WORLD BANK GROUP GFDRR

EUROPE AND CENTRAL ASIA (ECA)
RISK PROFILES

Czech Republic

GDP $183 billion*

Population 10.5 million*

AFFECTED BY 100-YEAR FLOOD	AFFECTED BY 250-YEAR EARTHQUAKE	CAPITAL LOSS FROM 250-YEAR EARTHQUAKE
$20 billion (9%)	$5 billion (2%)	$700 million (<1%)
1 million (9%)	300,000 (3%)	0 (<1%)

*2015 estimates

The Czech Republic's population and economy are exposed to earthquakes and floods, with floods posing the greater risk. The model results for present-day risk shown in this risk profile are based on population and gross domestic product (GDP) estimates for 2015. The estimated damage caused by historical events is inflated to 2015 US dollars.

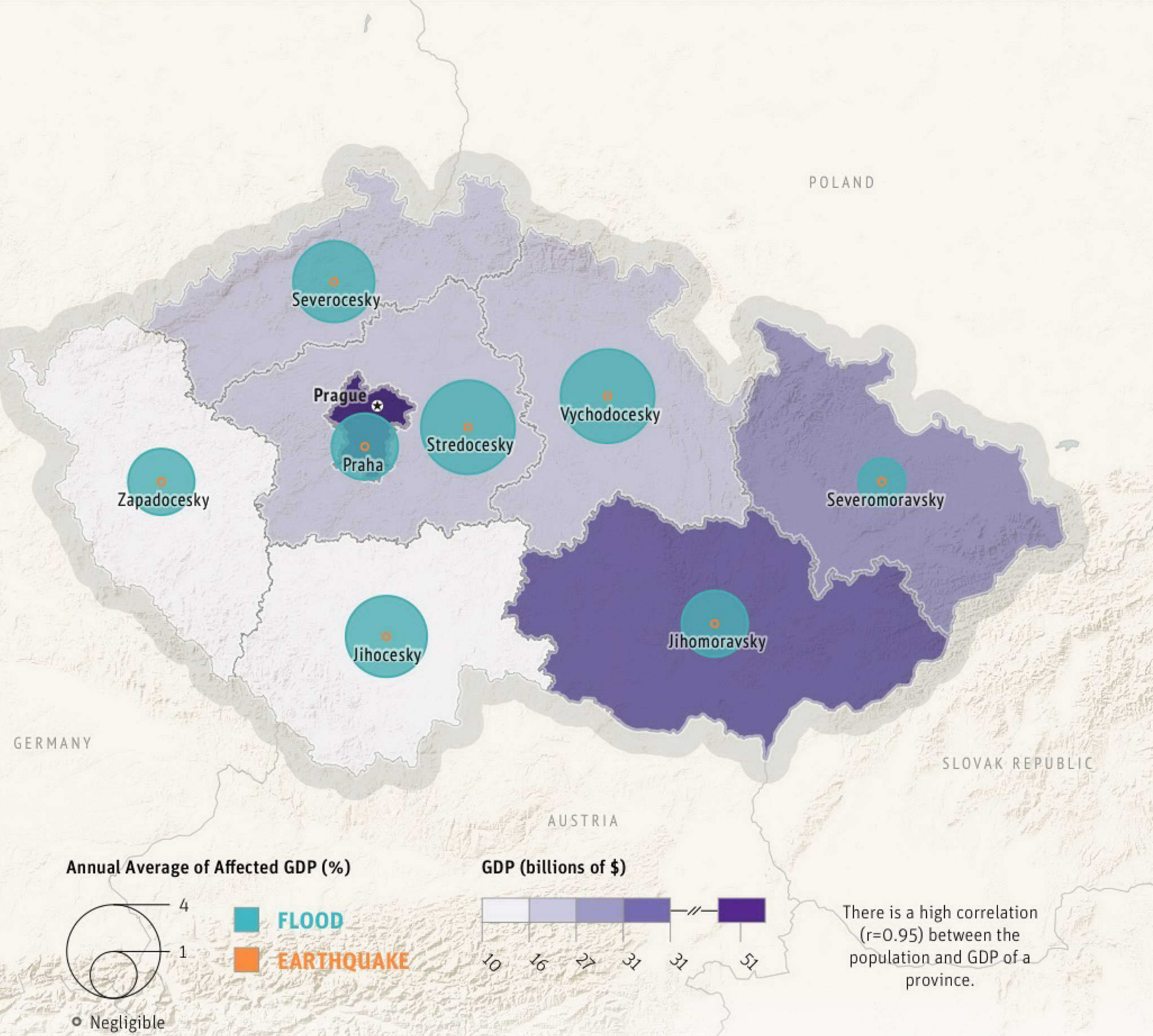
Close to 75 percent of the population of the Czech Republic lives in urban environments. The country's GDP was approximately US$183 billion in 2015, with 60 percent derived from services, most of the remainder generated by industry, and agriculture making a small contribution. The Czech Republic's per capita GDP was $17,300.

