TECHNICAL DESCRIPTION - DASHBOARD ON INSURANCE PROTECTION GAP FOR NATURAL CATASTROPHES

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1. DISCLAIMER

The protection gap score derived for the dashboard are based on a quantitative approach with scientific based data and data from external sources. Where no data were available, EIOPA used expert judgement to fill the gap. However, especially for data very distant in time, it has not always been possible to fill gaps or to validate such data. Where assumptions and expert judgements have been applied, this is clearly stated in the methodological document, to allow users to understand the scores and draw meaningful conclusions. In addition, it is important to note that having a low risk score does not mean that there is no risk (only that the probability*intensity is low).

The methodology for deriving the relevant scoring, as well as the existence of data gaps will be subject to review and will be updated based on further evidence and discussion in the future.

2. INTRODUCTION

The dashboard aims at providing a common measure for the protection gap.

VALIDATION

The dashboard was discussed and validated by:

- National competent authorities from all EEA countries.

- EIOPA's Cat Risk expert network for the risk estimation.

SCOPE

The scope includes the countries of the EEA (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Norway, Iceland, and Lichtenstein).

A natural catastrophe is an unexpected event, caused by natural physical perils, such as an earthquake or flood, causing damage, injury or death. Natural catastrophes can be caused either by rapid or slow onset events which can be geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought and wildfires), meteorological (cyclones and storms/wave surges) or biological (disease epidemics and insect/animal plagues)[1].

In the current pilot dashboard version, EIOPA focuses on the following perils:

Flood: Flood is a hydrological disaster and defined in the EM-DAT[2] as a general term for the overflow of water from a stream channel onto normally dry land in the floodplain (riverine flooding), higher-than-normal levels along the coast and in lakes or reservoirs (coastal flooding) as well as ponding of water at or near the point where the rain fell (flash floods). The dashboard focuses on (a) riverine (or fluvial) and pluvial flooding (flash floods which can be pluvial or fluvial are included) in the dashboard this will be named flood*and (b) on coastal floods.

[1] Centre for Research on the Epidemiology of Disasters – CRED Université catholique de Louvain, Belgium https://www.emdat.be/classification.

[2] Centre for Research on the Epidemiology of Disasters – CRED Université catholique de Louvain, Belgium "Emergency Events Database (EM-DAT)", https://www.emdat.be/classification.

Windstorm[3]: The peril “windstorm” has different categories (cyclonic storms and convective storms):

- Extra-tropical cyclones: Type of low-pressure cyclonic system in the middle and high latitude that primarily gets its energy from the horizontal temperature contrasts in the atmosphere.
- Tropical cyclones: Originates over tropical or subtropical waters[4]. In the dashboard not considered due to the geographical coverage.
- Convective storm: Range of events generated by strong vertical movements in the troposphere, implying fast condensation and release of big amounts of energy. Among its effects are hail, lightning, heavy showers, strong winds and tornadoes.

Wildfire: as per EM-DAT classification, wildfires are climatological disasters. Wildfires are defined as any uncontrolled and non-prescribed combustion or burning of plants in a natural setting such as a forest, grassland, brush land or tundra, which consumes the natural fuels and spreads based on environmental conditions (e.g., wind, topography). Wildfires can be triggered by lightning or human actions. In the dashboard, EIOPA mainly focus on forest fire, which is a type of wildfire in a wooded area.

Earthquake: as per EM-DAT classification, earthquakes are geophysical disasters. Earthquake are defined as a sudden movement of a block of the Earth’s crust along a geological fault and associated ground shaking. The dashboard focuses on the ground movement and do not consider tsunamis.

Flood, Wildfire and Windstorm were chosen because they are climate-related perils and the amount of damage caused by these perils in Europe is high. Earthquake was also chosen as the losses of this peril in some region is very high and the protection gap might be very high for this peril.

[3] The definition for Windstorm partly deviate from the definition of the EM-DAT for convective storms. The definition used in this paper was found to be more appropriate.

[4] Depending on their location, tropical cyclones are referred to as hurricanes (Atlantic, Northeast Pacific), typhoons (Northwest Pacific), or cyclones (South Pacific and Indian Ocean).

3. THE DASHBOARD

The main purpose of the dashboard is to understand the natural catastrophe insurance protection gap in the EEA. In addition, such a dashboard should also help to:

- Increase the awareness of the protection gap issues for all stakeholders.
- Promote a science-based approach to protection gap management and decision-making.
- Identify at-risk regions and identify the underlying protection gap risk drivers.
- Develop pro-active prevention measures based on a granular assessment of risk drivers.
- Identify the potential for synergies between national policies to improve protection against natural catastrophes across borders at European level.

MEASURING THE INSURANCE PROTECTION GAP

The insurance protection gap is a combination of different elements:

Figure 1: Elements of the protection gap and their descriptions.

The dashboard provides four different views :

1. The current protection gap

Based on a modelling approach to have an estimation of the current protection gap. In order to estimate the current protection gap, the following information is required: the risk (which is composed of the hazard, vulnerability, exposure) and insurance coverage at present time.

Pros:

- It uses a risk-based modelling approach;
- It is an up-to-date estimation of the protection gap;
- It allows for identification of the different sources of the protection gap (it explicitly considers the different elements of the insurance protection gap (the risk components [exposure/vulnerability/hazard] and the insurance coverage).

Cons:

- Accessing the individual data is challenging;
- Not trivial to derive the scoring factors as a combination of different types of scientific data, models and expert judgment.

