

From news deserts to news resilience: Analysis of media in depopulated areas

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Abstract

This article delves into the established concept of news deserts within the broader field of Communication Geography, aiming to propose a comprehensive methodological framework for exploring the absence of local media. This approach considers crucial variables including geography, demography, public services, and infrastructure, all contributing to the configuration of the media landscape. By focusing on the depopulated region of Castile-La Mancha in Spain, we examine the relationship between the presence (or lack) of media outlets and factors such as population density, average per capita income, business activity, public service availability, accessibility, and other pertinent elements. Our analysis reveals that the media structure mirrors demographic and concentration patterns, primarily favoring central areas while leaving peripheral areas virtually isolated. This is despite the fact that the majority of the region has public services such as libraries, health centers, and telecommunications infrastructure. Income and business activity do not seem to correlate with a greater media presence. These findings underscore the necessity for sub-national studies with a specific focus on rural environments, accounting for territorial diversity, in order to better understand what occurs happens in areas considered to be news deserts.

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Keywords

news deserts, local media, depopulated areas, communication geography

Introduction

It is some years now since Geography and Communication ceased to progress in parallel, having met at a crossroads in what is known as the spatial turn of communication (Jansson and Falkheimer, 2006). Communication Geography (Adams and Jansson, 2012), rooted in Lefebvre's traditional conceptualization (2013/1974), argues that communication always occurs in space, and at the same time is involved in the construction and definition of spaces and places through representation. The convergence of geographical, socio-demographic, and communicative elements, as well as the intricate relationship among infrastructures, representations, and practices, can be observed across several lines of research, including Geomedia Studies (Fast et al., 2018), geographies of the news (Chang, 1998; Gasher, 2015), and the mediation of places (Gutsche and Hess, 2018).

This focus is likewise becoming more relevant in the study of media systems and journalistic practices (Usher, 2021). The fact is that geographical factors, such as the size of a region, not only impact the distribution metrics of a media outlet but may also influence content priorities, working methods and the relationship with readers (Høst, 2016). Furthermore, the distance from a major city or peripheral location may dictate the coverage of a local media outlet or even its very existence, since its communities may be geographically and socially closer to a bordering region, even if politically dependent on another (Freeman, 2020).

In this context, one of the trends which has become established is the development of national-level media mappings to detect the emergence of informational gaps under the concept of 'news deserts' (Abernathy, 2018), which arose as a result of the crisis of print journalism and the closure of local newspapers in the U.S. This paper aims to elaborate on this theoretical and methodological framework, a more intricate approach to studying the presence or absence of media, transcending the mere geolocation of media markets. The case study for this purpose is Castile-La Mancha, a Spanish region primarily rural, marked by widespread population decline and vast depopulated areas (Pillet Capdepón et al., 2018). This historical backdrop has shaped a fragile local media system, further aggravated by the early effects of the local press crisis (Galletero-Campos, 2019). The primary objective is to propose an exploratory methodological strategy within the context of Communication Geography, where geographical and socio-demographic factors are treated not merely as auxiliary or contextual elements, but as inherent elements of media systems.

The article unfolds as follows: first a theoretical review of the notion of news deserts is developed. There then follows the presentation of the media census generated (DESCOM), together with the open datasets used in the study, covering geographical, demographic, economic and public service dimensions, and the analysis techniques applied. The findings superimpose these data onto the media structure. Finally, the discussion

underscores the necessity for a multidimensional approach to comprehend media systems, capable of explaining them in terms of the characteristics of each territory.

News deserts, more than just empty spaces

Traditionally, the academic focus in the field of communication has leaned heavily towards the urban perspective, highlighting the city as a mediatised centre (Jansson, 2013). In contrast, the development of a critical theory of rural communication is still in its early stages (Ali, 2018). This predominant approach is informed by the inequality generated by rural/urban access, raising epistemological challenges such as how to explore what happens in environments distant from the main media hubs. On the rural environment, we must also acknowledge the potential biases stemming from academia, as there is a risk of theorizing about problems in places from an external, primarily urban standpoint (Hobbis et al., 2023).

In our case, our interest is in depopulated regions because they possess unique socio-cultural, political, and economic characteristics that can significantly influence the media landscape and the interactions between communities and the media (Picard and Russi, 2012). This concern is also shared by political institutions, which are crafting multi-level strategies to address demographic change, ‘a genuine issue in Europe and across the globe and a key challenge, not just in general, but also for local development and territorial enhancement policies in the EU’ (European Parliament, 2017). They emphasize the importance of setting up ‘instruments to reduce subregional disparities and help bring about a better territorial balance in terms of urban, peri-urban and rural areas’. Achieving these objectives, prioritized in the 2030 Agenda and the EU’s long-term vision for rural areas (2021-2040), places a crucial role on local media, as they can act as strategic players, ensuring access to quality information and catalyzing political, social, and cultural life of communities.

Our analysis prioritise the study of those variables identified as relevant in the characterisation of depopulated territories and for the definition of public policies in relation to this demographic challenge, such as density, ratio of male population, percentage of population aged over 65 and percentage of locally-born population, as can be seen on the SIDAMUN portal (Integrated Municipal Data System) of the Ministry of Demographic Challenge. The accessibility variable, which is common in depopulation studies, has also been incorporated (Ruiz-Pulpón and Martínez Sánchez-Mateos, 2022).

