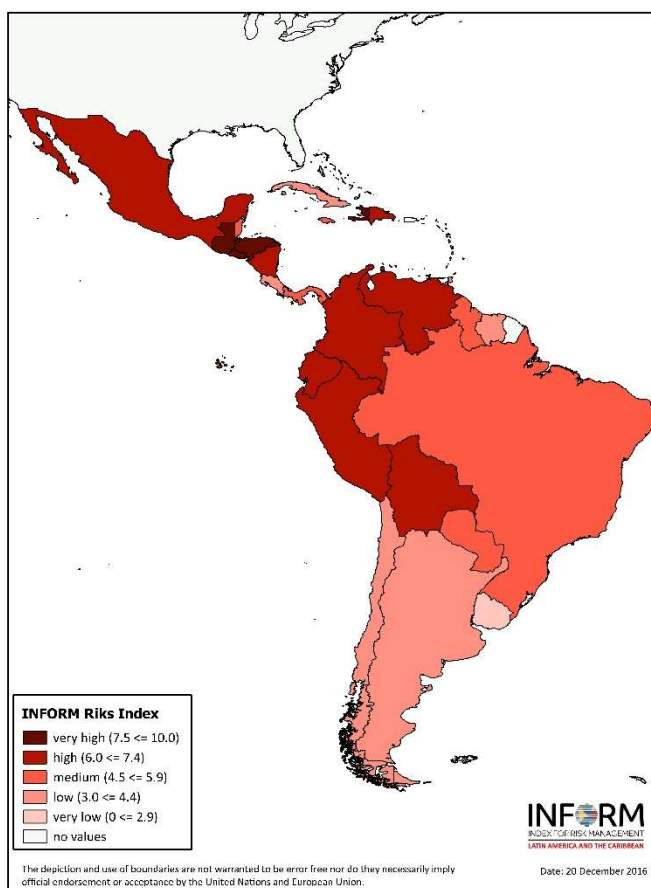


# INDEX FOR RISK MANAGEMENT FOR LATIN AMERICA AND THE CARIBBEAN (LAC-INFORM)

Version 2017



	EXPOSURE	Socio-Economic Vulnerability	Vulnerable Groups	VULNERABILITY	Infrastructure	LACK OF COPING CAPACITY	INFORM RISK
	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)
Paraguay	3.0	3.7	1.6	2.7	5.0	3.4	4.2
Peru	4.3	3.1	3.9	3.5	4.1	3.6	3.9
Saint Kitts and Nevis	4.4	2.6	1.7	2.2	5.9	4.0	3.6
Saint Lucia	2.4	3.5	3.6	4.3	3.9	6.0	2.7
Saint Vincent and the Grenadines	5.6	7.4	5.0	6.3	6.7	4.2	6.0
Suriname	5.4	3.6	5.5	4.6	2.9	5.9	4.2
Trinidad and Tobago	6.3	7.4	3.8	7.0	7.1	4.1	3.7
Uruguay	4.9	2.9	8.4	3.9	4.0	3.0	3.6
Venezuela	2.4	7.9	4.9	4.4	2.9	3.5	6.1
	3.0	4.7	3.4	2.2	3.9	3.8	6.4
	2.4	5.7	3.5	2.9	5.2	6.4	7.1
	4.1	3.6	5.9	4.4	6.5	8.8	7.5
	2.0	6.2	5.1	7.5	7.3	4.6	4.1
	4.9	6.5	6.2	8.1	2.9	8.5	8.5
	5.0	8.5	4.4	1.1	8.4	7.2	7.1
	1.7	1.2	8.8	8.0	6.0	7.2	8.7
	3.4	8.7	3.6	6.7	8.9	8.7	8.3
	4.6	3.4	7.6	9.6	7.8	8.3	6.5
	7.7	7.4	8.4	8.7	2.4	5.8	5.0
	8.1	8.7	6.0	4.7	6.7	6.9	4.7
	5.8	6.1	8.4	6.7	5.5	5.4	6.0
	8.5	8.3	6.7	4.5	3.7	5.8	5.5
	9.3	4.2	4.5	5.3	6.4	7.6	6.2
	5.9	2.8	3.4	5.3	1.2	2.9	3.7
	4.1	2.7	5.9	4.3	1.5	4.8	4.4
	7.3	4.1	4.3	3.6	1.7	3.2	5.0
	3.2	5.3	3.2	4.7	2.0	3.7	6.1
	2.8	3.5	4.1	3.3	2.0	3.1	7.8
	1.7	5.9	1.7	2.9	2.7	3.0	5.2
	3.9	4.1	3.2	3.2	7.2	6.1	6.7
	2.2	1.7	2.0	4.7			6.8

## CONTENT

1. INTRODUCTION .....	3
2. KEY CONCEPTS OF THE LAC-INFORM INDEX .....	4
2.1 Objective of LAC-INFORM.....	4
2.2 Risk concept.....	4
2.3 LAC-INFORM Model.....	5
3. COMPONENT AND INDICATORS .....	8
3.1 Hazard and exposure dimension .....	8
3.1.1 Natural hazard category .....	8
3.1.2 Human hazard category .....	10
3.2 Vulnerability dimension.....	11
3.2.1 Socio-economic vulnerability category .....	11
3.2.2 Vulnerable group category .....	13
3.3 Lack of coping capacity dimension .....	16
3.3.1 Institutional category .....	16
3.3.2 Infrastructure category.....	19
4. INTERPRETATION OF THE LAC-INFORM INDEX SCORES .....	21
5. LIMITATIONS AND CONSTRAINTS.....	29
ANNEX I: Outline of the LAC-INFORM Model's Excel file .....	30
ANNEX II: Aggregation rules used for new and adjusted components in the LAC-INFORM model.....	31
ANNEX III: LAC-INFORM class limits at level of the risk index, dimensions and categories .....	35
ANNEX IV: Reliability index and recentness of the data.....	37
ANNEX V: Key statistical metrics .....	39
ANNEX VI: LAC-INFORM INDEX – Countries by alphabetical order .....	42
ANNEX VII: LAC-INFORM INDEX – Countries by rank .....	43
ANNEX VIII: Latin America and Caribbean INFORM maps.....	44

## LIST OF FIGURES

Figure 1: LAC-INFORM Model.....	5
Figure 2: Hazard and exposure dimension .....	9
Figure 3: Vulnerability dimension.....	12
Figure 4: Lack of coping capacity dimension .....	17

## LIST OF TABLES

Table 1: LAC-INFORM adaptation at component level .....	6
Table 2: Transformation criteria for under-five stunting .....	14
Table 3: Transformation criteria for low birthweight .....	15
Table 4: Transformation criteria for anemia incidence among pregnant and lactating women .....	16
Table 5: Transformation criteria for the relative value of undernourishment prevalence.....	16
Table 6: Classification of the Latin America and Caribbean countries by risk level on the LAC-INFORM index and its dimensions.....	22
Table 7: Latin America and Caribbean countries grouped by LAC-INFORM risk level .....	27
Table 9: Reliability index and recentness of the data .....	37
Table 10: Missing scores at component level .....	38
Table 11: Statistical influences of the INFORM categories within dimensions.....	39
Table 12: Statistical influences of the underlying components in the hazard and exposure dimension.....	40
Table 13: Statistical influences of the underlying components in the vulnerability dimension .....	40
Table 14: Statistical influences of the underlying components in the lack of coping capacity dimension.....	41

## 1. INTRODUCTION

The Index for Risk Management (INFORM) is the first global, open-source tool for assessing the risk of humanitarian crises and disasters. It is a composite index that aims to identify: *'Countries or areas of countries at risk from humanitarian emergencies that could overwhelm national response capacity and lead to a need for international assistance.'*

The INFORM index simplifies a lot of information about hazards, vulnerability and coping capacity. It is an approach to analyze, understand and measure the risk of humanitarian crises and disasters, and how the conditions that lead to them affect sustainable development. The index also allows to analyze and compare humanitarian crises and disaster risks and its components between countries across a region in the case of a regional adaptation, or between areas within a country in the case of a national adaptation. The index helps to identify areas at risk from humanitarian emergencies and determine the major underlying conditions leading to the risk, so these risks can be better managed.

The index can be used by governments, humanitarian, development and disaster risk and reduction (DRR) sectors to support objective, risk-based decisions to help prevent, prepare for and respond to crises and disasters, and build resilience.

The aim of the regional adaptation of the global INFORM model for the Latin America and Caribbean region (LAC-INFORM) is to count with a risk tool that incorporates a set of risk indicators that capture the realities of the Latin America and Caribbean region (LAC) and provide a realistic comparison of the countries within the region.

The LAC-INFORM results are a valuable input into any analysis that supports planning or resource allocation processes at the regional level. The tool will be used to support regional prevention and preparedness actions, for example of the REDLAC group. It can also contribute to the implementation of the Sendai Framework for Disaster Risk Reduction, the Sustainable Development Goals, etc.

The LAC-INFORM index is an adaptation of the global INFORM model. The conceptual model and methodology of the global model provide the basis for the regional model and have been adapted and complemented to the regional context. This report summarizes the methodology of the first version of the LAC-INFORM index, focusing on the changes and additions made to the global model, and presents the main regional results.<sup>1</sup>

The development of this regional adaptation has been a collaborative exercise involving a wide range of actors. Their suggestions and feedback received during a broad consultative process have shaped the regional model. The Joint Research Centre (JRC) of the European Commission is leading the technical work on INFORM at global level and has also provided valuable technical guidance to this regional adaptation.

The LAC-INFORM presented in this report is a first version. The regional model is expected to continue to evolve with future updates, when new data, insights and feedback become available. The main concepts, dimensions and indicators are expected to remain stable to ensure comparability over time. The data, analysis and results are open and freely accessible.

For more information, please, refer to the INFORM website: <http://www.inform-index.org/> and REDHUM website: <http://www.redhum.org/>.

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<sup>1</sup> For a detailed overview of the concept and methodology the INFORM global, please, refer to the following report: "Index for Risk Management – INFORM, Concept and Methodology, version 2016", <http://www.inform-index.org/>

## 2. KEY CONCEPTS OF THE LAC-INFORM INDEX

### 2.1 Objective of LAC-INFORM

The LAC-INFORM index is an adaptation of the global INFORM model. As the global index, the LAC-INFORM index simplifies a lot of information about hazards, vulnerability and coping capacity. It is a composite index that aims to identify:

*'Countries within the Latin America and Caribbean (LAC) region at risk from humanitarian emergencies that could overwhelm national response capacities and lead to a need for humanitarian assistance.'*

LAC-INFORM seeks to answer the following questions:

- Which countries within the LAC region are at risk of crisis that will require humanitarian assistance in response to disasters?
- What are the underlying factors that could cause a crisis in those countries?
- How does the risk of humanitarian crisis change over time?

The global INFORM model uses a relatively simple framework for quantifying humanitarian crisis risk to answer those questions. This model is based on risk concepts as described in scientific literature. The LAC-INFORM model builds on this same framework.

### 2.2 Risk concept<sup>2</sup>

The INFORM risk concept considers three dimensions of risk:

- (1) Hazard and exposure
- (2) Vulnerability
- (3) Lack of coping capacity

The hazard and exposure dimension integrates physical exposure and physical vulnerability. It captures events that could occur and the population that could potentially be exposed to these events. The vulnerability dimension focuses on the susceptibility of communities to those hazards. It captures the fragility of socio-economic systems and the strengths of communities, households and individuals to confront a crisis situation.

Finally, the lack of coping capacity dimension encompasses the lack of resilience and takes into account the institutional and infrastructural strengths to cope with and recover from a crisis.

The hazard and exposure dimension involves hazard dependent factors, while the other two dimensions concern hazard independent factors. The risk model of INFORM balances these two major forces: the hazard and exposure dimension on the one side and the vulnerability and lack of coping capacity dimensions on the other side.

Each of these three dimensions has an equal weight in the calculation of the INFORM score. The following equation is used to derive the final score:

$$RISK = HAZARD \text{ and } EXPOSURE^{1/3} \times VULNERABILITY^{1/3} \times LACK \text{ of } COPING \text{ CAPACITY}^{1/3}$$

---

<sup>2</sup> This section summarizes the risk concept used in the INFORM framework. For a more detailed description and background, please, refer to chapter 2 of "Index for Risk Management – INFORM, Concept and Methodology, version 2016", <http://www.inform-index.org/>

As each dimension is treated equal, the final score is more susceptible to the hazard independent factors captured in the vulnerability and lack of coping capacity dimensions. The factors imbedded in those two dimensions can be most influenced through disaster risk reduction, resilience and development programs and activities.

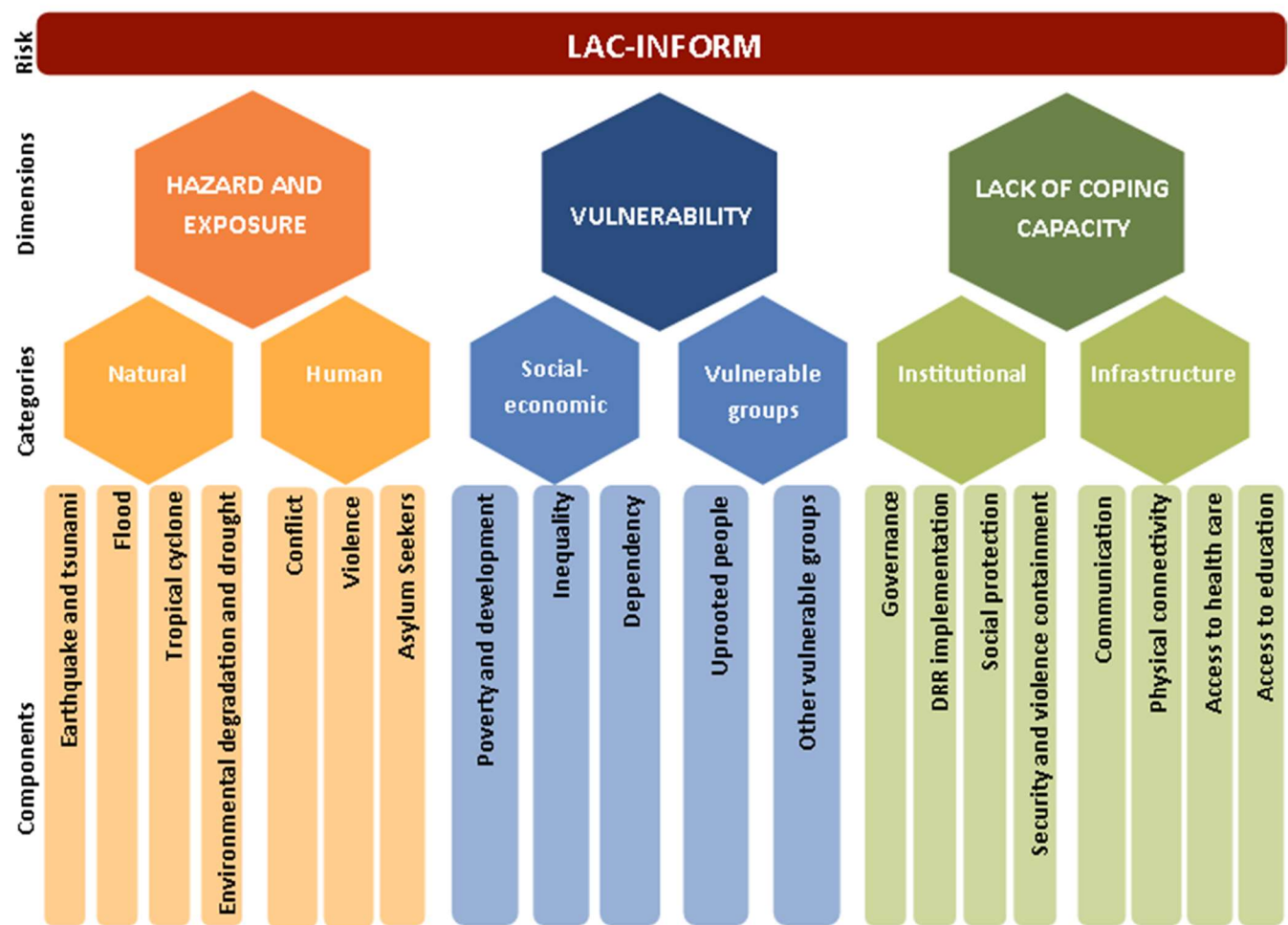
A higher score on an index in the LAC-INFORM model corresponds to worse conditions or a higher risk. A country will have worse outcomes if it scores high on the vulnerability and lack of coping dimensions and also has a high score on the hazard and exposure dimension.

