

“HOUSING” IN THE CONTEXT OF URBAN VULNERABILITY: MADRID’S MUNICIPAL POLICIES AND PRACTICES TACKLING RESIDENTIAL VULNERABILITY

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Summary

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1. Introduction

Nowadays we live in an essentially urban world, where more than half of humanity lives in cities. In this context, housing is a basic element of human existence itself. The dissatisfaction linked to it means the loss of quality of life that, in the most extreme cases as in the substandard housing, shows up the accumulation of problems of various kinds that go far beyond the purely constructive or architectural kind.

Housing, as an another element of the complex system of causes and factors involved in urban spatial inequalities, plays a fundamental role when refer-

ring to the generic concept of vulnerability, thus understood, it would have to do with how socio-spatial differentiation leads to an unequal behaviour of the population (individuals, households, groups,...) before environmental and social risks or threats. In this sense, the shortages and deficiencies that orbit around accommodation, and also often forgotten, on the built environment, would be the origin of what has been referred to as residential vulnerability.

The geographical approach towards these types of issues, which occur with greater intensity in urban areas, dates back centuries, and is one of the pillars that identifies the spatial inequalities that exist in cities. Along with this, it is clear that social and demographic shortages very often accompany strictly urban ones. The concept of socio-demographic vulnerability referred to in scientific literature come from here.

It is precisely this combination of problems and shortcomings of a diverse nature (urban, social, economic, environmental, etc.), which accurately lead to a closer reality of the concept of socio-residential vulnerability as well as the various policies that, from the local/municipal level, have been developed to try to solve it. This is the main purpose of study and analysis of this contribution and will focus on the city of Madrid, and that will start from a conceptual and methodological literature review. On this basis, the analysis of the vulnerability, using geographical information systems and statistical information will be considered, in such a way as to allow the socio-spatial inequalities to be visualised in a multidimensional way. Once the configuration and spatial patterns of residential vulnerability in Madrid as at 2016 have been examined, we will go on to assess the various policies and actions implemented since the beginning of this century, both from regional and local level, to finish with a paragraph of discussion and conclusions on the subject.

2. Theoretical premises of vulnerability

Vulnerability is an essentially urban phenomenon for which there is no consensus on its definition or measurement¹. Although it is a multidimensional and multifaceted concept², the Department of Economic and Social Affairs of the United Nations defines vulnerability as:

“a state of high exposure to certain risks and uncertainties, in combination with a reduced ability to protect or defend oneself against those risks and uncertainties and cope with their negative consequences. It exists at all levels and dimensions of society and forms an integral part of the human condition, affecting both individuals and society as whole”³.

Within the urban area, vulnerability will be understood:

“as that process of unrest in cities produced by a combination of multiple dimensions of disadvantage, in which all hope of upward social mobility, to overcome their social status of exclusion or that close to it, is referred to as extremely difficult to achieve. On the contrary, this leads to a perception of insecurity and fear of the possibility of a downward social mobility, of the deterioration in their current conditions of life.”⁴

¹ P. Mateos, “La doble segregación urbana: desigualdades socio-espaciales y justicia ambiental”, in *Actas del III Congreso Internacional de Desarrollo Local*, ed. by J. Márquez, et al., Cuba, La Habana University, 2013, pp. 3488-3510.; D. Sánchez and C. Egea, “Enfoque de vulnerabilidad social para investigar las desventajas socioambientales. Su aplicación en el estudio de los adultos mayores”, *Papeles de población*, XVII (69), (2011), pp. 151-185.

² J. Alguacil, J. Camacho, and A. Hernández, “La vulnerabilidad urbana en España. Identificación y evolución de los barrios vulnerables”, *EMPIRIA. Revista de Metodología de Ciencias Sociales*, XXVII, (2014), pp. 73-94.

³ United Nations, *Report on the World Social Situation 2003. Social Vulnerability - Sources and Challenges*, Nueva York, Department of Economic and Social Affairs, United Nations Publications, 2003, p. 8.

⁴ J. Alguacil, “Barrios desfavorecidos: un diagnóstico de la situación española”, in *Informe FUEM de políticas sociales: La exclusión social y Estado de Bienestar en España*, ed. by FUEM-Icaria V, Madrid, 2006, p. 161.

In urban terms, and applied on a social space considered as a geographical location, urban vulnerability:

“would refer to the potentiality that the population of a particular specific urban space is affected by any adverse circumstance(s), so that the concept refers not so much to the existence of a critical situation observed in this as to certain conditions of risk, vulnerability and disadvantage that would make entry into this critical situation of disadvantage possible, understood as the materialisation of this risk in an already consolidated situation of exclusion”⁵.

In the urban system, we would speak of spatial segregation when there are neighbourhoods that are outside the “normalised” urban system⁶ and therefore in a situation of vulnerability.

However, it should not be forgotten that social inequalities refer to the individuals who live in a particular place. Then, vulnerability has a clear social component, given that it does not affect all populations the same, but that it depends on the susceptibility or predisposition of the population to suffer an impact⁷. Vulnerability would then be the inability of the population to face a risk and/or recover from it later⁸.

In similar terms, Eakin and Luers⁹ argue that vulnerability is a function of three factors: firstly, the exposure to risk; secondly, the sensitivity of the sys-

⁵ M. Bruquetas, J. Moreno, and A. Walliser, *La regeneración de barrios desfavorecidos*, Documento de Trabajo 67, Madrid, Fundación Alternativas, 2005, p. 11.

⁶ EDIS (Equipo de Investigación Sociológica) –J. Alguacil Gómez, J. Camacho Gutiérrez, F. Fernández Such, V. Renes Ayala, and E. Trabada Crende –, *Las condiciones de vida de la población pobre desde la perspectiva territorial. Pobreza y territorio*, Madrid, FOESSA / Cáritas, 2000.

⁷ O. Cardona, *La necesidad de repensar de manera holística los conceptos de vulnerabilidad y riesgo: una crítica y una revisión necesaria para la gestión*, Centro de Estudios sobre Desastres y Riesgos, Universidad de los Andes, Bogotá (Colombia), 2003.

⁸ C. Egea, J.A. Nieto, J. Domínguez, and R. González, “Viejas y nuevas realidades urbanas. Identificación de zonas de habitabilidad desfavorecida en la ciudad de Granada,” *Cuadernos Geográficos*, XLV (2), (2009), pp. 83-105.

⁹ H. Eakin and A. Luers, “Assessing the vulnerability of social-environmental systems,” *Annual Review of Environment and Resources*, XXXI (1), (2007), pp 365-394.

tem to stress; and, finally, the capacity or ability of the system to withstand and absorb (also respond to and cope) the impacts of these "stressors". Considered in this way, there are a number of issues that appear on the scene. The first is resilience, i.e., the ability of a community to respond, cope with, recover and adapt to specific hazards¹⁰, which can be facilitated or hampered by certain environments and strategies, which should not be seen as a resigned acceptance of the new context, but of the ability to understand and act accordingly¹¹. Secondly, the existence of that which in the scientific literature has been named as "assets" and that in the countries of the OECD Morrone et al.¹² cluster into four categories: economic capital, human capital, social capital and collective or public assets, which refer to the mechanisms of social support and public services, such as public health, education and housing or unemployment assistance.

However, once again it is necessary to stress the need to humanise the generic concept of vulnerability to refer to individuals or groups that are particularly vulnerable to environmental and social risks. Morrone et al.¹³ consider in their study that vulnerable people are those who lack the assets needed to cope with negative events (decrease in income, unemployment or illness). Without leaving aside the above, it is no less true, and it is often forgotten, that all people are potentially vulnerable to some degree. The dynamic nature of vulnerability¹⁴ provides that in the light of own weaknesses we can find our-

¹⁰ S. Cutter, B. Boruff, and W. Shirley, "Social vulnerability to environmental hazards," *Social Science Quarterly*, LXXXIV, 2, (2003), pp. 242-261.

¹¹ R. Méndez, "Crisis económica y desarrollo metropolitano: una propuesta de investigación," *Terra. Revista de Desarrollo Local*, I, (2015), pp. 1-22.

¹² A. Morrone, K. Scrivensm, C. Smith, and C. Balestra, *Measuring vulnerability and resilience in OECD countries*, Report prepared for the IARW-OECD Conference on Economic Insecurity, 22-23 November, Paris (France), 2011.

¹³ A. Morrone, K. Scrivensm, C. Smith, and C. Balestra, 2011.

¹⁴ P. Mateos, "La doble segregación urbana: desigualdades socio-espaciales y justicia ambiental," in *Actas del III Congreso Internacional de Desarrollo Local*, ed. by J. Márquez, et al., Cuba, La Habana University, 2013, pp. 3488-3510.

selves under the effects of risks of a diverse nature at some point in our lives¹⁵. However, there are more sensitive groups or collectives for various reasons such as their geographical location, their position in society or the time of the life cycle in which they are in. These would be the poor, informal workers, women, migrants, persons with disabilities, minorities, young people or children and the elderly.

At this point it would then be interesting to then make reference to how the vulnerability is closely related with risks and threats. Literature reveals two types of dangers, of natural origin and those of human origin, which are then the cause of their origin. Egea et al.¹⁶ divided the latter into risks and/or hazards in urban areas (poor accessibility, speculative pressure, physical degradation, major infrastructures or the loss of symbolic references), and social (social recomposition, marginal activities or criminal activity, existence of a floating population, inadequate or non-existent institutional interventions, modification of the socio-economic fabric, inadequacy of housing, household composition, lack of expectations, or even the perception of space).

The diversity of risks that are associated with vulnerability and its diverse nature, explain that this has been studied from different perspectives, approaches and methodologies, depending on the risk that is considered¹⁷. The causes that explain this have given rise to the existence of various types of vulnerability. The most common are the social or socio-demographic, economic or socio-economic, environmental and or biophysical. Other contributions, such as the Alguacil et al.¹⁸ consider the existence of two further types, residential and subjective, putting the emphasis in that vulnerability is then a

¹⁵ D. Sánchez, C. Egea, and J. Soledad, "Apuntes sobre los riesgos sociales, componente principal de la vulnerabilidad social", in *Vulnerabilidad social: posicionamiento y ángulos desde geografías diferentes*, ed. by C. Egea, et al., Granada University Publisher, (2012), pp. 57-68.

¹⁶ C. Egea, J.A. Nieto, J. Domínguez, and R.A. Rego, "Zonas desfavorecidas potencialmente vulnerables y respuesta vecinal. Estudio de Torreblanca, Sevilla (España)", in *Pobreza y vulnerabilidad, enfoques y perspectivas*, ed. by ALAP, Brasil, Río de Janeiro, 2008, pp. 231-246.

¹⁷ A. Morrone, K. Scrivensm, C. Smith, and C. Balestra, 2011, p. 6.

¹⁸ J. Alguacil, J. Camacho, and A. Hernández, 2014.

relative, contextual, perceptive question, which also has a markedly territorial perspective.

In this way, the concept would be closely related to an operational point of view, that is to say, with the implementation of preventive actions or measures for which potential negatives do not finally become facts:

"so that if we do not take action on the basis of the problem the area shall enter into crisis, being able to produce a functional and social degradation of the area that leads to marginalisation"¹⁹.

3. The "housing" in the conceptualization of urban vulnerability

Vulnerability arises as an analytical concept in environmental sciences for the study of the population affected by natural hazards²⁰. However, more recent approaches²¹ have highlighted the importance of the structural dimensions of socio-demographic and environmental vulnerability as a product of a social construction generated from social inequalities, lack of opportunities for empowerment and access to social protection. A social approach to vulnerability has been developing since the 1980's, which stresses the importance of dynamic spatial structures and processes, determinants of vulnerability in people and disadvantaged groups, emphasizing the understanding of the conditions of daily life of individuals and communities²² to generate focused strategies to address and reduce vulnerability.

¹⁹ A. Hernández Aja, "Áreas vulnerables en el centro de Madrid", Cuadernos de Investigación Urbanística, LIII, Escuela Técnica Superior de Arquitectura, (2007). <<http://www.aqupm.es/Departamentos/Urbanismo/publicaciones/ciur53.html>>, p. 5.

²⁰ M. Prowse, Towards a clearer understanding of "vulnerability" in relation to chronic poverty, Chronic Poverty Research Centre Working Paper 24, Manchester, University of Manchester, 2003.

²¹ D. Hilhorst, and G. Bankoff, "Introduction: mapping vulnerability", in Mapping vulnerability: disasters, development and people, ed. by G. Bankoff, G. Frerks, and D. Hilhorst, London, Earthscan, 2004, pp. 1-9.