Previous studies have revealed that it is in sparsely populated areas with limited economic activity that the decline of legacy media has been most pronounced (Abernathy, 2018). In Spanish specific case, a link has been established between depopulation and the absence of local digital media (Negreira-Rey et al., 2023). The absence of local media and lack of coverage of certain territories has driven a range of research, drawing attention to the consequences of these information gaps for local communities. Various terms have been used to describe these phenomena: media shadows (Nord and Nygren, 2002), blind spots (Høst, 2016), or news black holes (Howells, 2015). Nevertheless, the most impactful conceptual metaphor hails from North America: the news desert, described as ‘a

community, either rural or urban, where residents have very limited access to the sort of credible and comprehensive news and information that feed democracy at the grassroots level' (Abernathy, 2018: 18).

In recent years, this framework has been applied to various regions around the world, unveiling media systems with diverse idiosyncrasies in countries such as the United Kingdom (Gulyas, 2022), Australia (Barnes et al., 2022), Sweden (Nygren et al., 2018), Portugal (Jerónimo et al., 2022), Argentina (FOPEA, 2021), Colombia (FLIP, 2016), and Brazil (Atlas da Notícia, 2022). There is also a project underway to cover the entire European continent (Blagojev et al., 2023). In general terms, these studies adopt a structural focus and employ more or less systematic mapping processes, varying in their level of updates, while observing census variations such as the emergence and disappearance of media outlets. This is done through official registers, collaborative approaches, or supplemented by qualitative methods.

Despite the narrative potential of the concept, it is important not to apply it uncritically. Firstly, it must be noted that while the national focus of news deserts reports provides a panoramic view that positions major information gaps, it often fails to capture the heterogeneity present at a smaller scale (Usher, 2023). Countries are not uniform across their regions; they comprise areas with diverse demographics, geography, and socio-economic factors that get blurred by overarching figures. Secondly, analyses must encompass a historical perspective, not solely attributing the problem to the legacy media crisis as its origin. Focusing on the loss of media outlets suggests recent structural changes, whereas, in some cases such as the one analyzed in this article, these gaps already existed, and the media ecology was historically fragile. Lastly, some studies indicate that even in the absence of professional media outlets, communities may still receive essential information through what Hepp (2020) defines as 'media ensembles', such as social media. This means that the residents of these communities might not perceive themselves as living in news deserts (Collier and Graham, 2022). Additionally, Gulyas and Baines (2020: 15) argue that the mere existence of a media outlet does not guarantee the distribution of relevant local content. Instead, they prefer the term 'local media gaps' to encompass the broader notion of lacking access to information content deeply tied to the local territory and the commitment to its inhabitants. In such communities, a media outlet serves as more than a platform for service information and current affairs; it can also function as a site for public recognition and a showcase for the community's identity (Galletero-Campos et al., 2024), both internally and to the outside world (Harte et al., 2017).

As an alternative to news deserts, Usher proposes a shift in focus and advocates for the concept of news resilience to reframe the deficit in terms of possibility or opportunity, rather than delving solely into the negative aspects of territories with lower population density. News resilience takes into account indicators linked to communication practices which, together with data concerning media structure, could better describe specific contexts: 'Some examples might include the presence or absence of libraries, community colleges, local political parties, community-based organizations, and access to information about public services' (Usher, 2023: 247).

The case of castile-la mancha: low population density, low information density

Spain stands as one of the EU nations where the issue of depopulation has risen to significant public awareness and has secured a prominent position on the political agenda (Pazos-Vidal, 2022). Notably, combating the phenomenon of shrinking territories is a core focus of the 'Recovery Plan. 130 measures to address the Demographic Challenge,' introduced by the Spanish government in 2021. The country is organized into 17 autonomous regions and two autonomous cities, each further subdivided into smaller administrative units (provinces), encompassing a total of 8131 municipalities. 86.93% of these municipalities have populations of fewer than 5000 residents, and eight out of ten have witnessed population decline over the past decade (Government of Spain, 2021).

Castile-La Mancha, the third-largest autonomous region in Spain in terms of land area (79,436 km²), ranks ninth in population size. It is divided into five provinces: Albacete, Ciudad Real, Cuenca, Guadalajara, and Toledo, collectively hosting 919 municipalities, which constitute 11.3% of the country's total. The demographic makeup of this region was profoundly shaped by mid-20th-century migration patterns. Initially, there was the phenomenon of rural exodus (Collantes and Pinilla, 2011), a movement within Spain toward major cities and their peripheries, resulting in over a million people leaving the region between 1941 and 1980 (Artola, 1993). Additionally, there has been a redistribution of the rural population to urban settings, primarily concentrated in the provincial capitals. At the beginning of this period, provincial capitals accounted for only 9.3% of the population, but this figure has now escalated to 23% (data from the Spanish National Statistics Institute - INE). This depopulation trend has been persistent, linked to a model of territorial cohesion focused on modernizing the country to integrate with Europe, with less emphasis on regional harmonization (Pazos-Vidal, 2022).

