

Developing a Global Indicator on Bullying of School-aged Children

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DEVELOPING A GLOBAL INDICATOR ON BULLYING OF SCHOOL-AGED CHILDREN

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1. Main messages

The rate of bullying among children is a key indicator of children's well-being and an important marker for comparing global social development.

- Both victims and perpetrators (and to an extent, witnesses; UNESCO, 2016) of bullying in childhood suffer across various dimensions, including personal social development, education, and health, with negative effects persisting into adulthood.
- For policymakers and professionals working with children, high rates of bullying amongst children should raise warning flags regarding child rights' failings (e.g. child protection, education, health, and so on).
- Moreover, bullying amongst school-aged children highlights existing inefficiencies in the social system, and the potential for incurring future social costs in the communities and schools in which children live their lives.

Inevitably, these concerns have contributed to bullying becoming a globally recognised challenge – every region in the world collects information on children's experiences of bullying.

- Yet, despite the identification and monitoring of bullying having global appeal, so far a validated global measure has not been produced.
- To fill this gap in knowledge, this paper develops a global indicator on bullying amongst children using existing school-based surveys from around the world.

The findings of this paper show that bullying is a complex phenomenon that takes multiple forms, and is experienced to widely varying degrees across the world. Importantly:

- Experiencing some form of bullying at least once in a couple of months¹ is most common amongst school children in poorer countries around the globe.
- By region, on average, South Asia and West and Central Africa experience most bullying, while countries from Central and Eastern Europe and the Commonwealth of Independent States (CEE/CIS) experience the lowest rates of bullying.
- Neither girls nor boys are consistently more affected by bullying, but often boys and younger children experience more bullying. Major surveys rarely, if ever, probed bullying experiences based on non-binary disaggregation of sex, a key limitation to be addressed by future studies².

Finally, although surveys can be harmonised to provide a global and robust picture of bullying risks, more effort needs to be made to develop comparable and meaningful estimates of bullying to inform policy and practice worldwide.

¹ The definition of bullying as the experience of any type (teased, left out of play, had lies spread about them, been threatened, hit, forced to do things, had things stolen, or made to feel afraid), at least once in a couple of months, has been selected as the most robust definition for global, national and by-region comparisons.

² The authors recognise the limitation of the binary disaggregation of sex used in this paper, which was a function of existing data availability. Future cross-national studies should further probe bullying experiences in the sub-categories of boys and girls based on sexual orientation and gender identity (UNESCO, 2016).

2. The need to address bullying in schools: for children's rights, well-being, and school effectiveness

Addressing bullying in schools is important for a number of reasons. First, from a child rights perspective (as well as arguably a moral and ethical standpoint), all adults, whether parents, teachers, school principals or policymakers, have a responsibility to ensure that children under their care are safe (from both physical threats of violence and passive forms of aggression), and are facilitated in accessing their rights to be heard, to be educated, and to be healthy (both emotionally and physically), amongst others (UNCRC, 1989). Action to combat bullying in schools is undoubtedly a major contributor to the achievement of child rights globally.

Second, with regard to child well-being, bullying in schools has been a long-standing concern for educationalists, health professionals, child advocates, researchers and policymakers alike. Bullying has been linked to a variety of negative child well-being outcomes, including poorer education results and mental health problems such as anxiety and depression symptoms, suicide ideation, self-harm and violent behaviour, which have been found to persist into adulthood (Schwartz, Lansford, Dodge, Pettit, & Bates, 2015; Arseneault, Bowes, & Shakoor, 2010; Rudolph et al., 2014; Wolke, Copeland, Angold, & Costello, 2013; Copeland, Wolke Angold, & Costello, 2013; Olweus, 1994; Rueger, Malecki, & Demaray, 2011). These associations have been found in both developed and developing countries (Boyes, Bowes, Cluver, Ward, & Badcock, 2014; Brown, Riley, Buchart, & Kann, 2008).

Moreover, bullying is not only a concern for the victim's well-being, as research has shown that being the child that bullies is also associated with poorer child and later-life outcomes (Copeland et al., 2013). In particular, bullies have been shown to exhibit higher antisocial and risk-taking behaviour, as well as later criminal offending (Ttofi, Farrington, Lösel, & Loeber, 2011; Liang, Flisher, & Lombard, 2007). Importantly, being both a perpetrator of bullying as well as the victim further compounds risks for psychological and conduct problems (Haynie et al., 2001; Copeland et al., 2013).

Bullying does not only represent a cost to the children involved, it is also a serious concern for policymakers and child practitioners. Education constitutes the largest public investment on children in the vast majority of countries globally (see OECD, 2016 and expenditure figures in World Bank data, 2016), and is a key factor in breaking cycles of disadvantage and dependency. Due to its damaging effects on learning and behaviour (e.g. disrupted classrooms and children being unable to concentrate on lessons due to fear; see Richardson, Benitez and Hiu, forthcoming), bullying in schools could reduce the effectiveness of public investment in children. Beyond decreasing the cost effectiveness of child policies, experiences of bullying may lead children to contribute less to the social and economic development of the communities and countries in which they live or incur future costs through risk-taking and criminal behaviour.

2.1 Aims and structure of the paper

The purpose of this paper is to document the process of building and validating a global indicator of bullying in schools. This paper will present and assess global information on the bullying of school-aged children, overall and by gender, as well as examine the feasibility of developing a global measure from existing survey data. This paper also aims to provide basic analyses on bullying rates (as measured in this study) and its links to potential macro-level determinants, such as national income inequality, wealth, and heterogeneity in socio-demographic characteristics, as well as its associations with educational outcomes, youth suicide rates, and estimates of mental health on a national level.³

³ Data on suicide, mental health, and socio-demographics are not yet reported in this draft version.

Finally, as will be addressed in Section 7– and although this particular indicator *is not* developed for the purposes of operationalising an SDG goal – a further ambition of this work is to assess the feasibility of repeating these methods for indicators that may be used to operationalise the Sustainable Development Goals (SDGs) and targets. Of the 17 global goals, and over 140 targets, many are without existing global indicators, and will either need new primary collections of data or assessments of available data and secondary analyses similar to this process. In the absence of a globally representative survey of children, this work serves as a basis for exploring new methods of global indicator development.

The remainder of the paper is structured as follows. Section 3 introduces the comparative sources used to populate the Global Bullying Database (GBD) and contents of the database itself. Section 4 presents the raw data showing high and low estimates, how these vary by gender, and initial sensitivity tests. Section 5 undertakes further tests to assess the robustness of comparing the findings across the various cross-national surveys using normalised estimates. Section 6 undertakes global comparisons of bullying by order of countries with comparable data in low-, medium-, and high-risk bullying groups. Section 6 also presents basic bivariate analyses of potential factors related to the difference in children’s risk of bullying in different countries. Section 7 concludes with a brief reflection on the potential contribution of this study to the SDG data challenge.

3. The Global Bullying Database (GBD): sources, contents, and analysis

This section introduces the comparative sources of bullying data, the contents of the GBD, and the data used to inform the analysis below.

3.1 Comparative data sources on bullying

The GBD combines data from six international surveys on bullying prevalence amongst 11- to 15-year-olds in 145 countries, with a special focus on 12- to 13-year-olds⁴. The six international surveys are:

- Health Behaviour in School-aged Children (HBSC; 2001/2; 2009/10; 2013/4 – 36 countries; 11- to 15-year-olds)
- Global School-based Student Health Surveys (GSHS; 2003-2014 – 85 countries; 13- to 15-year-olds)
- Trends in Mathematics and Science Study (TIMSS; 2011 – 46 countries; 11- to 15-year-olds)
- Children’s Worlds Report (2015 – 16 countries; 12-year-olds) Second Regional Comparative and Explanatory Study (SERCE) by Latin American Laboratory for Assessment of the Quality of Education (LLECE; SERCE, 2008 – 16 countries; 6th Graders/11- to 12-year-olds)
- Third Regional Comparative and Explanatory Study (TERCE) by LLECE (TERCE, 2015 – 15 countries and the State of Nuevo Leon; 6th Graders/11- to 12-year-olds).

Table 1 reports the way in which bullying is defined and itemised by each survey. It compares the definitions of bullying used, as well as the timescales and frequencies that children are asked to refer to when reporting their experiences of being bullied. From the information in Table 1 it is worth noting that:

⁴ Apart from China (2003; GSHS), Kenya (2003; GSHS), Uganda (2003; GSHS), Zimbabwe (2003; GSHS), Zambia (2004; GSHS), Israel (2001; HBSC), Botswana (2005; GSHS), and Senegal (2005; GSHS) all data was collected within the last 10 years.

