated extreme poverty and suffer from ceiling effects. Russia has much more room for improvement in its anti-poverty efforts. Due to data limitations (especially the missing data), we could not obtain a reliable ranking for many countries in Asia and Africa.

However, it is worth noting that China's poverty alleviation campaign in recent years has borne outstanding results. However, as data sources differ in statistical criteria, the results were not duly represented on the index, which greatly undermined its rankings. Our poverty index is based on three key indicators: Gini coefficient, poverty gap, and poverty rate. Unfortunately, because of differences in statistical methods and criteria, we have not found well-tested data related to China to replace or complement World Bank's data for the indicators mentioned above.

1. Gini coefficient

Gini coefficient is a widely used indicator for measuring the income disparity in a country or region. "Gini coefficient is calculated with income data by household

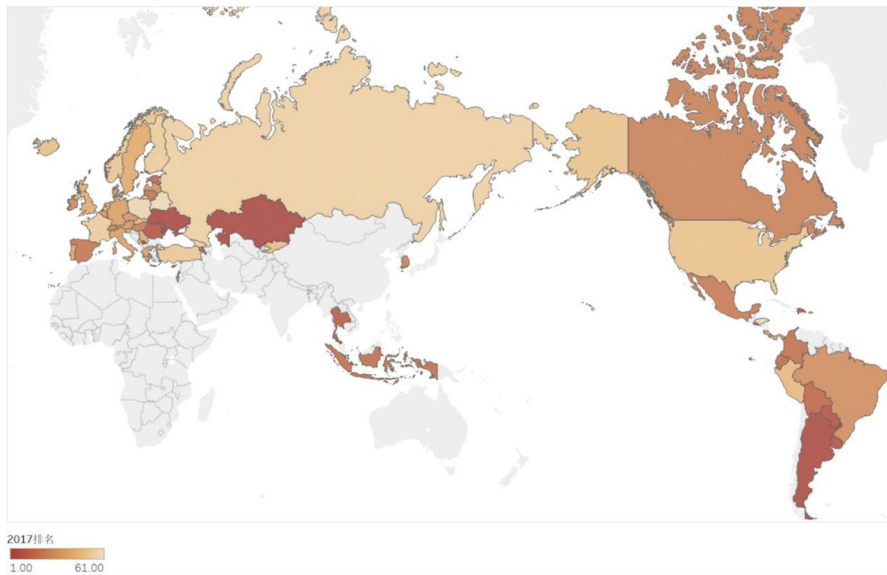


Fig. 6 2017 index ranking of poverty reduction on a world map

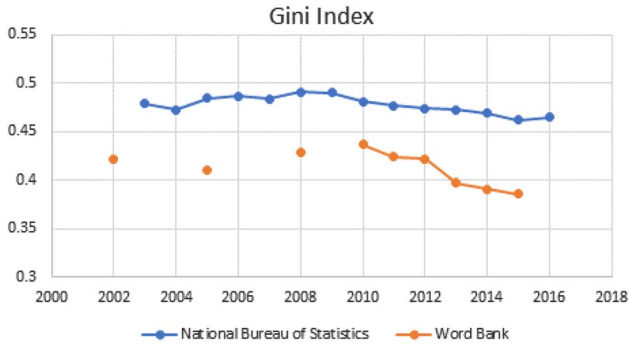
or group. It varies with the source and criteria of the basic income data used. For instance, whether the income standards are testified, whether the general income standards or the disposable income standards should be used, whether the income data include in-kind benefits from government, or whether annual CPIs or regional price differences are taken into account, all these have an effect on the coefficient and its changes. One must pay attention to the comparability of basic data when making international or temporal comparisons of Gini coefficients.”⁵

The Chinese National Bureau of Statistics has released China’s Gini coefficients from 2003 to 2016, which range from 0.45 to 0.5. They were calculated based on data from a sample survey of urban and rural household income and expenditure around the country,⁶ whereas the Gini coefficients released by the World Bank were calculated based on data from surveys carried out by national governments and estimates

⁵ WANG, Pingping. *A Few Issues Regarding the Calculation of Gini Coefficients on China’s Resident Income*. (http://www.stats.gov.cn/ztc/ztfx/grdd/201302/t20130201_59099.html).

⁶ As of December 2012, the national survey of urban and rural household income and expenditure had a sample size of 140,000 households—74,000 rural from 896 counties, randomly sampled through a stratified and multi-phase process, and 66,000 urban from 476 cities and counties, randomly sampled through a stratified and two-phase process. At the end of 2012, the National Bureau of Statistics established a new and unified household survey system and a uniform income index system, and selected a consistent survey sample. Since December 1, 2012, the 400,000 sampled households across the country have been surveyed pursuant to the new survey system. Please see WANG, Pingping: *A Few Issues Regarding the Calculation of Gini Coefficients on China’s Resident Income*.

made by agencies under the World Bank.⁷ The two adopt different statistical methods and samples.



From the above line chart, we can see that China's Gini coefficients calculated by the National Bureau of Statistics are even higher than those of the World Bank. Therefore, they cannot be directly used to replace the latter's statistics. To ensure that the poverty data are comparable across countries, we chose to use the Gini coefficients calculated by the World Bank.

2. Poverty gap

Apart from the Gini coefficients, a lot of data on China's poverty gap in recent years are also missing. Available data are particularly lacking in the calculation of each country's poverty alleviation index.

Poverty gap refers to the average income shortfall in proportion to the poverty line of poor families,⁸ and it is used to measure the depth of poverty in a country. The universally accepted criteria are the following: poverty gap at \$1.90 a day (2011 PPP) (% population); poverty gap at \$3.20 a day (2011 PPP) (% of population); and poverty gap at \$5.50 a day (2011 PPP) (% of population). It means that different poverty lines (e.g., US\$1.9 per day, US\$3.2 per day, US\$5.5 per day, etc.) are defined on the basis of the international purchasing power parity (PPP) of 2011 to measure the size of impoverished population and poverty gap.⁹

Chinese authorities adopt the average disposable income of urban residents, rural residents, and others as criteria. So far, we have not found any shared criterion between them and the World Bank. According to the *Working Plan for Archiving Poverty Alleviation and Development Records* published by the State Council's Leading

⁷ See: <https://databank.worldbank.org/metadataglossary/gender-statistics/series/SI.POV.GINI>.

⁸ Please see: "Millennium Development Goal Indicators." United Nations. 2008.

⁹ Purchasing Power Parity (PPP), as a currency converter, is used as a solution to the issue of currency differences in cross-national comparisons, corrected for differences in price level. PPP estimates currently used by the World Bank are based on the 2011 round of International Comparison Program, which is by far the most extensive international statistical survey involving the largest number of countries.

Group Office of Poverty Alleviation and Development in April 2014, during China's "targeted poverty alleviation" campaign, "the national rural poverty line—RMB 2736 yuan, the per capita net income of rural residents in 2013 (2300 yuan in constant prices in 2010)—shall be adopted as the identification standard for the impoverished population."¹⁰ The standard is adjusted every year in accordance with variations in CPI, cost-of-living index, etc., and it is much different from the statistical methods and criteria used by the World Bank and relevant UN organizations.¹¹ For this reason, it is not suitable for direct cross-national comparisons, and is thus not included in the calculation of our index.

3. Poverty rate

We faced the same issue in the poverty rate calculation. World Bank's poverty headcount ratios are calculated based on the poverty lines determined on the basis of the PPP in 2011 (e.g., US\$1.9 per day, US\$3.2 per day, US\$5.5 per day, etc.): poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population); poverty headcount ratio at \$3.20 a day (2011 PPP) (% of population); poverty headcount ratio at \$5.50 a day (2011 PPP) (% of population).

In its targeted poverty alleviation campaign, the Chinese government adopted "poverty incidence" as a major evaluation criterion. [Poverty incidence = number of individuals in poverty ÷ total headcount × 100%]. This rate is based on the poverty line of RMB 2300 yuan (per capita net income), which makes it rather different from World Bank's statistical methods and criteria, and not suitable as a direct alternative to them.

To ensure a plausible and operable comparative analysis of poverty data across different countries, including that on China, we chose one single data source—the World Bank. The downside of this choice is that not all the data of every country in every year are represented by the resulting rankings, as many years' numbers are missing and the data of recent years are not updated in a timely manner. We believe that the issue will be resolved when new data are released in succession, and we keep improving our calculation methods. There is no doubt that "targeted poverty alleviation" and China's other agendas for enhancing global justice have borne remarkable results. In the future, our project will be dedicated to the collection of country-specific data and exploration of conversion methods of different poverty lines to improve the comparability of China's poverty alleviation data with its international counterparts and extend the coverage of the Global Justice-Anti-poverty Index to more countries and years.

3.8 Issue 7: Education

Education is essential for global justice. The Convention on the Rights of the Child and the International Covenant on Economic, Social and Cultural Rights explicitly

¹⁰ At the Central Working Conference on Poverty Alleviation and Development in Beijing on November 29, 2011, Wen Jiabao, then Premier of the State Council, announced that the central government would adopt the average net income of rural residents—RMB 2300 yuan—as the new national poverty relief standard.

¹¹ Many research institutes and media agencies believe that the poverty line currently adopted by China is higher than that of the World Bank.

highlight states' obligations to take measures toward realizing the right to education, to which the principle of CDDR applies (as elaborated in our concept paper). There is an international consensus as to the protection of rights to education. To improve global justice, steps must be taken by nation states to realize the basic human right of receiving education, using the maximum available resources.

3.8.1 Dimensions and Indicators

Based on internationally recognized components of the right to education, this project measures each country's influence on global justice in education by focusing on two categories: performance and contribution. We first focus on individual countries' performance on basic education, by measuring the extent to which an individual's educational right is adequately protected. Drawing on the literature, this category is measured along three thematic indicators: (1) school enrollment ratio, (2) children out of school, (3) pupil–teacher ratio. For the category of contribution, we assess the government's effort to improve its basic education nationwide by measuring government expenditure on education per capital while determining if a state is fulfilling its basic obligation. The World Bank is the main source of global information on education (Table 14).

3.8.2 Results

Using index construction methods (see the methodological section), this sub-index ranks 76–105 countries from 2010 to 2017 (Table 15).