Alongside the concentration in provincial capitals, one notable trait of this predominantly rural region is the widespread dispersion of its population, with a staggering 69.7% of its municipalities harboring fewer than 1000 inhabitants. Nevertheless, this situation is not evenly distributed across all provinces. Cuenca and Guadalajara boast the highest number of municipalities (206 and 255, in contrast to 43 in Albacete, 47 in Ciudad Real, and 90 in Toledo). However, these provinces are smaller in size, with 86.5% and 88.5% of their municipalities housing less than 1000 residents, respectively (INE). Across the region, the population percentage living in this type of municipality (<1000) accounts for 7.7%, while in Cuenca and Guadalajara these figures rise to 23.7% and 10.3%, respectively. Consequently, a significant portion of the regional territory faces an extremely low population density, as evidenced by 58% of municipalities in the region harboring fewer than 8 inhabitants per km². In terms of economic indicators, it ranks 13th out of the 17 autonomous regions for average per capita income, which is 84.8% of the national average (INE).

In order to address the complex issues of the demographic challenge, a series of public policies have been enacted since 2016, with the most notable and recent being Act 2/2021, dated 7 May 2021, encompassing Economic, Social, and Taxation Measures to Tackle Depopulation and Foster Rural Development in Castile-La Mancha, in tandem with the

2021-2031 Strategy. However, local media were conspicuously absent from the list of stakeholders engaged in the discussions surrounding this action plan, and the sector has been relegated to a limited role within the strategy—primarily instrumental—aligning it with the objective of ‘raising awareness of positive aspects intrinsic to rural life’.

One of the noteworthy advancements introduced by this regional legislation is a territorial zoning model, distinct from the administrative and political units represented by provinces and municipalities, based on principles of contiguity and homogeneity (Article 9.2 of Act 2/2021). This zoning framework will serve as the foundation for shaping public policies and delivering services by governmental authorities. The primary aim is to capture the diversity present in these zones, which is not adequately represented by provincial demarcations alone as within a single province, distinct areas might exhibit divergent demographic and socio-economic characteristics. A prime illustration can be found in the province of Guadalajara, where there is a substantial contrast between municipalities neighboring the Autonomous Region of Madrid, boasting large population centers and a significant industrial sector, and areas like the Sierra Norte mountains or the district of Molina de Aragón, grappling with severe demographic decline.

The zoning system outlined in Decree 108/2021 takes into account various criteria encompassing demographics, economic activities, land usage, and proximity to urban environments. Consequently, the region’s municipalities are grouped into 52 zones classified as urban, peri-urban, intermediate rural (agricultural or diversified), zones at risk of depopulation, or those with a small population. The latter category is further divided into two: intense depopulation zones (comprising municipalities with a density exceeding 8 inhabitants per km²) and extreme depopulation zones (consisting of municipalities with a population density below 8 inhabitants per km²). Under this classification, 721 out of the 919 municipalities fall within zones that manifest varying degrees of depopulation or are otherwise at risk, collectively housing 22% of the region’s population (438,024 individuals).

Media context

These demographic particularities have left a profound imprint on the media landscape, shaping its evolution throughout the 20th Century. Various factors, including political constraints and geographical challenges, significantly influenced the development of local and regional press. The dictatorship that persisted in Spain from 1939 to 1975 imposed restrictions on press and media market freedom, inhibiting growth and openness nationwide, including in Castile-La Mancha (Sevillano Calero, 1997). On the other hand, the region’s mountainous terrain posed delivery obstacles, particularly in sparsely populated areas, leading to a concentration of publications in larger towns where achieving higher sales volumes was more feasible. As historians have noted, the dispersion of the population in the region has historically limited its journalistic market potential (Sánchez, 1986: 47).

Other characteristic features included the absence of a regional newspaper covering information in all five provinces, and a press crisis with the closure of most provincial titles, which emerged earlier than elsewhere in Spain (Galletero-Campos, 2019).

Historically, Castile-La Mancha has displayed notably lower levels of press circulation compared to the rest of Spain. In 2001, prior to the decline in newspaper sales, only 43 copies were sold per 1000 inhabitants, the lowest figure nationwide, lagging far behind the Spanish average of 102 copies (AMI, 2017).

Although the digital environment makes it easier to launch media outlets at a lower cost, the region is also at the bottom of the Spanish rankings in number of cybermedia (Salaverría et al., 2019). In addition, a significant portion of journalists in Castile-La Mancha work for media outlets with fewer than five employees, and over half work in establishments with fewer than ten (Galletero-Campos et al., 2019). These figures underscore the predominance of a micromedia model, highlighting the region's distinctive media landscape.

Aside from private media, some publicly-owned media outlets are in operation, the most important is the one run by the regional government, the public broadcaster Castilla-La Mancha Media. Besides this, most public media outlets correspond to the broadcasting sector. However, municipal radio stations prove highly vulnerable (of the 108 broadcast licences granted, only 37% are operational), limiting the opportunities they offer to develop grassroots journalism (Peralta-García et al., 2022).