- What constitutes the experience of being bullied varies from a broad definition, including indirect bullying such as experiences of being teased or being excluded, which is used by HBSC and GSHS, to narrower definitions around direct bullying, for example physical threats and violence, such as in TERCE. Both indirect and direct bullying have been shown to have significant negative impact on young people involved (van der Wal, de Wit, & Hirasing, 2003).
- Frequency of bullying refers to the number of instances a child experiences being bullied over a defined period of time, which ranges from once in a month (i.e. about monthly, as in TIMSS; or once or twice in the past couple of months, as in HBSC) to more severe bullying rates of 2-3 times a month or more (or about weekly, as in TIMSS).
- Some of the surveys specifically refer to bullying in school, such as SERCE and TERCE, and HBSC; others do not. All surveys sample school-going children, in the school setting.

Although each is slightly different (some are more broadly defined, and look at different time spans), the surveys are broadly comparable insofar as that they can be used to estimate the proportion of children responding to each survey that have experienced some form of bullying at least once in the past couple of months. All estimates were calculated and collated to populate the GBD.

Table 1: How bullying data is defined and itemised by survey

Survey	Bullying definition	Frequency
Children's World	<ul style="list-style-type: none"> • Being left out by other students • Being hit by other students 	<ul style="list-style-type: none"> • Bullied once in the last month • Bullied 2-3 times in the last month • Bullied more than 3 times in the last month
HBSC	<p>"...a student is being bullied when another student, or a group of students, say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she does not like or when he or she is deliberately left out of things. But it is not bullying when two students of about the same strength or power argue or fight. It is also not bullying when a student is teased in a friendly and playful way."</p>	<ul style="list-style-type: none"> • Bullied once or twice a month at school in the past couple of months • Bullied 2-3 times (a month) or more in the past couple of months
GSHS	As HBSC	<ul style="list-style-type: none"> • Bullied on one or more days during past 30 days
SERCE	<ul style="list-style-type: none"> • Robbed • Insulted or threatened • Physically bullied 	<ul style="list-style-type: none"> • Bullied at school during the past month
TERCE	<ul style="list-style-type: none"> • Teased • Threatened • Left out • Hit • Forced to do things • Afraid (of another classmate) 	<ul style="list-style-type: none"> • Bullied at school during the past month
TIMSS	Made fun of or called names, left out of games or activities, spread lies about, stolen from, hit or hurt and made to do things they didn't want to do by other students.	<ul style="list-style-type: none"> • About weekly: experiencing each of 3 of 6 behaviours "once or twice a month" (i.e. bullied 3-6 times a month) and in addition, each of the other three "a few times a year" on average • About monthly: between weekly and never • Almost never: never experiencing 3 of 6 bullying behaviours, and each of the other 3 "a few times a year" on average

Sources: Trends in Mathematics and Science Study (TIMSS, 2016), The Children's World Survey (IscWEB, 2016), Health Behaviour in School-aged Children Study (HBSC, 2016), The Global School-based Student Health Surveys (WHO/GSHS, 2016), Second Regional Comparative and Explanatory Study (SERCE) and the Third Regional Comparative and Explanatory Study (TERCE, see UNESCO, 2016).

3.2 The contents of the Global Bullying Database (GBD)

Prior to undertaking the analysis in this report, data from all the above surveys (and waves) were collected into a single database. The database recorded:

- a) The country, sub-national entity, and/or region of the sample;
- b) The data source and the year of data collection;
- c) The age(s) of children in the sample(s) or subsample(s) for whom the bullying data is collected;
- d) The definition(s) of bullying; and
- e) The estimate(s) of bullying (of any form, at least once) for the total population, and girls and boys separately.

Also included in the GBD are complementary data on macro-economic and macro-social indicators, by country, mapped to the year during which the bullying survey was in the field. Besides bullying information, data has also been included on Gross Domestic Product (GDP) (USD purchasing power parity (PPP), current prices), Gini index for income inequality (as a proportion of the 0-1 scale); on public educational expenditure (as a proportion of GDP); and net enrolment rates of children of compulsory secondary school age. This complementary data is sourced from the World Development Indicators database (2016).

3.2.1 Definitions

Gini index

The Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality (World Bank, Development Research Group).⁵

GDP per capita based on purchasing power parity (PPP)

PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current international dollars based on the 2011 figures (World Bank, International Comparison Program database).

Government expenditure on education, total (% of GDP)

General government expenditure on education (current, capital, and transfers) is expressed as a percentage of GDP. It includes expenditure funded by transfers from international sources to government. 'General government' usually refers to local, regional and central governments (UNESCO Institute for Statistics).

Secondary school enrolment (% net)

Net enrolment rates represent the ratio of children of official school age who are enrolled in school to the population of the corresponding official school age. Secondary education

⁵ Data are based on primary household survey data obtained from government statistical agencies and World Bank country departments. For more information and methodology, please see PovcalNet (<http://iresearch.worldbank.org/PovcalNet/index.htm>).

completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers (UNESCO Institute for Statistics).

This additional data has been used in the analysis below. The database will be made available online following the launch of the publication.

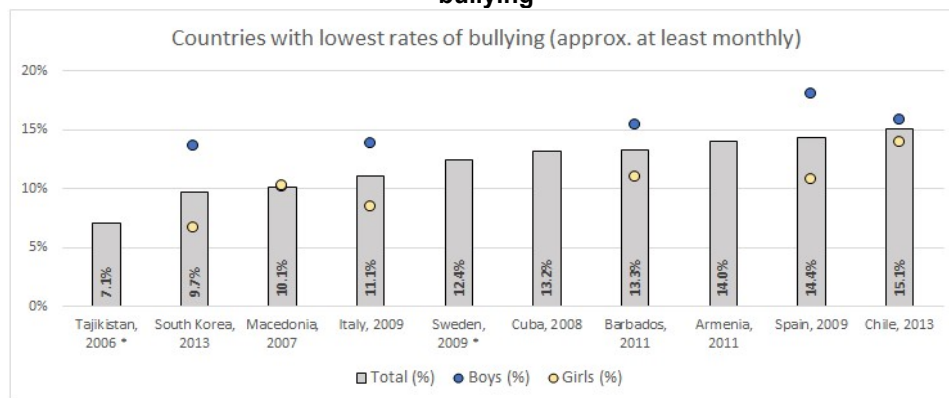
4. What does the raw data look like, and is it fit-for-purpose?

Once the database was complete, the first step was to assess the face-validity of the data by comparing the outer ranges of raw estimates by country and by sex, as well as regional comparisons. The second step was to undertake basic tests to check if there was an indication of whether some surveys produced systematically higher or lower estimates.

4.1 Raw estimates comparisons – the initial comparisons of raw data

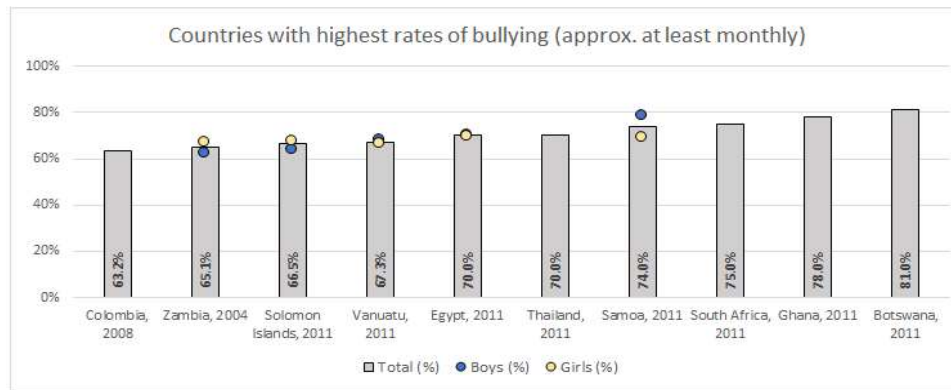
Figures 1 and 2 use raw data combined across all surveys to report the 10 countries with lowest and highest bullying estimates. Results show that the prevalence of bullying varies vastly across countries, from 7.1% in Tajikistan to 81% in Botswana. Bullying rates are roughly aligned with local studies on bullying prevalence. For example, a study reported ~60% of Samoan adults surveyed experienced some form of childhood victimisation (Semenyna & Vasey, 2015) compared with 74% reported in this study. Further, UNICEF’s Vanuatu Field Office reported that 90% of surveyed school children are being affected by bullying, either as victims or as perpetrators (UNICEF Pacific, 2014), while this study reports 67% as being victims of bullying. However, little is known about the factors that drive high or low bullying rates in most of these countries. More research is needed to understand the confluence of factors behind high rates of bullying in these countries, in particular non-WEIRD (White, Education, Industrial, Rich, Democratic) populations (e.g. adoption of corporal punishment, wider societal violence, government policies).