The data indicate that most countries take the necessary measures to protect children's educational rights. The OECD countries including Sweden, Finland, the United Kingdom, Germany, France, and Ireland do particularly well in this domain. East Asian countries emphasis on education has been well documented, China and the Republic of Korea score relatively strongly in this issue area. Some rich countries in the Middle East and the Gulf Region such as Qatar and Israel have also invested heavily in education. Except for the countries with missing data, developing countries, including Pakistan, Tanzania, Niger, Mali, Guinea, and Senegal, are at the bottom. This finding largely occurs, because these countries either have insufficient educational resources or are experiencing political instability. Although the country ranking fluctuates slightly, the general pattern is stable over the observation decade.

On a world map (Fig. 7), the 2017 index ranking of countries in the domain of education illustrates that the Nordic countries including Sweden and Finland maintain their good score and are closely followed by other Western European countries such as the United Kingdom, Germany, and France. Notably, Eastern European countries, namely, Cyprus, Slovenia, Poland, and Hungary are also doing well compared with many other countries and regions in the world. Some disparities exist in the implementation of the right to education in Latin America, with Argentina ranked 18th and Uruguay at 46th. Countries in Western Africa and South Asia are in a concerning situation of fulfilling the mandates that the state actively create the conditions necessary for individuals' enjoyment

Table 14 Data on education

Category	Dimension	Indicator	Data source	Coverage
Performance	Enrollment ratio	School enrollment ratio, primary (% net)	World Bank	76–105 (2010–2017)
	Completion rates	Children out of school (% of primary school age)		
Contribution	Teachers	Pupil–teacher ratio, primary		
	Government expenditure on education	Government expenditure on education per capital		

Table 15 Country ranking in education aspect of promoting global justice

Country	2010	2011	2012	2013	2014	2015	2016	2017
Sweden	1	2	1	2	5	4	4	1
Finland	3	4	6	5	8	5	5	2
China	4	1	3	7	4	6	3	3
New Zealand	NA	NA	NA	9	13	10	6	4
United Kingdom of Great Britain and Northern Ireland	7	10	10	12	12	8	7	5
Israel	10	13	14	15	17	14	10	6
Germany	8	9	11	13	15	12	8	7
France	6	8	12	14	16	13	9	8
Ireland	5	6	9	11	14	11	12	9
Qatar	2	5	8	6	11	9	11	10
Cyprus	9	11	13	17	19	16	16	11
Republic of Korea	16	18	19	20	22	15	17	12
Spain	12	16	16	21	23	19	19	13
Slovenia	14	17	20	22	25	20	21	14
Portugal	15	19	22	23	26	21	22	15
Oman	NA	NA	NA	NA	NA	NA	NA	16
Estonia	19	22	26	25	27	23	24	17
Argentina	25	25	28	28	32	24	26	18
Latvia	27	30	24	24	30	26	29	19
Chile	28	35	33	33	38	28	30	20
Cuba	20	23	23	35	40	30	31	21
Barbados	17	21	25	27	29	22	27	22
Brazil	18	20	21	26	28	27	28	23
Poland	21	26	29	30	31	29	32	24
Hungary	23	31	35	40	39	33	34	25
Lithuania	22	27	31	31	33	31	33	26
Russian Federation	29	24	27	29	35	37	39	27
Bahrain	NA	36	34	38	41	32	35	28
Malaysia	30	29	30	34	37	35	36	29
Mauritius	39	44	45	46	44	39	40	30
Croatia	26	33	38	37	43	38	41	31
Mexico	24	28	36	39	36	34	37	32
Saint Lucia	NA	NA	49	45	47	42	38	33
Saint Vincent and the Grenadines	36	52	40	56	83	40	42	34
Maldives	37	54	53	50	53	41	43	35
Belize	38	49	47	53	50	45	44	36
Romania	40	50	56	63	59	51	47	37
Peru	50	55	59	57	54	50	46	38
Eswatini	45	46	48	55	58	56	51	39
Bulgaria	42	47	54	47	57	55	52	40
Belarus	35	45	43	43	45	48	50	41
Kazakhstan	43	40	41	42	46	47	54	42

Table 15 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Colombia	34	39	44	44	49	52	55	43
Tunisia	41	43	50	52	52	49	48	44
Bolivia (Plurinational State of)	NA	62	64	66	62	59	56	45
Uruguay	48	32	69	36	87	44	94	46
Serbia	44	42	51	51	55	57	53	47
Bhutan	65	68	70	71	70	61	58	48
Ukraine	53	53	46	49	63	64	66	49
Iran (Islamic Republic of)	32	38	39	54	51	58	45	50
Indonesia	33	37	42	67	85	75	79	51
Lebanon	61	64	63	62	66	63	62	52
Republic of Moldova	52	56	61	59	65	67	65	53
Cabo Verde	51	57	62	65	68	68	61	54
Georgia	63	69	71	74	73	78	64	55
Albania	58	63	66	69	67	70	63	56
Mongolia	59	60	58	60	64	66	59	57
Uzbekistan	NA	NA	NA	68	61	60	57	58
Sri Lanka	69	73	77	81	76	77	60	59
Lesotho	57	58	67	70	71	72	71	60
El Salvador	NA	65	NA	72	72	71	67	61
Djibouti	70	66	75	73	78	73	73	62
Honduras	NA	NA	NA	75	74	74	69	63
Lao People's Democratic Republic	74	78	81	83	81	81	74	64
Nicaragua	67	75	76	78	77	80	70	65
Guatemala	64	71	74	79	79	79	77	66
Sao Tome and Principe	NA	70	73	76	82	84	75	67
Kyrgyzstan	71	74	72	77	80	83	76	68
Philippines	78	85	93	88	75	76	72	69
Azerbaijan	56	61	65	61	60	65	68	70
Myanmar	NA	88	NA	NA	NA	NA	NA	71
Tajikistan	72	77	78	86	84	85	80	72
Nepal	68	76	79	85	88	86	78	73
Ghana	NA	81	88	80	86	82	84	74
Mauritania	76	82	86	89	90	90	89	75
Benin	73	79	82	87	89	87	81	76
Togo	77	80	85	92	91	88	85	77
Senegal	81	87	87	91	95	89	93	78
Gambia	80	84	83	93	92	93	87	79
Cameroon	NA	86	90	NA	94	NA	86	80
Burundi	75	NA	NA	NA	NA	97	97	81
Cote d'Ivoire	92	92	96	99	98	96	91	82
Cambodia	79	83	89	94	93	92	90	83
Rwanda	NA	NA	NA	NA	NA	NA	88	84

Table 15 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Guinea	87	90	92	95	97	95	96	85
Burkina Faso	91	95	97	100	99	99	98	86
Mali	90	93	95	101	100	100	100	87
Niger	93	97	98	102	101	101	101	88
Bangladesh	84	NA	NA	NA	NA	NA	NA	89
United Republic of Tanzania	88	98	100	103	102	103	102	90
Pakistan	95	101	102	105	105	105	103	91
Norway	NA	NA	NA	1	1	1	1	NA
Switzerland	NA	NA	4	3	6	NA	2	NA
Malta	NA	15	17	16	18	18	13	NA
Japan	NA	NA	NA	18	20	NA	14	NA
Singapore	NA	NA	NA	NA	NA	NA	15	NA
Italy	11	14	15	19	21	17	18	NA
Brunei Darussalam	NA	NA	18	NA	24	NA	20	NA
Grenada	NA	NA	NA	NA	NA	NA	23	NA
Costa Rica	NA	34	32	32	34	25	25	NA
Fiji	55	59	60	64	56	62	49	NA
India	96	100	NA	104	103	104	82	NA
Sierra Leone	NA	NA	84	90	NA	91	83	NA
Central African Republic	85	89	91	NA	NA	NA	92	NA
Liberia	NA	NA	NA	NA	96	94	95	NA
Chad	89	94	NA	96	NA	98	99	NA
Iceland	NA	3	5	4	7	2	NA	NA
Luxembourg	NA	NA	2	NA	3	3	NA	NA
Belgium	NA	NA	NA	NA	10	7	NA	NA
Turkey	NA	NA	37	41	42	36	NA	NA
Micronesia	NA	NA	NA	NA	NA	43	NA	NA
Ecuador	46	51	52	48	48	46	NA	NA
South Africa	NA	NA	NA	NA	NA	53	NA	NA
Dominica	NA	NA	NA	NA	NA	54	NA	NA
Vanuatu	NA	NA	NA	NA	NA	69	NA	NA
South Sudan	NA	96	NA	NA	NA	102	NA	NA
Denmark	NA	NA	NA	NA	2	NA	NA	NA
United States of America	NA	7	7	8	9	NA	NA	NA
Namibia	31	NA	NA	NA	69	NA	NA	NA
Saudi Arabia	49	12	99	10	104	NA	NA	NA
Viet Nam	47	41	55	58	NA	NA	NA	NA
Zimbabwe	NA	NA	80	82	NA	NA	NA	NA
Comoros	NA	NA	NA	84	NA	NA	NA	NA
Mozambique	NA	NA	94	97	NA	NA	NA	NA
Uganda	86	91	NA	98	NA	NA	NA	NA
Paraguay	NA	NA	57	NA	NA	NA	NA	NA

Table 15 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Guyana	62	67	68	NA	NA	NA	NA	NA
Kenya	NA	NA	101	NA	NA	NA	NA	NA
Panama	NA	48	NA	NA	NA	NA	NA	NA
Timor-Leste	66	72	NA	NA	NA	NA	NA	NA
Ethiopia	94	99	NA	NA	NA	NA	NA	NA
San Marino	13	NA	NA	NA	NA	NA	NA	NA
Congo	54	NA	NA	NA	NA	NA	NA	NA
Solomon Islands	60	NA	NA	NA	NA	NA	NA	NA
Guinea-Bissau	82	NA	NA	NA	NA	NA	NA	NA
Angola	83	NA	NA	NA	NA	NA	NA	NA