Materials and methods

This is an exploratory study based on an initial enquiry into whether geographic and demographic variables can condition the local media network.

Data

We first of all created a database (DESCOM 2023) geo-locating the headquarters of media outlets operating in Castile-La Mancha. This was built up by aggregating various sources, along with a mapping process by the authors themselves to confirm and update the available data. The following data sources were used: censuses performed by the Communication Observatory-UCLM MEDIACOM (Laguna et al., 2016) in 2015 and 2018, the Iberian Digital Media Map of the Digital Media Observatory of Spain and Portugal (IBERIFIER), data from the Regional Government of Castile-La Mancha through the Audiovisual Agenda, the digital media audited by OJD Interactiva and the Communication Agenda of the Press Association of Guadalajara. DESCOM 2023 records the following data: name of the media outlet; platform (radio, TV, digital, print or print/digital); municipal headquarters of the publication; local or district scope of coverage; ownership (public or private); and whether or not the media outlet was included in the 2015 census. The database excluded: those that are not updated at least once per month; those containing no type of local information and those for purely advertising purposes.

The second dataset is drawn from the open data portals of the Regional Government of Castile-La Mancha and the Ministry for Ecological Transition and Demographic Challenge. Aside from the cartography obtained by means of demographic display systems, work was also performed with the archive “Municipal Data for the diagnosis of the rural environment within the context of the LEADER 2023-2027 intervention”.

Following an exploration of the data available at a local level (919 municipalities), the following variables were extracted for study: surface area, population in 2021 (segmented by age, sex, origin), average income per inhabitant (2019), municipal budgets (revenue, expenditure and debt for the financial year 2019), presence of companies overall and in the information and communications sector and the media sector (2021), educational, health and cultural services (2019), digital inclusion points (2021) and libraries (2022), hotel beds and catering establishments, registered sporting entities and associations. The accessibility variable was generated measuring the time required to travel from a locality to the closest municipality with a population of over 30,000 inhabitants. Work was performed on the basis of the accessibility map for Castile-La Mancha ([Ruiz-Pulpón and Martínez Sánchez-Mateos, 2022](#)), which registers six time bands (from 0 min to more than 75 min), supplementing the data with information obtained via the Google Maps tool.

All data at a municipal level were aggregated to adopt the zoning established in Decree 108/2021 as the spatial analysis unit, and the final database therefore comprises information for the 52 zones. The cartography of these zones corresponds to the resource “[Characterisation of the rural environment in Castile-La Mancha \(demographic challenge\)](#)”. Work was performed with aggregate variables calculated to combine the presence of services per 1,000 inhabitants:

- sociocultural indicator (digital inclusion points, libraries, youth information centres and performing arts venues);
- participation indicator (number of associations, sporting organisations);
- public services indicator (educational institutions and healthcare services);
- tourism indicator (hotel beds and catering establishments).

The media presence per zone per 1,000 inhabitants operated as a dependent variable in the study.

Methods

A descriptive statistical analysis was conducted to identify the presence and types of media by zone using the [DESCOM interactive map](#) designed on the ARC-GIS platform as a data display tool. This map presented the geographical distribution of media outlets and allowed for the consultation of census data. The second phase involved analyzing the relationships between the independent variables and the registered media outlets in the census, utilizing the software ArcGIS Pro 3.1.2 and SPSS 9.9.0.0. Initial data exploration began with the design of bivariate maps in ArcGIS to display geographical patterns, identify differences and similarities between zones, and detect potential deviation patterns. Meanwhile, the Pearson coefficient was calculated to evaluate the existence of correlations between the dependent variable and other variables.

Subsequently, an ANOVA test was performed, categorizing the zones into three groups: urban/peri-urban (13 zones), intermediate (13 zones), and depopulated (26 zones). Post hoc range tests were conducted, involving multiple two-by-two

comparisons to pinpoint the differences, utilizing the Bonferroni test based on Student's t-statistic (with significance set at 0.05). This test was particularly effective when dealing with reduced comparison pairs (Kutner, 2005: 757-758).

Lastly, linear regression models were explored to deepen and broaden the insights derived from the previous tests. The available data did not satisfy the homoscedasticity hypothesis, as the variances were heterogeneous. Therefore, a Weighted Least Squares (WLS) approach was chosen to rectify the issue of heteroscedasticity, assigning more weight to observations with lower variance (Kutner, 2005: 424-426). Similarly, the model design aimed to mitigate high degrees of collinearity by considering the Variance Inflation Factor statistic, as many variables exhibited correlations with one another.

Results

Structure

In March 2023, 211 active media outlets were found in Castile-La Mancha, concentrated primarily in Ciudad Real (35%), Toledo (25%), and Albacete (16%), compared with the two provinces most affected by depopulation: Cuenca (12%) and Guadalajara (12%). According to Negreira-Rey et al. (2023), 77.53% of Spanish municipalities have no digital media outlet, and 90.86% in Castile-La Mancha, a very similar figure to that generated by our DESCOM database: 92.17% calculated for any type of media. For the remainder, 4.13% are home to one single media outlet, and 3.7% to more than one. It is nonetheless important to lend nuance to these figures in order to appraise what could be properly identified as a news desert. When correlating media distribution with depopulation zones, we observe that 60% of media outlets operate in urban or peri-urban areas, 32% in intermediate zones, and a mere 8% ($n = 16$) in depopulated zones characterized as at risk or with intense depopulation, where 438,024 people reside. Figure 1 illustrates the link between media concentration and urban hubs, highlighting the scarcity of media outlets in more sparsely populated regions.