2.3 LAC-INFORM Model

The LAC-INFORM model has a multi-layer structure that builds up a risk score by bringing together 81 indicators (see figure 1). The upper three levels of the LAC-INFORM model are defined by the global model and exist of:

- ✓ The **LAC-INFORM risk** at the top of the model.
- ✓ The **three dimensions** of the risk concept (hazard and exposure, vulnerability and lack of coping capacity), which together compose the final index.
- ✓ The **six risk categories** feeding into the three dimensions. Each dimension is made up of two risk categories.

Figure 1: LAC-INFORM Model



The adaptation of the LAC-INFORM model has been made at the lower levels of the model: the component, subcomponent and indicator levels.

Each category is comprised of a **number of components**. Components are carefully chosen sets of indicators that capture a specific topic of the component. These components should meet the ‘3 Rs’ criteria: relevant, representative, and robust.

The majority of the components included in the global INFORM model were also considered relevant for the regional context and have been maintained in the LAC-INFORM model. A number of the global components have been adjusted and a few new components have been introduced in the regional model to better capture the realities of the LAC context.

The LAC-INFORM model is a multi-sectoral model and seeks to represent a balanced view of different sectors. This has also been taken into account in the adjustment of existing and the selection of new components. The adjustments made at the component level in the LAC-INFORM adaptation are summarized in table 1.

Table 1: LAC-INFORM adaptation at component level

Category	Global INFORM Component	Adjusted and new components in LAC-INFORM
Natural hazard	Earthquake	Earthquake and tsunami
	Tsunami	
	Drought	Environmental degradation and drought
Human hazard		Violence
		Asylum seekers
Social-economic	Economic dependency	Dependency
Institutional		Social protection
		Security and violence containment
Infrastructure		Access to education

Each component is composed of one or more **indicators**. Indicators are individual datasets and the basis of the model. Indicators are for example percentage of children under five who are stunted, or the number of people exposed to earthquakes of a certain magnitude. Indicators may also be composite indices, such as the Human Development Index. Indicators measuring the same concept could be combined into a subcomponent first, before including them in a component.

The majority of the indicators in the global model were also considered relevant for the LAC region and have been maintained in LAC-INFORM. A number of indicators in the global model has been replaced by new indicators, which regional actors considered to better capture the situation of the region. Also, additional indicators have been selected to measure the new components introduced in LAC-INFORM. The choice of these indicators is based on a broad consultation with regional actors and a review of available indicators in existing regional and global datasets.

As an INFORM index simplifies information about crisis risk, only a few indicators are included in the model to measure each component. It was sought to include the most relevant indicators for each component, based on the consultation with regional actors. The final decision on the introduction of an indicator and composition of a



new component also depended on the availability of existing data sources, their quality and country coverage, as well as the contribution of the new indicators to the model.

Data sources used for the LAC-INFORM model were selected based on the same basic criteria defined for the INFORM global model. The data sources for the new indicators were selected if they: (i) Are freely and publicly available and transparent, (ii) Have sufficient coverage of countries in the region, (iii) Are reliable: best data available for the indicator, which is maintained and regularly updated, (iv) Are comparable between countries: maintained by one regional or global source.

The disaggregation of the LAC-INFORM model is at country level and includes national statistics only.

In the case of some indicators, global data sources have been complemented with information from regional data sources to improve their country coverage. In other cases, where the country coverage of an indicator was considered weak or the quality of an indicator was considered less strong, complementary indicators were introduced in the same component.

The source data of each indicator is pre-processed before it is used in LAC-INFORM<sup>3</sup>. In the case of the global indicators maintained in LAC-INFORM, the same data processing steps were applied on the raw data as in the global model. The minimum and maximum values used for the normalization of these indicator datasets were adjusted to the regional context though, if this was relevant<sup>4</sup>.

Each indicator is re-scaled into a range of 0 to 10 when pre-processed. A score of 0 on this range indicates a better condition (very low risk) and a score of 10 a worse condition (very high risk)<sup>5</sup>. The pre-processed and re-scaled indicators are considered indices in the INFORM model and are all included in the calculations of the three dimensions of the model.

Aggregation rules are applied to combine indices and compose each next level in the hierarchy of the model. Two aggregation rules are used by the INFORM methodology: arithmetic average and geometric average<sup>6</sup>. Starting at the indicator level, first subcomponents and components are composed using one of these two aggregation rules. Next, components are aggregated into categories, and these categories are subsequently combined into the three dimensions. The final LAC-INFORM risk index is calculated using the risk equation described above.

The complete LAC-INFORM model, including the raw source data, components and dimensions are made available in an Excel file (see Annex I for a description of the file). The indicators included in the model, their relevance, and data sources are described in the metadata sheets of the same Excel file. Users of the LAC-INFORM model can explore risk at different levels of detail in the Excel file, according to their specific needs and interest.

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<sup>3</sup> Chapter 6, Building the INFORM Model, in “Index for Risk Management – INFORM, Concept and Methodology, version 2016” (see <http://www.inform-index.org/>) explains the pre-processing of the raw data for the construction of the model.

<sup>4</sup> The minimum and maximum values used for the normalization of each indicator are included at the bottom of the dimensions sheets in the LAC-INFORM model. If a global minimum or maximum value has been adjusted for the regional model, this value has been highlighted in yellow.

<sup>5</sup> If necessary, raw data values are inverted to ensure that a higher value corresponds to a worse situation.

<sup>6</sup> See Chapter 6, Building the INFORM Model, in “Index for Risk Management – INFORM, Concept and Methodology, version 2016” (see <http://www.inform-index.org/>) for a more detailed explanation of the aggregation rules and the difference between geometric and arithmetic average.



### 3. COMPONENT AND INDICATORS

This chapter presents the component selection for each dimension of the LAC-INFORM model. It focuses on the adjustments of components, and the new components and indicators introduced in the LAC-INFORM adaptation.<sup>7</sup> A more detailed description of the indicators, their relevance for the LAC-INFORM model and their sources are described in the “LAC indicator metadata” sheet in the Excel file with the actual model. The aggregation rules used to compose the new or adjusted components in the different levels of the model are summarized in Annex II.

#### 3.1 Hazard and exposure dimension

The hazard and exposure dimension consists of two categories: natural hazards and human hazards. Figure 2 summarizes the composition of this dimension.

##### 3.1.1 Natural hazard category

The natural hazard category of LAC-INFORM builds on the global INFORM model. The category includes five components:

- ✓ Earthquake and tsunami
- ✓ Flood
- ✓ Tropical cyclone (cyclone wind and storm surge)
- ✓ Environmental degradation and drought (historical impact of drought)

##### Rapid-onset hazards

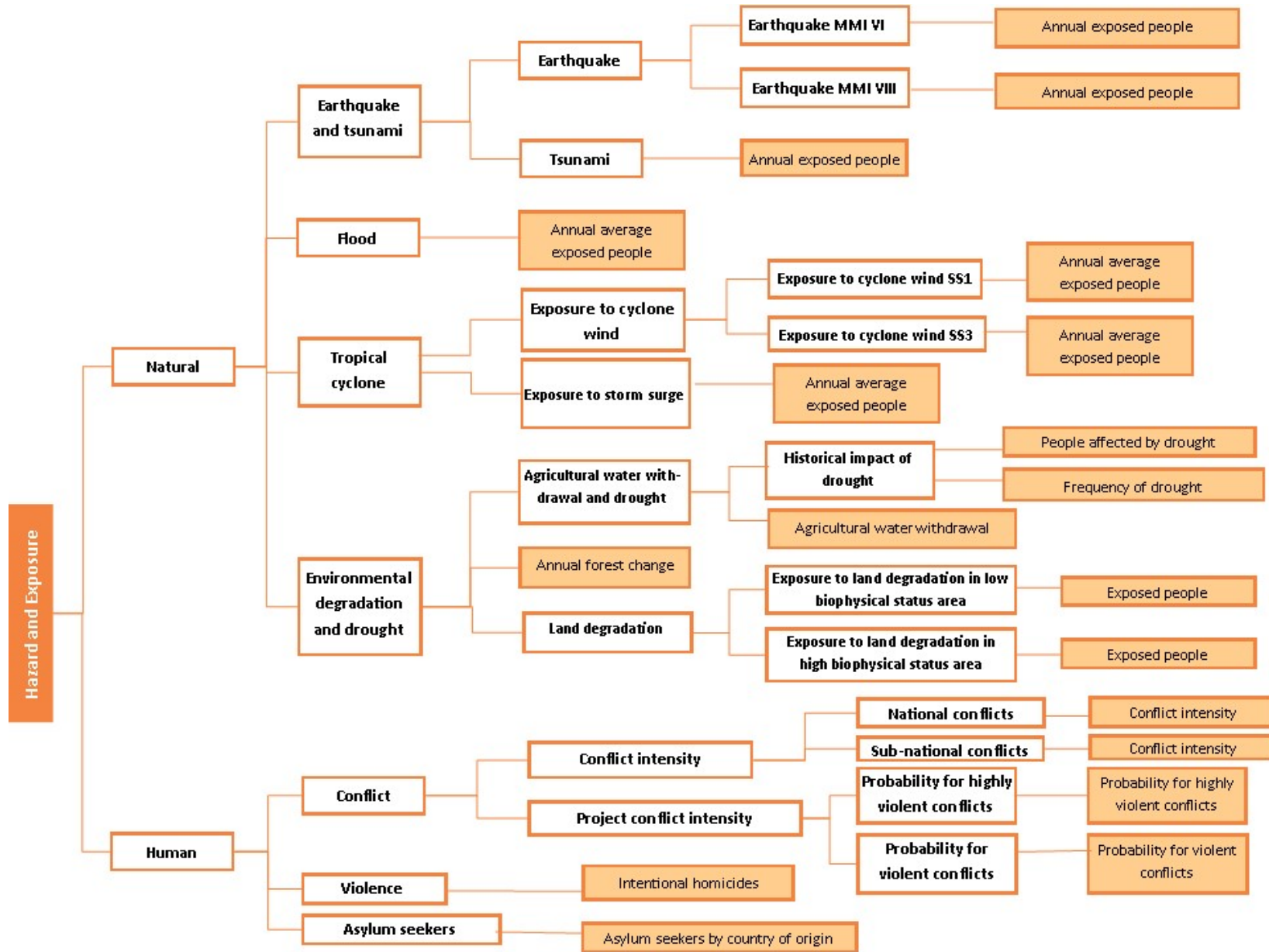
The indicators for each component of the rapid-onset hazards - earthquake, tsunami, flood and tropical cyclone - are the same as in the global INFORM model and based on the physical exposure to the hazard.

The global INFORM model considers earthquake and tsunami as two separate components in the composition of the natural hazard category. The earthquake and tsunami are considered subcomponents in LAC-INFORM and have been combined into one new component (earthquake and tsunami). This results in a more balanced model for the region. In this way, the risk in countries exposed to both tsunami and earthquakes receives less weight in the composition of the natural hazard category and the risk of countries exposed to other natural hazards only is better reflected.

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<sup>7</sup> For a description of the components of the global INFORM model, which have been maintained in the same way in LAC-INFORM, please, refer to Chapter 4 in “Index for Risk Management – INFORM, Concept and Methodology, version 2016” (see <http://www.inform-index.org/>).

Figure 2: Hazard and exposure dimension



### Environmental degradation and drought

The drought component of the global INFORM model has been adjusted to the regional context to incorporate environmental degradation. This approach was chosen as drought and environmental degradation are closely related. Also, the magnitude of the impact of drought events compared to the impact of other natural hazard events is less in the LAC region. By combining drought and environmental degradation into one component, drought is given less weight in the natural hazard category compared to the other hazards. At the same time, the aspect of environmental degradation, which could be considered a crucial aggravating factor in the region, is taken into account in the regional adaptation.

The component is composed of the following subcomponents and indices:

- **Agricultural water withdrawal and historical drought impact:** This subcomponent was created combining pressure of agricultural water withdrawal on water sources and population affected by drought and drought frequency.
- **Annual average forest change between 1990 and 2015**
- **Exposure to land degradation:** This subcomponent was created combining the relative and absolute physical exposure to medium and strong land degradation in low and high biophysical status areas.

Exposure to land degradation has been given double weight in the composition of the environmental degradation and drought component, to emphasize this aggravating factor. In addition, the indicator is considered more robust than the historical drought impact, annual forest change and agricultural water withdrawal indicators.

