URBAN POVERTY PARTNERSHIP:
REPORT ABOUT URBAN DEPRIVATION/POVERTY OBSERVATORIES IN THE EUROPEAN UNION

GIAU+S UPM (UNIVERSIDAD POLITÉCNICA DE MADRID RESEARCH GROUP)
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ACKNOWLEDGEMENTS

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1. INTRODUCTION

1.1. Scope of the report

The Urban Poverty Partnership (UPP) is an initiative created by the Urban Agenda for the European Union in the Pact of Amsterdam (2016). The aim in this priority area of the agenda is to reduce urban poverty and improve the inclusion of people in or at risk of poverty in deprived neighbourhoods, and to promote the creation of better (EU) policies with an impact on the inclusion of vulnerable groups and the regeneration of these neighbourhoods. The territorial dimension of urban poverty is an important issue due to the structural concentration of poverty in Urban Deprived Areas and Neighbourhoods (UDAN).

Poverty has a spatial dimension, but there is a lack of open access and awareness of the possibilities for comparing statistical data on urban poverty, disaggregated at the sub-municipal level (district, neighbourhood, census sector, postcode, etc.).

To achieve this goal, a transversal priority of the Urban Poverty Partnership (UPP) is to develop data to identify, measure, monitor and evaluate urban poverty. The action plan of the UPP therefore includes a proposal to set up a European network of national observatories with experience in urban poverty (Action 2) by creating a single European website (a one-stop shop) to compile relevant statistics on urban poverty that can be used by urban authorities and other actors to deliver evidence-based policies to fight urban poverty. It will be based on the experience of national observatories.

This report is framed within this context. The Urban Poverty Partnership through Ecorys UK commissioned GIAU+S (Research group on Architecture, Urbanism and Sustainability of Universidad Politécnica de Madrid) to conduct a survey of existing national observatories with experience in urban poverty, and to produce a report analysing its results.

The study focuses on national observatories of urban poverty in deprived neighbourhoods or areas in the EU. It is very important to define the type of observatory included in this study in order to understand the scope of this work. A national observatory is considered to be a mapping tool with statistical information related to poverty/deprivation at the intra-city (neighbourhood) level, allowing the identification of "deprived neighbourhoods" or "pockets of deprivation" at the national scale. Some approaches to the territorialisation of urban poverty have therefore been discarded because they did not focus on the neighbourhood scale or referred to the entire national territory.

The report also aims to explore the potential relationship between these national observatories and evidence-based public policies, and –more particularly– national policies or programmes for urban regeneration. However, this would require a specific work of analysis which is beyond the scope of this work.

Two main public policy approaches can be distinguished to combat problematic urban poverty clusters: addressing the most pressing policy sectors (employment, education, health, housing, etc.) and concentrating on the most deprived geographic areas.

Sector-based interventions, in a "people-based approach", are not linked to any particular spatial level, but focus on improving the situation of low-income individuals or households with specific needs regardless of where they live. These interventions do not directly affect the deprived areas themselves but may have positive effects on them.

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Area-based interventions, constituting a "place-based approach", concentrate on deprived areas and do not focus on individuals in general but on neighbourhoods and their residents. Typically, they include "hard" or physical measures such as physical restructuring or upgrading programmes (e.g. demolition, new infrastructure, housing regeneration, etc.) and "soft" or social regeneration measures, such as fostering the skills, social capital and building capacity of the people living in the area through work integration and training programmes, local festivals and others. Area-based policies follow the assumption that focusing on places with specific problems (e.g. concentration of poverty) will improve the situation of their inhabitants.

There appears to be a consensus that the key to success in tackling urban poverty is to replace individual interventions with complex policies that integrate the two types of intervention paradigm.

1.2.   Preliminary methodological issues

This report has been based on a brief but intense research carried out through two approaches that have been conducted in parallel: a survey aimed at the managers of previously determined observatories; and an in-depth review of the institutional websites where the different observatories and reports detected on the study of Urban Deprived Areas or neighbourhoods (UDANs) in the EU are hosted.

To elaborate this report, it has been used the following steps. Firstly, from a list of contacts provided by the coordinators of the partnership, it was made a register of institutions related to the observation of Urban Poverty in Europe.

A first contact mail was sent to introduce this project, encouraging them to take part in answering a survey (See 11. Annex. Survey about Urban Deprivation/Poverty Observatories in the European Union). From the 29 countries contacted, 11 do not answer our mail. Other group of 10 countries declare not having developed an observatory or having developed some analysis on the territorialisation of urban poverty, but not outputs at sub-city scale for their entire national territory. Finally, a group of 8 countries was analysed in-depth to make this report, which are Belgium, Denmark, England, France, Ireland, Netherlands, Romania and Spain. All of them have got some sort of national observatories or report about urban deprived areas at sub-city level.

Once the observatories were identified they have been analysed. The research process has consisted in two different points: 1) a survey to the Urban Poverty Observatories in Europe which has been completed by themselves, 2) and an in-depth research of tools, studies or reports and all available information in the official observatories' website.

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Country	Answer	Have a UDAN observatory?	Name	Contact person
Austria	Yes	No		
Belgium	Yes	Yes*	Analyse dynamique des quartiers en difficulté dans les régions urbaines belges	Taïs Grippa y Gilles Van Hamme (University). Sabine Amato (SPP)
Bulgaria	No	-		
Croatia	No	-		
Cyprus	No	-		
Denmark	Yes	Yes	The Ghettolist	Anders Hüttel
Estonia	No	-		
Finland	No	-		
France	Yes	Yes	Observatorie National de la Politique de la Ville	Stephanie Mas
Germany	Yes	No		Jürgen Göddecke-Stellmann
Greece	No	-		
Hungary	No	-		
Ireland	Yes	Yes	POBAL Deprivation Index	POBAL Agency
Italy	Yes	No		
Latvia	Yes	No		
Lithuania	Yes	No		
Luxembourg	Yes	No	STATEC (National statistical agency of Luxembourg)	Mr. Charlie Klein and Mr. François Peltier
Malta	No	-		
Netherlands	Yes	Yes	Leefbaarometer	Mailbox
Poland	Yes	No		
Portugal	No	-		
Romania	Yes	Yes*	Atlas of marginalized urban areas Atlas of marginalized rural areas	Mrs Manuela Stanculescu
Slovakia	No	-		
Slovenia	Yes	No		
Spain	Yes	Yes	Observatory of Urban Vulnerability in Spain	Eduardo de Santiago Pablo Fidalgo
Sweden	No	-		
United Kingdom	Yes	Yes	Index of Multiple Deprivation for England	Mailbox
Switzerland	Yes	No		National Statistics: Thomas Priester Geneva: Laboratoire d'Economie appliquée. Universitá de Geneva

*For these countries it has been analysed a specific report in a sub-city level

Table 1. Answers of the countries and analysed observatories
Source: Own elaboration

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2. GENERAL MAPPING OF OBSERVATORIES RELATED TO URBAN POVERTY IN EUROPE

As previously mentioned, this report is focused in the analysis of National Observatories of Urban Deprived Neighbourhood/Areas in Europe. As it can be seen later, two cases corresponding to National Reports instead of National Observatories was included in the analysis because they incorporate interesting methodological approaches.

During the research process, other interesting tools have been detected in some UE countries. Although that are not the object of this report it seems necessary to give a general overview about the different tools found. For a better understanding, they have been classified according to the two main criteria detected in the different cases: on the one hand, the territorial scope of the observatory (national, regional, local); and on the other hand, the minimum unit of aggregation space (municipality level or sub-municipality level) used in each of the observatories.

The result is collected in the following table:

Scope of analysis		Scope of the tool	Minimum spatial unit of aggregation	
			Municipality	**Sub-municipality**
	National	**Observatories**	Belgium** Germany	Denmark* England France Ireland Netherlands Spain
		Report		Belgium** Romania
	Regional Observatories			Canton de Gèneve (Switzerland) Comunitat Valenciana (Spain)
	Local Observatories			Vienna Lisbon

*   Denmark is a special case, as will be explained later
** Belgium presents two different tools: a national report at sub-city level and a national observatory at municipality level

Table 2. General mapping of European observatories depending of scope of the tool and minimum spatial unit of aggregation
Source: Own elaboration

2.1.   National observatories of Urban Deprived Areas or Neighbourhood (UDAN)

Some member states (France, United Kingdom, Spain, Netherlands, etc.) have developed various online visualisation or mapping tools (GIS: Geographical Information Systems) that give local authorities and citizens access to poverty indicators at the sub-city district (SCD) level in order to identify deprived neighbourhoods and compare their indicators with the national or regional averages.

2.1.1. Denmark

Denmark, through the Danish Ministry of Transport, Building and Housing, has developed a method to identify public housing areas with social and integration problems. The result is a list of deprived areas or neighbourhoods known as the *Ghettoliste* which is updated once a year. Since 2002, this has been part of a

government strategy for the elimination of ghettos ("Ghetto Plan: A Denmark without parallel societies- No ghettos in 2030")[1].

Ghetto policy has endorsed the discourse on "parallel societies"[2] as a threat rather than an opportunity that has a negative impact on immigration, counteracts efforts in the areas of employment and social welfare and leaves children and young people with poor job and educational prospects. This view holds that large housing estates, which are physically and socially isolated from the surrounding community, create good conditions for the emergence of parallel societies with deviant norms of behaviours and values and constitute a democratic threat to social cohesion.

Two types of deprived areas are defined: exposed residential areas and ghetto areas. Each area must have at least 1,000 residents.

An *exposed residential area* fulfils at least two of the following five criteria:

1. Proportion of immigrants and descendants from non-western countries exceeds 50%.

2. Proportion of residents aged 18-64 years who are not in the labour market or education exceeds 40%.

3. Number of people convicted for criminal or weapons offenses or the law on euphoric substances exceeds 2.7% of the number of residents.

4. The proportion of residents aged 30-59 with only primary education exceeds 60%.

5. The average gross income for people excluded from education between the ages of 15 and 64 is less than 55% of the average gross income for the same group in the region.

To qualify as a *ghetto area*, it must be included on the list of vulnerable residential areas and meet at least two of the three initial ghetto criteria for:

1. Share of population with a criminal record over 2.7%

2. Share of population not in the labour market or in education over 40%.

3. Proportion of immigrants and descendants from non-western countries over 50%.

If the area has over 60% of immigrants and descendants from non-Western countries it is directly considered a ghetto area without the need to meet any other condition.

The *Ghettoliste* is not actually a conventional observatory. The information obtained through the Ministry of Transport, Building and Housing website is quite limited, containing a list of ghetto areas, updated yearly, and a schematic map of their location in the county. It includes definitions and criteria on the delimitation of ghetto areas and links to government's strategy for eliminating these areas but lacks any detailed analysis of each area or any mapping tools.

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[1] https://www.regeringen.dk/nyheder/ghettoudspil/

[2] Parallel society refers to the self-organisation of an ethnic or religious minority, often immigrant groups, to achieve a reduced or minimal spatial, social and cultural contact with the majority society into which they immigrate. The term was introduced into the debate on migration and integration in the early 1990s by the German sociologist Wilhelm Heitmeyer. This discussion came to prominence in the European public discourse following the murder of the Dutch director and critic of Islam Theo van Gogh.

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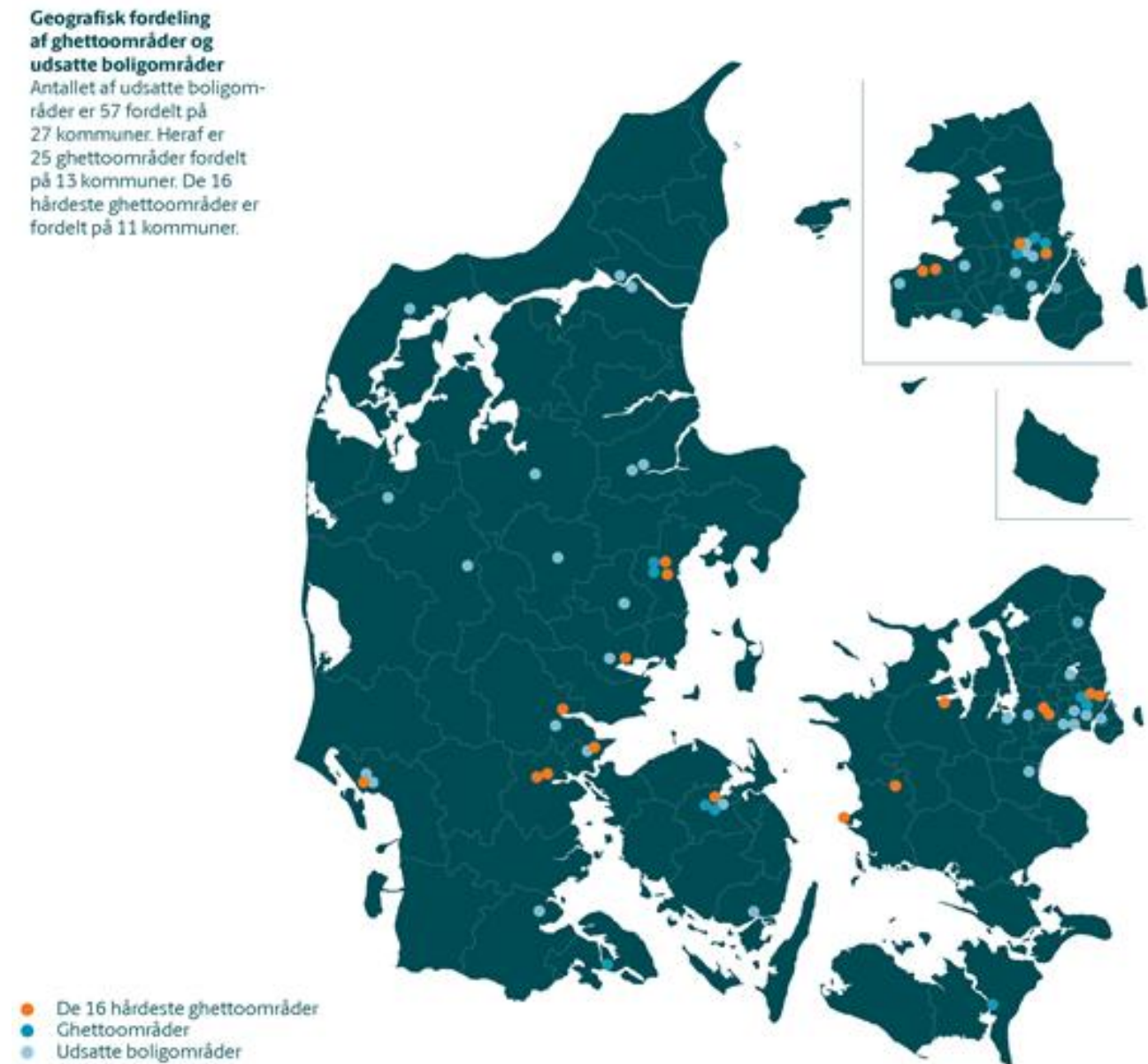
Figure 1. Geographical distribution of ghetto areas and exposed areas in Denmark
Source: https://www.regeringen.dk/nyheder/ghettoudspil/liste-over-ghettoer-og-udsatte-bolig-omraader/

2.1.2. England (UK)

Measures to combat deprivation have a long tradition in the UK, and all use different census variables or give different weights to the same variables. Each country in the UK has its own index, but all are derived from two main methodologies: the Townsend Index and its subsequent developments; and the Indices of Deprivation produced by communities and local government (CLG). We focus on the latter, but we should make a brief reference to the first.

The Townsend Index is an area-based measure and can be constructed for any geographical area for which census data are available, but which makes extensive use of the 1981, 1991 and 2001 censuses throughout the UK. It is usually calculated for wards, enumeration districts (EDs) and output areas (OAs)[3], and is based on four deprivation indicators: non-home ownership, non-car ownership, unemployment and overcrowding.

Indices of deprivation are mainly produced by communities and local government (CLG) to measure deprivation for every lower layer super output area[4] (known as LSOA in England, Wales and Northern Ireland and SIMD in Scotland). In the case of England, since the 1970s the Department for Communities and Local Government has calculated local measures of deprivation. The latest version of these statistics, the English Indices of Deprivation 2015, updates the 2010 indices. It is important to note that these statistics are a measure of relative deprivation, not affluence, and to recognise that not everyone in a highly deprived area will themselves be deprived. Likewise, there will be some deprived people living in the least deprived areas. The English Indices of Deprivation 2015 are based on 37 separate indicators, organised across seven distinct domains of deprivation which are combined, using appropriate weights, to calculate the Index of Multiple Deprivation 2015 (IMD 2015). This is an overall measure of multiple deprivation experienced by people living in an area and is calculated for each lower layer super output area (LSOA) or neighbourhood in England. Each neighbourhood of this kind in England is ranked according to its level of deprivation relative to that of other areas. There is no definitive threshold above which an area is described as "deprived" or "highly deprived"; the indices are a continuous scale of deprivation. Users often take the most deprived 10% or 20% of neighbourhoods (or local authority districts) to constitute the group of highly deprived areas, but other thresholds can be used.

The observatory can be accessed through the website of the Ministry of Housing, Communities and Local Government, but not directly: users first need to click on *Statistics at MHCLG* and then on *Latest Statistics releases* to obtain the *Collection of statistics on English indices of deprivation*. Once inside, it is possible to access the databases of the different series (2000, 2004, 2007, 2010 and 2015). This collection contains data and documents relating to the deprivation indices.

The section on the English Indices of Deprivation 2015 allows access to various publications and two important tools: an open database[5] with all the indicators for each LSOA and the Indices of Deprivation 2015 Explorer[6] mapping tool.

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[3] Enumeration districts (EDs) are the most finely-grained units of census geography in England and Wales while in Scotland they are known as output areas (OAs). They are contained within wards and postcode sectors.

[4] Lower-layer super output areas are small areas designed to be of a similar population size with an average of approximately 1,500 residents or 650 households. There are 32,844 lower-layer super output areas (LSOAs) in England. They were produced by the Office for National Statistics for the reporting of small-area statistics.

[5] http://opendatacommunities.org/def/concept/folders/themes/societal-wellbeing

[6] http://dclgapps.communities.gov.uk/imd/idmap.html

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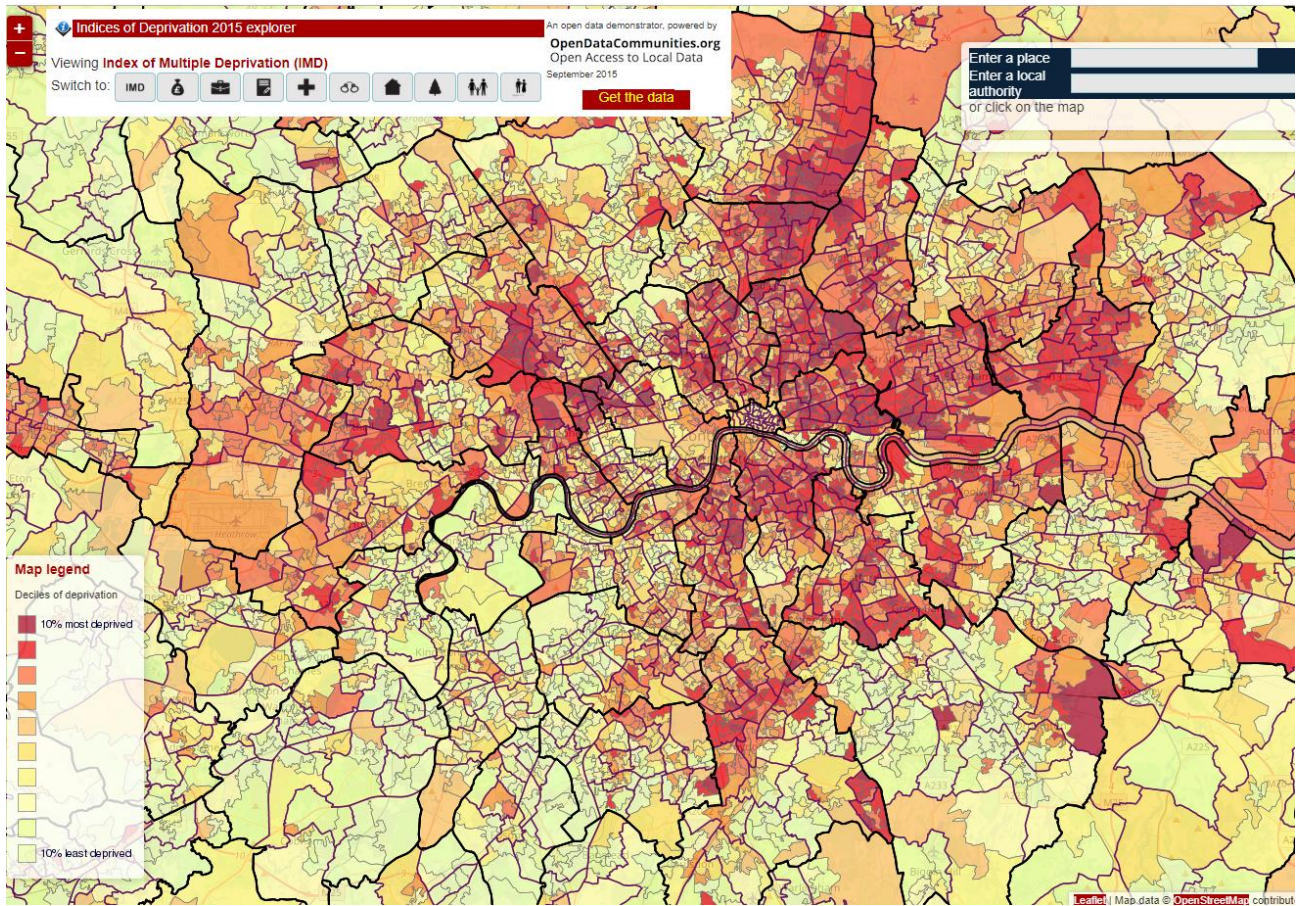
Figure 2. Index of Multiple Deprivation (IMD)
Source: http://dclgapps.communities.gov.uk/imd/idmap.html
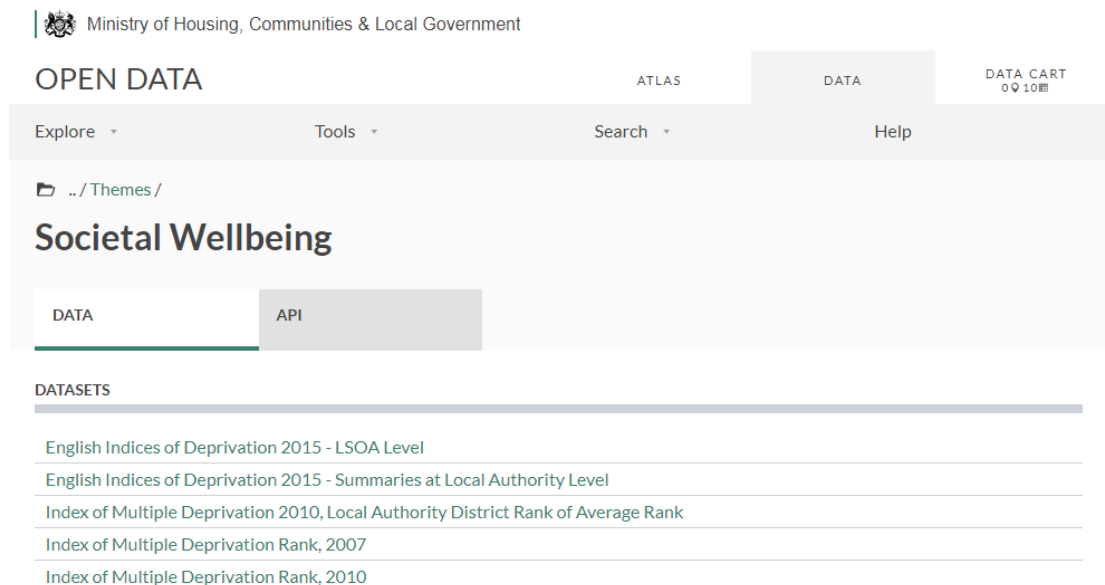
Figure 3. Societal Wellbeing datasets from Ministry of Housing, Communities & Local Government
Source: http://opendatacommunities.org/def/concept/folders/themes/societal-wellbeing

2.1.3. France

In France, *l'Observatoire National de la Politique de la Ville (L'ONPV)* was created in 2016 by the Planning Act for the City and Urban Cohesion (*Loi de Programmation pour la Ville et la Cohésion Urbaine)* adopted in 2014 and plays a major role in the city's policy in the knowledge of priority neighbourhoods. This observatory is part of the *Commissariat Général à l'Égalité des Territoires (Ministère de la Ville).* It succeeded the National Observatory of Sensitive Urban Areas (*l'Observatoire National des Zones Urbaines Sensibles,* ONZUS) and the Evaluation and Monitoring Committee of the National Urban Renewal Agency (*Comité d'Évaluation et de Suivi de l'Agence Nationale pour la Rénovation Urbaine,* CES de l'ANRU). This change aims to simplify the old agencies and redefine the perimeters of intervention in the priority areas of the city's policy to concentrate resources towards the most problematic zones. The superposition of zonings (sensitive urban area (ZUS), urban revitalization zones (ZRU), urban contract of social cohesion (CUCS), ...) and the dissemination of the resulting credits have been replaced by a single perimeter: the priority neighbourhoods for city policy (*quartiers prioritaires*, QPV).

Figure 4. L'Observatoire National de la Politique de la Ville website
Source: http://www.onpv.fr/accueil

Since 2015, this list of *quartiers prioritaires* has been compiled based on a single criterion: income. The methodology identifies urban population clusters with low incomes from a fine grid (200x200 metres) in the metropolitan territory. The approach is twofold and uses two indicators: the district's position in terms of income in the agglomeration where it is located, and its position in terms of income in metropolitan France. The result is the identification of approximately 1,300 neighbourhoods with over 1,000 inhabitants located in agglomerations of more than 10,000 inhabitants. Priority neighbourhoods are only identified in areas of over 1,000 people whose boundaries are predetermined by the ministry after consultation with local elected representatives. The final delimitation is issued as a law by the government. The method has been adapted for overseas territories. The radical change in methodology precludes any diachronic analysis of the evolution of *quartiers prioritaires* before 2015.