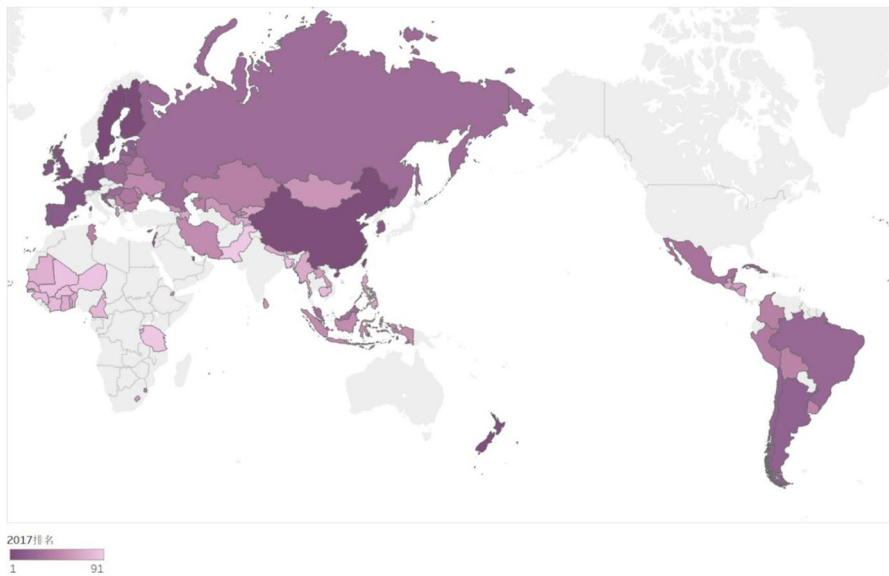


Fig. 7 2017 index ranking of education on a world map

of education. As shown in this index, significant worldwide disparities are observed in guaranteeing basic access to education, with developed countries substantially outperforming developing countries. According to UN treaties, if individual countries do not have the resources to fulfill this obligation, “the international community has a clear obligation to assist”. Education is linked to another issue area covered by this project, humanitarian aid, which we discuss in another section of this report.

3.9 Issue 8: Public Health

Health is primarily viewed by many as a domestic issue. The connections can be unclear between public health as a domestic public good and public health as a country's contribution to the global public good. The rationale is that when one country progresses in public health, the country improves the whole world's public health. Notably, the global community, especially the United Nations, has taken many measures (e.g., sustainable development goals) to solve public health problems to promote an equal, just, and prosperous world.

3.9.1 Dimensions and Indicators

Although public health has normally been considered a national public good, its deficit constitutes inequality at the global level, and its improvement has positive implications for global justice. In measuring public health, we first focus on health-related performance by measuring the protection of an individual's right to health and then focus on a government's effort to improve its health system. The dimensions we use include life expectancy, health infrastructure, key diseases, and governmental expenditure (Table 16). These data are from the WHO and covers 195 countries from 2010 to 2017. In this study, a major challenge is the missing value problem. Thus, data quality is unsatisfactory. Many countries, especially developing countries, have incomplete public health data.

3.9.2 Results

In this section, we present the ranking result of countries' contributions to global justice from the public health perspective (Table 17). The Table 17 shows 9 years of results—from 2010 to 2017—in 195 countries.

Table 17 shows that China, Finland, France, Sweden, the United Kingdom, Germany, and Norway have consistently performed the best in of global justice from a public health perspective. India and some African countries do not perform well in this regard and have much more to do to catch up. The general trend is that countries tend to do better when their economy is more developed. Thus, developing countries still have a many improvements to make in public health (Fig. 8).

In 2017, Sweden, Finland, China, New Zealand, and the United Kingdom are the top five countries in promoting global justice from a public health perspective. China is the only developing country among the top five nations.

3.10 Issue 9: Protection of Women and Children

Protection of women and children is essential for global justice. Each country's contribution (e.g., financial contribution) to women and children is difficult to distinguish from other issues such as public health, education, and poverty. Thus, we focus on the performance dimension, because it is measurable. Additionally, the protection issue concerns gender inequality and children's situations. First, we use the ratio of health, demography, economic status, and political empowerment between male and female to measure gender inequality from the perspective of gender-based gaps in resources

Table 16 Data on public health

Category	Dimension	Indicators	Data source	Coverage
Performance	Life expectancy	Life expectancy at birth (years), both sexes	WHO	169–178 (2010–2017)
		Life expectancy at age 60 (years), both sexes		
	Health infrastructure	Infant mortality rate (probability of dying between birth and age 1 per 1000 live births), both sexes		
		Neonatal mortality rate (per 1000 live births), both sexes		
		Under five mortality rate (probability of dying by age 5 per 1000 live births), both sexes		
		Adult mortality rate (probability of dying between 15 and 60 years per 1000 population), both sexes		
Key diseases	Population using at least basic drinking-water services (%), total			
	Population using at least basic sanitation services (%), total			
	Population practicing open defecation (%), total			
	Treatment success rate: new TB cases			
	Tuberculosis effective treatment coverage (%)			
	Raised blood pressure (SBP \geq 140 or DBP \geq 90) (age-standardized estimate) 18 years, both sexes			
	Raised fasting blood glucose (\geq 7.0 mmol/L or on medication)(age-standardized estimate) 18 years, both sexes			
	Contribution	Incidence of tuberculosis (per 100,000 population per year), both sexes		
		Out-of-pocket expenditure as a percentage of total expenditure on health		
		Out-of-pocket expenditure (OOP) per capita in US\$		
Current health expenditure (CHE) per capita in US\$				
Expenditure	Domestic general government health expenditure (GGHE-D) per capita in US\$			
	Domestic private health expenditure (PVT-D) per capita in US\$			

Table 17 Country ranking in the public health aspect of promoting global justice

Country	2010	2011	2012	2013	2014	2015	2016	2017
China	8	6	5	4	3	4	1	1
United States of America	4	4	4	5	4	3	2	2
Sweden	13	5	6	3	5	5	3	3
Germany	7	9	10	9	8	6	5	4
Austria	12	12	13	12	12	12	6	5
Belgium	10	11	12	11	11	10	8	6
Denmark	5	8	9	8	7	7	7	7
Singapore	22	21	19	21	21	18	12	8
United Kingdom of Great Britain and Northern Ireland	21	20	20	17	14	9	10	9
Republic of Korea	24	24	23	23	23	19	14	10
Italy	15	15	15	18	19	17	13	11
Iceland	18	17	17	19	15	11	11	12
Luxembourg	3	7	7	6	6	8	9	13
Cyprus	23	22	22	24	25	25	20	14
Venezuela (Bolivarian Republic of)	31	35	31	32	29	26	21	15
Spain	19	19	21	22	22	21	18	16
Australia	9	10	8	10	10	27	17	17
Norway	2	2	2	2	2	2	4	18
Azerbaijan	32	31	30	29	28	28	24	19
Malta	27	27	26	27	26	24	22	20
Netherlands	16	16	16	16	18	16	16	21
New Zealand	25	25	24	25	24	22	19	22
Canada	11	13	11	14	16	13	15	23
Mexico	29	29	28	30	31	30	26	24
Russian Federation	39	36	34	33	32	32	27	25
Georgia	33	32	33	34	36	36	30	26
Sudan	70	66	48	48	45	40	36	27
Cambodia	62	56	38	37	34	35	34	28
France	17	18	18	20	20	20	23	29
Iran (Islamic Republic of)	30	30	32	42	40	37	35	30
Yemen	42	42	45	41	37	49	29	31
Grenada	40	39	43	44	43	39	37	32
Bangladesh	65	63	56	52	49	51	41	33
Bahamas	35	40	37	45	47	34	33	34
Morocco	46	45	47	46	44	47	38	35
Trinidad and Tobago	51	44	36	40	38	33	32	36
Bulgaria	52	46	50	43	42	44	39	37
Portugal	26	26	29	31	30	31	28	38
Argentina	87	83	70	60	59	48	43	39
Ecuador	48	52	40	51	39	38	42	40
Saint Lucia	38	33	44	35	57	42	40	41
Armenia	53	76	46	47	48	45	46	42

Table 17 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Sierra Leone	57	54	54	61	60	55	48	43
Mauritius	55	55	52	53	46	50	45	44
Barbados	44	43	42	49	50	46	44	45
Tajikistan	43	53	53	55	51	52	50	46
Paraguay	45	47	55	58	54	54	49	47
Chile	41	37	39	38	41	41	47	48
Guatemala	54	48	49	57	56	58	52	49
Albania	56	59	57	62	53	56	54	50
Egypt	47	50	51	54	55	59	53	51
Brazil	34	34	35	39	35	43	51	52
Serbia	66	64	67	63	65	63	56	53
Montenegro	73	73	82	67	64	61	55	54
Ukraine	80	72	73	70	68	64	58	55
Honduras	74	67	66	77	79	70	61	56
Japan	6	3	3	7	9	23	31	57
Philippines	75	69	69	71	77	85	67	58
Malaysia	93	81	84	79	76	78	59	59
Sri Lanka	79	74	72	89	87	73	66	60
Kazakhstan	69	68	59	50	58	60	57	61
Lebanon	37	38	62	66	69	62	64	62
Guinea-Bissau	108	86	89	90	80	84	70	63
Uzbekistan	83	82	77	78	85	76	69	64
Afghanistan	68	57	71	69	75	79	63	65
Hungary	58	58	61	65	67	67	65	66
Turkmenistan	89	95	94	95	84	81	72	67
Lithuania	71	70	60	59	52	57	60	68
Djibouti	105	101	107	102	117	101	80	69
Finland	14	14	14	13	13	14	25	70
Republic of Moldova	78	90	78	87	95	86	78	71
Mongolia	103	105	87	82	91	88	77	72
Bahrain	119	123	81	76	74	66	62	73
Nepal	106	111	99	86	90	91	76	74
Cameroon	61	106	65	64	62	74	74	75
Costa Rica	92	88	86	83	83	69	71	76
Panama	107	100	104	100	96	80	75	77
Tunisia	94	92	90	88	86	87	82	78
Viet Nam	64	60	83	81	78	83	81	79
Belarus	137	122	137	97	93	100	85	80
Latvia	36	41	41	36	33	53	68	81
United Arab Emirates	67	71	79	72	66	68	73	82
Estonia	88	96	92	80	71	75	79	83
Algeria	113	108	116	117	113	106	95	84

Table 17 (continued)