Figure 1: In only two countries, globally, do fewer than one in ten children experience bullying



Source: Author’s analysis of Global Bullying Dataset, 2016.

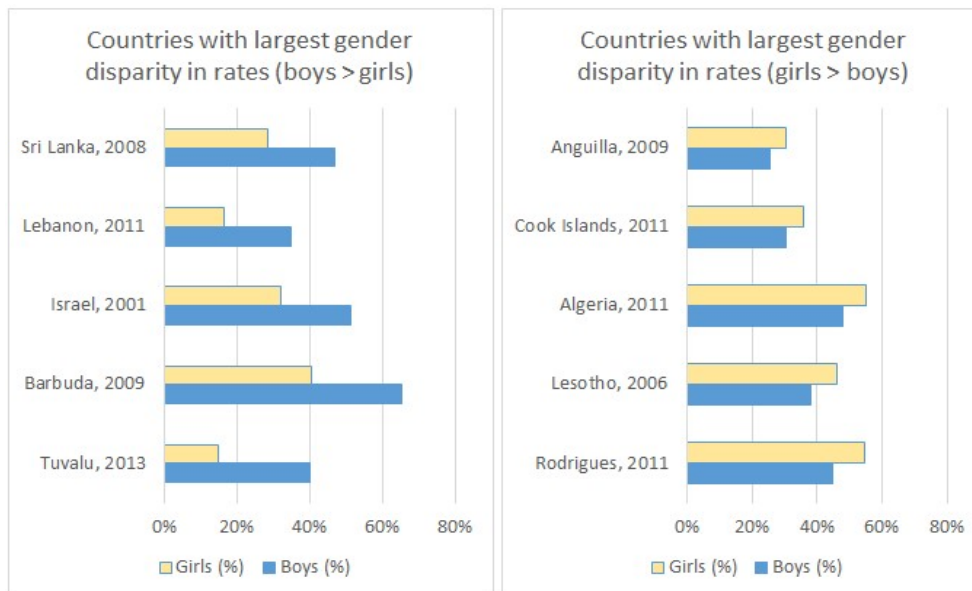
Figure 2: African countries are most common in the top ten countries with highest bullying rates



Source: Author's analysis of Global Bullying Dataset, 2016.

Data split by gender was available for 126 countries. Across this, on average bullying rates for boys (36.1%) were significantly higher than for girls (32.1%; $p < 0.05$). This small (but significant) gap (~4%) between boys and girls may be due to the broad definition of bullying used in this study, which includes both direct and indirect bullying, which has a gender-influenced impact (girls experience more indirect bullying while boys more often experience direct forms; Pells, Portela, & Revollo, 2016). Gender differences were particularly apparent in the countries where boys are bullied much more than girls (left-hand panel of Figure 3). Less than a third of the countries reported higher bullying rates for girls than for boys. In countries where girls are bullied more than boys, this difference is smaller (right-hand panel).

Figure 3: Gender differences are largest when boys are at a higher risk of bullying



Source: Author's analysis of Global Bullying Dataset, 2016.

The regional comparisons in Table 2 are most accurately interpreted in relation to the confidence interval and the number of countries contributing to each value, specifically when breakdowns by gender are made. In the cases of the CEE/CIS region, 9 countries contribute to the bullying average, but only in three cases are gender breakdowns possible. Across regions, South Asia and West and Central Africa (WCAR) have very few observed cases (though gender breakdowns are more comparable than in the CEE/CIS), meaning that the average results are less accurate representations of the regional experience than in other settings (as highlighted by their large confidence intervals).

According to the raw data, results show that countries from the CEE/CIS region report the lowest bullying rates while West and Central African countries report the highest bullying rates amongst all regions.

Table 2: Average bullying prevalence by region^a

	All bullying		Boys		Girls	
	Mean (N)	C.I. (95%)	Mean (N)	C.I. (95%)	Mean (N)	C.I. (95%)
CEE/CIS	26.6 (9)	+/- 9.6%	31.3 (3)	+/- 32%	25.9 (3)	+/- 29.5%
EAPR	41.1 (23)	+/- 6.8%	40.6 (18)	+/- 7.5%	36.7 (17)	+/- 8.6%
ESAR	50.2 (11)	+/- 6.4%	50.9 (11)	+/- 6.3%	49.5 (11)	+/- 6.7%
LACR	34.2 (41)	+/- 3.5%	35.1 (39)	+/- 3.6%	33.1 (39)	+/- 3.3%
MENA	44.6 (22)	+/- 4.4%	45.1 (10)	+/- 7.1%	34.8 (10)	+/- 10%
OECD/EU	34.1 (41)	+/- 3.4%	35.6 (31)	+/- 4.4%	32.1 (31)	+/- 4.3%
SAR	43.5 (4)	+/- 9.7%	46.9 (4)	+/- 6.5%	39.6 (4)	+/- 13.9%
WCAR	53.1 (6)	+/- 12%	51 (5)	+/- 8.3%	45.4 (5)	+/- 9.7%
Total	38.3 (157)	+/- 2.2%	39.3 (121)	+/- 2.5%	35.5 (120)	+/- 2.5%

Note: ^aCountries are organised into the following regional groups: Central and Eastern Europe and the Commonwealth of Independent States (CEE CIS), East Asia and the Pacific region (EAPR), Eastern and Southern African region (ESAR), Latin America and Caribbean Region (LACR), Middle East and North Africa (MENA), OECD or European Union countries (OECD/EU), South Asian region (SAR), West and Central African region (WCAR). C.I. refers to the confidence interval.

Source: Author's analysis of the GBD, 2016.

4.2. Assessing raw data comparability: do some surveys produce systematically higher or lower bullying estimates?

To investigate the potential effect of differing definitions used by each survey, analysis of covariance (ANCOVA) with survey source (6 levels: HBSC, TIMSS, TERCE, SERCE, GSHS, CW) as the random effect independent variable, country region (8 levels, as above in Table 1) as the fixed effect independent variable, age⁶ and year of survey (completed) as covariates, and bullying prevalence (%) as the dependent variable was conducted for any bullying ever (prevalence of those who experienced any type of bullying at least once).

Table 2 presents results which show that significant differences exist for mean estimates produced for country groupings in different surveys – with HBSC standing out as producing a significantly lower mean estimate. The results of the ANCOVA show that survey sources produce significantly different variances, after controlling for the region in which the country is located, date of the survey and age of respondents. TERCE has the lowest variation in scores around the mean, and GSHS and TIMSS have the largest differences.

Table 3: Average bullying prevalence by survey source

Survey source	N	Estimate% (SE)	Std. deviation
Children's World	16	45.9 (3.3)	13.2
GSHS	85	36.2 (1.6)	14.7
HBSC	36	29.6 (1.7)	10.4
SERCE	16	48.6 (3.0)	12.0
TERCE	16	40.5 (1.6)	6.3
TIMSS	44	43.0 (2.2)	14.7

Note: Covariates appearing in the model are evaluated at the following values: Age = 13.19, Year = 2009.9. There was a main effect of survey source (when holding regional effects constant at zero) $F(5, 213) = 5.74, p = 0.002$,

⁶ If only the range was available for age for a survey, the average was used in analysis (GSHS: 13 to 15 years = 14 years; TERCE: 6th Graders/11 to 12 years = 11.5 years; HBSC: 11 to 15 years = 13 years).

and regional group (when holding survey source effects constant at zero), $F(7, 213)=5.44$, $p = 0.001$, when controlling for year of survey completion and age, neither of which were significant.

Source: Author's calculations of the GBD.