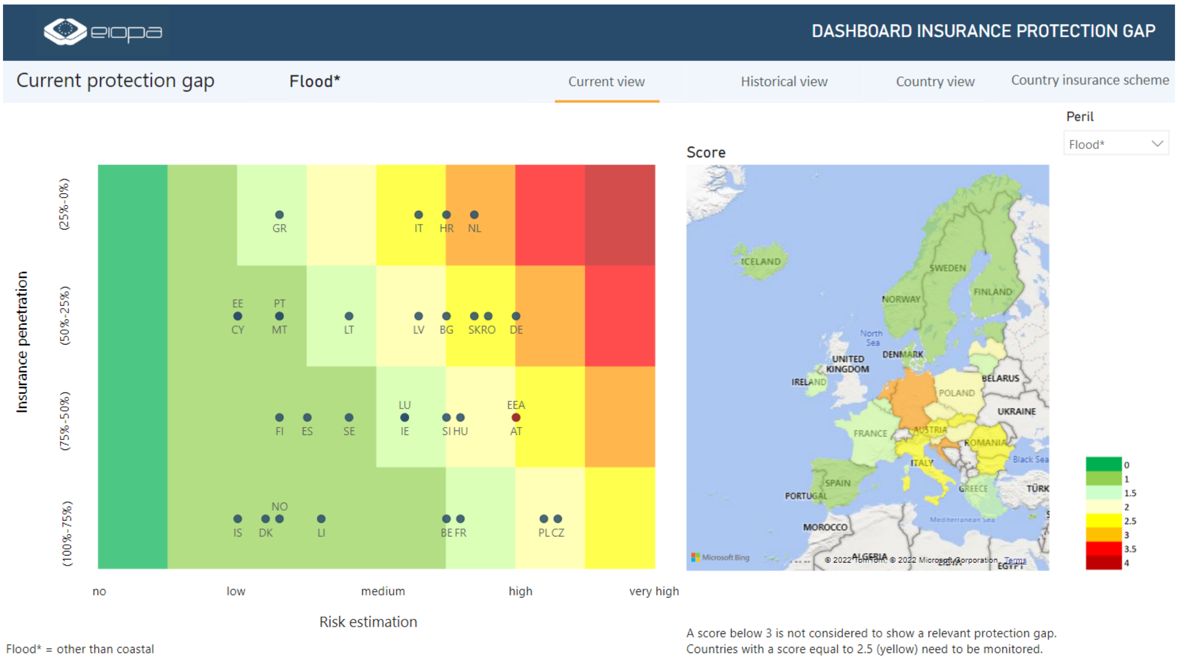


Figure 2: Screenshot of the dashboard current view

The details on how the scores are computed can be found in part 3 of this document.

2. The historical protection gap

Based on historical data on economic and insured losses, which help to know the protection gap in the past. The historical losses will depend on the past hazards (past events), exposures, vulnerabilities and insurance coverages (the three last parameters measured at the time of the event).

Pros:

- It is a risk-based measure
- Clear quantitative way to measure the protection gap

Cons:

- It only measures the past protection gap
- It might underestimate the protection gap as if no event occurred in the past, no loss data will be available to measure the protection gap. It can be misleading for low-frequency events.
- It does not allow for the identification of the main source/cause of the protection gap.
- There are uncertainties when assessing past losses (significant differences between data providers).

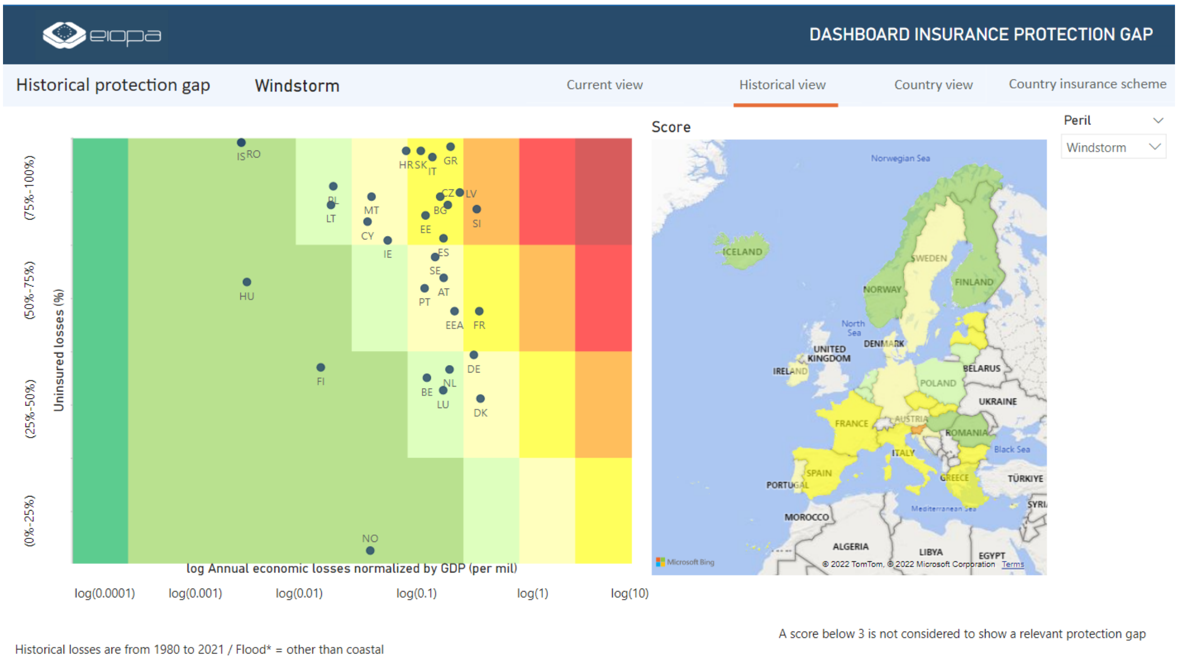


Figure 3: Screenshot of the dashboard historical view

The details on how the scores are computed can be found in part 3 of this document.

