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IGOT Instituto de Geografia e Ordenamento do Território UNIVERSIDADE DE LISBOA

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FORLAND

Comparing Flood Mortality in Portugal and Greece under a gender and age perspective

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Session HS1.9




OBJECTIVES

DATA AND METHODS


RESULTS

CONCLUSIONS

Environmental Hazards and Risk Assessment and Management
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Comparing Flood Mortality in Portugal and Greece under a gender and age perspective


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1. OBJECTIVES

Flood mortality is analyzed and compared between Portugal and Greece for the period 1960-2010 in terms of :


- temporal evolution;
- spatial distribution;
- deadliest flood types;
- age of the victims;
- gender of the victims;
- surrounding environments.

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2. DATA AND METHODS

A common flood fatalities database for the period 1960–2010 was formed by merging the two existing databases of Portugal and Greece previously built from documental sources.

Each entry corresponding to a fatal incident provides a description including:

- the ID number of the flood case;
- the flood type (riverine flood, flash flood, urban flood, or not defined type);
- the date of the fatal incident (day-month-year);
- the location of the flood case (x and y coordinates)
- the number of fatalities;
- the gender of the victim (male, female, or gender not reported);
- the age of the victim (< 15; 15-29; 39-44; 45 – 64; >65 years);
- the surrounding environment where the flood fatal incident occurred (outdoors on foot, outdoors inside a vehicle, or inside a building).



OBJECTIVES

DATA AND METHODS

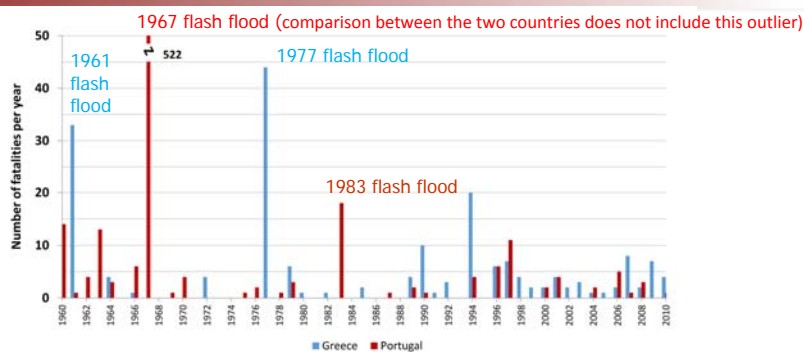
RESULTS

CONCLUSIONS



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3. RESULTS 3.1 Annual distribution of mortality



- The number of fatalities in both countries is not regularly distributed.
- Since the 1980's the number of flood cases with multiple fatalities has been gradually decreasing.



OBJECTIVES

DATA AND METHODS

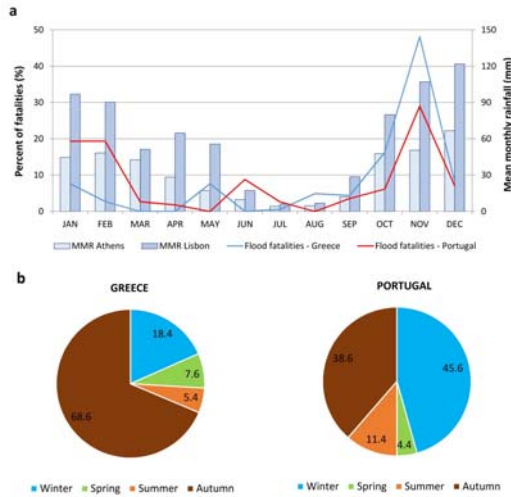
RESULTS

CONCLUSIONS



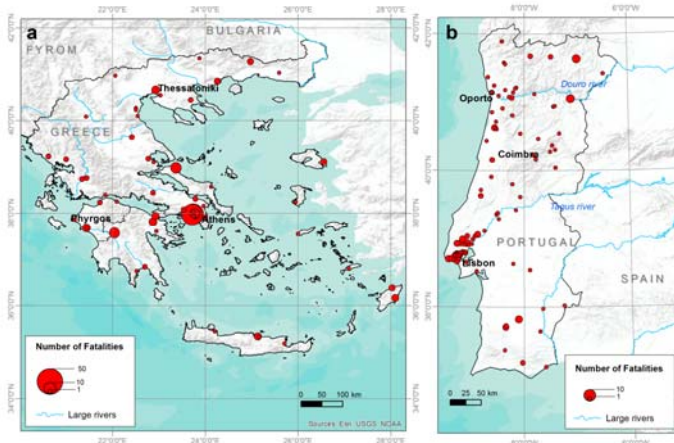
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3. RESULTS 3.2 Seasonal distribution of mortality



