

The impact of earthquake on demographic trends: L'Aquila's case.

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Abstract

The wide literature on the role played by environmental disasters in shaping population movements analyses mostly less-developed countries. Differently this paper investigates the demographic changes resulting from the earthquake occurred in the context of a developed country: particularly the population and migration dynamics in the municipalities affected by the so-called L'Aquila earthquake in 2009.

The first aim of the paper is to study demographic changes, in the populations of the municipalities hit by the L'Aquila earthquake. The second aim is to describe the migration system and to understand how it has been influenced by the pre-existent vulnerabilities. We consider the different contribution of Nationals and non-Nationals to the changes of migratory system.

In the analyses we take into account the main demographic and socio-economic trends in the earthquake's area. Relying on ISTAT data on population and international/internal migration in Italy, we offer a general model of how environmental disaster might affect population and migratory system. Main changes in population growth and migration inflows and outflows are analysed for the period before and after the earthquake.

1 Introduction

Disasters and natural hazards have entailed a wide range of social, economic and demographic consequences.

In the last decade, geographical research into the causation of the disaster-related displacement, began to involve multi-scalar analysis with an emphasis on interaction across multiple spatial-temporal scales. This particular approach called for a rethinking of disasters from a political economic perspective, based on the high correlation between disaster predisposition, low local income and under-development, and leads to the conclusion that the root causes of disasters lay more in society than in nature.

In this theoretical approach the concept of “vulnerability” is crucial because it allows to go in the depth in the understanding of disasters, recognizing that disasters are not caused by a single agent but by the complex interaction of both environmental and social features and forces (Hunter 2005). Indeed, disasters do not affect all individuals, households and communities equally, and environmental hazard is not faced in the same way everywhere and by everyone. The consequences of an event such as the earthquake can have different effects, connected not only to the degree of the intensity of the event itself, but also to the social and environmental characteristics of the population and territory affected (Piguet 2010).

Differently from the wide literature that analyses the role played by environmental disasters in shaping population movements in under-developed countries, this paper analyses the demographic changes and environmentally-induced migration resulting from the earthquake occurred in the context of a developed country: more specifically, the L'Aquila earthquake in the Italian region of Abruzzo, in 2009. This earthquake affected mountain and internal areas, which already presented vulnerable demographic and socio-economic characteristics, such as population ageing and depopulation (Reynaud & Miccoli 2018).

In this work, we aim to study demographic changes, in the populations of the municipalities hit by the L'Aquila earthquake. In particular, we aim to connect these changes with the demographic vulnerabilities already existing in these territories before the earthquake. We then purpose to analyze the demographic evolution before and after the disaster by highlighting possible discontinuities.

Furthermore, we aim to describe the migratory system and to understand how it has been influenced by the pre-existent vulnerabilities and pre-quake social and institutional backgrounds before and after the hazard (Mabogunje 1970, Fussell et al. 2014). We analyze different contribution of Nationals and non-Nationals to the changes of migratory system.

Relying on Italian National Institute of Statistics (Istat) data about population in Italian municipalities, we offer a general model of how environmental disaster might affect demographic dynamics and migration and suggest the main challenges related to the post-disaster governance.

2 Data and methods

The L'Aquila earthquake of April 6 2009 killed 309 people and caused significant material damages to public and private buildings. The municipalities which have been more affected by material injuries were 49 (seismic crater), in the Abruzzo region (NUTS1).

We use Istat data referred to the population of all these municipalities: in particular, data of Population registers for the period 2002-2017. For every year, we consider population at 1st January (1.1.t) and other demographic and age structure indicators, such as the growth rate and the proportion of the population over 65. We calculate additional indicators of the population evolution, as the natural increase and the international and internal net migration by using Istat demographic balance data. We consider data of changes of residence for the period 2002-2017 for both the Nationals and non-Nationals. In our analysis, focused to connect population growth evolution with

territorial characteristics and vulnerabilities, we include data on the socio-economic characteristics of the Municipalities.

A descriptive analysis is conducted to observe and describe the demographic trends in the municipalities which experienced the earthquake. The focus is on the population growth evolution and on migration changes. Demographic and socio-economic variables are considered.

We hypothesize that demographic, social, economic factors are interrelated with change in population distribution before and after the earthquake. Pre-existing in-flow and out-flow towards specific territories can shape migration movements also after the earthquakes (Ambrosetti & Petrillo 2017). Regarding migration, we expect also that internal migration of Nationals and non-Nationals follow different trajectories and evolution, connected also with reconstruction process.

3 Preliminary results

Italy is one of the most earthquake-prone countries in the world. The L'Aquila earthquake destroyed a large part of the built environment, as well as essential infrastructure networks. The earthquake and the relief and recovery operations have changed the territories. In this area, the earthquake exhausted populations which were already experiencing demographic and economic challenges (Pesaresi, 2017).

L'Aquila earthquake has changed the demographic composition and distribution across the territories which were hit by damages and losses, but these changes are complex and multifaceted.

After the earthquake, the municipalities of the seismic crater suffered a demographic shock and their population suddenly decreased for the next two years with a growth rate of -11.2%. In particular, there was a slowdown in the evolution of the non-Nationals population. It seems that the earthquake has therefore influenced the growth of the population. In the following years there was a growth of the population, which can be seen as a recovery: in 1.1.2018 the amount of population corresponded nearly to the levels before the earthquake.

The negative population growth following the earthquake is attributable mostly to the net migration evolution. The migratory system recorded a shock in the year of the earthquake and it has undergone relevant changes in the following period. In addition to the negative peak recorded in the year of the earthquake, in the following years the net migration remained at much lower values than those recorded before the earthquake, due to a high number of out-flows. The recovery period was characterized by a strong increase of out-flows from the analysed municipalities to municipalities of other provinces, within the Abruzzo region and outside the Abruzzo region. In the period after the disaster, a slight increase of in-flows in some municipalities occurred. Part of L'Aquila population was resettled in other crater' municipalities, which indeed recorded a positive net migration (both internal and international) in the period after the earthquake. However, as outlined by Petrei & Petrei (2010), people may have chosen to keep their administrative residence in L'Aquila even if they moved to another municipality, in order to receive benefits connected with the recovery measures prepared by the Italian government. Indeed, aids are allocated to the people on the basis of their administrative residence.

The increase in the in-flows after the earthquake has concerned both Nationals and non-Nationals from southern Italy. This could be linked to the post-earthquake reconstruction that attracted workers and labourers, especially non-Nationals, from other municipalities and regions of Italy.

Demographic and socio-economic characteristics and vulnerabilities have had an important influence in shaping the effect of the earthquake. Demographic, social, economic vulnerabilities of the territories exacerbated the negative effects of a natural shock. This is particularly true for these municipalities, which are located in mountain and internal areas. Most of these municipalities are classified as "mountain municipalities" and register a population size under 2,000 inhabitants. In the years preceding the earthquake many municipalities were already affected by depopulation and strong population ageing processes. The ageing index was equal to 184 and the proportion of over-65 was more than 22%; while the same values for Italian population were respectively 144 and 20%. A strong correlation between high level of population ageing at beginning of period and population growth rate after earthquake is statistically significant.

These results show the important effect of a natural disaster on the population dynamics. The consequences are observable also after various years. In particular, the results demonstrate that the effects of the earthquake in these municipalities are filtered by some relevant characteristics of the territories.

Therefore, this work shed light on the population dynamics of particular vulnerable territories which should be preserved and protected more from negative shocks as those already experienced. Further results will be ready for EPC 2020.

4 References

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