²² F. Arias (Dir.), La desigualdad urbana en España, Madrid, Ministerio de Fomento, Dirección General de Programación Económica y Presupuestaria, Centro de Publicaciones, 2000.

In this sense, geographic and demographic research²³ is interested in analysing vulnerability from a socio-environmental perspective, associated with natural and social risks; ecological, environmental and social justice and inequality, from approaches that privilege, as could not be otherwise, the interactions between the socio-demographic and environmental issues covering different areas. One of the most attractive for research is urban, exemplified in large cities and metropolitan areas, where vulnerability is associated with increased dynamic risks for its inhabitants and assets²⁴, such as traffic problems, overcrowding, poverty, lack of housing²⁵, crime and insecurity, unemployment, pollution, lack of infrastructures, shortage of social and welfare services, consequences of natural and anthropogenic events²⁶, different manifestations of urban reform processes, such as gentrification processes²⁷, etc.

The physical supports that protect the life of citizens are very important, since their poor conditions will not allow a satisfactory development of every-

²³ S. Cutter, J.T. Mitchell, and M.S. Scott, "Revealing the vulnerability of people and places: A case study of Georgetown County, South California", *Annals of the Association of American Geographers*, XC (4), (2000), pp. 713-737; P. Deboudt and V. Houillon, *Populations, vulnérabilités et inégalités écologiques. Espace, Populations, Sociétés*, Université des Sciences et Technologies de Lille, Villeneuve d'Ascq, 2008.

²⁴ K. Krellenberg, J. Welz, F. Link, and K. Barth, "Urban vulnerability and the contribution of socio-environmental fragmentation: Theoretical and methodological pathways", *Progress in Human Geography*, XLI (4), (2016), pp. 1-24.

²⁵ Y. Fijalkow, "Crises et mal-logement : réflexions sur la notion de vulnérabilité résidentielle", *Politiques sociales et familiales*, CXIV (Logement : enjeux d'actualité), (2013), pp. 31-38.

²⁶ O. Cardona, "The need for rethinking the concepts of vulnerability and risk from a holistic perspective: A necessary review and criticism for effective risk management", in *Mapping Vulnerability: Disasters, Development and People*, ed. by G. Bankoff, G. Frerks, and D. Hilhorst, London, Earthscan, 2004, pp. 37-51. G. McGranahan, P. Jacobi, J. Songsor, C. Surjadi, and M. Kjellen, *The citizens at risk: from urban sanitation to sustainable cities*, London, Earthscan, 2001.

²⁷ C. Egea, J.A. Nieto, J. Domínguez, and R. González, *R. Vulnerabilidad del tejido social de los barrios desfavorecidos en Andalucía. Análisis y potencialidades*, Sevilla, Centro de Estudios Andaluces, Consejería de Presidencia, Junta de Andalucía, 2008. <<http://bit.ly/1f0y15H>>.

day life: a basic dimension of the human condition is the adequacy of the habitat to the needs of the population. The residential factor does not refer exclusively to the houses where the private sphere of our lives is carried out. That is why, instead of housing, the concept of accommodation refers to a more complex dimension, which refers to both housing and the environment in which a good part of our social life is undertaken: man, as a social being, needs the relational dimension to be complete²⁸. In this sense, a degraded habitat, irrespective of whether it involves housing or the neighbourhood, are expressions of unfavourable conditions that can lead to the emergence of feelings of vulnerability. Substandard housing would be the ultimate expression of residential vulnerability, understood as those accommodations that do not meet conditions of habitability, either because of the poor state of preservation of the buildings, or having an insufficient surface area according to residents who live in the housing or due to the lack of basic facilities in the home (heating, toilet/service, lift,...)²⁹.

In short, at this time studies on the situation and the evolution of residential vulnerability have become essential, as urban and social policies that aim to combat socio-spatial inequalities have been hindered by the global economic crisis³⁰. This fact is reflected in cities such as Madrid, where the neo-liberal policies have dominated the urban management since the 1990s. Right now as the town councils of change, or the new left, have come to power, it seems a new stage wants to be opened up, which for the time being can only be analysed in its first approaches and actions.

4. Methodology

The complexity of the concept should be moved to the instruments in order to measure it. The availability of updated statistical data is a central element for urban analysis, but there are serious difficulties, particularly for the scales of analysis below municipal level and, more specifically, at census tract level, which is

²⁸ Y. Fijalkow, 2013.

²⁹ J. Alguacil, J. Camacho, and A. Hernández, 2014.

³⁰ U. Beck, *Democracy without enemies*, Cambridge, MA: Polity Press, 2000.

the level necessary to address a detailed spatial analysis. Given that the intention is to build a multidimensional concept of vulnerability, it should be measured through various indicators that express the complexity by combining different dimensions, and this confronts us with the problem of the sources. At the beginning, it only seemed possible to use the Population and Housing Census to obtain the necessary data set at infra-municipal level, because although for some socio-demographic variables there is the possibility of access to the annual data of the Municipal Register of Inhabitants, such statistical information is insufficient to draw up a complete interim update between census periods. Based on this premise, and taking as a first reference the study carried out for 1991³¹, it would be possible to establish an analysis of the evolution of vulnerability in the areas defined through the census sections for the municipality of Madrid.

However, the last Population and Housing Census conducted in 2011 has broken the historical role of this source as the basis of the Modern State since that up to that year it was understood as a universal count of each and every one of the citizens and their homes. The last Census carried out is based on a series of pre-census files to which other administrative records and statistical operations have been associated, as well as the Cadastre. A sample survey has been added to these prior preparations in order to know the population and housing features, with an overall designed sample of 12.3% of the population and 11.9% of the houses. Although this fraction varies depending on the municipal size. The starting problem is the unreliability of the administrative records without a thorough control of the data since they are tools designed with very specific objectives and not to create structural and census statistics. The results obtained can be accessed through a telematic application of the INE which offers five channels for consultation of census data. Each of these channels has limitations that are exacerbated as you go down to more disaggregated geographical and conceptual levels.

³¹ A. Hernández Aja, "Catálogo De Barrios Vulnerables," Cuadernos de Investigación Urbanística, XIX, Universidad Politécnica de Madrid. Escuela Técnica Superior de Arquitectura, (1997). <<http://www.aqupm.es/Departamentos/Urbanismo/publicaciones/ciur19.html>>.

As we have just demonstrated, one of the concerns of this study has been to work with updated and reliable data, which are properly harmonised and easy to access. In this way, the use of the 2011 census was ruled out from the beginning, and we proceeded to carry out a first effort to search and compile the more appropriate sources. This selection was always led by the basic principle of reliability of the source and possibility for future reproduction. For the data relating to the characteristics of the housing stock we turn to the Cadastre, essentially a register where all the country's real estate, property that is rustic or urban in nature, is recorded. The set of physical data that it stores for each unit is invaluable information and with a degree of unusual sustainability. Unlike other records, all the data contains the corresponding territorial reference, overcoming the traditional separation between numerical and cartographic information, presenting an updated inventory of the territory. The information grouped this way is from our point of view a fundamental piece for knowledge (with a level of detail that is unusual in other sources), the planning of the territory and its resources.

In turn, the municipal Register has been referred to for the socio-demographic data, this is an administrative record containing the residents of the municipality. Its data is proof of residence in the municipality and usual domicile in it. Any person living in Spain is obliged to register in the Register of the municipality in which they have their habitual residence. Whoever lives in several municipalities must register in the one that they live the longest during the year. The Register provides data on the resident population in Spain to 1st January of each year, according to place of residence, gender, age, nationality and place of birth.

The minimum territorial unit of physical reference at work has been the census section, an entity in which it is possible to obtain disaggregated statistical information. The sections are properly delimited areas, which divide all the municipal territory avoiding overlaps and areas not included. However, the sectioned census serves directly to population dynamic criteria that make such division, for our purposes, doubly fragile. On the one hand, this demographic dependence prevents a fixed delimitation of the sections year after year, greatly hindering the serialisation of data and the comparison between them. In turn, the census divisions do not deal with morphological criteria that give greater coherence to the areas studied.

To address the above, and in this way deal with the uneven distribution of the population by the space, this contribution has used the concept of “urban populated area” (UPA). This is defined by a notable habitual presence of residents, also taking into account their nearest surroundings. Operationally, this has been delimited including the use of urban type land as continuous and discontinuous residential and economic activities, but also the non-residential, but that are more or less commonly used by the population, such as commercial, recreational, sporting, green areas, etc. In this way large areas of industrial, transport, agricultural, livestock or forestry use, where population density was low or very low, have been excluded. The delimitation of this area has been based on the interpretation of recent aerial images (National Plan of Aerial Orthophotography of the National Geographic Institute) and mapping of land use (Corine LandCover), supported by GIS.

Although there is no consensus on the determination of the variables for the analysis of the integral vulnerability³² in this discipline, those we have finally adopted do not differ very much from those that have been used in similar studies carried out by various authors³³ for other geographical areas or to other scales of analysis.

³² P. Mateos, “La doble segregación urbana: desigualdades socio-espaciales y justicia ambiental”, in *Actas del III Congreso Internacional de Desarrollo Local*, ed. by J. Márquez, et al., Cuba, La Habana University, 2013, pp. 3488-3510. He carried out an analysis of 22 scientific publications and showed that the majority of the indicative variables used can be grouped into eight categories: demography; identity; economic capital; human capital; social capital; material conditions; urban environment; and, finally, governance.

³³ M. Conway and J. Konvitz, “Meeting the challenge of distressed urban areas,” *Urban Studies*, XXXVII (4), (2000), pp. 749-774. S. Cutter, B. Boruff, and W. Shirley, 2003. C. Egea, J.A. Nieto, J. Domínguez, and R.A. Rego, 2008. A. Hernández Aja, 2007. A. Moreno, A. Palacios, and P. Martínez, “Medición de la vulnerabilidad socio-ambiental intraurbana: un ensayo exploratorio basado en SIG”, in *Aplicaciones geotecnológicas para el desarrollo económico sostenible*, ed. by F. Galacho, et al., XVII Congreso Nacional de Tecnologías de la Información Geográfica, AGE, Málaga (Spain), 2016, pp. 214-223. V. Pérez, *Estudio sobre barrios desfavorecidos de Madrid*. Madrid, Federación Regional de Asociaciones de Vecinos de Madrid, 2007. R. Rodríguez Alonso, I. Rodríguez Suárez, and A. Hernández Aja, “Vulnerabilidad residencial y dinámicas inmobiliarias. Del crecimiento urbano a la rehabilitación.”

Urban vulnerability will be conditioned by the combination of several factors, as well as their concentration in certain areas. Partially following both the methodology used for the delimitation of vulnerable neighbourhoods in Spain of Hernández Aja et al.³⁴, as well as the contributions of Temes³⁵ for the delimitation and assessment of comprehensive vulnerability in the municipality of Madrid, our contribution will use six different indicators to determine the level of vulnerability from the most up-to-date data available. Three of them affect the scope of vulnerability of the building, and three others are linked to problems of socio-demographic vulnerability. They are the following: (a) concentration of small surface area housing (percentage of housing with a total useful floor area of less than 30 square metres); (b) relative weight of the properties located in buildings built before 1940; (c) relative weight of the properties located in buildings built between 1940 and 1970; (d) percentage of the population over 25 years who is illiterate or without studies - low educational level-; (e) rate of aging - percentage of the population 80 years old and over-; and (f) percentage of immigrants from non-EU countries and with low levels of human development. The date of general reference used has been 2016, although, as we can see in the list

International Conference Contested Cities. From CONTESTED_CITIES to global urban justice - critical dialogues, Madrid, July 4th - 7th 2016, Axis 2, Article nº 2-511, 2016. <<http://contested-cities.net/working-papers/2016/vulnerabilidad-residencial-y-dinamicas-inmobiliarias-del-crecimiento-urbano-a-la-rehabilitacion/>>. J. Subirats and R. Gomà, Un paso más hacia la inclusión social. Generación de conocimiento, políticas y prácticas para la inclusión social. Madrid, Acción Social, 2003. R. Temes, "Valoración de la vulnerabilidad integral en las áreas residenciales de Madrid", EURE, XL (119), (2014), pp. 119-149. F. Antón, L. Cortés, C. Martínez, and J. Navarrete, "La exclusión residencial en España", in Políticas y bienes sociales. Procesos de vulnerabilidad y exclusión social, ed. by A. Arriba González, Madrid, Fundación Foessa, 2008, pp. 219-229. Ministerio de Fomento and Instituto Juan de Herrera. Escuela Técnica Superior de Arquitectura de Madrid, Análisis urbanístico de barrios vulnerables en España. Sobre la vulnerabilidad urbana. Research conducted by Professor Agustín Hernández Aja, Madrid, 2010. <<http://bit.ly/18lfgeB>>.