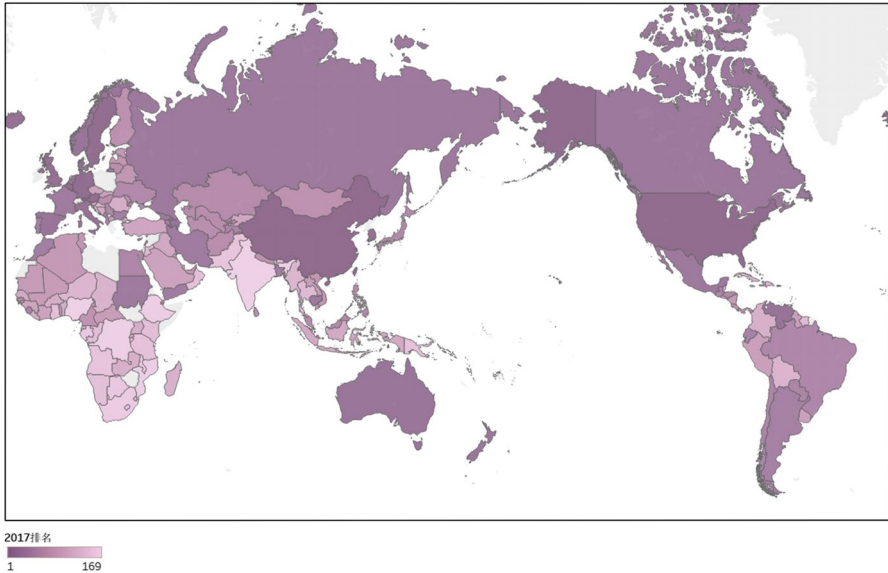
Country	2010	2011	2012	2013	2014	2015	2016	2017
Nicaragua	124	119	98	93	105	98	91	85
Comoros	117	77	100	84	89	94	86	86
Togo	95	80	96	108	97	96	89	87
Mauritania	81	87	97	110	98	89	84	88
Mali	86	99	105	96	109	97	93	89
Central African Republic	110	102	102	104	100	102	94	90
Republic of North Macedonia	82	94	101	114	88	92	90	91
Lao People's Democratic Republic	112	78	80	113	115	112	102	92
Antigua and Barbuda	101	109	111	112	108	109	96	93
Guyana	125	124	121	92	102	107	103	94
Peru	85	85	88	99	114	104	100	95
Uruguay	104	103	95	85	92	93	88	96
Slovakia	50	51	58	56	63	65	83	97
Czechia	63	65	76	73	73	82	87	98
Maldives	91	97	114	107	103	90	97	99
Saudi Arabia	111	114	112	111	101	95	101	100
Cote d'Ivoire	84	84	103	109	107	108	104	101
Slovenia	49	61	74	75	72	77	92	102
Haiti	140	148	142	131	128	120	109	103
Guinea	97	91	85	91	110	110	106	104
Turkey	126	116	118	116	111	113	107	105
Kyrgyzstan	114	117	117	115	104	99	99	106
El Salvador	109	110	113	120	119	114	114	107
Iraq	135	134	106	106	99	118	111	108
Kuwait	98	98	93	98	94	105	105	109
Jamaica	115	107	126	126	122	115	130	110
Indonesia	129	127	129	130	129	122	110	111
Bosnia and Herzegovina	102	104	108	101	106	111	108	112
Senegal	122	121	119	118	120	119	113	113
Qatar	77	93	110	103	82	72	98	114
Liberia	144	133	134	129	132	116	112	115
Uganda	155	152	131	143	138	129	121	116
Romania	123	125	127	123	124	121	116	117
Burkina Faso	141	118	124	135	126	127	120	118
Benin	120	126	120	119	118	123	117	119
Zambia	138	129	132	139	141	135	124	120
Colombia	128	128	133	134	131	130	122	121
Rwanda	143	142	139	142	142	132	125	122
Madagascar	127	135	125	144	121	136	118	123
Fiji	150	145	144	147	143	134	126	124
Chad	96	113	115	121	127	125	119	125
Belize	132	131	130	128	134	128	127	126

Table 17 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Bolivia (Plurinational State of)	133	137	135	133	137	133	128	127
Cabo Verde	134	138	138	136	144	137	129	128
Myanmar	59	49	91	94	112	117	123	129
Niger	76	79	75	124	136	139	132	130
Bhutan	163	162	140	141	139	138	133	131
Dominican Republic	100	112	122	122	130	131	131	132
Saint Vincent and the Grenadines	146	147	64	146	61	164	115	133
Cuba	151	150	154	151	148	140	135	134
Equatorial Guinea	145	143	148	138	133	143	137	135
Suriname	154	154	152	154	151	146	143	136
Thailand	142	146	145	145	145	144	138	137
Jordan	130	132	136	132	135	141	136	138
Eswatini	156	155	159	159	159	151	140	139
Croatia	90	115	123	125	125	126	134	140
Congo	118	139	151	149	153	149	142	141
Kenya	116	136	155	153	156	152	146	142
Ghana	161	163	147	157	147	145	139	143
Lesotho	157	158	156	156	155	148	141	144
Namibia	160	159	160	160	161	157	147	145
Tonga	158	157	158	158	158	153	144	146
Oman	149	151	149	152	149	147	145	147
United Republic of Tanzania	159	160	170	169	168	160	152	148
Papua New Guinea	167	168	166	168	166	161	153	149
Burundi	148	149	153	155	152	156	149	150
Angola	153	156	157	162	154	158	151	151
Pakistan	136	140	146	148	150	155	150	152
Gambia	152	153	150	150	157	154	148	153
Vanuatu	170	169	168	166	170	166	158	154
Seychelles	165	164	164	164	163	159	155	155
Solomon Islands	173	171	172	173	172	168	160	156
Botswana	168	167	165	171	167	165	157	157
Samoa	164	165	163	165	165	163	156	158
Gabon	147	130	143	140	140	150	154	159
Malawi	171	173	171	172	171	167	161	160
Sao Tome and Principe	131	144	161	163	160	162	159	161
South Africa	172	172	173	174	173	170	162	162
Timor-Leste	166	166	167	167	164	169	163	163
Kiribati	174	174	175	176	174	171	164	164
Ethiopia	175	175	174	175	175	173	165	165
Mozambique	176	176	176	177	176	174	166	166
Democratic Republic of the Congo	169	170	169	170	169	172	167	167
Nigeria	177	177	177	178	177	175	168	168

Table 17 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
India	178	178	178	179	178	176	169	169
Switzerland	1	1	1	1	1	1	NA	NA
Ireland	NA	NA	NA	15	17	15	NA	NA
Greece	20	23	25	28	27	29	NA	NA
Poland	NA	NA	NA	74	70	71	NA	NA
Libya	99	89	109	105	116	103	NA	NA
Zimbabwe	121	120	128	127	123	124	NA	NA
Brunei Darussalam	139	141	141	137	146	142	NA	NA
South Sudan	NA	NA	63	68	81	NA	NA	NA
Micronesia (Federated States of)	162	161	162	161	162	NA	NA	NA
Israel	28	28	27	26	NA	NA	NA	NA
Syrian Arab Republic	60	62	68	NA	NA	NA	NA	NA
Eritrea	72	75	NA	NA	NA	NA	NA	NA

**Fig. 8** 2017 index ranking of public health on a world map

and opportunities in countries. Second, we focus on the gender difference of children's situations from the perspective of poverty, health, and education.

3.10.1 Dimensions and Indicators

Table 18 reports the indicators used in protection of women and children. We use two data sources. The information on children's health and demography is from the WHO, and the remainders are from the World Bank.

Table 18 Data on the protection of women and children

Category	Dimensions	Indicators	Data source	Coverage		
Performance (women)	Health and demography	Life expectancy at birth, ratio female to male (years)	World Bank	155–159 (2010–2017)		
		Maternal mortality ratio female to male (modeled estimate, per 100,000 live births)				
	Economic status	Number of under five death of thousands, female				
		Sex ratio at birth (male to female births)				
		Unemployment, female (% of female labor force)				
		Vulnerable employment, ratio female to male				
	Political status	Wage and salaried workers, ratio female to male				
		Proportion of seats held by women in national parliaments (%)				
	Performance (children)	Children health and demography			Number of deaths per 1000+ (include 13 indicators)	WHO
					Prevalence of thinness among children and adolescents, BMI < -2 standard deviations below the median (crude estimate) (%)	
	Children education (the educational difference between males and females)	School enrollment, primary (gross), gender parity index (GPI)	World Bank			

3.10.2 Results

The ranking results of countries' contributions to global justice from the perspective of protection of women and children during 2010–2017 are presented in Table 19.

Our robust result during 2010–2017 in Table 19 shows that countries such as China, the United States, Russia, Mexico, Germany, and other North European countries are at the top levels for protection of women and children, which suggests that these countries do well in protecting their women and children. However, most African countries (e.g., Nigeria, Congo, Egypt, and Kenya) and South Asian countries (e.g., Pakistan, Indonesia, and Afghanistan) display low levels.

The following map displays the results of the protection of women and children in 2017. The higher the ranking in the protection of women and children, and vice versa. As the map shows, generally, the countries in the south and west and the countries in Africa rank lower, whereas China, the North American countries, and European countries rank high (Fig. 9).

Protection of women and children focuses on gender inequality. As introduced in the methodology section, we use a population-based weighed score of indices to construct the score of this issue in the perspective of global justice. Thus, the highest score does not mean the top level of protection of women and children. For instance, China ranks first of all countries in this protection of women and children in 2017. However, this finding does not mean that China performs the best of all countries; by contrast, the finding means that China has made a sufficient number women and children far better off than the world average.

3.11 Global Justice Index: Our Main Results

This study has the limitation of the dilemma of missing values. For instance, for climate change, most notably, the data on carbon emission are unavailable after 2014. Another limitation is that, for anti-poverty, the data for many countries were unavailable. Thus, we provide a global justice index that excludes anti-poverty (Table 20) and climate change (Table 21), respectively. Next, we provide a global justice index that excludes anti-poverty and climate change (Table 22). Finally, we provide a global justice index of all nine issues (Table 23).