Likewise, the map aligns with the population density-based view (Figure 2), illustrating how media mirror the region's polycentric demographic pattern, approximating its 10 Functional Urban Areas (Pillet Capdepón et al., 2018). Media primarily cluster within the central zone, encompassing parts of Ciudad Real, Toledo, and Albacete provinces (an area which covers the provinces of Ciudad Real, Toledo and Albacete), characterised by larger towns, with geographical proximity and strong agricultural economies, leaving the peripheral areas prone to desertification in both population and media terms. An exception lies in boundary zones with the Madrid Region, both in Guadalajara and Toledo, where there is a population concentration as a result of occupational mobility towards the Spanish capital. The grouping of media outlets in these areas, numbering more than 20, suggests that there is an interest in local current affairs about people's home towns.

Zoning analysis unveils distinct media structure patterns. In sparser regions, radio broadcasters predominate, making up 75% ($n = 12$) of the 16 recorded outlets. Funding models also contrast (75% publicly/community-owned vs. 25% commercial), possibly due to challenges in sustaining local media through advertising. In contrast, intermediate

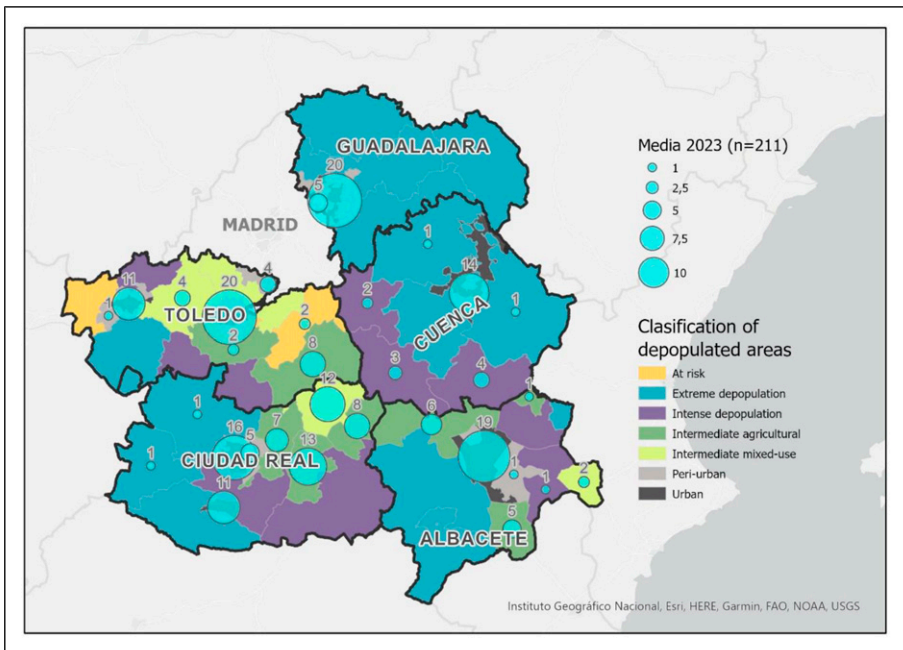


Figure 1. Depopulation areas and active media in 2023. Source: produced by the authors.

zones display concentrations in radio and digital media (44%, $n = 30$ and 36%, $n = 25$, respectively), primarily owned by private entities ($n = 63.5\%$). Urban and peri-urban areas collectively account for 60% of all outlets.

Comparing 2015 to 2023, a clear correspondence underscores the pre-existence of what could be considered news deserts and concentration trends in the central. Of the 241 registered outlets in 2015, 74 ceased, while 44 new ventures emerged. Although a relative loss of regional media (30 outlets) is evident, the distribution remains consistent. Nearly half closures (48.64%) occurred in urban/peri-urban zones, and 14.8% ($n = 11$) in depopulated zones. Urban/peri-urban zones display balance between closures and openings, since enterprises tend to be created in territories where there are already other media operating, with greater population density and more economic activity (Negreira-Rey et al., 2023). In contrast, only 4 new media outlets (radio broadcasters) were detected in depopulated zones.