This observatory *(l'Observatoire National de la Politique de la Ville, l'ONPV)* provides access to periodical publications and specific analyses on *quartiers prioritaires.* It also has a geographical information system[7] on the *politique de la ville* to obtain dynamic information though mapping tools and an open database. Of particular interest is the collection of atlases which include dynamic maps and a complete thematic file for each of the domain topics (demography, education, professional insertion, income and economic fabric) containing an exhaustive analysis with unmeasurable variables.
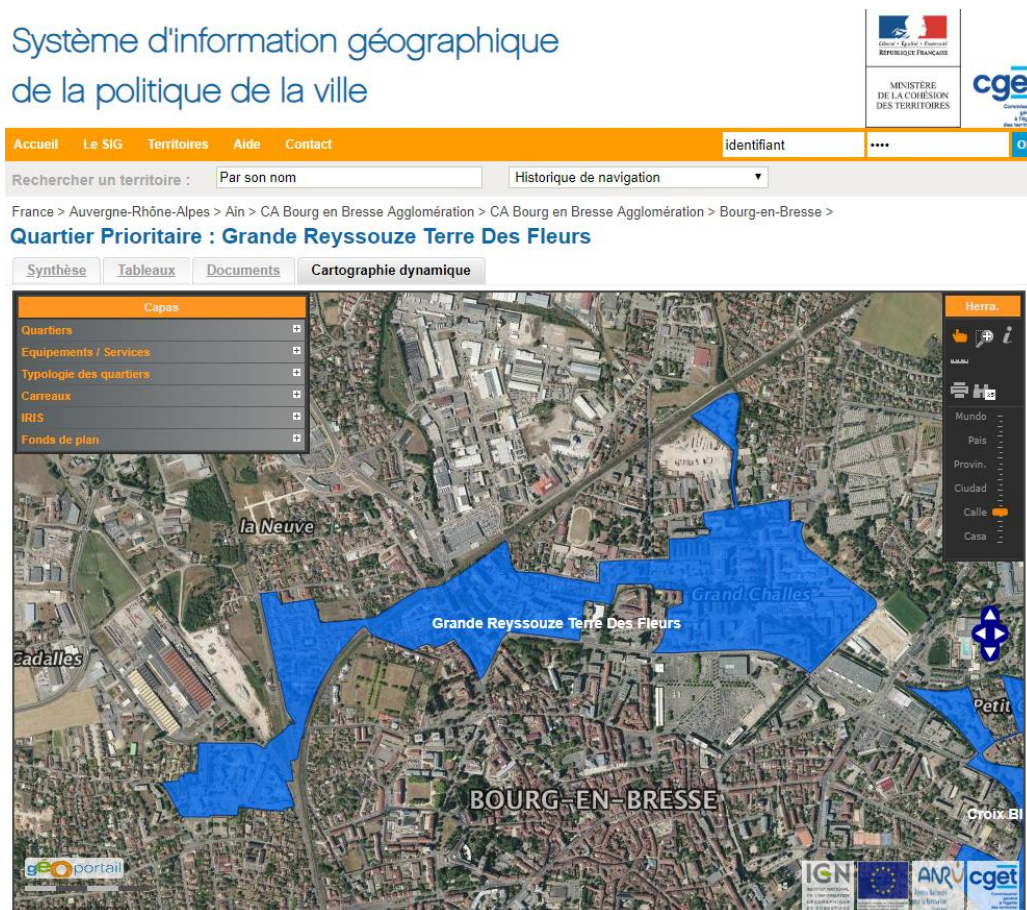
Figure 5. Priority neighbourhoods prioritized by the NPNRU
Source: https://sig.ville.gouv.fr/Cartographie/QP001001

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[7] https://sig.ville.gouv.fr

2.1.4. Ireland
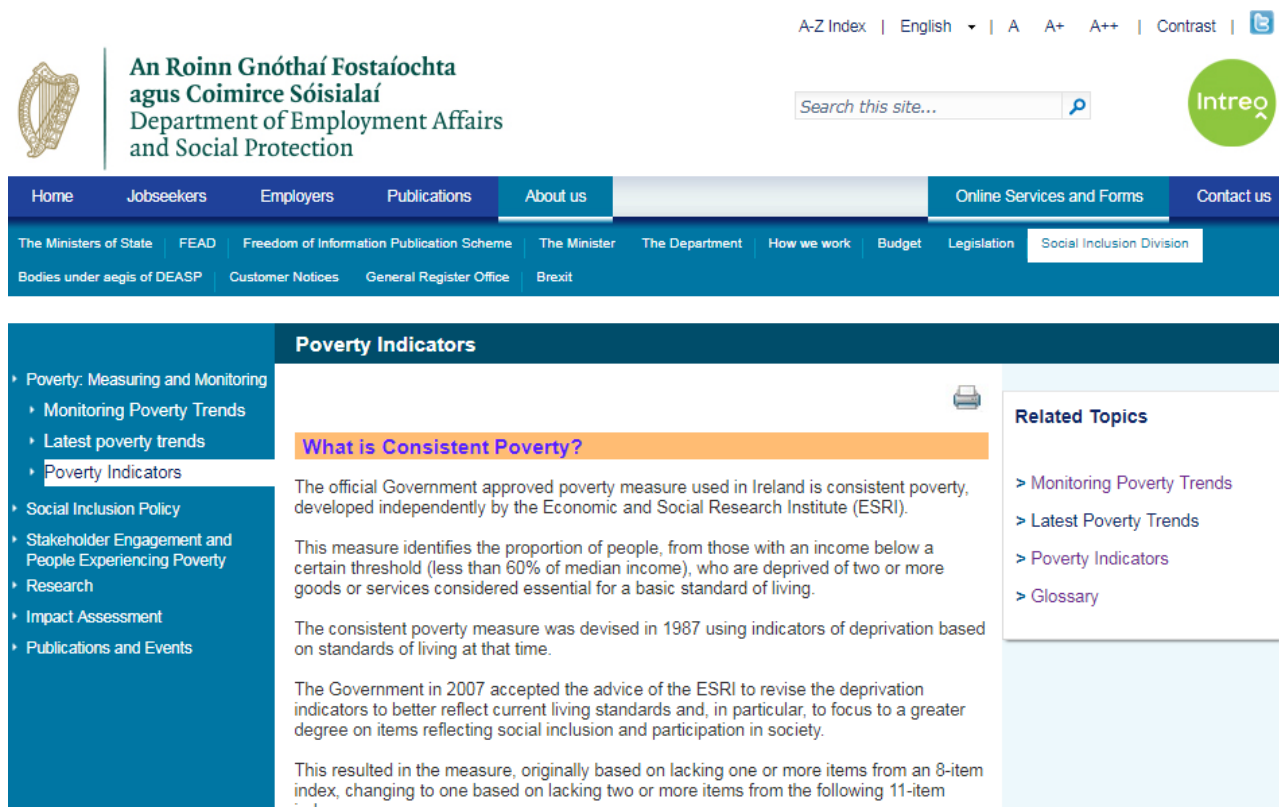
The Irish Government defines poverty as follows: "People are living in poverty if their income and resources (material, cultural and social) are so inadequate as to preclude them from having a standard of living which is regarded as acceptable by Irish society generally. As a result of inadequate income and resources, people may be excluded and marginalised from participating in activities which are considered the norm for other people in society" (Government of Ireland, 1997).

This definition reflects the multidimensional nature of poverty and is confirmed in the Updated National Action Plan for Social Inclusion 2015-2017, the basis for the revised National Social Target for Poverty Reduction 2012.

The official measure of poverty in Ireland is "consistent poverty". The consistent poverty measure was devised in 1987 using indicators of deprivation based on standards of living at that time. This indicator is the overlap of two component indicators:

- At-risk-of-poverty, which identifies individuals with household incomes below 60% of the median; and

- Basic deprivation, which captures individuals lacking two or more of 11 basic necessities.

This measure reflects the multidimensional understanding of poverty and is designed to identify the population with the greatest needs in terms of being both income-poor and deprived.

Figure 6. Irish poverty indicators website
Source: http://www.welfare.ie/en/Pages/Poverty-Indicators.aspx

In 1992, the Irish Government, in agreement with the European Commission, set up a non-profit organisation called Area Development Management Ltd. (ADM) as an intermediary company working on behalf of the government to support social and economic development within Ireland. In 2005 the company name changed its name to Pobal.

This organisation developed the Pobal HP deprivation index, Ireland's most widely used social gradient metric, which scores each small area (50 – 200 households) in terms of affluence or disadvantage. The index uses information from Ireland's census such as employment, age profile and educational attainment to calculate this score.

To support the use of their data, Pobal have developed an interactive graphic information system called Pobal Maps[8] using data compiled from various censuses (2006, 2011 and 2016). This free geographical information system is based on small-area statistics that refer to between 80 and 100 households on average, and shows the extent to which each neighbourhood, suburb and village in the country is affluent or deprived. The index is colour-coded with a spectrum from red, signifying deprivation, to bright blue, signifying affluence.
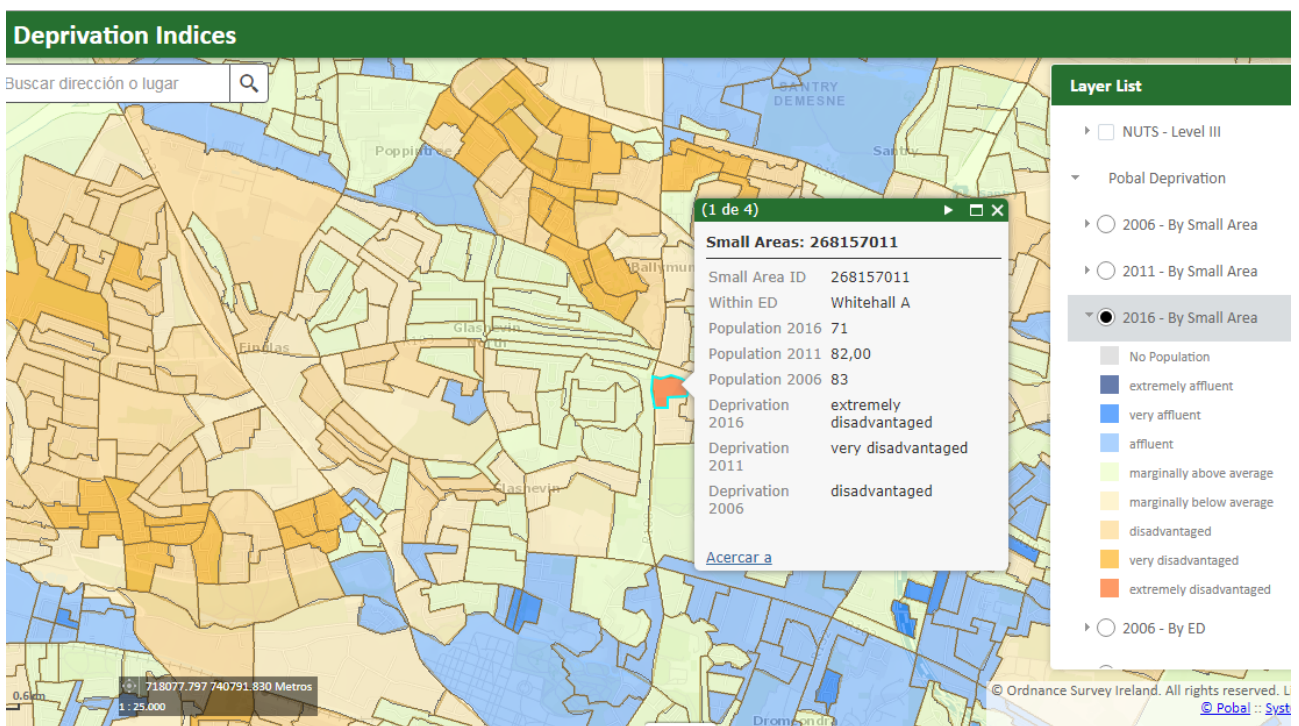
Figure 7. Irish deprivation indices website
Source: https://maps.pobal.ie/WebApps/DeprivationIndices/index.html

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[8] https://maps.pobal.ie

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2.1.5. Netherlands

In the Netherlands the tool known as the Quality of Life Barometer (*Leefbaarometer*) includes a map viewer with a set of indicators at the cluster level, grouped into six categories: housing; public space infrastructure and services; population (social/economic aspects); social cohesion; and environmental quality (discomfort and insecurity). The main novelty of the Dutch example is that offers a synthetic quality-of-life indicator (*Leefbaarheid* Index) which can be inversely used to indicate urban vulnerability, so the results can be analysed at different scales or levels (city, district, neighbourhood and cluster), as well as their evolution between certain reference dates (1998-2002, 2002-2006 and 1998-2006). The synthetic indicator is built using a methodology based on complicated mathematical calculations, but with a simple conception, and consists of assigning a unique scalar value to the *Leefbaarheid* Index as a set of indicators grouped in the six categories mentioned.

The *Leefbaarometer* provides information on quality of life in all the neighbourhoods and districts in the Netherlands. It reflects the situation in the neighbourhood, but also the development and background of the neighbourhood. The Liveability Meter allows the authorities to react quickly and adequately in the event of any negative developments.

Figure 8. Leefbaarometer homepage
Source: https://www.leefbaarometer.nl/home.php

The Liveability Meter can be used by municipalities to design policy, for example by problem-signalling and establishing a first-district diagnosis, as well as for monitoring, evaluations and in-depth research. The Liveability Meter was developed in response to two demands: a recommendation from the civic platform to the former Ministry of Housing, Spatial Planning and the Environment for a country-wide instrument indicating quality of life; and the need for a liveability monitor for cities identified within the urban policy framework.

Ministry of the Interior and Kingdom Relations uses the *Leefbaarometer*, among other things, to monitor quality-of-life developments in the Netherlands and to inform the House of Representatives of these developments. The Ministry complies with the House's wishes be informed every two years about the state of affairs in terms of quality of life.

The Liveability Monitor (*Leefbaaromete*r) contains information for 2002, 2008, 2012, 2014 and 2016, and is updated every two years.

The *Leefbaarometer* is based on an extensive study of the literature on quality of life (Leidelmeijer and Van Kamp, 2003), from which is derived the definition of quality of life used in the *Leefbaarometer*: "liveability" is the extent to which the environment meets the demands and wishes that people place on it.
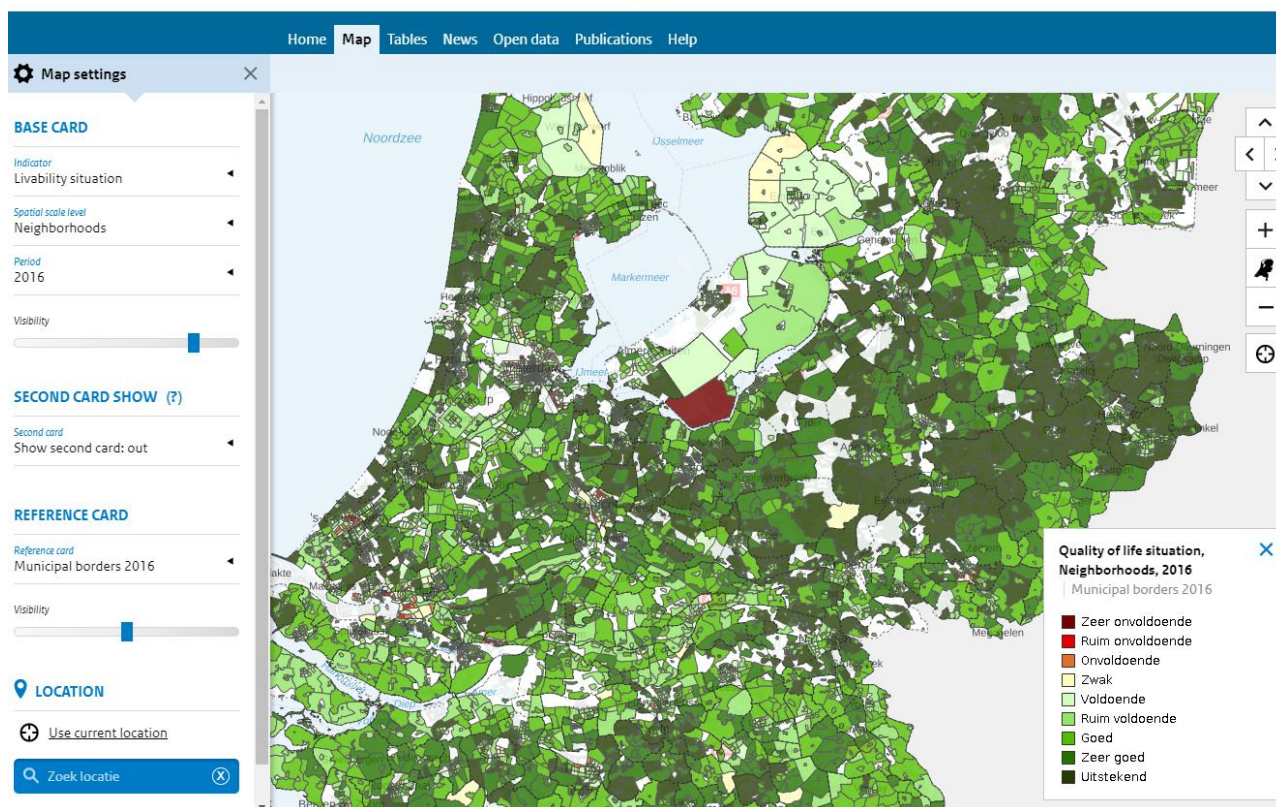
Figure 9. Quality of life situation in neighbourhoods, 2016 in Netherlands
Source: https://www.leefbaarometer.nl/kaart/#kaart

The *Leefbaarometer* provides a model-based estimate of quality of life. We looked at the extent to which different environmental conditions influence the judgment and appreciation of the immediate living environment in places for which data on judgments and valuations are available. Assuming that, the relationships found are in principle valid for the whole of the Netherlands, the liveability for the whole country was then mapped out on a small-area level using land-based sources for these environmental conditions.

The *Leefbaarometer* shows the liveability situation in nine classes: five positive and three negative. There is also a middle class, the "weak" class (pale yellow). If an area turns pale yellow, even though it may not score negatively, it indicates that there is some factor that produces only a moderate quality of life, and highlights this area as deserving of attention.

The *Leefbaarometer* shows liveability with the aid of maps, but the scores from the Liveability Meter are also available in tabular form or as open data, for example in the form of Excel spreadsheets, ESRI shape files and web map services. To display the liveability situation in an area, the user must select "Liveability situation" from the menu item "Map". Maps with different spatial scales and different dates can be chosen in the map settings. A map will be automatically displayed once it has been selected.

The introduction of the *Leefbaarometer 2.0* follows a different trend. The *Leefbaarometer 2.0* is partly based on indicators other than the *Leefbaarometer 1.0,* so the previous measurements of 1998 and 2010 have been cancelled and are no longer included in the maps and analyses.

2.1.6. Spain

The Observatory of Urban Vulnerability is a long-term project by the Ministry of Development based on several studies on urban vulnerability in Spain. This is a development of the specifications of the first additional provision of Royal Legislative Decree 7/2015 of October 30 (*Real Decreto Legislativo 7/2015, de 30 de octubre, por el que se aprueba el texto refundido de la Ley de Suelo y Rehabilitación Urbana*), which approves the revised text of the Urban Land and Rehabilitation Law.

The Urban Vulnerability Observatory contains:

- Atlas of Urban Vulnerability, with information at the census sector level on all Spanish municipalities (referred to the Population and Housing Censuses of 2001 and 2011).

- Atlas of Residential Construction in Spain, with information on the characteristics of the residential buildings and dwellings at the census sector level on all Spanish municipalities (referred to the Population and Housing Censuses of 2001 and 2011).

- Analysis of the characteristics of Residential Construction in Spain, reporting at the national level and by autonomous region on residential building characteristics and their rehabilitation needs, based on the 2001 and 2011 censuses.

- Urban Analysis of Vulnerable Neighbourhoods in Spain for 1991, 2001 and the 2006 addenda, which is updated with the data from the 2011 Population and Housing Census. It also contains, for the 12 largest Spanish cities, the Atlas of Vulnerable Neighbourhoods in Spain: 12 Cities.

- Map of Housing and the Roma Community in Spain (2007), compiled by the *Fundación Secretariado Gitano* and the Ministry of Housing.

- Access to other European observatories with similar characteristics.

- Featured links with other autonomous or municipal observatories.

The Observatory of Urban Vulnerability in Spain follows a twofold approach: it proposes a series of objective indicators with respect to the national average; and uses certain subjective indicators relating to citizens' personal perception of problems (extracted from direct surveys of the population), including contextual analysis with references to the values of the indicators within each context (autonomous region or municipality).
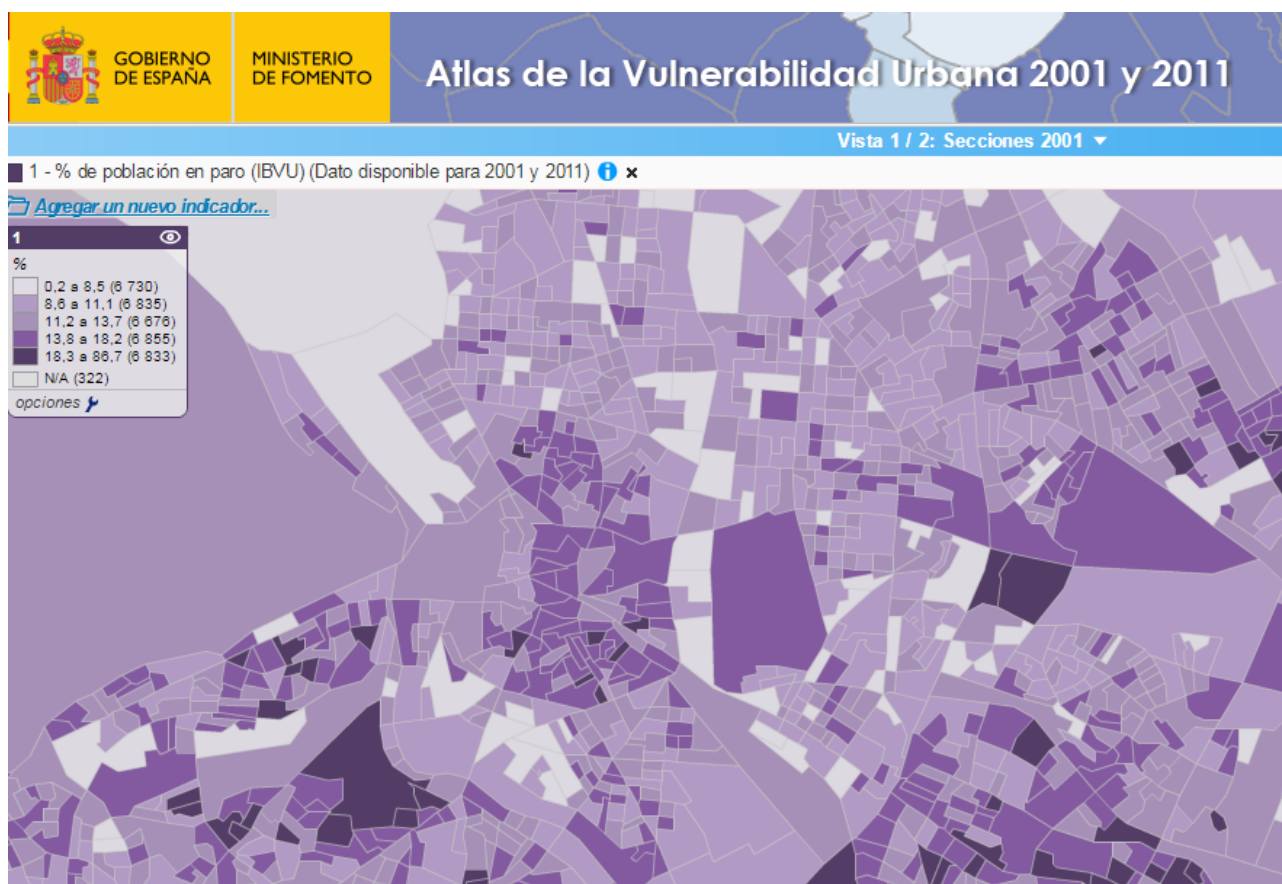
Figure 10. Atlas of Urban Vulnerability website
Source: http://atlasvulnerabilidadurbana.fomento.es/#z=435012,4477711,17880,6512;l=es;i=indvulse.indvulse020;v=map1

Of particular interest is the Atlas of Urban Vulnerability in Spain, a web application that provides statistical information with which to create maps to analyse urban vulnerability at the census sector level[9] in all the municipalities in Spain. It is based on data from the 2001 and 2011 population and housing censuses, and is organised in four domains:

- Urban Vulnerability Indicators. Contains 24 thematic maps, corresponding to 24 urban vulnerability indicators grouped into four major themes: sociodemographic vulnerability, socioeconomic vulnerability, residential vulnerability and subjective vulnerability.

- Contextual Analysis of Urban Vulnerability. Allows the creation of maps to compare the vulnerability indicators of each census sector with the municipal, regional (autonomous region) or national context, representing the number of times in which the value of a given indicator in

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[9] In Spain, census sectors are the lowest-level units for the dissemination of statistical information (for example, censuses) and are also used to organise electoral processes. They are defined by easily identifiable limits and have a size of between 1,000 and 2,500 inhabitants, unless the municipality has a smaller population.

a census sector is below or above the value in the municipality, the autonomous region or in Spain as a whole.

- Urban Inequality Indices. Offers two large indices (synthetic) of inequality: the IDS (Index of Socioeconomic Inequality) and the IDU (Index of Urban Inequality), each of which can be referenced for the municipality, the autonomous region or the whole of Spain.

- Synthetics of Urban Vulnerability (multicriteria classification). Allows the representation of multicriteria classification maps of urban vulnerability, in which each census sector is classified at the national level or in its regional context (autonomous region).

