Research note

# Temporary population estimates of mass tourism destinations: The case of Benidorm

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## HIGHLIGHTS

- Population is a key figure for the correct sizing of the urban public services.
- A methodology for estimating total population in tourist areas is established.
- Average total population of Benidorm at least doubles the population registered.

## ARTICLE INFO

## ABSTRACT

Benidorm (Spain) is a large-scale tourism destination on the Mediterranean coast, and its temporary population can be divided into users of regulated tourist accommodation and unregistered visitors, as occurs in other destinations. The number of these different types of unregistered temporary inhabitants should be estimated separately to gauge more accurate population figures in tourist destinations which are subject to seasonality. Indicators such as drinking water consumption or solid waste generation are used to estimate the number of unregistered visitors. The results reveal that the average total population of Benidorm at least doubles the registered resident population. Additionally, a population density index has been calculated to assess urban sustainability. The methodology adopted can be applied to other case studies in order to estimate total populations, which is vital for the adequate provision of public services.

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## 1. Introduction

Cohabitation of space by visitors, tourists and residents in Spanish tourist areas poses a number of important administrative difficulties because there is a lack of specific data on the constantly changing population. Research in this field has been confounded by the lack of resilient definitions that include all possible population types and, thereby would result in a more accurate method to estimate population. Indeed, the massive influx of foreign tourists and residents, seasonally or temporarily, underlines the need for a scientific analysis of this phenomenon (Rodríguez, 2001). The tourist population generates high fluctuations in the total number of inhabitants of a territory (Sánchez & Mendizábal, 1997), and the seasonal population often exceeds the resident population. This fluctuation inevitably influences the need for an appropriate sizing of the urban space and the adequate provision of different public services. Tourist areas must service a transient visitor population that, in the peak season, significantly outnumbers the permanent residents, creating a surge in demand for public services (Voltes-Dorta, Jiménez, & Suárez-Alemán, 2014).

The methods for estimating the total population and possible fluctuations and applying them to a specific case are highly interesting for territories with significant flows of temporary visitors (Navarro, 1998). Quantifying the total population is essential for the correct sizing of the urban public services (Salinas, Zúñiga, Arranz, & Pueyo, 2012) which are provided by the government on a local, provincial or regional level. This is even more important in tourist areas which have to absorb the so-called tourist load.

Benidorm has been selected for this study because it is highly

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representative of the problems inherent in tourist population flows. In fact, it is a highly relevant tourist destination (Gaviria, Iribas, Sabbah, & Sanz, 1977; Gaviria, 2009; Ivars et al., 2013), holding the fourth position in Spain's tourism index in 2013 (Anuario Económico de La Caixa, 2016) and ranked fourth in terms of the number of overnight stays in hotels in 2015 with a total of 11,064,332 (INE, 2016)—after the cities of Barcelona or Madrid and the tourist resort of San Bartolomé de Tirajana in the Canary Islands. The competitive advantage of this destination is due to its unique urban tourist model, which is based on hotels and economies of scale that create a critical mass of accommodation and recreational facilities (Ivars et al., 2013). Benidorm's competitive success is explained by a consolidated and loyal demand for the destination together with exceptional basic factors (sun and sand) and a firm sector formed by mostly proprietors of their own establishments, with strong local connections (Perles-Ribes, Rodríguez-Sánchez, & Ramón-Rodríguez, 2015).

This study establishes a methodology for calculating the temporary population in tourist areas. The results present the monthly population totals for one year, making it possible to identify seasonal fluctuations in Benidorm's population. First, the conceptual framework will guide the theoretical base for developing the use of indicators to estimate population and the data sources will be indicated. Next, the mathematical treatment of the information required to obtain an estimate of the population will be explained. Finally, a reflection will be made on the sustainability of its population density as well as on the planning and management of infrastructures and services which must adapt to the total population so as to achieve a sustainable use of resources.

