



Earthquake risk in Italy

Comment on data from ANIA

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ITALY: standard formula settings for earthquake risk

there are 92 zones

(ID based on postal code – first two digits)

risk factor

$$Q_{(earthquake,r)} = 0.80$$

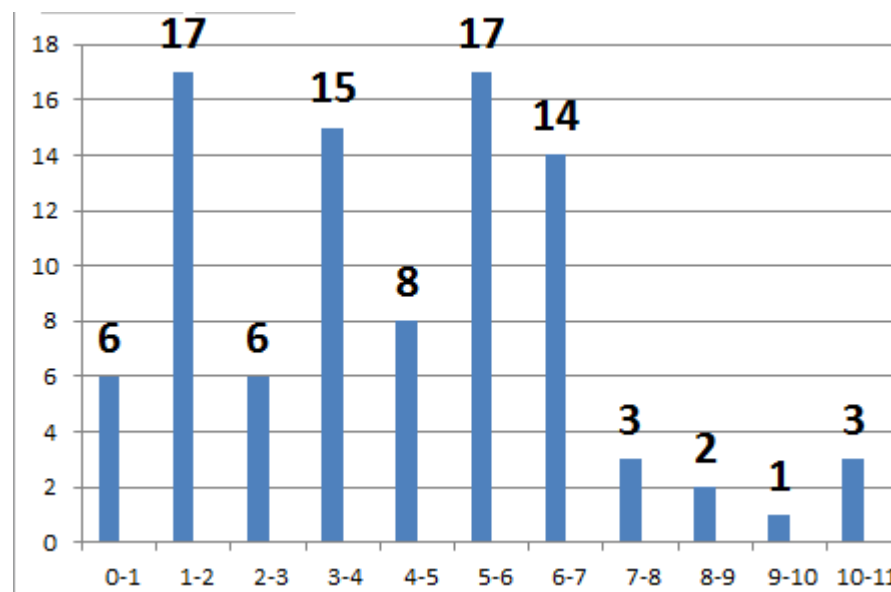
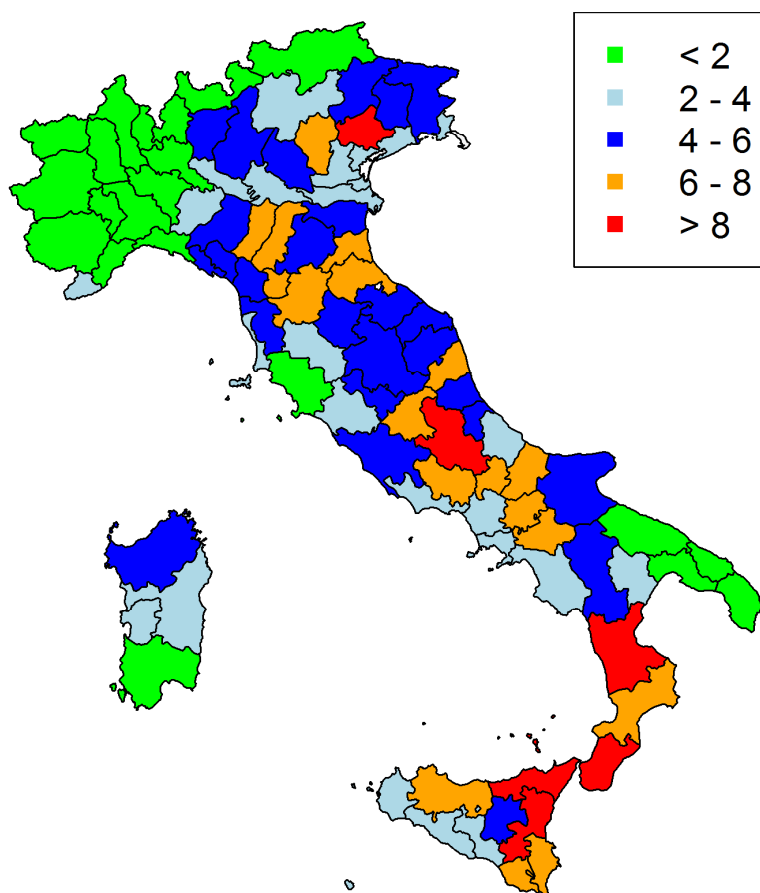
Correlation with other countries: just SLOVENIA (25%)