- Flood fatalities occurred predominantly during autumn and winter;
- Greece has a peak on flood fatalities in autumn (68.6%), whereas in Portugal the higher percentage was recorded during the winter (45.6%).

3. RESULTS 3.3 Spatial distribution of mortality



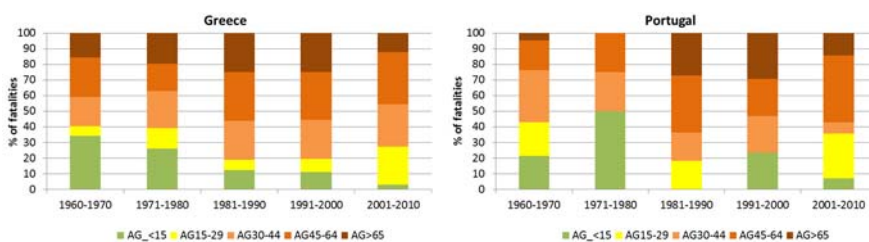
The main metropolitan areas have a clustering of fatalities, attributed to the higher population density combined with the presence of flood-prone areas.

3. RESULTS 3.3 Deadliest flood types



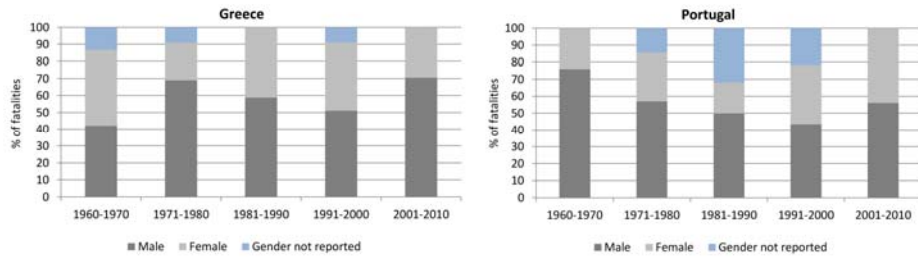
- In Greece **flash floods** have been responsible for 82% of the total mortality while in Portugal, the same value reaches 38.6% (87.9% including the 1967 flash flood).
- In Greece **flash floods** were the deadliest flood type in all decades.
- In Portugal **riverine floods** were the deadliest flood type between 1960-1980, whereas **flash floods** were dominant in the last decades.

3. RESULTS 3.4 Age distribution



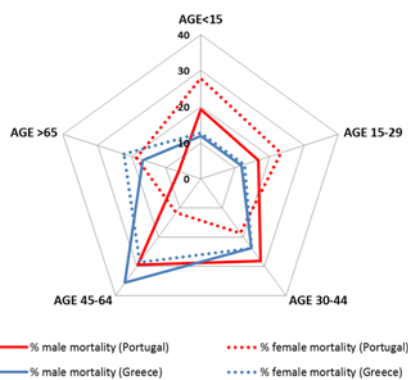
- In Greece **younger than 15** recorded a gradual decrease the last decades.
- Adults (**30-44 and 45-64 years**) registered more than 50% of fatalities in the last 30 years.
- In Portugal in the last 30 years a **reduced number of young fatalities** (<15 years) was registered;
- Adults (**30-44 and 45-64 years**) registered the **highest number of fatalities**.