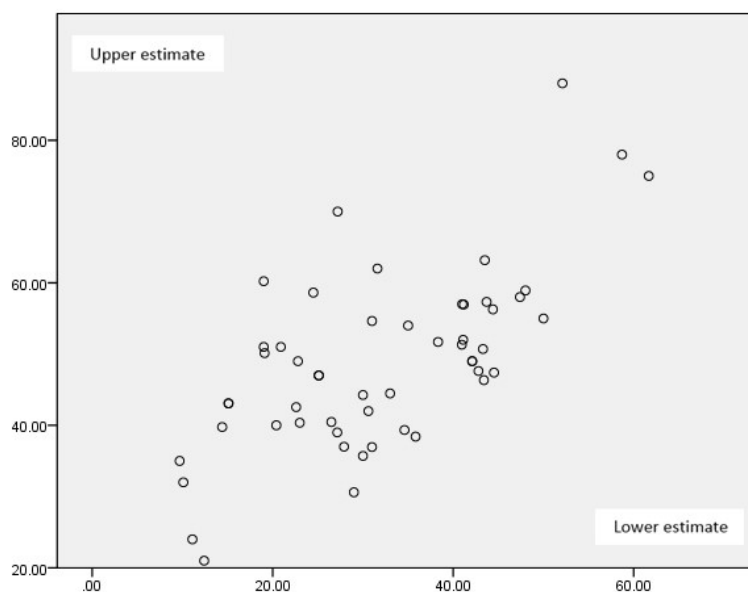
4.3 Sensitivity of estimates to survey questions by country

A final validity test of raw estimates can be undertaken by comparing estimates of countries that answer more than one questionnaire item on bullying or are included in more than one survey. The figure below shows results for 53 countries that answer more than one item on bullying. The results are used to determine how effective these studies are for obtaining accurate national estimates.

As Figure 4 shows, there is some difference in the maximum and minimum estimates reported by the same country from the different studies. This is to be expected to a degree, as it is very unlikely that estimates from different studies, and sometimes at different points in time, would produce the same outcomes (after accounting for sampling error, and therefore estimates within confidence intervals). Indeed, even when a study and item is repeated over time there is an expectation that estimates will change (as experiences by cohort change).

In short, the clear pattern in Figure 4 below, a lack of notable outliers, and the correlation of 0.66 ($p<0.001$), is reassuring as it indicates that the studies are comparable across the group, and between maximum and minimum estimate there is a fair amount of reliability in the sample.

Figure 4: Differences in high and low estimates by survey are reasonably consistent



Note: Raw estimates are plotted for 53 countries. Correlation coefficient = 0.66 ($p < 0.001$).

Source: Author's analysis of the global bullying database.

4.4 Key points from the assessment of comparability of raw estimates

The conclusion to be drawn from the above tests is that raw estimates are significantly biased by survey methods, and that net of regional variations, surveys can produce different distributions of responses. However, analysis of different source estimates matched by country show that although accuracy in estimates is variable, reliability across the sample is good. A correlation of close to 0.7 shows that in the majority of cases low scoring countries on low scoring scales are also low-scoring on high-scoring scales and *vice versa*.

Overall, the evidence above brings into question the validity of comparing raw estimates between countries, but supports reliability, and therefore justifies the use of normalisation techniques to facilitate comparison across surveys.

5. Achieving comparability: normalising estimates and validation

Results in Section 3 have shown that although raw estimates are collected on the same scales, differences in definitions / survey methods can determine the size of the estimate, and the range of estimates reported across countries in the study. In order to assess the feasibility of developing a global indicator, the following sections explore the feasibility of using a normalisation process to adjust for survey bias, before validating a proposed global indicator.

5.1 The process of normalising the data, and basic validation

Given each survey can produce significant differences in means and variances, the data are normalised using z-scores.

Z-scores (normalisation) work by creating boundaries for the variance on a given measure using numbers of standard deviations, around centralised means. Z-scores set raw (or observed) means to zero, and each raw score in the sample is then recalculated in terms of the numbers of standard deviations above or below the mean.

As absolute values are no longer used (raw estimates are rescaled), and differences in variances by survey are effectively reset, normalised results are interpreted in terms of relative risk of bullying. Countries with low normalised scores, are low-risk countries relative to their comparative group (countries using the same definition, by year and age of child), and countries with high normalised scores are high-risk countries relative to their comparative group.

Normalising data allows for the score in each country to be interpreted as high or low relative to other countries in the same surveys, using the same definition, in the same year,⁷ on children of the same age. The normalisation process is undertaken by survey question, year, and age (or average age) to ensure that survey estimates are not combined, and to control for potential effects of variation in bullying over time and by child age.

Normalisation based on available observable data, and accounting for significant differences found in the means and variances of the different collections methods, allows for all countries to be categorised into low-, medium-, and high-risk bullying groups and compared.

To build on the evidence in Section 4, and to assess whether the normalisation process accounts for inherent bias in collection methods on estimates, Table 4 compares the associations between survey type and raw estimates and between survey type and normalised estimates. In each case, the models are run with and without macro-economic and education-based controls.

The results from Table 4 show that, following the normalisation procedure, survey source is no longer associated with estimates of bullying. This remains the case following the inclusion of controls for country wealth, inequality and educational factors (suggesting that addressing bias in survey methods by normalisation is robust to these effects).

Importantly, results based on regional variation (including significances) remain largely unchanged, and although the small effects for the Gini and public education expenditure controls change direction, they remain insignificant.

⁷ In the case of surveys with different years or waves, years have been aligned for comparability before normalization.

Table 4: Comparing survey bias before and after normalisation

	Raw estimates (betas)		Normalised estimates (betas)	
	Model 1	Model 2	Model 1	Model 2
Year	-0.057	-0.017	-0.119	-0.089
Age	-0.102	-0.128	0.066	-0.074
Reference: TIMSS Study estimates				
Children's World Study	0.046	0.095	0.11	0.102
Global Student Health Survey	-0.473***	-0.547***	-0.256	-0.326
Health Behaviour in School-aged Children	-0.18*	-0.22*	0.189	0.053
Third Regional and Comparative Explanatory Study (TERCE)	-0.094	-0.194	0.108	-0.129
Regional group reference: OECD / European Union members				
Middle East and North Africa	0.344***	0.317***	0.414***	0.421***
East and Southern Africa	0.498***	0.443***	0.498***	0.437***
West and Central Africa	0.387***	0.443***	0.396***	0.456***
South Asia	0.165**	0.143*	0.238**	0.195*
CEE/CIS countries	-0.06	-0.069	-0.073	-0.187
East Asia and Pacific Region	0.391***	0.481***	0.413***	0.435**
Latin America and Caribbean region	0.265**	0.321**	0.238	0.299
GDP	...	-0.171	...	-0.164
GINI income coefficient	...	0.031	...	-0.029
Public education exp. (%GDP)	...	0.02	...	-0.062
Enrolment rate	...	0.111	...	0.042
Adjusted R²	0.38***	0.44***	0.23***	0.29***

Note: *** = $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Dependent Variable: Bullying estimate (raw estimates are proportions as reported in the survey data, normalized estimates are z-scores). Dates for control variable have been aligned to dates of bullying estimates.

Source: Author's analysis of the Global Bullying Dataset.

Although non-significant in the model, the hypothesis behind how rates of enrolment might affect the likelihood of having higher or lower raw estimates for bullying experiences is an important discussion for analysts of school-based surveys.

Low enrolment might be an indication of homogeneity in the school population as drop out from school is likely to be biased towards certain groups of children, and in turn reduce bullying as a positive side-effect of a negative condition (a potential trade-off which would require more consideration and analysis before these bullying estimates could be considered valuable for international comparison). Notably, however, the results of Table 4 show that this potential form of selection bias is not consistently inflating estimates across the comparison. Conversely, countries with high bullying rates report the lowest enrolment rates (though the difference is not significant), which aligns with studies that show bullying may lead to truancy and drop outs (Pells et al., 2016; Gastic, 2008). That said, a clear limitation of this analysis is the inability to test in detail how school management and systemic differences relate to higher or lower risks of bullying.

Box 1: Children and topics missing from these surveys, and potential implications

The surveys included in this study are limited insofar as they are inevitably selective in terms of the children they include, and the questions they ask.

All of the studies derived their estimates from school-based surveys. School-based surveys are selective in terms of their target population, as are all surveys, in different ways. First, school-based surveys will sample only schools, and follow up with a sampling of pupils in the school itself. Schools are generally sampled in a country proportionate to its size (large and small schools), within regions, and school types. In schools, the studies can randomly sample the pupils or the classes in the school. Commonly surveys involving assessments (such as TIMSS)

will exclude schools that are not mainstream schools (e.g. schools for children with special educational needs). When certain schools are excluded from sampling, or when children out of school for various reasons, such as fear of being bullied (see Gastic, 2008 for association between bullying and truancy), which can vary widely by country and age, are excluded due to collection methods, reported results are likely to underestimate the extent of bullying, which could occur also outside the school setting, as the most vulnerable children are often not represented.