### 3.1.2 Human hazard category

The human hazard category of LAC-INFORM is based on the conflict component of the global INFORM model complemented with two additional components. It exists of the following components:

- ✓ Conflict
- ✓ Violence
- ✓ Asylum seekers by country of origin

#### Conflict

The indicators used for the composition of the conflict component are the same as in the global INFORM model. During the consultation, several actors considered conflict less relevant for the LAC region than exposure to violence and organized crime. Instead of completely replacing the conflict component, it has been decided though to maintain it and complement it with indices considered more relevant for capturing exposure to violence and persecution in the context of the LAC region. Conflict currently is a relevant factor for a number of countries. Furthermore, maintaining the conflict index also still allows to capture future conflicts in countries where this is not an issue now, but could become in the future. The results show that the conflict index also contributes to a more balanced view on the exposure to human hazards in the region.

#### Violence

The violence index is an aggregation of the **absolute and relative intentional homicide rate**.

#### Asylum seekers by country of origin

**The number of people of a given country applying for asylum elsewhere** could be considered as a reflection of the exposure of a population to conflict, violence or persecution in their country of origin. This index is composed by the absolute and relative number of people of a country who have applied for asylum in another country during a given year.

### 3.2 Vulnerability dimension

The vulnerability dimension consists of two categories: socio-economic vulnerability and vulnerable groups. Figure 3 summarizes the composition the vulnerability dimension.

#### 3.2.1 Socio-economic vulnerability category

The socio-economic category of the LAC-INFORM builds on two components of the global INFORM model. The third component of the global model, economic dependency, has been revised and captures dependency in a broader sense than the macro-economic dependency incorporated in the global model. The socio-economic vulnerability category in the LAC-INFORM therefore is an aggregation of the following three components:

- ✓ Development and deprivation
- ✓ Inequality
- ✓ Dependence

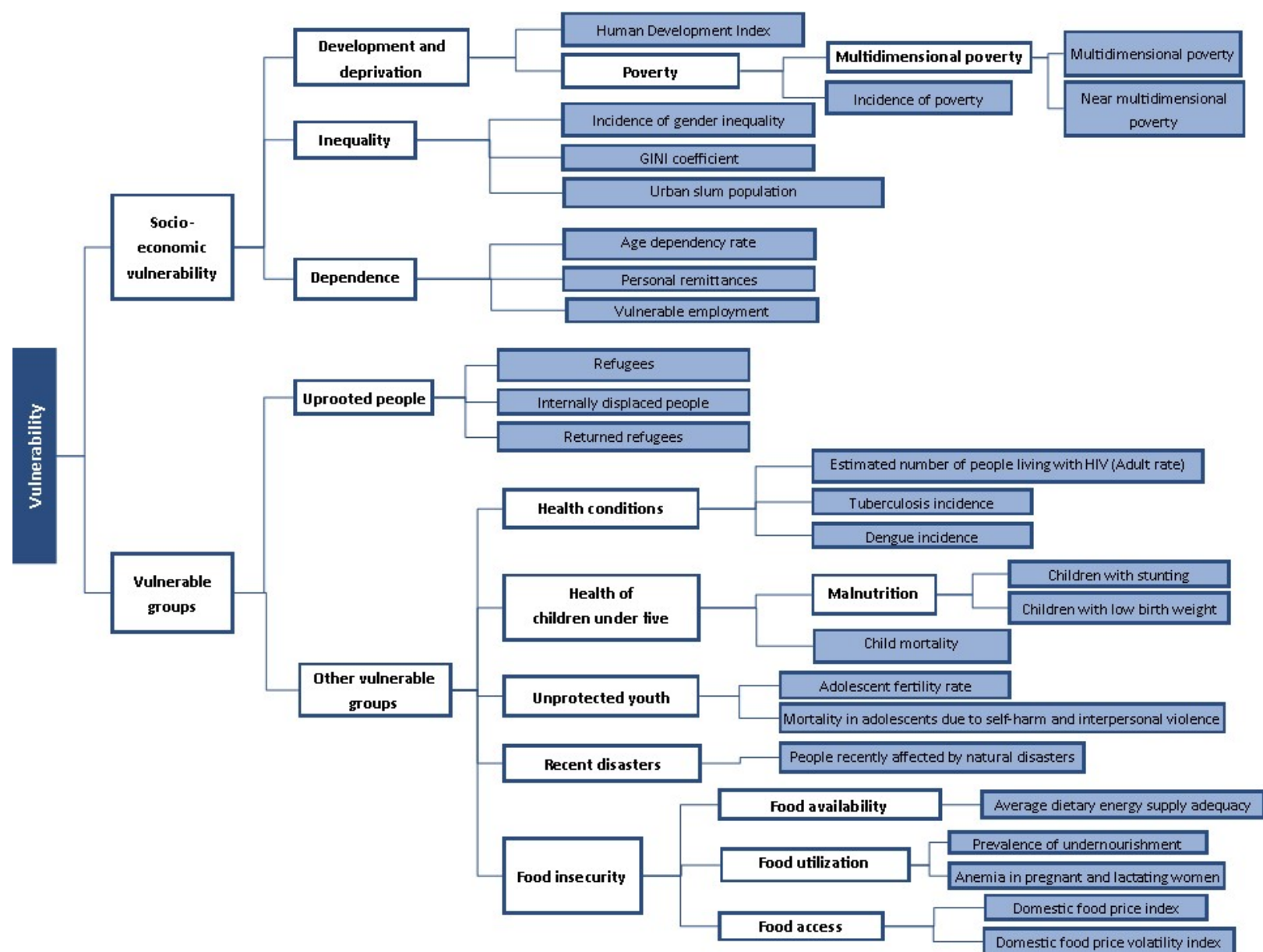
#### Development and deprivation

As in the global INFORM model, this component describes how a population is doing on average. It comprises the Human Development Index (HDI) and a poverty subcomponent.

The poverty subcomponent is an adjustment to the regional context. Deprivation in the global model is reflected by the multi-dimensional poverty index. This indicator did not reflect the situation in the Latin America and Caribbean region very well though. The adjusted poverty subcomponent is comprised of the following indices:

- **Multi-dimensional poverty (MDP):** This index is constructed by the MDP head count and the near-MDP head count. Poor people are inherently vulnerable, but those at risk of falling into poverty through, for example, the impact of a natural disaster or another sudden event, are also vulnerable. The inclusion of near-MDP allows to also capture this aspect. The current focus on strengthening the measurement of multi-dimensional poverty is likely to improve the data availability for these indicators in the future.
- **National poverty headcount:** This indicator has been included to complement the MDP index and capture deprivation in particular in those countries where MDP is not reported for. The national poverty headcount data should be interpreted with caution though. One limitation is that the national poverty headcount is based on national poverty lines and the data are therefore not comparable between countries. Besides, CARICOM data have been used for several Caribbean countries to fill in data gaps in the global dataset of the World Bank used for this indicator. The data reported by CARICOM for several countries are more than five years old though and therefore considered less reliable.

Figure 3: Vulnerability dimension



## Inequality

This component takes into the account the dispersion of conditions within the population of a country. It uses the same two proxy measures as in the global model – the Gini index and the gender inequality index – complemented with population living in urban slums, as proportion of the total urban population.

**Urban slum population** has been incorporated in the regional model to better reflect urban issues in the LAC context. Several actors have emphasized the relevance of urban aspects for a regional adaptation of INFORM. According to UN-HABITAT, cities in the LAC region are deeply divided socially and spatially and inequality is persistent. Although unsystematic, there is a strong correlation between income inequality and spatial fragmentation; they are mutually reinforcing and represent a challenge for governments and society alike<sup>8</sup>. Vulnerabilities related to urban areas has therefore been introduced within inequality. The urban slum population is a Sustainable Development Goal (SDG) indicator and therefore is likely to be further improved in the future.

**Gini index** data of the global source have been complemented with Caribbean Development Bank data to fill in data gaps for several countries in the Caribbean. According to JRC, the INFORM global model uses the latest available value in past ten years. Experts consulted for the development of the global model considered that ten year old Gini index still valid.

## Dependence

This component is an adjustment of the model to the regional context and builds on the following indices:

- **Age dependency rate:** The age dependency ratio allows to measure the burden weighing on members of the labor force within the household. It is assumed that a high dependency ratio is associated with greater poverty and vulnerability.
- **Remittances:** Dependency on remittances reflects a dependency on income from abroad and lack of local employment opportunities. Also, it is considered an indication of higher vulnerability to global economic and financial crisis.
- **Vulnerable employment:** People engaged in vulnerable employment are considered the most vulnerable and most likely to fall into poverty. They are the least likely to have social protection and safety nets to guard against economic shocks, and often are incapable of generating sufficient savings to offset these shocks. A high proportion of unpaid family workers in a country indicates weak development, little job growth, and often a large rural economy (World Development Indicators<sup>9</sup>).

### 3.2.2 Vulnerable group category

The vulnerable group category is comprised of two components: uprooted people and other vulnerable groups.

#### Uprooted people

The indicators to construct the uprooted people component have been maintained as they are in the global INFORM model. The indicators are aggregated with a geometric average in the LAC-INFORM model, in line with the approach applied for the aggregation of relative and absolute population data in the recent disasters components and in the hazard and exposure dimension.

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<sup>8</sup> The state of Latin American and Caribbean cities, 2012, towards a new urban transition.

<http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3386>

<sup>9</sup> See also development relevance described in the metadata of the indicator in the World Development Indicator database: <http://databank.worldbank.org/data/reports.aspx?source=2&type=metadata&series=SL.EMP.VULN.ZS#advancedDownloadOptions>

### Other vulnerable groups

The component has been adjusted to the regional context to better reflect the vulnerability of youth in the region. Also, various aspects of the four subcomponents of the global model have been revised to better capture and reflect the situation of the Latin American and Caribbean context. The other vulnerable groups component exists of the following subcomponents:

- ✓ Health conditions
- ✓ Health conditions of children under five
- ✓ Unprotected youth
- ✓ Recent disasters
- ✓ Food security

The **health conditions** subcomponent refers to people in weak health conditions. It is composed of three deadly infectious diseases: **HIV-AIDS incidence** and **tuberculosis incidence**, which are also considered in the global INFORM model, and **dengue incidence**. Dengue incidence has been introduced in the LAC-INFORM model and replaces malaria mortality rate. According to PAHO, severe dengue affects most Latin American and Caribbean countries and has become a leading cause of hospitalization and death among children and adults. The dengue virus is transmitted by female mosquitoes mainly of the species *Aedes aegypti*. This mosquito also transmits chikungunya, yellow fever and Zika infection. Dengue incidence rate is therefore considered also as a proxy for the incidence of these other infections.

**Health conditions of children under five** are captured through **mortality of children under five** and **malnutrition**. The malnutrition index is an aggregation of the percentage of children under five who are stunted and low birth weight. These two indicators replace the underweight indicator included in the global INFORM model. According to UNICEF, analyses of Latin America and Caribbean nutrition data has shown that stunting affects a much larger number of children in the region than underweight. It is therefore considered a better indicator to capture the cumulative effects of undernutrition and predict health and well-being in adulthood, and to track regional progress in nutrition. A baby's weight at birth is considered another strong indicator of maternal and newborn health and nutrition.

Specific criteria have been used to transform the two nutrition indicators to a scale of 0 to 10, based on available references. These criteria are summarized in table 2 and 3.

Table 2: Transformation criteria for under-five stunting

Under-five stunting (%)	Classification of stunting (UNICEF)(*)	Level of vulnerability in LAC-INFORM	Under-five stunting (relative)
< 5%	Low	very low	2
5% < 20%	Low	low	4
20% < 30%	Moderate	medium	6
30% < 40%	High	high	8
>= 40%	Very high	very high	10

(\*) Based on the nutrition map presented in <http://data.unicef.org/topic/nutrition/malnutrition/>



Table 3: Transformation criteria for low birthweight

Low birth weight (%)	Classification of low birth weight rate (UNICEF, GRIN)(*)	Level of vulnerability in LAC-INFORM	Low birth weight (relative)
0%	Low	very low	0
>0% and < 5%	Low	very low	2
5 < 9%	Low	low	4
9 < 12%	Moderate	medium	6
12% < 15%	High	high	8
>= 15%	Very high	very high	10

(\*) Based on the nutrition adaptation of INFORM developed by the REDHUM regional nutrition resilience group (the GRIN-LAC matrix), <http://www.redhum.org/sectores/12>. The GRIN matrix distinguishes four classes only. The class with the lowest vulnerability level (<9%) in the GRIN-LAC matrix has been split into low (5% < 9%) and very low (0% < 5%) in the LAC-INFORM adaptation.

**Unprotected youth** is a new subcomponent in the LAC-INFORM model. Vulnerability of adolescents is considered a key issue for the LAC region by various actors, which should be taken into account in a risk model. The subcomponent captures health conditions and protection issues among adolescents. It is composed by two indicators: **adolescent birth rate** (or age-specific fertility rate) and **cause of death in adolescents (15 - 19 years) due to self-harm and interpersonal violence**.

The adolescent birth rate provides a basic measure of reproductive health focusing on the vulnerable group of adolescent women. The causes of death in adolescents due to self-harm and interpersonal violence reflect the disproportional impact of insecurity in the region on adolescents.

**Recent disasters** subcomponent is based on the global INFORM model and accounts for the increased vulnerability of a population due to the impact of a recent disaster. The subcomponent has been adjusted to the regional context and considers not only the relative number, but also the absolute number of people affected by natural disasters in the past three years. It is assumed that vulnerability decreases during the three years' recovery period. As in the global model, the affected people in the most recent year are therefore fully considered, while the number of affected people in the second and third year are scaled down with a factor of 0.5 and 0.25, respectively.

**Food insecurity** is defined by Food Access, Food Availability and Food Utilization. The first two indices build on the global INFORM model. The third index, the Food Utilization subcomponent, has been adjusted to the regional context and introduces **anemia in pregnant and lactating women**. This indicator complements the undernourishment indicator included in the global INFORM model.

Beside this addition, specific criteria are used in the LAC-INFORM model to transform the undernourishment indicator to a scale of 0 to 10, based on the categories of the global hunger map<sup>10</sup>. The criteria used for the transformation of this indicator and the anemia incidence are presented in table 4 and 5.

<sup>10</sup> <http://www.wfp.org/content/hunger-map-2015>

Table 4: Transformation criteria for anemia incidence among pregnant and lactating women

Anemia incidence (%)	Classification of anemia as problem of public health significance (WHO)	Level of vulnerability in LAC-INFORM	Anemia incidence (relative)
< 5%	No public health problem	very low	0
5% < 20%	Mild public health problem	low	3
20% < 30%	Moderate public health problem	medium	6
30% < 40%	Moderate public health problem	high	8
>= 40%	Severe public health problem	very high	10

Table 5: Transformation criteria for the relative value of undernourishment prevalence

Undernourishment prevalence (%)	Classification in hunger map 2015	Level of vulnerability in LAC-INFORM	Undernourishment prevalence (relative)
0%	No prevalence	No vulnerability	0
< 5%	Very low	very low	2
5% < 15%	Moderately low	low	4
15% < 25%	Moderately high	medium	6
25% < 35%	High	high	8
>= 35%	Very high	very high	10

### 3.3 Lack of coping capacity dimension

The lack of coping capacity dimension consists of two categories: institutional and infrastructure. Figure 4 summarizes the composition of this dimension.