³⁴ A. Hernández Aja, M. Vázquez Espí, C. García Madruga, A. Matesanz Parellada, E. Moreno García, J. Alguacil Gómez, and J. Camacho, Análisis urbanístico de Barrios Vulnerables 1991 y 2001. Madrid, Ministerio de Fomento, 2011.

³⁵ R. Temes, 2014.

below, the Cadastre data refer to the month of December 2016 and those of the Electoral Register at 1st January of the same year (Table 1).

Table 1. List of Sources
Municipal Register of Inhabitants on January 1st, 2016. Subdirectorate General for Statistics of the City of Madrid.
Cadastral database for the municipality of Madrid as of December 2016. General Directorate of Cadastre.

In works of this nature, this often tends to be an especially risky decision in establishing thresholds to determine the critical areas with regard to vulnerability. In our case, we consider the option of thresholds determined from n times the municipal average as the most appropriate for the classification of all the data. To work with this criterion we made several approaches aimed at deciding the value of the deviation n , determining that the most appropriate was 1.5 time the municipal average (Table 2).

Once the subjects of the vulnerability identified in the study are known (demographic vulnerability and residential vulnerability), and the range from which it is considered that the critical level has been reached in each of them has been determined, we proceeded to assess the possible combinations (Table 3), establishing a typological distinction for each of the cases:

Single-vulnerability. This is detected in those census tracts in which only one type of vulnerability is identified and for which the critical level is exceeded by at least two variables.

Poly-vulnerability. This is detected in those census tracts in which it is possible to identify two types of vulnerability at the same time.

On the other hand, and in parallel to establishing this first classification, a second one is carried out that defines three categories on the basis of the intensity and severity of the characters of the vulnerability (Table 4), namely:

- a. Low vulnerability. When the critical level is exceeded by two variables in a same census tract.

Table 2. Selection of explanatory variable(s) and census tracts concerned						
Explanatory variable(s)						
	Popula- tion aged 80 and over	Low edu- cational level	Immi- grants from de- veloping countries	Dwellings of less than 30m ²	Dwellings built befo- re 1940	Dwellings built between 1940 and 1970
Average percen- tage of Madrid municipa- lity	7.3%	5.9%	7.9%	0.9%	9.3%	35.7%
1.5 times the Madrid average percen- tage	10.9%	8.8%	11.8%	1.4%	14.0%	53.6%
Number of census tracts meeting the vul- nerability criteria	301	535	503	353	439	837

Data source: Municipal Register of Inhabitants on January 1st, 2016, and Cadastral database for the municipality of Madrid as of December 2016. The ranking criteria are the responsibility of the authors.

- b. Moderately vulnerable. When the critical level is exceeded by three variables in a same census tract.
- c. High vulnerability. When the critical level is exceeded by four or more variables in a same census tract.

Table 3. Urban vulnerability categories and data by census tract		
	Number of census tracts	Percentage share of the total census tracts
Single-vulnerable census tracts	916	38.0%
Meets 1 housing variable	380	15.8%
Meets 1 socio-demographic variable	286	11.9%
Meets 2 housing variables	175	7.3%
Meets 2 socio-demographic variables	65	2.7%
Meets 3 housing variables	10	0.4%
Meets 3 socio-demographic variables		
Poly-vulnerable census tracts	725	30.1%
Meets 1 housing variable + 1 socio-demographic variable	411	17.1%
Meets 1 housing variable + 2 socio-demographic variables	162	6.7%
Meets 1 socio-demographic variable + 2 housing variables	124	5.1%
Meets 2 housing variables + 2 socio-demographic variables	14	0.6%
Meets 1 socio-demographic variable + 3 housing variables	3	0.1%
Meets 1 housing variable + 3 socio-demographic variables	11	0.5%
Census tracts without vulnerability indicators	768	31.9%

Data source: Municipal Register of Inhabitants on January 1st, 2016, and Cadastral database for the municipality of Madrid as of December 2016. The ranking criteria are the responsibility of the authors.

Table 4. Urban vulnerability categories according to intensity and severity, and data by census tract		
	Number of census tracts	Percentage share of the total census tracts
Low vulnerability	651	27.1%
Meets 1 housing variable + 1 socio-demographic variable	411	17.1%
Meets 2 housing variables	175	7.3%
Meets 2 socio-demographic variables	65	2.7%
Moderately vulnerable	296	12.2%
Meets 3 housing variables	10	0.4%
Meets 1 housing variable + 2 socio-demographic variables	162	6.7%
Meets 1 socio-demographic variable + 2 housing variables	124	5.1%
High vulnerability	28	1.2%
Meets 2 housing variables + 2 socio-demographic variables	14	0.6%
Meets 1 socio-demographic variable + 3 housing variables	3	0.1%
Meets 1 housing variable + 3 socio-demographic variables	11	0.5%

Data source: Municipal Register of Inhabitants on January 1st, 2016, and Cadastral database for the municipality of Madrid as of December 2016. The ranking criteria are the responsibility of the authors.

5. Identification and characterization of vulnerable areas: results

5.1. The dimensions of sociodemographic and residential vulnerability

First we are going to carry out an approach to the vulnerability of Madrid by analysing the demographic indicators and housing independently. This will serve to highlight the intra-urban spatial inequalities there are in the city.

Thus, although the three sociodemographic indicators show a clear concentration in peripheral districts, there are some differences between them. For example, the census tracts that accumulate high percentages of the population of 80 years old and over (Figure 1) have a unique relationship with historical colonies or housing developments of the Franco regime. Inside the urban central core this is especially striking in the Colonia de los Carteros and in the Peral, in the Guindalera Neighbourhood (Salamanca district), in the Colonia Metropolitana and the surroundings of Francisco de Sales, in the Vallehermoso neighbourhood in Chamberí, in the Colonia San Cristóbal and in the San Damián area in the Chamartín district, or in Mártires de la Ventilla in Tetuán. Beyond that, the aging is evident in areas of the Moratalaz district, in the neighbourhoods of Fontarrón, Vinateros or Marroquina, as occurs in the Colonia Hogar del ferroviario or in the surroundings of the Vinateros market. Also in the neighbourhoods of Amposta or Hellín (San Blas-Canillejas district), specifically in the Colonia Benéfica Belén or in the Gran San Blas. Other examples that are also interesting would be the neighbourhood of la Concepción or of la Alegría in the Ciudad Lineal district, in Entrevías in Puente de Vallecas, the Colonia de los Ángeles in Villaverde, the Poblado Dirigido in Orcasitas, the Colonia Zofío in Usera, the Colonia Juan Tornero in Latina, or the Colonia de San Antonio de la Florida and the surroundings of Casa de Campo.

With regard to the low levels of education, we could say that their pattern of location is similar to the previous indicator in the sense that it tends to be concentrated mainly in the Southern peripheral districts (Figure 2). This is the case in Gran San Blas, in the Neighbourhoods of Ambroz and the Historical Centre of Vicálvaro, or in Santa Eugenia and in the historical centre of Villa de Vallecas. In both cases, moreover, this is also related to former colonies such as the railway or the military in Vicálvaro or Virgen de la Torre or of the Rosario in Vallecas. In similar terms are census tracts that bring together this phenomenon in Usera (Orcasitas or the Poblado de Almendrales), Villaverde (Colonias Marconi, Divina Pastora or San Nicolás, San Cristóbal or Ciudad de los Ángeles), Carabanchel (Pan Bendito or Carabanchel Alto) or Latina (Polígono C, San Ignacio de Loyola or the Colonia Jesús Divino Obrero). The case of the Puente de Vallecas district is unique given that it accumulates a large number of cen-

sus tracts. This occurs on the Neighbourhood of Entrevías (La Viña, La Paz or el Pozo) and in the Neighbourhoods of Palomeras and Portazgo where plenty of colonies are concentrated such as Sandi, San Pablo or Villota, some of which were included as an Integrated Rehabilitation Zone (IRZ) of a few years ago.

The concentration of the immigrant population in certain areas of the city³⁶ is also evident (Figure 3). As in the previous indicators, the overall trend is to their preferential location in the Southern districts of the city. This is the case of the Neighbourhoods of San Diego and Numancia in Puente de Vallecas, where we find the Colonias de San Jorge or Erillas, as well as the surroundings of the boulevard of Peña Gorbea and of the Plaza de Puerto Rubio or Plaza Vieja, of the Neighbourhoods of San Andrés, Los Rosales and San Cristóbal in Villaverde, of the Neighbourhood of Terol and of the Colonias de San Fermín, San José Obrero and of Nuestra Señora de los Remedios in Carabanchel, or of the Colonias del Olivar, Lucero, Cerro Bermejo, and Olivos in the Neighbourhood Lucero in the Latina District. However, unlike the previous cases, there is also a high concentration of immigrants in inner areas of the city as in the Lavapiés district, in the surroundings of Puerta del Sol and those at the rear of Gran Vía, or a good part of the neighbourhoods of the Tetuán District (Berruguete, Bellas Vistas, Valdeacederas or Cuatro Caminos).

On the other hand, the spatial distribution of the census tracts that bring together the housing indicators also presents peculiarities. Thus, the concentration of homes built between 1940 and 1970 (Figure 4) shows some similarities with those commented regarding indicators of level of education and of immigrants. This is especially significant in the Districts of Latina, Carabanchel, Usera, Villaverde, Moratalaz or San Blas-Canillejas. However, in other areas of the city, not commented up to now, the presence of this type of housing is notable. This happens in the Chamberí District in the Neighbourhoods of Arapiles, Gaztambide and Vallehermoso, in Ciudad Lineal in La Elipa, Hermanos García Noblejas and in the Neighbourhood of Concepción, and in Chamartín in the Neighbour-

³⁶ A. Palacios and M. Vidal, "La distribución intraurbana de los inmigrantes en las ciudades españolas: un análisis de casos con SIG y técnicas cuantitativas," Cuadernos Geográficos, LIII (1), (2014), pp. 98-121.

hoods of El Viso and Hispanoamérica, in the surroundings of Nuevos Ministerios, Bernabéu and la Avenida de Brasil. In almost all these latter cases discussed it is necessary to indicate that although the age of housing is notable, its geographical location and its construction characteristics, show that these are dwellings with a high selling price, therefore far away from residential vulnerability.

In turn, housing prior to 1940, as shown in Figure 5, has a clear geographical location in the centre of the city. In fact, the Centro District and its corresponding neighbourhoods have practically all of the census tracts included in this indicator. Without leaving the urban central core and even the streets following the old boundary of the fence demolished in 1868, the Retiro District has some neighbourhoods included such as Jerónimos, Ibiza or Pacífico, in the surroundings of the Narváez and Menéndez Pelayo streets and the Reina Cristina avenue. In similar terms would be the Districts of Salamanca (Castellana, Recoletos, Goya or Lista), Chamberí (Gaztambide, Ríos Rosas or Bilbao), Arganzuela (in the surroundings of Palos de Moguer and Legazpi), and lastly Tetuán (Bellas Vistas, Cuatro Caminos and Berruguete).

To conclude this review, we analyse the spatial distribution of the census tracts that are characterised by a high concentration of houses with reduced dimensions, of less than 30 m². Thus, in Figure 6 the importance of this type of housing in the Centro District can be seen, except perhaps in the most Northern zone, and in Arganzuela (Palos de Moguer) and Tetuán (Bellas Vistas, Berruguete and Valdeacederas). In the Salamanca district, the presence of these homes appears scattered around all its neighbourhoods and more concentrated in the Colonia Fuente del Berro or in the areas at the back of Alcalá street. Also worthy of mention is the presence of these homes in the historic suburb of Puente de Vallecas, in the same areas where the concentration of immigrants is high.