The estimation of the current protection gap will provide a more accurate view of the current risk as:

(a) from a hazard perspective just because an event hasn't occurred in the past doesn't mean it can't or won't in the near future. A modelling approach is therefore needed to ensure that all the risks are properly considered.

(b) In addition, the current protection gap also uses the up-to-date information on exposure, vulnerability and insurance coverage available. The historical losses are based on past exposure, vulnerability, hazard and insurance coverage. Some of these elements (mainly exposure or insurance coverage) can be expected to have changed significantly during the last 40 years. For example, in the historical protection gap, EIOPA uses historical economic and insured losses from storm Lothar, which occurred in 1999. These losses are based on the exposure, vulnerability and insurance coverage in place in 1999. The losses, which would result today from the same event would be different as the exposure, vulnerability and insurance coverages are different.

The historical protection gap can give insightful information but it is important to consider the view of the protection with a modelled approach to have an estimation of the current protection gap. This is the view on which policy measures can be applied.

3. The country view

The country view provides a view for the historical and estimated protection gap by countries.

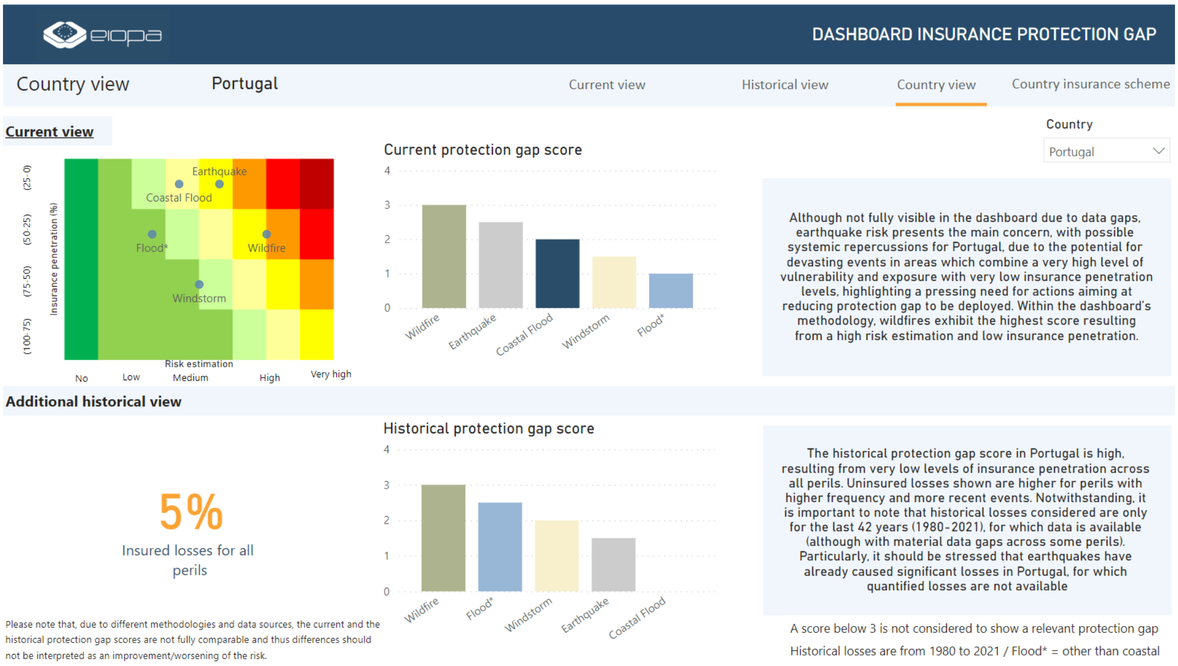


Figure 4: Screenshot of the dashboard country view

4. The country insurance scheme

This section aims at collecting qualitative information on general practices related to the property insurance business.