#### 3.3.1 Institutional category

The institutional category of the LAC-INFORM builds on two components of the global INFORM model, disaster risk reduction implementation and governance, complemented with two new components, social protection and security and violence containment. The institutional category in LAC-INFORM therefore is an aggregation of the following four components:

- ✓ Disaster Risk Reduction implementation (DRR)
- ✓ Governance
- ✓ Social protection
- ✓ Security and violence containment

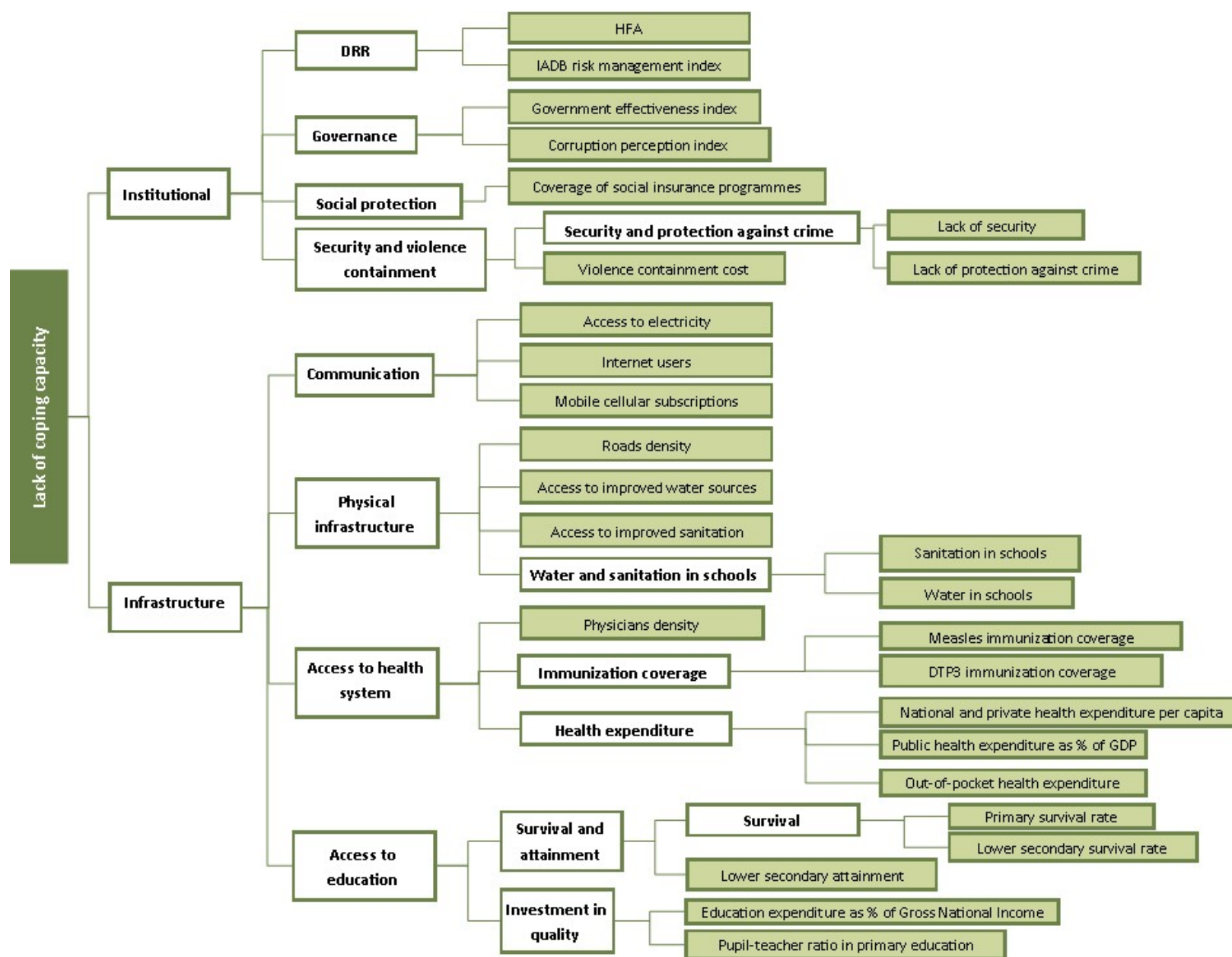
#### Disaster Risk Reduction implementation (DRR)

This component has been adjusted to the regional context. It combines the **Hyogo Framework of Actions Scores** (HFA) incorporated in the global INFORM model with the **Risk Management Index** (RMI) developed by the Inter-American Development Bank<sup>11</sup>.

The RMI is available for 22 countries in the Latin America and Caribbean region. The main objective of the RMI is to measure the performance of risk management. The index reflects the organizational, development, capacity and institutional action taken in a country to reduce vulnerability and losses, to prepare for crisis and efficiently recover. It is a robust indicator and complements well the HFA.

<sup>11</sup> <http://www.iadb.org/es/temas/desastres-naturales/indicadores-de-riesgo-de-desastres,2696.html>

Figure 4: Lack of coping capacity dimension



## Governance

The governance component of the global INFORM model has been maintained in the LAC-INFORM model as it is and is composed of two indicators: the **Government Effectiveness** and **Corruption Perception Index**.

## Social protection

This component has been introduced in the LAC-INFORM model, as social protection systems could contribute to resilience building and enhance the coping capacity of communities and people affected by a disaster.

According to the World Bank, social protection and labor systems help individuals and families, especially the poor and vulnerable cope with crises and shocks, find jobs, invest in the health and education of their children, and protect the aging population. Social protection systems that are well-designed and implemented can enhance human capital and productivity, reduce inequalities, build resilience and end inter-generational cycle of poverty.

Social protection systems figure prominently in the UN Sustainable Development Goals (SDGs). Goal 1.3 calls for the implementation of “nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and vulnerable”.<sup>12</sup>

Statistics on social protection are often incomplete though. Also, reporting on existing indicators often does not comply with international statistical standards hampering a comparison between countries. The current availability of indicators allowing a regional comparison of the capacity of social protection systems is therefore limited.

The component in the LAC-INFORM model has been based on the **coverage of social insurance programmes**. This indicator covers 19 countries in the region. Considering the importance given to social protection systems in the SDGs, this component is expected to be further refined in future updates of the model, when reporting on existing indicators is improved and complementary indicators with sufficient country coverage become available.

## Security and violence containment

This component has been introduced in the LAC-INFORM model to capture the influence of violence on the coping capacity of people and society. Violence and crime affect access to infrastructure and weaken the capacity of government institutions to implement programs. Expenditures on containing and dealing with the consequences of violence also affect the availability of government resources for allocation to other areas.

The security and violence containment component is an aggregation of the following two indices:

- **Security and protection against crime index** is composed of two indicators: lack of protection against crime and lack of security. Both indicators are part of opinion based surveys. The lack of protection against crime indicator captures the proportion of respondents of the Latino Barometer survey<sup>13</sup> that consider protection against crime is not guaranteed in a country. The lack of security indicator captures the proportion of respondents of the AmericasBarometer<sup>14</sup> that view security as the most important problem within their country.

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<sup>12</sup> <http://www.worldbank.org/en/topic/socialprotectionlabor/overview#1>

<sup>13</sup> <http://www.latinobarometro.org/lat.jsp>

<sup>14</sup> <http://www.vanderbilt.edu/lapop/about-americasbarometer.php>. This indicator is based on 2014 LAPOP complemented with 2016 LAPOP data for Easter Caribbean.

- **Violence containment cost index** has been developed by the Institute for Economics and Peace<sup>15</sup>. Violence containment refers to economic activity related to the consequences or prevention of violence where the violence is directed against people or property.

The violence containment cost index is given more weight compared to the perception of security and protection from crime index in the aggregation of the component. As the security and protection against crime index is based on opinion surveys and public perception, it could be perceived as a less reliable measure than the violence containment cost. Besides, the opinion surveys are not carried out in all countries in the LAC region, affecting data availability.

### 3.3.2 Infrastructure category

The infrastructure category is based on three components of the global INFORM model, communication, infrastructure and access to health systems, complemented with a new component, access to education. The category in the LAC-INFORM therefore is an aggregation of the following four components:

- ✓ Communication
- ✓ Infrastructure
- ✓ Access to health systems
- ✓ Access to education

#### Communication

The communication component is based on three of the four indicators of the global INFORM model: **access to electricity, internet users and mobile cellular subscriptions**.

The literacy indicator incorporated in the global INFORM model has not been included in the LAC-INFORM model. The literacy indicator only partially captures the geographic, socio-economic and ethnic disparities that persist in the region and hamper access to education and communication capacity in emergencies. Furthermore, the accessibility of education system is considered a crucial characteristic of coping capacity in emergency situations in the LAC context. A separate component has therefore been introduced within the infrastructure category.

#### Physical infrastructure

The physical infrastructure component is composed of three subcomponents included in the global INFORM model, **road density, access to improved water sources, and access to improved sanitation sources**. These three subcomponents are complemented with a new component capturing **water and sanitation in schools**.

The **water and sanitation in schools** subcomponent is based on two indicators: water in schools and sanitation in schools. Safe water supply and sanitation coverage in schools and health care facilities is considered a critical aspect of access to basic infrastructure. Universal access to water and sanitation in schools remains a challenge in LAC region though. The two indicators on water and sanitation in schools also show larger dispersion and differences between countries in the region compared to the household access to improved water and sanitation indicators.

#### Access to health systems

The access to health systems component builds on the same aspects as the global INFORM model: **physician density, immunization coverage and health expenditure**. The physician density subcomponent is based on the same indicator as in the global INFORM model. The other two aspects are comprised of the indicators of the global model complemented with new indicators.

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<sup>15</sup> <http://economicsandpeace.org/>

**Immunization coverage** subcomponent is captured by measles and DTP3 immunization coverage. The DTP3 indicator is an addition to regional model.

**Health expenditure** subcomponent is composed of the national and public health expenditure per capita indicator of the global INFORM model, complemented with public health expenditure as percentage of GDP and Out-Of-Pocket healthcare expenditures (OOPS).

Timely access to health services is critical, in particular in emergency contexts. Public expenditure in health systems has been introduced in the model to better capture public investment in the health sector in order to achieve universal coverage. A well-functioning health financing system is considered the basis for achieving universal coverage of health services. It determines whether people can afford the use of these services when they need them and do not suffer financial hardship paying for them.

OOPS is another indicator related to universal health coverage. If the OOPS are high, they can pose a significant financial risk to vulnerable people. The indicator is recognized as a proxy measure for financial risk assessments of access to the health care system.

#### Access to education

The access to education component is an addition in the LAC-INFORM model. It is an aggregation of **survival and attainment** and **investment in education quality**.

Survival and attainment captures educational outcomes. Survival is measured through **primary and lower secondary survival rates**, while attainment focuses on **educational attainment of lower secondary**. According to UNESCO, inequality in access to secondary education persists in the region. Analysis reveals differences in the likelihood of transitioning from primary to lower secondary school and from lower secondary to upper secondary school between children from the richest and poorest households in low and medium income countries. Inequalities in the attainment of lower secondary education also relate to where adolescents live. Access to secondary school has been an issue for marginalized groups, including working children and migrants<sup>16</sup>.

Investment in education quality is an aggregation of **education expenditure as % of GNI** and **pupil/teacher ratio in primary education**. These two indicators are an indication of investments made in the educational infrastructure. They don't capture the effectiveness of these investments, nor take into account other factors which could affect the quality of education, such as the teachers' qualifications. Therefore, the educational outcomes captured in the survival and attainment subcomponent have been given more weight than the education investment subcomponent in the construction of the access to education component.

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<sup>16</sup> <http://unesdoc.unesco.org/images/0023/002325/232567E.pdf>

#### 4. INTERPRETATION OF THE LAC-INFORM INDEX SCORES

The countries have been classified into five groups (very high, high, medium, low and very low risk) on the final INFORM index, each of the three dimensions, and the six categories. As in the global model, a cluster analysis was used to group the countries for each of these ten indices, and class limits were defined based on this analysis (see Annex III)<sup>17</sup>.

Classification of the countries on the INFORM index and dimensions are summarized below and presented in the four maps in Annex VIII.