School-based studies are also commonly restricted in terms of the topics they can explore when surveying children. For example, items on children's drug use and sexual health, which are part of the Health Behaviour in School-aged Children study, have been excluded by various countries (see Richardson and Ali, 2014). Aside from behaviours that are considered taboo, sensitive questions can also include items that schools or survey coordinators feel are likely to stigmatise the child. As a result, surveys that could otherwise inform the extent of bullying experienced by children from certain sociocultural groups (foster children, migrants, LGBT children) more often than not do not provide the additional information (or sometimes necessary oversampling) for such important breakdowns to be examined.

Moreover, a number of factors were not able to be investigated in this study due to the lack of consistent data availability across the surveys. Age, a key factor that affects bullying rates (e.g. early adolescents are typically at higher risk for bullying than older teens; Pells et al., 2016), was not captured widely or consistently enough across surveys to allow any comparative analyses. Further, a lack of consistent definitions of bullying used across surveys also restricted this study's ability to break down analyses by type (e.g. indirect vs. direct) and frequency (e.g. every week) of bullying. We were also unable to examine the effects of poly-victimisation on the perpetrator-victim cycle.

Finally an entire topic missing from this study is cyberbullying. At present there is little comparative information on cyberbullying, an issue gaining increasing attention as the use of handheld mobile devices for communication and access to social networks is becoming more common. At present cyberbullying is only being surveyed as part of [EU Kids Online](#), a European-based survey of children's internet use in Europe (Gorzig, 2011).

UNICEF Office of Research is also beginning a pilot study of adolescent Internet use, including cyberbullying, in three additional countries: Philippines, Serbia and South Africa (for more information please see: <http://www.unicef-irc.org/article/1194/>).

5.2 Validating country grouping for a global comparison

Following the reassurance that the normalisation procedure provides unbiased estimates of relative bullying risk, the next step in the analysis was to calculate and to compare the raw estimate groupings to the normalised groupings in order to assess whether the grouping comparisons are valid, or in other words, that the categories of relative risk provide meaningful indicators for global comparison.

Table 5 compares the country groups using raw estimates and normalised estimates, before and after adjustments (final groupings – after adjustments – are displayed in parentheses). In this analysis, although it is expected that centralising of raw estimates will happen (this is the purpose of normalisation), the existence of outliers or uneven shifts in classification would indicate problems with the normalisation process or the underlying raw data.

Table 5 shows that a number of countries move from low scoring countries in the raw estimates comparison to high scoring countries in the normalised estimates comparison, and *vice versa*. Following adjustments and exclusions, explained below, no countries move from low-to-high or high-to-low groups (group membership following adjustments is reported in parentheses in Table 5).

Table 5: Outliers in the normalisation process: number of countries by group

		Normalized estimates (after adjustments)			Total
		Low-scoring countries	Medium range	High-scoring countries	
Raw estimates (proportions)	Low-scoring countries	34 (40)	26 (21)	2 (0)	62 (61)
	Medium range	3 (6)	42 (41)	26 (24)	71 (71)
	High-scoring countries	1 (0)	1 (0)	24 (23)	26 (23)
	Total	38 (46)	69 (62)	52 (47)	159 (155)

Note: $X^2 = 99.2$, $DF = 4$, $p < 0.001$. Values in parentheses are group memberships after adjustments and exclusions described below.

Source: Author's analysis of the global bullying database.

In the original transformation, the solitary country with a low normalized score *and* a high raw score is Yemen (bottom left square of Table 5). The raw estimate used for Yemen is from TIMSS for 2011 (its most recent value), superseding the GSHS survey estimate from 2008. Both the survey (TIMSS) and the age group (11 year olds) could inflate estimates of bullying due to higher prevalence in the younger years, and a broader definition of the concept, leading to the high raw estimate (47%). The low normalized estimate is due to comparators by date, definition and age (Botswana and Honduras) both of which report estimates above 60% (88% and 62% respectively).

To address this problem, for the grouping analysis and reporting, the Yemen GSHS estimate is used (41%) which, when compared to the GSHS group, places this country in the high estimate and high normalized groupings. Botswana and Honduras also have multiple estimates, and given the tendency for TIMSS and the age group to provide higher raw estimates, TIMSS data for 11-year-olds will also be excluded, and where relevant, countries' next available estimates by date will be used (meaning for Botswana, the TIMSS estimate for children aged 14.5 years is used [81%], and for Honduras the TERCE estimate for 2013 is used [42.9%]).

Zambia is the only country with a high-scoring estimate in a medium-scoring normalization (65%, 0 SDs). This is because Zambia is the *only country* with a raw estimate from 2004. To be meaningful, normalization requires a selection of cases in a single comparable group (without outliers). So the estimate for Zambia, along with Venezuela (GSHS data from 2003, which also falls down a group in the normalization process), and other countries with early GSHS data, is renormalized as part of a new comparison group made of country GSHS estimates from prior to 2007. This re-normalization also captures Tanzania (2006), which along with Swaziland (2013), is a low-scoring country, with a high-scoring normalization result.

Swaziland's result is unusual insofar as the data source and age group do not, combined, lead to an expectation of bias. Instead the result instead might be driven by both groups entering at the margins. Because it is not straight forward to account for the Swaziland case, or to replace the estimate, data for Swaziland is excluded from later analysis.

It is not necessary to assess the reason why some low-scoring estimate countries report mid-range normalized values, or mid-range raw estimate countries enter the high-scoring normalized group. The movement is to be expected, and is due to the alignment of distributions of different scales through the normalization process, designed to account for incomparability of raw scales identified earlier in the paper.

5.3 Key points from the validation analysis

Based on the analysis above, and to maximize confidence in the reliability of a globally comparable indicator, the standardized measures on at-risk of bullying by group are used for all further analysis.

To facilitate comparisons of raw estimates in the future however, new surveys, and indeed existing surveys, should strive to harmonize questions whilst ensuring that items used to estimate bullying rates are robust to translation, as well as selection bias and cultural bias (see Richardson and Ali, 2014 for a discussion of some of these issues). A further recommendation would be to design a standardized bullying questionnaire, similar to that used in measuring educational outcomes, which can be validated in various contexts and cultures, and added as part of a child-centered module in future data collection surveys.

The process of harmonization and validation of standardized estimates of bullying is a method that can be repeated for other indicators, and may be an option for other researchers wishing to operationalize the Sustainable Development Goals for purposes of monitoring. In the case of the above surveys, and similar surveys (e.g. SAQMEQ, UWEZO), other measures such as adolescent alcohol consumption or measures of school engagement can also be developed (see Section 7).

6. Comparing bullying across the globe: where is the risk and what does it mean?

This section of the report looks at global bullying risk, reported by country and by region. It also briefly explores the links between bullying risk and income inequality, school enrolment, country wealth (GDP), and educational investment (as a proportion of GDP).

6.1 Global bullying rates: countries and regions

Figure 5 provides a global map of bullying by low, medium and high risk. The vast majority of the globe has usable data, and these have been shaded according to the risk of bullying from light grey (low) to black (high). Gaps in the data (white areas) are most notable in central and West Africa, South Asia, parts of Central and Eastern Europe and the CIS, and islands in the Pacific. Bullying risks in the smaller nation states (not visible on the maps) are presented using a separate key in Figure 5.

At a glance, the global map shows higher risk in the western hemisphere, and lowest risk in the eastern hemisphere. However, this picture serves best to highlight the variation in experiences within regions, and as a reminder of the variation that is also likely to exist within countries, and between socio-economic and socio-demographic groups, and which cannot be uncovered using this analysis.

Canada, Greenland, the western side of South America, Southern Africa, parts of Eastern Europe, and the MENA region, and islands in the Pacific just north of Australia are all countries with the highest relative risk of bullying according to data from their most recent surveys.

Countries in Western Europe, the United States, eastern parts of South America, much of the Middle East and North Africa, Australia, Japan and Mongolia, are all countries with medium risks of bullying.

Few countries in Central and South America are low bullying-risk countries, compared to many countries in Northern Europe through to South East Asia, including Russia, as well as China, Kazakhstan, and South Korea.

Some less expected categorisations (e.g. Russia in the low-risk and Switzerland in the high-risk group) may be due to the broad definition of bullying used in this study, which includes infrequent bullying (about once a month) and passive forms of bullying (such as teasing and being left out).

For full details by country, including year of study, average age group, source of data, and raw estimates (including gender breakdowns) can be found in the annex to this paper.

Figure 6 repeats the exercise of Figure 5, but uses regional averages. The highest average bullying risks are found in South Asia, followed by West and Central Africa. In both of these cases, bullying data is least common, and represents a challenge for fully interpreting regional risk. However, the lack of data in these regions, and the need to fill these gaps, is only brought into sharper relief considering the high rates of reported bullying in neighbouring countries.