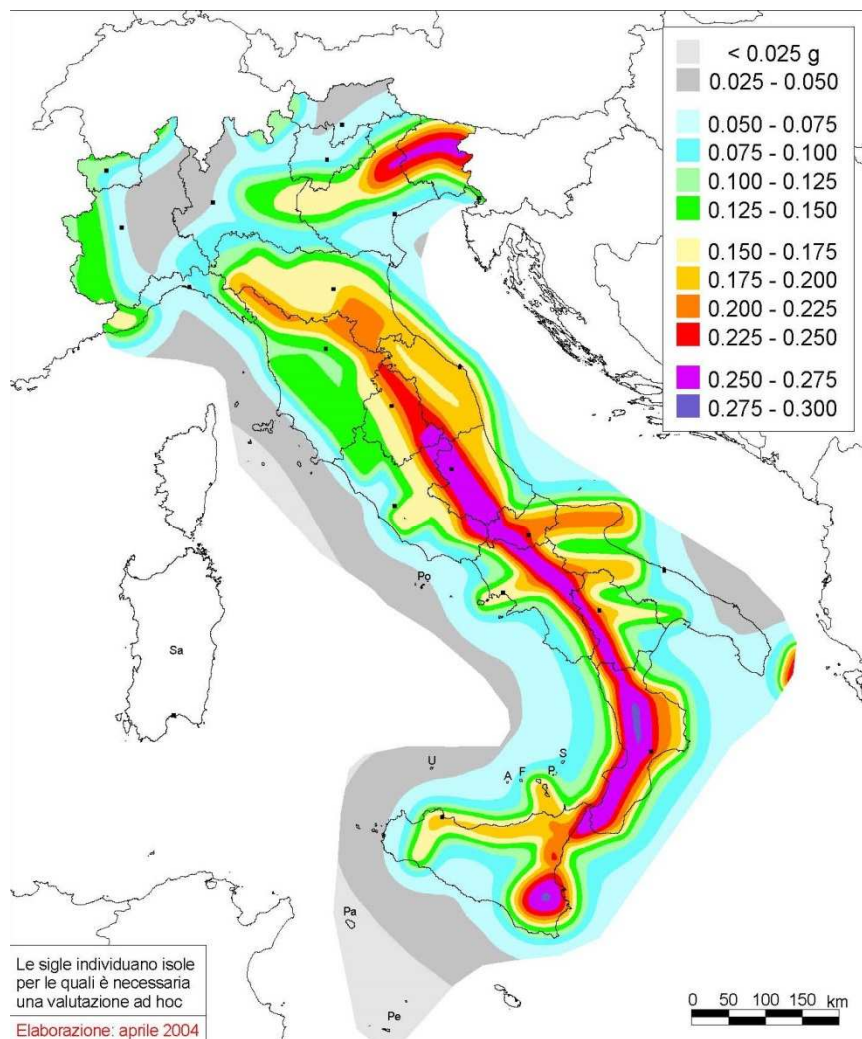
Correlation between zones: just contiguous one

Most of the coverage concerns industrial buildings
(insurance sector not developed for private housing)



Earthquake cresta relativity





Source



ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

Probability estimated in 10% of exceeding the trasversal peak acceleration indicated, in a period of 50 years.