“HOUSING” IN THE CONTEXT OF URBAN VULNERABILITY

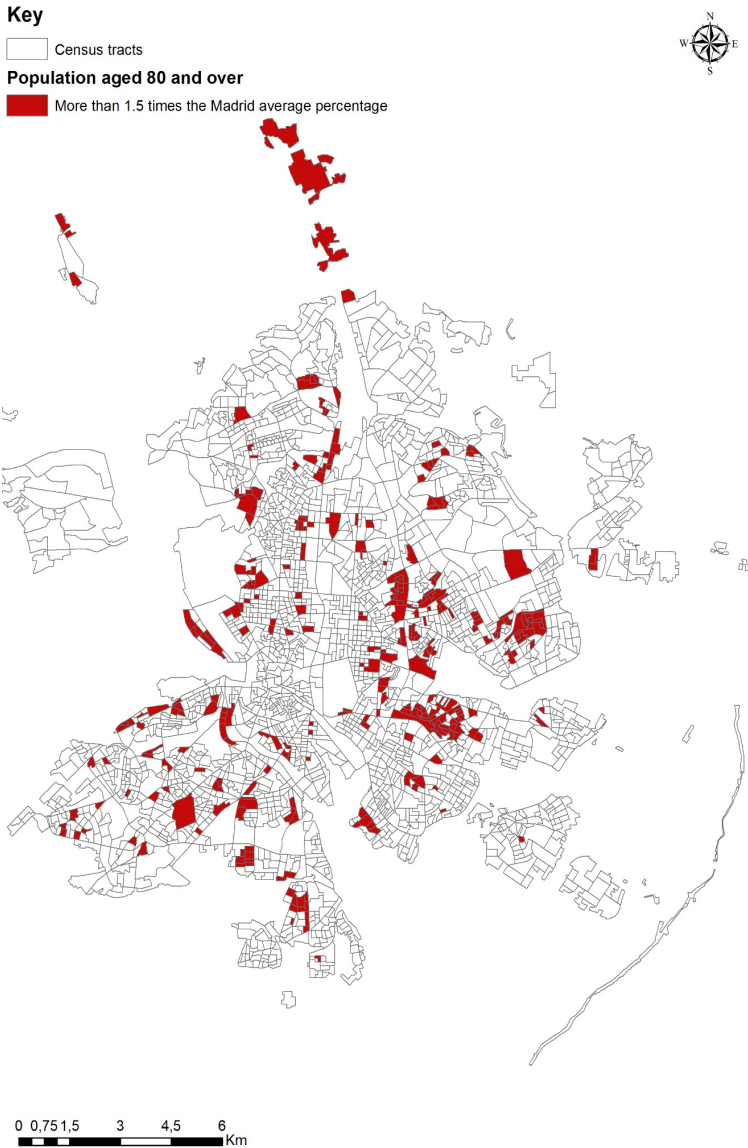


Figure 1. Census tracts with vulnerability problems due to the concentration of population aged 80 and over. Source: Municipal Register of Inhabitants on January 1st, 2016 and Cadastral database for the municipality of Madrid as of December 2016.

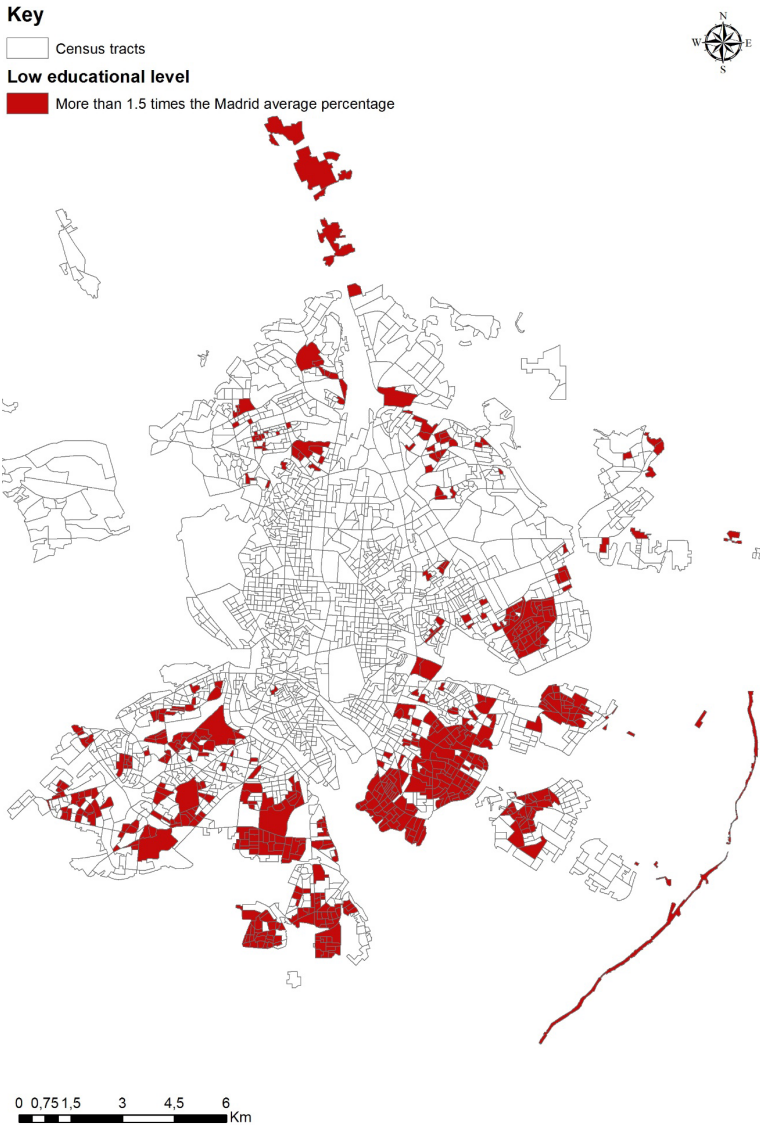


Figure 2. Census tracts with vulnerability problems derived from the concentration of population with low educational level. Source: Municipal Register of Inhabitants on January 1st, 2016 and Cadastral database for the municipality of Madrid as of December 2016.

“HOUSING” IN THE CONTEXT OF URBAN VULNERABILITY

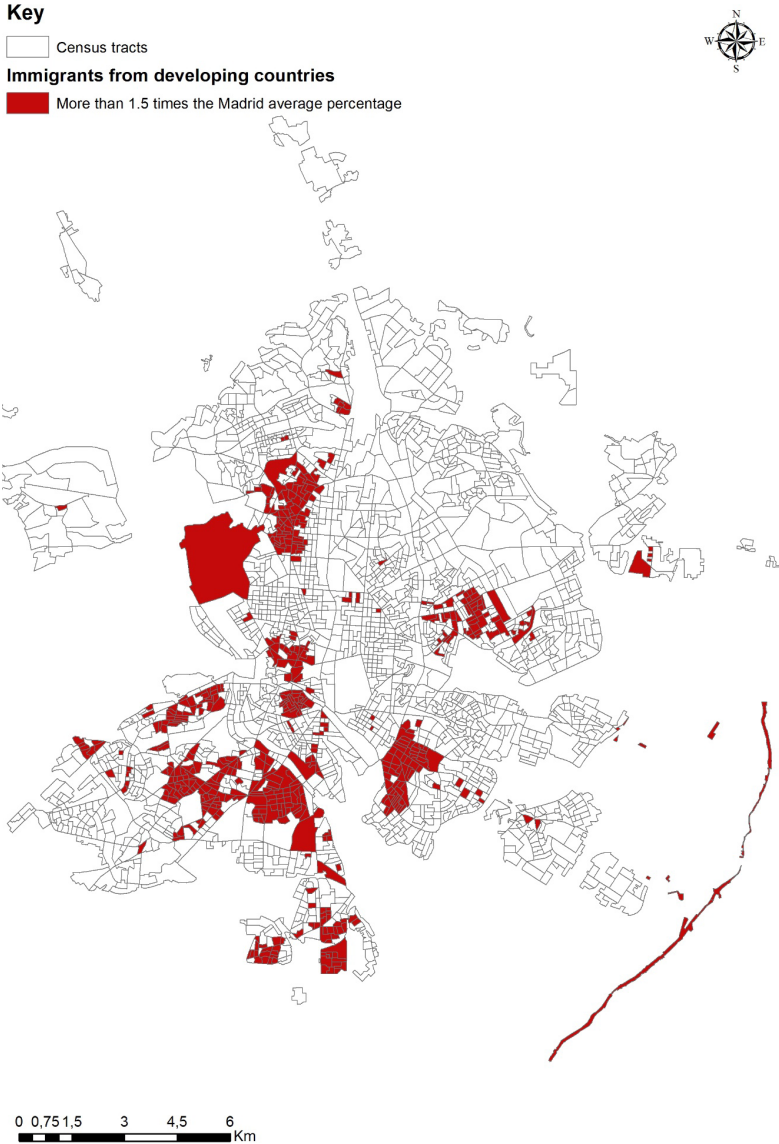


Figure 3. Census tracts with vulnerability problems derived from the concentration of immigrants from developing countries. Source: Municipal Register of Inhabitants on January 1st, 2016 and Cadastral database for the municipality of Madrid as of December 2016.

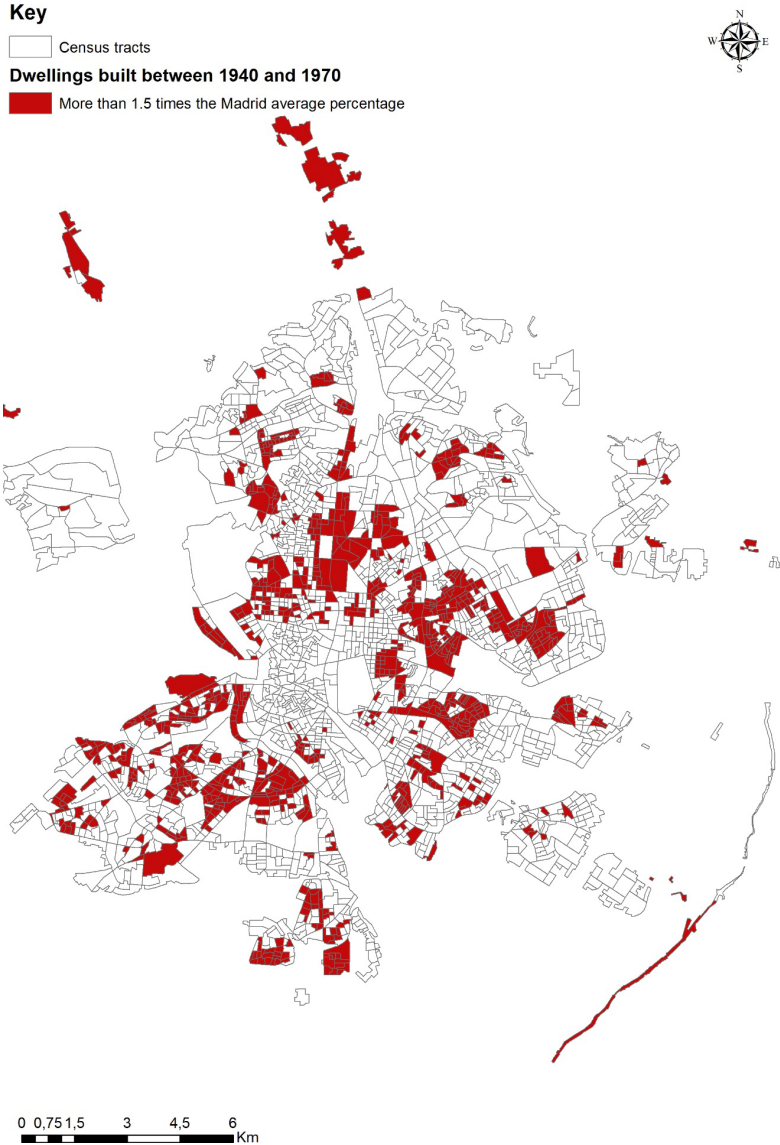


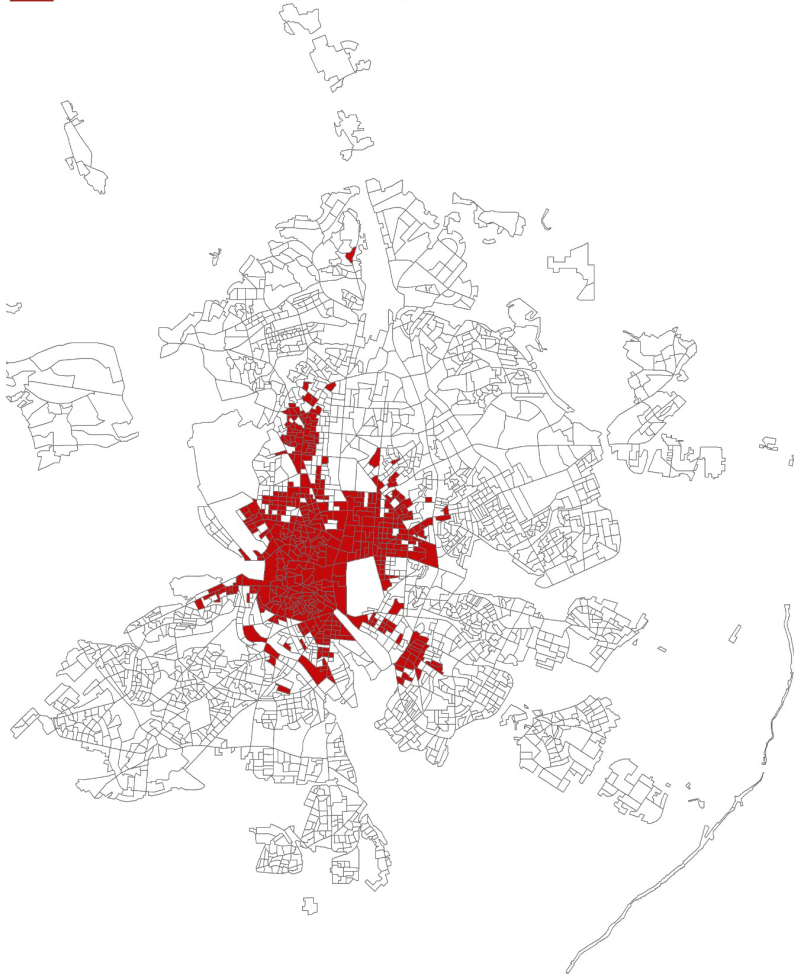
Figure 4. Census tracts with vulnerability problems derived from the concentration of dwellings built between 1940 and 1970. Source: Cadastral database for the municipality of Madrid as of December 2016.