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<sup>17</sup> For a more detailed description of the interpretation of the INFORM results, please, refer to chapter 7 of “Index for Risk Management – INFORM, Concept and Methodology, version 2016”, <http://www.inform-index.org/>



Table 6: Classification of the Latin America and Caribbean countries by risk level on the LAC-INFORM index, dimensions and categories

LAC-INFORM risk

VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
Guatemala (8.5)	Colombia (7.1)	Jamaica (5.5)	Saint Kitts and Nevis (4.2)	Barbados (2.7)
Haiti (8.4)	Venezuela (6.8)	Guyana (5.5)	Costa Rica (4.2)	Uruguay (2.7)
Honduras (8.3)	Nicaragua (6.6)	Brazil (5.1)	Argentina (3.9)	Grenada (2.4)
El Salvador (7.8)	Mexico (6.5)	Panama (5.0)	Saint Vincent and the Grenadines (3.8)	
	Ecuador (6.4)	Belize (4.9)	Trinidad and Tobago (3.8)	
	Dominican Republic (6.1)	Paraguay (4.7)	Cuba (3.7)	
	Bolivia (6.0)		Chile (3.7)	
	Peru (6.0)		Bahamas (3.6)	
			Dominica (3.6)	
			Suriname (3.6)	
			Saint Lucia (3.3)	
			Antigua and Barbuda (3.2)	

Hazard and exposure risk dimension

VERY HIGH	HIGH	MEDIUM	LOW
Guatemala (8.6)	Nicaragua (6.7)	Chile (4.9)	Dominica (3.6)
El Salvador (8.5)	Ecuador (6.5)	Costa Rica (4.7)	Paraguay (3.4)
Honduras (8.4)	Brazil (6.3)	Panama (4.5)	Saint Lucia (3.2)
Mexico (8.4)	Dominican Republic (6.2)	Bahamas (4.4)	Trinidad and Tobago (3.2)
Colombia (7.9)	Jamaica (6.0)	Saint Kitts and Nevis (4.3)	Antigua and Barbuda (3.0)
Haiti (7.6)	Peru (5.9)	Argentina (4.3)	Suriname (2.9)
Venezuela (7.6)	Cuba (5.7)	Saint Vincent and the Grenadines (4.1)	VERY LOW
	Belize (5.6)	Guyana (4.0)	Barbados (2.4)
	Bolivia (5.4)		Uruguay (2.0)
			Grenada (1.2)

### Natural hazard category

VERY HIGH	HIGH	MEDIUM	LOW
Mexico (8.5)	Venezuela (7.0)	Brazil (5.3)	Suriname (3.9)
Guatemala (8.4)	Cuba (6.9)	Argentina (5.0)	Antigua and Barbuda (3.8)
Nicaragua (8.3)	Chile (6.7)	Dominica (4.9)	Saint Kitts and Nevis (3.2)
Honduras (8.1)	Costa Rica (6.4)	Guyana (4.6)	Barbados (3.1)
Colombia (7.8)	Belize (6.3)	Bahamas (4.3)	Saint Lucia (2.8)
Haiti (7.7)	Panama (5.9)	Paraguay (4.1)	<b>VERY LOW</b>
Ecuador (7.7)	Bolivia (5.9)		Trinidad and Tobago (2.2)
El Salvador (7.6)	Jamaica (5.8)		Uruguay (2.2)
Dominican Republic (7.3)			Saint Vincent and the Grenadines (1.7)
Peru (7.3)			Grenada (0.7)

### Human hazard category

VERY HIGH	MEDIUM	LOW	VERY LOW
El Salvador (9.1)	Jamaica (6.1)	Bahamas (4.5)	Panama (2.8)
Guatemala (8.7)	Saint Vincent and the Grenadines (5.9)	Nicaragua (4.2)	Paraguay (2.7)
Honduras (8.7)	Saint Kitts and Nevis (5.3)	Cuba (4.1)	Costa Rica (2.4)
Mexico (8.3)	Ecuador (5.0)	Trinidad and Tobago (4.1)	Chile (2.4)
Venezuela (8.1)	Dominican Republic (4.9)	Peru (4.1)	Antigua and Barbuda (2.1)
Colombia (8.0)	Bolivia (4.9)	Saint Lucia (3.5)	Dominica (2.0)
<b>HIGH</b>	Belize (4.8)	Argentina (3.5)	Grenada (1.7)
Haiti (7.4)		Guyana (3.4)	Suriname (1.7)
Brazil (7.1)			Uruguay (1.7)
			Barbados (1.6)

### Vulnerability risk dimension

VERY HIGH	MEDIUM	LOW	VERY LOW
Haiti (8.9)	Ecuador (6.5)	Dominican Republic (5.2)	Argentina (3.5)
Guatemala (8.4)	Bolivia (6.3)	Panama (5.0)	Chile (3.4)
Honduras (8.3)	Venezuela (6.1)	Brazil (4.6)	Saint Vincent and the Grenadines (3.3)
HIGH	Guyana (6.0)	Paraguay (4.5)	Uruguay (3.1)
El Salvador (7.3)	Peru (5.9)	Belize (4.3)	Cuba (2.9)
Colombia (7.0)	Mexico (5.8)	Jamaica (4.0)	Grenada (2.9)
	Nicaragua (5.8)	Dominica (3.9)	Saint Kitts and Nevis (2.9)
		Costa Rica (3.9)	Trinidad and Tobago (2.9)
			Antigua and Barbuda (2.7)
			Suriname (2.7)
			Barbados (2.6)
			Saint Lucia (2.6)
			Bahamas (2.2)

### Social-economic vulnerability category

VERY HIGH	MEDIUM	LOW	VERY LOW
Haiti (9.6)	Dominican Republic (5.9)	Colombia (4.9)	Antigua and Barbuda (3.7)
Guatemala (8.8)	Jamaica (5.3)	Dominica (4.8)	Saint Lucia (3.6)
Honduras (8.7)	Paraguay (5.3)	Saint Vincent and the Grenadines (4.7)	Brazil (3.6)
	Peru (5.3)	Mexico (4.7)	Barbados (3.5)
	Ecuador (5.1)	Venezuela (4.7)	Cuba (3.5)
	Belize (5.0)	Panama (4.5)	Costa Rica (3.4)
HIGH		Grenada (4.4)	Suriname (3.3)
Bolivia (7.4)		Saint Kitts and Nevis (4.3)	Uruguay (3.2)
Nicaragua (6.7)			Argentina (3.1)
Guyana (6.7)			Chile (2.9)
El Salvador (6.2)			Trinidad and Tobago (2.7)
			Bahamas (2.6)

### Vulnerable group category

VERY HIGH	HIGH	MEDIUM	VERY LOW
Colombia (8.4) El Salvador (8.1) Guatemala (8.0) Haiti (7.8) Honduras (7.8) Ecuador (7.5) Venezuela (7.2)	Mexico (6.7) Peru (6.4) Panama (5.5) Brazil (5.5) Guyana (5.2) Bolivia (5.0)	Nicaragua (4.6) Dominican Republic (4.4) Costa Rica (4.4) Argentina (3.9) Chile (3.8) Paraguay (3.7) Belize (3.6)	Suriname (2.0) Bahamas (1.7) Saint Vincent and the Grenadines (1.7) Antigua and Barbuda (1.6) Barbados (1.5) Saint Lucia (1.5) Saint Kitts and Nevis (1.2) Grenada (1.1)
		LOW	
		Trinidad and Tobago (3.0) Uruguay (3.0) Dominica (2.9) Jamaica (2.4) Cuba (2.2)	

### Lack of coping capacity risk dimension

VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
Haiti (8.7) Guatemala (8.5) Honduras (8.1)	El Salvador (7.7) Nicaragua (7.4) Dominican Republic (7.1) Guyana (7.1) Jamaica (6.8) Paraguay (6.7) Venezuela (6.7) Bolivia (6.5) Colombia (6.5)	Ecuador (6.3) Peru (6.2) Trinidad and Tobago (6.1) Saint Kitts and Nevis (6.0) Suriname (5.9) Mexico (5.6) Panama (5.5) Bahamas (5.0) Belize (5.0)	Brazil (4.7) Saint Lucia (4.4) Antigua and Barbuda (4.2) Saint Vincent and the Grenadines (4.2) Grenada (4.1) Costa Rica (4.1) Argentina (3.9)	Dominica (3.4) Uruguay (3.1) Barbados (3.0) Cuba (3.0) Chile (3.0)

### Institutional category

VERY HIGH	HIGH	MEDIUM	VERY LOW
El Salvador (8.8) Honduras (8.7) Guatemala (8.5) Jamaica (8.0)	Venezuela (7.8) Saint Kitts and Nevis (7.6) Trinidad and Tobago (7.6) Dominican Republic (7.5) Haiti (7.2) Guyana (7.2) Colombia (7.1) Paraguay (7.0) Nicaragua (6.9) Bolivia (6.7)	Mexico (6.2) Ecuador (6.2) Bahamas (5.9) Suriname (5.9) Peru (5.8) Panama (5.5)	Argentina (4.1) Costa Rica (4.0) Belize (3.9) Uruguay (3.7) Cuba (3.5) Barbados (3.2) Saint Vincent and the Grenadines (3.2) Dominica (3.0) Chile (2.9)
		LOW	
		Brazil (5.1) Antigua and Barbuda (5.0) Saint Lucia (4.8) Grenada (4.6)	

### Infrastructure category

VERY HIGH	MEDIUM	LOW	VERY LOW
Haiti (9.6) Guatemala (8.5)	Ecuador (6.4) Paraguay (6.4) Bolivia (6.3) Belize (6.0)	Brazil (4.2) Trinidad and Tobago (4.1) Costa Rica (4.1) Bahamas (4.0)	Barbados (2.7) Uruguay (2.5) Cuba (2.4)
HIGH	El Salvador (6.0)	Saint Lucia (3.9)	
Nicaragua (7.8) Honduras (7.3) Guyana (6.9) Dominican Republic (6.6) Peru (6.5)	Colombia (5.9) Suriname (5.8) Panama (5.4) Venezuela (5.2) Jamaica (5.1) Saint Vincent and the Grenadines (5.0) Mexico (5.0)	Dominica (3.8) Saint Kitts and Nevis (3.7) Argentina (3.6) Grenada (3.5) Antigua and Barbuda (3.4) Chile (3.1)	

Table 7: Latin America and Caribbean countries grouped by LAC-INFORM risk level

INFORM RISK IS VERY HIGH										
	INFORM RISK	HAZARD & EXPOSURE	Natural	Human	VULNERABILITY	Socio-economic	Vulnerable groups	LACK OF COPING	Institutional	Infrastructure
El Salvador	7.8	8.5	7.6	9.1	7.3	6.2	8.1	7.7	8.8	6.0
Guatemala	8.5	8.6	8.4	8.7	8.4	8.8	8.0	8.5	8.5	8.5
Haiti	8.4	7.6	7.7	7.4	8.9	9.6	7.8	8.7	7.2	9.6
Honduras	8.3	8.4	8.1	8.7	8.3	8.7	7.8	8.1	8.7	7.3
INFORM RISK IS HIGH										
	INFORM RISK	HAZARD & EXPOSURE	Natural	Human	VULNERABILITY	Socio-economic	Vulnerable groups	LACK OF COPING	Institutional	Infrastructure
Bolivia	6.0	5.4	5.9	4.9	6.3	7.4	5.0	6.5	6.7	6.3
Colombia	7.1	7.9	7.8	8.0	7.0	4.9	8.4	6.5	7.1	5.9
Dominican Republic	6.1	6.2	7.3	4.9	5.2	5.9	4.4	7.1	7.5	6.6
Ecuador	6.4	6.5	7.7	5.0	6.5	5.1	7.5	6.3	6.2	6.4
Mexico	6.5	8.4	8.5	8.3	5.8	4.7	6.7	5.6	6.2	5.0
Nicaragua	6.6	6.7	8.3	4.2	5.8	6.7	4.6	7.4	6.9	7.8
Peru	6.0	5.9	7.3	4.1	5.9	5.3	6.4	6.2	5.8	6.5
Venezuela	6.8	7.6	7.0	8.1	6.1	4.7	7.2	6.7	7.8	5.2
INFORM RISK IS MEDIUM										
	INFORM RISK	HAZARD & EXPOSURE	Natural	Human	VULNERABILITY	Socio-economic	Vulnerable groups	LACK OF COPING	Institutional	Infrastructure
Belize	4.9	5.6	6.3	4.8	4.3	5.0	3.6	5.0	3.9	6.0
Brazil	5.1	6.3	5.3	7.1	4.6	3.6	5.5	4.7	5.1	4.2
Guyana	5.5	4.0	4.6	3.4	6.0	6.7	5.2	7.1	7.2	6.9
Jamaica	5.5	6.0	5.8	6.1	4.0	5.3	2.4	6.8	8.0	5.1
Panama	5.0	4.5	5.9	2.8	5.0	4.5	5.5	5.5	5.5	5.4
Paraguay	4.7	3.4	4.1	2.7	4.5	5.3	3.7	6.7	7.0	6.4

INFORM RISK IS LOW										
	INFORM RISK	HAZARD & EXPOSURE	Natural	Human	VULNERABILITY	Socio-economic	Vulnerable groups	LACK OF COPING	Institutional	Infrastructure
Antigua and Barbuda	3.2	3.0	3.8	2.1	2.7	3.7	1.6	4.2	5.0	3.4
Argentina	3.9	4.3	5.0	3.5	3.5	3.1	3.9	3.9	4.1	3.6
Bahamas	3.6	4.4	4.3	4.5	2.2	2.6	1.7	5.0	5.9	4.0
Chile	3.7	4.9	6.7	2.4	3.4	2.9	3.8	3.0	2.9	3.1
Costa Rica	4.2	4.7	6.4	2.4	3.9	3.4	4.4	4.1	4.0	4.1
Cuba	3.7	5.7	6.9	4.1	2.9	3.5	2.2	3.0	3.5	2.4
Dominica	3.6	3.6	4.9	2.0	3.9	4.8	2.9	3.4	3.0	3.8
Saint Kitts and Nevis	4.2	4.3	3.2	5.3	2.9	4.3	1.2	6.0	7.6	3.7
Saint Lucia	3.3	3.2	2.8	3.5	2.6	3.6	1.5	4.4	4.8	3.9
Saint Vincent and the Grenadines	3.8	4.1	1.7	5.9	3.3	4.7	1.7	4.2	3.2	5.0
Suriname	3.6	2.9	3.9	1.7	2.7	3.3	2.0	5.9	5.9	5.8
Trinidad and Tobago	3.8	3.2	2.2	4.1	2.9	2.7	3.0	6.1	7.6	4.1

INFORM RISK IS VERY LOW										
	INFORM RISK	HAZARD & EXPOSURE	Natural	Human	VULNERABILITY	Socio-economic	Vulnerable groups	LACK OF COPING	Institutional	Infrastructure
Barbados	2.7	2.4	3.1	1.6	2.6	3.5	1.5	3.0	3.2	2.7
Grenada	2.4	1.2	0.7	1.7	2.9	4.4	1.1	4.1	4.6	3.5
Uruguay	2.7	2.0	2.2	1.7	3.1	3.2	3.0	3.1	3.7	2.5



## 5. LIMITATIONS AND CONSTRAINTS

LAC-INFORM is a composite indicator and presents a simplified view of reality. Also, certain areas of the three dimensions of the LAC-INFORM model are not covered or only partially captured by the model. The user of the model should take into account these limitations, when using the results of the LAC-INFORM index for decision making. The methodological and data limitations of the global INFORM model also apply to the regional LAC-INFORM model and are explained in detail in chapter five of the INFORM Concept and methodology document (INFORM, 2016)<sup>18</sup>.

The score on the LAC-INFORM index is based on the information measured by the indicators incorporated in the model. The INFORM methodology establishes a set of criteria for the selection of those indicators. If the availability of indicators to measure a certain aspect is limited or the existing indicators only cover a small number of countries, the selection of the indicator for incorporation in the model can be more data-driven than user-driven.

**A reliability index** was calculated to assess the reliability of the LAC-INFORM model. Its calculation has been based on the approach developed for the global INFORM model. The reliability index combines two indices: the number of missing indicators and the recentness of data. A value of 10 corresponds to lowest reliability and 0 to highest reliability.

The results of the index show that data gaps exist in particular among the Caribbean countries (see table 9 in Annex IV). To compensate for these gaps, complementary indicators have been introduced in the LAC-INFORM model. In this way, it was sought to ensure that each country would at least have scores at the component level, even if this score would be represented by only one indicator.