(Sardinia not reported)

Data sent by ANIA

Occurrence year	Number (or name) of event	Total aggregated losses for event for the whole country	Total Exposure for the whole country	Total SCR for this risk/year for the whole country
2006	-	-	156.206.041.097	1.405.854.370
2007	-	-	166.815.704.455	1.501.341.340
2008	-	-	162.441.679.588	1.461.975.116
2009	06/04/2009	195.698.157	375.304.952.083	3.485.350.575
2010	-	-	170.306.960.616	1.532.762.646
2011	-	-	169.658.172.195	1.526.923.550
2012	20/05/2012	300.188.509	473.356.680.990	4.431.444.837
2012	29/05/2012	146.456.947	472.859.091.401	4.431.444.837
2013	21/06/2013	486.643	401.935.983	89.195.142
2013	-	-	155.109.983.064	1.389.958.299
2014	-	-	166.645.744.860	1.477.832.779
2015	-	-	174.706.774.820	1.558.452.374
2016	24/08/2016	33.994.927	353.201.895.269	3.024.082.908
2016	20/10/2016	8.047.002	53.970.164.300	614.693.227
2016	26/10/2016	19.901.288	353.201.895.269	3.024.082.908
2016	30/10/2016	14.832.867	347.433.147.726	3.403.615.653

**Region:
EMILIA**

ANIA COMMENT (part 1)

In certain cases until 09-2016 the earthquake risk has derived from a particular collective insurance product sell in 2008-2009 (currently in run-off) that provide with a maximum indemnity of 2,5 mln € that has to be proportionally distributed for all the exposures when a claim occurred. For this reason gross risk capital was the amount we have to pay in case of claim occurrence. The amount is calculated as $\min(2,5 \text{ mln}; \text{standard formula result})$. From 09/16 the amount of Earthquake gross risk capital is determined as the sum of the amount as specified in the firstcell (for run-off business) plus earthquake risk generated from the products that contain earthquake insurance cover

ANIA COMMENT (part 2)

It seems that the calibration of the Standard Formula Italian Earthquake submodule does not adequately account for the effective impact of contractual policy conditions (**indemnity limits and deductibles**) that need to be taken into consideration to adequately assess the Italian insurers' exposure to earthquake risk. **Evidence shows that the average contractual limit in the Italian portfolio is less than 30% of the sums insured.** In this regard, EIOPA has never provided disclosure on the parameters used to calibrate the Italian Earthquake submodule. Evidence based on historical events and their related losses as well as the results of evaluations carried out by the internal model (RQE) or by specialised key third party software providers (RMS, AIR) points to a heavy miscalibration in the risk calculation amounting to approx. a 270% difference between the STDF and the internal model results gross of reinsurance. Moreover, **the reinsurance and CAT Bond markets reflect an implicit risk assessment inconsistent with that expressed by the Standard Formula.**

DATA COVERAGE

Almost 50% of the whole italian market

DATA ON «SUMS INSURED»

Mostly referred to LoB 7 - *Fire and Other damage to property*.

Industry reported that the average contractual limit for earthquake risk is, for the italian portfolio, less than 30% of the sums insured.

MAXIMUM INDEMNITY

In several cases the SCR was capped at the maximum indemnity (2,5 M€):

SCR = min (maximum indemnity; standard formula result)

Despite this, the SCR appeared to be hugely larger than CAT losses reported.

Is this a mis-estimation or the effect of Var calculation at 99.5%?

DEDUCTIBLES

Are deductibles reflected in an appropriate manner in the standard parameters?

Are there differences across EU countries?

