

Chapter 8

Methodology for the Evaluation of Fire Safety in Existing Urban Residential Areas in Spain: The Case of Social Housing in Pamplona (1940–80)

María Fernández-Vigil

Universidad de Navarra, Spain


Carmen Corrales

Universidad de Navarra, Spain

Raquel Garin

Universidad de Navarra, Spain

Juan Bautista Echeverría

 <https://orcid.org/0000-0002-4438-6449>

Universidad de Navarra, Spain

ABSTRACT

Residential buildings are the most common scenario of fatal fires in Spain, and over the past decade, there has been no significant decrease of fatalities in this kind of accident, even a slight increase in recent years. In this context, a systematic methodology to evaluate the risk level of residential buildings, previously grouped into building typologies, is presented. Its application to different housing typologies allows covering large urban ensembles, providing an important information to regulators and fire services. The factors that most increase the level of fire risk are identified, analyzing them both by their construction stage and by their morphology.

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INTRODUCTION

Between 2010 and 2017, there were 1359 fatal victims in fires in Spain (Fundación Mapfre & APTB, 2010, 2011, 2014, 2015, 2016, 2017, 2018), that is, an average of about 170 people per year. During this period, deaths in residential buildings represented 77% of casualties, meaning that houses are the most common scenario for this kind of fatal fires. 60.1% of these victims were more than 65 years old, this value contrasting with the percentage of people over this age in Spain, 18.3% (Instituto Nacional de Estadística, 2011). In other words, the risk of dying in a domestic fire is multiplied by 3.3 for the elderly people.

This is particularly relevant attending to demographic forecast for the coming decades: in 2064 people over 65 will be 38.7% of the entire Spanish population, which means that the elderly will account for more than the third part of the society (Instituto Nacional de Estadística, 2014). By the same date, life expectancy will be 95 years for women and 91 years for men; and the largest population group will be those between 85 and 89 years old (Instituto Nacional de Estadística, 2014).

The situation is therefore critical since, as the number of elderly people increases, it is expected that the number of deaths in residential fires will also increase. In fact, the downward trend that could be appreciated in the reduction of fatalities in domestic fires had a turning point in 2013, and it is still growing (Fundación Mapfre & APTB, 2018).

The main objective of this research is the creation of a systematic and regular methodology to evaluate and quantify the fire safety of a large number of residential buildings, and the identification of the most dangerous elements. Safety in these blocks built in the second half of the 20th century is often critical. For this reason, the conclusions of this assessment should be taken into account when considering the unavoidable urban regeneration that many Spanish cities will undergo. This renovation will be a great opportunity to solve the safety problem.

BACKGROUND

The first challenge when addressing fire safety in residential buildings in Spain is the lack of official data, what makes impossible to know what the risk factors behind fire events are and, therefore, design the more efficient measures to fight against them. At the present time, there is no nation-wide, systematic approach to collecting, analyzing and presenting fire loss data in Spain, in spite of being an essential tool for fighting against those accidents (Fernández-Vigil & Echeverría, 2019). The statistic treatment of the fire departments interventions in Spain is poorly regulated, and it does not have homogeneity. In 1985, the Spanish Royal Decree 1053/1985 about the statistical treatment in the Fire and Rescue Services was published (“Real Decreto 1053/1985, de 25 de Mayo, Sobre Ordenación de La Estadísticas de Las Actuaciones de Los Servicios Contra Incendios y de Salvamento,” 1985). However, since 1994, official statistics have not been published. Every Fire Service has its own system for fire data collection, according to its resources and the regulation established in each community, region or municipality, as appropriate (Fernández-Vigil & Echeverría, 2019).

There are only few documents elaborated by MAPFRE Foundation in collaboration with APTB (Professional Association of Firefighters, *Asociación Profesional de Técnicos de Bomberos* in Spanish) collecting data on fatal victims since 2010 (Fundación Mapfre & APTB, 2010, 2011, 2014, 2015, 2016, 2017, 2018). Despite the utility of these documents, the information they present is limited and only

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