Key

□ Census tracts

Dwellings built before 1940

■ More than 1.5 times the Madrid average percentage



0 0,75 1,5 3 4,5 6 Km

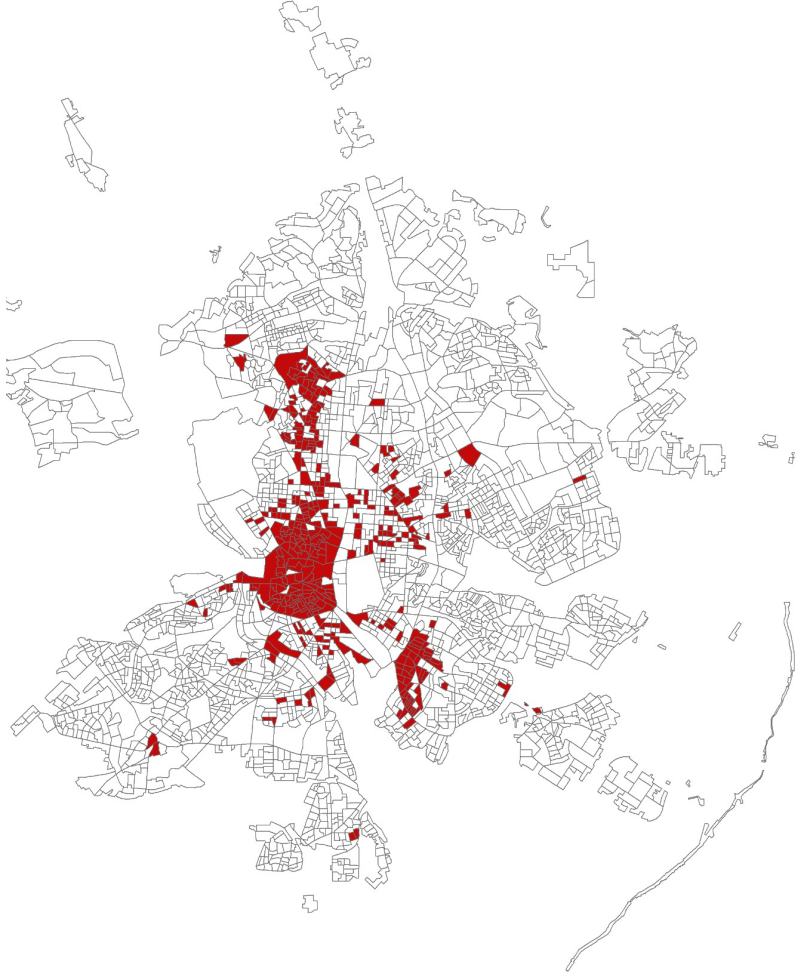
Figure 5. Census tracts with vulnerability problems derived from the concentration of dwellings built before 1940. Source: Cadastral database for the municipality of Madrid as of December 2016.

Key

□ Census tracts

Dwellings of less than 30m²

■ More than 1.5 times the Madrid average percentage



0 0,75 1,5 3 4,5 6 Km

Figure 6. Census tracts with vulnerability problems arising from the concentration of dwellings with a surface area of less than 30m². Source: Cadastral database for the municipality of Madrid as of December 2016.

From what has been said above, certain patterns of vulnerability appear to be seen that have something to do with a dominant geographical location of sociodemographic indicators analysed in the peripheral districts and suburbs. Low educational levels and the high presence of immigrants also seem to be focused on the Southern districts and neighbourhoods such as Latina, Carabanchel, Usera, Villaverde or Vallecas and some areas like Tetuán o Lavapiés. In turn, the indicators relating to housing also show patterns of individual location, where small sized older houses appear in the central area for the most part, that is, in the districts and neighbourhoods of Centro, Chamberí, Salamanca or Retiro, plus some isolated enclaves such as Tetuán or Puente de Vallecas. The housing built between 1940 and 1970 tends to be concentrated in almost all peripheral districts, as was the case with the population of 80 years old and over.

5.2. Identification of distressed urban spaces based on housing and sociodemographic indicators: contrasted spatial patterns

The results obtained for the two sets of selected variables (sociodemographic indicators and housing indicators) and the resulting mapping that is attached (Figures 8 and 9) show that while the housing indicators tend to interact and intensify in the central areas (Centro district) and in specific tracts to the North and East of the central core, to which should be added the neighbourhood of Puente de Vallecas in the Southeast and outside the first ring road (M-30), the vulnerability arising from the sociodemographic indicators presents a spatial distribution pattern associated to the presence of annexed towns and social housing estates built between the 1950's and 1970's to accommodate the most vulnerable sectors of the rural exodus who arrived to work in the capital, and that are preferably located to the North (neighbourhood of Fuencarral) and in a border that runs from the west to the East (Puerta del Angel, Vista Alegre, Villaverde, Los Angeles, San Cristobal, Usera, Entrevías, Puente de Vallecas and San Blas-Canillejas) of the central areas of the built-up area of the city, plus some tracts in the North-East (neighbourhood of Hortaleza).

In general, the sociodemographic vulnerability presents a pattern of spatial segregation in which most of the tracts identified are located outside of

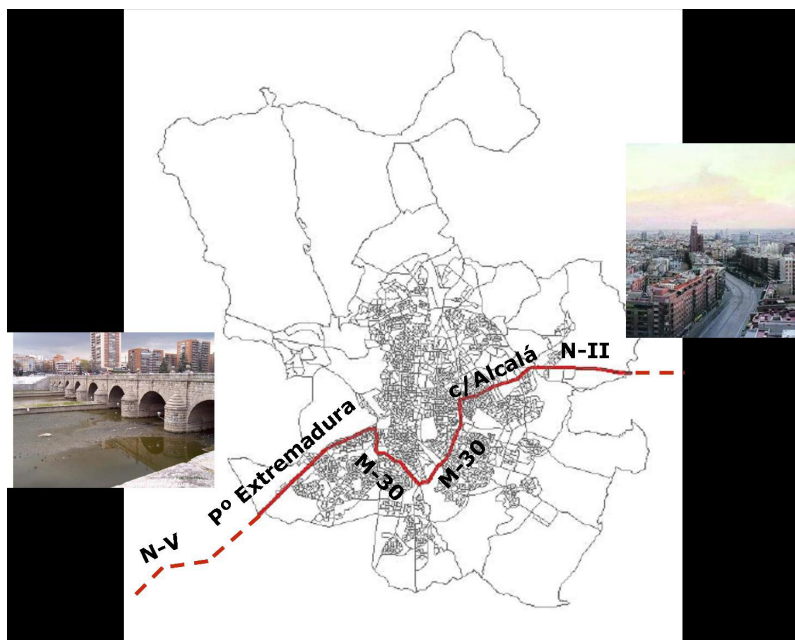


Figure 7. The poverty line of Madrid municipality. Source: Enrique Montoliu Martínez. Madrid Statistics Department.
http://www.madrimasd.org/blogs/salud_publica/wp-content/blogs.dir/97/files/770/o_linea2.jpg.

the urban central core in the Southern half following the so-called “poverty line”³⁷, neighbourhoods characterised as vulnerable areas that respond to the typology of open block estates built between the 1950s and 1970s and to which it would be necessary to add the cases of the historical colonies (Figure 7). Thus, the poverty line, after entering through the Puente de Segovia, clearly borders the Southern stretch of the M-30. This inner ring road motorway separates, on its two sides, two very different social realities. This North/South pattern we also find in more recent studies that attempt to represent the geographical distribution of social deprivation.

³⁷ E. Montoliu, *La línea de la pobreza del municipio de Madrid*. Madrid, Departamento de Datos Estadísticos del Ayuntamiento de Madrid, 2008.

In turn, the vulnerability associated to housing is concentrated basically in the historic centre, with older houses and a high proportion of small sized accommodation, but also in the *Ensanche* (urban extension dating back to the second half of the 19th century) and peripheral settlements and annexed towns (Cuatro Caminos-Tetuán, Guindalera, neighbourhoods of Numancia and San Diego in the Puente de Vallecas, etc) which were contemporaries of the progressive development and occupation of the Ensanche. In the latter two cases the working class that began to arrive in Madrid at the beginning of the 20th century found a space where to build with the minimum possible rules and although much of the pockets of substandard housing that existed at the beginning of the last decade of the 20th century have disappeared, there are still some neighbourhoods with very precarious indices. Tetuán was already a suburb of enormous extension in the early 20th century, its expansion toward the South was merged with the so-called suburb of Cuatro Caminos and in 1948 it was incorporated into Madrid, becoming an independent district in the division of 1955 and remained as such in subsequent divisions. At the present time, Tetuán is the district with the highest socioeconomic contrasts of Madrid, contrasts that are also reflected in the buildings, with neighbourhoods that are typologically as well as morphologically very different. It can be said that Bravo Murillo street serves as a border between the most aged and, in some cases, most degraded areas, and those that have experienced a more intense urban and population transformation. In this way the neighbourhoods of Bellas Vistas, Berruguete and Valdeacederas, show a structure of lower storey houses, with a semi-rural character and certain architectural "primitivism" and more basic roads; which does not prevent that on the other side of Bravo Murillo street, the neighbourhood of Cuatro Caminos still retain examples of small affordable housing built at the beginning of the 20th century for migrants that came from the rural world.