This map displays GDP by province in the Czech Republic, with greater color saturation indicating greater GDP within a province. The blue circles indicate the risk of experiencing floods and the orange circles the risk of earthquakes in terms of normalized annual average of affected GDP. The largest circles represent the greatest normalized risk. The risk is estimated using flood and earthquake risk models.

The table displays the provinces at greatest normalized risk for each peril. In relative terms, as shown in the table, the province at greatest risk of floods is Stredocesky, and the one at greatest risk of earthquakes is Severomoravsky. In absolute terms, the province at greatest risk of floods is Praha, and the one at greatest risk of earthquakes is Severomoravsky.

TOP AFFECTED PROVINCES

FLOOD ANNUAL AVERAGE OF AFFECTED GDP (%)		EARTHQUAKE ANNUAL AVERAGE OF AFFECTED GDP (%)	
Stredocesky	4	Severomoravsky	0
Vychodocesky	4	Zapadocesky	0
Severocesky	3	Vychodocesky	0
Jihocesky	3	Severocesky	0
Zapadocesky	2	Jihomoravsky	0
Jihomoravsky	2	Jihocesky	0
Praha	2	Stredocesky	0
Severomoravsky	1	Praha	0



There is a high correlation (r=0.95) between the population and GDP of a province.

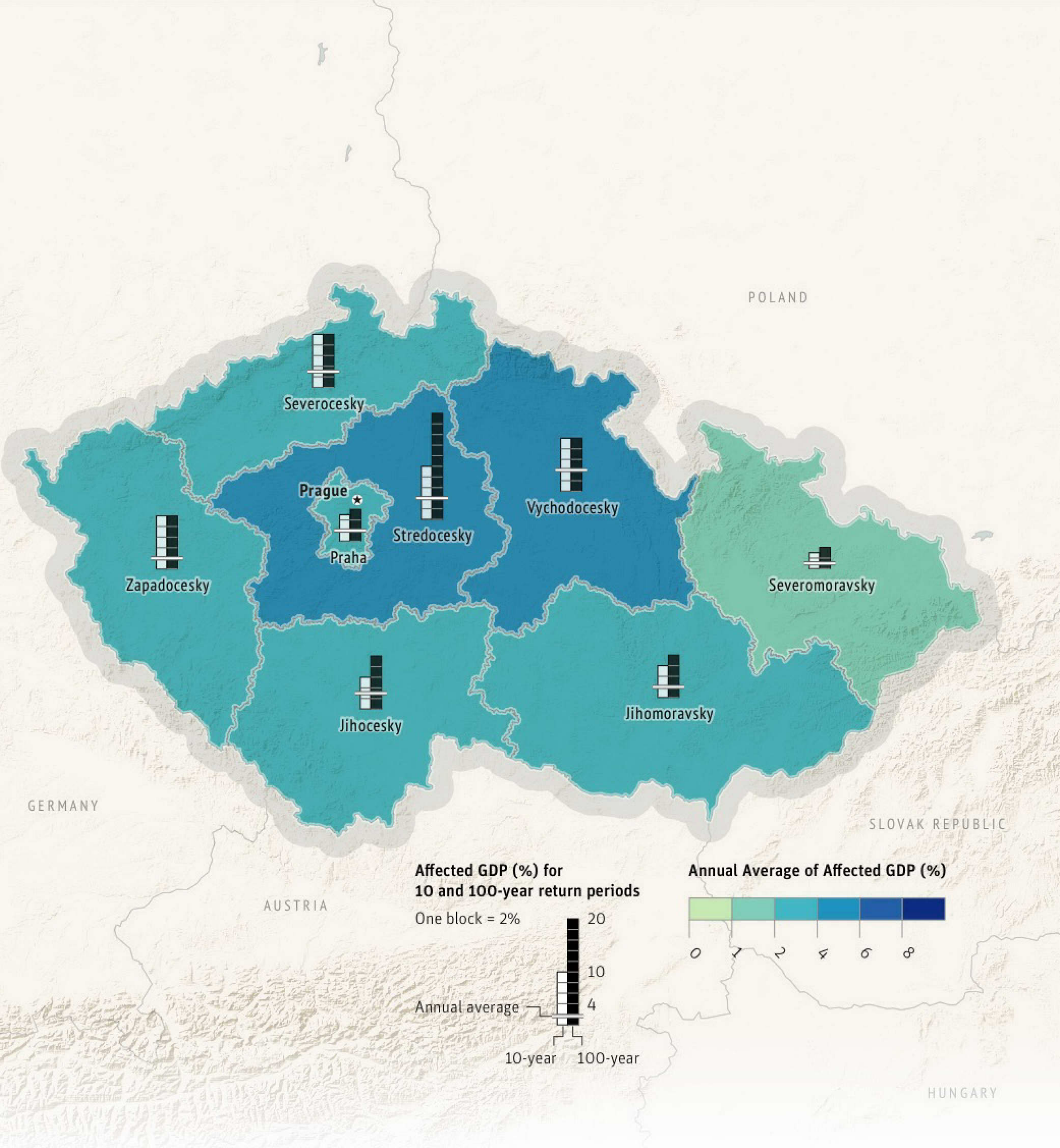
The most devastating flood in the Czech Republic since it gained its independence in 1993 occurred in 2002. It killed 18 people and caused over $3 billion in damage. A 1997 flood caused 29 fatalities and almost $3 billion in damage. More recently, flooding in 2013 affected over 1 million people and caused close to $850 million in damage. Further floods in 2009 and 2010 caused over $150 million in damage per event.