## 2. Conceptual framework

Temporary population estimates constitute a useful tool for determining the real population load of a town. The total population can be calculated by adding this estimate to the permanent population which is drawn from the municipal register of inhabitants published by the INE (Spain's National Institute of Statistics). This concept has been given different names by different authors (Gaviria, 2009; Módenes, 2006; Navarro, 1998; Sánchez & Mendizábal, 1997), including seasonal, floating or temporary population and is used for sizing the different urban public services (Módenes, 2006). In the specific case of tourist areas, the tourism load concept is introduced, which is associated to the variable volume of tourists absorbed by a certain territory. The sources used by the public authorities for quantifying the number of tourists are mainly direct sources, such as the different tourist entry records (entries through borders, overnight stays in establishments, etc.) and surveys (Navarro, 1998).

Due to the wide range of terms used to refer to the estimate of the population variable of interest, throughout this study the term "temporary population" will be used, which is understood as being those inhabitants who, while not being registered as residents of a place, are absorbed by that place (López & Módenes, 2004). Temporary population movements encompass a wide variety of purposes ranging from holiday travel to seasonal migration, in their own properties or in tourist establishments (hotels, campsites, apartments, etc.); from short business or study trips to long distance commuting; and from hospital stays to conference travel. The one feature they share in common is the absence of any stated intention to make a permanent or lasting change of usual residence (Bell & Brown, 2006; Bell & Ward, 2010). However, the calculation does not usually consider movements for work or study that do not include an overnight stay (for example, leisure or shopping).

The quantification of the temporary population usually takes a synthetic statistical approach which collects information from different sources such as municipal registers, population censuses, tourism statistics, employment statistics, education statistics or the statistics on living conditions and the habits of the population. These sources provide a diverse territorial and temporal level of disaggregation but, in general, do not provide annual results on a municipal level. Therefore, mathematical models and estimation methods must be applied.

Carrying out surveys (or counts and censuses) is a reliable direct approach (Charles-Edwards, 2016), but one which involves a high economic cost if it is to be performed frequently with a significant sample space. The maximum unit of time commonly admitted for quantifying the temporary population is one month, so longer lengths of time can cloud a satisfactory perception of the fluctuation of the total population. For the aforementioned reasons, and due to the absence of official records at municipal level of population presence, particularly tourism derived from stays in non-regulated tourism establishments, researchers use indirect sources or indicators (Charles-Edwards, 2016) such as: the consumption of goods or recourses or the generation of solid and/or liquid urban waste. In the 1960s, the consumption of flour (bread) or meat was proposed (Barbaza, 1966) and, years later, the analysis of aerial photographs was used to analyse the occupation of territory by vehicles, caravans, etc. (Richez, 1981). Another indirect approach involves estimating periodic variation in population from symptomatic indicators such as electricity and water usage (Smith, 1989).

In recent years, further lines of calculation have been introduced based on housing occupation, leisure trips, mobile phone dataset and their combination. Accordingly, some studies are based on the occupation estimates of the different types of housing and provide a sociological approach which focuses on population movements in the territory (Módenes, 2006). Other studies use mobile phone positioning datasets, but all of these data sources have advantages and disadvantages in different research fields and applications (Ahas, Anto, Mark, Pae, & Kull, 2007; Silm & Ahas, 2010). Leisure trips have an important economic impact on the Spanish economy. Therefore, a whole range of studies have been carried out on the mobility generated by tourism and reliable data are available at a regional and national level but not at municipal level. However, the unique characteristics of each local dimension give rise to the need for more in-depth study even though the findings of each case will not enable automatic extrapolation of its conclusions to other towns.

By combining data on census, habitual mobility, secondary residence, tourism accommodation and all types of estimates related to the leisure and cultural activities offered, Sánchez and Mendizábal (1997) systematised a methodology for calculating the total population.

More detailed calculations have also been carried out based on indirect data, such as those drawn from urban services. In 1987–1988 the Escuela Universitaria Politécnica de Gerona conducted a study on the consumption of drinking water, the generation of urban waste waters, the generation of solid urban waste and a fourth indicator, the monthly average telephone expenditure on calls made from landlines, establishing a correlation between the population and their consumption of different products and services. From that time, new research has continued using people's consumption but limited to the regional scale. From these studies, it can be observed that the temporary population varies both spatially and over time, being higher in the coastal areas and during holiday periods and in some places widely exceeding the registered population. Only general points are examined with respect to the spatial variation, the effects of which are not studied on an infra-municipal level.