The spontaneous, irregular and fragmented city on the outskirts, which grew from the end of the 19th century next to main roads on the basis of peripheral building plots has also left its legacy in the district of Puente de Vallecas, more specifically in the current neighbourhoods of Numancia and San Diego. It is a space with a suburban origin and typological heterogeneity that

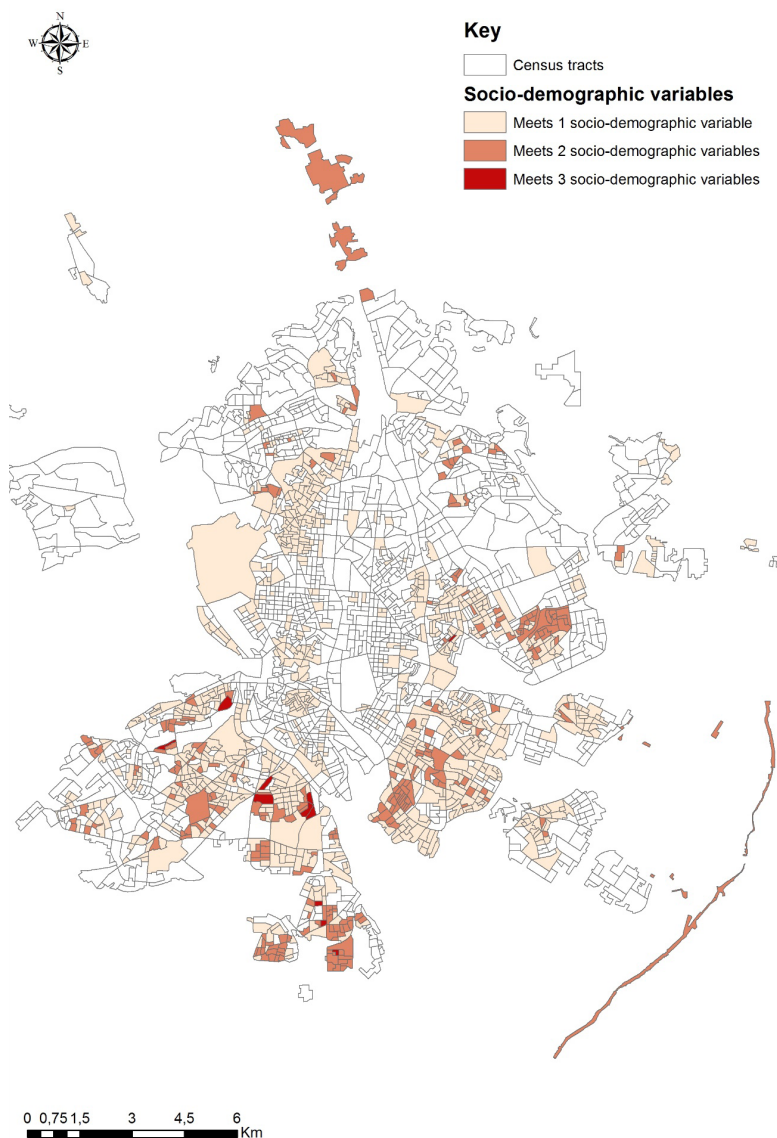


Figure 8. Census tracts with vulnerability problems derived from the concentration of different socio-demographic variables. Source: Municipal Register of Inhabitants on January 1st, 2016 and Cadastral database for the municipality of Madrid as of December 2016.

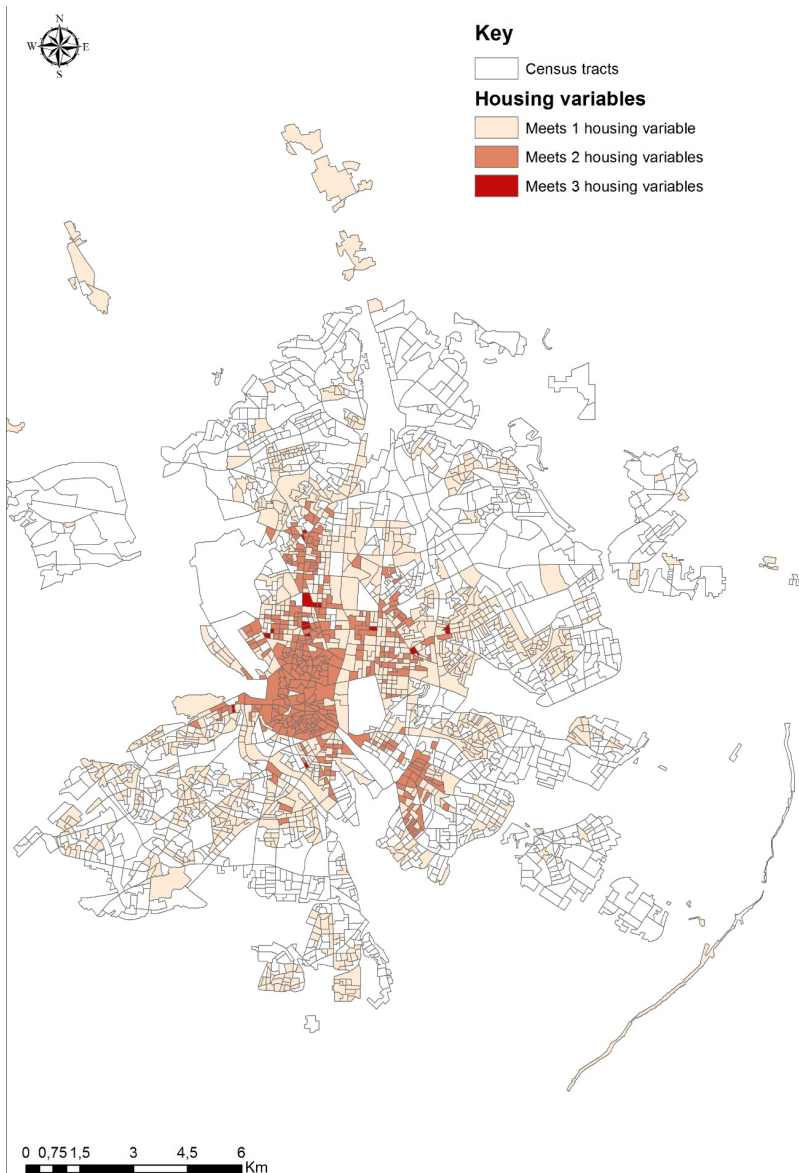


Figure 9. Census tracts with vulnerability problems derived from the concentration of different housing variables. Source: Cadastral database for the municipality of Madrid as of December 2016.

has gradually been densifying and renewing³⁸. The problems of residential fabric are associated with the age of the building, which can partly be alleviated by public and private intervention over time, and the small size of the houses. However, the lack of appropriate intervention policies in a disadvantaged neighbourhood and exclusive attention to the intervention on the physical environment related to housing and the urban fabric explain the relative failure of integrated rehabilitation programmes that have not been able to resolve the needs arising out of the socio-economic condition of the residents.

With regard to *Ensanche* (districts of Salamanca and Chamberí), and for the readers who are not familiar with these urban spaces linked to the bourgeoisie, they may find it curious that a large group of census tracts are located there that meet two or more indicators of vulnerability. One should remember that in them there are areas in which the type of housing consists of a first block of homes of higher quality and size that face the street, and that these hide from view two, three or even more bays of lower quality housing and with very much smaller living conditions. In addition, the district of Salamanca has, at its Eastern end, in contrast with the widespread perception of *Ensanche* as a space built to accommodate the upper classes, less known neighbourhoods such as La Guindalera, an area with working class origins where we can still find brick buildings dating back to the late 19th and early 20th centuries. Their origin, in the second half of the 19th century, is located in private plots from land owners given over to different construction companies to build a neighbourhood in the suburbs of the capital.

In other cases, such as the Northern part of the Arganzuela district, in contact with the South of the historical centre, this was included from its origin as a part of the *Ensanche*; it was intended to serve as the headquarters for the industry that was established as part of the railways, installed in the city since 1850, and to create modest neighbourhoods for the workers, thus distancing them from other urban areas of greater social level. Today the most obvious morphological feature is the contrast between an old building, prior to the

³⁸ A. Palacios, *Barrios desfavorecidos urbanos. De la identificación a la intervención. Madrid como laboratorio*. Madrid, Madrid Autonomous University Publisher, 2006.

war and other recent one, from the gradual disappearance of industry and the compaction and renewal of the workers' houses in the last half century. This contrast transcends the mere physical appearance and is situated at social level, because the urban morphology is substantially a transcript of the socio-economic structure of its inhabitants. In the Northwest of the historic centre, another neighbourhood that also accumulates indicators of vulnerability in its housing stock is Argüelles. Again a neighbourhood integrated in the *Ensanche*, although not originally part of it, and a splendid example of Madrid bourgeois.

5.3. The spatial distribution of vulnerability: by way of synthesis

To complete this block of analysis we will return to the methodological proposal of three broad categories of vulnerable spaces/census tracts under the intensity and severity of the characters of vulnerability and study their patterns of spatial distribution. To begin, it should be noted that the results of our research largely coincide with other constraints of a similar nature made in the past for the municipality of Madrid³⁹, which already gives us an idea of the institutionalisation problem of urban vulnerability and, more specifically, the existing residential problem in the municipality.

In the light of the results of our study, we can say that more than half of the census tracts identified by their problems of vulnerability are outside of the "Urban central core" of Madrid, with a preferential location in neighbourhoods located to the South/South-East of Madrid, within which some authors have called them spaces defined by the poverty line⁴⁰. From the morphological point of view, it is, for the most part, characterised by their origin as neighbourhoods of open block estates, built between the 1960s and the 1970s of the last century, to which should be added a not inconsiderable number of historical colonies. They are for the most part vulnerable spaces understood

³⁹ F. Antón, L. Cortés, C. Martínez, and J. Navarrete, 2008. A. Hernández Aja, 2007. A. Hernández Aja, M. Vázquez Espí, C. García Madruga, A. Matesanz Parellada, E. Moreno García, J. Alguacil Gómez, and J. Camacho, 2011. V. Pérez, 2007. R. Temes, 2014.

⁴⁰ E. Montoliu, 2008.

as dynamic and unstable areas, which can evolve in two directions⁴¹. One way would be to go towards exclusion, which would happen if the vulnerability status persists in time, the other way would be to go towards integration, which would be achieved if the population is helped with appropriate measures to achieve this.

In this group of spaces we should include the aforementioned neighbourhoods of Numancia and San Diego in the Puente de Vallecas, San Blas, Fuenarral at the Northern end of the municipality, or the neighbourhood of San Cristóbal de Los Angeles in the district of Villaverde, South of the capital. In fact, a recent study on the neighbourhood of San Cristóbal de Los Angeles defined it as the example of the precariousness as a state (Río, 2016), a qualification that could be extended to a good part of the tracts marked by problems of medium and high vulnerability. This is a neighbourhood in which the low quality of the urban landscape, motivated, above all, by the constant repetition of the basic architectural model used, the fragility of the construction materials and the disconnection between occupied spaces and free spaces, is joined by the social fragility of its resident population, essentially composed of retired people, which corresponds to the population that originally occupied the neighbourhood, followed years later by the entry of residents of gypsy origin and, in recent years, due to the arrival of successive waves of immigrants, unskilled and unemployed people, which come to the capital and find in the neighbourhood affordable housing, even facilities for a possible “squatting”⁴². In short, all of them spaces which in the growing urban social fragmentation between the rich and the poor areas of Madrid belong according to the indicators managed to the furthest end of the side of the poor.

⁴¹ R. Castell, “De la exclusión como estado a la vulnerabilidad como proceso,” *Archipiélago*, 21, (1995), pp. 27-36.

⁴² I. del Río, “El barrio de San Cristóbal de los Ángeles. La precariedad como estado,” in *Estudios de Geografía Urbana en Tiempos de Crisis. Territorios inconclusos y sociedades rotas en España*, ed. by D. Brandis, I. del Río, and G. Morales, Madrid, Biblioteca Nueva, 2016, pp. 137-156.

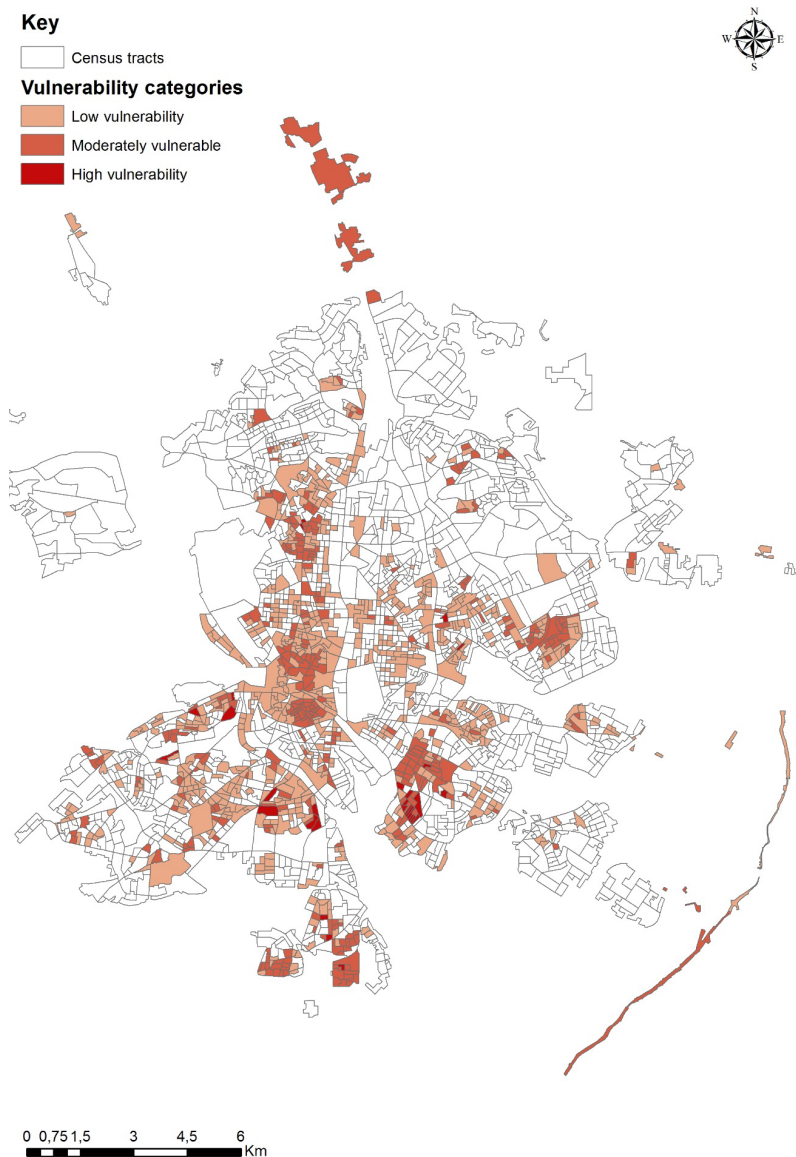


Figure 10. Census tracts with vulnerability problems derived from the concentration of different socio-demographic variables. Source: Municipal Register of Inhabitants on January 1st, 2016 and Cadastral database for the municipality of Madrid as of December 2016.