Users can also customise their analysis by superimposing the choropleths with symbols of the most important quantitative variables (population, housing, etc.). Two maps can also be displayed simultaneously on the screen allowing two variables to be compared at the same time, or the evolution of the same variable between 2001 and 2011.
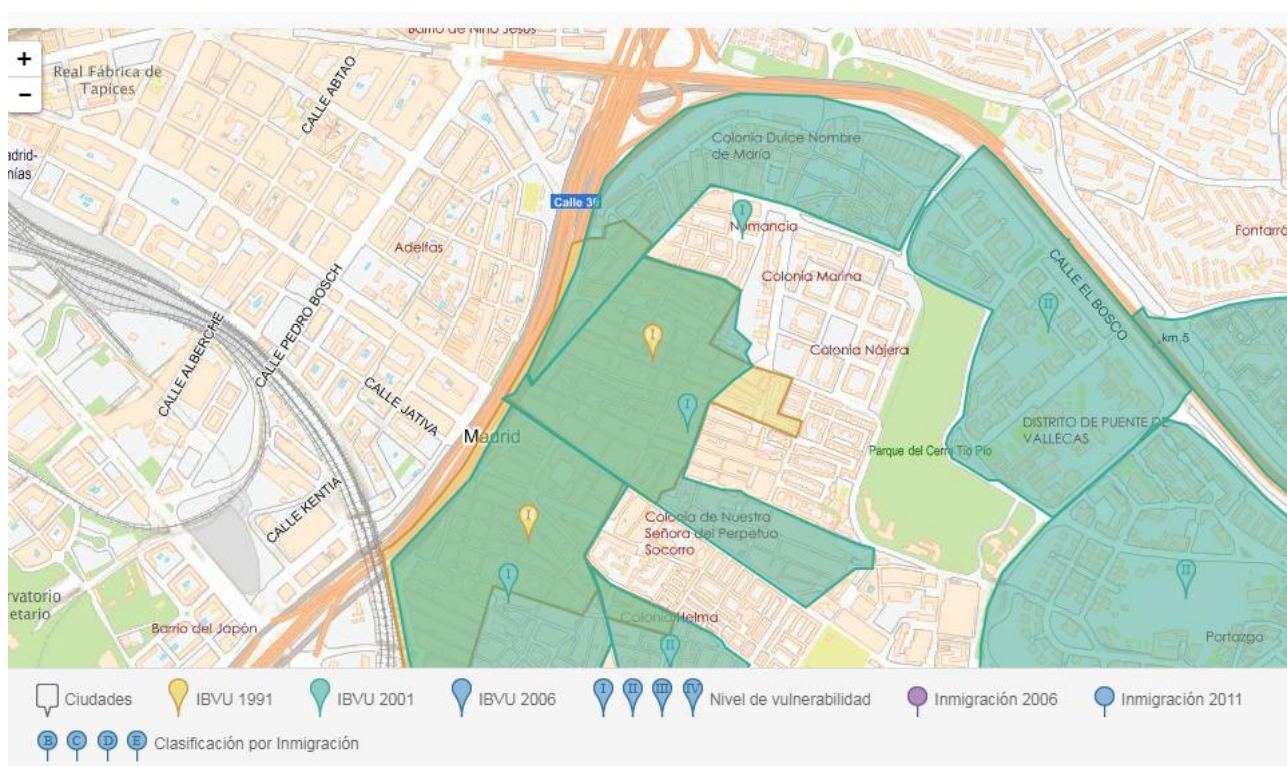
Figure 11. Viewer of the Catalogue of Vulnerable Neighbourhoods
Source: https://apps.fomento.gob.es/BarriosVulnerables/

Another key instrument of the observatory is the list of deprived Neighbourhoods viewer, where each deprived area can be visualised on a map or on an aerial photograph, and fact sheets can be downloaded for each one. Different search options can be selected and filtered with the dialogue box: by neighbourhood, city, year, or level of vulnerability. There are two series of vulnerability indicators: the three basic urban vulnerability indicators (unemployment, educational level and housing) available for 1991, 2001 and 2011; and the immigration indicator series available for 2006 and 2011.
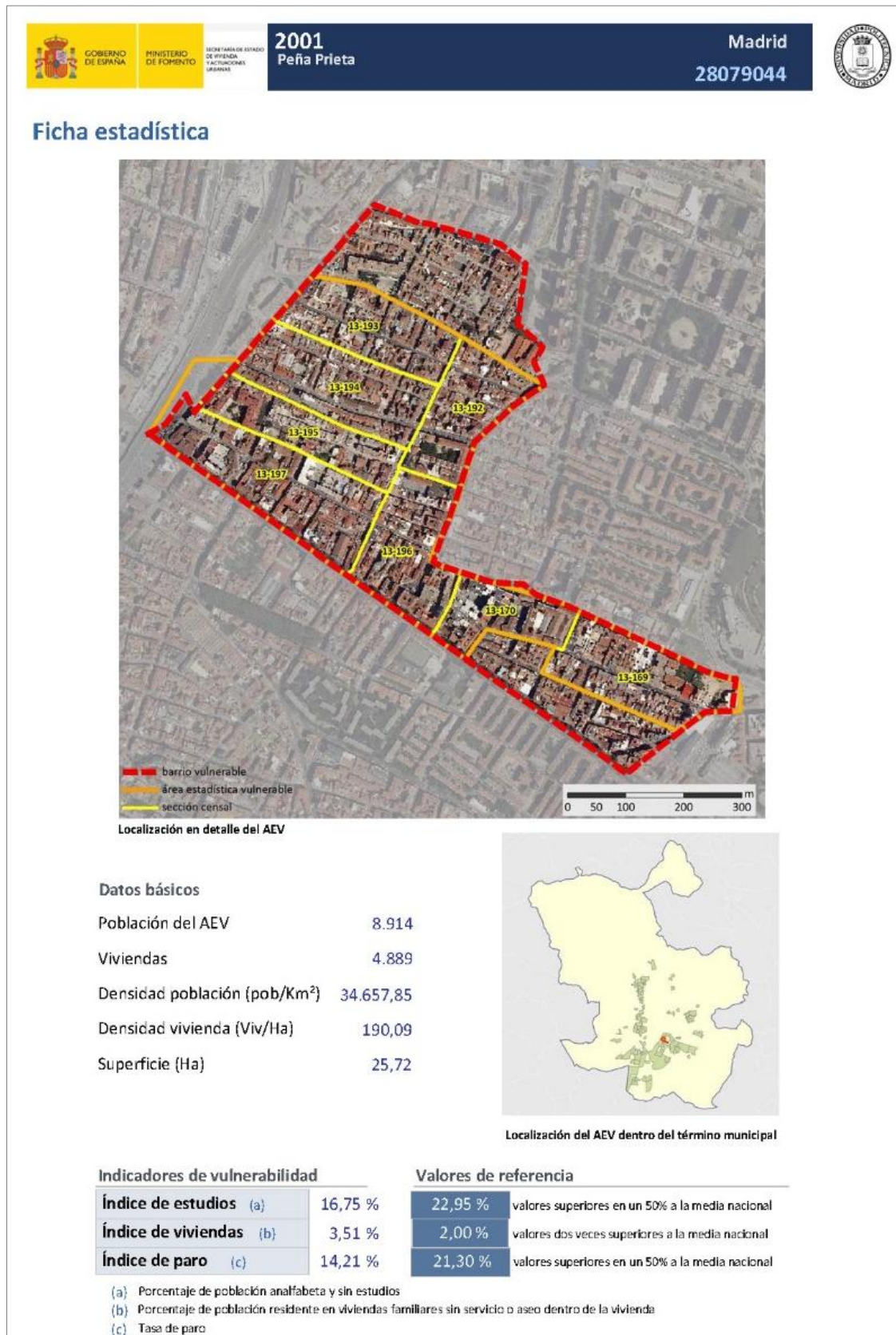
Figure 12. Example of statistical sheet of a deprived neighbourhood
Source: https://apps.fomento.gob.es/BarriosVulnerables/static/fe/fe01_28079044.pdf

2.2.   National reports of Urban Deprived Areas or Neighbourhood (UDAN)

Some member states such as Romania and Belgium have produced interesting reports or documents to identify deprived neighbourhoods or areas and compare their indicators with the national or regional averages. This kind of report can give local authorities and citizens access to poverty indicators at the sub-city district (SCD) level at a specific point in time.

2.2.1. Belgium

Belgium has two different tools to territorialise urban poverty for its entire territory: an observatory of urban deprived areas at the municipality (*commune*) level, and a report on disadvantaged neighbourhoods. Here we focus on the report, as the observatory is discussed in subsequent sections.

The Dynamic Analysis of Distressed Neighbourhoods in Belgian Urban Regions brings a fresh look at disadvantaged neighbourhoods in Belgium. It covers the sectors in greatest difficulty, involving 30% of the population, or about two million people. The study was conducted under the direction of the Free University of Brussels (ULB), at the request of the SPP Social Integration and in collaboration with the Katholieke Universiteit van Leuven (KUL).

Figure 13. Dynamic Analysis of Distressed Neighbourhoods website
Source: https://www.mi-is.be/fr/etudes-publications-statistiques/analyse-dynamique-des-quartiers-en-difficulte-dans-les-regions

The available data cover the period from 2003 to 2010 and identify the dynamics of disadvantaged neighbourhoods and the different sources of their problems (unemployment, income, importance of non-native populations, etc.). To understand these dynamics, our study also mapped and analysed migration, distinguishing between external and internal migration, and taking into account the social status of migrants.

This study focuses on the identification of these areas, with socioeconomic difficulties, in the Belgian cities. It updates previous studies conducted by mobilizing other data than the censuses (general socio-economic survey) because they are currently considered obsolete. Unlike previous studies, a limited number of simple indicators, available annually and representative of different dimensions to obtain a synthetic socio-economic index at the neighbourhood level. This index is the main base of delimitation of disadvantaged neighbourhoods

Based on the different aspects of precariousness, the disadvantaged neighbourhoods were classified in order to better identify their needs and to guide action public authorities should lead.

However, as the socio-economic index developed by this study is not enough to describe the diversity neighbourhoods in difficulty, data were supplemented by more complex analyses to describe residents' situation with regard to health and education. These dimensions had not been integrated into socio-economic index focused on the poverty of households and individuals to facilitate its updating annually. But these dimensions related to health and teaching are essential to identify neighbourhood needs and thus orientate public actions.
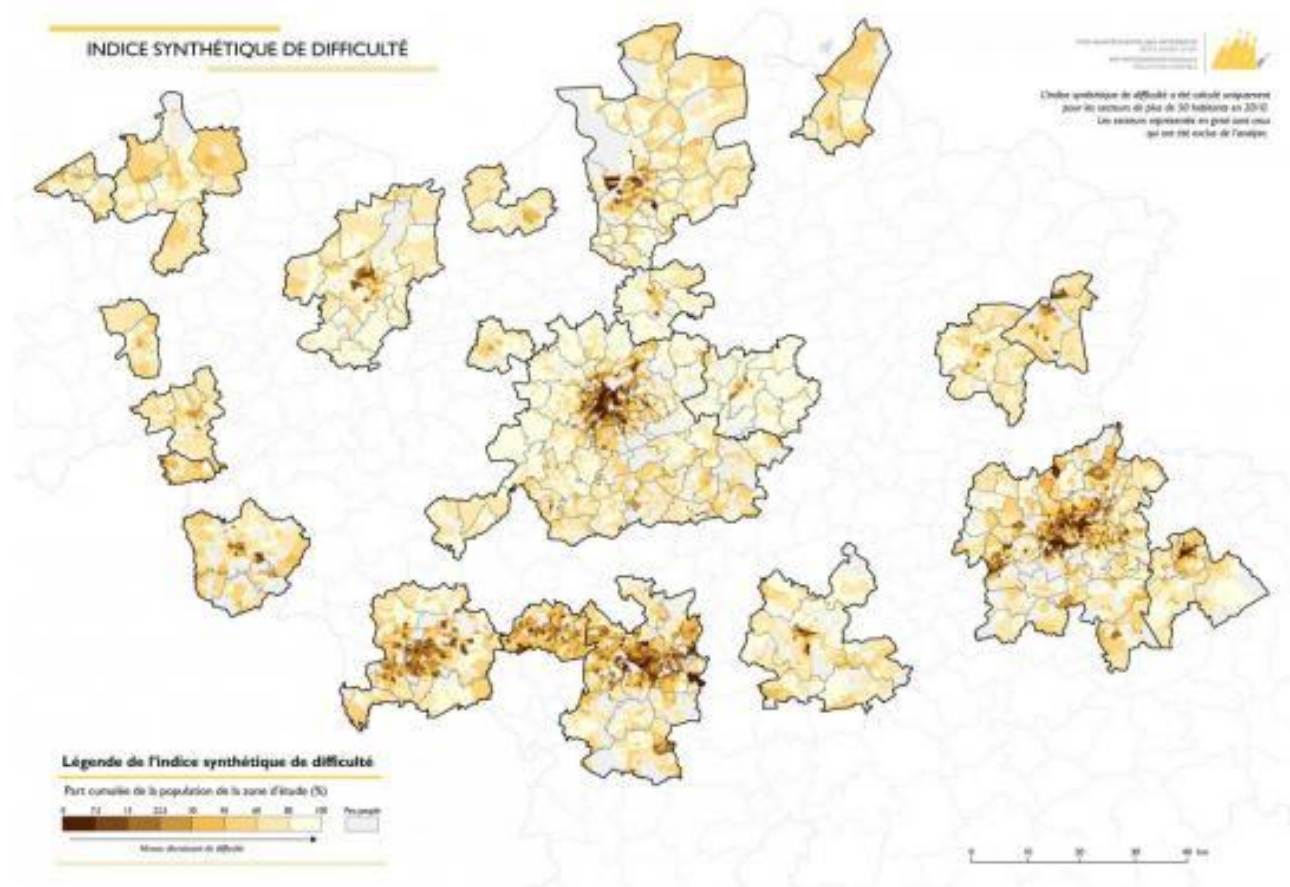
Figure 14. Belgium Synthetic index of difficulty
Source: https://www.mi-is.be/fr/etudes-publications-statistiques/analyse-dynamique-des-quartiers-en-difficulte-dans-les-regions

The scale used to identify poor neighbourhoods is statistical sector, the smallest scale for which statistics are produced. These sectors have an average population of 530 and it can be significantly higher in urban areas. In addition, despite some modifications, this division is fairly stable and therefore allows to propose dynamic analyses. Finally, although urban morphologies have evolved since these sectors were defined, they remain a relatively homogeneous and coherent division of urban spaces. Sectors with 50 or fewer inhabitants were removed from the analysis.

This analysis had a dynamic mapping tool for analysis not currently available. It was a tool developed in Geoclip13, which offered the 5 complex indices developed from the combination of statistical indicators: housing, employment, professional qualification, and health index; and the global synthetic index.
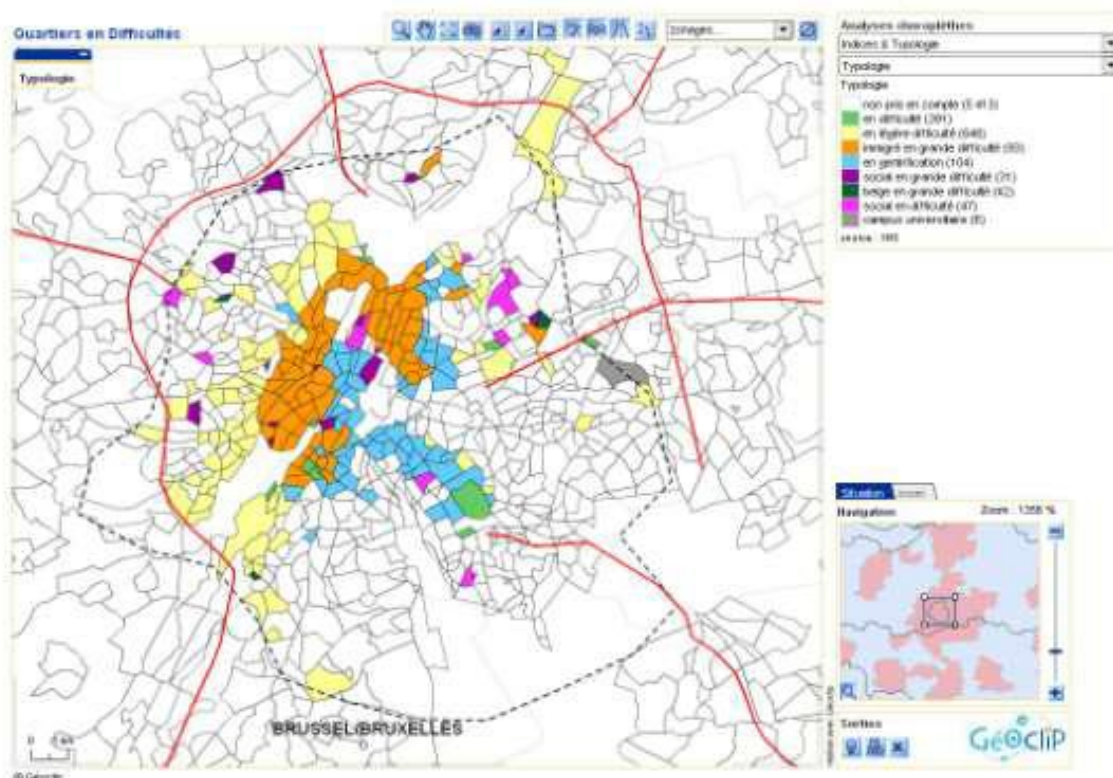
Figure 15. Analyse cartographique des quartiers en difficulté with Geoclip13
Source: https://enquete.miis.be/buurten_in_moeilijkheden/framesFR.html

2.2.2. Romania

In January 2012, the GoR and the World Bank signed an agreement on partnership and support for the purpose of promoting the preparation and implementation of projects funded by the European Union (EU). One such initiative was an Atlas of Urban Marginalised areas in Romania which was framed within a wider project of designing strategies for the integration of poor areas and disadvantaged communities in Romania.

The World Bank's technical assistance provided through this project focuses on three primary components: (1) a methodology for defining different types of urban disadvantaged communities based on a set of key criteria and indicators; (2) detailed maps that present the spatial distribution of these indicators and the corresponding types of marginalised communities; and (3) strategies for integrating these communities in the form of an integrated intervention tool and six conceptual pilots.

Prior to this research, most studies on marginalisation in Romania focused on rural areas and estimated community poverty or community deprivation at the locality level (usually at the commune level). Only a few studies analysed urban marginalised areas at the sub-locality level and most of these were case studies using qualitative research techniques, so this report applying a methodology for marginalised areas at the sub-locality level in urban areas is highly novel in the Romanian context, particularly because it includes both qualitative research techniques and a quantitative assessment.

The atlas concludes that there are three main criteria for defining and analysing different types of urban marginalised areas in Romania: human capital (usually education, health and family size), employment and housing conditions. This report and the accompanying integrated intervention tool use the terms "disadvantaged" and "marginalised" urban areas. Disadvantaged urban areas are areas which meet one or two of the abovementioned criteria, while marginalised urban areas refer to areas where all three criteria are met and which thus have low human capital, low formal employment and poor housing.

Urban marginalisation is manifested in the spatial concentration (pockets) of deprivation in urban areas. This phenomenon was analysed at the lowest spatial level of the census sector, which typically covers around 200 households. Microdata from the 2011 population and housing census were therefore aggregated at this level.

The atlas identified four types of areas:

- Type 1. Areas disadvantaged in housing: neighbourhoods where a significant proportion of residents suffer from inadequate housing, even if many of them have some form of formal employment. The level of education varies.

- Type 2. Areas disadvantaged in employment: areas with a relatively high concentration of residents who do not have a human capital deficit but cannot find work in the formal sector, regardless of their housing conditions (the quality of housing varies and does not define the area). This type refers to areas that had a high concentration of large- and medium-scale industries during the communist era, and which closed after 1990.

- Type 3. Areas disadvantaged in human capital include people with low levels of formal education and varying levels of employment, but with fair housing conditions typical of urban areas in Romania.

- Type 4. Urban marginalised areas are severely deprived areas with low human capital, low formal employment and inadequate housing.

The research also identified four subtypes for urban marginalised areas (which partially overlap) which could not be distinguished through the census data: (1) "ghetto" areas of low-quality blocks of flats or in former workers' colonies; (2) slum areas of houses and/or improvised shelters; (3) modernised social housing; and (4) social housing in the historical city centre.

The document incorporates a collection of plans at different levels: the administrative unit, county, regional and census sector.

The atlas also incorporates qualitative information provided by the local authorities to identify areas that they themselves consider as marginalised areas in their cities. Specific maps were created with this information.

County: Botoşani
City: Dorohoi
Typology of urban areas

Non-disadvantaged area
Area disadvantaged on housing
Area disadvantaged on employment
Area disadvantaged on human capital
Marginalized area
Area with institutions or with less than 50 persons
No data (shapefile with no data)
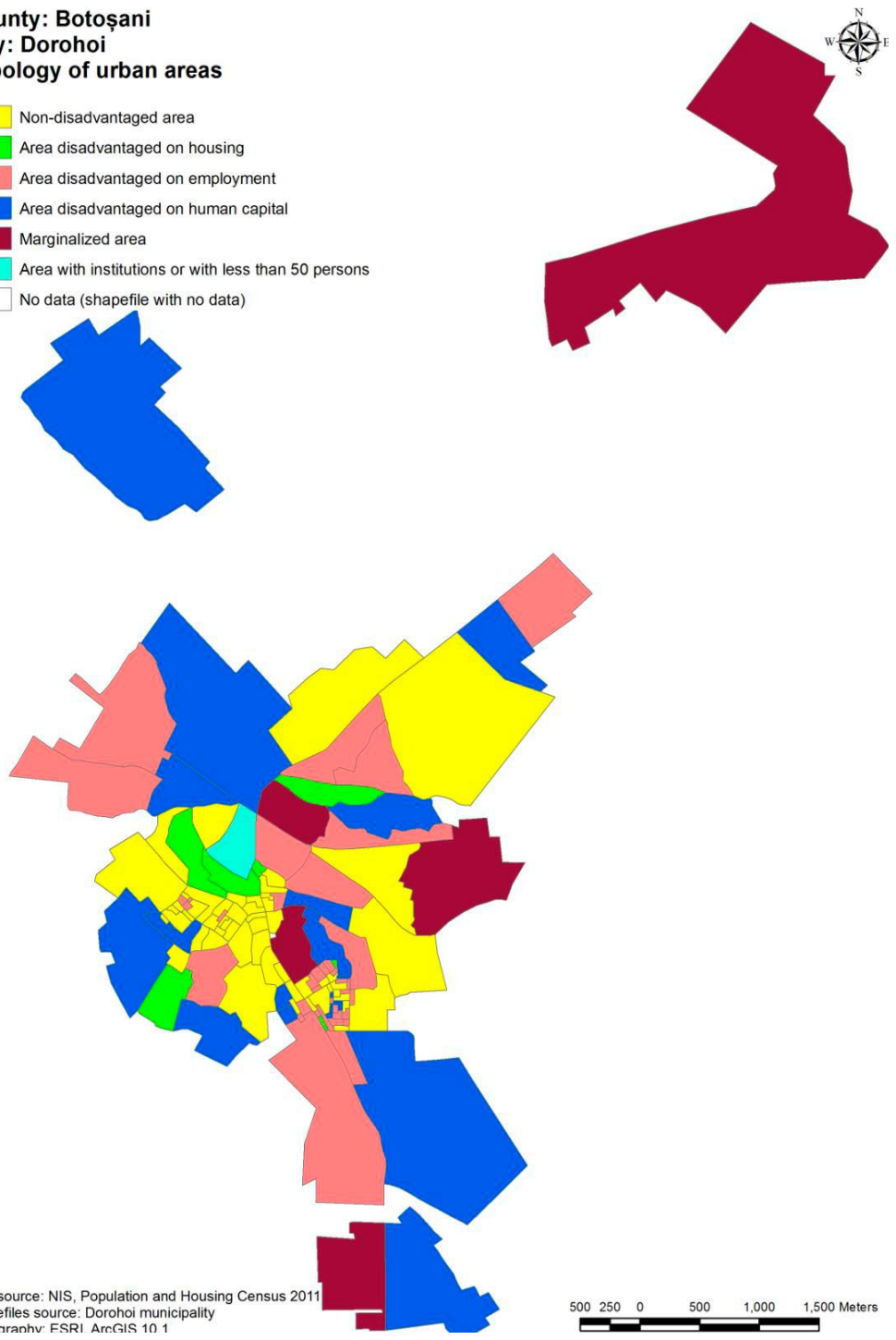
Data source: NIS, Population and Housing Census 2011
Shapefiles source: Dorohoi municipality
Cartography: ESRI ArcGIS 10.1

500 250 0   500   1,000   1,500 Meters

Figure 16. City maps at census sector level. Dohohoi
Source: http://documents.worldbank.org/curated/en/668531468104952916/pdf/882420WP0P1430085232B00OUO0900Atlas.pdf

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Figure 17. City maps with marginalized communities reported by the local authorities. Medgidia
Source: http://documents.worldbank.org/curated/en/668531468104952916/pdf/882420WP0P1430085232B00OUO0900Atlas.pdf

2.3. National observatories of Urban Deprived at municipality scale

Some Member States, such as Belgium or Germany, have developed very interesting Observatories because they has got online visualisation and mapping tools (GIS: Geographical Information Systems) and extensive data but with a minimum spatial aggregation at municipality level allowing them to compare their indicators with national or regional averages.

2.3.1. Belgium

As a result of the Federal Government agreement to develop an open data policy, the SPP Social Integration *(SPP IS*) makes its data available to citizens, researchers and other public services. This tool known as Barometer of Social Integration (*Le baromètre de l'intégration sociale*) allows using an interactive tool (*MISTATIS*) to follow in a visual and dynamic way any process related with integration income and many other data at national, regional and local level. The electronic version of the Barometer can be found in the '*Barometers*' section of the *SPP IS* website. The main goal is to provide a frame of reference to which everyone can compare their own analyses at regions, provinces, boroughs and municipalities level, as needed.

Figure 18. Belgium Barometer of Social Integration
Source: https://stat.mi-is.be/

This barometer contains different sets of data, such as:

- Vertical map (type A): This is a dynamic map of the country from the regional level to the municipal level through the regional, provincial and district levels. Zooming in on the map allows users to move from one geographic level to another and view the indicator values for the selected geographic features.

- Horizontal map (type B): This is a static map that allows users to view all the communes in the country, most often divided into quintiles (or colours) according to a chosen indicator. A swipe on the map shows the values of the indicator selected for each municipality.

- Cloud of points: a cloud of points makes it possible to visualize graphically (on two axes) the existence or not of a relation between two indicators.

- Evolving chart: An evolving chart shows the monthly or annual change in the number of beneficiaries of a specific measure for a selected geographical level.
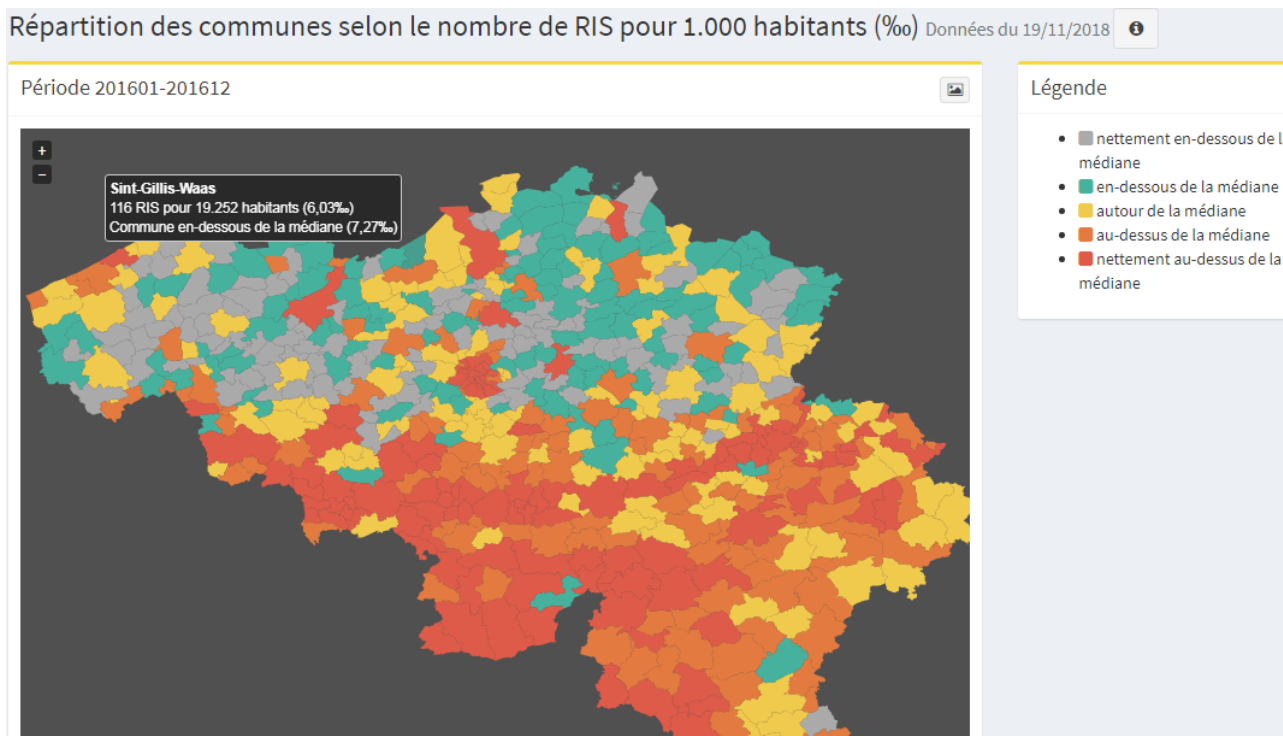
Figure 19. Example of horizontal map (Type 2)
Source: https://stat.mi-is.be/fr/dashboard/ris_cities?menu=map

2.3.2. Germany

A dedicated spatial observatory for Germany is provided by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR). The tool known as INKAR is the interactive online atlas of the Federal Institute for Research on Building, Urban Affairs and Spatial Development, that illustrates the living conditions in Germany and Europe. Around 600 indicators allow city-country comparisons as well as evaluations over the last two decades.