In Table 20, the United States, the United Kingdom, Germany, China, and France rank as the top five in the global justice index that excludes anti-poverty. Other developed countries such as Switzerland, Sweden, Italy, Canada, and Finland also perform well in the global justice index. Developing countries, by contrast, do not perform well in general. China is an exception, because this largest developing country ranks fourth in the index. Brazil's ranking is approximately 15th, which is the second-highest country in the developing world. The results in Table 20 imply that the more developed a country's economy, the higher its ranking in the global justice index. Figure 10 also presents the index of global justice (except for anti-poverty) in 2014.

In Table 21, the United States, the United Kingdom, Germany, Italy, France, and other developed countries perform well in the global justice index except for climate change. The United States ranks the highest in the index. Among developing countries,

Table 19 Country ranking in protection of women and children

Country	2010	2011	2012	2013	2014	2015	2016	2017
China	1	1	1	1	1	1	1	1
United States of America	2	2	2	2	2	2	2	2
Russian Federation	3	3	3	3	3	5	5	3
Mexico	7	6	5	5	5	3	3	4
Germany	5	4	4	4	4	4	4	5
United Kingdom of Great Britain and Northern Ireland	6	7	7	8	7	6	6	6
France	8	8	6	7	8	8	8	7
Italy	9	9	8	9	10	9	9	8
Spain	10	12	12	14	13	12	11	9
Argentina	11	10	10	11	11	11	10	10
Poland	16	15	15	16	15	14	12	11
Republic of Korea	12	11	9	12	12	13	13	12
Canada	14	14	13	15	14	15	15	13
Ukraine	19	19	17	20	16	16	16	14
Australia	17	17	16	17	19	18	18	15
Viet Nam	23	22	11	22	20	17	17	16
Brazil	139	140	20	10	9	10	14	17
Thailand	15	13	14	13	17	33	19	18
Netherlands	18	18	19	19	21	20	20	19
Saudi Arabia	60	54	45	24	29	23	27	20
Philippines	13	16	18	18	18	19	21	21
Sweden	26	24	23	23	22	21	22	22
Kazakhstan	31	30	26	27	25	22	26	23
Cuba	24	21	21	21	24	25	25	24
Belgium	27	25	24	25	23	24	24	25
Romania	35	41	38	35	35	31	31	26
Belarus	28	26	25	26	26	26	23	27
Syrian Arab Republic	70	37	35	28	28	28	29	28
Colombia	58	108	110	62	27	27	28	29
Czechia	29	28	28	31	30	29	32	30
Portugal	42	33	39	40	34	30	30	31
Israel	41	40	40	39	42	34	34	32
Dominican Republic	109	62	63	46	45	54	40	33
Austria	34	32	34	33	33	32	33	34
Finland	38	35	36	34	39	37	35	35
Norway	36	36	37	36	40	39	36	36
Denmark	37	38	42	41	43	41	37	37
Switzerland	39	39	41	42	41	40	39	38
Bulgaria	44	44	44	43	50	45	46	39
Peru	25	29	43	67	55	46	38	40
Serbia	52	55	49	52	46	44	45	41
Ireland	47	49	50	50	54	52	47	42

Table 19 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Venezuela	40	27	27	30	31	38	61	43
Hungary	43	43	48	44	44	43	44	44
Chile	49	51	56	49	49	48	52	45
Tunisia	55	64	60	54	47	50	51	46
New Zealand	45	45	47	45	52	51	49	47
Slovakia	50	50	52	51	56	57	53	48
Bolivia	105	105	105	109	58	53	48	49
Malaysia	22	20	22	29	32	42	50	50
Costa Rica	46	47	51	48	57	58	54	51
Kyrgyzstan	51	53	57	57	59	60	57	52
Senegal	72	46	29	56	53	47	59	53
Lebanon	104	81	76	60	63	64	60	54
Ecuador	30	31	31	38	36	36	43	55
Kuwait	57	59	58	55	62	62	56	56
Uzbekistan	33	34	33	37	38	56	58	57
Republic of Moldova	54	56	59	58	60	59	62	58
Nicaragua	61	48	53	59	61	61	64	59
Lithuania	56	61	62	61	64	63	63	60
Tajikistan	59	63	67	63	65	65	65	61
Croatia	53	57	66	64	66	69	67	62
Slovenia	62	58	68	65	68	66	66	63
Rwanda	32	42	46	53	51	49	55	64
Uruguay	67	68	73	69	69	70	69	65
Panama	78	66	74	73	67	67	68	66
Greece	48	52	61	71	71	71	75	67
Qatar	64	69	69	66	70	73	71	68
Mongolia	77	74	72	70	74	74	72	69
Estonia	65	67	71	72	76	75	73	70
Latvia	66	65	70	68	73	72	70	71
Trinidad and Tobago	69	70	75	74	77	76	77	72
Albania	96	82	94	93	88	84	81	73
Georgia	73	76	85	81	81	78	76	74
Republic of North Macedonia	74	77	79	77	79	77	79	75
El Salvador	99	88	81	88	75	68	78	76
Cyprus	68	72	78	76	80	82	80	77
Mauritius	71	71	77	75	78	79	82	78
Iceland	75	78	82	82	86	83	83	79
Malta	80	79	86	83	85	85	85	80
Bahrain	79	73	80	78	83	81	84	81
Montenegro	83	80	83	84	87	87	87	82
Luxembourg	76	75	84	85	84	86	86	83
Suriname	86	84	89	87	90	88	89	84

Table 19 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Armenia	101	101	102	105	105	102	98	85
Barbados	84	83	87	86	89	89	90	86
Saint Vincent and the Grenadines	90	89	91	90	91	90	92	87
Samoa	88	87	92	92	92	91	91	88
Tonga	89	90	93	91	93	92	93	89
Brunei Darussalam	NA	NA	NA	NA	NA	NA	94	90
Cabo Verde	97	94	99	99	100	98	96	91
Belize	95	96	97	96	99	97	100	92
Vanuatu	91	91	95	94	95	95	97	93
Fiji	85	85	88	89	94	93	95	94
Sao Tome and Principe	93	93	96	95	97	96	99	95
Sri Lanka	81	104	65	79	82	100	104	96
Solomon Islands	94	95	98	97	102	101	101	97
Guyana	87	86	90	98	98	99	102	98
Maldives	98	99	101	102	103	104	105	99
Timor-Leste	100	100	100	101	101	103	103	100
Bhutan	92	98	103	103	106	105	106	101
Paraguay	106	103	107	80	104	94	107	102
Comoros	103	109	104	106	108	106	109	103
Djibouti	111	106	108	107	109	108	110	104
Honduras	63	60	64	100	96	80	108	105
Equatorial Guinea	108	107	109	108	110	110	111	106
Botswana	113	111	112	110	111	112	113	107
Azerbaijan	102	97	111	114	112	116	117	108
Oman	110	102	106	104	107	107	114	109
Eswatini	119	116	116	113	114	113	115	110
Namibia	114	112	115	116	115	111	112	111
Lesotho	115	114	114	112	113	114	116	112
Gambia	112	110	113	115	116	115	118	113
Cambodia	121	119	121	121	117	109	119	114
Congo	126	123	118	120	121	121	122	115
Lao People's Democratic Republic	124	118	120	119	122	122	121	116
Mauritania	116	115	117	118	119	119	120	117
Algeria	136	131	55	47	48	55	74	118
Burundi	122	122	123	122	123	123	124	119
Guatemala	117	92	119	117	118	120	125	120
Nepal	21	23	30	111	120	117	123	121
Togo	127	126	126	123	125	124	127	122
Madagascar	128	127	125	126	126	126	128	123
Central African Republic	132	132	132	125	128	128	131	124
Malawi	125	125	124	127	130	129	132	125
Papua New Guinea	130	128	127	129	127	131	129	126

Table 19 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Uganda	107	117	122	128	129	127	130	127
Sierra Leone	NA	130	129	130	NA	133	133	128
Zambia	129	129	130	131	134	136	134	129
Turkey	141	135	133	134	131	130	136	130
United Republic of Tanzania	120	120	131	137	133	132	135	131
Benin	131	134	135	132	135	137	138	132
Iran	145	145	142	139	132	134	139	133
Morocco	137	133	134	133	136	138	140	134
Myanmar	133	137	136	136	139	135	137	135
Burkina Faso	138	138	140	138	137	140	143	136
Guinea	135	136	137	135	138	139	142	137
South Africa	142	141	139	142	140	142	141	138
Niger	143	142	141	140	141	143	144	139
Ghana	134	139	138	141	142	141	145	140
India	155	155	152	150	152	153	150	141
Mozambique	140	143	143	147	145	145	146	142
Cameroon	146	147	146	143	143	144	147	143
Bangladesh	20	NA	NA	NA	NA	NA	NA	144
Chad	147	146	145	146	146	147	148	145
Mali	144	144	144	144	144	146	149	146
Ethiopia	151	150	149	152	151	151	151	147
Yemen	150	149	148	149	148	150	152	148
Kenya	148	148	147	148	147	149	153	149
Afghanistan	152	151	150	151	149	152	154	150
Indonesia	4	5	54	145	150	154	156	151
Egypt	153	153	151	153	153	156	155	152
Democratic Republic of the Congo	154	154	153	154	154	155	157	153
Pakistan	156	156	155	155	155	157	158	154
Nigeria	157	157	154	156	156	158	159	155
Japan	NA	NA	NA	6	6	7	7	NA
United Arab Emirates	NA	NA	32	32	37	35	41	NA
Bahamas	82	NA	NA	NA	NA	NA	88	NA
Liberia	NA	124	NA	NA	124	125	126	NA
Democratic People's Republic of Korea	NA	NA	NA	NA	NA	118	NA	NA
Angola	149	152	NA	NA	NA	148	NA	NA
Turkmenistan	NA	NA	NA	NA	72	NA	NA	NA
Zimbabwe	NA	NA	128	124	NA	NA	NA	NA
Eritrea	123	121	NA	NA	NA	NA	NA	NA
Gabon	NA	113	NA	NA	NA	NA	NA	NA
Guinea-Bissau	118	NA	NA	NA	NA	NA	NA	NA