Characterisation of zones and factors impacting on the (non-)existence of media

The ratio of media outlets per 1000 inhabitants is 0.14 in urban zones, 0.09 in intermediate zones, dropping to 0.02 in depopulated zones, the category revealing the lowest standard

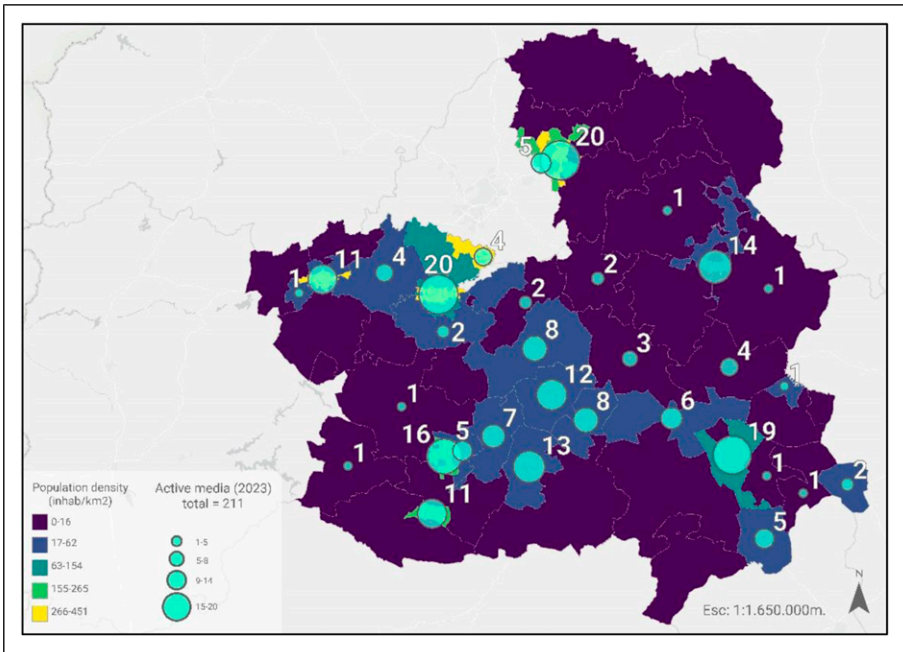


Figure 2. Population density and active media in 2023. Source: produced by the authors.

deviation (0.41 compared with 0.88 for urban and 0.63 for intermediate zones). The ANOVA test demonstrates that the three groups of zones (depopulated, intermediate and urban) are distinguished from one another in terms of the media presence variable. The media presence difference is not statistically significant between urban and intermediate zones, but it is between these groups and the depopulated zones [Table 1](#).

Using the Pearson correlation coefficient, we observe the relationship between the media structure and those variables defined for the study which are related to the indicators taken as the reference in demographic challenge policies affecting the population.

Various weighted least squares (WLS) regression models were likewise tested to explain the media presence in a zone. The selected test presents an R ($R = 0.827$), and R-squared of ($R = 0.684$), with a standard estimation error of 1.225 and a score of 1.67 on the Durbin-Watson test, indicating a moderate degree of co-linearity.

In this case study, the Pearson correlation reinforces the significant relationship with population density ($r = 0.490$), which aligns with our earlier findings of more media outlets in denser areas. This significant relationship nonetheless occurs inversely with regard to the male population ratio ($r = -0.719$) and also the aged population percentage ($r = -0.442$) and is likewise consistent with the regression model data ([Table 3](#)), confirming that media outlets tend to be in areas with a lower male population and younger population. Meanwhile, no statistically-significant correlation is seen in the percentages of locally born and foreign population, since no common patterns may be seen in these

Table 1. Differences between the groups of depopulated, intermediate and urban areas.

Dependent variable	Zone 1	Zone 2	Difference in means (I-J)	Standard error	Sig
Media outlets per 1000 inhabitants	Urban-peri-urban	Intermediate	0.0440	0.0241	0.222
	Depopulated	Urban-peri-urban	-.11440*	0.0208	<.001
	Depopulated	Intermediate	-.07038*	0.0208	0.004

variables for the region as a whole: for example, zones categorised as ‘extreme and intense depopulation’ group together the highest percentages of foreign population in some provinces (Guadalajara-2 16.73% and Cuenca-5 16.73%), and the lowest in others (Albacete-6 3.24% and Ciudad Real-8 2.27%).

In economic terms, in a region with below-national-average wealth, depopulated zones are those presenting lower income and the bivariate correlation suggests a directly proportional relationship between average income and media outlets per inhabitant ($r = 0.575$). However, this was not confirmed in the regression models, a finding consistent with another study by which did find a correlation between media outlets and income for Spain as a whole by means of Pearson, although this revealed low values (Negreira-Rey et al., 2023). A noteworthy negative correlation appears between media outlets and telecommunications infrastructure ($r = -0.409^{**}$), as areas with fewer media outlets tend to have more telecommunications masts for rural connectivity. This indicates higher public infrastructure investment relative to address the needs of a dispersed population.

Regarding economic variables, we find that municipal expenditure per inhabitant is not statistically significant either in the bivariate correlations, or in the regression analyses (Tables 2 and 3). Nor does the presence of a business sector have a significant impact on media structure, in general terms, although it does have a direct relationship with the presence of companies in the Communication and Telecommunication sector ($r = 0.694$). The zonal distribution does not correspond to a uniform pattern, since some depopulated zones with moderate and high business activity scarcely have any media outlets. Nor does the tourism and leisure activity indicator prove conclusive.