INKAR contains regional statistical information on almost all socially important topics such as the labour market, education, social benefits, demography, income, the economy, housing, public finances, transport and the environment. With the interactive application, informative thematic maps and tabular overviews for all regions in Germany and Europe can be created in just a few steps. It is not a specific tool about deprived neighbourhood but a general observatory about living conditions at regional level. Collected Data goes back to 1995.

Figure 20. INKAR online tool
Source: https://www.inkar.de/

2.4.   Regional observatories of Urban Deprived Areas and Neighbourhoods (UDAN)

Some regions (sub-national scale) in Europe have developed observatories focused in their own territories. They have got online tools that allows data visualisation, mapping tools (GIS: Geographical Information Systems) and extensive data with a minimum spatial aggregation to identify their deprived areas at sub-city level and to compare their indicators with the national, regional and local averages. The examples of the Valencian Community (Spain) and the Canton of Geneva (Switzerland) are included here.

2.4.1. Canton de Genève (Switzerland)

The Centre for Territorial Analysis of Inequalities (CATI-Ge) aims to analyse broadly and systematically the inequalities in the canton of Geneva and their evolution. It was designed as a decision-making support tool for the Urban Social Cohesion Policy (PCSMU). Created in September 2009, it is attached to the Laboratory of Applied Economics (LEA) of the University of Geneva.
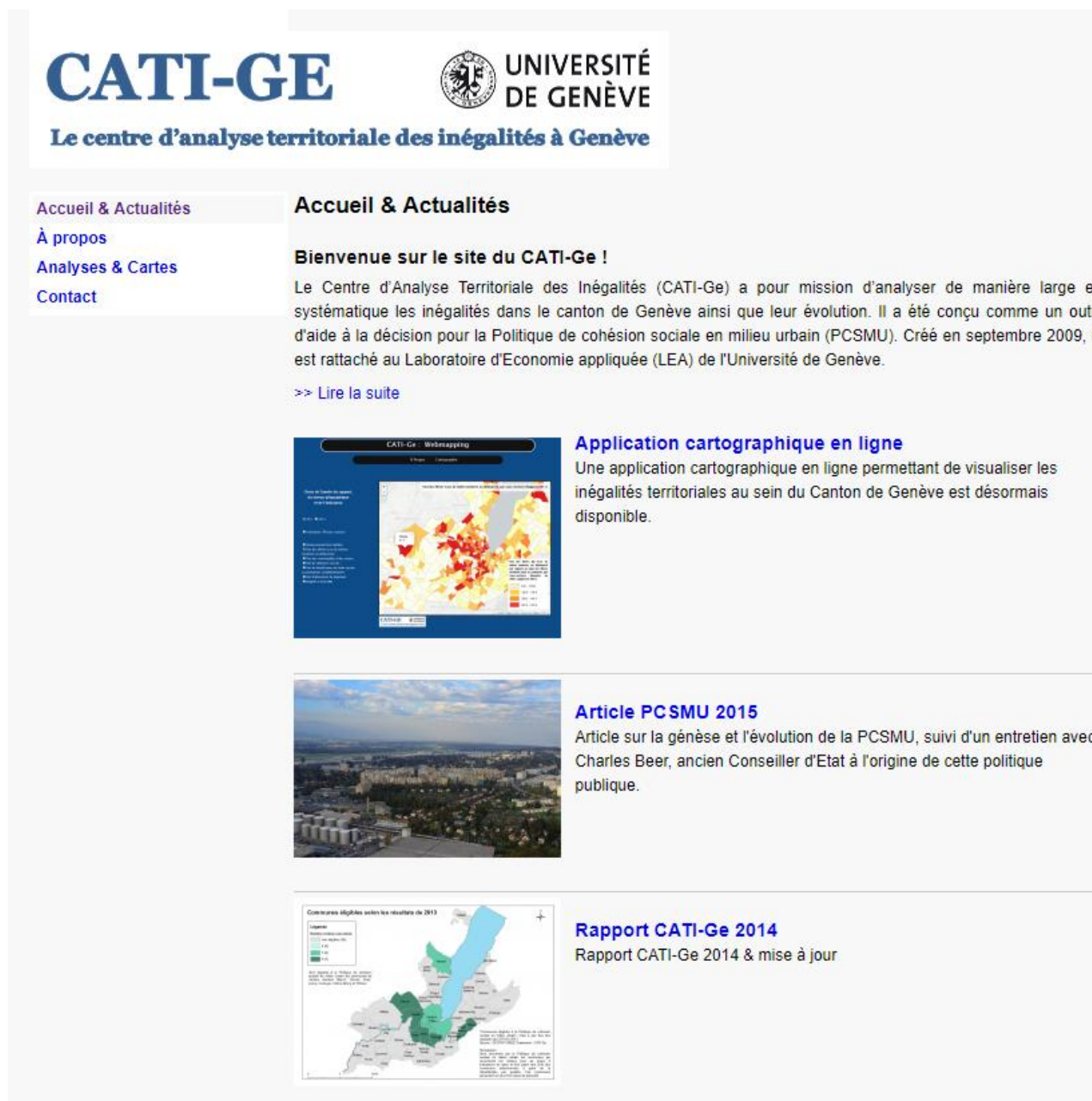
Figure 21. The Centre for Territorial Analysis of Inequalities website
Source: https://cati-ge.ch/

2.4.2. Comunitat Valenciana (Spain)

In 2016, The General Directorate of Housing, Rehabilitation and Urban Regeneration (depending of Regional Government), in collaboration with the Cartographic Institute of Valencia and the Valencian Institute of Building, developed a tool called "Viewer of Sensible Urban Spaces of the Valencian Community (VEUS)". This viewer aims to identify through the cartography of the so-called "sensitive urban areas", understanding as such, urban areas where socio-economic, residential and socio-demographic dimensions are notably lower than the average of the Comunitat Valenciana. The minimum spatial unit of aggregation is census sector.
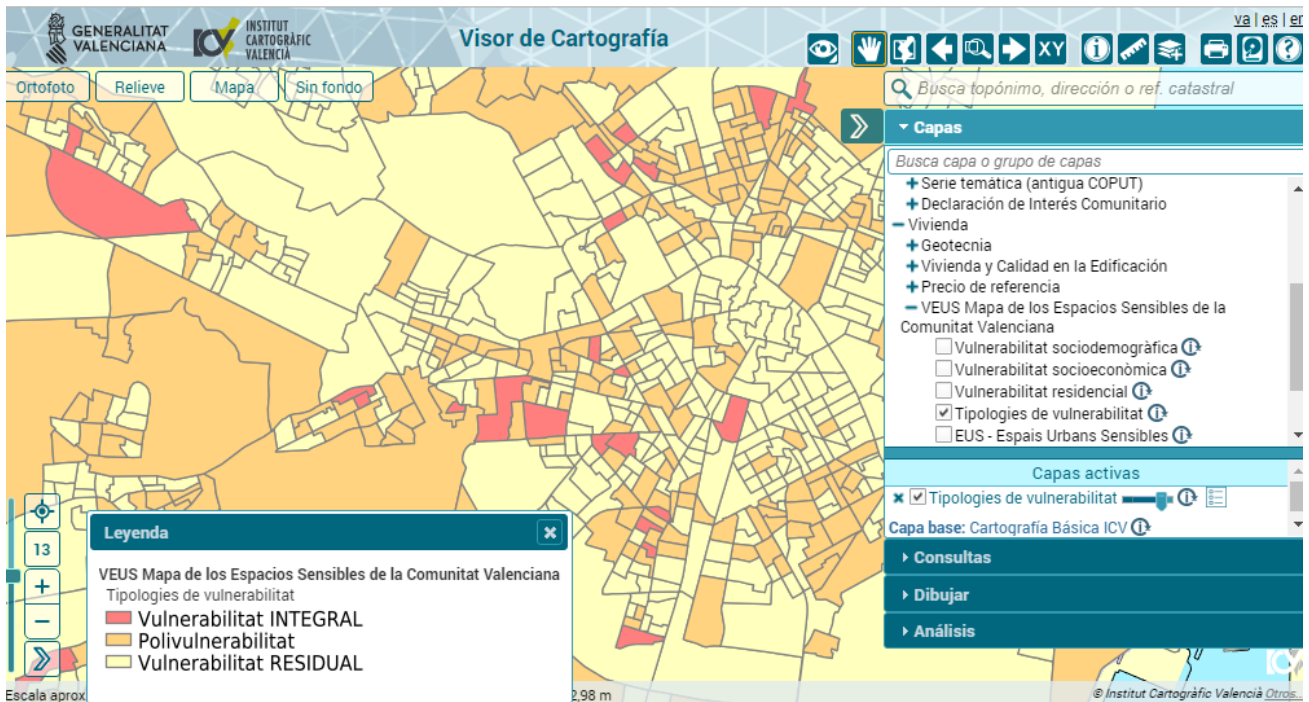
Figure 22. Generalitat Valenciana Cartographic viewer
Source: https://visor.gva.es/visor/index.html?idioma=es&capasids=VEUS;4,3,2,1,0

2.5.   Local observatories of Urban Deprived Areas or Neighbourhoods (UDAN)

More and more cities in Europe have developed local observatories to monitor and manage their urban areas (and particularly, urban deprived areas) for the diagnosis of their needs and for the implementation of neighbourhood improvement policies. As in the rest of the cases, they usually have online tools or periodic reports that allow the visualization of data, mapping tools (GIS: geographic information systems) and extensive data with a minimum spatial aggregation to identify those areas at the sub-level city and compare its Indicators with national, regional and local averages. In this report, some references are incorporated by way of example.

2.5.1. Vienna

In the case of Vienna, strictly speaking, there is no observatory of deprived neighbourhoods in the city, but rather on the city web, a large amount of information and studies related to the city are collected: from systematic studies on quality of life with regular updates (with a collection of thematic maps); until an interesting long-time project to monitor migration and integration of inhabitants (Cohabitation Monitoring) developed since 1983. There is not an interactive tool but periodic reports and researching.

Figure 23. Vienna observatory of Urban Deprived Areas or Neighbourhoods (UDAN)
Source: https://www.wien.gv.at/stadtentwicklung/grundlagen/stadtforschung/karten/

2.5.2. Lisbon

In July 2006, EAPN[10] Portugal signed a cooperation agreement with the *Santa Casa da Misericórdia de Lisboa* (SCML) to set up and develop an Observatory to combat poverty in the city of Lisbon.

This Observatory has as main goal to contribute to the knowledge of the socioeconomic reality of Lisbon through the adoption of methodologies and diverse instruments that allow to support strategic decision making and the adoption of concrete measures aimed at the insertion of people socially disadvantaged, stimulating and promoting projects and measures aimed at strengthening the dynamics of local

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[10] EAPN (European Anti-Poverty Network) is an independent coalition of NGOs and other groups involved in the fight against poverty and social exclusion in the Member States of the European Union. It was established in December 1990.

development and networking. It also aims to be a pilot project capable of being disseminated and adopted by other municipalities and/or territorial dimensions.

The Observatory includes interesting studies such as 'Barometer of people in situations of vulnerability' or 'the social precarity index of the city of Lisbon'. However, there is not any mapping tool or dynamic cartography.

Figure 24. Lisboa observatory of Urban Deprived Areas or Neighbourhoods (UDAN)
Source: https://observatorio-lisboa.eapn.pt/

The municipality of Lisbon designed a rehabilitation program for the so-called 'Priority Intervention Neighbourhoods' (BIP) at the end of 2009. The first task involved the construction of the Priority Intervention Neighbourhood concept, which was defined from the mixture of different delimitations

previous from socio-economic, urban and environmental indicators. Evolution later, for a finer definition, which includes not only neighbourhoods of priority intervention (BIP), but also areas of priority intervention (ZIP).

There is a neighbourhood viewer or areas of priority intervention where users can find an updated list of BIP / ZIP, the delimitation methodology and extensive information about these areas as well as the diverse intervention programs implemented.

Figure 25. Lisboa Priority Intervention Neighbourhoods
Source: http://habitacao.cm-lisboa.pt/?no=402000,020

Figure 26. Identification of Lisboa Priority Intervention Neighbourhoods
Source: http://habitacao.cm-lisboa.pt/documentos/1278934997V6fFZ8jj3Bn71RN9.pdf

3. COMPARISON OF METHODOLOGICAL ASPECTS

3.1. The spatial variable

Analysing deprivation through an area perspective is based on the idea that the deprivation experienced by individuals living in an area can in principle be estimated and measured at the area level. An area can be characterised as deprived relative to other areas, on the principle that a higher proportion of people in the area are experiencing a specific type of deprivation. In other words, the experience of the people in an area gives the area its deprivation characteristics.

The area itself is not deprived, and although the presence of a cluster of people experiencing deprivation in an area may give rise to a compounding deprivation effect, it is still measured by reference to these individuals.

Almost every observatory analysed takes the minimum census area as geographical unit, postal codes, census sectors, or similar, to create an operational minimum spatial unit for their investigations. These spatial units are the geographical reference used to dump all the data analyses. Observatories normally express their limitations and difficulties with this procedure.

One of the most common issues is the variation in the contours of these areas, which are usually defined by a statistical agency along with other criteria such as population distribution. Some observatories fix their spatial units to the contour map for a specific year, while others update them every time they produce a new output.

A second problem highlighted is the lack of data available due to problems of statistical secrecy for rural areas or not having a sufficient number of cases to use solid statistics. To resolve this, observatories usually group the minimum area available into groups of four or six to ensure a broad enough scope to avoid this type of problems. Observatories sometimes use statistical methods to "correct" the methodological problems associated to the lack of data in these areas. Some even decide not to extend the research investigation into rural areas.

Most observatories apply the contours of the minimum area unchanged and build their own maps over them, but some –such as the Spanish observatory– take them as a starting point to create their own areas, adjusting their borders based on consistent, organic or urban-functional criteria. Census areas are adapted under urban-functional criteria.

The Netherlands is a special case among the observatories analysed. In contrast to the geographical census area, the Netherlands' observatory follows a cell map system, based mainly on information from postcode areas.

Other countries with no observatories but which analyse intra-city deprivation take a more qualitative, inclusive or bottom-up perspective to generate the spatial areas (Lisbon or Germany).

3.2. Data sources

Observatories normally use data from their national statistical office, the census if it exists, and sometimes social welfare or finance department sources. The type and number of indicators selected varies considerably from one observatory to another. Depending on the variables of interest, some observatories enrich their database with data sources from other public offices such as the police, or from private databases related to commerce or property prices.

One of the main difficulties facing observatories is the availability of the data source and its periodicity throughout the series. Occasionally, some variables are no longer updated or are gathered following a different prior methodology. Another possible option used by some observatories is to incorporate surveys that are methodologically adapted to the database, as in the case of the Dutch and English observatories (see the English case).

The observatories ultimately adapt to the available data and seek to apply flexible methodologies that allow changes in the data sources. They also depend heavily on the periodicity of the data and so create an output each time the data is updated. In some cases, such as the Spanish example, ten years must elapse between updates.

It is essential to record and present all the data sources used in an accessible way. Data are the cornerstone of the research, so they must be part of the output of the observatories (the UK is the best example of the accessibility of sources).

3.3. <u>Indicators</u>

Indicator dimensions change more than spatial dimensions, not only among the different observatories analysed, but with each version of a specific observatory as it changes over time, as some have undergone methodological changes over time. The variation in the different observatories' approaches to deprivation lies mainly in the indicators used.

As described in the section on data sources, the observatories' indicators are highly dependent on the availability of the data. Although income is the most widely recommended indicator in the literature, it is unavailable in some countries for their deprivation studies. In this situation, unemployment, educational level and housing indicators are highly recommended as the best approximation to income.

Although the domains may have been created with different information, indicators and methodology, they all aim to measure the same parameters and make them comparable. However, there are still major differences between the indicators used. Sometimes the availability of the data sources varies, and sometimes improvements in the methodology change the indicators. The social reality itself may have changed so much that the information on deprivation in neighbourhoods cannot be captured by the same means.

The observatories respond to the availability of the data sources, but they also apply different methods to sift the most valuable indicators with the greatest explanatory power. This section explains how the observatories in the various countries structure their domains.

A table briefly summarising the indicators selected by the observatories has been created for the purposes of comparison. Independently of the distribution of the domains established by each observatory, the variables identified are income, educational level, nationality/ethnicity, employment, crime, sex, age, family type, private households, housing conditions, health and environmental conditions.

The variables not included by the observatory are classified with "1". The key variables that define part of the methodology for the indicator are classified with "3". The variables included by the observatory in a limited way or that contribute with additional information are classified with "2".

As can be seen from the tables below, although different variables are used, some are more common than others. For example, employment is used by all the observatories with the exception of France, though this is partially recorded in its indicator of family income (employment is used as a descriptive variable).

However, sex is the least used variable, applied only as a descriptive or environmental condition, and is not included by five of the eight observatories analysed.

The differences show that the conception of deprivation and vulnerability differs from one country to another, in line with the needs of the population.

	BE	DK	ENG	FR*	IE	NL	RO	ES
Income	3	3	3	3	1	3	1	1
Educational level	1	3	3	2	3	1	3	3
Nationality/Ethnicity	3	3	2	2	1	3	3	3
Employ	3	3	3	2	3	3	3	3
Crime domain	1	3	3	2	1	3	1	1
Sex	1	1	2	2	1	1	1	2
Age	1	1	2	2	3	3	2	3
Family type	2	1	2	2	3	3	1	3
Private households	1	1	3	2	1	3	3	2
Housing conditions	1	1	2	2	1	3	3	3
Health	2	1	3	2	1	2	3	1
Environmental conditions	1	1	3	2	1	3	1	1

*France only employs income as variable to identify deprived neighbourhood. The other domains indicated in this table are only for describe purposes to its observatory. Valuation based in the information gather from the survey and reports of the observatories

Table 3. Comparing chart of indicators
Source: Own elaboration

	Key	Descriptive	Not registered	Total
Income	5	0	3	8
Educational level	5	1	2	8
Nationality/Ethnicity	5	2	1	8
Employ	7	1	0	8
Crime domain	3	1	4	8
Sex	0	3	5	8
Age	3	3	2	8
Family type	3	3	2	8
Private households	3	2	3	8
Housing conditions	3	2	3	8
Health	2	3	3	8
Environmental conditions	2	1	5	8

Table 4. Number of observatories that consider the variable as Key, Descriptive or Not Registered
Source: Own elaboration

3.4. Methodology & classification approaches

In general, the observatories take three methodological stages to process their indicators with a certain degree of rigor. Firstly, a previous qualitative test is decided to check the quality, availability and periodicity of the datasets. After, there is a second stage to transform the data into indicators, for example, making rates or proportions. A third step is to standardise indicators involved in making possible the comparison

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between them and their eventual synthetisation. A usual way to do this is through logarithmic standardisation.

At this point, observatories can structure their output in various and not mutually exclusive ways. One option is to create composites or synthetic indexes. The other is to establish taxonomies or typologies. The first option is usually measured on a continuous scale which is defined by the combination of the different domains that compose the index. All indicators are checked to know their explanatory power through different statistical methods like factorial analysis, regressions, shrinkage etc., and then rate domains rigorously.

In the final analysis there is no one method by which to measure deprivation, as it is a combination of individual deprivations measured in the component domains. However, the choice of weights is not arbitrary; the aim was that the weights should be explicit and based on clear criteria.

Composite indexes usually classify their neighbourhoods by quartiles, distribution or comparing the scores with averages. This is the case of the English Index of Multiple Deprivation, the Irish Pobal HP Deprivation Index, and the Dutch *Leefbaarometer.*

The second option is based on a typology or classes. Depending on the neighbourhoods' characteristics they are classified by the behaviour and distribution of the analysed domains. Thus, finding groups of neighbourhoods with similar characteristics. The most representative cases of this way of classification are Belgium, or the Atlas of Urban Marginalised Areas in Romania.

As it is said above, in some observatories it can be found that both approaches are developed in different degree, like The Atlas of Urban Vulnerability in Spain. Others, on the contrary, do not follow the mentioned stages and classifications, like France or the *Ghettolist* in Denmark. On one hand, France delimits their UDAN only by family income, characterising them with the rest of variables and making a classification by the historical context and urban structure. On the other hand, Denmark establishes a required binary list to identify their UDAN and classify them by those requirements that are fulfilled on the list.

3.5. Validation

Validation is one the most important steps for controlling the quality of the observatories' output and generating information that closely reflects reality. Like every process of this kind, measuring deprivation through different methodologies can produce results that do not completely match the real situation in the cities analysed.

This process can be done in different ways. The most usual are comparisons with historical results and previous outputs from other years, checking whether the new information is consistent. When there is a change in the methodology. Another common practice is for observatories to verify the information produced with the stakeholders in the cities, such as NGOs, local associations and municipalities. However, some observatories do not devote much effort to validation but prefer to focus more on the accuracy of the methodology.

4. DETAILED ANALYSIS OF THE OBSERVATORIES

4.1. Belgium

4.1.1. Introduction

The neighbourhood difficulty index is based on simple socio-economic indicators that are available on an annual basis. The main interest of this method is that it enables the index to be regularly updated to develop a monitoring tool for neighbourhood dynamics. The synthetic index presented in this atlas is calculated for the year 2010 and aims to assess the socio-economic level of neighbourhoods based on a series of variables indicating their level of difficulty.

This atlas presents a detailed portrait of the distribution of social groups in the 22 main urban areas of Belgium. These analyses are based on 23 indicators representing different dimensions of precariousness: labour market, origin, income and weight of social transfers. On this basis, a synthetic difficulty index was built for all neighbourhoods with over 50 inhabitants in the 22 urban areas. As it is recognised that these dimensions do not represent all aspects of precariousness at the local level, indicators have also been developed for health and education, based on different sources from the Crossroads Bank for Social Security (BCSS) or INS. Some dimensions are unfortunately missing due to their lack of visibility since the socio-economic survey of 2001: these refer to housing and education level, two essential dimensions of precariousness.

4.1.2. Definition of minimum spatial/geographical unit

This study was done at the level of urban areas and is not limited to the administrative definitions of cities, but takes into account all municipalities (*communes*), including peripheral ones, integrated in a continuous urban area. The delimitation of urban areas is based on various criteria such as population growth, median income in the municipality, incoming and outgoing migration, building permits and the built area.

The geographical scope of the analysis has undergone some modifications compared to previous studies, which focused on the 17 main urban agglomerations in Belgium within the limits defined for the preceding version of 1996, based on the 1991 census. Indeed, for this new edition of the Atlas, *Dynamiques des Quartiers en Difficulté*, three new urban areas were added to the 17 cities in the 2001 edition. For the sake of coherence, the spatial scale of the urban areas in these cities was determined on the basis of the criteria for the review of the 1996 methods, carried out in 2009.

Deprived neighbourhoods are identified at the scale of the statistical sector, the finest grain for which statistics are available. These sectors have an average population of 530 inhabitants, but this figure is much higher in urban areas: for example, 1,500 inhabitants for the city of Antwerp. Despite some modifications, this division is fairly stable and therefore allows the proposal of dynamic analyses. Finally, although urban morphologies have evolved since these sectors were defined, they remain a relatively homogeneous and consistent division of urban spaces. To avoid the effects of small numbers, sectors with 50 or fewer inhabitants were removed from the analysis and maps.

4.1.3. Variables, domains & indicators

23 indicators have been chosen to best capture the various difficulties potentially facing neighbourhoods. These indicators are grouped into four dimensions: "origins", "income", "precariousness in the labour

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market" and "precarious household and transfer income". It should be emphasised at the outset that there are no significant specific dimensions such as skills and housing. Indeed, there have been no systematic statistics on these dimensions at the neighbourhood level since the socio-economic survey of 2001. In order to broaden our approach, it is proposed to develop two original indicators on health and education. These complex indicators from different sources have not been included in the summary index for the sake of simplicity and monitoring.

4.1.4. Method

The synthetic neighbourhood difficulty index was calculated from a Principal Component Analysis (PCA) in order to condense the information on the various indicators. This type of analysis makes it possible to synthesize the information provided by many indicators that have strong correlations between them. When the indicators are highly correlated with each other, a significant part of the information can be considered with a single axis. In other words, the overall difficulty index is the first axis of a principal component analysis of socio-economic indicators at the neighbourhood level. This method takes account of the theoretical insufficiencies and statistical biases of the indicators by considering them separately so only the common aspects can be retained. This index can therefore be interpreted as a synthetic index of the level of difficulty of the neighbourhoods.

To give equal importance to all the different dimensions in the synthetic index of difficulty, the final index is itself based on four partial indices related to origins, insertion in the job market, income and the importance of social transfers.

Neighbourhoods characterised by a similar synthetic difficulty index do not necessarily face the same types of problems, and although the different dimensions may be highly correlated, it is not a perfect match. Some neighbourhoods may be specifically affected by problems of integration into the labour market, and others by low income or high clusters of populations recently arrived from intermediate or poor countries. Other dimensions are also important –particularly housing– but unfortunately could not be taken into account.

4.1.5. Classification & types

The grouping has been made to maximize the intra-group similarity and the differences between groups. These classifications do not distribute spatially in a uniform way, but follow geographical patterns depending on the territory.