To this whole set of spaces outside the “Urban central core” would have to be added the census tracts identified by problems of vulnerability in the historical centre and in the most degraded neighbourhoods of the Tetuán district. The coincidence of the vulnerable areas identified and areas delimited by the Integrated Rehabilitation Areas are more than 50% in these central spaces. What is certain is that the rehabilitation policies (housing rehabilitation, re-qualifying of public spaces, and comprehensive rehabilitation programmes for neighbourhoods) already have a long tradition in these central areas, especially in the historical centre, which dates back to the 1980s. However, budgetary constraints, management difficulties, and changes of a clear neo-liberal hue in the municipal policy from the 1990s explain the persistence of pockets of substandard housing and the institutionalisation of vulnerability in certain neighbourhoods before the presence of re-qualification/gentrification processes in others.

In short, an approximation of the magnitude and spatial patterns of vulnerability mapping, in the municipality of Madrid which is intended to serve as a framework and reference to assess the policies and practices deployed to fight and eradicate vulnerability in the capital of the state.

6. Assessing municipal policies and practices dealing with residential vulnerability

The current housing policy in Spain, as in other European countries, is to a large extent the inheritance of the interventions over the last century, and especially in the last fifty years⁴³. Thus, for example, from the beginning of the 1990s, from neo-liberal currents, are extended a willingness to reduce public intervention in housing issues in order to alleviate the heavy financial burden supported in the past. It is understood that the huge housing needs of the post-war years and the period of strong urban industrial growth are already overcome and that the time had come to look for less onerous solutions and

⁴³ J. Vinuesa and A. Palacios, “Una reflexión necesaria. Marco normativo y organizativo”, in *La vivienda social en Europa. Alemania, Francia y Países Bajos desde 1945*, ed. by L. Moya, Madrid, Mairca Libros, 2008, pp. 38-73.

greater participation of private entities. However, all countries continue to have severe housing problems, although they are more or less short-term and focused on specific areas of the centres and the peripheries of large urban agglomerations. In the same vein, extensive and intense public intervention has also been materialised in large social housing stocks, with a common feature at present, which is an important physical deterioration and a certain segregating nature of the more disadvantaged social groups, with the social conflict resulting from these. A good proof of this is that many vulnerable areas in Madrid have to do with such indicated practices.

On the other hand, the strong financial demands and management difficulties, never totally resolved in a very satisfactory manner, along with a strong support for the increase of the homeowner households, are the main vectors of a new side to the housing policy, which is reflected in the increase of stimulus measures to purchase housing, while free and social rental housing is contracting. In Spain the very low presence of rental (11.4%), especially social housing (2%), obliges us to consider the urgent need for an increase in this type of accommodation, to achieve as other countries are trying to do, a more diverse and balanced market⁴⁴.

The evolution of social housing stock to rent in the municipality of Madrid has been particularly negative in the last decade. In this context, there is a particularly critical assessment of the consequences arising from the sale of social housing to private managers triggered by the lack of funds of the public bodies after the outbreak of the financial-real estate crisis. The town council of Madrid in 2013 sold 1,800 public housing units in 18 developments to the real estate group Magic Real State Blackstone for 128.5 million euros. Almost at the same time, the IVIMA (Housing Institute of Madrid region) delivered 3,000 flats from the Young Plan to the Goldman Sachs and Azora investment funds, which paid 201 million for them.

⁴⁴ A. Palacios, and J. Vinuesa, "Un análisis cualitativo sobre la política de vivienda en España. La opinión de los expertos", *Anales de Geografía de la Universidad Complutense*, XXX, (2010), pp. 101-118.

Despite the need to rehabilitate, in an integrated manner, the existing city and despite the interest of the experiences carried out, we can establish that until the arrival of the last real estate crisis (initiated in 2007) the Integrated Urban Regeneration in Madrid has had, in the framework of public housing policies, a marginal presence compared to the dimension of new building. In this context, we cannot forget to mention here the *Neighbourhoods in Refurbishment* Programme, a project that addressed the eradication of substandard housing settlements (shanty settlements and public housing in ruins) in an urban redevelopment process in which the Administration accepted the leadership of the Neighbourhood Associations and that lasted between 1979 and 1996. The programme finally affected 30 districts of very different characteristics with a total of 39,000 housing units constructed for a housed population of around 150,000 people and this significantly changed the South-East periphery of Madrid. The capital went from offering a periphery of mud and shacks, which were closer to a city in the third world than a European capital, to neighbourhoods with good habitability generally well integrated into the continuous urban landscape⁴⁵. The new homes were built shaping the city. In this way, whole pieces of the city such as Palomeras and Pozo del Tío Raimundo in the Vallecas district or Orcasitas area in Villaverde and Usera radically changed their urban image.

After the outbreak of the crisis, there have been several initiatives that point to the action in the consolidated fabric as a priority, both at European level, with the Toledo Declaration in 2010, as at Spanish level, with the approval of the State plan for the development of rental housing, rehabilitation of buildings, and urban regeneration and renewal and *Law 8/2013 for urban rehabilitation, renewal and regeneration*. The Integrated Urban Rehabilitation has now become a central part of the speech of institutions and technicians.

⁴⁵ F.J. Bataller, R. López de Lucio, D. Rivera, and J. Tejera, "Operaciones públicas de remodelación integral de barrios," in *Madrid Siglo XX. Guía de Urbanismo*, Madrid, Ayuntamiento de Madrid, 2004, pp. 228-243. T. Heitkamp, "Die Stadterneuerung von Fontarrón-Palomeras (Madrid)," *Jahrbuch Stadterneuerung* 1994, (1994), pp. 311-330.

In a first phase (1978-1991), the intervention in urban areas was regulated independently from the housing plans. The main features of the programmes for Integrated Rehabilitated Areas (IRA) were established and the first operations financed by the housing plans started, dedicated mainly to the financing of new buildings. The framework of the state housing policy evolved to its stabilisation at the beginning of the 1990s, at which time the distribution of competences and operational structures were developed. During the second phase (1992-2012), in which there were six state housing plans, the intervention in IRA was consolidated as a programme more within the plans, acquiring complexity with its development. Since 2013 the state housing policy has taken a turn and is determined as the main objective of the rehabilitation process, which culminates with the establishment of a new legal framework for rehabilitation, following the adoption of Law 8/2013.

In this legal context, the most benefited district from the performances of integral rehabilitation affecting vulnerable neighbourhoods in which the weight of the indicators of inadequate housing is key has been the Historical Centre or Centro district, in the unfolding of intervention programmes from the 1980's. To this space should be added, more recently, the Area of Integrated Rehabilitation of Tetuán and of San Cristobal de Los Angeles. In the case of Tetuán, despite the differences with the historic centre, it is an intervention on an area with a position of centrality and an urban morphology of buildings between party walls, similar in many respects to the rehabilitation areas of the Centro district. The second case corresponds to interventions on an area with open planning morphology whose origin dates back to the 1960s. In 2010 the Urban Renewal Plan of the Manzanares River began, with the will to accompany the transformation process resulting from the burial of the first ring road (M-30), the so-called *Calle 30* and *Madrid Rio* projects. Due to the extent of the area concerned, this had an impact on both urban centre areas with closed blocks between party walls as on neighbourhoods characterized by high-rise buildings in a layout of open volumetry.

However, much remains to be done yet, despite the positive balance of these intervention areas, there are many neighbourhoods with vulnerability problems which have not yet been intervened or this has not been done with

sufficient intensity or public commitment. In addition, in spite of the fact that there has been a substantial improvement in conditions in a large number of dwellings and free spaces, the action of the interventions has been conditioned by the possibilities or private will of intervening on the inside of the houses, so often the intervention occurs on the public space and the substandard housing situations persist. To all this should be added the fact that, in the central areas, the listing of the buildings sometimes involves a rigid constraint for interventions on the dwellings⁴⁶.

Most of the neighbourhoods and vulnerable urban fabrics identified in this contribution already appeared in the repertoires of vulnerable neighbourhoods of 2001 and 2006 prepared for the whole of Spain by the Spanish Ministry of Development, in the framework of the OECD, and in academic studies carried out in the previous decade and already mentioned such as Agustín Hernández Aja entitled *Análisis urbanístico de barrios desfavorecidos: Catálogo de áreas vulnerables Españolas* and that of Rafael Temes with the title of *Banco de Indicadores para la valoración de la vulnerabilidad del suelo urbano consolidado de uso predominantemente residencial* for the town council of Madrid. In addition, the fact is that between the studies conducted in 1991 and 2001 there was an increase of the resident population in vulnerable neighbourhoods. As some specialists confirm⁴⁷, if the urban model applied, as well as redistribution policies applied in boom times did not allow to reduce the differences in our cities, what can we expect from a period in which these policies have been on the verge of disappearing or being diluted into a framework of reduction or liquidation of the Welfare State. From a spatial point of view, urban vulnerability has increased very significantly in the suburbs, both in open-block towers built in the 1960-1975 period, during which the corruption of the Franco regime was allied to a real estate system in pursuit of the greatest profit, as in the peripheral building plots that were the way of the contemporary growth

⁴⁶ J.M. Ezquiaga Domínguez, J. Barros Guertón, and G. Peribáñez Ayala, "La rehabilitación como sector de futuro en Madrid", *Barómetro de Economía de la ciudad de Madrid*, XXXV (1), (2013), pp. 103-142.

⁴⁷ J. Alguacil, J. Camacho, and A. Hernández, 2014.

of the *Ensanche*, but built outside this with the minimum standards for the accommodation of the working class that began to reach the cities at the beginning of the 20th century. In other words, this dubious honour of being the spaces in which urban vulnerability increases in the most significant way, goes hand in hand with the two historical peripheries that housed the masses of the working class of our cities.

Since the beginning of the 21st century, the town council of Madrid has assumed the problem of the territorial imbalance of the city and has begun a new stage in which it collaborates with those living in the most precarious neighbourhoods of the city through the Regional Federation of Neighbourhood Associations of Madrid to diagnose their problems and propose possible solutions. At the beginning of the past decade an investment plan was started for the most deprived districts and neighbourhoods of the capital. *The Special Plan for District Investments*, which amounts to 472 million euros from 2004 to 2009, was established in 2004 and involves six municipal districts, mostly located in the periphery of Madrid. In turn, the Neighbourhood Investment Plan, designed in 2008, has led to the management, implementation and monitoring of preferential actions, distributed in two time periods, from 2009 to 2013 and from 2013 to 2016 (Figures 11 and 12). The total investment in the first period, which benefited 16 neighbourhoods, amounted to little more than a million euros. In the second period, the Neighbourhood Investment Plan lowered to 9 the neighbourhoods that benefited.

With the coming to power of the new left in the town council in June 2015, a reorientation of policies was produced in Madrid⁴⁸ to combat the vulnerability that, in keeping with the *Neighbourhood Plans*, incorporates the so-called 'Territorial Rebalancing Funds'. This starts from the idea that in the

⁴⁸ C. Herranz Muelas, "Ayuntamientos del cambio y políticas urbanas. La acción de los movimientos sociales en la ciudad de Madrid", International Conference Contested Cities. From CONTESTED_CITIES to global urban justice - critical dialogues, Madrid, July 4th - 7th 2016, Axis 5, Article n° 5-516, 2016. <<http://contested-cities.net/working-papers/2016/ayuntamientos-del-cambio-y-politicas-urbanas-la-accion-de-los-movimientos-sociales-en-la-ciudad-de-madrid/>>/



Figure 11. Location of the 16 disadvantaged neighbourhoods benefited by the Neighbourhood Plans 2009-2012. Source: <http://www.madrimas.org/blogs/salud_publica/files/2010/03/planesbarrio0912.jpg>.