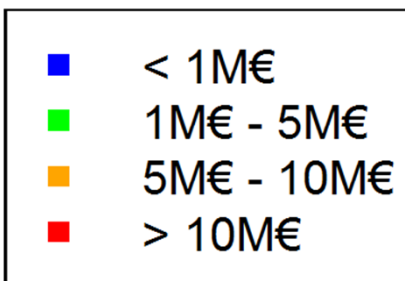
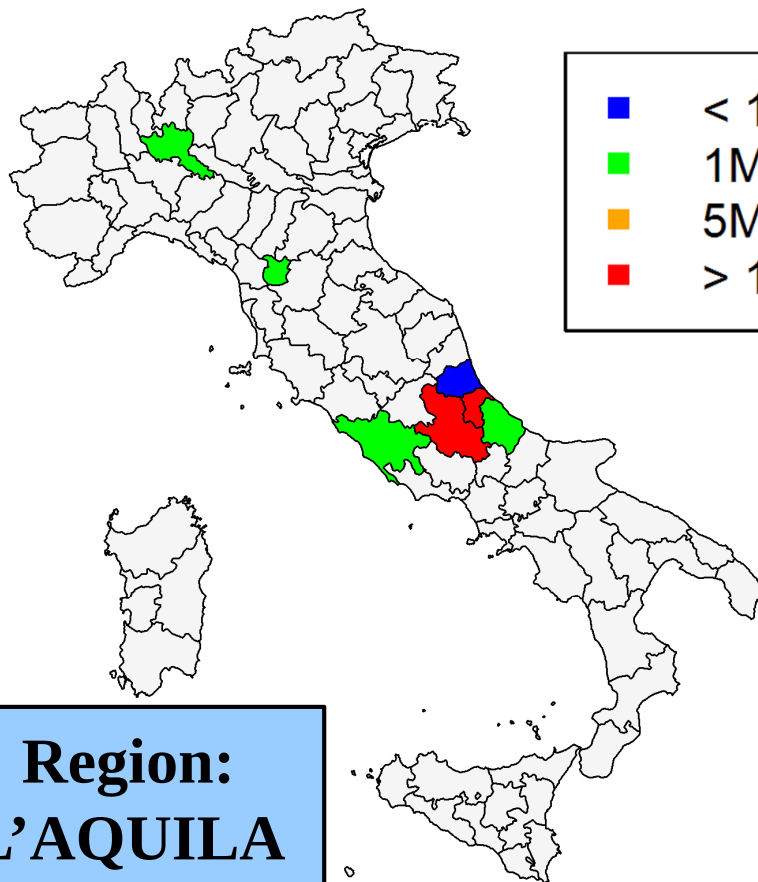
Are ex post adjustments, to take account of specific deductibles

and in order to avoid any over estimation of the SCR, a valid solution?

Earthquake losses in Italy

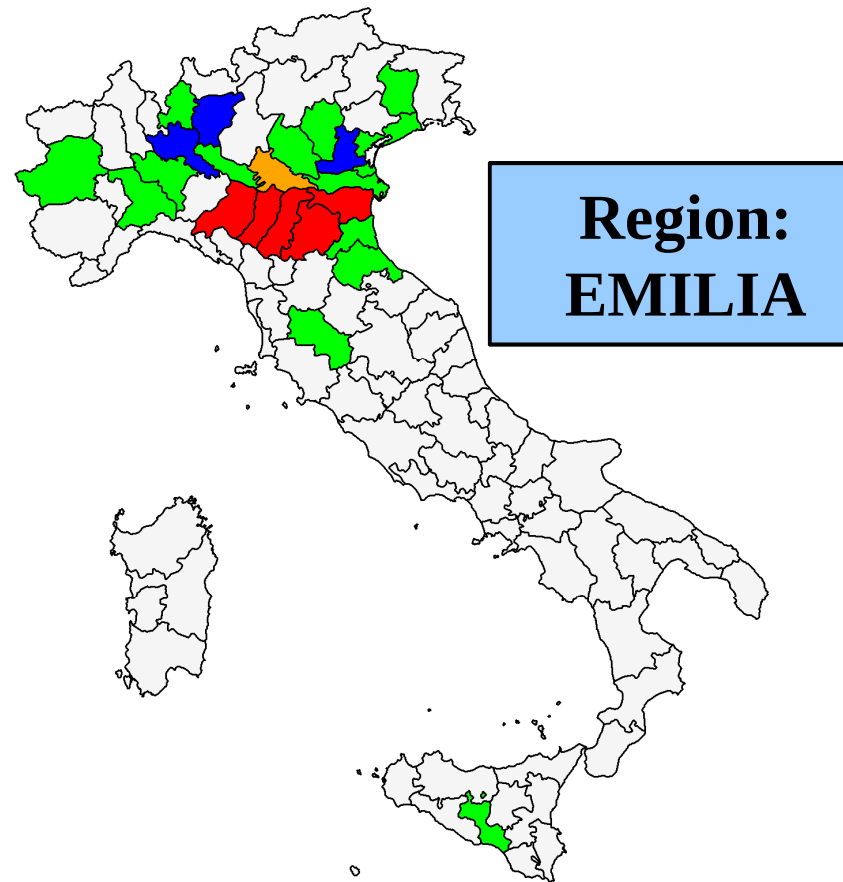
Earthquake: 06/04/2009.