The typological analysis of the four dimensions of poverty mentioned above ("origins", "income", "precariousness in the labour market", and "precarious households and transfer income") highlight these differences. In general, typological analyses aim to group observations (here neighbourhoods) into a smaller number of types. They operate by minimising intra-group and maximizing inter-group variance, thus clustering neighbourhoods with the same combinations of difficulties into types that are as different as possible from each other. The ascending hierarchical classification was chosen as the method of typological analysis.

In order to describe the different types of difficult neighbourhoods more precisely, a typological analysis was done on only the most problematic neighbourhoods in 2010, accounting for 30% of the population in the study area. These represent 1,451 statistical sectors within the 22 urban areas. The neighbourhoods were classified in seven groups:

- Type 1: Walloon-type neighbourhoods. Sectors of this type have unfavourable situations in all five indicators. However, the greatest difficulties lie in "income", and "unemployment". This type is located in the major Walloon cities and differs from Brussels-type neighbourhoods in great difficulty (type 2) in that a much smaller share of people are born abroad.

- Type 2: Brussels-type neighbourhoods in very great difficulty. Like type 1, this type of sector has an unfavourable situation in all five indicators, although with high unemployment rates and a smaller share of workers. The share of people born in an intermediate or poor country is much higher. This type is specific to populations living in sectors in difficulty in Brussels, although it is also found in Antwerp.

- Type 3: Neighbourhoods in great difficulty with a high proportion of workers. Sectors of this type have a lower level of difficulty than the two previous types. They are characterised by a very large share of workers in the occupied labour force. This type is characteristic of industrial cities, or at least with a proportion of people still employed in industry.

- Type 4: In great difficulty with a low proportion of people born in an intermediate or poor country. Sectors of this type are in a slightly worse situation than the average sectors in difficulty. Type 4 is significant as the "place of birth" indicator, although this is due to a smaller proportion of people born in an intermediate or poor country.

- Type 5: Neighbourhoods in intermediate difficulty. This type has a level of difficulty that can be classified as intermediate compared to the sectors in most difficulty. Type 5 sectors have more favourable situations in the "income", "unemployment" and "dependence on CPAS" indicators. They can be separated into two subtypes (5a and 5b) that differ in the "place of birth" and "employment" indicators.

  - ✓ Type 5a is in medium difficulty with a high proportion of people born in an intermediate or poor country. In addition to type-5 characteristics, this type of sector has a very small share of workers in the employed labour force (the least important part in the sectors subject to classification) and a greater share of people from intermediate or poor countries than type-5b sectors.

  - ✓ Type 5b has an intermediate difficulty with a high proportion of workers. Sectors of this type are distinguished from those of type-5a by a larger share of workers in the employed labour force and a smaller proportion of people born in an intermediate or poor country.

- Type 6: Moderate difficulty with a low proportion of people born in an intermediate or poor country. Sectors of this type have more favourable situations for all the indicators compared to the average situation for the sectors in most difficulty. In particular, they are characterised by a lower proportion of people born in a poor or middle-income country and a higher average income. This type of sector tends to be in more peripheral locations than the preceding types and characterises the spaces where the poverty is more diffuse.
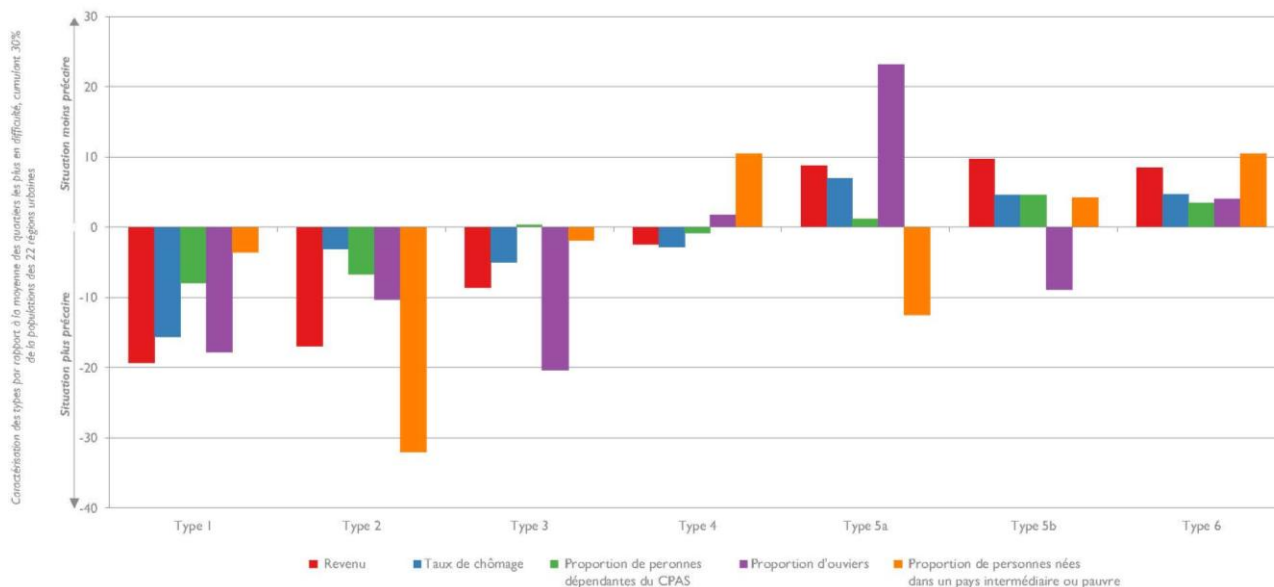
Figure 27. Characteristics of types. Dynamiques des quartiers en difficulte. Belgium
The types are arranged, in descending order, according to the average level of difficulty of the sectors that compose them. The rods represent the average situation of neighbourhoods included in the different types for 5 important indicators. The differences were ordered so that a negative value indicates a worse situation than the average of the most distressed neighbourhoods, which accounts for 30% of the entire study area. Source: http://forms.mi-is.be/Atlas_FR.pdf

4.2.   Denmark

4.2.1. Introduction

The purpose is to identify areas of public housing with social and integration problems. The list is updated once a year.

4.2.2. Definition of minimum spatial/geographical unit

The physical boundaries are generally fixed by Statistics Denmark and have undergone little modification over time. However, a minimum of 1,000 inhabitants is required for the inclusion of a spatial area in the study.

The characteristics of the *Ghettoliste* and the policy measures behind it do not require the creation of maps of the neighbourhoods included in the list. Although interactive mapping is possible, the *Ghettoliste* is simply based on descriptive data updated once a year.

4.2.3. Indicators & method

Apart from having 1,000 inhabitants, a housing area is included in the *Ghettoliste* if at least two of the following five requirements are met:

1.   The share of immigrants and descendants from non-Western countries is over 50%.

2.   The share of inhabitants aged 18-64 in neither employment or education is over 40%, as an average over a two-year period.

3. The share of inhabitants aged 18 and over convicted for criminal offenses or violations of weapons and drug laws is over 2.2 %, on average over a two-year period.

4. The share of inhabitants aged 30-59 with only primary education or lower is greater than 60%.

5. The average gross income for inhabitants aged 18-64 excluding those in education is less than 55% of the average gross income for the region in question.

If there are over 60% of immigrants and descendants from non-Western countries, the area is automatically considered a ghetto with no need to fulfil any other conditions.

The data are updated once a year.

4.2.4. Classification & types

The indicators in the Danish observatory reflect the problems experienced in the neighbourhood and are decided at the political level. When the *Ghettoliste* was launched in 2010, a housing area was on the list if it fulfilled two of three criteria (income, crime and ethnicity). More indicators were included in 2013, although the five criteria remain the same. An area was submitted to the list if it fulfilled three of the five criteria, although in all cases the requirement of 1,000 inhabitants was a precondition. All the indicators were decided politically. A distinction is made between vulnerable housing areas, ghettos and severe ghettos:

- Vulnerable housing areas: fulfil two of the four criteria but not the ethnicity criterion. These are not included in the *Ghettoliste*.

- Ghettos: as defined above, that is with the ethnicity criterion fulfilled.

- Severe ghettos: ghettos that have appeared on the *Ghettoliste* for four consecutive years.

4.3. **England**

4.3.1. Introduction

The Index of Multiple Deprivation 2015 is a measure of multiple deprivation at the small-area level. The multiple deprivation model underpinning the index is the same as for its predecessors and is based on the idea of distinct dimensions of deprivation which can be recognised and measured separately. These dimensions (or domains) of deprivation are experienced by individuals living in an area. The overall multiple deprivation index is measured by combining these specific dimensions of deprivation.

4.3.2. Definition of minimum spatial/geographical unit

The spatial definition of the Multiple Deprivation Index is taken from the census. The UK census is undertaken every ten years, the most recent being on 27 March 2011, which is the previous version of the index. Its purpose is to collect population and other statistics essential for planning and allocating resources.

The census takes place simultaneously in all parts of the UK. In England and Wales, the Office for National Statistics (ONS) is the body responsible; in Scotland, the National Records of Scotland (NRS); and in Northern Ireland, the Northern Ireland Statistics and Research Agency (NISRA).

The main areas directly associated with the census are output areas (OA) and super output areas (SOA). OAs are the base unit for census data releases. Urban/rural mixes are avoided where possible; OAs preferably consist of entirely urban postcodes or entirely rural postcodes. They have approximately regular shapes and tend to be constrained by obvious boundaries such as major roads. OAs are required to have a specified minimum size to ensure the confidentiality of the data.

The minimum OA size is 40 resident households and 100 resident people, but the recommended size is somewhat larger at 125 households. These size thresholds mean that unusually small wards and parishes are incorporated into larger OAs.

Changes in the OA and SOA boundaries for the 2011 census were made in the case of significant changes in population since the 2001 census; boundaries of local authority districts changed between 2003 and 2011; OA boundaries that were realigned to the England/Scotland border, as occurred for 2001; and areas that were independently assessed as lacking social homogeneity when they were created for 2001.

The redesigned OAs and SOAs do not align to ward and parish boundaries that have changed since 2003, or necessarily to real-world features; they have more than 100 persons and 40 households, even if they contain one or more communal establishments.

4.3.3. Variables, domains & indicators

The overall Index of Multiple Deprivation 2015 combines indicators under seven different domains of deprivation, described in the following sections: income deprivation; employment deprivation; education, skills and training deprivation; health deprivation and disability; crime; barriers to housing and services; living environment deprivation.

In addition, there are two supplementary indices: the Income Deprivation Affecting Children Index and the Income Deprivation Affecting Older People Index. An assessment was made for each of the seven deprivation domains to determine whether the indicators in the Indices of Deprivation 2010:

- Are still appropriate measures of deprivation for that domain.
- Can be updated.
- Can be strengthened, for example due to the availability of better data.

The research team also did considerable work to explore whether there are possible new indicators which would improve the deprivation measure captured by each domain. To be considered for inclusion, any new or modified indicators had to meet the same criteria as for the Indices of Deprivation 2010 and its predecessors. Indicators should:

- Be "domain specific" and appropriate for the purpose (and as far as possible, be direct measures of that form of deprivation)
- Measure major features of that deprivation (not simply conditions experienced by a small number of people or areas)
- Be up-to-date and (as far as possible) updateable
- Be statistically robust at the small area level
- Be available for the whole of England at the small area level in a consistent form.

In order to be considered for inclusion in the Indices of Deprivation 2015, indicators also had to have sufficiently robust data that was readily available to use for updating the indices without significant extra work.

The aim for each domain was to include a small selection of indicators that comprehensively captured the deprivation for each domain, within the constraints of data availability and the criteria listed above.

Combining the different domains into an overall index always involves weighting the domains, whether the weights are set explicitly or not. Greater weight on a specific domain gives greater importance to that domain in the overall index. If the domain scores are simply added together (after standardisation), this explicitly gives each domain an equal weight. Conversely, if domains are not standardised to the same scale or distribution, then weights are set implicitly by the domain distributions.

In the Index of Multiple Deprivation 2015, the income and employment domains carry more weight than the other domains. This is supported by research and the wider academic literature. Accordingly, the income and employment domains have been given the highest weights, accounting in combination for 45% of the final domain weights in the Indices of Deprivation 2015.

Domains with the most robust indicators should be given greater weights. Only indicators that are sufficiently robust are included in the indices. In addition, all the indicators must meet specific criteria for their inclusion: they are "domain specific" and measure major features of deprivation in that domain, they are up-to-date, can be updated on a regular basis, and are available for the whole of England at a small area level. The relative robustness of the indicators was gauged by extensive and detailed quality assurance testing of the data which also drew on long experience of working with these data.

4.3.4. Method

The English observatory creates its composite index using factor analysis and shrinking methods, which effectively enables the introduction of new indicators and the removal of non-operational ones.

The construction of the Indices of Deprivation 2015, including the Index of Multiple Deprivation, broadly consists of the following seven stages to define the indices and data processing, and produce the Index of Multiple Deprivation and summary measures. Below is a description of each stage, and the procedure used to produce the indices for each domain and the Index of Multiple Deprivation:

1. Dimensions (referred to as domains) of deprivation are clearly identified.

2. Indicators are chosen which provide the best possible measure of each domain of deprivation.

3. "Shrinkage estimation" is used to improve the reliability of small-area data.

4. Indicators are combined to form the domains, generating separate domain scores. These can be regarded as indices in their own right, or domain indices.

5. Domain scores are ranked, and the domain ranks are transformed to a specified exponential distribution.

6. The exponentially transformed domain scores are combined using appropriate domain weights to create an overall index of multiple deprivation at the small-area level. This stage completes the construction of the Indices of Deprivation 2015 at the lower-layer super output area level.

7. The overall index of multiple deprivation, the domains and the supplementary indices are summarised for higher-level geographical areas such as local authority districts.
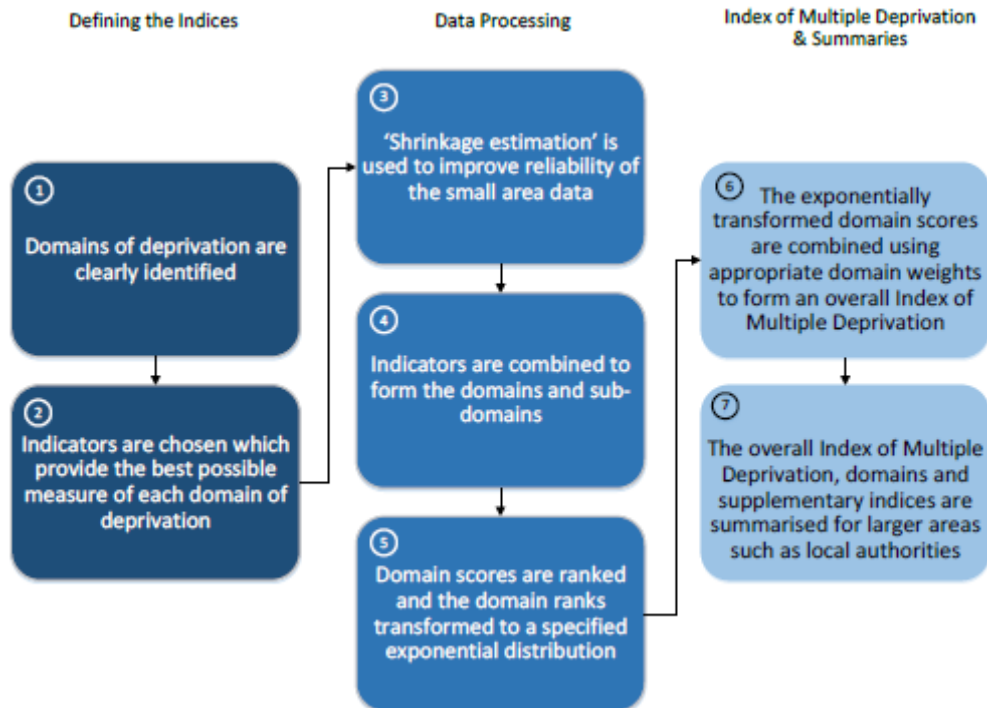
Figure 28. Overview of the methodology used to construct the Indices of Deprivation 2015. England
Source:https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/464485/English_Indices_of_Deprivation_2015_-_Technical-Report.pdf

4.3.5. Classification & types

There is no definite threshold in the classification and identification of neighbourhoods above which an area can be described as "deprived"; the deprivation indices in England are a continuous scale of deprivation. Users often take the most deprived 10% or 20% of lower-layer super output areas (or local authority districts) as the group of highly-deprived areas, although there is no reason not to use other thresholds instead.

4.3.6. Validation

The methods used to construct the Indices of Deprivation 2015 have been carefully designed to ensure the robustness and reliability of the output datasets. This is ensured by the design of the indices and many other quality management actions and quality assurance checks.

The robustness of the index methodology is reinforced by the fact that a consistent and uniform methodology is applied across the country. The indices are a relative measure of multiple deprivation. The national comparisons enabled by such a relative measure are only possible if the same methodology is consistently applied irrespective of local conditions or the local availability of data.

There was a great deal of evidence for the weights chosen during the consultation for the Indices of Deprivation 2000 and all the subsequent English deprivation indices. The assessment of potential weights based on empirical methodologies also supports the weights used for the Indices of Deprivation 2010.
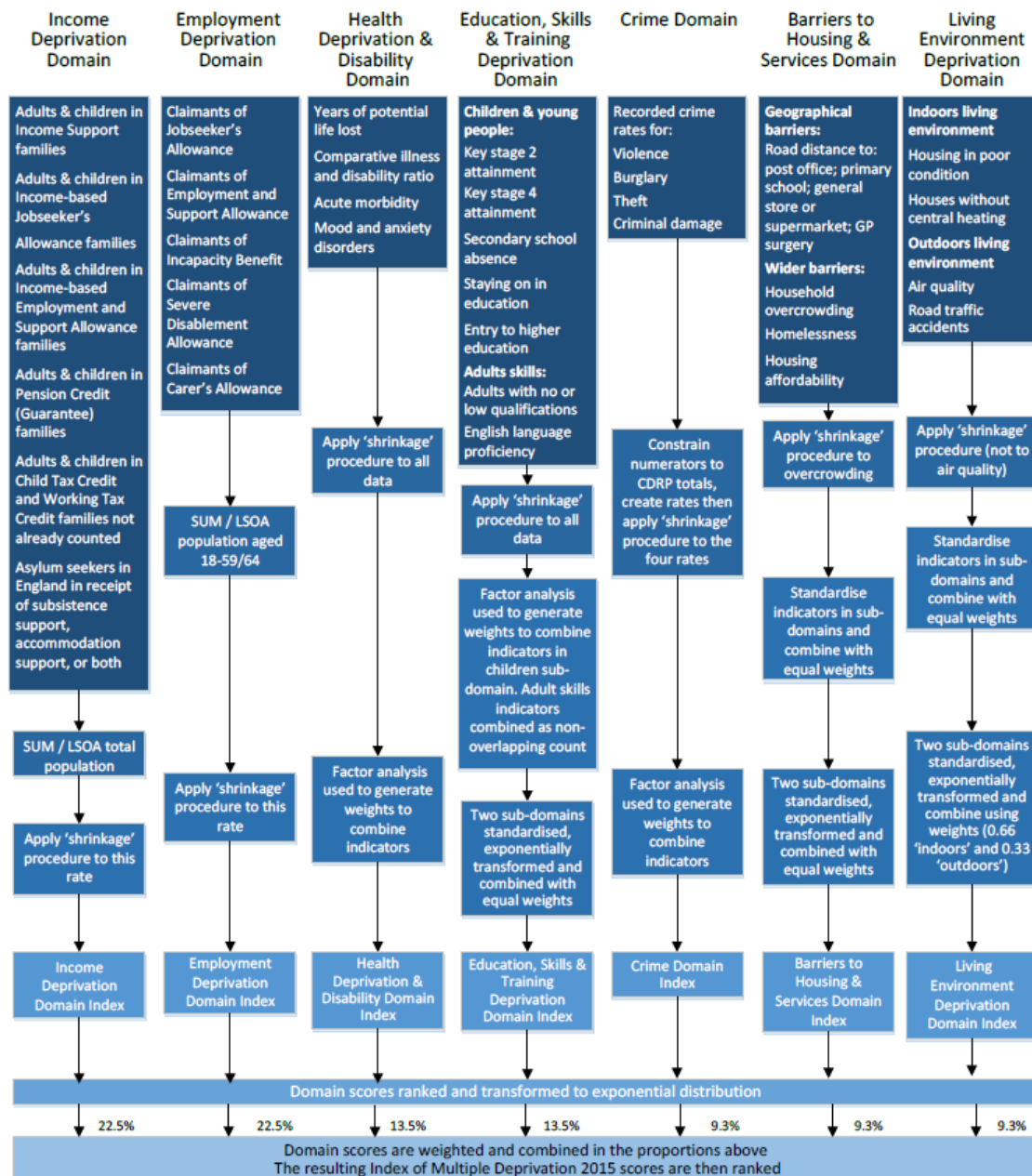
Figure 29. Summary of the domains, indicators and statistical methods used to create the Indices of Deprivation 2015. England
Source:https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/464485/English_Indices_of_Deprivation_2015_-_Technical-Report.pdf

With reference to these research findings, the use of these weights was revisited in the most recent consultations preceding the release of the Indices of Deprivation 2007 and 2010. Both consultations found 89% of respondents were in favour of keeping the weights the same. Furthermore, the survey of users in July 2014 did not reveal any significant support for moving to new weights. In light of the very high level of user support, the weights used in the Indices of Deprivation 2015 remain the same as in the Indices of Deprivation 2010.

The design of the Indices of Deprivation 2015 is based on a set of principles and practices that help ensure data quality.

The domains and Index of Multiple Deprivation contain 37 deprivation indicators from a wide range of data sources. This sheer diversity of inputs also leads to more reliable overall data outputs; to be considered as highly deprived on the Index of Multiple Deprivation, an area is likely to be highly deprived in many of the domains. Due to the variety of data inputs, there is little chance of an area being identified as highly deprived due to a bias in one of the component indicators; the use of multiple independent indicators increases the robustness of the final outputs.

Shrinkage estimation is used to improve the reliability of the small-area data, by "borrowing strength" from larger local authority districts. This tends to result in unreliable values (with larger standard errors) being shifted or "shrunk" towards the average of the larger area. During the development of the indices, all the indicators were compared before and after shrinking to examine the extent of the movement of unreliable scores.

The different domain scores are standardised (in order to combine them into the overall multiple deprivation index) by ranking across all areas. This has the effect of pulling in any outlying scores at the top or bottom of the distribution. Exponential transformation is then used to ensure that deprivation in one domain is not completely cancelled out by lack of deprivation in another domain.

The domains are weighted before they are combined into the overall multiple deprivation index. The smallest weights are given to the two domains containing modelled indicators (barriers to housing and services, and living environment), which therefore have a relatively small impact on the overall multiple deprivation index.

4.4.   France

4.4.1. Introduction

Since 2015, France has had a list called QPV (Quartiers Prioritaires de la Politique de la Ville). The 1300 priority districts in metropolitan France are all defined by a concentration of low-income inhabitants.

4.4.2. Method changes & definition of minimum spatial/geographical unit

With the 2014 urban planning and urban cohesion law, the State implemented a simplification of the old instruments and redefined the perimeters of intervention of the QPV to concentrate the means towards the most troubled territories. Replacing the superposition of zonings (sensitive urban area (Zus), urban revitalization zone (ZRU), urban contract of social cohesion (Cucs)) and the dissemination of the resulting outputs, creating a single perimeter: the priority district of city policy (QPV).

The General Commissariat for Territorial Equality (CGET) has drawn up the list and contours of the QPVs, which have been identified according to a single criterion of income per inhabitant through a grid of 200x200 metres in the mainland national territory. The income criterion is defined in two ways: by comparison with incomes in the agglomeration where the district is located, and with incomes in metropolitan France. Tiles on the grid were determined with a significant poverty concentration and sufficient people in urban territories (1,000 people). In a second phase, local elected officials were contacted to ensure the consistency of the regulatory perimeter of the priority neighbourhood and, if necessary, to adjust it.

The perimeters of the city's policy for priority neighbourhoods have been fixed by decree since 2014 and were rectified for the departments and collectivises of Overseas Territories in 2015. Their complete renewal will be in 2022. This date was also fixed by decree.

It should be noted that the radical change in methodology interrupts the times series and precludes any diachronic analysis of the evolution of *quartiers prioritaires* before 2015.

4.4.3. Variables, domains & indicators

Although France uses a large number of indicators to characterise its neighbourhoods, they are only delimitated by income, as measured through taxes per family. There are five descriptive domains: demography, education, labour integration, income and economic fabric, and their quality and periodicity vary from one neighbourhood to another

4.4.4. Classification & types

The neighbourhood situations can be very different. The identification method based on family income provides the city's policymakers with clear information on the situation in the neighbourhoods but erases their differences by showing them as a homogeneous whole. The typologies below aim to group neighbourhoods into a smaller number of classes, in order to analyse their situations synthetically while distinguishing them according to their characteristics.

Priority neighbourhoods are classified in three typologies, based on the living environment; cohesion and employment, according to the threefold articulation of new city contracts.

The living environment typology distinguishes five neighbourhood classes from housing and housing market data dynamics: old centres, neighbourhoods with social housing with small and medium urban units, outlying districts with few addresses (less than 20 dwellings), residential areas on the periphery of large urban units and neighbourhoods with social issues in remote suburbs.

There are four classes relating to social cohesion: two (integrated neighbourhoods in a mixed environment and segregated neighbourhoods) are characterised by a more favourable environment compared to other neighbourhoods, but they differ from each other in terms of the benefit they derive from this environment. The other two classes (highly precarious neighbourhoods that merge with their environment and large deprived neighbourhoods) are in more disadvantaged environments.

Finally, the typology devoted to employment differentiates three classes: neighbourhoods that benefit from a dynamic environment, stalled neighbourhoods and struggling neighbourhoods in an industrial setting.

Classical methods of data analysis have been used to achieve these three typologies, all based on an ascending hierarchical classification (CAH) from factor axes derived from a principal component analysis (PCA) for typologies related to social cohesion and employment variables. Unfortunately, it was impossible to apply a principal component analysis to "size of the urban unit" as it was a categorical variable.

4.5.   Ireland

4.5.1. Introduction

The Pobal HP Deprivation Index is a project from Pobal whose role is to provide management and support services to around 23 programmes in the areas of social inclusion and equality, inclusive employment and enterprise, and early years and young people. However, its index is managed and built by Trutz Haase, a social and economic consultant with a strong relationship with various institutions and area-based policies.

4.5.2. Definition of minimum spatial/geographical unit

The Small Area Population Statistics (SAPS) in the 2011 population census has been published for the first time at the level of 18,488 small areas (SAs). In this new census geography, SAs are standardised in size and have a minimum of 50 households and a mean of just under 100, thus effectively providing street-level information on the Irish population. The move away from Electoral Divisions (EDs) –which may range in population from under 100 to over 32,000– marks a major advance, particularly where a census-based deprivation index is used as a proxy for individual-level social position. Based on a special compilation of the 2006 SAPS data at the level of the new SAs, the HP Index is the only deprivation index in Ireland to have implemented the new small-area census geography using the 2006 and 2011 census data on a consistent basis.