This map depicts the impact of flooding on provinces' GDPs, represented as percentages of their annual average GDPs affected, with greater color saturation indicating higher percentages. The bar graphs represent GDP affected by floods with return periods of 10 years (white) and 100 years (black). The horizontal line across the bars also shows the annual average of GDP affected by floods.

When a flood has a 10-year return period, it means the probability of occurrence of a flood of that magnitude or greater is 10 percent per year. A 100-year flood has a probability of occurrence of 1 percent per year. This means that over a long period of time, a flood of that magnitude will, on average, occur once every 100 years. It does not mean a 100-year flood will occur exactly once every 100 years. In fact, it is possible for a flood of any return period to occur more than once in the same year, or to appear in consecutive years, or not to happen at all over a long period of time.

If the 10- and 100-year bars are the same height, then the impact of a 10-year event is as large as that of a 100-year event, and the annual average of affected GDP is dominated by events that happen relatively frequently. If the impact of a 100-year event is much greater than that of a 10-year event, then less frequent events make a larger contribution to the annual average of affected GDP. Thus, even if a province's annual affected GDP seems small, less frequent and more intense events can still have large impacts.

The annual average population exposed to flooding in the Czech Republic is about 200,000 and the annual average affected GDP about $4 billion. For most provinces, in which the impacts from 10- and 100-year floods do not differ much, relatively frequent floods have large impacts on these averages. For the few in which the 100-year impacts are much greater than the 10-year impacts, less frequent events make a significant contribution to the annual average of affected GDP.



The Czech Republic has experienced several earthquakes of magnitude 7 in its history, including one in 1786 in Tesin, one in 1872 in Gera, and one in 1901 in Trutnov.

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When an earthquake has a 10-year return period, it means the probability of occurrence of an earthquake of that magnitude or greater is 10 percent per year. A 100-year earthquake has a probability of occurrence of 1 percent per year. This means that over a long period of time, an earthquake of that magnitude will, on average, occur once every 100 years. It does not mean a 100-year earthquake will occur exactly once every 100 years. In fact, it is possible for an earthquake of any return period to occur more than once in the same year, or to appear in consecutive years, or not to happen at all over a long period of time.