Losses: 195.698.157 M€



Earthquake: 20/05/2012.

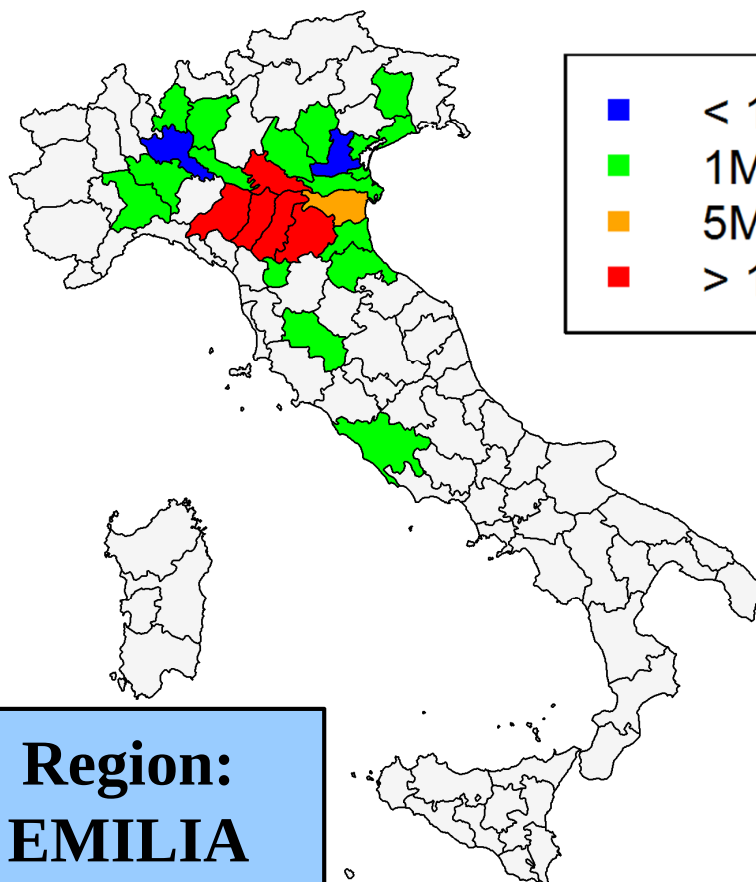
Losses: 300.188.508 M€



Earthquake losses in Italy

Earthquake: 29/05/2012.