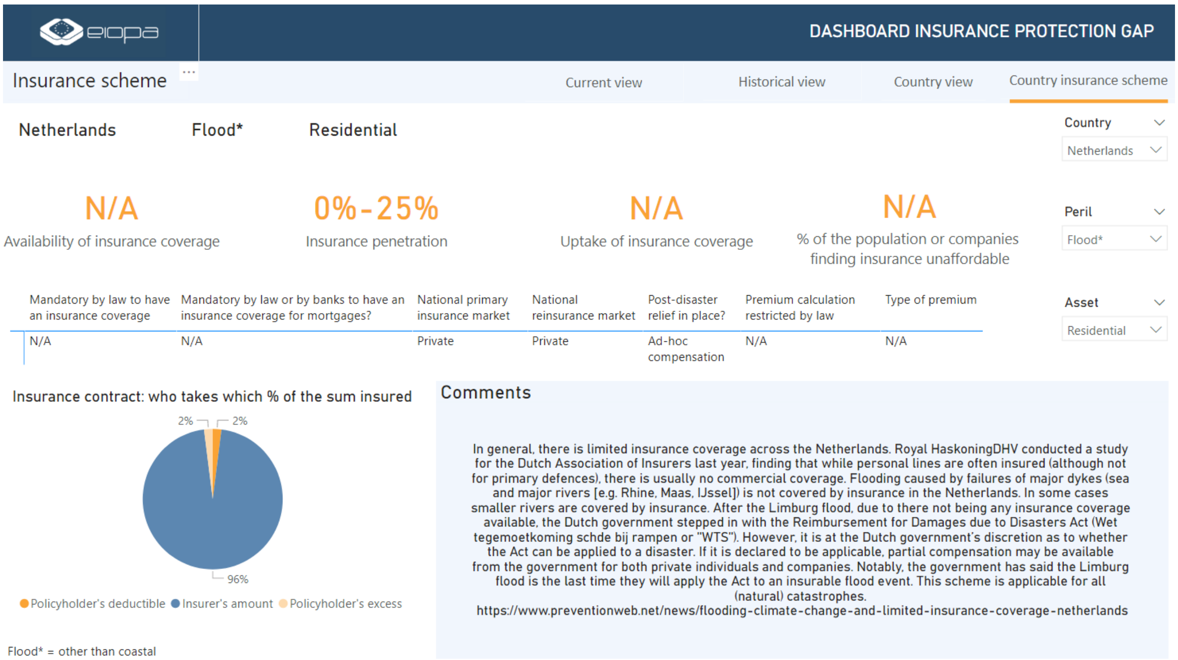


Figure 5: Screenshot of the dashboard insurance scheme view

4. DEFINITION OF THE DASHBOARD SCORES

CURRENT PROTECTION GAP

The main concept behind the formula used to estimate the current protection gap, is to compare the risk of a specific peril in a country with the insurance penetration for the corresponding peril/country.

RISK ESTIMATION

The first parameter considered was the risk for a specific peril in a specific country. The risk is a combination of exposure, hazard and vulnerability.

The risk estimation was based on catastrophe models from the following vendors:

- Verisk[5]
- RMS[6]

[5] Catastrophe Modeling | AIR Worldwide (air-worldwide.com)

[6] Risk Management Models, Analytics, Software & Services | RMS

- JBA[7].

In addition, the open-source model Open Quake[8] was also considered for earthquakes.

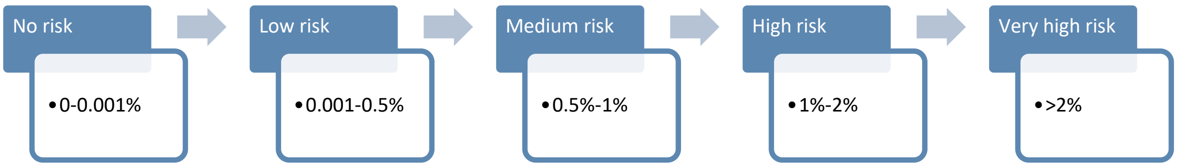
The risk was compared between the different perils and countries using the below index:

$$Index_{Country\ A, peril\ B} = \frac{200\ year\ loss_{Country\ A, peril\ B}}{GDP_{Country\ A}}$$

The index compares the aggregated natural catastrophes losses which have a return period of 200 years with the GDP[9] in order to compare the size of the losses to the countries' economies.

When no model is available, EIOPA used expert judgement from EIOPA's Cat Risk Expert Network. Please see in Annex 1 the peril/regions which have been modelled and/or which are based on expert judgement.

The thresholds used to derive the scores are the following:



To derive the final scores for the risk estimation, EIOPA used the average score obtained from all the models and expert inputs. The average risk scores are between 0 (no risk) and 4 (very high risk).

INSURANCE PENETRATION

The current insurance penetration comes from a cross-assessment of several sources both quantitative and qualitative in collaboration with the supervisory authorities of the EU countries.

The insurance penetration was defined using the following formula:

$$Insurance\ penetration = \frac{Sum\ insured}{Replacement\ value}$$

[7] Catastrophe Models | JBA Risk Management

[8] OpenQuake Platform

[9] Data source: EUROSTAT in EUR as of 2021 https://ec.europa.eu/eurostat/databrowser/view/tec00001/default/table?lang=en

Where:

- Sum insured relates to the property values covered by NatCat policies in a reference country. For the sum insured, EIOPA used year-end 2020 data on sum insured related to insurance contracts covering for European wildfire, earthquake, windstorm, coastal and flood* risks for residential and commercial buildings[10]. The data sample included 35 large European groups active in non-life business and 9 non-life and composite solo undertakings with relevant exposure to fire and other damages to property business[11]. The selection of companies has been based on the annual direct business gross written premiums in 2019 for fire and other damages to property insurance LoB as well as on expert judgment to ensure sufficient sample coverage at country level and encompasses insurers registered in 19 European jurisdictions. Groups and solos in the sample typically write business in multiple countries, thus the selected sample covers all 30 EEA jurisdictions. The selected sample provides (at least) 50% coverage at country level for 24 jurisdictions. On aggregate, the groups and solos in the sample cover approximately 59% of the EEA-wide market in terms of gross premiums (for direct business) written in 2020 for fire and other damages to property insurance LoB;
- Replacement value corresponds to the overall property value in a reference country. For this EIOPA has considered two datasets:
  (a) RiskMap data[12]
  - Created by: ETH, GEM funded by the EU
  - Exposure Data: EFEHR Risk Services Exposure Data : EFEHR Risk Services
  - Total replacement cost: this is the reconstruction cost of structural and non-structural elements, as well as the contents of the buildings.
  - The datasets employed to develop this exposure model were publicly provided through national institutions and local experts, and have been processed and combined within the scope of the European FP7 Framework Project NERA and the European Horizon 2020 project SERA. This European model and the underlying databases are based on the best available and publicly accessible datasets and studies, and all underlying data and assumptions, as well as the full final exposure models, are available from a dedicated GitLab repository.

[10] Residential refers to buildings that are designed to be lived in. Commercial buildings are much more varied than residential properties. While residential properties are exclusively used for private living quarters, commercial refers to any property used for business activities. For the purpose of this analysis, industrial properties have been included into commercial.

[11] The sample comprises of 15 full internal model or partial internal model users, as well as 29 standard formula users.