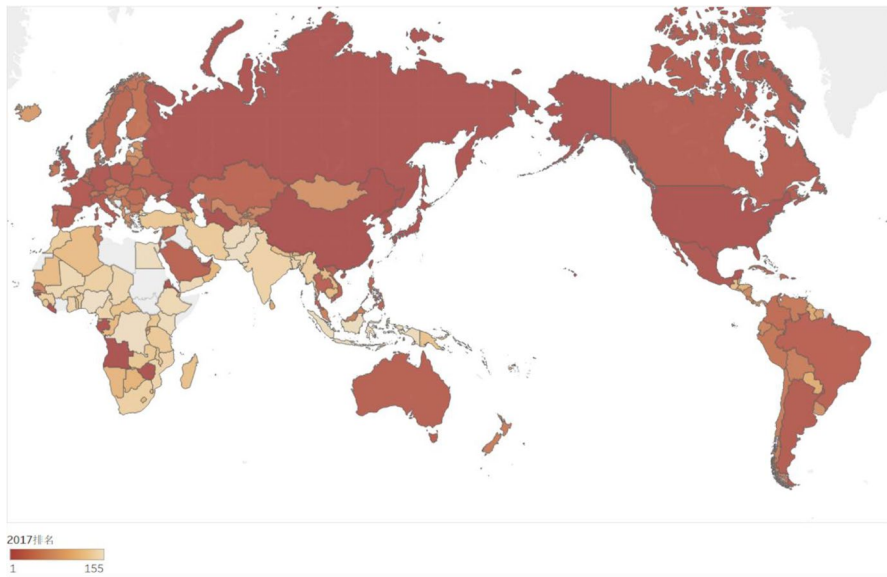


Fig. 9 2017 index ranking of protection of women and children on a world map

China, Slovenia, and Mexico's rankings are notable. China ranks fourth in the years of 2011, 2012, 2014, and 2015. However, the problem is that we only have ranking results of approximately 40 countries from 2010 through 2017. Figure 11 also shows the index of global justice (except for climate change) in 2017.

Table 22 shows the results of the global justice index without considering climate change and anti-poverty from 2010 to 2017. This table presents approximately 100 countries' ranking results. Once again, the United States, Germany, the United Kingdom, China, and France rank as the top five in the global justice index that excludes climate change and anti-poverty. China performs best in the developing world, followed by Rwanda, another developing country, in 2017. Other developing countries such as Bangladesh, Brazil, Nepal, and Cyprus rank in the top 20, as well. Figure 12 also shows the index of global justice (except for climate change and anti-poverty) in 2017.

Table 23 presents the global justice index with nine issues areas covered. The United States, the United Kingdom, Germany, China, and France rank as the top five in the global justice index. China is the highest ranking developing country and the United States performs best in the index. Other developed countries that rank among the top 20 include Switzerland, Norway, Sweden, Italy, Finland, Canada, Denmark, Belgium, Spain, Ireland, and Luxembourg. In the developing world, Brazil, Russia, Mexico, Slovenia, and Costa Rica have also done well in the index. We compare Tables 20, 21, 22, and 23, and observe that most countries' rankings are consistent in these tables. For example, the United States always ranks first in these results. Similarly, China consistently ranks among the top of the developing countries. This

Table 20 Global Justice Index (except for anti-poverty)

Country	2010	2011	2012	2013	2014
United States of America	1	1	1	1	1
United Kingdom of Great Britain and Northern Ireland	3	3	3	2	2
Germany	2	2	2	3	3
China	7	5	5	5	4
France	4	4	4	4	5
Switzerland	NA	NA	6	6	6
Norway	NA	NA	NA	7	7
Sweden	9	9	7	8	8
Italy	5	7	9	10	9
Finland	10	10	10	11	10
Canada	8	8	8	9	11
Denmark	NA	NA	NA	NA	12
Spain	6	6	11	12	13
Belgium	NA	NA	NA	NA	14
Japan	NA	NA	NA	14	15
Brazil	12	12	12	15	16
Australia	11	11	13	13	17
Nepal	64	13	15	17	18
New Zealand	NA	NA	NA	16	19
Ukraine	52	59	57	55	20
Luxembourg	NA	NA	14	NA	21
Ghana	NA	73	18	23	22
Russian Federation	14	14	16	19	23
Ireland	NA	NA	NA	18	24
Senegal	19	20	21	25	25
Portugal	13	15	17	24	26
Uruguay	15	16	23	20	27
India	68	40	NA	21	28
Iceland	NA	22	19	22	29
Mexico	18	19	22	28	30
Slovenia	16	18	20	27	31
United Republic of Tanzania	26	28	39	32	32
Cambodia	33	33	32	33	33
Costa Rica	NA	21	24	29	34
Cameroon	NA	45	46	NA	35
Estonia	21	25	29	34	36
Togo	49	51	42	41	37
Latvia	25	29	26	30	38
Argentina	23	23	27	31	39
Chile	28	30	33	35	40
Guatemala	22	24	30	36	41
Hungary	32	32	35	40	42

Table 20 (continued)

Country	2010	2011	2012	2013	2014
Peru	24	26	34	39	43
Cyprus	20	27	31	37	44
Indonesia	17	17	25	38	45
Ecuador	41	44	44	47	46
Lithuania	40	41	40	43	47
Benin	37	48	48	48	48
Albania	29	35	38	45	49
Poland	NA	NA	NA	44	50
Bulgaria	36	43	43	46	51
Honduras	NA	NA	NA	51	52
Malaysia	39	38	37	49	53
Sri Lanka	38	42	50	50	54
Croatia	30	46	49	53	55
Nicaragua	45	56	51	56	56
Romania	42	53	55	59	57
Philippines	31	36	41	54	58
Georgia	35	47	52	57	59
Serbia	48	58	59	64	60
Niger	57	62	61	65	61
Turkey	NA	NA	45	52	62
El Salvador	NA	50	NA	61	63
Tajikistan	43	49	53	60	64
Pakistan	27	37	63	58	65
Colombia	44	55	56	63	66
Mauritius	46	57	60	67	67
Malta	NA	60	62	62	68
Mongolia	62	70	69	69	69
Belarus	59	65	68	70	70
Azerbaijan	50	61	65	72	71
Bolivia (Plurinational State of)	NA	63	66	73	72
Namibia	51	NA	NA	NA	73
Kyrgyzstan	55	64	70	74	74
Tunisia	54	67	71	76	75
Republic of Moldova	61	68	73	77	76
Kazakhstan	63	69	74	78	77
Saudi Arabia	56	34	67	26	78
Lebanon	58	66	72	79	79
Qatar	NA	NA	NA	75	80
Republic of Korea	65	71	75	80	81
Bahrain	NA	72	NA	NA	82
Iran (Islamic Republic of)	69	75	76	82	83
Israel	34	52	47	42	NA
Viet Nam	66	74	54	66	NA

Table 20 (continued)

Country	2010	2011	2012	2013	2014
Mozambique	NA	NA	64	68	NA
Zimbabwe	NA	NA	36	71	NA
Uzbekistan	NA	NA	NA	81	NA
Paraguay	NA	NA	28	NA	NA
Kenya	NA	NA	58	NA	NA
Myanmar	NA	31	NA	NA	NA
Panama	NA	39	NA	NA	NA
Ethiopia	60	54	NA	NA	NA
Congo	47	NA	NA	NA	NA
Bangladesh	53	NA	NA	NA	NA
Angola	67	NA	NA	NA	NA

comparison implies that our results are robust and scientific. Figure 13 also shows the index of global justice in 2014.

4 Conclusion

This paper focuses on a measurement and operationalization of global justice that identifies, evaluates, and assesses the performance of nation states in conducting projects and endeavors to promote justice at the global level. First, we briefly introduced our conceptualization of global justice and our development of the theoretical framework, which provides a basis for the subsequent measurement. Through the synthesis of three approaches—rights-based, goods-based, and virtue-based—embedded in the historical discussion of global justice, we proposed the principles of CBDR-RC and CDDR to further determine nine issue areas of crucial importance: climate change, peacekeeping, humanitarian aid, counter-terrorism, cross-national criminal police cooperation, anti-poverty, education, public health, and the protection of women and children. By collecting, processing, and normalizing the data, we generate ranks for each issue area and aggregate them to create the final index. Through various visualization tools, we provide a visual exhibition of the performance and contribution of each nation state in the areas of global justice, the regional comparisons, and the trends of change over time.

Our result shows that the United States, the United Kingdom, Germany, China, and France rank as the top five in the global justice index. The United States undoubtedly ranks first in the index. China ranks the highest among developing countries. In general, developed countries have performed better than their counterparts in the developing world. This finding implies that the more developed and wealthier a country, the higher its ranking.

The contribution of this paper can be summarized as follows: (1) the global justice index is the first attempt to measure the performance and contribution of nation states to enhance justice at the global level; (2) the index presents a rich, comprehensive

Table 21 Global Justice Index (except for climate change)

Country	2010	2011	2012	2013	2014	2015	2016	2017
United States of America	1	1	1	1	1	1	1	1
Germany	3	3	3	3	3	3	2	2
United Kingdom of Great Britain and Northern Ireland	2	2	2	2	2	2	3	3
France	4	5	5	4	5	5	4	4
Sweden	8	9	9	10	9	8	8	5
Canada	7	8	8	7	10	10	6	6
Finland	9	10	11	12	12	13	11	7
Republic of Korea	34	43	46	43	46	15	10	8
Spain	6	7	10	11	13	14	9	9
Russian Federation	15	18	15	29	21	20	14	10
Brazil	11	11	13	13	19	17	15	11
Portugal	16	12	16	19	24	21	18	12
Mexico	19	14	17	17	20	22	12	13
Slovenia	17	16	27	21	29	25	24	14
Cyprus	36	NA	NA	NA	23	48	NA	15
Belarus	35	35	45	48	47	19	33	16
Indonesia	23	20	24	34	34	35	19	17
Latvia	25	22	22	25	28	31	22	18
Honduras	NA	NA	NA	38	39	37	32	19
Serbia	10	38	23	24	43	45	13	20
Hungary	21	19	21	31	27	30	23	21
Peru	28	30	35	36	35	36	26	22
Georgia	24	32	42	41	45	43	28	23
Estonia	12	21	36	23	41	39	21	24
Lithuania	26	26	28	28	25	24	20	25
Argentina	30	28	18	20	22	32	17	26
Kyrgyzstan	20	41	33	35	50	33	37	27
Uruguay	27	27	20	15	38	23	25	28
Romania	22	23	31	30	36	40	30	29
El Salvador	NA	31	NA	40	37	42	27	30
Colombia	31	40	44	39	48	46	35	31
Bolivia (Plurinational State of)	NA	44	40	42	44	41	34	32
Republic of Moldova	33	42	38	45	52	38	31	33
Kazakhstan	32	45	39	46	30	28	16	34
Ukraine	37	34	34	44	17	11	36	35
Italy	5	6	6	9	8	7	5	NA
Norway	NA	NA	NA	6	7	6	7	NA
Costa Rica	NA	29	30	26	32	29	29	NA
Iran (Islamic Republic of)	NA	NA	NA	NA	49	47	38	NA
Malta	NA	15	26	47	51	NA	39	NA
China	NA	4	4	5	4	4	NA	NA
Belgium	NA	NA	NA	NA	14	9	NA	NA