In terms of higher bullying risks, following South Asia and West and Central Africa are the regions of Eastern and Southern Africa and the Middle East and North Africa. East Asia and Pacific countries, and OECD / European Union countries, are middling in terms of risk, and the lowest risk is seen in Latin America and the Caribbean Region, and the CEE CIS.

Earlier comparisons of regional outcomes, including controls for country wealth etc. (see Table 4), are consistent with CEE/CIS being the lowest risk region for bullying overall, and LACR and OECD/EU groups also being lower-risk settings. Moreover, the multivariate tests place all African regions (including MENA) amongst the highest risk settings globally.

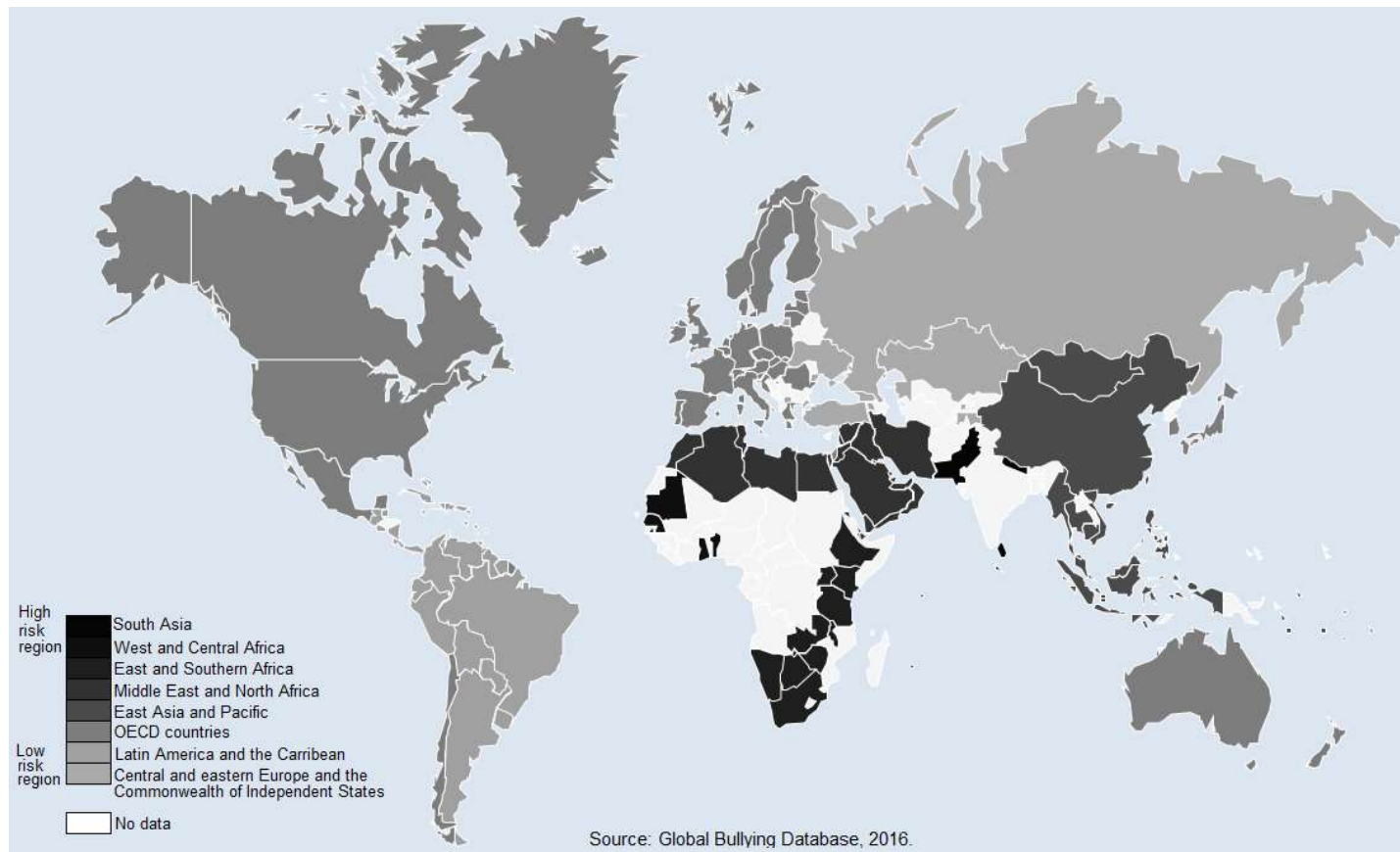
Figure 5: Global national map of bullying by relative risk



Notes: Missing countries include: Afghanistan, Azerbaijan, Bangladesh, Belarus, Bhutan, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burma, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Republic of the Congo, Cyprus, Equatorial Guinea, Eritrea, Gabon, Gambia, The, Guinea, Guinea-Bissau, Haiti, India, Cote d'Ivoire, North Korea, Kyrgyzstan, Laos, Lesotho, Liberia, Liechtenstein, Madagascar, Mali, Marshall Islands, Federated States of Micronesia, , Moldova, Monaco, Montenegro, Mozambique, Niger, Nigeria, Palau, Papua New Guinea, Rwanda, Serbia, Sierra Leone, Somalia, Sudan, Swaziland, Timor-Leste, Togo, Turkmenistan, Uzbekistan, Western Sahara.

Source: Global Bullying Database, 2016.

Figure 6: Global regional map of bullying by relative risk



Notes: Missing countries include: Afghanistan, Azerbaijan, Bangladesh, Belarus, Bhutan, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burma, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Republic of the Congo, Cyprus, Equatorial Guinea, Eritrea, Gabon, Gambia, The, Guinea, Guinea-Bissau, Haiti, India, Cote d'Ivoire, North Korea, Kyrgyzstan, Laos, Lesotho, Liberia, Liechtenstein, Madagascar, Mali, Marshall Islands, Federated States of Micronesia, , Moldova, Monaco, Montenegro, Mozambique, Niger, Nigeria, Palau, Papua New Guinea, Rwanda, Serbia, Sierra Leone, Somalia, Sudan, Swaziland, Timor-Leste, Togo, Turkmenistan, Uzbekistan, Western Sahara.

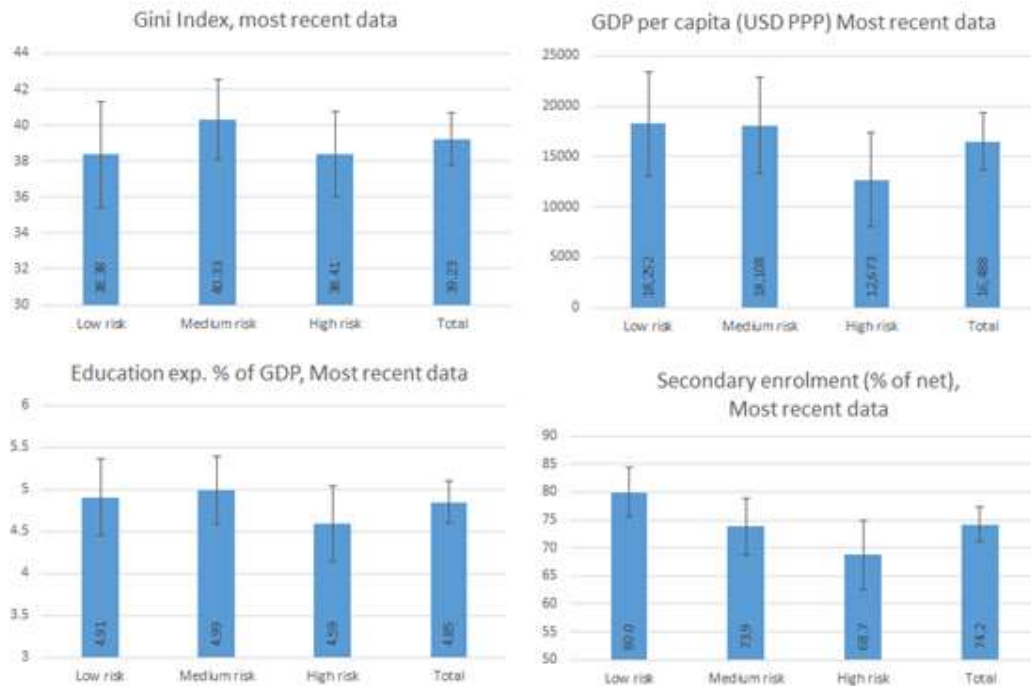
Source: Global Bullying Database, 2016.