[12] European Exposure Model Viewer - Gridded Data (eucentre.it): EFEHR Risk Maps - European Exposure Model Viewer - Gridded Data (eucentre.it)

(b) LitPop[13]

- Created by: ETH
- LitPop: Global Exposure Data for Disaster Risk Assessment - Research Collection (ethz.ch)
- The advantages of LitPop are global consistency, scalability, openness, replicability, and low entry threshold. The open-source LitPop methodology and the publicly available asset exposure data offer value for manifold use cases, including globally consistent economic disaster risk assessments and climate change adaptation studies, especially for larger regions, yet at considerably high resolution.
- Gridded physical asset values per country. Gridded nightlight intensity and gridded population data are combined to compute a digital number at grid cell level. Physical asset stock values are then disaggregated proportionally to the digital number per grid cell. This results in the gridded asset exposure dataset.

EIOPA considered the quantitative estimation of the insurance penetration using both databases (RiskMap and Litpop) as these databases showed differences between the countries. It has to be noted that the sum insured that is taken from a survey does not cover the whole market in a country, while the replacement value does. The quantitative estimation is complemented by the qualitative estimations. The indicators used in the final assessment of the insurance penetration are therefore:

- Qualitative estimation of insurance penetration coming from a qualitative survey within national supervisors;
- Qualitative estimation of insurance penetration from the pilot EU dashboard published in 2020;
- Quantitative estimation of insurance penetration using the formula above and the RiskMap data as replacement values;
- Quantitative estimation of insurance penetration using the formula above and the LitPop data as replacement values.

ESTIMATED SCORE THRESHOLDS

The score considers two dimensions, namely the risk of a specific peril for a specific country and the corresponding insurance penetration. Figure 6 shows an example of the matrix to derive the current protection gap score for Windstorms.

[13] Global Exposure Data for Disaster Risk Assessment - Research Collection (ethz.ch): LitPop: Global Exposure Data for Disaster Risk Assessment - Research Collection (ethz.ch)

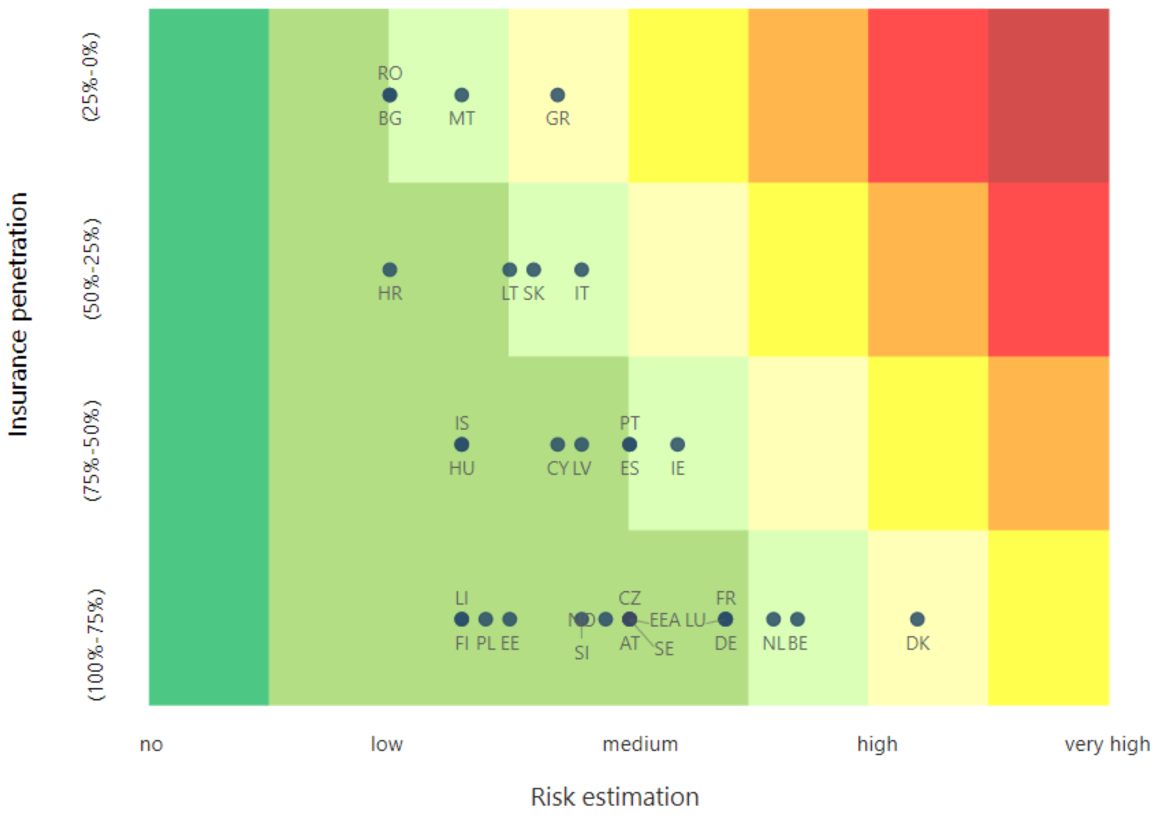


Figure 6: Matrix to derive the current protection gap score

The final assessment for the insurance penetration comes from a joint qualitative assessment of the indicators described above and will go from "no" to "Very high":

		Risk estimation score							
		0-0.5	0.5-1	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5	3.5-4
Insurance penetration (%)	0-25	0	1	1.5	2	2.5	3	3.5	4
	25-50	0	1	1	1.5	2	2.5	3	3.5
	50-75	0	1	1	1	1.5	2	2.5	3
	75-100	0	1	1	1	1	1.5	2	2.5

Table 1: Score for the current protection gap – see also Figure 6.

The thresholds have been based on expert judgement to allow for a differentiation between very high protection gap (score = 4), high protection gap (score = 3), medium protection gap (score = 2), low protection gap (score = 1) and no protection gap (score = 0). A protection gap below 3 is not expected to be relevant.