Table 21 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Luxembourg	NA	NA	12	NA	15	12	NA	NA
Iceland	NA	13	14	16	18	16	NA	NA
Ireland	NA	NA	NA	14	16	18	NA	NA
Poland	NA	NA	NA	22	26	26	NA	NA
Ecuador	29	36	37	37	40	27	NA	NA
Turkey	NA	NA	25	27	31	34	NA	NA
Croatia	18	33	29	33	33	44	NA	NA
Switzerland	NA	NA	7	8	6	NA	NA	NA
Denmark	NA	NA	NA	NA	11	NA	NA	NA
Bulgaria	13	24	32	32	42	NA	NA	NA
Israel	14	17	19	18	NA	NA	NA	NA
Paraguay	NA	NA	41	NA	NA	NA	NA	NA
Mongolia	NA	39	43	NA	NA	NA	NA	NA
Pakistan	NA	25	NA	NA	NA	NA	NA	NA
Panama	NA	37	NA	NA	NA	NA	NA	NA

picture of global justice that offers a guide to global justice for individuals who want to observe annual achievement and changes over time; (3) the index is a barometer for the international community to implement and monitor global justice in different issue areas, enabling international organizations and policymakers to target resources and design policies more effectively; and (4) the index can be used as an analytical tool to compare relevant global justice issues across nations and included as a dependent variable or independent variable in causal analysis.

Notably, this study has several limitations: (1) based on the previous theoretical research, we used nine issues to measure global justice. We excluded refugees and other issues which might have also been highly related to global justice for various reasons. (2) Because no theoretical research has provided the weight of the nine issues to global justice, we, in practice, assume that the nine issues equally contribute to global justice. How to weight the nine issues is a subject for further theoretical research. (3) Due to data limitations, we did not include all countries in this study. For some issues, such as poverty, climate change, and education, the problem of missing values is more serious. Thus, in further research, we will continue to collect data to overcome this problem. (4) The results of this study only apply to comparisons between countries in each year because of the various numbers of countries each year. Regarding our conclusion, a comparison of the global justice index across years is inappropriate.

Table 22 Global Justice Index (except for of both climate change and anti-poverty)

Country	2010	2011	2012	2013	2014	2015	2016	2017
United States of America	1	1	1	1	1	1	1	1
Germany	3	3	3	3	3	3	2	2
United Kingdom of Great Britain and Northern Ireland	2	2	2	2	2	2	3	3
China	6	4	4	4	4	4	4	4
France	4	5	5	5	5	5	5	5
Sweden	10	10	9	10	9	8	9	6
Canada	8	8	8	8	10	9	7	7
Australia	9	9	10	11	12	12	10	8
Spain	7	7	11	13	16	14	11	9
Finland	11	11	12	12	13	11	14	10
Republic of Korea	81	89	90	97	97	15	13	11
Rwanda	NA	NA	NA	NA	NA	NA	12	12
Bangladesh	55	NA	NA	NA	NA	NA	NA	13
New Zealand	NA	NA	NA	19	22	18	21	14
Russian Federation	14	13	15	20	24	21	20	15
Brazil	12	12	14	17	18	19	17	16
Nepal	82	21	21	23	23	20	18	17
Cyprus	13	16	17	26	29	23	25	18
Senegal	24	26	25	30	26	24	19	19
Argentina	18	20	18	25	28	26	26	20
Mexico	16	17	19	27	25	22	22	21
Portugal	15	18	20	29	31	28	30	22
Ghana	NA	90	29	33	30	30	24	23
Burkina Faso	57	49	58	48	38	36	23	24
Indonesia	21	22	27	41	54	40	29	25
Chile	25	27	26	32	36	33	32	26
Slovenia	22	28	30	35	39	35	39	27
Qatar	17	23	22	24	32	25	37	28
Uruguay	20	19	24	22	34	32	33	29
Estonia	29	37	38	44	45	41	42	30
Togo	52	57	51	42	35	38	31	31
Hungary	31	30	35	43	47	44	44	32
Malaysia	28	31	31	38	44	48	41	33
Barbados	83	91	91	98	46	39	45	34
Mongolia	44	61	42	39	41	46	36	35
Latvia	27	32	34	36	42	43	48	36
United Republic of Tanzania	54	56	73	47	40	52	34	37
Cambodia	51	50	49	56	48	45	35	38
Ukraine	48	47	41	40	19	29	40	39
Lithuania	32	35	36	45	50	47	50	40
Mauritius	40	46	54	60	58	53	52	41
Oman	NA	NA	NA	NA	NA	NA	NA	42

Table 22 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Mauritania	58	66	74	79	79	77	43	43
Serbia	41	45	52	58	60	55	49	44
Cuba	60	72	77	66	71	60	61	45
Bulgaria	38	41	50	57	63	58	56	46
Peru	36	38	43	55	62	59	51	47
Azerbaijan	30	34	39	53	53	51	53	48
Benin	35	42	46	46	49	50	38	49
Tunisia	37	52	57	65	68	61	57	50
Kazakhstan	42	44	44	51	61	57	59	51
Guatemala	39	39	48	61	64	62	58	52
Belarus	53	59	64	64	67	66	62	53
Romania	47	58	65	70	72	67	64	54
Cameroon	NA	84	83	NA	51	NA	55	55
Albania	45	53	59	67	69	68	60	56
Lebanon	43	51	61	76	84	73	68	57
Honduras	NA	NA	NA	69	73	70	65	58
Croatia	33	43	55	63	70	64	74	59
Republic of Moldova	50	60	60	68	75	72	71	60
Georgia	56	62	67	71	76	78	72	61
El Salvador	NA	63	NA	73	77	75	69	62
Bahrain	NA	69	72	74	83	69	73	63
Guinea	74	82	85	83	88	83	66	64
Burundi	89	NA	NA	NA	NA	71	63	65
Nicaragua	61	70	70	72	78	79	75	66
Niger	66	68	62	62	56	63	47	67
Sri Lanka	62	65	69	75	74	74	76	68
Lao People's Democratic Republic	63	64	71	78	81	81	78	69
Philippines	34	36	47	59	66	80	77	70
Tajikistan	59	67	76	77	80	82	79	71
Saint Vincent and the Grenadines	67	80	63	84	82	87	80	72
Belize	71	81	81	86	90	84	84	73
Lesotho	69	76	80	82	87	89	83	74
Kyrgyzstan	70	77	79	81	85	86	82	75
Maldives	87	94	95	93	96	94	87	76
Colombia	72	83	86	88	93	91	90	77
Uzbekistan	NA	NA	NA	85	89	90	85	78
Pakistan	23	29	68	52	65	65	54	79
Bolivia	NA	85	87	90	92	92	91	80
Mali	65	75	37	49	52	56	88	81
Gambia	73	79	82	87	91	93	89	82
Myanmar	NA	74	NA	NA	NA	NA	NA	83
Sao Tome and Principe	NA	78	88	91	94	95	92	84

Table 22 (continued)

Country	2010	2011	2012	2013	2014	2015	2016	2017
Iran (Islamic Republic of)	84	92	92	99	99	96	94	85
Bhutan	90	96	96	102	100	98	95	86
Italy	5	6	7	9	7	7	6	NA
Norway	NA	NA	NA	6	6	6	8	NA
India	86	33	NA	21	27	27	15	NA
Japan	NA	NA	NA	14	15	NA	16	NA
Singapore	NA	NA	NA	NA	NA	NA	27	NA
Malta	NA	25	28	31	33	31	28	NA
Costa Rica	NA	40	40	50	57	42	46	NA
Sierra Leone	NA	NA	93	101	NA	76	67	NA
Chad	77	88	NA	89	NA	88	70	NA
Liberia	NA	NA	NA	NA	86	85	81	NA
Central African Republic	46	48	66	NA	NA	NA	86	NA
Fiji	88	95	94	100	98	97	93	NA
Belgium	NA	NA	NA	NA	14	10	NA	NA
Luxembourg	NA	NA	13	NA	17	13	NA	NA
Iceland	NA	15	16	18	21	16	NA	NA
Ireland	NA	NA	NA	15	20	17	NA	NA
Poland	NA	NA	NA	34	37	34	NA	NA
South Africa	NA	NA	NA	NA	NA	37	NA	NA
Turkey	NA	NA	32	37	43	49	NA	NA
Ecuador	49	54	56	54	55	54	NA	NA
Switzerland	NA	NA	6	7	8	NA	NA	NA
Denmark	NA	NA	NA	NA	11	NA	NA	NA
Saudi Arabia	26	14	33	16	59	NA	NA	NA
Namibia	68	NA	NA	NA	95	NA	NA	NA
Israel	19	24	23	28	NA	NA	NA	NA
Viet Nam	85	93	78	80	NA	NA	NA	NA
Zimbabwe	NA	NA	53	92	NA	NA	NA	NA
Comoros	NA	NA	NA	94	NA	NA	NA	NA
Uganda	78	87	NA	95	NA	NA	NA	NA
Mozambique	NA	NA	89	96	NA	NA	NA	NA
Paraguay	NA	NA	45	NA	NA	NA	NA	NA
Guyana	64	71	75	NA	NA	NA	NA	NA
Kenya	NA	NA	84	NA	NA	NA	NA	NA
Panama	NA	55	NA	NA	NA	NA	NA	NA
Ethiopia	80	73	NA	NA	NA	NA	NA	NA
Timor-Leste	76	86	NA	NA	NA	NA	NA	NA
Guinea-Bissau	75	NA	NA	NA	NA	NA	NA	NA
Congo	79	NA	NA	NA	NA	NA	NA	NA
Solomon Islands	91	NA	NA	NA	NA	NA	NA	NA
Angola	92	NA	NA	NA	NA	NA	NA	NA