When evaluating public service indicators, it is noteworthy that the Regional Government of Castile-La Mancha, in line with European strategies, has made efforts to ensure essential rural services (Aparicio Guerrero, Serrano Gil and Espejo Marín, 2022). While the urban-rural composition influences the distribution of public amenities (healthcare, education, libraries, etc.), our analysis reveals that more depopulated zones are not completely neglected. Statistically significant negative correlations emerge regarding sociocultural indicators ($r = -0.451^{**}$) and education/healthcare ($r = -0.441^{**}$), yet these correlations are not confirmed in the models, necessitating comprehensive studies to explore this dimension further.

The participation indicators lacks statistical significance in bivariate correlation but serves as an explanatory factor in weighted regression model, revealing a correlation between a higher presence of sports entities and associations and greater media presence. However, as

Table 2. Correlations between the media structure and the rest of variables.

Media outlets per 1000 inhabitants	Pearson correlation	Sig. (Bilateral)
Demographic challenge indicators		
Population density	.490**	<.001
Percentage ageing	-.442**	.001
Male population ratio	-.719**	<.001
Percentage of locally born population	.341*	.013
Percentage of foreign population	.045	.752
Economic indicators		
Average income per inhabitant	.575**	<.001
Municipal expenditure per inhabitant	-.175	.214
No. of companies per inhabitant	.167	.238
No. of companies in information and telecommunication sector per inhabitant	.694**	<.001
Public service indicators		
Infrastructure indicator	-.409**	.003
Sociocultural indicator	-.451**	<.001
Educational-health service indicator	-.441**	.001
Participation indicator	-.296*	.033
Tourism indicator	-.320*	.021

Table 3. Weighted Least Square Regression model to explain the presence of local media (dependent variable) in relation to demographic and geographical factors.

	Non-standardised B coefficient	Deviation error	Standardised B coefficient	t	Sig	VIF co-linearity statistic
Constant	1.053	.133		7.890	<.001	
Percentage ageing	-.003	.001	-.287	-2.299	.026	2.268
Male population ratio	-.925	.138	-1.213	-6.683	<.001	4.790
Travel time	-.001	.000	-.182	-1.441	.156	2.329
Participation indicator	.003	.001	.952	5.109	<.001	5.050
Municipal expenditure per inhabitant	1.909E-6	.000	.009	.093	.926	1.406

previously noted, in-depth analysis is essential, incorporating more precise rural participation indicators, such as those linked to Local Action Groups (Esparcia et al., 2015), to ascertain if these social dynamisation organisations can indeed catalyze journalistic activity by promoting alternative media outlets or forming alliances with existing ones.

In geography studies, service access is typically analysed not only in terms of territorial distribution, but also in how they are accessed. Accessibility defines dependence in rural areas compared with urban hubs, since in spaces with a low demographic density it is difficult to achieve the minimum demand thresholds for services to be located in all municipalities (Ruiz-Pulpón and Martínez Sánchez-Mateos, 2022).

Previous studies have demonstrated physical distance can shape a media outlet's capacity for information coverage (Freeman, 2020). Travel costs in terms of time and resources may alter news values for events in extensive areas of the region, which not only lack local media but may not be sufficiently noteworthy in everyday current affairs to be attended to by media situated in geographically distant locations. In our exploratory regression model, accessibility does not exhibit clear statistical significance. However, the interpretation of the map (Figure 3), that overlays the media structure onto travel time to a town with over 30,000 inhabitants, explains why we consider this to be a factor that requires further investigation.

As it can be seen, media outlets not only cluster in densely populated areas but also replicate a concentration pattern within territories less than 30 min from medium-sized towns, following the Functional Urban Areas framework (Pillet Capdepón et al., 2018).

It is noteworthy that the northeastern zone, with no municipalities having over 30,000 inhabitants and most population centers requiring travel times exceeding 75 min to

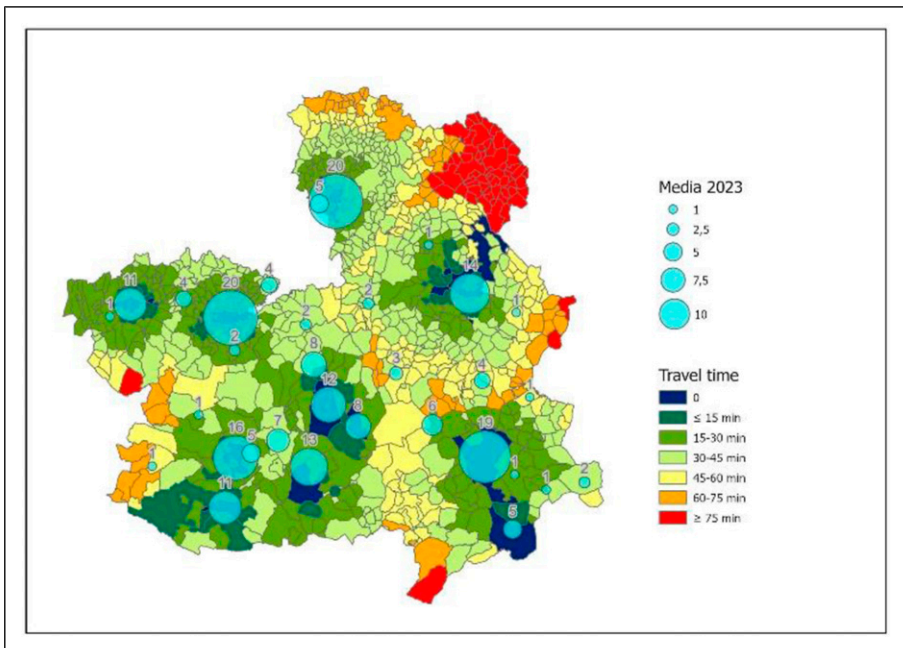


Figure 3. Media and travel time to a town of more than 30,000 people. Source: Ruiz-Pulpón and Martínez Sánchez-Mateos (2022) and Google Maps.