The Pobal HP Deprivation Index is based on small areas (SA), the new census geography developed jointly by the Ordnance Survey of Ireland (OSI) and the Central Statistics Office (CSO) for the publication of the 2011 Small Area Population Statistics (SAPS). Before 2011, the smallest spatial units for which consistent SAPS data were available were the electoral divisions (EDs). However, EDs do not provide homogeneous coverage of all areas in the country, as they contain as few as 76 individuals in some rural areas, and over 32,000 in others. This unevenness in population generates considerable difficulties when mapping social and economic data. The introduction of the small-area (SA) geography for Ireland follows analogous revisions to the census geography in the UK and Northern Ireland and yields a number of benefits. SAs are much more homogeneous in their social composition and have a uniform population size with a mean of just under 100 households. The 2016 Pobal HP Deprivation Index is consistent with data published following the 2011 census, and all scores are computed in a consistent manner for the 2006, 2011 and 2016 waves. It should be noted that index scores built from the SA-level analysis cannot be compared with those derived from an ED level analysis. All the HP deprivation indices for the period 2006-2016 are shown in Figure 1. The pink fields indicate the level at which each index was built, while the green fields represent population-weighted aggregates based on the small-area scores.

4.5.3. Variables, domains & indicators

The domains in the Pobal Deprivation Index are demographic profile, social class composition and labour market situation. Each dimension is calculated in the same way for each census wave and then combined to form an absolute index score and relative index score. The absolute index scores had a mean of zero and a standard deviation of ten in 2006, with varying means and standard deviations in 2011 and 2016 that reflect the underlying trends. The relative index score is specific to a given census wave and does not capture trends over time. By removing the national trend from the index scores, this index highlights differences in the relative values. The standard deviation is set to ten for each wave, so that the relative index scores provide a standardised measurement of relative affluence and deprivation.

4.5.4. Method

In Ireland, the HP deprivation scores can be used in different ways: (i) the relative HP deprivation score provides a measurement of the affluence/deprivation of a given area relative to the national mean at a specific point in time; (ii) the comparison of absolute HP deprivation scores from different census waves offers a measure of how much an area has improved or deteriorated in absolute terms; (iii) changes in the mean of the absolute HP deprivation scores indicate the underlying trend of how affluence/deprivation has changed over time; and (iv) by comparing relative HP deprivation index scores for a particular area at two different points in time, we can assess whether its position has improved or deteriorated relative to the rest of the country.

4.5.5. Classification & types

Why are the scores in the Pobal HP Deprivation Index not expressed as decile rankings? Decile rankings divide all geographical areas into ten equally-sized categories, and are frequently used for mapping purposes, or when comparing scores from indices that do not have a common measurement scale across successive waves of data. However, it should be noted that this use of decile rankings is problematic, as relatively large changes at the extremes of the affluence-to-deprivation spectrum may not be reflected in a change in decile ranking, while relatively minor changes in the middle of the distribution can easily result in a change of one or two deciles. The 2016 Pobal HP Deprivation Index uses the same measurement structure and scale for successive census waves, eliminating the need for rankings and allowing the comparison of the absolute and relative HP deprivation index scores over time. This approach pays greater attention to the actual level of deprivation experienced, reflected in the distance from the mean, and is superior to decile rankings.

4.5.6. Validation

A range of statistical tests and alternative fit indices can be used to test model adequacy. For a deprivation index based on Exploratory Factor Analysis (EFA), it makes no sense to ask whether the model "fits" the data, as all indicators load on all factors. For the same reason, the factors can be unstable and counter-intuitive. In a Confirmatory Factor Analysis (CFA) model, by contrast, statistical tests and alternative fit indices provide a systematic way to assess whether a given theoretical model (i.e. our ideas about the key dimensions of deprivation and their relationship with a set of indicator variables) is consistent with the empirical evidence.

The ultimate proof of the validity and usefulness of the *Pobal HP Deprivation Index* lies in its ability to act as a reliable predictor to the social gradient that can be observed across those spheres where the research team is most concerned about the structuration effects of social class; i.e. in Health, Education, Income and Wealth, Housing, Environment and Crime. It is exactly because the *Pobal HP Deprivation Index* does not include indicators of these domains in its construction, that one can empirically test the ability of the *Pobal HP Deprivation Index* to predict outcomes in these domains. It is this ability, which provides the ultimate proof of the *Pobal HP Deprivation Index* validity.

The consultants have finalised a study under a Framework Agreement with the HSE / Health Intelligence Unit in which they are providing detailed proof of the superior performance of the *Pobal HP Deprivation Index* when compared with other deprivation indices such as the SAHRU Index or the NIMDM. The superior performance of the *Pobal HP Deprivation Index* is closely related to a number the conceptual and statistical features described in the Overview section.

4.6. **Netherlands**

4.6.1. Introduction

The Liveability Monitor (*Leefbaaromete*r) contains information from 2002 to 2016 and is updated every two years since 2008. It provides information on quality of life in all the neighbourhoods and districts in the Netherlands. It therefore reflects the situation in the neighbourhood, but also the development and background of the neighbourhood.

It was developed in response to two demands: a recommendation from the civic platform to the former Ministry of Housing, Spatial Planning and the Environment for a country-wide instrument indicating quality of life; and the need for a liveability monitor for cities identified within the urban policy framework.

4.6.2. Definition of minimum spatial/geographical unit

The *Leefbaarometer* 1.0 was presented at the lowest scale level in the form of clusters. These clusters were formed by combining six postal code areas (6-PPC) with the same score. Single postal codes were not shown unless more than one hundred residents lived in the area. The disadvantage of this presentation form was that it was very dependent on the 'accidental' division of the postcode areas. This sometimes resulted in strange images such as flats, one half of which received a different score than the other. Clusters were also less useful for comparisons over time, because a cluster can change (areas were added and areas were removed, the cluster itself could not be followed).

In the *Leefbaarometer* 2.0 the outcomes were presented at the lowest scale level in the form of grids of 100 x 100 meters. The grids are intersected with the shape of the residential area to do justice to the actual borders in a city or village. This means, for example, a park or the border with the surrounding area are recognisable. That also means that it is on the edge of residential areas, a part of the grid remains, since they are intersected. These grids can be monitored throughout time. An additional advantage of the grids is that they show more emphatically that the *Leefbaarometer* maps represent a model.

All calculations were performed at 6-PPC level. In order to arrive at the calculation of the grids scores, they examined which 6-PPC areas are located in such a grid. All 6-PPC areas, however, run straight through the grids. Therefore, they are subdivided based on the number of houses and then the weighted average is calculated for the 6-PPC areas within such a grid. A zip code that forms only a small part of such a grid counts only for a small part in the calculation of the *Leefbaarometer* of that particular grid.

Because of privacy and stigmatisation were considered, not all grids are depicted. Only grids whose postal codes consist of a total of at least 100 inhabitants in a radius of 200 meters are taken into account. Specifically, for each postcode, it is calculated how many residents live within a radius of 200 meters and this number is added to all grids. If this aggregated number is lower than 100 residents, but such a grid is located in a contiguous area with several grids with the same viability class, then three hundred inhabitants of all grids are added to the lower limit. Ultimately, this means that grids in the rural area that consist of only a few dwellings are removed. Grids in the nuclei and cities are shown in this way.

4.6.3. Variables, domains & indicators

Many of the almost 400 indicators on the list have been removed due to their low significance in the models, so the *Leefbaarometer* comprises only 100 indicators. Other methods have also been used to monitor the indicators, namely residuals and validity.

Several indicators have been converted to "residuals". This has been done for income-based indicators, although we are not (initially) interested in the part relating to income but in the part relating to quality of life regardless of income. For example, age and income are linked: on average, young people have a lower income than other households (like the elderly). Without control for income, there is a negative correlation between young people and quality of life, which is partly due to the fact that quality of life is rated less favourably in areas where there are many low incomes. However, the question is whether this connection exists regardless of income. This was determined by first applying a regression analysis to explain the relationship between the target variable (for example the share of young people) and the average income in an area, and then continuing to work with the unexplained part of the target variable.

No indicator was discarded *a priori* in the investigation, but two filters were applied. The first is a qualitative filter to control expandability in the case of land-cover characteristics, availability, the time

period and the reliability of the indicator data. The second is a quantitative filter that regression-tests the indicators to check their level of significance.

The total scores of both individual models are calculated (coefficient multiplier indicator + coefficient multiplier indicator, etc.) to combine the results from both models into one quality-of-life score. The average and standard deviation are then determined for both models. The judgment model was chosen to review the behavioural model. The coefficients were rescaled to calculate a viability score on the basis of both models.

The *Leefbaarometer* 2.0 consists of exactly 100 indicators. Although the score is composed of 116 variables, 18 of them measure similar information in a slightly different way, such as high-voltage pylons within 500 meters, within 1500 meters, and the distance to high-voltage pylons. Despite been very similar, these variables can contribute differently to the model's score. We have combined these variables under one heading, in this case "high-voltage pylons", to create a list of exactly 100 indicators, which are then subdivided into five dimensions.

Each dimension score has been calculated based on this classification, indicating its contribution to the total score in the *Leefbaarometer*. The weight per indicator in the dimensions is determined on the basis of the combined coefficients from the two models underlying the *Leefbaarometer*. The standard deviation of the various combined dimension scores has been determined in order to arrive at the distribution in Figure 30.
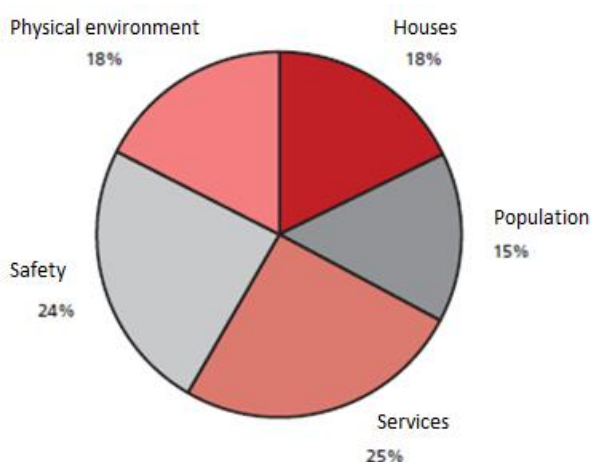
Figure 30. Weight per dimension in the *Leefbaarometer*. Netherlands
Source: https://doc.leefbaarometer.nl/resources/Leefbaarometer%202.0%20Instrumentontwikkeling%20CONCEPT.pdf

4.6.4. Method

The *Leefbaarometer* registers quality of life by analysing two aspects: environmental characteristics and judgments. It should be noted that while judgments are gathered by surveys, environmental characteristics can be located and spatialised. The relationships between environmental characteristics and the judgment and appreciation of the living environment are estimated using regression analyses, resulting in two sub-models that indicate which environmental characteristics (and to what extent) explain the differences in quality of life. Both (sub) models have strong similarities, but also assign their own meaning to the concept of quality of life as they emphasise different types of indicators. In combination they give a good picture of the differences in quality of life at the local level, as demonstrated by external validation studies and by the widespread application of the model by municipalities and corporations.

One point worth noting in regard to the approach in versions 2.0 (the most recent) and 1.0 (the previous version) is that the model estimation in the *Leefbaarometer* 2.0 has gradually developed into a model for liveability differences, applying the indicators in five steps. After each step the (non-standardised) residual of the model estimate for that particular step is used as a dependent variable for the next step. This strategy differs from the construction of the model in the *Leefbaarometer* 1.0 –which is preferable from a statistical point of view– where all the indicators were included together in the analysis and could be effectively checked for all mutual relationships to produce the model with the optimally optimized "fit". Although in this new model estimate the research is guided more by theory, it goes without saying that the model estimate is still sufficiently robust.

For the effects of comparison and validation, the model results are estimated according to the original method, and not step-by-step. No interactions with urbanity scores are tested with this model estimate, and the population characteristics are not checked for consistency with income differences, in accordance with the original approach.

The explanatory power of the step-by-step model estimation is equal to the original viability model at 0.55, explaining 55% of the variance, which can be considered good for this type of model. The correlation with the outcomes of the original model is high (r = 0.90), which is also to be expected as it is not intended to measure any other concept. This fulfils the initial objective of developing an improved and theoretically substantiated model with at least as much explanatory power.

4.6.5. Classification & types

The models that underlie the *Leefbaarometer* result in a continuous score. This provides a nuanced picture of the differences in quality of life. The maps of the *Leefbaarometer* 1.0 use seven classes: from very negative to extremely positive. In the development of the *Leefbaarometer* 1.0, these classes were defined in such a way that they followed the distribution of opinions about the quality of life (2006). Classes 1 to 3 (The most deprived) have become the 'problem classes', class 4 (moderately positive) is in practice a class that signals: there are risks of falling, or they are the first steps on the road to improvement.

The class boundaries are arbitrary because they do not match the natural ones. Because these class boundaries are used strictly, it can happen that an area differs only minimally from an adjoining neighbouring area but has a different colour: score 4.01 versus 4.010001 for example. There is a certain risk involved because of the value that is attached to the classes from the users. A disproportionate amount of attention can be given to a negligible difference.

That risk can only be "resolved" if the scale is not represented as a seven-point scale, but as a semi-continuous scale, with for example fifty classes of which only a number of anchor points are appointed. Then the colours run more gradually and there is less chance that an area "accidentally" ends up in a specific class. Naturally, there are also disadvantages to this approach: less precision and possibly also lack of clarity, while a large gradation in colours suggests a high degree of accuracy.

In consultation with the advisory committee it was decided not to use a semi-continuous scale. However, it was decided to move to a larger number of classes: nine for the fixed maps and seven for the development maps, so that more off a distinction is made. In addition, the labels have also been adjusted. The following labels are used in the *Leefbaarometer* 2.0 for the regular maps: very insufficient, largely insufficient, insufficient, delicate situation, adequate, satisfactory, good, very good and excellent. For development maps: In great decline, in decline, potentially in decline, no development, potentially in improvement, improving, and in high improvement.

In the *Leefbaarometer* 1.0 the category "no development" was larger - in other words: the development had to be greater to end up in a positive or negative category - than in the *Leefbaarometer* 2.0. The result is that - especially over shorter periods - the development map was often predominantly grey: no development. In order to make more distinctions in the development map, the category "no development" has been reduced and two categories have been added: "possible decline" and "possible progress". Areas that fall into these categories show some positive or negative development, but not so large that it can be stated with certainty that significant changes have taken place. This means that the maps show more development than in the past. The distance between the different development classes is set at a half average class.

4.6.6. Validation

The external validation involves a comparison with reality. After all, the models can statistically predict the judgment and behaviour of residents, but they do not correspond well with the differences in quality of life as assessed by local experts. There may also be specific biases that make the model better in some areas than in others.

The external validation is done by local experts in fourteen municipalities and / or regions. These are municipalities / regions with a different profile: large, medium and small, in different parts of the country and with different types of problems. The following topics were central to the validation:

- Is the image of the 2014 stand for the municipality recognisable and (if applicable) in which places not and why not (ideally with substantiation)?

- Is the development between 2012-2014 recognisable and (if applicable) in which places (ideally with justification)?

- To what extent does the map (status 2014) and development 2012-2014 give a more recognizable image based on Life Model 1 or Life Model 2? And why?

The general picture is that differences within a municipality in the model maps (2014) of model 1 are well recognized and plausible. It is true that in many municipalities there are specific areas where the score is different (both more positive and more negative) than expected. In those municipalities where the stand design of model 2 was subsequently discussed, it first appears that the general picture does not deviate much from the image based on model 1. In principle, this also involves differences in nuances. In some municipalities, some of the areas that have an "unexpected" score based on model 1 are better recognized in the model 2 map. On the other hand, in the location maps of model 2 areas, they sometimes have a different colour than in model 1, which are then less well recognised.

The development maps were often relatively difficult to validate. This is because a large part of the map is grey (no or hardly any development) and the period is relatively short to indicate whether the location has improved or has deteriorated. In addition, there is often no (alternative) data on which the validation could be done, or the periods of comparison are different. In addition, the short period and the fact that the map only shows some more extensive developments that play a role in making the validation difficult. In two years, there are relatively few areas where the quality of life has changed substantially.

4.7. Romania

4.7.1. Introduction

Two different outputs are produced for Romania: The Atlas of Marginalised Urban Areas and the Atlas of Marginalised Areas and Local Human Development in Romania, which focuses on rural deprived areas. Although both follow a similar methodology, the divergence is justified by the different quality and availability of the data and the diversity of the approaches in rural and urban contexts. Indeed, the research on rural marginalised areas follows a more qualitative approach.

4.7.2. Definition of minimum spatial/geographical unit

Urban marginalisation manifests itself in the spatial concentration (pockets) of deprivation in urban areas. The analysis of this phenomenon must therefore be made at the lowest spatial level. The data collected through the 2011 population and housing census provide a unique opportunity for such an analysis, that is, at the level of small geographical units.

The lowest spatial level in the census is the census sector, which typically covers around 200 households. The microdata from the 2011 population and housing census were aggregated at this level for the analysis in this atlas. However, marginalised communities are not always entirely concentrated in one census sector, so community characteristics cannot always be analysed at the census-sector level. The figure below shows a few typical examples of this situation, including example 1 where a large community covers several census sectors; example 2 depicts a situation where a community covers parts of two or more census sectors; example 3 shows a situation where a small community sits inside a census sector; and finally example 4 is a community located on the city boundaries, partly within the city's built-up territory and partly outside it (these could for instance include improvised shelters near rubbish dumps). The census data may not be suitable to identify the situation in this last example. Residents in these areas may not be fully covered in the census, and those who are covered are likely to be allocated to a range of existing census sectors in the nearby area. This kind of a community therefore cannot be identified or reconstituted using the data aggregated at the census-sector level.
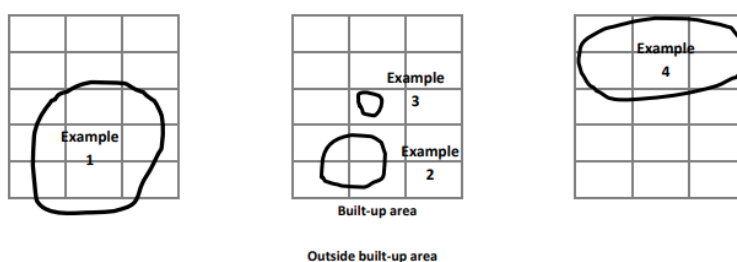
Note: Cells denote built-up territory divided into counting areas, while shapes show actual communities

Figure 31. Examples of interaction in territory between census sectors and actual communities. Romania
Source: http://documents.worldbank.org/curated/en/668531468104952916/pdf/882420WP0P1430085232B00OUO0900Atlas.pdf

The 2011 population and housing census contains 50,299 census sectors in urban areas, with an average of 216 inhabitants each one. However, they vary widely and range from a minimum of one person to a maximum of 10,385 per census sector. 2.8% of all census sectors are very small (under 50 inhabitants), while 2.2% are large (500 inhabitants or more). The number of census sectors also varies considerably from one city to another, from ten to 1,459, with a maximum of 7,573 sectors in Bucharest. As can be expected, the average number of census sectors in a city is related to its population size. There are 33 census sectors (with between ten and 62 inhabitants) in cities with fewer than 10,000 inhabitants, and 1,112 (with between 739 and 1,459) in cities with over 150,000 inhabitants.

| City size | | Census sectors | | | |
Resident population	Number of cities	Total number	Average per city	Minimum per city	Maximum per city
< 10,000 inhabitants	134	4,404	33	10	62
10,000 - 20,000 inhabitants	91	5,688	63	31	100
> 20,000 - 150,000 Inhabitants	82	19,290	235	67	776
> 150,000 Inhabitants	12	13,344	1,112	739	1,459
Bucharest	1	7,573	7,573	7,573	7,573
Romania urban	**320**	**50,299**	**157**	**10**	**7,573**

Data: NIS, Population and Housing Census, 2011

Table 5. Distribution of census sectors by city size
Source: http://documents.worldbank.org/curated/en/668531468104952916/pdf/882420WP0P1430085232B00OUO0900Atlas.pdf

In the case of rural deprived areas, the World Bank team carried out an extensive validation study to confirm the marginalised status of the communities theoretically identified (through quantitative methods applied to the 2011 census data) and checked for both inclusion and exclusion errors. The fieldwork was conducted in May to June 2015 in two counties. The sample consisted of 68 communes incorporating 232 villages, with a total of 1,123 census sectors, of which 82 are theoretically rural marginalised areas.

The field research was based on a mix of qualitative methods. In each commune selected, the team first paid a visit to the mayor's office to conduct one or more interviews with the mayor, vice-mayor, secretary, or a social worker from the local public social assistance service. In the interviews the team described the study, the methodology used to identify rural marginalised areas and the theoretical results; and –with reference to a map of the commune– asked the respondents their opinion on the marginalised areas identified. In the next step, the team visited the marginalised areas previously identified and organised group discussions on site with local people, following preestablished guidelines. The research team also sought to identify any inclusion errors by making their own direct observations based on a list of indicators that are highly suggestive of marginalisation in Romania.

In order to identify any exclusion errors, the team asked the local authorities and local people about any census sectors that were not identified as being marginalised according to the 2011 census data. If the respondents indicated that a certain additional area should be considered as marginalised, the team arranged a field visit to the area where they conducted group discussions and made direct observations. If no new marginalised areas were mentioned by the respondents, the research team randomly selected one or two villages per commune (particularly those located furthest from the commune centre) and visited them to check for any marginalised areas that had not previously been identified using the 2011 census data.

Based on all this information, the research team used inter-rater comparisons to decide which areas to validate as marginalised and which newly-identified marginalised areas to add to the list.

4.7.3. Variables, domains & indicators

A simple summative index was calculated at the level of the census sector by counting the number of indicators that exceed the threshold for each of the three criteria. This then determines whether a census sector has low human capital, low formal employment or poor housing, calculated as follows.

A census sector is defined as having low human capital if any two of the three human capital indicators have values above the threshold. In other words, a census sector is considered disadvantaged in human capital if it has a relatively high concentration of at least two of the following groups: working-age population with poor education, children, and people with disabilities, chronic diseases or other health

conditions. A high concentration indicates that the share of the respective group in the total relevant population of the census sector is within the top 20% values of all the urban census sectors in the country.

A census sector is defined as having low formal employment if its share of the working-age population without formal employment and not in education is among the top 20% of all the urban census sectors in the country.

A census sector is defined as having poor housing if any two of the three housing indicators have values above their thresholds; that is, with a relatively high concentration of at least two of the following groups: (i) people living in dwellings not connected to electricity, (ii) people living in overcrowded dwellings, and (iii) households with a low degree of security of plot tenure. "Concentration" here again indicates that the share of the respective group in the census sector is in the top 20% values of all the urban census sectors in the country.

4.7.4. Method

4.7.4.1. The Atlas of marginalised urban areas

The literature review carried out in the first phase of research found that the most relevant, useful, practical and measurable criteria for defining different types of disadvantaged communities/areas are: (1) human capital (i.e. education, health and demographic behaviour), (2) employment, and (3) housing quality. Ethnicity may be used as a second level criterion for the following reasons: (a) the stigma and discrimination faced by Roma people, in addition to other types of disadvantages; (b) for practical reasons, when for a specific intervention a community must be selected among urban communities that are similarly marginalised in terms of human capital, employment and housing quality; and (c) different or additional financing opportunities may be available for specific interventions in Roma communities. A theoretical typology of urban disadvantaged areas and a first version of the methodology were also developed to identify these areas at the intra-city level.

The second phase comprised qualitative research to review past efforts to address urban exclusion in Romania and served to further refine the typology of urban marginalised communities where deprivation is most acute and to define a number of corresponding subtypes, based on observations in the field. The research methodology was piloted, and the subsequent fieldwork covered ten cities selected in close consultation with MRDPA officials. The qualitative research confirmed that these cities cover a variety of urban settings containing all three types of urban disadvantaged areas, as proposed in the initial typology.

The third phase of the research consisted of two parts: the first was to produce six conceptual pilots by means of follow-up field work in six different types of marginalised areas; and the second was to collect data from all the urban authorities in Romania. Using the refined typology of urban marginalised communities (where deprivation was most serious) resulting from the qualitative research in the second phase, they were asked to provide information on whether each of these types of marginalised communities existed in their municipality, and if so where.

The fourth phase included further work to adjust the initial typology of urban marginalised communities based on the qualitative field work and an analysis of the dataset from the latest official 2011 census. This yielded a series of census-based maps of urban marginalisation in Romania, at the city, county and regional level. However, census sector shape files –needed to produce city maps that show the spatial location of these census sectors– were available for only eight cities. Maps were produced at the census sector level for these eight cities, showing the typology of urban areas as determined by the census data. Apart from these eight cities, four maps were produced with the findings based on information obtained from the

municipalities, and on the method using the census data, which does not register at census sector level. While we believe the approach for defining and identifying deprived areas using census data to be promising, further work has been done to assess its validity.

4.7.4.2. The Atlas of marginalised Areas and of Local Human Development in Romania:

The first key step in producing the Atlas of Rural Marginalised Areas and Local Human Development in Romania was to conduct a desk review of the existing criteria and indices used to define "poor communities", "segregated communities", and "marginalised rural communities" in Romania. Based on this review, in the second key step, the team developed a methodology to identify rural marginalised areas using data from the 2011 Population and Housing Census. This drew heavily on the methodology used in the Atlas of Urban Marginalised Areas but was adapted to take account of the particular characteristics of rural communities. In the third step, the results of the methodology for identifying rural marginalised areas were validated through extensive field research based on qualitative methods. The aim of the validation study was to check the quantitative results for both inclusion and exclusion errors. The field research also refined the typology of rural marginalised communities by distinguishing two subtypes – communities that are geographically isolated and those that are peripherally located within well-connected villages.

The qualitative research largely confirmed the results of the methodology based on quantitative techniques, but it also highlighted several limitations of the approach. Finally, in the fourth step, the main characteristics of each subtype of rural marginalised areas were determined and the mapping was done.

4.7.5. Classification & types

The structure of the variables produces four types of disadvantaged areas depending on the four criteria below:

- **Type 1. Areas disadvantaged on housing:** neighbourhoods where a significant part of residents suffers from inadequate housing, even if many of them have some form of formal employment. The level of education of inhabitants varies. These include parts of towns that are poorly endowed with housing infrastructure and include old neighbourhoods of houses situated at the town/city periphery, with poor provision of utility services and without modern roads. It also includes groupings of apartment blocks or houses owned by dwellers, mainly built in the '60s-early '70s, which are in a poor state as the dwellers cannot afford investments in building upgrades and refurbishment. These areas are nearly heterogeneous in terms of population. Houses can be owned by elderly with a possible high proportion of people with chronic diseases or other health conditions. This category also includes areas with many young well-educated tenants, but who cannot afford to buy their own home (such as in Bucharest and in the large university centres). An area referred to as an 'area disadvantaged on housing' is therefore a census sector that has poor housing but does not have low employment and has a varying level of human capital.