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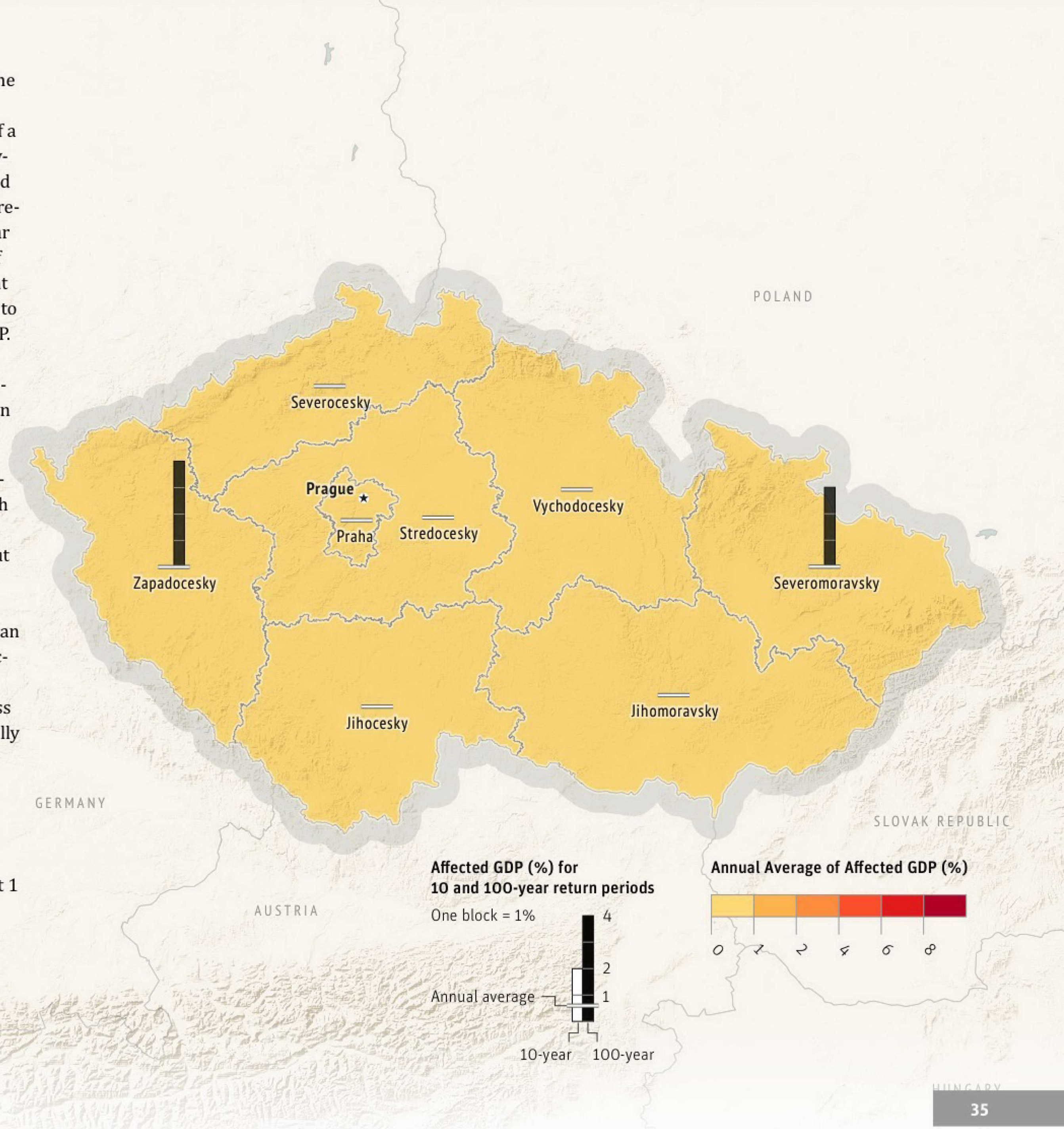
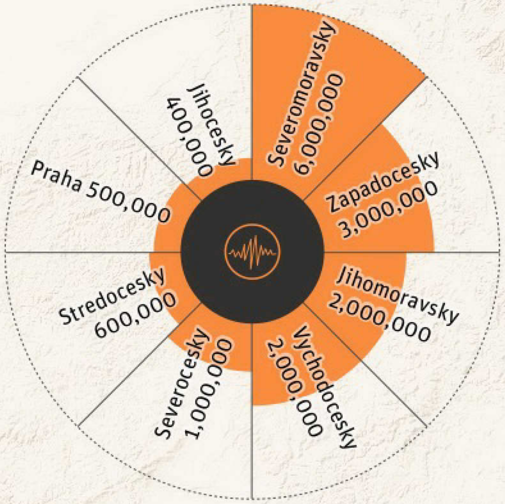
The annual average population affected by earthquakes in the Czech Republic is about 6,000 and the annual average affected GDP about $100 million. The annual averages of fatalities and capital losses caused by earthquakes are less than one and about $20 million, respectively. The fatalities and capital losses caused by more intense, less frequent events can be substantially larger than the annual averages. For example, an earthquake with a 0.4 percent annual probability of occurrence (a 250-year return period event) could cause nearly $800 million in capital loss (about 1 percent of GDP).