3. RESULTS 3.5 Gender distribution



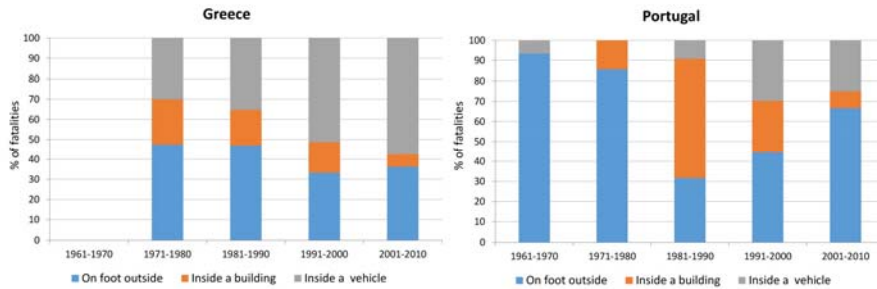
In both countries floods have been caused **more male victims** (male fatalities are more than twice the number of female fatalities).

3. RESULTS 3.5 Gender and age distribution



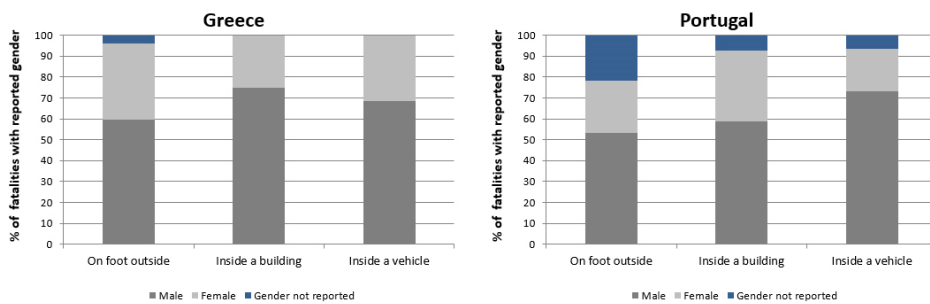
- **Male mortality** is highest in the age class **45-64 years** in both countries.
- In Greece female mortality per ages is very similar to male mortality.
- In Portugal the **young females** (<15 and 15-29 years) have been more affected by flood mortality.

3. RESULTS 3.6 Surrounding environments



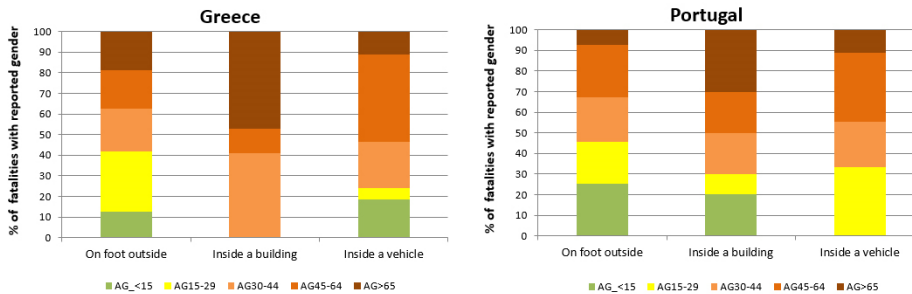
Indoor fatalities have been gradually decrease with time, whereas vehicle-related deaths have been increase in both countries.

3. RESULTS 3.6 Surrounding environments



Male fatalities are predominantly in all surrounding environments, specially inside a building in Greece and inside a vehicle in Portugal.

3. RESULTS 3.6 Surrounding environments



- In Portugal mortality occurring **inside a vehicle affects more younger** (15-29 years) and adults (45-64 years).
- **Elder people** (> 65 years) are more vulnerable to dying **inside buildings** in both countries.

4. CONCLUSIONS

- Both countries showed very **similar age and gender characteristics of flood fatal incidents.**
- In both countries the **majority of flood victims are adult males (45-64 years)**, indicating that males are more vulnerable to fatal floods. These gender differences can be explained by cultural reasons that expose men to hazardous occupations or risk behaviors, or underestimation of risk.

For further information: Pereira S, Diakakis M, Deligiannakis G, Zêzere JL (2017) Comparing flood mortality in Portugal and Greece (Western and Eastern Mediterranean). International Journal of Disaster Risk Reduction. doi: 10.1016/j.ijdrr.2017.03.007