HISTORICAL PROTECTION GAP

The historical protection gap is calculated using historical economic and insured losses. Two elements are considered which represent the risk and the insurance penetration from an historical point of view:

1. The Annual uninsured losses normalized by GDP

The economic losses give an indication of the risk in each country.

$$Annual\ economic\ losses\ normalised\ by\ GDP = \frac{Economic\ losses}{number\ of\ year * GDP}$$

EIOPA decided to normalize the score with the GDP in order to better compare the different countries. This normalization should also allow to better weight the impact of the losses for each country. Indeed, if a country shows large losses compared to another country, it might not necessarily mean that the hazard is bigger, it can be due to the fact that the economy is bigger. EIOPA therefore wanted to normalize the score in order to have a better idea of what the impacted exposure means for each countries' economies. The number of years depend on the time period considered.

The economic and insured losses are adjusted to the current value as done in the EMDAT database[14] using the Consumer Price Index.

2. The % of uninsured losses

In addition to the normalized view, EIOPA also considers the % of uninsured losses, this gives an indication of how much of the losses were insured.

$$Uninsured\ losses\ \% = \frac{Economic\ losses - Insured\ losses}{Economic\ losses}$$

The historical losses are mainly based on the CATDAT[15] and EMDAT[16] datasets. The CATDAT dataset on economic losses and fatalities from weather- and climate-related events from RiskLayer GmbH

[14] Guidelines | EM-DAT (emdat.be)

[15] Risklayer

[16] EM-DAT | The international disasters database (emdat.be)

are received by the European Environment Agency (EEA) under institutional agreement. The EMDAT datasets are open source and developed by the University of Louvain. It is important to note that the dashboard considers 42 years of historical data (from 1980 to 2021), which means that older events are not included in the calculation.

In the case of Spain, the insured loss data from EMDAT and CATDAT do not take into account the data from the CCS which covers directly losses caused, among others, by flood*, earthquake and most of losses caused by windstorms in Spain. The data from the CCS[17] have therefore been used for insured losses in Spain. Similarly for Norway, the NPP[18] loss data have been used.

In addition, due to missing data for certain perils/countries, the following NCAs have provided additional loss data:

- FIN-FSA[19] Finland
- CNB[20] Czech Republic
- MFSA[21] Malta
- NBB[22] Belgium
- FI[23] Sweden
- CAA[24] Luxembourg
- FMA[25] Liechtenstein
- CB IS[26] Iceland

Note that the historical loss data have been discussed bilaterally with the NCAs. When possible, NCAs have provided corrections. However, this was not always possible as the losses cover a period over the last 40 years.

[17] https://www.consorseguros.es/web/documents/10184/44193/Estadistica_Riesgos_Extraordinarios_1971_2014/14ca6778-2081-4060-a86d-728d9a17c522

[18] www.landbruksdirektoratet.no/naturskadeordningen

[19] Financial Supervisory Authority - www.finanssivalvonta.fi

[20] Czech National Bank (cnb.cz)

[21] Home - MFSA

[22] Welcome to the website of the National Bank of Belgium | nbb.be

[23] Finansinspektionen

[24] Accueil - Commissariat aux Assurances (caa.lu)

[25] FMA - FMA - Finanzmarktaufsicht Liechtenstein (fma-li.li)

[26] Central Bank of Iceland (cb.is)

When no data were available, EIOPA depicts it by giving the country a score equal to -9 in the formula.

HISTORICAL SCORE THRESHOLD

The score considers two dimensions, namely an absolute value of the losses for each country by peril (the annual economic losses normalized by the GDP) and the percentage of uninsured losses. Figure 7 shows an example of the Annual uninsured losses normalized by GDP versus the uninsured loss percentage. EIOPA decided to represent the Annual economic losses normalized by GDP with its log to better differentiate the small values.

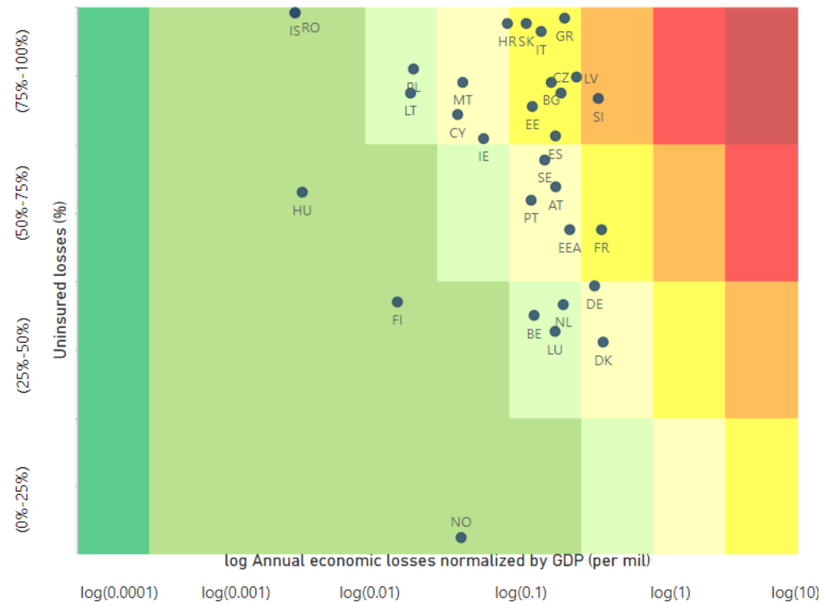


Figure 7: Matrix to derive the historical protection gap score

The below thresholds for the Annual economic losses normalized by GDP and the uninsured loss percentage are used to derive the historical protection gap (see Table 2).