Losses: 146.456.947 M€



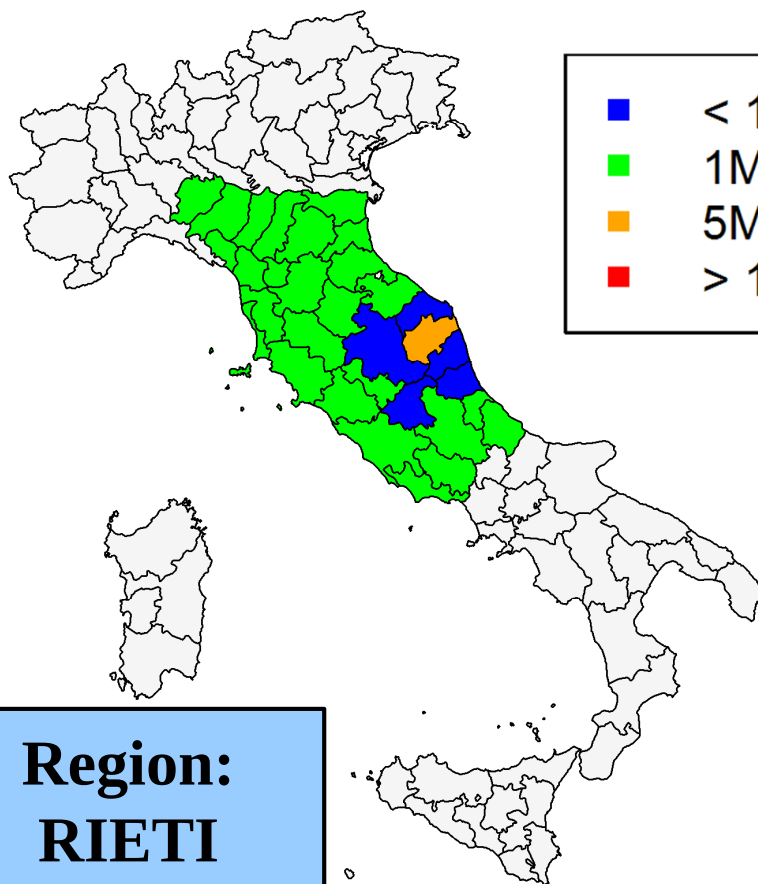
Earthquake: 21/06/2013.