reach larger towns like Guadalajara or Cuenca, is virtually isolated from the media landscape. Additionally, there are very few media outlets in the southwestern zone bordering the Autonomous Region of Extremadura, which is administratively tied to Castile-La Mancha but closer geographically to towns in another region. These accessibility challenges condition the possibility of setting up regional media outlets that cover multiple municipalities, as well as place-based journalistic coverage for the entire province from the capital city's media.

Conclusions

There has been a growing scholarly interest in examining the relationship between geographical and communication aspects in the context of mediatization processes. Within journalism, a specific concern lies in the absence of local media outlets in certain regions, commonly referred to as news deserts (Abernathy, 2018). However, we contend that a more nuanced comprehension of these deficiencies necessitates a focus on sub-national levels, recognizing the territorial diversity within countries, particularly gaining a deeper understanding of rural environments where such gaps often emerge. This approach prevents the uncritical transfer of methodological parameters from media and socio-cultural systems that are foreign to the places studied (Usher, 2023). Addressing them on a national or regional scale is not impossible, but it should be done taking into account the particularities of the territories, such as the number of municipalities, population size or geographical extension. Therefore, analyzing deserts requires accounting for administrative structures and population distribution to ensure the relevance and accuracy of data interpretation.

Contexts influence the local media ecology, reflecting the idiosyncrasy of territories in political, social, economic and cultural aspects (Picard and Russi, 2012). This study focused on Castile-La Mancha, a partially depopulated region where the distribution of local media reproduces polycentric demographic patterns derived from historical trends, with a concentration of media outlets in provincial capitals and a number of medium-sized cities, which corresponds to a zoning structure distinguishing between urban and peri-urban, intermediate and depopulated zones.

The Demographic Challenge indicators in Spain, identifying areas in need of urgent intervention, closely align with the absence of media presence. Rural zones with lower population density, older and masculinized communities, and those lacking a school-age population have virtually no active media outlets. Meanwhile, business activity, average income per inhabitant, and public expenditure do not significantly impact media presence. The analysis specifically shows that for certain depopulated zones which do not have low average incomes and where there is business activity, this does not act as a positive factor for media presence.

From a public service perspective, territories grappling with depopulation generally maintain basic provisions like healthcare, education, libraries, and telecommunication infrastructure. While public authorities make efforts to ensure these basic services, media access across much of the territory relies on private investments supporting commercial media outlets, particularly as the presence of third-sector media is residual, yet to be

developed. Future research should focus on the role of communication public policies, particularly on the potential of municipal broadcasters.

The impact of distance in territorial structure is likewise a factor to be taken into account for information coverage (Freeman, 2020). The maps show that journalistic coverage of certain places may be particularly challenging, causing these communities to be neglected in terms of media attention. This could be the result of both travel times with regard to newsroom locations, and the existence of cultural and administrative boundaries which facilitate the risk that peripheral zones of the region will become news deserts.

Methodologically, it is essential to note that this regression model serves as an exploratory tool with limitations. Its primary goal is to fine-tune the identification of significant variables explaining media presence while mitigating the impact of multicollinearity. However, a more comprehensive analysis of the model's predictive capacity requires a deeper understanding of the territory. For example, it is crucial to consider that regions in Spain with lower population density often consist of numerous municipalities. Consequently, basic services at the municipal level in these areas may carry more weight than in densely populated zones, even if the latter have a higher population ratio.

It is not possible to establish a causal relationship between depopulation and the absence of media. It is worthwhile to explore deeply the connection between the two phenomena. In future research, it will be essential to explore the reciprocal aspect of this interdependence – specifically, the role of media in retaining or attracting population to these regions. We furthermore see it is important to combine these mapping and quantitative analysis approaches with a qualitative analysis of the production conditions for local media. This will serve to observe the extent to which local titles are fulfilling the values and practices of grassroots journalism, or otherwise failing to fulfil quality requirements, and establishing no type of connection or rootedness in these territories and the communities that live there.

Lastly, it should be noted that journalistic media form part of the local information landscape but are not the whole story (Collier and Graham, 2022; Hepp, 2020). In communities with historically precarious media structures, it is important to ascertain which other information tools are mobilised. This therefore requires consideration of civil society organisations and institutions, which often use social media and other instruments to structure the functions previously covered by legacy media. As indicated, this demands a reconsideration of the framework of shortcomings towards another, namely the resilience of these communities (Usher, 2021), emphasising the opportunities and the possibilities they present to make their voices heard.

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