An analysis of the component scores shows that five of the 25 components incorporated in the model lack scores for a number of countries (see table 10 in Annex IV). The lack of coping capacity dimensions has three components with missing scores. In particular the social protection component could be considered as less reliable based on data availability of this component. Though availability of statistics on social protection is weak, the component has been maintained, considering the importance of social protection systems for building resilience. As mentioned in chapter 3, social protection systems are considered a key aspect in the SDGs. Therefore, this component is expected to be further refined in future updates of the model.

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<sup>18</sup> See Index for Risk Management – INFORM, Concept and Methodology, version 2016”, <http://www.inform-index.org/>

## ANNEX I: Outline of the LAC-INFORM Model's Excel file

The LAC-INFORM model is maintained in an Excel file. The contents of the sheets in the file are:

<b>Sheet</b>	<b>Content</b>
Home	Brief overview of INFORM and conceptual model
Content	Overview of content of the sheets, with hyperlinks to corresponding sheets.
INFORM 2017	Summary of the LAC-INFORM model. Includes LAC-INFORM final score, scores on the three dimensions and the six categories for each country. The sheet has been structured by geographical sub-region and the countries are ordered alphabetically.
Hazard and Exposure <sup>1,2</sup>	Calculations of the indices, (sub-)components and categories for the dimension.
Vulnerability <sup>1,2</sup>	Calculations of the indices, (sub-)components and categories for the dimension.
Lack of Coping Capacity <sup>1,2</sup>	Calculations of the indices, (sub-)components and categories for the dimension.
Indicator Data	Raw data values used to construct the model
Indicator Sources	Source for each data value in the Indicator Data sheet
Indicator Dates	Date for each data value in the Indicator Data sheet
Indicator Data Imputation	Details for imputed data values
INFORM Reliability Index	Index estimating the reliability of the LAC-INFORM score, taking into account missing data values and recentness of the data.
Global Indicator Metadata	Metadata of common indicators with the global INFORM model. A regional data source has been used to complement data for the GINI coefficient, which has been indicated in the sheet
LAC Indicator Metadata	Metadata of indicators of the LAC-INFORM regional model.

<sup>1</sup>Indices and (sub-)components constructed for the LAC-INFORM model have been highlighted with yellow. Minimum and maximum values used for normalization of the indicators has been included at the bottom of each page. If values of the global model were adjusted to the regional context, they have been highlighted.

## ANNEX II: Aggregation rules used for new and adjusted components in the LAC-INFORM model<sup>19</sup>

Category	Component	Subcomponent	Aggregation rule	Indices
Natural hazard	Earthquake and tsunami		Geometric average	Earthquake
				Tsunami
Natural hazard	Environmental degradation and drought	Historical drought impact	Arithmetic average	Population affected by drought
				Frequency of drought events
Natural hazard	Environmental degradation and drought	Agricultural pressure on water sources and historical drought impact	Arithmetic average	Historical drought impact
				Agricultural pressure on water sources
Natural hazard	Environmental degradation and drought	Physical exposure to land degradation (relative)	Geometric average	Physical exposure to land degradation in low biophysical status areas (relative)
				Physical exposure to land degradation in high biophysical status areas (relative)
Natural hazard	Environmental degradation and drought	Physical exposure to land degradation (absolute)	Geometric average	Physical exposure to land degradation in areas with low biophysical status (absolute)
			Geometric average	Physical exposure to land degradation in high biophysical status areas (absolute)
Natural hazard	Environmental degradation and drought	Physical exposure to land degradation	Geometric average	Physical exposure to land degradation (relative)
				Physical exposure to land degradation (absolute)
Natural hazard	Environmental degradation and drought		Weighted average: A (0.5), B (0.25), C (0.25)	Physical exposure to land degradation (A)
				Annual forest change (B)
				Historical drought impact (C)
Human hazard	Violence		Geometric average	Intentional homicide rate
				Intentional homicide count
Human hazard			Geometric average	Asylum seekers by country of origin (relative)

<sup>19</sup> The table focuses on new and adjusted aggregation rules only. (Sub-)components and categories, which have been incorporated in the same way as in the global INFORM model applying the same aggregation rules, have not been included.

Category	Component	Subcomponent	Aggregation rule	Indices
	Asylum seekers by country of origin			Asylum seekers by country of origin (absolute)
Human hazard			Geometric average	Violence
				Asylum seekers by country of origin
				Conflict
Socio-Economic Vulnerability	Development and Deprivation	Poverty	Arithmetic average	Multidimensional poverty
				Poverty headcount ratio
Socio-Economic Vulnerability	Development and Deprivation		Geometric average	Poverty
				Human Development Index
Socio-Economic Vulnerability	Inequality		Arithmetic average	Gender Inequality Index
				Gini Index
				Urban slum population
Socio-Economic Vulnerability	Dependency		Geometric average	Age dependency ratio
				Personal remittances
				Vulnerable employment
Socio-Economic Vulnerability			Weighted average: A (0.5), B (0.25), C (0.25)	Development and Deprivation
				Inequality
				Dependency
Vulnerable groups	Uprooted people		Geometric average	Uprooted people (absolute)
				Uprooted people (relative)
Vulnerable groups	Other vulnerable groups	Health conditions	Geometric average	HIV-AID incidence (adult rate)
				Tuberculosis incidence
				Dengue incidence rate
Vulnerable groups	Other vulnerable groups	Child malnutrition	Arithmetic average	Under five stunting
				Low birth weight

Category	Component	Subcomponent	Aggregation rule	Indices
Vulnerable groups	Vulnerable groups	Health conditions of children under five	Arithmetic average	Child mortality
				Child malnutrition
Vulnerable groups	Vulnerable groups	Unprotected youth	Arithmetic average	Adolescent fertility rate
				Mortality in adolescents due to self-harm and interpersonal violence
Vulnerable groups	Vulnerable groups	Recent shocks	Geometric average	People affected by natural disasters last 3 years (absolute)
				People affected by natural disasters last 3 years (relative)
Vulnerable groups	Vulnerable groups	Food utilization score	Arithmetic average	Prevalence of anemia among pregnant women
				Prevalence of undernourishment
Institutional	DRR		Arithmetic average	HFA Scores
				IADB Risk Management Index
Institutional	Security and violence containment	Security and protection against crime	Arithmetic average	Lack of protection against crime
				Lack of security
Institutional	Security and violence containment		Weighted average: A (0.33) and B (0.66)	Security and protection against crime (A)
				Violence containment cost (B)
Infrastructure	Physical connectivity	Water and sanitation in schools	Arithmetic average	School water coverage
				School sanitation coverage
Infrastructure	Physical connectivity		Geometric average	Road density
				Improved sanitation facilities
				Improved water sources
				Water and sanitation in schools
Infrastructure	Access to health care index	Immunization coverage	Arithmetic average	Measles immunization coverage
				DTP3 coverage

Category	Component	Subcomponent	Aggregation rule	Indices
Infrastructure	Access to health care index	Health expenditure	Geometric average	Per capita public and private expenditure on health care
				Public health expenditure
				Out-of-pocket health expenditure
Infrastructure	Access to education	Educational survival	Arithmetic average	Survival rate to the last grade of primary education
				Survival rate to the last grade of lower secondary general education
Infrastructure	Access to education	Survival and attainment	Arithmetic average	Educational survival
				Educational attainment
Infrastructure	Access to education	Investment in education quality	Arithmetic average	Education expenditure
				Pupil-teacher ratio in primary education
Infrastructure	Access to education		Weighted average: A (0.66) and B (0.33)	Survival and attainment (A)
				Investment in education quality (B)

**ANNEX III: LAC-INFORM class limits at level of the risk index, dimensions and categories**

Dimension/Categories	CLASS	MIN	MAX
<b>RISK</b>	<b>very high</b>	<b>7.5</b>	<b>10</b>
	<b>high</b>	<b>6.0</b>	<b>7.4</b>
	medium	4.5	5.9
	low	3.0	4.4
	very low	0.0	2.9
<b>HAZARD&amp;EXPOSURE</b>	<b>very high</b>	<b>7.0</b>	<b>10.0</b>
	<b>high</b>	<b>5.0</b>	<b>6.9</b>
	medium	4.0	4.9
	low	2.5	3.9
	very low	0.0	2.4
<b>VULNERABILITY</b>	very high	8.0	10.0
	high	7.0	7.9
	medium	5.5	6.9
	low	3.8	5.4
	very low	0.0	3.7
<b>CAPACITY</b>	<b>very high</b>	<b>8.0</b>	<b>10.0</b>
	<b>high</b>	<b>6.5</b>	<b>7.9</b>
	medium	5.0	6.4
	low	3.5	4.9
	very low	0.0	3.4
<b>NATURAL</b>	<b>very high</b>	<b>7.3</b>	<b>10.0</b>
	<b>high</b>	<b>5.5</b>	<b>7.2</b>
	medium	4.0	5.4
	low	2.5	3.9
	very low	0.0	2.4
<b>HUMAN</b>	<b>very high</b>	<b>8.0</b>	<b>10.0</b>
	<b>high</b>	<b>7.0</b>	<b>7.9</b>
	medium	4.6	6.9
	low	3.0	4.5
	very low	0.0	2.9



Dimension/Categories	CLASS	MIN	MAX
<b>RISK</b>	<b>very high</b>	<b>7.5</b>	<b>10</b>
	<b>high</b>	<b>6.0</b>	<b>7.9</b>
	medium	5.0	5.9
	low	4.0	4.9
	very low	0.0	3.9
<b>VULNERABLE GROUPS</b>	<b>very high</b>	<b>7.0</b>	<b>10.0</b>
	<b>high</b>	<b>5.0</b>	<b>6.9</b>
	medium	3.5	4.9
	low	2.1	3.4
	very low	0.0	2.0
<b>INSTITUTIONAL</b>	<b>very high</b>	<b>8.0</b>	<b>10.0</b>
	<b>high</b>	<b>6.5</b>	<b>7.9</b>
	medium	5.5	6.4
	low	4.5	5.4
	very low	0.0	4.4
<b>INFRASTRUCTURE</b>	<b>very high</b>	<b>8.5</b>	<b>10.0</b>
	<b>high</b>	<b>6.5</b>	<b>8.4</b>
	medium	4.5	6.4
	low	3.0	4.4
	very low	0.0	2.9

## ANNEX IV: Reliability index and recentness of the data

Table 8: Reliability index and recentness of the data

COUNTRY	ISO3	Reliability Index (*)	Missing Indicators (Number)	Missing Indicators (%)	Recentness data (average years)
		(0-10)	(0-81)	(0-100%)	
Antigua and Barbuda	ATG	7.8	21	26%	0.42
Bahamas	BHS	7.1	21	26%	0.32
Barbados	BRB	6.9	11	14%	0.48
Cuba	CUB	6.9	15	19%	0.28
Dominica	DMA	8.5	22	27%	0.52
Dominican Republic	DOM	2.1	1	1%	0.27
Grenada	GRD	6.6	22	27%	0.23
Haiti	HTI	4.6	6	7%	0.40
Jamaica	JAM	5.8	5	6%	0.62
Saint Kitts and Nevis	KNA	7.4	27	33%	0.36
Saint Lucia	LCA	7.9	13	16%	0.53
Saint Vincent and the Grenadines	VCT	7.8	17	21%	0.42
Trinidad and Tobago	TTO	7.9	9	11%	0.73
Belize	BLZ	5.6	6	7%	0.54
Costa Rica	CRI	2.4	3	4%	0.21
El Salvador	SLV	3.8	5	6%	0.32
Guatemala	GTM	2.9	4	5%	0.23
Honduras	HND	3.1	4	5%	0.27
Mexico	MEX	2.3	2	2%	0.25
Nicaragua	NIC	5.6	5	6%	0.59
Panama	PAN	3.7	3	4%	0.41
Argentina	ARG	5.2	5	6%	0.53
Bolivia	BOL	4.3	1	1%	0.59
Brazil	BRA	3.4	3	4%	0.36
Chile	CHL	3.4	6	7%	0.21
Colombia	COL	2.7	1	1%	0.36
Ecuador	ECU	2.0	2	2%	0.20
Guyana	GUY	7.3	9	11%	0.64
Paraguay	PRY	4.1	4	5%	0.42
Peru	PER	2.1	1	1%	0.27
Suriname	SUR	5.6	9	11%	0.40
Uruguay	URY	4.4	6	7%	0.36
Venezuela	VEN	4.9	6	7%	0.43

(\*) Reliability Index: 0 more reliable, 10 less reliable.

Table 9: Missing scores at component level

		Components with missing scores					Totals		Number of components missing in		
COUNTRY	ISO3	Asylum seekers by country of origin	Unprotected youth	DRR	Social protection	Security and violence containment	Missing components (N)	Missing components (%)	Hazard and exposure	Vulnerability dimension	Lack of coping capacity dimension
Antigua and Barbuda	ATG	0	0	0	1	0	1	4%	0	0	1
Bahamas	BHS	0	0	0	1	1	2	8%	0	0	2
Barbados	BRB	0	0	0	1	1	2	8%	0	0	2
Cuba	CUB	0	0	0	1	0	1	4%	0	0	1
Dominica	DMA	0	0	1	1	0	2	8%	0	0	2
Dominican Republic	DOM	0	0	0	0	0	0	0%	0	0	0
Grenada	GRD	0	0	0	1	0	1	4%	0	0	1
Haiti	HTI	0	0	0	1	0	1	4%	0	0	1
Jamaica	JAM	0	0	0	0	0	0	0%	0	0	0
Saint Kitts and Nevis	KNA	1	1	0	1	0	3	12%	1	1	1
Saint Lucia	LCA	0	0	0	1	0	1	4%	0	0	1
Saint Vincent and the Grenadines	VCT	0	0	1	1	0	2	8%	0	0	2
Trinidad and Tobago	TTO	0	0	0	1	0	1	4%	0	0	1
Belize	BLZ	0	0	0	0	0	0	0%	0	0	0
Costa Rica	CRI	0	0	0	0	0	0	0%	0	0	0
El Salvador	SLV	0	0	0	0	0	0	0%	0	0	0
Guatemala	GTM	0	0	0	0	0	0	0%	0	0	0
Honduras	HND	0	0	0	0	0	0	0%	0	0	0
Mexico	MEX	0	0	0	0	0	0	0%	0	0	0
Nicaragua	NIC	0	0	0	0	0	0	0%	0	0	0
Panama	PAN	0	0	0	0	0	0	0%	0	0	0
Argentina	ARG	0	0	0	0	0	0	0%	0	0	0
Bolivia	BOL	0	0	0	0	0	0	0%	0	0	0
Brazil	BRA	0	0	0	0	0	0	0%	0	0	0
Chile	CHL	0	0	0	0	0	0	0%	0	0	0
Colombia	COL	0	0	0	0	0	0	0%	0	0	0
Ecuador	ECU	0	0	0	0	0	0	0%	0	0	0
Guyana	GUY	0	0	1	1	0	2	8%	0	0	2
Paraguay	PRY	0	0	0	0	0	0	0%	0	0	0
Peru	PER	0	0	0	0	0	0	0%	0	0	0
Suriname	SUR	0	0	1	1	1	3	12%	0	0	3
Uruguay	URY	0	0	0	0	0	0	0%	0	0	0
Venezuela	VEN	0	0	0	1	0	1	4%	0	0	1
TOTAL		1	1	4	14	3					

## ANNEX V: Key statistical metrics

Correlation analysis is used to analyze the consistency of INFORM models. The correlation analysis reveals the bivariate (i.e., pairwise) Pearson's correlation coefficients between the indexes (positioned at the same level within the model and different levels in the model). The results of the correlation analysis are shown in the tables below.