- **Type 2. An area disadvantaged on employment** is by definition a census sector with a relatively high concentration of residents that do not have a human capital deficit but do not find work in the formal sector, irrespective of their housing conditions (the quality of housing varies and does not define the area). This type refers to areas that had a high concentration of large and medium scale industries during the communist era. Inhabitants were skilled and had medium to good educational qualifications. However, after 1990 many of the industries were closed down. In spite of its qualified workforce little new investment from the private sector entered these areas. As a consequence, there is a low level of formal employment.

- Type 3. Areas disadvantaged on human capital include people with low levels of formal education with varying levels of employment, but who have fair housing conditions typical for the urban areas of Romania. These are urban areas in Romania that are inhabited by people who tend to be unskilled and are employed in agriculture, construction or other – often informal – activities. The level of formal employment in these areas is usually low, but unlike type 2 areas, this is caused by the human capital deficit. Therefore, interventions here should focus on activating and training the workforce.

- Type 4. Urban marginalised areas are the severely deprived areas that accumulate low human capital with low formal employment and inadequate housing. They often consist of socially isolated poor areas within cities and towns in Romania and as such are not always well reflected in average poverty statistics at the locality or county level. These are often pocket of social exclusion and have a high concentration of people with low human capital (little education, poor health and or a higher number of children), low formal employment, and with poor housing conditions. They often have segregated schools where only poor households take their children, living in poor quality blocks of flats or slums often marked by fear and petty crime. The strong stigmatization associated with these places alongside lack or poor quality of services (education, health, infrastructure) drastically reduce the chances of the population to escape poverty. The qualitative research confirmed that these areas are the most deprived.

	Criteria		
	Low human capital	Low formal employment	Poor housing
Type 1. Areas disadvantaged on housing	Varies	No	Yes
Type 2. Areas disadvantaged on employment	No	Yes	Varies
Type 3. Areas disadvantaged on human capital	Yes	Varies	No
Type 4. Urban marginalised areas	Yes	Yes	Yes
Non-disadvantaged areas	No	No	No
Other urban areas	-	-	-

Note: Other urban areas refer to census sectors with less than 50 inhabitants and those with various institutions (e.g. hostels, asylums, prisons, monasteries, etc.) without or with a very small number of households.

Table 6. Typology of urban areas (census sectors). Romania
Source: http://documents.worldbank.org/curated/en/668531468104952916/pdf/882420WP0P1430085232B00OUO0900Atlas.pdf

4.8. Spain

4.8.1. Introduction

The Atlas of Urban Vulnerability in Spain 2001-2011 is a GIS-based tool that allows the analysis of urban vulnerability at the census tract or sector level in Spanish municipalities. For each of the nearly 35,000 census sectors in the more than 8,000 Spanish municipalities, the Atlas of Urban Vulnerability in Spain offers a total of 145 vulnerability indicators and indexes.

4.8.2. Definition of minimum spatial/geographical unit

The spatial unit in the Atlas of Urban Vulnerability is the census sector, which is the smallest spatial unit with census data in Spain. The term demographic census actually comprises three different censuses: the population census, the housing census and the building census. Of the three, the population census is undeniably the most important and longstanding.

The population census is defined as a set of operations consisting of the compilation, summarising, assessment, analysis and publication of demographic, cultural, economic and social data on the inhabitants of the country and its political-administrative divisions, for a given moment in time. This operation targets everyone residing in dwellings (either family dwellings or accommodations) or in collective establishments (such as hotels, residences, shelters, etc.).

The housing census is the set of operations consisting of the compilation, summarising, assessment, analysis and publication of data related to all the 14 places used for human habitation and that are intended as such (family and collective dwellings), and listing those that although they were not conceived for this purpose, are used for it (accommodations).

The multiple purpose of these spatial units requires close attention to their limits and size. The limits can change, as the statistical sector is essentially an area of land in the municipality, and each dwelling or inhabitant must belong to one and to only one statistical sector. Size must also be considered, as the electoral system law assigns minimum and maximum sizes measured by the number of voters. Within such limits, it is recommended that the size of a section does not exceed the 2,500 inhabitants fixed by law, so it can be available to an interviewing agent for the purpose of population counts or statistical surveys.

As the main external source for contrasting and completing this information, it is aided by the Directorate General of the Land Registry, with whose records the information has already been crossed. The INE also collaborates with the various statistics offices in the autonomous regions to improve these territorial directories before contrasting them with the fieldwork.

The main objectives of the census operation are as follows:

- To accurately determine a basic population structure (the stock and its distribution by sex, age and country of birth/nationality), and its territorial breakdown by autonomous region, province and municipality.

- To determine the characteristics of the population, dwellings and buildings in these social and demographic variables, sufficiently broken down by territory.

- To provide a sufficient set of information for all municipalities, regardless of their population size.

- To geo-reference the information to the geographical coordinates of the buildings.

- To reduce the scale of the fieldwork and data collection operations so they are sufficient to cover the expected work, and are sustainable in terms of monitoring the quality of the work.

Two different spatial areas have been established for the use of this entire data source in the Atlas of Urban Vulnerability: neighbourhoods with vulnerability (BBVV) and statistical areas with vulnerability (AEV).

The neighbourhoods with vulnerability (BBVV) are urbanistic delimitations of perimeters that match a physical and morphological reality and which have a poorer social or residential situation compared to the national average. They are therefore delimited following a twofold statistical and urban process.

Three basic indicators of vulnerability are established, along with a reference threshold that identifies an area as vulnerable. The 1991, 2001, and 2011 censuses were used as input data. The delimitation process starts by grouping census sectors with a population of between 3,500 and 15,000 that exceed the established vulnerability threshold in one of the three basic indicators. These groups of census sectors are

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designated "statistical areas with vulnerability" (AEV) and were delimited by the investigators and experts of this atlas.

Once these areas were established, they were used to define the contours of the neighbourhoods with vulnerability (BBVV). This second delimitation has a more organic and urban-functional character and was created by the investigators and field researchers.

For the 1991 and 2001 atlas, both BBVVs and AEVs were delimited for all the cities where they were found, and were used as the basis for the 2011 version, after verifying whether they were still vulnerable. The appearance of statistical areas with vulnerability that are not linked to the neighbourhoods with vulnerability identified in 2001 was also checked.

Two different delimitations were therefore used in the 2011 catalogue of vulnerable neighbourhoods: statistical areas with vulnerability which are still vulnerable compared to 2001, and the new statistical areas with vulnerability identified in 2011. The first group has a statistical and urban delimitation (BBVV), and the second group has only a statistical delimitation (AEV).

4.8.3. Variables, domains & indicators

The Atlas is organised in four domains:

- Domain 1: urban vulnerability indicators, divided into sociodemographic vulnerability (five indicators and eight variables), socioeconomic vulnerability (six indicators and ten variables), housing vulnerability (eight indicators and nine variables) and subjective perception vulnerability (five indicators and six variables, only available for 2001).

  Out of these 24 indicators, three are considered basic indicators of urban vulnerability (BIUV): percentage of unemployed population, percentage of illiterate population (or without basic education), which are common for 2001 and 2011, and –as a proxy for poor housing conditions– percentage of population in dwellings without a WC (for 2001), and percentage of dwellings located in ruined buildings or in deficient physical condition (for 2011).

- Domain 2: contextual analysis of urban vulnerability indicators. This domain allows the creation of 72 contextual analysis maps, comparing the 24 urban vulnerability indicators in each census sector (or minimum population unit) with the municipal, regional (autonomous regions) or national context. The number of times the value of each indicator in the census section is above or below the value can be represented for the same indicator in the municipality, the region (autonomous region) or as a national value.

- Domain 3: urban inequality indices. Two synthetic inequality indexes are provided, calculated by combining the three basic indicators of urban vulnerability (BIUV): IDS (index of socioeconomic inequality) and IDU (index of urban inequality), which may refer to the municipality, the region (autonomous region) or to the whole of Spain.

- Domain 4: synthetic indices of urban vulnerability (multiple criteria classification). Multiple criteria classification produces synthetic indices of vulnerability by creating different simple vulnerability indicators grouped into four thematic categories. Multiple criteria classification is an alternative to traditional synthetic indices obtained by defining scalar-type functions that combine the various vulnerability indicators by assigning a proportional weight to each one. This avoids any potential subjectivity in assigning proportional weights to each indicator when using scalar functions.

4.8.4. Method

The Atlas of Urban Vulnerability in Spain includes two composite or synthetic groups of indicators:

- Inequality indices, comprising IDS (index of socioeconomic inequality) and IDU (index of urban inequality). Each one can be referred to the municipality, the region (autonomous region) or to the whole of Spain.

  The three basic indicators of urban vulnerability (BIUV) in each census sector are standardised using the chi square method. This is done based on the respective values of the indicator for each context, whether the municipality, autonomous region, or Spain. The standardised value of each basic urban vulnerability indicator (BIUV) for each census sector is calculated by dividing the square of the difference between the value of the BIUV for the census sector and the BIUV value for the municipality, autonomous region or Spain, divided by the BIUV value for each unit. Once the values are standardised, a logarithmic transformation is applied to adjust their distribution by calculating its base-10 logarithm.

  Finally, the index of socioeconomic inequality (IDS) is obtained by adding together the basic indicators of urban vulnerability (BIUV), the percentage of the unemployed population and the percentage of the illiterate population (or without basic education), once standardised using the chi-square method, then applying a logarithmic transformation to adjust their distribution.

  The IDU (index of urban inequality) is obtained by adding together the three basic urban vulnerability indicators (BIUV). As in the IDS, the percentage of the unemployed population, percentage of the illiterate population (or without basic education), plus the percentage of population in dwellings without a WC (for 2001) or the percentage of dwellings located in ruined buildings or in deficient physical condition (for 2011). After standardising with the chi-square method, a logarithmic transformation is applied to adjust their distribution.

- Synthetic indices of urban vulnerability (multiple criteria classification). Multiple criteria classification offers synthetic vulnerability indices by amalgamating different simple vulnerability indicators –in our case 20 +1– grouped into four thematic categories. Multiple criteria classification is an alternative to traditional synthetic indices and is obtained by defining scalar-type functions that combine the various vulnerability indicators by assigning a proportional weight to each one.

  The four thematic categories of vulnerability indicators in the Atlas allow the organisation of four thematic classifications for the partial subsets of criteria: sociodemographic criteria, socioeconomic criteria, housing criteria and subjective perception criteria (only for 2001), in addition to a global criteria classification encompassing the 20 vulnerability indicators considered.

4.8.5. Classification & types

From the methodological point of view, the Multiple Criteria classification which is part of the Atlas of Urban Vulnerability consists in grouping the elements of a set into equivalent classes or ranges, attending to the value of p indicators or magnitudes, assigning the same global value to each of the element of each class or range. The scope of this method is to measure the intensity of the vulnerability dimensions: socioeconomic and household conditions.

The Multiple Criteria evaluate each neighbourhood by the cross of the three basic variables: education, unemployment and household conditions. In the case of education and unemployment there are 4

different levels and in household condition 5. The value of the indicators for each neighbourhood refers to the national average. In the end, depending on the thresholds established at each level, each neighbourhood it will have a classification in the variable through its value (0, A, B, C or D, as it can be seen in the table). The cross between education and unemployment generates a first classification of 4 groups based on thresholds in both variables. Then, this first classification is crossed again with the household conditions by the same thresholds system generating the final classification. The rank of ISVU (Urban Vulnerability Synthetic Indexes) is between 0 and 1, 0 being less vulnerable and 1 more vulnerable.

			PARO			
			0	**A**	**B**	**C**
			0-MN	MN-VR	VR-2,5MN	>2,5MN
ESTUDIOS	**0**	0-MN	NV	NV	VL	VS
	A	MN-VR	NV	NV	V	VS
	B	VR-2,5MN	VL	V	V	VS
	C	>2,5MN	VS	VS	VS	VC

Leyenda: · "MN": media nacional. / · "VR": valor de referencia. / · Sombreado correspondiente, de más oscuro a más luminoso, al nivel de clasificación: "vulnerabilidad crítica" ("VC"), "vulnerabilidad severa" ("VS"), "vulnerabilidad media" ("VM"), "vulnerabilidad leve" ("VL"), y "no vulnerable" ("NV").

Table 7. Classification of a vulnerable neighbourhood according to study level and unemployment indicators
Source: Barrios vulnerables de las grandes ciudades españolas. 1991/ 2001/ 2011. (2018). Hernández Aja, et al.
(http://oa.upm.es/51015)

		VIVIENDA				
		0	**A**	**B**	**C**	**D**
		0-MN	MN-VR	VR-4MN	4MN-8MN	8MN
ESTUDIOS + PARO	No vulnerabilidad	NV	NV	VL	VL	V
	Vulnerabilidad leve	VL	VL	VL	V	VS
	Vulnerabilidad media	V	V	V	VS	VC
	Vulnerabilidad severa	VS	VS	VS	VC	VC
	Vulnerabilidad crítica	VC	VC	VC	VC	VC

Leyenda: · "MN": media nacional. / · "VR": valor de referencia. / · Sombreado correspondiente, de más oscuro a más luminoso, al nivel de clasificación: "vulnerabilidad crítica" ("VC"), "vulnerabilidad severa" ("VS"), "vulnerabilidad media" ("VM"), "vulnerabilidad leve" ("VL"), y "no vulnerable" ("NV").

Table 8. Classification of a vulnerable neighbourhood according to level of study, unemployment and housing indicators
Source: Barrios vulnerables de las grandes ciudades españolas. 1991/ 2001/ 2011. (2018). Hernández Aja, et al.
(http://oa.upm.es/51015)

It is established which neighbourhoods are more vulnerable, using the multicriteria classification. This makes it possible to ascertain levels for each of the analysed criteria (the three basic detection indicators). The Multicriteria Classification allows, through its application to the total set, the simplification and readable analysis in five sets of criteria which can place each vulnerable neighbourhood in one of the below classes. It is a grade scale which classifies all neighbourhoods from a not vulnerable situation to a critical vulnerable situation.

- Class 1: Not vulnerable neighbourhoods.

- Class 2: Slightly vulnerable neighbourhoods.

- Class 3: Vulnerable neighbourhoods.

- Class 4: Severely vulnerable neighbourhoods.

- Class 5: Neighbourhoods in a critical vulnerable situation.
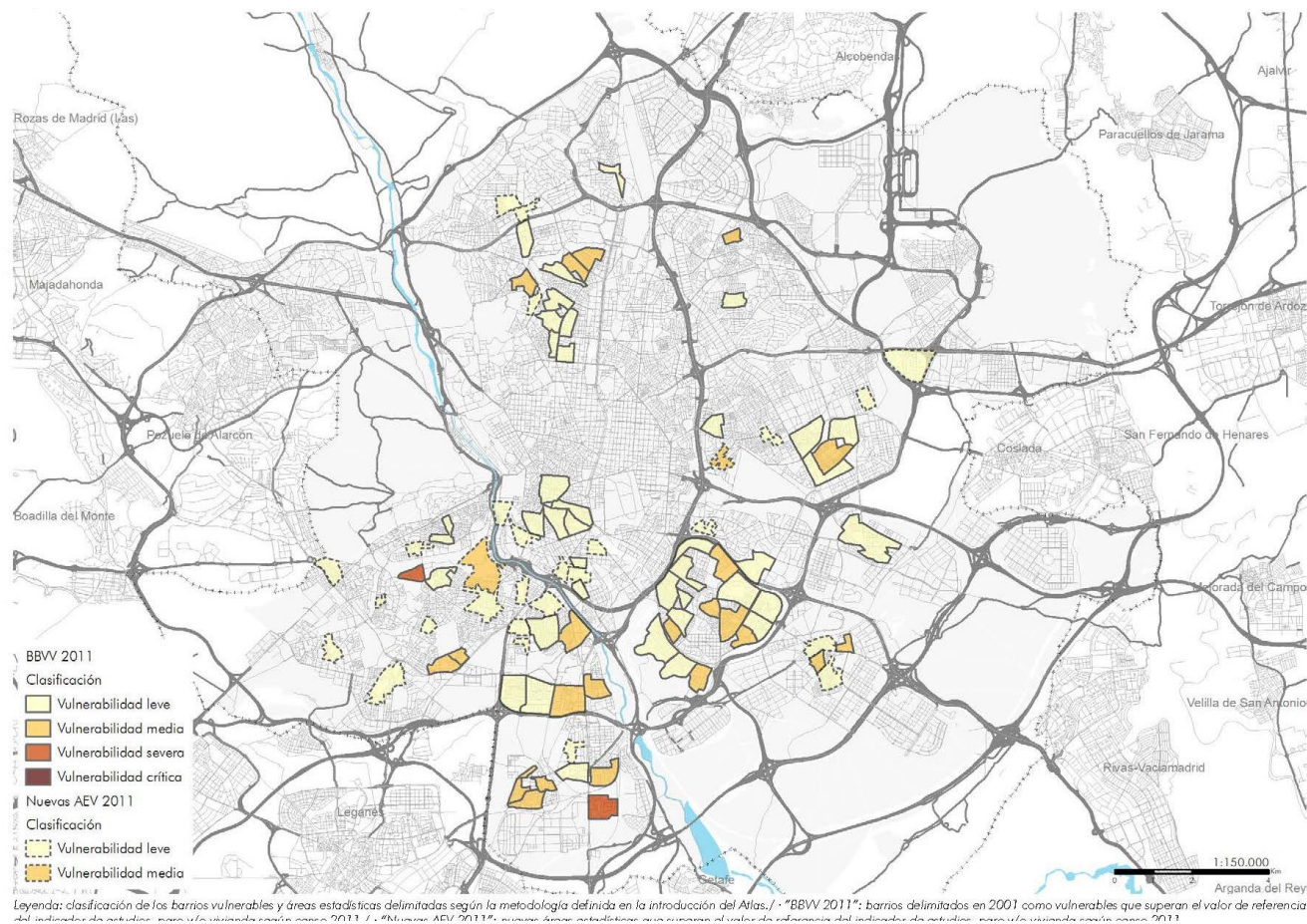
Figure 32. Madrid. Classification of vulnerable neighbourhoods according to census 2011
Source: Barrios vulnerables de las grandes ciudades españolas. 1991/ 2001/ 2011. (2018). Hernández Aja, et al.
(http://oa.upm.es/51015)

Furthermore, there are three possibilities of comparison available that allow creating ranges and groups as the user needs.

- Automatic quantiles grouping: For each one of the 24 indicators included in the Urban Vulnerability Atlas, the maps show the values of the indicator of the census sections visualized in the screen grouped in quantiles (equal count) of 5 ranges, each of them with a similar number of census sections. The user can customise the output by different means (manually, or using different statistical methods: custom breaks, nested means, K-means, Natural breaks (Jenks-Fischer) or standard deviation) changing the number of ranges and the threshold values to be represented.

- Contextual Analysis of Urban Vulnerability: The Urban Vulnerability Atlas also allows for the making of contextual analysis maps, comparing the Urban Vulnerability Indicators of each "census section" (or minimum population unit) with the municipal, regional (Autonomous Communities) or national context. It is possible to represent the number of times that the value (%) of each indicator for the census section is above or below the comparison value (%) for the municipality, the region or the national value for Spain, grouped in 5 categories:

  ✓ >1 (Census sections in which the value of the chosen indicator is one time higher than the comparison value –municipal, regional or national-);

- ✓ Between 0.5 and 1(Census sections in which the value of the chosen indicator is between 0.5 and 1 times higher than the comparison value –municipal, regional or national);

- ✓ Between 0 and 0.5 (Census sections in which the value of the chosen indicator is between 0 and 0.5 times higher than the comparison value –municipal, regional or national);

- ✓ = 0 (Census sections in which the value of the chosen indicator is exactly the same as the comparison value –municipal, regional or national);

- ✓ Between 0 and -0.5 (Census sections in which the value of the chosen indicator is between 0 and 0.5 times lower than the comparison value –municipal, regional or national);

- ✓ < -0.5 (Census sections in which the value of the chosen indicator is 1 time lower than the comparison value –municipal, regional or national).

- Indirect comparison using the inequity indexes described above (IDS: Index of Socioeconomic Inequity, and IDU: Index of Urban Inequity), as the Index calculated for each census sector can refer to the municipality, the region (Autonomous Community) or to Spain.

5. TECHNICAL ISSUES AND MANAGEMENT

5.1. Basic software data (Geographical Information System)

A geographic information system (GIS) is a system of computer applications that can be used to display, process and analyse a variety of spatial information from multiple sources. GIS can support either graphic or spatial data, and also include tabular information or attributes for items such as population, rent, poverty index, etc. There are endless possibilities for associating data between attributes and graphic information, which is useful for enabling an external viewer to understand the situation in a particular place. The observatories analysed use these products to facilitate the data. Different software can be applied to show this information. None of the observatories analysed use the same software: Belgium uses GRASS, Spain uses GEOCRIPS and Romania uses ESRI ArcGIS, for example.

The software programs depend on the relationship with their support platform, and can be grouped into three major types. Software may be specially developed for the observatory, or it may be free or paying. Each option has advantages or disadvantages for the user and for the organisation that supports it. We found different cases in the study: Romania uses paying software, while the Belgian observatory uses a free one. The French observatory operates with programs specially designed for the ministry.

The observatory may also decide to use more than one software. This is the Spanish case: both the Atlas of Urban Vulnerability and the Atlas of Residential Buildings operate under GEOCLIP (commercial software under a licencing agreement), while the Catalogue of Vulnerable Neighbourhoods (part of the Urban Analysis of Vulnerable Neighbourhoods) is a mapping tool designed by the IT department at the Ministry of Public Works.

5.2. Interactive mapping/visualisation

The territorial observatory is an application that records the data and statistics necessary to characterise a territory, and structures them to highlight patterns and territorial disparities. It can gather information and mapping to track changes in time and space, or to show changes representing the time variation itself. The information in the observatory is regularly updated, aggregated and presented in summary form, for example in maps. In most cases the indicators can be shown for the specific years in which the analysis has been carried out.

Methodologically it is not always possible to show the information on an interactive map. In the *Observatorie National de la Politique de la Ville*, for example, it is difficult to map data because urban neighbourhoods may have very different shapes and sizes. It therefore provides the data (for example, the unemployment rate) and shows only the boundaries of deprived areas and schools or police stations on the map. Another similar situation occurs in the *Ghettoliste*. Although it is possible to implement interactive mapping and create interactive maps, it is not useful for the observatory's purposes and so is not enabled. The *Ghettoliste* is simply based on descriptive data updated once a year.

The representation of these indicators on the maps of changes is more problematic. In most cases this is prevented by the methodologies used in the previous analyses. In the *Observatorio de la Vulnerabilidad*, although the data can be consulted in different years, their progress cannot be tracked due to the differences in the boundaries in the census tract in the different years.

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6. PRODUCTS AVAILABLE AND OBSERVATORY DATA OUTPUTS

6.1. Online GIS/ mapping tool and the possibility of customisation by users

All the observatories detected have an online GIS-based visualisation / mapping tool except the Danish *Ghettoliste.*

One of the most interesting uses of these applications is that it usually allows users to download a shape with the minimum spatial units in order to make their own maps. This information does not necessarily have to be in the observatory itself, as in the case of the census sectors used by the Spanish methodology. This layer is downloadable by the researcher from the website of the National Statistical Institute (INE). Research can be downloaded in all the countries in the study.

These types of platforms that work with attribute files often allow this information to be downloaded. The interest of this is that the minimum spatial units can be linked to the indicators in the observatory so that researchers can make their own analyses or use them in other methodologies.

In most cases the indicators can be downloaded by cities or researchers (for example in EXCEL or CSV format) for these minimum spatial units in order to make their own maps. No special application is generally required, although in certain cases like Spain or Denmark, users must apply to the Ministry of Public Works. In other cases only certain indicators are directly available from the statistical institute (DGSIE), as in Belgium.

One usual condition is that after the request, researchers, municipalities and the general public must undertake not to use it for commercial purposes.

6.2. Reports-based observatory data

Each of these online applications is available to users free of charge and without the need to register on the server. It is also possible to access the methodology used in each study. Some of them are also accompanied by help manuals, practical guides or answers to FAQs to support users who are less familiar with these tools. One particular case is the POBAL Deprivation Index which has a website where videos can be viewed or downloaded on "How to access POBAL maps and the home screen" or "The deprivation index viewer".