Figure 12. Location of the 9 disadvantaged neighbourhoods benefited by the Neighbourhood Plans 2013-2016. Source: <<http://www.madrivad.es/portales/munimadrid/es/Inicio>>.

city there is a historical imbalance, which especially affects the districts South and East of the city, and it is intended that the Territorial Rebalancing Fund will lead different actions and projects that can serve to begin to balance the municipality and cover some of the basic needs of the neighbourhoods and districts. More specifically, the funds are an instrument intended to intervene in less-favoured areas or neighbourhoods, as well as implement specific needs to improve facilities, urban planning and social development of the city as a whole. During 2016 the fund was endowed with 30 million euros to develop more than 100 projects distributed throughout the city in its different districts, and structured around 5 axes: employment, housing, improvement and adaptation of the urban environment, facilities and services, as well as intervention and social promotion.

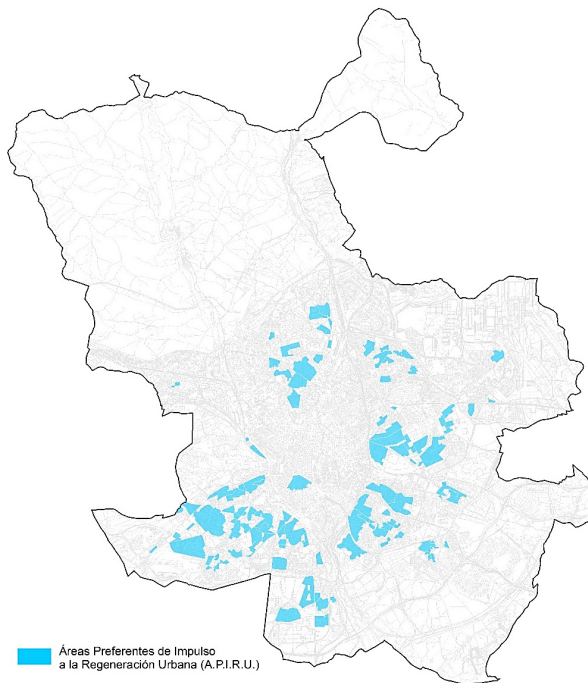


Figure 13. MAD-Re Plan. Target areas to promote urban regeneration in distressed neighbourhoods. Source: Madrid, Urban Development Area, 2016.

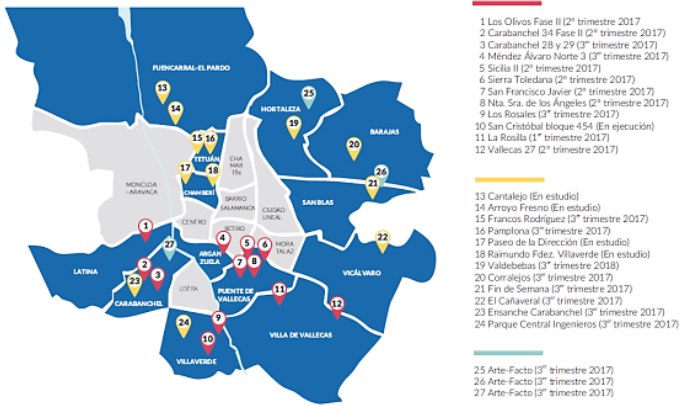
In order to identify the neighbourhoods with greater needs, there is a methodology that allows the 128 neighbourhoods (and therefore the districts) in Madrid to be sorted according to their rebalancing needs. For the selection of the dimensions to be taken into account in this study (and of the indicators that allow them to be measured), they start from other reports and studies previously published by various government entities, among others: the *Informe Urbanístico de Barrios Vulnerables* (2011) from the Observatory of Vulnerability of the Ministry of Public Works and Transport, the *Informe sobre el desequilibrio y reequilibrio intraurbano de Madrid* (2013), the *Informe de desigualdad* (2015) from the Economic Barometer of Madrid city council, the *Estudio de Salud 2014* published by Madrid Health (2015) and the *Informe de identificación de barrios vulnerables y prioridades de intervención* (2015) from the Government Area of Sustainable Urban Development of Madrid. To get to know which areas suffer the most imbalance problems, 7 synthetic indicators were crossed: Estimated rate of registered unemployment, percentage of inhabitants who were not born in Spain, registered unemployed among the 16-19 years, the unemployed without unemployment allowance, gross income per capita, life expectancy at birth, and a synthetic index of urban vulnerability in the Area of Sustainable Urban Development, which includes: age of the building, the cadastral value of the building, percentage of aging population and percentage of population with no education. The resulting mapping repeats, by and large, the same patterns of location of vulnerable neighbourhoods identified in previous studies (Figure 13).

In the framework of these new programmes the housing projects will be allocated to correct inequalities of access and to cover needs of social emergency. To do this, 3 T.R.A. (Territorial Rebalancing Actions) are planned that consist of social housing for rent with public facilities; and acquisition of public housing for emergencies, as well as a Support and continuity office for the rehabilitation programme in the Centro district. All these actions will be managed from the Municipal Housing and Land Company (EMVS).

During the first year of implementation of this fund eight intervention projects for housing have been funded that have been distributed in six districts of the city (Fuencarral, Carabanchel, Hortaleza, Villaverde, Vicálvaro, and San Blas-Canillejas), according to the ranking of vulnerability developed in 2016,

with a total cost of €4,045,000. All of them are projects already executed or currently under development in different areas: projects of social intermediation for social rental between apartment owners and tenants, acquisition of public housing for emergency housing and construction of public housing.

In close interaction with the *Neighbourhood Plans* is also the *Municipal Plan for Housing of the Town Council of Madrid*, which provides for the construction of more than 4,000 housing units until the end of its term. For the moment, work has begun on the building of a housing development located in San Cristobal de Los Angeles, and it is expected that in the first half of 2017 building will be started for work in the colonies of San Francisco Javier and Nuestra Señora de los Ángeles, in Puente de Vallecas. The land where the new houses will be built are located in the districts in which the most demand has been registered: Fuencarral-El Pardo, Tetuán, San Blas-Canillejas, Barajas, Carabanchel, Puente de Vallecas, Villa de Vallecas, Villaverde, Vicálvaro, Latina, Retiro, Chamberí y Hortaleza, thus contributing to the spatial balance, one of the challenges of the Government of the capital (Figure 14). Both the housing that the EMVS has in its assets, such as the 4,000 to be built will be destined only and exclusively to rent and in no case for sale, a figure that was eliminated with the arrival of the new municipal government to preserve the heritage, severely eroded by the sale to the investment funds in the previous legislature. Since 2012 there has been no housing construction promoted by the EMVS, the last one being delivered in the "Colonia de los Olivos," the first phase, in the Latina district. The second phase of this development was scheduled to start in June 2017. The purpose of the town council of Madrid is, precisely, to reach the level of existing public housing in the years prior to the sale of municipal housing estate to investment funds. In fact, the decline in public housing stock is evident from 2010. The EMVS had more than 10,600 homes in December of that year. In December 2012 this had fallen to 8,719, and when the current government team arrived at the Town Council, it barely exceeded 6,000. With the construction of these more than 4,000 homes it is intended to respond to the high demand and to start the way so that Madrid can be equivalent to other European capitals in the provision of public housing that, at present, is only 1%.



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Figure 14. Municipal social housing plan 2016-2019. Source: <<http://www.espomadrid.es/2017/02/plan-vivienda-del-ayuntamiento-de.html>>.

7. Conclusions

The lack of statistical information, study and, in short, knowledge about the market and the housing problem, with the necessary spatial disaggregation, prevent Spain being able to create a solidly based policy, with a vocation for temporary stay and with capacity to effectively impact on the causes. Obviously, the fact that, since the last decades of the 20th century, the real estate market, and more specifically the housing market, was dominated by agents and private interests does not contribute to improving the problem.

Residential vulnerability, as a facet of residential urban vulnerability, and the policies and actions to eradicate it were deferred during the real estate boom years (1997-2007) in favour of a model of residential and urban expansive and dispersed development that reached the highest levels recorded since the 1960's both in the number of housing units constructed as in the land occupied and that implied the abandonment of the consolidated city. After the financial-real estate bubble burst, the cities were found with a huge real estate assets that had

never been used, oversized structures and urban developments that were paralysed and of dubious economic profitability. To all this tangible legacy should be added the inherited urban models, contained in the overall planning and designed in a completely different socio-economic context. In turn, and parallel to the processes described above, the regulatory framework of housing policies has redirected part of its objectives, committing to urban rehabilitation and regeneration as an alternative to growth.

As with the previous housing schemes, the local administration is present in the management of the urban rehabilitation and renewal operations, including those related to the empty housing stock. Town councils are bodies in charge of proposing areas to rehabilitate, dealing with the grants once these are approved and adopted, as the case may be, the corresponding urban planning instrument for implementation equal distribution, necessary to qualify for public aid. However, recent legal changes continue without resolving some of the problems to address the situation of the residential housing stock in worse condition. The traditional policy of subsidies has proved ineffective, in order to facilitate the improvement of the houses inhabited by people of lower income, and the attempt to derive maximum benefit from the rehabilitation operations runs the risk of transferring the speculation model to the inhabited fabric⁴⁹, sometimes favouring gentrification and touristification processes.

On the other hand, it would be important to ensure that the rehabilitation does not only serves the real estate sector that passes for a revision of the model provided for in the urban planning by linking housing needs with the deficiencies of the residential housing stock, its degree of underutilisation and causes, and the needs of the population. In this sense, it should be recalled that in the municipality of Madrid there were 14,000 social housing applications recorded until 31 January 2017, of which 11,970 had already been registered to meet all the requirements, while the rest were in the management process finalising some procedure required in the awarding regulations.

The coming to power of the new left in June of 2015, known as the city councils of the change in Spain, meant a transformation in the political framework

⁴⁹ R. Rodríguez Alonso, I. Rodríguez Suárez, and A. Hernández Aja, 2016.

that links the municipal citizen-based platforms, which make up the new local governments, with the movements and social groups that have been manifesting more strongly and breaking into the social landscape in recent years. To assess the extent to which a particular social movement has been able to achieve some of its objectives impacting heavily on local politics and thus offering anti-neoliberal alternatives is extremely complicated. In fact, for now the municipal policy in the field of social housing and vulnerable neighbourhoods tries to, on the one hand, regain lost ground with the construction of a public housing stock of social housing that will compensate for that sold and privatised during the previous mandate, and to address the comprehensive rehabilitation of neighbourhoods and the territorial rebalancing from participatory and agreed proposals with the social fabric of the affected neighbourhoods. For the time being, after just two years ago, the achievements are very modest. However, the empirical research lines that are opening up on housing policies and urban regeneration of the city of Madrid and its relationship with collective action are exciting. Some of the questions that should be responded are what changes and what continuities can be seen in the institutional attitudes of the city of Madrid, with regard to the housing and regeneration/revitalization policies of neighbourhoods? Is there a relationship between these changes in attitude and social movements such as the 15-M? Have they been able to transform these movements and move specific urban demands to the institutions? We are confident that the study and follow-up of all these processes over the coming years will provide answers to some of these questions.

Acknowledgements

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This volume provides a detailed overview of new developments in the housing policy and governance sector in southern Europe following the financial crisis and the burst in the housing bubble. The contributions collected in this volume touch on changes such as immigration and the movement of people, the financial and economic crisis and new poverties, urban changes such as the degradation of public tenures, social movements, and touristification. The papers also provide an overview of new policy trends. The development paths of the countries under study show some commonalities but also some important differences.

In analysing individual new trends in the countries at stake, the book spotlights the development and the direction of Southern European housing.

Housing provision, policies and governance in southern Europe are under constant change. The kind, scope and outcome of these changes will need to be further monitored and analysed as will any benefit generated for those demanding affordable housing opportunities.

Elena Bargelli is full Professor of Private Law at the University of Pisa. From 2012 to 2015 she was one of the team leaders of the project Tenancy Law and Housing Policy in Multi-level Europe, which received funding from the European Union's Seventh Framework Programme. From 2014 to 2017 she acted as one of the coordinators of the working group Southern European housing under the European Network of Housing research (ENHR).

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II

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