Log of the annual economic losses normalized by GDP

		log(0.0001); log(0.00032)[27]	log(0.00032); log(0.001)[28]	log(0.001); log(0.0032)[29]	log(0.0032); log(0.01)[30]	log(0.01); log(0.032)[31]	log(0.032); log(0.1)[32]	log(0.1); log(0.32)[33]	log(0.32); log(1)[34]	log(1); log(3.2)[35]	log(3.2); log(10)[36]
Uninsured losses (%)	75-100	0	1	1	1	1.5	2	2.5	3	3.5	4
	50-75	0	1	1	1	1	1.5	2	2.5	3	3.5
	25-50	0	1	1	1	1	1	1.5	2	2.5	3
	0-25	0	1	1	1	1	1	1	1.5	2	2.5

Table 2: Score for the historical protection gap – see also Figure 7.

The thresholds have been based on expert judgement to allow for a differentiation between very high protection gap (score = 4), high protection gap (score = 3), medium protection gap (score = 2), low protection gap (score = 1) and no protection gap (score = 0). A protection gap below 3 is not expected to be relevant.

[27] log(0.0001)=-4 and log(0.00032)=-3.5

[28] log(0.00032)=-3.5 and log(0.001)=-3

[29] log(0.001)=-3 and log(0.0032)=-2.5

[30] log(0.0032)=-2.5 and log(0.01)=-2

[31] log(0.01)=-2 and log(0.032)=-1.5

[32] log(0.032)=-1.5 and log(0.1)=-1

[33] log(0.1)=-1 and log(0.32)=-0.5

[34] log(0.32)=-0.5 and log(1)=0

[35] log(1)=0 and log(3.2)=0.5

[36] Log(3.2)=0.5 and log(10)=1

Please note that, due to different methodologies and data sources, the current and the historical protection gap scores are not fully comparable and thus differences should not be interpreted as an improvement/worsening of the risk.

COUNTRY INSURANCE SCHEME

GENERAL INFORMATION

This section aims at collecting qualitative information on general practices related to the property (residential and commercial) insurance business. The assessment results are shown by selecting a reference country from a drop-down list. The inputs of the below indicator come from a qualitative survey involving the supervisory authorities at EU level. It is based on internal studies and / or NCA expert judgement.[37] It is possible to select results by country, by peril, by property type for the below aspects:

- Premium type: Does the premium reflect the insured risk (risk-based) or is it a flat premium? For example, if the insurance covers a house for flood* is the premium reflecting the risk of the house been flooded? If yes, this would be risk-based as per definition or are premiums set as a fixed percentage of the total value insured (this would be "fixed percentage of insured value" as per definition)? For example, in France, premiums for Nat Cat coverage are a flat 12% surcharge on property insurance.
- Is the premium calculation restricted by the legislation? In France for example, the premium is set in a Ministerial Order for each type of base contract.
- Mandatory insurance coverage for housing loan/mortgage? Do banks provide with mortgages only in the case of insurance coverage? Is it mandatory by law?
- Primary insurance: Is the national primary insurance scheme based on the private sector, public sector or public-private partnership?
- Reinsurance: Is the national reinsurance scheme based on the private sector, public sector or public-private partnership?
- Post disaster governmental funds? Is there a clear systematic mechanism in place which provides post disaster relief funds? Or are there ad-hoc possibilities of compensations? Or would it not be possible?
- Insurance compulsory by law? Is it mandatory by law to have an insurance coverage?
- The percentage of the population finding insurance unaffordable: This indicator is judged by the percentage of the population that would find the presented insurance premium ‘unaffordable’. This is a residual income definition, whereby a private property finds

[37] Insurance associations and the industry might have also been involved to complement the views.

insurance unaffordable if the premium is larger than the difference between disposable income and the poverty line (defined as 60% of national median income).

- Estimation of Insurance penetration: the following metric was considered: quantitative estimation of the building sum insured divided by the total replacement value of buildings.
- Uptake of insurance coverage: the action of taking up or making use of insurance coverage that is available. Qualitative estimation about the fact that insurance is available but not usually taken by policyholder. As an indication, low is defined as when people are using less than ~30% of the available insurance capacity, medium as people are using between ~30 and ~60% of the capacity available and high as people are using more than ~60% of the capacity available.
- Availability of insurance coverage: Insurance being able to be used or obtained. Estimation of whether there is enough insurance available to cover the natural catastrophe risk. As an indication, low is defined when the insurance capacity available is less than ~30% to cover the specific peril, medium as the insurance capacity available is between ~30 and ~60% to cover the specific peril and high as the insurance capacity available is more than ~60% to cover the specific peril.

Limits and deductible

The country insurance scheme section also includes a quantitative estimation of limits and deductibles whose underlying data has been collected by EIOPA through a data collection at EU level launched in 2021.

Limits and Deductibles as a portion of the sum insured are percentages included between 0% and 100%. They are computed using the following formulas:

$$\boldsymbol{Deductible}\ \% = \frac{\boldsymbol{Deductible\ amount}}{\boldsymbol{Sum\ Insured}}$$

Where:

- Deductible amount is the amount of money on the policyholder toward a specific property claim. When possible, the amounts are grouped by CRESTA zones;
- Sum Insured is the aggregated monetary replacement for building. When possible, exposures are grouped by CRESTA zones.

$$\boldsymbol{Limit}\ \% = \frac{\boldsymbol{Limit\ amount}}{\boldsymbol{Sum\ Insured}}$$

Where:

- Limit amount is the maximum amount of money an insurer will pay toward a covered claim and it is capped to the Sum Insured.