Main aspects to consider when analyzing the consistency of an INFORM model:

- Lack of correlation (and negative correlation) among sub-indices of the same component/category/dimension (indices within the same level), indicate that they are measuring different “statistical dimensions” in the data.
- The square of a Pearson's correlation coefficient between the sub-indices and the one-level-up aggregate index (component/category/dimension) can measure the influence of the sub-index on the aggregate index due to correlation. Relative differences among those correlations explain the influence of a given sub-index for the aggregate index. Ideally, the influence of the different sub-indices (that is the correlation coefficient) on the aggregate index should be similar.

Table 10: Statistical influences of the INFORM categories within dimensions

	Natural	Human	HAZARD & EXPOSURE	Socio-Economic Vulnerability	Vulnerable Groups	VULNERABILITY	Institutional	Infrastructure	LACK OF COPING CAPACITY
Natural	1.00								
Human	0.60	1.00							
HAZARD & EXPOSURE	0.90	0.89	1.00						
Socio-Economic Vulnerability	0.54	0.56	0.60	1.00					
Vulnerable Groups	0.80	0.71	0.84	0.63	1.00				
VULNERABILITY	0.76	0.72	0.82	0.87	0.93	1.00			
Institutional	0.41	0.65	0.58	0.60	0.55	0.64	1.00		
Infrastructure	0.59	0.52	0.62	0.87	0.68	0.84	0.66	1.00	
LACK OF COPING CAPACITY	0.53	0.65	0.65	0.80	0.66	0.80	0.92	0.90	1.00
INFORM RISK	0.82	0.83	0.92	0.82	0.90	0.96	0.75	0.84	0.86

Table 11: Statistical influences of the underlying components in the hazard and exposure dimension

	Earthquake and Tsunami	Flood	Tropical Cyclone	Environmental degradation and drought	Natural	Conflict	Violence	Asylum seekers	Human	HAZARD & EXPOSURE
Earthquake and Tsunami	1.00									
Flood	0.45	1.00								
Tropical Cyclone	0.07	-0.41	1.00							
Environmental degradation and drought	0.63	0.66	-0.06	1.00						
<b>Natural</b>	0.84	0.67	0.21	0.81	1.00					
Conflict	0.49	0.56	0.08	0.74	0.67	1.00				
Violence	0.19	0.27	0.29	0.36	0.41	0.54	1.00			
Asylum seekers	0.46	0.15	0.46	0.54	0.55	0.65	0.55	1.00		
<b>Human</b>	0.39	0.33	0.37	0.60	0.60	0.80	0.85	0.87	1.00	
<b>HAZARD &amp; EXPOSURE</b>	0.70	0.55	0.32	0.79	0.90	0.82	0.70	0.79	0.89	1.00
<b>INFORM RISK</b>	0.65	0.57	0.17	0.83	0.82	0.78	0.62	0.75	0.83	0.92

Table 12: Statistical influences of the underlying components in the vulnerability dimension

	Development & Deprivation	Inequality	Dependency	Socio-Economic Vulnerability	Uprooted people	Health Conditions	Children U5	Unprotected youth	Recent Shocks	Food Security	Other Vulnerable Groups	Vulnerable Groups	VULNERABILITY
Development & Deprivation	1.00												
Inequality	0.58	1.00											
Dependency	0.82	0.56	1.00										
<b>Socio-Economic Vulnerability</b>	0.96	0.71	0.93	1.00									
<b>Uprooted people</b>	0.38	0.59	0.34	0.44	1.00								
Health Conditions	0.47	0.57	0.50	0.55	0.43	1.00							
Children U5	0.73	0.54	0.67	0.75	0.12	0.52	1.00						
Unprotected youth	0.34	0.35	0.46	0.42	0.45	0.40	0.34	1.00					
Recent Shocks	0.46	0.66	0.49	0.56	0.44	0.53	0.40	0.30	1.00				
Food Security	0.73	0.50	0.61	0.72	0.05	0.39	0.82	0.05	0.35	1.00			
<b>Other Vulnerable Groups</b>	0.69	0.73	0.70	0.78	0.48	0.82	0.74	0.64	0.79	0.59	1.00		
<b>Vulnerable Groups</b>	0.54	0.71	0.52	0.63	0.93	0.63	0.37	0.61	0.62	0.25	0.75	1.00	
<b>VULNERABILITY</b>	0.80	0.78	0.77	0.87	0.80	0.65	0.59	0.58	0.65	0.50	0.84	0.93	1.00
<b>INFORM RISK</b>	0.75	0.71	0.75	0.82	0.79	0.65	0.56	0.61	0.57	0.43	0.79	0.90	0.96

Table 13: Statistical influences of the underlying components in the lack of coping capacity dimension

	DRR	Governance	Social protection	Security and violence containment	Institutional	Communication	Physical infrastructure	Access to health care	Access to education	Infrastructure	LACK OF COPING CAPACITY
DRR	1.00										
Governance	0.31	1.00									
Social protection	0.19	0.55	1.00								
Security and violence containment	0.00	0.15	0.33	1.00							
<b>Institutional</b>	0.44	0.64	0.86	0.71	1.00						
Communication	0.27	0.50	0.66	-0.09	0.36	1.00					
Physical infrastructure	0.13	0.71	0.55	0.15	0.47	0.47	1.00				
Access to health care	0.35	0.71	0.79	0.30	0.69	0.47	0.68	1.00			
Access to education	0.49	0.54	0.58	0.25	0.60	0.32	0.52	0.52	1.00		
<b>Infrastructure</b>	0.37	0.78	0.76	0.19	0.66	0.70	0.87	0.83	0.74	1.00	
<b>LACK OF COPING CAPACITY</b>	0.45	0.78	0.87	0.51	0.92	0.57	0.71	0.83	0.73	0.90	1.00
<b>INFORM RISK</b>	0.27	0.73	0.68	0.49	0.75	0.57	0.77	0.65	0.64	0.84	0.86

# ANNEX VI: LAC-INFORM INDEX – Countries by alphabetical order

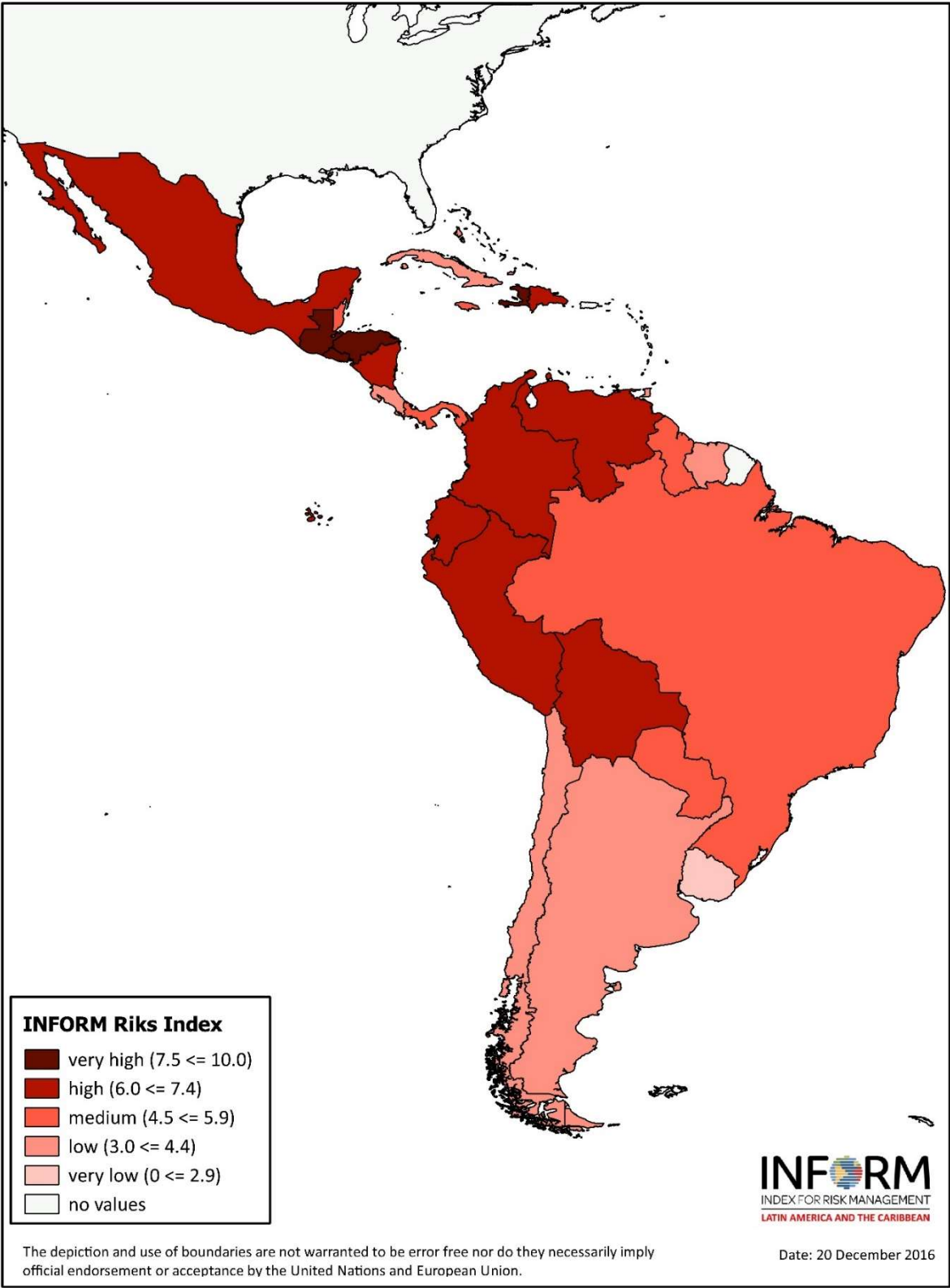
COUNTRY	ISO3	Natural (0-10)	Human (0-10)	HAZARD & EXPOSURE (0-10)	Socio-Economic Vulnerability (0-10)	Vulnerable Groups (0-10)	VULNERABILITY (0-10)	Institutional (0-10)	Infrastructure (0-10)	LACK OF COPING CAPACITY (0-10)	INFORM RISK (0-10)	Rank (1-33)	Reliability Index (*) (0-10)	Missing Indicators (Number) (0-81)
Antigua and Barbuda	ATG	3.8	2.1	3.0	3.7	1.6	2.7	5.0	3.4	4.2	3.2	30	7.8	21
Argentina	ARG	5.0	3.5	4.3	3.1	3.9	3.5	4.1	3.6	3.9	3.9	21	5.2	5
Bahamas	BHS	4.3	4.5	4.4	2.6	1.7	2.2	5.9	4.0	5.0	3.6	26	7.1	21
Barbados	BRB	3.1	1.6	2.4	3.5	1.5	2.6	3.2	2.7	3.0	2.7	31	6.9	11
Belize	BLZ	6.3	4.8	5.6	5.0	3.6	4.3	3.9	6.0	5.0	4.9	17	5.6	6
Bolivia	BOL	5.9	4.9	5.4	7.4	5.0	6.3	6.7	6.3	6.5	6.0	11	4.3	1
Brazil	BRA	5.3	7.1	6.3	3.6	5.5	4.6	5.1	4.2	4.7	5.1	15	3.4	3
Chile	CHL	6.7	2.4	4.9	2.9	3.8	3.4	2.9	3.1	3.0	3.7	24	3.4	6
Colombia	COL	7.8	8.0	7.9	4.9	8.4	7.0	7.1	5.9	6.5	7.1	5	2.7	1
Costa Rica	CRI	6.4	2.4	4.7	3.4	4.4	3.9	4.0	4.1	4.1	4.2	19	2.4	3
Cuba	CUB	6.9	4.1	5.7	3.5	2.2	2.9	3.5	2.4	3.0	3.7	24	6.9	15
Dominica	DMA	4.9	2.0	3.6	4.8	2.9	3.9	3.0	3.8	3.4	3.6	26	8.5	22
Dominican Republic	DOM	7.3	4.9	6.2	5.9	4.4	5.2	7.5	6.6	7.1	6.1	10	2.1	1
Ecuador	ECU	7.7	5.0	6.5	5.1	7.5	6.5	6.2	6.4	6.3	6.4	9	2.0	2
El Salvador	SLV	7.6	9.1	8.5	6.2	8.1	7.3	8.8	6.0	7.7	7.8	4	3.8	5
Grenada	GRD	0.7	1.7	1.2	4.4	1.1	2.9	4.6	3.5	4.1	2.4	33	6.6	22
Guatemala	GTM	8.4	8.7	8.6	8.8	8.0	8.4	8.5	8.5	8.5	8.5	1	2.9	4
Guyana	GUY	4.6	3.4	4.0	6.7	5.2	6.0	7.2	6.9	7.1	5.5	13	7.3	9
Haiti	HTI	7.7	7.4	7.6	9.6	7.8	8.9	7.2	9.6	8.7	8.4	2	4.6	6
Honduras	HND	8.1	8.7	8.4	8.7	7.8	8.3	8.7	7.3	8.1	8.3	3	3.1	4
Jamaica	JAM	5.8	6.1	6.0	5.3	2.4	4.0	8.0	5.1	6.8	5.5	13	5.8	5
Mexico	MEX	8.5	8.3	8.4	4.7	6.7	5.8	6.2	5.0	5.6	6.5	8	2.3	2
Nicaragua	NIC	8.3	4.2	6.7	6.7	4.6	5.8	6.9	7.8	7.4	6.6	7	5.6	5
Panama	PAN	5.9	2.8	4.5	4.5	5.5	5.0	5.5	5.4	5.5	5.0	16	3.7	3
Paraguay	PRY	4.1	2.7	3.4	5.3	3.7	4.5	7.0	6.4	6.7	4.7	18	4.1	4
Peru	PER	7.3	4.1	5.9	5.3	6.4	5.9	5.8	6.5	6.2	6.0	11	2.1	1
Saint Kitts and Nevis	KNA	3.2	5.3	4.3	4.3	1.2	2.9	7.6	3.7	6.0	4.2	19	7.4	27
Saint Lucia	LCA	2.8	3.5	3.2	3.6	1.5	2.6	4.8	3.9	4.4	3.3	29	7.9	13
Saint Vincent and the Grenadines	VCT	1.7	5.9	4.1	4.7	1.7	3.3	3.2	5.0	4.2	3.8	22	7.8	17
Suriname	SUR	3.9	1.7	2.9	3.3	2.0	2.7	5.9	5.8	5.9	3.6	26	5.6	9
Trinidad and Tobago	TTO	2.2	4.1	3.2	2.7	3.0	2.9	7.6	4.1	6.1	3.8	22	7.9	9
Uruguay	URY	2.2	1.7	2.0	3.2	3.0	3.1	3.7	2.5	3.1	2.7	31	4.4	6
Venezuela	VEN	7.0	8.1	7.6	4.7	7.2	6.1	7.8	5.2	6.7	6.8	6	4.9	6