6.2 How does variation in bullying relate to income, education and national wealth?

Analysis undertaken below compares at-risk of bullying groups on measure of GDP, education spending, GINI and enrolment in schools. It is important to note the correlational nature of these associations and the potential for unobserved factors that can moderate/contribute to this relationship.

Results in Figure 7 compare average rates of each indicator for groups of countries by at-risk of bullying. It can be seen from these results that bullying risk, as measured here, is not clearly linked with income inequality or educational expenditure, but high risk countries report lower per capita GDP and lower secondary school enrolment.

Figure 7: Bullying risk is not clearly linked with inequality and educational expenditure but high-risk countries report lower wealth, school enrolment and suicide rates



Notes: Definitions of indicators used are in section 3.2 above. ANALYSIS IS PROVISIONAL: New data will be calculated for further tests, including secondary spending figures, and suicide rates of 10-19 years old, and (based on methods used above) data on heterogeneity in socio-demographic characteristics, and where possible learning outcomes and mental health estimates. Whisker plots represent confidence intervals at the 90% level.

Source: Author's calculations.

With the exception of the results for income inequality, where the expectation was that high-risk bullying countries would on average have higher GINI coefficients, the macro-economic indicators follow an anticipated pattern, although insignificant, of poorer environments with lower investment being more commonly at a higher bullying risk. Perhaps counterintuitive, due to the assumption of greater social homogeneity of low enrolment settings, is the finding that low bullying risk countries also have higher enrolment rates. On the other hand, although the data on bullying is derived from existing school goers, there may be some justification to explore how high risk of bullying might contribute to overall secondary school dropout rates. For example, a study on 276 American public high schools (Cornell, Gregory, Huang, & Fan, 2013) found that the prevalence of teasing and bullying as perceived by both 9th grade students and teachers was predictive of dropout rates for the same cohort 4 years later.

7. Conclusion: an example of evidence building for the Sustainable Development Goals

The findings of this study have shown clearly that, despite a loss in detail in the scale, and much regional data being incomparable, it is possible to harmonise national-level data, to define and validate a measure of bullying risk for global comparison. This study has also assessed whether bullying risk, as defined by this new measure, is associated with key national level indicators of wealth, inequality, public investment in schools, and enrolment. Although results have produced some anticipated associations, further investigation is needed to complement these. Indeed, this reflection on global comparability, and its potential for replication and later global monitoring, brings into focus a final ambition of this study: to propose a method by which further global indicators can be developed in order to operationalise various SDG targets worldwide, and provide context to various child-focussed goals. By using bullying as an example, this paper has proposed one method, and identified multiple sources, through which child-focused aspects of the SDGs might be operationalised, monitored, and ultimately informed.

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Data annex: Experience of bullying in the last month, and global bullying risk, most recent data

Country	Region	Bullying: Total	Bullying: Boys	Bullying: Girls	Year	Average age	Data source	Global bullying risk
Algeria	MENA	38.32	40.94	34.91	2013	12.0	Children's World	Low
Anguilla	LACR	27.80	25.40	30.30	2009	14.0	GSHS	Medium
Antigua	LACR	24.40	22.70	26.50	2009	14.0	GSHS	Low
Argentina	LACR	47.80	46.70	49.00	2013	11.5	SERCE/TERCE	High
Armenia	CEECIS	14.00	.	.	2011	13.5	TIMSS	Low
Australia	OECD/EU	42.00	.	.	2011	13.5	TIMSS	Medium
Austria	OECD/EU	40.45	45.00	35.90	2009	13.0	HBSC	High
Bahamas	LACR	23.60	24.70	22.00	2013	14.0	GSHS	Medium
Bahrain	MENA	45.00	.	.	2011	13.5	TIMSS	Medium
Barbados	LACR	13.30	15.40	11.00	2011	14.0	GSHS	Low
Barbuda	LACR	50.00	65.30	40.40	2009	14.0	GSHS	High
Belgium	OECD/EU	41.82	47.42	36.21	2009	13.0	HBSC	High
Belize	LACR	30.70	30.30	31.10	2011	14.0	GSHS	Medium
Benin	WCAR	42.10	42.70	40.70	2009	14.0	GSHS	High
Bolivia	LACR	30.20	31.70	28.20	2012	14.0	GSHS	Medium
Botswana	ESAR	52.10	52.60	51.80	2020	14.0	GSHS	Medium
Brazil	LACR	42.80	42.40	43.20	2013	11.5	SERCE/TERCE	Medium
British Virgin Islands	LACR	17.20	18.30	16.50	2009	14.0	GSHS	Low
Brunei	EAPR	23.40	25.30	21.70	2014	14.0	GSHS	Medium
Cambodia	EAPR	22.40	22.50	22.20	2013	14.0	GSHS	Medium
Canada	OECD/EU	37.15	36.40	37.90	2009	13.0	HBSC	High
Cayman Islands	LACR	26.10	24.40	28.20	2007	14.0	GSHS	Low
Chile	OECD/EU	15.10	15.80	13.90	2013	14.0	GSHS	Low
Chinese Taipei	EAPR	33.00	.	.	2011	13.5	TIMSS	Low
China	EAPR	31.21	31.64	30.51	2020	14.0	GSHS	Low
Colombia	LACR	54.56	64.42	45.11	2013	12.0	Children's World	High
Colombia	LACR	32.14	33.08	31.30	2007	14.0	GSHS	Medium
Cook Islands	EAPR	33.00	30.60	35.80	2011	14.0	GSHS	Medium
Costa Rica	LACR	31.30	32.10	30.60	2013	11.5	SERCE/TERCE	Low
Croatia	OECD/EU	17.05	18.20	15.90	2009	13.0	HBSC	Low
Cuba	LACR	13.23	.	.	2006	11.5	SERCE/TERCE	Low
Czech Republic	OECD/EU	15.55	16.00	15.10	2009	13.0	HBSC	Low
Denmark	OECD/EU	19.95	19.90	20.00	2009	13.0	HBSC	Low
Djibouti	MENA	40.90	44.30	35.80	2007	14.0	GSHS	High
Dominica	LACR	27.40	28.70	26.00	2009	14.0	GSHS	Low
Dominican Republic	LACR	59.93	.	.	2006	11.5	SERCE/TERCE	High
Dominicana	LACR	49.40	49.70	49.00	2013	11.5	SERCE/TERCE	High
Ecuador	LACR	44.40	45.40	43.30	2013	11.5	SERCE/TERCE	High
Ecuador	LACR	28.09	30.76	25.55	2007	14.0	GSHS	Medium
Egypt	MENA	70.00	70.10	69.70	2011	14.0	GSHS	High
El Salvador	LACR	22.60	20.90	24.30	2013	14.0	GSHS	Medium
Estonia	OECD/EU	51.31	53.89	48.79	2013	12.0	Children's World	Medium
Ethiopia	ESAR	40.58	43.29	37.89	2013	12.0	Children's World	Medium
Fiji	EAPR	42.00	45.60	38.80	2010	14.0	GSHS	Medium
Finland	OECD/EU	29.00	.	.	2011	13.5	TIMSS	Low
France	OECD/EU	34.00	34.10	33.90	2009	13.0	HBSC	Medium
Georgia	CEECIS	21.00	.	.	2011	13.5	TIMSS	Low
Germany	OECD/EU	35.71	40.42	31.58	2013	12.0	Children's World	Low
Ghana	WCAR	78.00	.	.	2011	13.5	TIMSS	High
Ghana	WCAR	58.40	61.30	58.20	2012	14.0	GSHS	High
Greece	OECD/EU	27.60	29.30	25.90	2009	13.0	HBSC	Medium
Greenland	OECD/EU	37.80	39.60	36.00	2009	13.0	HBSC	High
Grenada	LACR	27.20	28.60	26.10	2008	14.0	GSHS	Low
Guatemala	LACR	34.60	35.00	34.20	2013	11.5	SERCE/TERCE	Low
Guyana	LACR	38.40	40.20	36.60	2010	14.0	GSHS	Low
Honduras	LACR	42.90	41.80	43.90	2013	11.5	SERCE/TERCE	Medium
Hong Kong	EAPR	46.00	.	.	2011	13.5	TIMSS	Medium
Hungary	OECD/EU	39.00	.	.	2011	13.5	TIMSS	Medium
Iceland	OECD/EU	18.67	20.33	17.00	2009	13.0	HBSC	Low
Indonesia	EAPR	55.00	.	.	2011	13.5	TIMSS	High
Iran	MENA	45.00	.	.	2011	13.5	TIMSS	Medium
Iraq	MENA	27.70	32.40	21.90	2012	14.0	GSHS	Medium
Ireland	OECD/EU	27.30	28.40	26.20	2009	13.0	HBSC	Medium
Israel	OECD/EU	38.41	40.52	35.87	2013	12.0	Children's World	Medium
Italy	OECD/EU	24.00	.	.	2011	13.5	TIMSS	Low
Jamaica	LACR	40.20	40.30	39.10	2010	14.0	GSHS	Medium
Japan	OECD/EU	37.00	.	.	2011	13.5	TIMSS	Medium
Jordan	MENA	52.00	.	.	2011	13.5	TIMSS	High
Kazakhstan	CEECIS	26.00	.	.	2011	13.5	TIMSS	Low
Kenya	ESAR	57.10	56.60	57.40	2020	14.0	GSHS	High
Kiribati	EAPR	36.80	42.10	32.20	2011	14.0	GSHS	Medium
Kosovo	CEECIS	19.20	24.50	14.80	2014	13.0	HBSC	Medium
Kuwait	MENA	27.70	36.40	18.50	2011	14.0	GSHS	Low
Latvia	OECD/EU	46.65	47.80	45.50	2009	13.0	HBSC	High