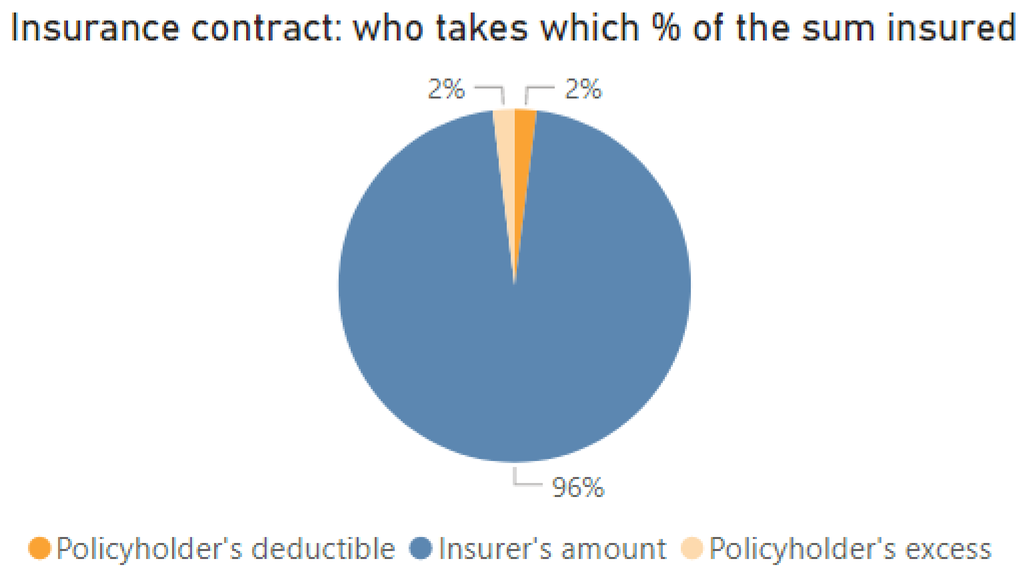
However, the limit should be deducted by the deductible amount to obtain the overall contribution of the insurer:

$$\boldsymbol{Insurer's\ amount}\ \% = \frac{\boldsymbol{Limit\ amount - \ Deductible\ amount}}{\boldsymbol{Sum\ Insured}}$$

Eventually, in addition to the deductible amount, the policyholder will be required to contribute to the following amount:

$$\boldsymbol{Policyholder's\ excess}\ \% = \frac{\boldsymbol{Sum\ Insured - Limit\ Amount}}{\boldsymbol{Sum\ Insured}}$$

The final result will be presented in the dashboard via a pie chart as per picture below:



5. SUMMARY OF THE DATA USED AND EXPERT JUDGEMENT

Module	Sub module	Category	Input data	Comments
Historical protection gap			EMDAT, CATDAT, CCS, NNP and complemented by data sent by the NCAs	Methodologies for collecting historical losses are not aligned between different data sources used to collect historical losses. Reliance on data which are not fully open source. Reliance on data from the private sector, which may limit use for public purposes. In the future, it will be important to improve the collection of historical losses as significant gaps have been identified in particular for insured losses.
Current protection gap	Estimated risk	Earthquake, River and pluvial floods, windstorms, wildfire, coastal flood	Cat model vendors (RMS, JBA, Verisk, EFEHR) Expert judgement from EIOPA's Cat Risk Expert Network.	The risk estimation was primarily done using cat models where available. When no model was available, expert judgement from EIOPA's Cat Risk Expert Network was used. In additional to the modelled results, Cat

				Risk Experts also provided additional inputs.
Currentprotection gap	Insurance penetration		EIOPA data collection from 2021 and NCA's expert judgement	To complement the data collection, EIOPA has also asked NCAs to review the estimation on the insurance penetration.
Insurance scheme	Limit and deductible		EIOPA data collection from 2021 and NCA's expert judgement	To complement the data collection, EIOPA has also asked NCAs to review the estimation on the limits and deductibles.
Insurance scheme	Information about each country		EIOPA data collection from 2021	

ANNEX 1

List of peril regions considered in the dashboard and the information if models were available or not to estimate the corresponding risk.

Country	Coastal flood	Earthquake	Flood*	Wildfire	Windstorm
Austria	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Belgium	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Bulgaria	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Croatia	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Cyprus	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Czech Republic	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Denmark	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Estonia	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Finland	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
France	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Germany	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Greece	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Hungary	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Iceland	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Ireland	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Italy	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Latvia	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Liechtenstein	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Lithuania	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Luxembourg	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Malta	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Netherlands	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Norway	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Poland	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Portugal	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Romania	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Slovakia	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Slovenia	Expert judgement	Modelled	Modelled	Expert judgement	Modelled
Spain	Expert judgement	Modelled	Modelled	Expert judgement	Expert judgement
Sweden	Expert judgement	Modelled	Modelled	Expert judgement	Modelled

LIST OF ACRONYMS

CAA:	Commissariat Aux Assurances Luxembourg
CB IS:	Central Bank Iceland
CCS:	Consorcio de Compensación de Seguros
CNB:	Czech National Bank
CRESTA:	Catastrophe Risk Evaluation and Standardizing Target Accumulations
EEA:	European Economic Area
EEA:	European Environment Agency
EFEHR:	European Facilities for Earthquake Hazard and Risk
FI:	Finanzinspektion Sweden
FIN-SA:	Financial Supervisory Authority Finland
FMA:	Financial Market Authority Liechtenstein
GEM:	Global Earthquake Model
GDP:	Gross Domestic Product
LoB:	Line of Business
MFSA:	Malta Financial Services Authority
Nat Cat:	Natural Catastrophe
NBB:	National Bank of Belgium
NCA:	National Competent Authorities
NNP:	Norwegian Natural Perils Pool

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