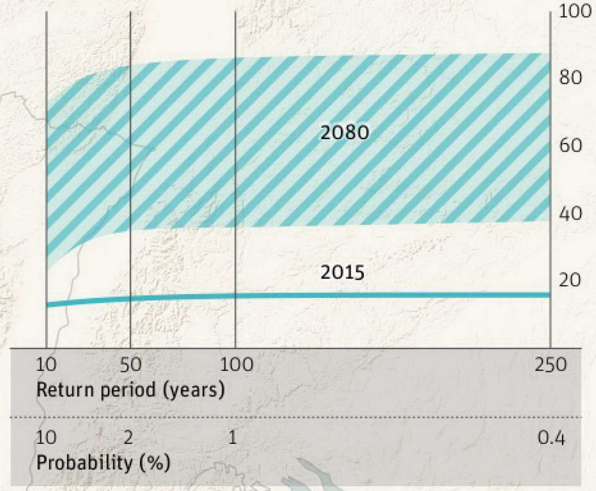
EARTHQUAKE
ANNUAL AVERAGE CAPITAL LOSS ($)



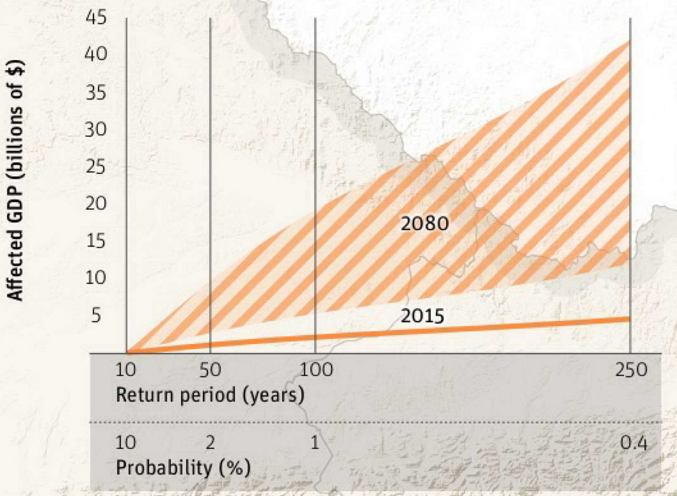
EARTHQUAKE
ANNUAL AVERAGE FATALITIES

The rose diagrams show the provinces with the potential for greatest annual average capital losses and highest annual average numbers of fatalities, as determined using an earthquake risk model. The potential for greatest capital loss occurs in Severomoravsky, which is not surprising, given the economic importance of the province.

FLOOD
EXCEEDANCE PROBABILITY CURVE, 2015 AND 2080



EARTHQUAKE
EXCEEDANCE PROBABILITY CURVE, 2015 AND 2080



The exceedance probability curves display the GDP affected by, respectively, floods and earthquakes for varying probabilities of occurrence. Values for two different time periods are shown. A solid line depicts the affected GDP for 2015 conditions. A diagonally striped band depicts the range of affected GDP based on a selection of climate and socioeconomic scenarios for 2080. For example, if the Czech Republic had experienced a 100-year return period flood event in 2015, the affected GDP would have been an estimated $20 billion. In 2080, however, the affected GDP from the same type of event would range from about $40 billion to about $90 billion. If the Czech Republic had experienced a 250-year earthquake event in 2015, the affected GDP would have been about $5 billion. In 2080, the estimated affected GDP from the same type of event would range from about $10 billion to about $40 billion, due to population growth, urbanization, and the increase in exposed assets.

All historical data on floods and earthquakes are from, respectively, D. Guha-Sapir, R. Below, and Ph. Hoyois, EM-DAT: International Disaster Database (Université Catholique de Louvain, Brussels, Belgium), www.emdat.be, and J. Daniell and A. Schaefer, "Eastern Europe and Central Asia Region Earthquake Risk Assessment Country and Province Profiling," final report to GFDRR, 2014. Damage estimates for all historical events have been inflated to 2015 US$.