

Gender Differences in Years of Life Lost resulting from the 2015 Gorkha Earthquake in Nepal

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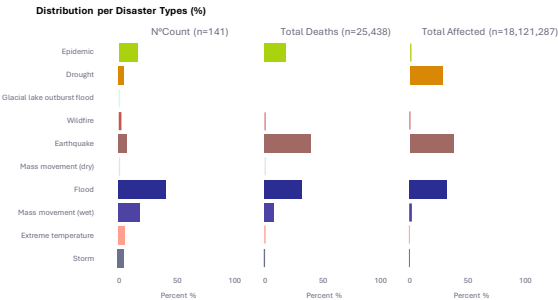
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BACKGROUND

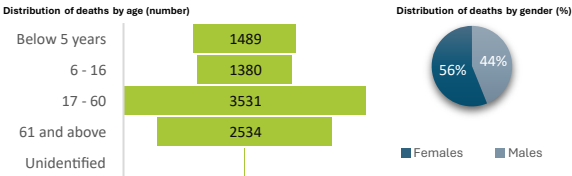
Nepal has a history of regular natural hazards, including significant earthquakes and floods (data from 1900 to 2024).



2015 Gorkha Earthquake is one of the major seismic events:

- April 25, 2015: Gorkha Earthquake, magnitude of 7.8
- May 12, 2015: 7.3 magnitude aftershock
- Total of 8,970 deaths and 22,302 injuries

Previous studies^{1,2} have shown that females, particularly younger females, are more likely to die due to seismic events compared to males. Epidemiological data from the 2015 Gorkha Earthquakes indicate³:



CONCLUSIONS

- Deaths and Years of Life Lost follow a logical concentric pattern around the epicentre.
- Using Years of Life Lost offers a clearer view of the spatial impact of mortality.

AIM

To explore gender differences in mortality – measured in **Years of Life Lost (YLL)** – caused by the 2015 Gorkha earthquake across 41 districts of Nepal. **YLL** refers to the loss of years due to premature mortality.

METHODS

Mortality data were derived from the Nepal Police Report³, disaggregated (**D'**) to obtain 5-year age classes (**a**) per sex (**s**) and district (**d**) according to the National Population Census⁴.

YLL was estimated by multiplying mortality counts (stratified by age, gender, and district) by age-conditional life expectancy from the 2019 Global Burden of Disease reference life table (**L**). Both absolute numbers (**Eq.1**) and rates (**Eq.2**) of **YLL** per 100,000 population were calculated.

$$YLL_{(d,a,s)} = D'_{(d,a,s)} \times L_{(a,s)} \text{ (Eq.1)}$$

$$YLL \text{ rate}_{(d,a,s)} = \frac{YLL_{(d,a,s)}}{P_{(d,s)}} \times 100,000 \text{ population (Eq.2)}$$

YLL per deaths, stratified by age-gender-and-location, were calculated and compared.

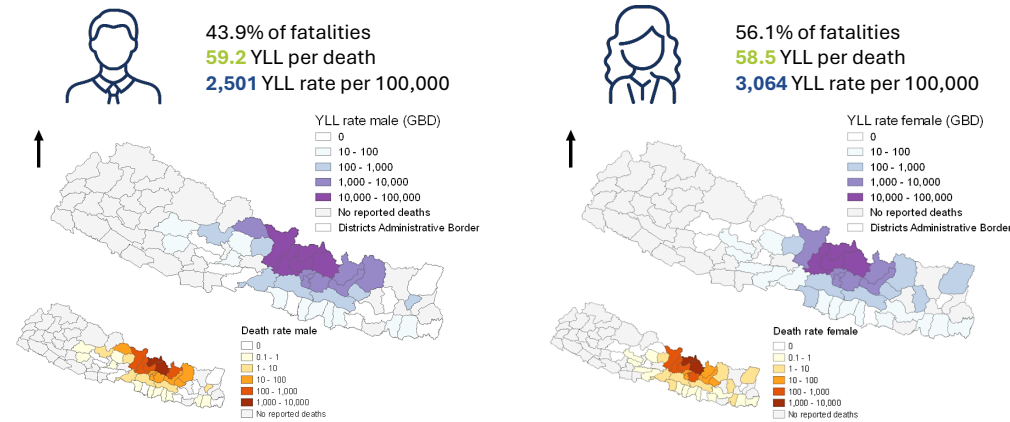
Male-to-female YLL rate ratios were calculated and compared across districts.

The results by gender were compared with Nepal's socio-economic statistics.

RESULTS

2015 Gorkha earthquake resulted in **526,617 YLL**.

40% of the districts had male-to-female YLL rate ratios of less than one.



- The districts with the highest YLL rates are not systematically those with the highest death rates.
- Gender differences are mainly explained by the different number of deaths between males and females.
- Since the first earthquake occurred during a weekend and the aftershock at night, linking the employment rate (68.4% for males vs 57.1% for females⁴) to YLL is challenging.
- The vulnerability of Nepalese women to earthquakes is linked to their education level and maternal health⁵, which may help explain YLL rates without accounting for other possible social restrictions.

ACKNOWLEDGEMENTS

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