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ABSTRACT

Expected earthquake losses are approached by the assessment of seismic risk which is a description of the measurable impact of the earthquakes on the human society. A measure of seismic risk can be considered the number of deaths caused by earthquakes. We plot the number of killed people during the 20th century in Turkey. We want to notice that in only the events caused 10 or more kills are applied. A first inspection in this plot reveals that the most deaths caused mainly by two shocks. The one of 1939 with magnitude $M=7.9$ and intensity $I>X$ in Erzincan and the second generated in 1999 with magnitude $M=7.4$ and intensity $I=X$ in Izmit, Marmara. A conclusion is derived from the plot. The 64.2% of the losses were during the first 50 years of the 20th century, while the rest 35.8% is observed during the second half of the examined century. This may depend on two reasons. The first one is that the most murderous earthquake occurred during the first half of the 20th century, and second is that during the last 50 years many improvements on the technical structures are applied. The data

set used is extracted from the Kandili observatory and covers the time period 1900-2000. A set of historical data is also obtained from the same observatory. A very useful catalog which includes a lot of information (year of occurrence, magnitude, intensity, number of deaths, damaged buildings, etc.) for the strong and catastrophic ($M > 5.5$) earthquakes, during 20th century, in Turkey, is also available and is used for the purpose of the assessment of seismic risk. The results show that, earthquakes which have intensity $I > VII$ caused the most of the deaths. We also introduced the ratio (r) which shows the number of deaths to damaged buildings. The ratio r was plotted versus intensity and reveals that almost high r values exceeded intensity VII. For the first half of the 20th century the ratio $r = 5.05$ kills/damaged-building, while for the second half $r = 2.63$ kills/damaged-building. We see a reduction of the ratio and we can conclude that some more improvements were taken into account to the seismic codes in order the ratio to be lower than the mean of the country which is 3.65.