# ANNEX VII: LAC-INFORM INDEX – Countries by rank

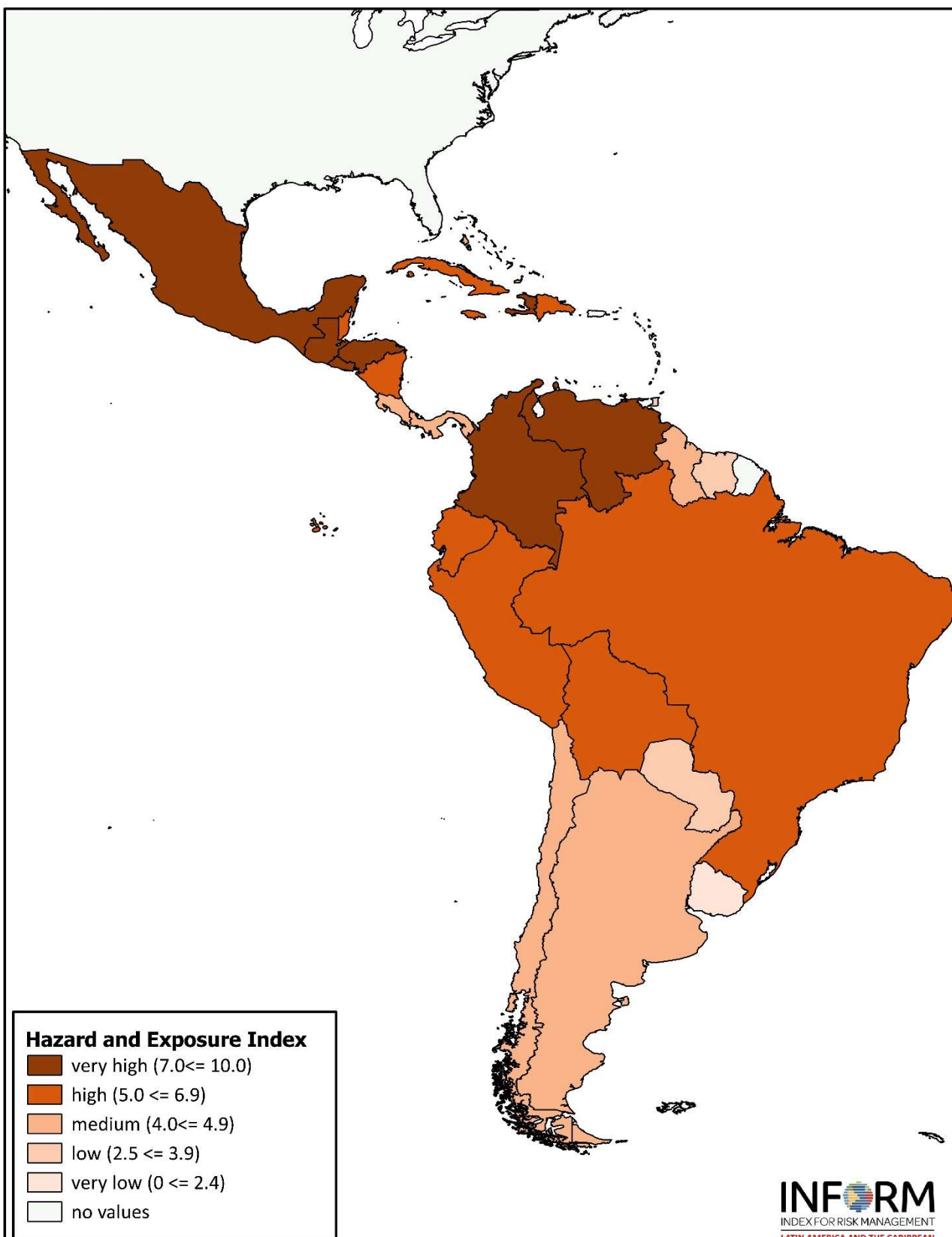
COUNTRY	ISO3	Natural (0-10)	Human (0-10)	HAZARD & EXPOSURE (0-10)	Socio-Economic Vulnerability (0-10)	Vulnerable Groups (0-10)	VULNERABILITY (0-10)	Institutional (0-10)	Infrastructure (0-10)	LACK OF COPING CAPACITY (0-10)	INFORM RISK (0-10)	Rank (1-33)	Reliability Index (*) (0-10)	Missing Indicators (Number) (0-81)
Guatemala	GTM	8.4	8.7	8.6	8.8	8.0	8.4	8.5	8.5	8.5	8.5	1	2.9	4
Haiti	HTI	7.7	7.4	7.6	9.6	7.8	8.9	7.2	9.6	8.7	8.4	2	4.6	6
Honduras	HND	8.1	8.7	8.4	8.7	7.8	8.3	8.7	7.3	8.1	8.3	3	3.1	4
El Salvador	SLV	7.6	9.1	8.5	6.2	8.1	7.3	8.8	6.0	7.7	7.8	4	3.8	5
Colombia	COL	7.8	8.0	7.9	4.9	8.4	7.0	7.1	5.9	6.5	7.1	5	2.7	1
Venezuela	VEN	7.0	8.1	7.6	4.7	7.2	6.1	7.8	5.2	6.7	6.8	6	4.9	6
Nicaragua	NIC	8.3	4.2	6.7	6.7	4.6	5.8	6.9	7.8	7.4	6.6	7	5.6	5
Mexico	MEX	8.5	8.3	8.4	4.7	6.7	5.8	6.2	5.0	5.6	6.5	8	2.3	2
Ecuador	ECU	7.7	5.0	6.5	5.1	7.5	6.5	6.2	6.4	6.3	6.4	9	2.0	2
Dominican Republic	DOM	7.3	4.9	6.2	5.9	4.4	5.2	7.5	6.6	7.1	6.1	10	2.1	1
Bolivia	BOL	5.9	4.9	5.4	7.4	5.0	6.3	6.7	6.3	6.5	6.0	11	4.3	1
Peru	PER	7.3	4.1	5.9	5.3	6.4	5.9	5.8	6.5	6.2	6.0	11	2.1	1
Guyana	GUY	4.6	3.4	4.0	6.7	5.2	6.0	7.2	6.9	7.1	5.5	13	7.3	9
Jamaica	JAM	5.8	6.1	6.0	5.3	2.4	4.0	8.0	5.1	6.8	5.5	13	5.8	5
Brazil	BRA	5.3	7.1	6.3	3.6	5.5	4.6	5.1	4.2	4.7	5.1	15	3.4	3
Panama	PAN	5.9	2.8	4.5	4.5	5.5	5.0	5.5	5.4	5.5	5.0	16	3.7	3
Belize	BLZ	6.3	4.8	5.6	5.0	3.6	4.3	3.9	6.0	5.0	4.9	17	5.6	6
Paraguay	PRY	4.1	2.7	3.4	5.3	3.7	4.5	7.0	6.4	6.7	4.7	18	4.1	4
Costa Rica	CRI	6.4	2.4	4.7	3.4	4.4	3.9	4.0	4.1	4.1	4.2	19	2.4	3
Saint Kitts and Nevis	KNA	3.2	5.3	4.3	4.3	1.2	2.9	7.6	3.7	6.0	4.2	19	7.4	27
Argentina	ARG	5.0	3.5	4.3	3.1	3.9	3.5	4.1	3.6	3.9	3.9	21	5.2	5
Saint Vincent and the Grenadines	VCT	1.7	5.9	4.1	4.7	1.7	3.3	3.2	5.0	4.2	3.8	22	7.8	17
Trinidad and Tobago	TTO	2.2	4.1	3.2	2.7	3.0	2.9	7.6	4.1	6.1	3.8	22	7.9	9
Chile	CHL	6.7	2.4	4.9	2.9	3.8	3.4	2.9	3.1	3.0	3.7	24	3.4	6
Cuba	CUB	6.9	4.1	5.7	3.5	2.2	2.9	3.5	2.4	3.0	3.7	24	6.9	15
Bahamas	BHS	4.3	4.5	4.4	2.6	1.7	2.2	5.9	4.0	5.0	3.6	26	7.1	21
Dominica	DMA	4.9	2.0	3.6	4.8	2.9	3.9	3.0	3.8	3.4	3.6	26	8.5	22
Suriname	SUR	3.9	1.7	2.9	3.3	2.0	2.7	5.9	5.8	5.9	3.6	26	5.6	9
Saint Lucia	LCA	2.8	3.5	3.2	3.6	1.5	2.6	4.8	3.9	4.4	3.3	29	7.9	13
Antigua and Barbuda	ATG	3.8	2.1	3.0	3.7	1.6	2.7	5.0	3.4	4.2	3.2	30	7.8	21
Barbados	BRB	3.1	1.6	2.4	3.5	1.5	2.6	3.2	2.7	3.0	2.7	31	6.9	11
Uruguay	URY	2.2	1.7	2.0	3.2	3.0	3.1	3.7	2.5	3.1	2.7	31	4.4	6
Grenada	GRD	0.7	1.7	1.2	4.4	1.1	2.9	4.6	3.5	4.1	2.4	33	6.6	22



Latin America and Caribbean INFORM Risk Index, 2017

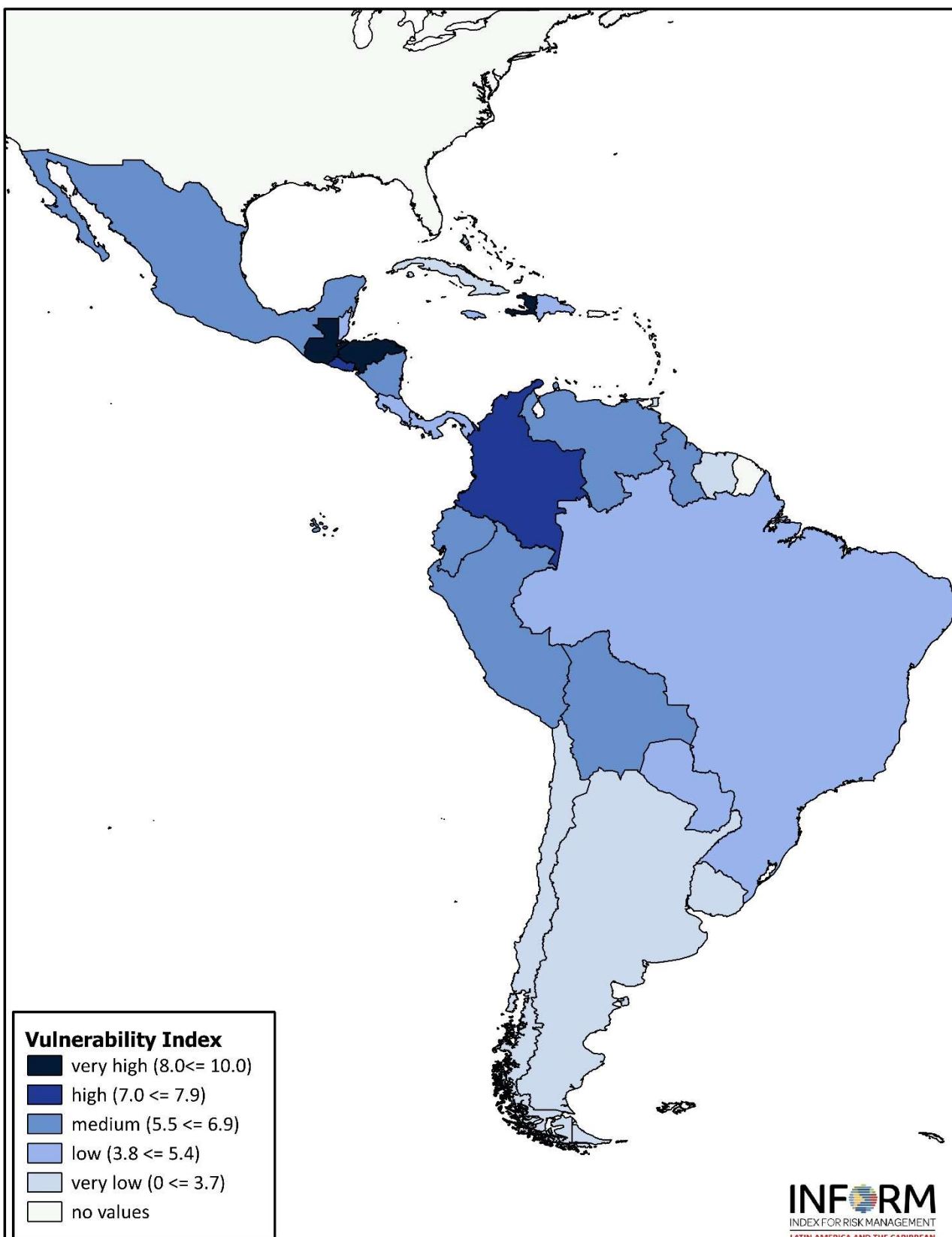


## Latin America and Caribbean INFORM Hazard and Exposure Index, 2017



The depiction and use of boundaries are not warranted to be error free nor do they necessarily imply official endorsement or acceptance by the United Nations and European Union.

## Latin America and Caribbean INFORM Vulnerability Index, 2017



The depiction and use of boundaries are not warranted to be error free nor do they necessarily imply official endorsement or acceptance by the United Nations and European Union.

## Latin America and Caribbean INFORM Lack of Coping Capacity Index, 2017