Table 23 Global Justice Index (all nine issues)

Country	2010	2011	2012	2013	2014
United States of America	1	1	1	1	1
United Kingdom of Great Britain and Northern Ireland	2	2	3	2	2
Germany	3	3	2	3	3
China	NA	5	5	9	4
France	4	4	4	4	5
Switzerland	NA	NA	6	7	6
Norway	NA	NA	NA	6	7
Sweden	8	9	7	5	8
Italy	5	8	9	10	9
Finland	9	10	10	12	10
Canada	7	7	8	8	11
Denmark	NA	NA	NA	NA	12
Spain	6	6	11	11	13
Belgium	NA	NA	NA	NA	14
Brazil	10	11	12	13	15
Ireland	NA	NA	NA	17	16
Luxembourg	NA	NA	13	NA	17
Ukraine	37	37	38	44	18
Russian Federation	15	20	14	31	19
Mexico	24	15	17	20	20
Iceland	NA	21	16	21	21
Slovenia	14	13	19	16	22
Portugal	16	12	15	15	23
Latvia	25	18	18	22	24
Costa Rica	NA	17	22	19	25
Argentina	31	32	23	23	26
Hungary	21	19	21	29	27
Lithuania	28	26	26	28	28
Cyprus	36	NA	NA	NA	29
Poland	NA	NA	NA	25	30
Croatia	17	33	29	33	31
Peru	27	25	27	30	32
Estonia	11	14	25	18	33
Uruguay	26	24	20	14	34
Indonesia	18	16	24	34	35
Romania	20	22	33	27	36
Honduras	NA	NA	NA	36	37
El Salvador	NA	28	NA	41	38
Turkey	NA	NA	32	35	39
Ecuador	30	34	35	38	40
Bulgaria	13	23	34	32	41
Colombia	29	35	36	39	42

Table 23 (continued)

Country	2010	2011	2012	2013	2014
Georgia	19	31	39	40	43
Serbia	12	41	28	24	44
Bolivia (Plurinational State of)	NA	42	40	42	45
Kazakhstan	34	45	44	46	46
Republic of Korea	32	40	43	43	47
Belarus	35	38	46	47	48
Kyrgyzstan	23	39	37	37	49
Iran (Islamic Republic of)	NA	NA	NA	NA	50
Malta	NA	29	41	48	51
Republic of Moldova	33	44	42	45	52
Israel	22	30	31	26	NA
Paraguay	NA	NA	30	NA	NA
Mongolia	NA	43	45	NA	NA
Pakistan	NA	27	NA	NA	NA
Panama	NA	36	NA	NA	NA

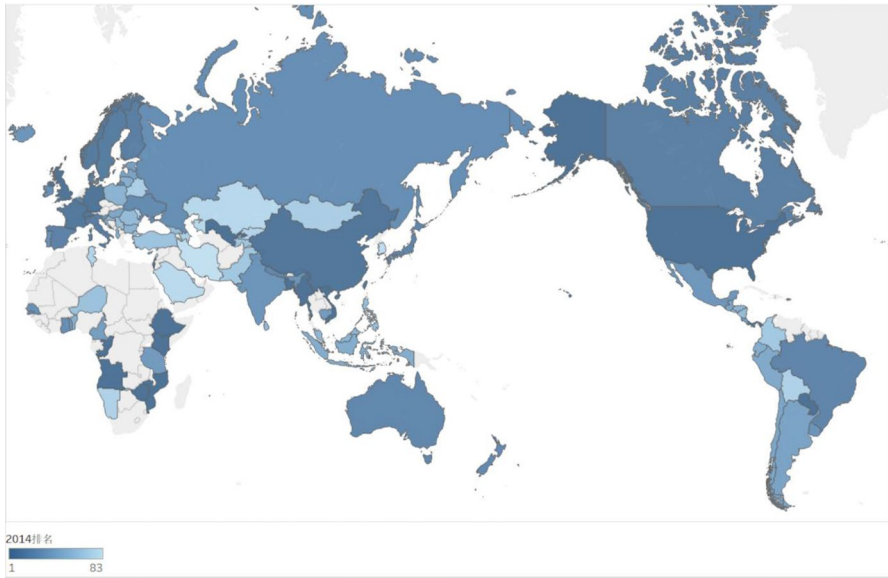


Fig. 10 2014 index ranking of global justice (except for anti-poverty) on a world map

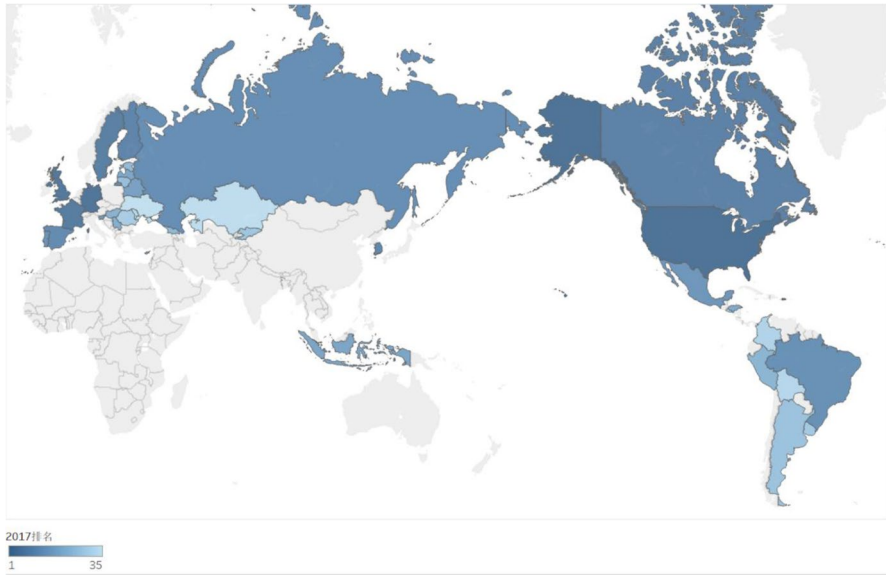


Fig. 11 2017 index ranking of global justice (except for climate change) on a world map

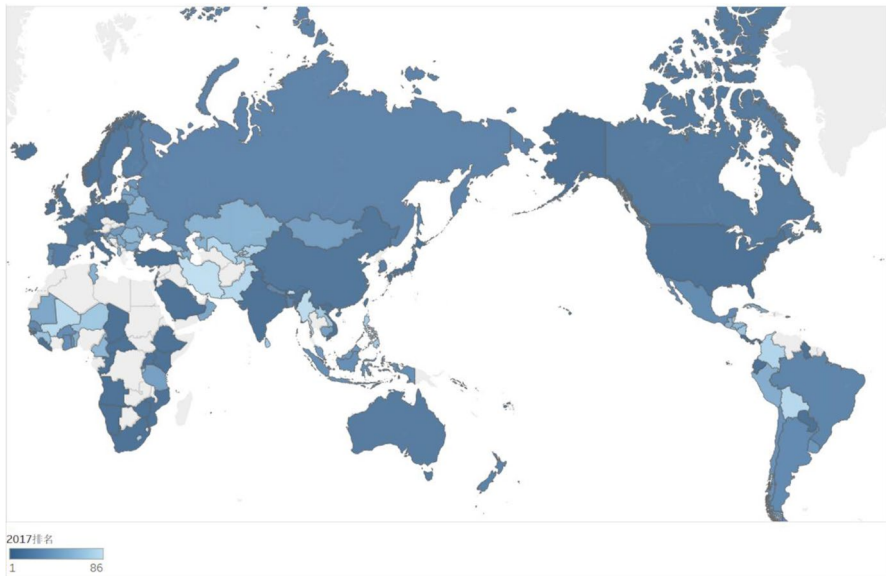


Fig. 12 2017 index ranking of global justice (except for both climate change and poverty) on a world map

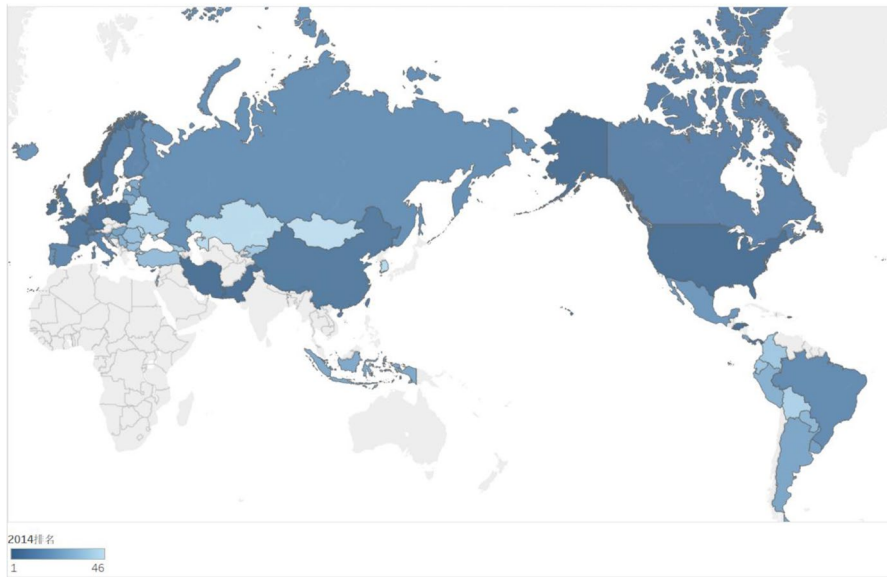


Fig. 13 2014 index ranking of global justice on a world map

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Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest. Authors have no financial or personal relationship with a third party whose interests could be positively or negatively influenced by the article’s content.

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