Lebanon	MENA	25.10	35.00	16.40	2011	14.0	GSHS	Low
Libya	MENA	35.30	40.00	30.50	2007	14.0	GSHS	Medium
Lithuania	OECD/EU	35.00	.	.	2011	13.5	TIMSS	Medium
Luxembourg	OECD/EU	30.17	30.67	29.67	2009	13.0	HBSC	Medium
Macedonia	CEECIS	32.00	.	.	2011	13.5	TIMSS	Low
Malawi	ESAR	44.90	42.90	46.50	2009	14.0	GSHS	High
Malaysia	EAPR	20.90	24.00	17.80	2012	14.0	GSHS	Low
Maldives	S. ASIA	36.90	39.90	34.10	2009	14.0	GSHS	Medium
Malta	OECD/EU	54.31	54.11	54.37	2013	12.0	Children's World	High
Mauritania	WCAR	47.20	48.00	46.30	2010	14.0	GSHS	Medium
Mauritius	WCAR	35.70	42.10	29.50	2011	14.0	GSHS	Medium
Mexico	OECD/EU	33.00	34.80	31.00	2013	11.5	SERCE/TERCE	Low
Mongolia	EAPR	30.50	35.90	25.00	2013	14.0	GSHS	Medium
Montserrat	LACR	28.10	31.80	24.80	2008	14.0	GSHS	Low
Morocco	MENA	51.00	.	.	2011	13.5	TIMSS	High
Myanmar	EAPR	19.40	22.90	16.00	2007	14.0	GSHS	Low
Namibia	ESAR	46.60	47.90	45.40	2013	14.0	GSHS	High
Nauru	EAPR	38.90	39.80	37.90	2011	14.0	GSHS	Medium
Nepal	S. ASIA	58.12	55.88	60.35	2013	12.0	Children's World	High
Netherlands	OECD/EU	24.70	26.80	22.60	2009	13.0	HBSC	Low
New Zealand	OECD/EU	45.00	.	.	2011	13.5	TIMSS	Medium
Nicaragua	LACR	43.30	43.10	43.50	2013	11.5	SERCE/TERCE	Medium
Niue	EAPR	35.50	38.20	.	2010	14.0	GSHS	Low
Norway	OECD/EU	40.36	36.56	42.68	2013	12.0	Children's World	Medium
Nuevo Leon	LACR	29.90	33.00	26.90	2013	11.5	SERCE/TERCE	Low
Oman	MENA	58.00	.	.	2011	13.5	TIMSS	High
Pakistan	S. ASIA	41.10	45.10	35.30	2009	14.0	GSHS	High
Palestine	MENA	55.43	57.76	53.03	2010	14.0	GSHS	High
Panama	LACR	43.70	43.30	44.10	2013	11.5	SERCE/TERCE	Medium
Paraguay	LACR	43.40	44.00	42.90	2013	11.5	SERCE/TERCE	Medium
Peru	LACR	47.40	48.60	46.20	2013	11.5	SERCE/TERCE	High
Philippines	EAPR	47.70	46.90	48.40	2011	14.0	GSHS	Medium
Poland	OECD/EU	40.46	42.28	38.63	2013	12.0	Children's World	Medium
Portugal	OECD/EU	37.85	43.80	31.90	2009	13.0	HBSC	High
Qatar	MENA	42.10	48.80	34.80	2011	14.0	GSHS	Medium
Rodrigues	LACR	50.00	44.80	54.40	2011	14.0	GSHS	Medium
Romania	OECD/EU	56.95	65.01	47.93	2013	12.0	Children's World	High
Russia	CEECIS	31.00	.	.	2011	13.5	TIMSS	Low
Saint Kitts & Nevis	LACR	22.70	24.90	20.40	2011	14.0	GSHS	Low
Saint Lucia	LACR	25.10	25.20	25.10	2007	14.0	GSHS	Low
Saint Vincent and the Grenadines	LACR	29.90	30.70	29.40	2007	14.0	GSHS	Medium
Samoa	EAPR	74.00	78.60	69.40	2011	14.0	GSHS	High
Saudi Arabia	MENA	40.00	.	.	2011	13.5	TIMSS	Medium
Senegal	WCAR	57.30	60.70	52.30	2020	14.0	GSHS	High
Seychelles	ESAR	50.50	52.60	48.60	2007	14.0	GSHS	High
Singapore	EAPR	48.00	.	.	2011	13.5	TIMSS	Medium
Slovakia	OECD/EU	26.50	29.33	23.67	2009	13.0	HBSC	Medium
Slovenia	OECD/EU	40.00	.	.	2011	13.5	TIMSS	Medium
Solomon Islands	EAPR	66.50	64.10	67.70	2011	14.0	GSHS	High
South Africa	ESAR	61.67	60.77	62.44	2013	12.0	Children's World	High
South Korea	OECD/EU	9.69	13.65	6.70	2013	12.0	Children's World	Low
Spain	OECD/EU	39.76	42.67	36.59	2013	12.0	Children's World	Medium
Sri Lanka	S. ASIA	37.90	46.90	28.60	2008	14.0	GSHS	High
Suriname	LACR	26.30	26.40	26.00	2009	14.0	GSHS	Low
Sweden	OECD/EU	21.00	.	.	2011	13.5	TIMSS	Low
Switzerland	OECD/EU	36.30	39.20	33.40	2009	13.0	HBSC	High
Syria	MENA	45.00	.	.	2011	13.5	TIMSS	Medium
Tajikistan	CEECIS	7.10	7.10	7.10	2020	14.0	GSHS	Low
Tanzania	ESAR	27.80	27.10	28.50	2020	14.0	GSHS	Low
Thailand	EAPR	70.00	.	.	2011	13.5	TIMSS	High
Tonga	EAPR	50.30	48.30	52.10	2010	14.0	GSHS	High
Trinidad and Tobago	LACR	15.40	17.90	13.00	2011	14.0	GSHS	Low
Tunisia	MENA	42.00	.	.	2011	13.5	TIMSS	Medium
Turkey	CEECIS	58.92	62.38	55.68	2013	12.0	Children's World	High
Tuvalu	EAPR	26.90	40.10	15.00	2013	14.0	GSHS	Medium
Uganda	ESAR	45.50	50.00	41.10	2020	14.0	GSHS	Medium
Ukraine	CEECIS	30.00	.	.	2011	13.5	TIMSS	Low
United Arab Emirates	MENA	49.00	.	.	2011	13.5	TIMSS	High
United Kingdom	OECD/EU	27.24	26.86	27.62	2009	13.0	HBSC	Medium
United States	OECD/EU	37.00	.	.	2011	13.5	TIMSS	Medium
Uruguay	LACR	36.70	35.20	38.30	2013	11.5	SERCE/TERCE	Low
Vanuatu	EAPR	67.30	68.00	66.50	2011	14.0	GSHS	High
Venezuela	LACR	35.63	37.34	34.08	2020	14.0	GSHS	Medium
Vietnam	EAPR	26.10	26.10	26.20	2013	14.0	GSHS	Medium
Yemen	MENA	41.00	45.50	32.70	2008	14.0	GSHS	High
Zambia	ESAR	65.10	62.50	67.10	2020	14.0	GSHS	High
Zimbabwe	ESAR	60.56	63.99	57.96	2020	14.0	GSHS	High