Losses: 486.643 M€

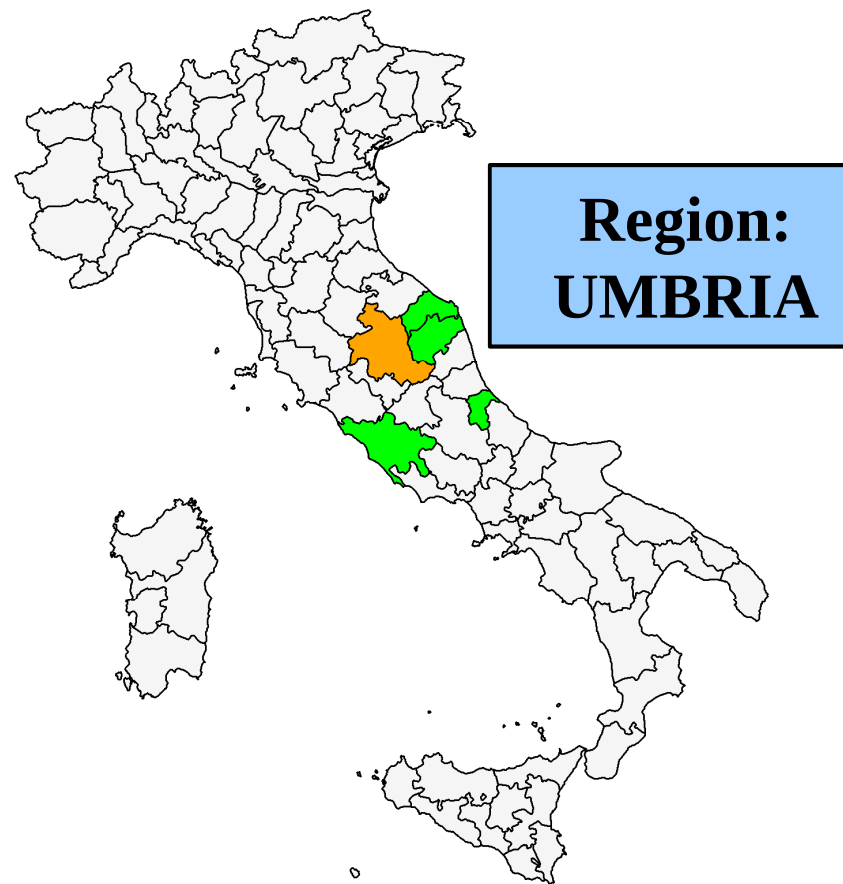


Earthquake losses in Italy

Earthquake: 24/08/2016.
Losses: 33.994.927 M€

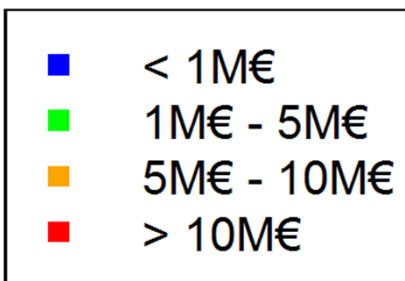
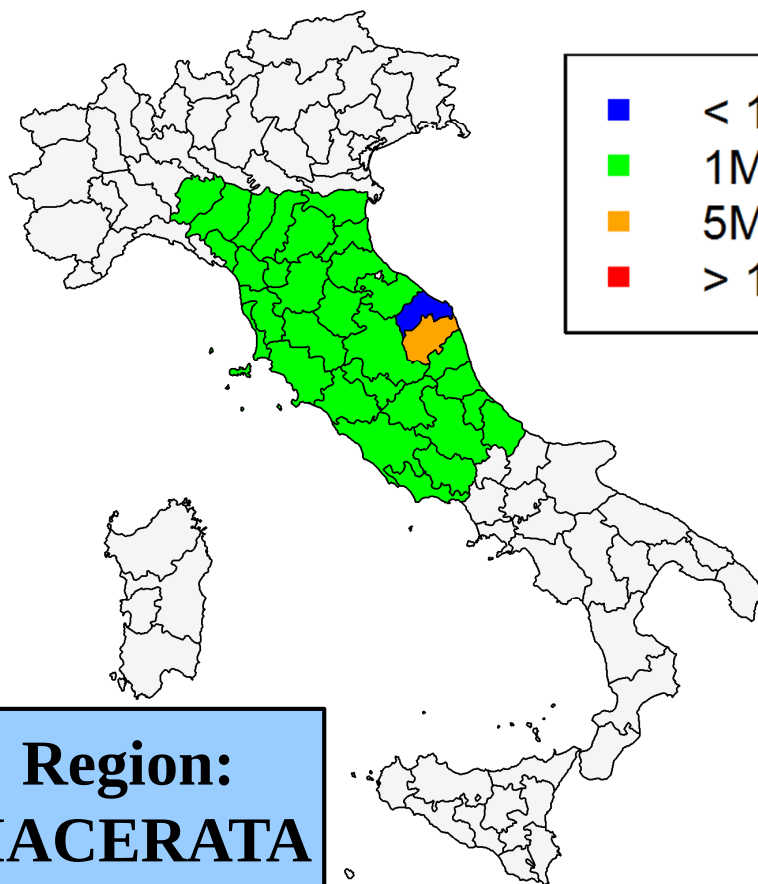


Earthquake: 20/10/2016.
Losses: 8.047.002 M€



Earthquake losses in Italy

Earthquake: 26/10/2016.
Losses: 19.901.288 M€



Earthquake: 30/10/2016.
Losses: 14.832.867 M€



QUESTION

Data display that most of the losses occurred in 2012.

The earthquake happened in an high industrial territory (Emilia).

Introducing a single (average) parameter for the calculation of the SCR would not be sufficiently risk-sensitive.

Distinct parameters for each single area necessary.

QUESTIONS FOR FURTHER CONSIDERATION IN THE CAT WS

1) Do standard parameters appropriately reflect the «average» deductibles?

How insurance companies may take account of specific deductibles and upper contractual limits in the SCR calculation – consistently with *recital 54* of delegated Acts?

RECITAL (54) of DELEGATED ACTS

In order to capture the actual risk exposure of the undertaking in the calculation of the capital requirement for natural catastrophe risk in the standard formula, the sum insured should be determined in a manner that takes account of contractual limits for the compensation for catastrophe events.

Is it possible to introduce, for example, ex-post corrections to the SCR due to specific deductibles?

2) How insurance companies may value the the risk-mitigating effect in the SCR due to:

- CAT bonds?
- non traditional reinsurance pattern?

The calculation is difficult and there are no EIOPA guidelines.