Some also allow the analysis to be personalised, superimposing the representation of choropleths with symbols of the most important quantitative variables (population, housing, etc.); these include the French *système d'information géographique de la politique de la ville* and the Spanish *Observatorio de la Vulnerabilidad.*

These visualisations also have some unique features. The first allows different layers of information to be loaded easily (*quartiers d'intérêt nacional du NPNRU, quartiers d'intérêt régional du NPNRU, quartiers d'habitat ancien dégradé* and *quartiers prioritaires*, for example), while the second can display two maps simultaneously on the screen, so two variables or the changes on the same variable between 2001 and 2011 can be compared at the same time.
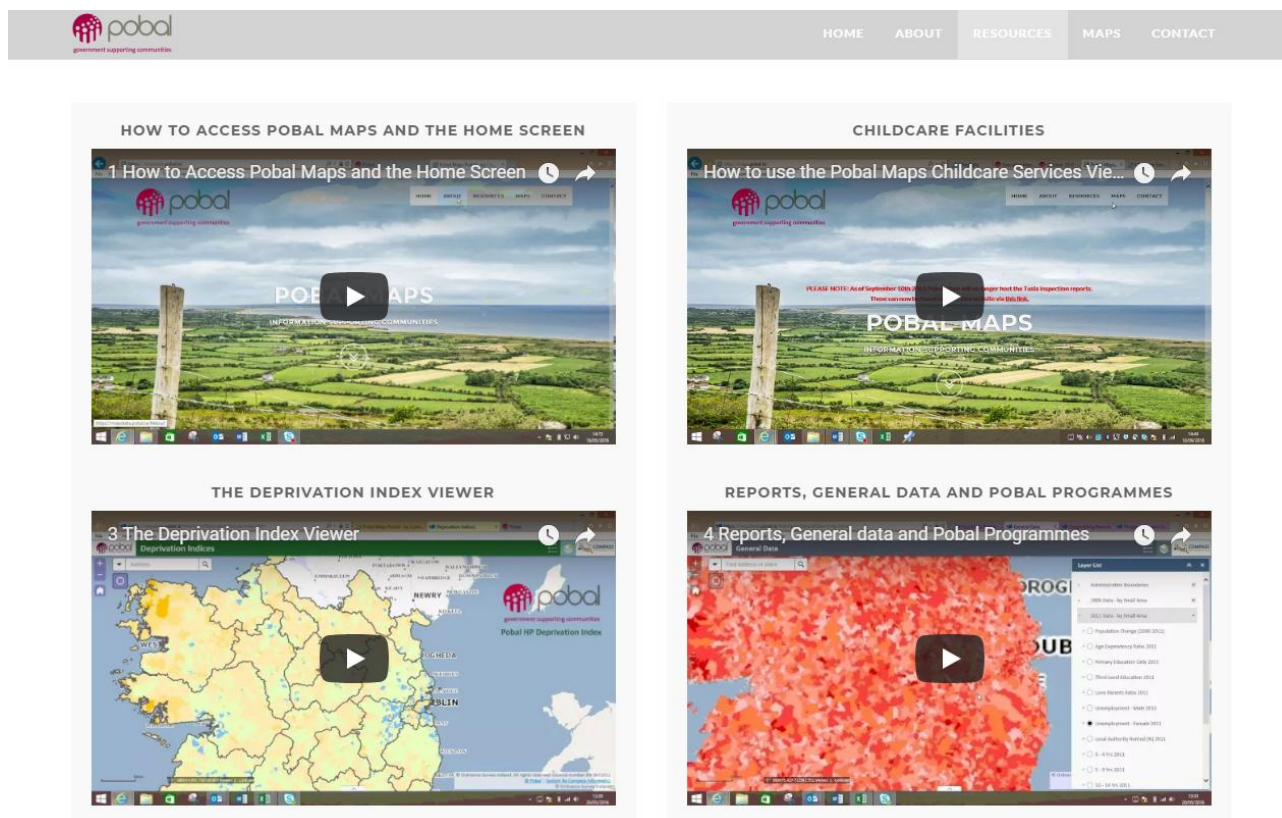
Figure 33. Pobal web resources
Source: https://maps.pobal.ie/

Another product available is the periodical report. The websites that offer this service do not share a common timeframe; this usually depends on the methodology used and the updating of secondary data sources. The periodicity varies from annually, in the case of the *Observatoire National de la Politique de la Ville,* to every ten years for the Spanish *Observatorio de la Vulnerabilidad*. This last study analyses the urban vulnerability of Spanish cities with over 50,000 inhabitants and provincial capitals in 1991, 2001 and 2006 (addenda), and is updated with data from the most recent census of 2011. It identifies the vulnerable districts in these Spanish cities from a multidimensional or multifactorial perspective using basic indicators of urban vulnerability to characterise the neighbourhoods from the statistical information available at the census sector level in the population and housing censuses (1991, 2001 and 2011).

Some also contain monographic reports. These documents analyse specific topics of current and future interest; in some cases, the report must be created and in others simply downloaded. The geo-profiling reports from the POBAL Deprivation Index are in the first group, where users can create their own monographic report by selecting one or more features from a table. The second group comprises observatories like the Spanish one, in which the reports are already elaborated and the user only has to download them. Between these options is the *"Atlas de barrios vulnerables de España: 12 ciudades 1991/2001/2006"* which presents a general overview of the dimension and evolution of the vulnerability of Spanish cities with over 50,000 inhabitants and the "*Análisis de las características de la edificación residencial en España"* containing –at the national level and broken down by autonomous region and province– the main characteristics of Spanish housing stock, and analysing several variables relating to residential construction (typology, age, area of dwellings, state of conservation, accessibility, etc.).

A third group consists of all the observatories that offer the user both options, such as the POBAL Deprivation Index, where users can create their own monographic report by selecting one or more features from a table and download monographic reports on rural deprivation or the Dublin situation.

6.3.   Management and resources

The type of management, direct or indirect, determines the results and periodicity of the reports and the content of the observatory itself. This type of information is not accessible through the web page of the different observatories and this report therefore only contains direct information from the agents who answered the survey.

The comparison between observatories highlights the importance of management. The system chosen depends on a person or a specific team or is outsourced. This outsourcing may be complete or partial and involve only certain reports or the management of the website. The work is usually outsourced to certain university departments or consultancies.

In Belgium, for example, the work is done by a federal public service (PPS Social Integration, fight against Poverty, Social Economy and Federal Urban Policy), represented by the Secretary of State for the Fight against Poverty, Equal Opportunities, Persons with Disabilities and Scientific Policy, in charge of large cities attached to the Ministry of Finance and the Ministry for the Middle Class, Self-employed, SMEs, Agriculture and Social Integration. It has its own guidance services created in 2003 aimed at guaranteeing a dignified existence for everyone living in poverty. For over ten years it has championed the right to social integration by seeking to ensure that anyone who falls through the cracks of social security and is living in precarious conditions can lead a dignified existence. There is no formal observatory, so their studies are produced sporadically. When there is no particular evaluation contract or follow-up work on urban poverty, no specific staffs are dedicated to these tasks.

The Danish *Ghettoliste* is compiled in collaboration with Statistics Denmark, the Danish Transport, Construction and Housing Authority and the Ministry of Transport, Building and Housing. The Ministry of Transport, Building and Housing oversees the planning, construction, operation and maintenance of the state transport infrastructure, as well as the regulation and supervision of the entire Danish transport system. The Ministry also manages and maintains the state's property in the office and university area and regulates the framework conditions for the construction industry in Denmark. The Danish Transport, Construction and Housing Authority respond to the Ministry of Transport, Building, and Housing and is responsible for railway, road and air transport. It establishes the framework for the Danish construction sector and the buildings of the future and oversees senior, public, student and youth housing, retirement housing, private rental and urban renewal. In this case, the number of public employees dedicated to the *Ghettoliste* cannot be estimated since they belong to organisations that work with a wide range of issues, and there are no staff exclusively dedicated to these tasks.

The Spanish *Observatorio de la Vulnerabilidad* has a single coordinator at the Ministry of Public Works, and the technical work is subcontracted to external collaborators (university researchers, GIS experts, private companies, etc.). The Spanish Ministry of Public Works is responsible for proposing and executing government policy in the area of land, air and maritime transport infrastructures, as well as their control, management and administrative regulation. It also has competences over access to housing, urban and land policies and architecture, within the scope of the powers of the general state administration; the regulatory arrangement of postal services; the promotion and management of state services related to astronomy, geodesy, geophysics and cartography; and for planning and scheduling investments for all these infrastructures, materials and services. Its *Atlas de Barrios Vulnerables de España* mapping tool has been developed by the Information & Technology department at the Ministry of Public Works. In this case, there

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is an observatory coordinator in this ministry who supplements this task with other requirements of his or her position, while external personnel produce the different reports and monitoring on the website, equivalent to around two or three people full-time per year.

Both the French *Observatorie National de la Politique de la Ville* and the British Indices of Deprivation 2015 Explorer prepare their information with the help of the ministry and different partnerships.

The ministry responsible for supporting the French observatory is the *Ministère de la Cohesion des Territories et des Relations avec les Collectivises Territorial's*. The Ministry of Territorial Cohesion is sometimes associated with other ministries depending on the composition of the government: Ministry of Housing, Reality, Spatial Planning, etc. Currently, it is a full-fledged ministry that merges the ministries of Housing and Cities and the Ministry of Spatial Planning, Reality and Territorial Communities. One of its partners for the preparation of reports is the *Institute National de la Statistique et des Etudes Économiques* (INSEE). This institute collects, produces, analyses and disseminates information on the French economy and society. Eight people work for the *Observatoire National de la Politique de la Ville*. They do not do so full time as they also answer to the administration of the Ministry of Territorial Cohesion. According to the survey, this would be equivalent to five or six employees in full-time work. One of its main collaborators, the INSEE, also has another ten people who work on the data obtained. To this staff must be added the employees in the different ministries who are specialised in data on these disadvantaged areas, and who in some way also provide their data for the different publications.

The Indices of Deprivation 2015 Explorer is coordinated by the Ministry of Housing, Communities and Local Government. The job of this ministry, formerly the Department for Communities and Local Government, is to create good places to live and work, and to give more power to local people to shape what happens in their area. Only one person in the ministry works on these issues according to the survey.

This study also aimed to assess the total annual funding dedicated to each observatory. The answers here were much fewer than in previous cases and were limited to the Danish, Spanish and French observatories.

No accounting is possible in the Danish case. The *Ghettoliste* itself does not require any funding. The Danish social housing sector receives funding from the state, as do the housing areas on the *Ghettoliste*. These funds are spent on renovation, demolition, construction etc.

The *Observatorio de la Vulnerabilidad* has an annual contract with the *Instituto Juan de Herrera*, which depends on the *Escuela Técnica Superior de Arquitectura* at the *Universidad Politécnica de Madrid,* for an average of €50,000 per year (without VAT); and other small contracts with private companies or experts averaging €18,000 per year (without VAT), for a total average per year of €68,000 (without VAT).

In France, the *Observatoire National de la Politique de la Ville* receives around €300,000 each year for the layout and production of the annual report and for participation in a survey to ensure a sufficient number of people and for researchers to address certain difficult subjects requiring time and expertise.

7. RELATIONSHIP BETWEEN THE OBSERVATORY AND URBAN POLICIES

7.1. Relationship with national/regional/local urban policies

Studies of urban policies should be treated as a scientific phenomenon and observed. They should be considered as a best practice of coordination between urban academics and public managers, otherwise the public may detect a divergence between the research agendas and the public and social administration agenda. However, in many cases there is a notable absence of information to support certain political decisions affecting citizens.

A series of common objectives have been established throughout the history of the various observatories, of which the most common and general are the following:

- To provide scientific and technological information and make it accessible to local decision-makers to resolve specific problems of cities or metropolitan areas.

- To generate and coordinate a continuous research programme on urban issues based on practical and applied experience, relevant to the urban environment and urban problems.

- To increase the capacities of the administration to relate and develop more effective training activities for issues concerning urban problems and living conditions in cities.

For all these reasons it is essential to identify the primary focus of each observatory and the priorities established in their agendas. The political priorities are identified below, based on the answers to the survey. Five different policies are differentiated in this study:

- **Social policies:** Social policy is concerned with the ways societies across the world meet human needs for security, education, work, health and wellbeing. Social policy addresses how states and societies respond to the global challenges of social, demographic and economic change, and of poverty, migration and globalisation, for example. Denmark, United Kingdom, France, Ireland and the Netherlands aim to use their observatories to implement policies in these areas. Spain is the only country that does not have this objective. Denmark, for example, uses the tools offered by its observatory to further its stated aim of integrating children into institutions.

- **Physical urban regeneration programmes:** Urban regeneration is the attempt to reverse decline by both improving the physical structure, and –more importantly and intangibly– the economy of these areas. In all regeneration programmes, public money is used as an attempt to pump prime private investment into an area. All the countries are interested in implementing these policies through their observatories. It is the sole policy pursued by the Spanish *Observatorio de la Vulnerabilidad.* Severely disadvantaged Danish ghettos pursue to reduce the proportion of family social housing to 40% by selling to private buyers, building housing for students, etc.

- **Health policies:** Health policy refers to decisions, plans and actions undertaken to achieve specific healthcare goals within a society. An explicit health policy can achieve several things: it defines a vision for the future, which in turn helps to establish targets and points of reference for the short and medium term. United Kingdom, France and Ireland aim to use their observatories to implement policies in this area. Denmark, Spain and Netherlands do not have this objective.

- **Environmental policies:** These are any measures by a government, corporation or other public or private organisation to combat the effects of human activities on the environment, and particularly designed to prevent or reduce the harmful effects of human activities on ecosystems. United Kingdom, France and Ireland pursue to use their observatories to implement policies in this area. Denmark, Spain and Netherlands do not have this objective.

- **Economic policies:** These are the actions taken by a government to influence its economy. Types of economic policy actions can include setting interest rates, regulating the level of expenditure, creating private property rights, and setting tax rates. Denmark, United Kingdom, France, Ireland and the Netherlands seek to use their observatories to implement policies in this area. Spain is the only country that does not have this objective. As an example of these policies, the Danish government does not allow recipients of cash benefits to move into severely disadvantaged ghettos.

Policies	BE	DK	ENG	FR	IE	NL	ES
With social policies	n/a	Yes	Yes	Yes	Yes	Yes	No
With physical urban regeneration programmes	n/a	Yes	Yes	Yes	Yes	Yes	Yes
With health policies	n/a	No	Yes	Yes	Yes	No	No
With environmental policies	n/a	No	Yes	Yes	Yes	No	No
With economic policies	n/a	Yes	Yes	Yes	Yes	Yes	No

Table 9. Relationship with national/regional/local urban policies
Source: Own elaboration based on questionnaire data

Only the United Kingdom assumes responsibility for implementing all the policies. It also asks users their opinion of the indices of deprivation, as shown below. Belgium is at the other end of the scale, and only considers the policies sporadically when awarded contracts for these issues. France is a singular case due to the zoning policy of the city intersecting a priority neighbourhood, as follows:

- Priority security zones (ZSP): they have been defined using criteria from the Ministry of the Interior relating to insecurity and socio-economic imbalances.

- Area of national/regional interest in the new national urban renewal programme (NPNRU): investment programme for the transformation of the living environment for inhabitants of the most severely disadvantaged neighbourhoods run by the Agency for National Urban Renewal (ANRU) in the period 2014-2024.

- First-generation, second-generation (2G) or third-generation (3G) urban free zones (1G): these are neighbourhoods with over 10,000 inhabitants located in so-called sensitive or disadvantaged areas, defined based on social-economic criteria (unemployment rate, proportion of people leaving the school system without a diploma, proportion of young people and tax potential per capita).

After defining each country's political priorities for the use of its observatories, it was considered interesting to assess the degree of relationship with national/regional/local urban policies. The survey respondents were therefore asked to evaluate three statements based on how each one best describes the actions in their country. They rated their degree of agreement with the following statements on a scale of 1 to 5.

	DK	ENG	FR	ES
National authorities use the Observatory to select priority deprived areas to be beneficiaries of urban regeneration	5	4	5	1
Local authorities (municipalities) can use the Observatory as a tool to help them identifying deprived areas and ask national/regional authorities for public investment	5	5	5	2
National authorities launch open calls for local authorities in order to select deprived areas to be beneficiaries of public funding and the indicators in the Observatory are used as the main criteria for selection	1	5	4	2

Table 10. Country's political priorities for the use of its observatories
Source: Own elaboration based on questionnaire data

In most cases, the national authorities use each observatory to select the priority disadvantaged areas to be beneficiaries of urban regeneration. The Spain answer expresses the least agreement with this statement, but the other countries consider it to be the one that best defines the relationship between the policies enacted by their country and the results provided by its observatory.

A very similar situation occurs with the statement of whether the local authorities (municipalities) can use the observatory as a tool to help them identify deprived areas and request public investment from national/regional authorities. All countries except Spain considerer that local authorities make a frequent use of the observatory. In Spain the respondents agree with its potential use by municipalities, but consider that, by different reasons, it is not currently used by them.

The last statement causes the most controversy. United Kingdom and France state that the national authorities launch open calls for local authorities to select areas to be beneficiaries of public funding using the observatory's indicators as the main selection criteria. At the other end of the scale, Denmark does not agree with this statement.

Spain recognises the existence of open calls, but the indicators are only used on a voluntary basis. Examples of these open calls are the National Housing Plan or the *Estrategias de Desarrollo Urbano Sostenible e Integrado* (EDUSI) (sustainable and integrated urban development strategies).

7.2. Usefulness of the observatory for decision-making in urban regeneration policies/programmes at the national scale

From the previous sections it can be deduced that each country considers the observatory to have a different utility for decision-making in urban regeneration policies/programmes at the national scale. Belgium intends the definition of the deprived neighbourhoods to serve as a legal basis for various urban regeneration programmes. However, since there are different levels (federal, regional) and definitions (regions can produce their own definitions), the practical impact of their definition is uncertain.

The Danish intend the *Ghettoliste* to be used to track the development of the neighbourhood and to see what initiatives are needed. The ambition is to have no ghettos at all by 2030. To achieve this goal, it will invest DKK10 billion from 2019-2026, to be spent on demolition, renovation and selling public housing, etc. The indicators currently show that many socially vulnerable citizens live in ghettos. Denmark considers that deprivation can be minimised by reducing the concentration of these citizens in these areas, thus creating a more representative composition of inhabitants.

According to many respondents, the data from the British Indices of Deprivation 2015 is used as way of strategically assessing local needs, often as part of statutory needs assessments such as the Joint Strategic

Needs Assessments, Child Poverty Needs Assessments and Crime and Community Safety Strategic Assessments.

The most commonly reported use of data from the indices was some form of targeting of resources to areas of greatest need. For some respondents this targeting involved only financial resources, ensuring that the priority areas identified using the data from the indices were allocated additional financial support. For others, the indices were a tool for targeting services and/or selecting areas for particular interventions. In most cases, however, respondents used data to target both financial resources and services to particular areas.

Less widespread was the use of the data for impact and policy assessments, essentially to offer a better understanding of how or why a policy is needed, whether it will work or has worked (although of course the indices measure area-level deprivation rather than individual deprivation). In some cases, this is described in terms of performance assessment and the impact of policies, services or interventions; for example, the creation of socio-economic baselines to evaluate an intervention.

For the Spanish *Observatorio de la Vulnerabilidad*, several tools use these basic indicators of urban vulnerability at the national level to identify and map vulnerable neighbourhoods. The two main instruments at the national scale that provide maps of urban poverty and/or vulnerable neighbourhoods are:

- The Urban Vulnerability Observatory (developed by the Ministry of Public Works), which includes different tools such as the Atlas of Urban Vulnerability in Spain 2001 and 2011, the Urban Analysis of Vulnerable Neighbourhoods and the Map of Roma Population and Housing Conditions.

- The urban audit project also includes statistical information at the district level on the 16 Spanish cities with over 250,000 inhabitants. The data is organised in seven domains: demography, social aspects, economic aspects, training and education, land use, travel and transportation, and tourism. One of the indicators provided is the average annual income by household, which identifies poverty pockets at the district level[11].

These tools enable public authorities to identify the vulnerable neighbourhoods in their city or region, as they compare the urban vulnerability indicators in each neighbourhood/census sector with the municipal, regional (autonomous regions) or national average. Nevertheless, this is only a tool for supporting decision-making and (unlike the French *Observatoire des Zones Urbaines Sensibles*, for example) it has no legal implications and is not directly used for selecting areas of public investment.

In some cases, like the urban regeneration programme in the National Housing Plan, or the EDUSI programme (ERDF 2014-2020 funds for sustainable urban development), cities requesting public funds for urban regeneration must submit an integrated action plan (for the urban regeneration programme) or an integrated strategy of sustainable urban development (EDUSI), and many cities use the indicators and maps of the urban vulnerability observatory, although it not compulsory to do so.

Municipalities or autonomous regions (regional authorities) can also use these indicators to develop their own plans or to select priority areas of intervention. For example, the *Castilla y León* region has developed

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[11] More information available at:
http://www.ine.es/ss/Satellite?L=0&c=INEPublicacion_C&cid=1259944561392&p=1254735110672&pagename=ProductosYServicios%2FPYSLayout&param1=PYSDetalleGratuitas&tittema=Sociedad

its own regional urban regeneration strategy[12] (ERUCyL) based on these indicators, and the city of Madrid has its own urban regeneration plan (Plan MADRE) after identifying priority areas (APIRUs[13]) using a similar methodology also based on these indicators.

According to the description on its own website (http://trutzhaase.eu/deprivation-index/applications/), the Irish HP Deprivation Index is the main index used in Ireland and applied by several government departments, state and semi-state agencies, and voluntary and non-governmental organisations. Its value derives from the way in which the deprivation indices can be used to facilitate the development of evidence-based policies, leading to greater efficiency in service delivery.

Probably the most exciting development in the use of the index over the past decade has been the move from the descriptive mapping of social gradients to the development of formal resource allocation models (RAMs). Originally developed for the distribution of funds by Pobal, the HP Deprivation Index is now used for formal RAMs across a number of area-based development programmes.

The second area –and one which has contributed most to the refinement of the RAMs– is health. Recent developments have also seen the systematic application of RAMs in the education and transport areas.

Any discussion of local development must include the Pobal Deprivation Index. Pobal works as an intermediary on behalf of the Irish government to support communities and local agencies towards achieving policy goals in relation to social inclusion, reconciliation and equality. Pobal oversees the distribution of some €100m per annum to local communities with the aim of alleviating poverty and promoting social inclusion. The Pobal resource allocation model (Pobal-RAM) is based on the HP Deprivation Index and has been in use for at least a decade.

In the health area, the Pobal Deprivation Index is fully available through Health Atlas Ireland and has come to be seen as a major tool for epidemiological research. Building on the Pobal-RAM, the Resource Analyser was originally conceived to facilitate the identification of the most disadvantaged areas for the systematic rollout of primary healthcare areas. It has subsequently developed into a more general tool for the distribution of resources.

These indices are also available in the education area. The Higher Education Access Route (HEAR) is a college and university admissions scheme which offers places on reduced points and extra college support to school leavers from socio-economically disadvantaged backgrounds. Scores from the Pobal Deprivation Index constitute one of the six criteria which are applied to assess whether a student is eligible to benefit from HEAR. It is also used in another programme, Delivering Equality of Opportunity in Schools (DEIS), and is the chief policy of the Department of Education and Skills (DES) to tackle educational disadvantage. The action plan focuses on addressing and prioritising the educational needs of children and young people from disadvantaged communities, from pre-school to secondary-level education (3 to 18 years). Since 2016, the DES has decoded the complete primary and post-primary student databases, comprising over 550,000 student addresses. By assigning a Pobal HP deprivation score to each of these records, an objective measure can now be derived of the socio-economic composition of each school, placing the DEIS designation on an objective footing.

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[12] http://www.jcyl.es/junta/cma/ERUCyL.pdf

[13] https://www.madrid.es/UnidadesDescentralizadas/UrbanismoyVivienda/Urbanismo/Destacamos/ficheros/MapaAreasPreferentes.pdf
https://www.madrid.es/UnidadesDescentralizadas/UrbanismoyVivienda/Urbanismo/Destacamos/PlanMAD-RE/PlanMADRERecuperaCasa%20Recupera%20tu%20barrioRecuperaCiudad/Ficheros/ANEXO1MapaAPIRU2018.pdf

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In the transport area, it is also used by the rural transport programme (RTP), which addresses unresolved transport needs from a social inclusion and community-based perspective. Priorities under the programme are identified by reference to the Pobal Deprivation Index and a transport accessibility index specifically designed by the consultants for this purpose.
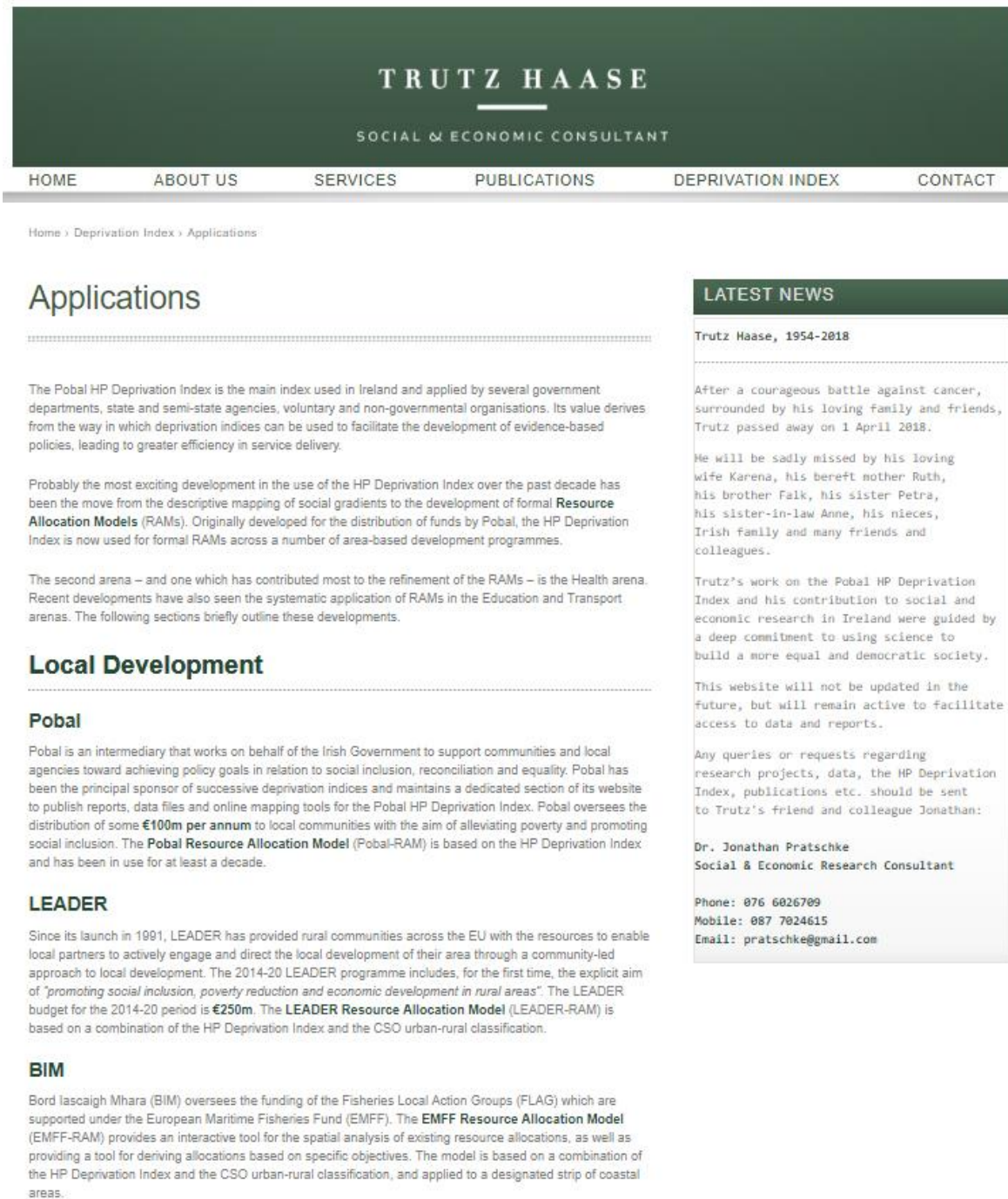

Figure 34. Irish HP Deprivation Index applications
Source: http://trutzhaase.eu/deprivation-index/applications/

8. CONCLUSIONS

The countries analysed present a great heterogeneity of approaches to measuring urban poverty and its concentrations in their territory, with different objectives and using different methodologies. There is a lack of consensus in defining what is or should be an instrument for delimiting and analysing the most disadvantaged areas in urban territories. This study has focused on what we have called national observatories of deprived areas or neighbourhoods that could be defined as a space (physical or virtual) in which, with the adequate instruments and experts, complex urban processes (related to the living conditions of residents in deprived areas) are identified, analysed and monitored. Some of the observatories also include a measurement of the quality of life in the neighbourhoods, an index of deprivation vulnerability, relationship with policies and neighbourhood improvement programmes.

Each country's objectives are different, and the instrument therefore varies from static tools of analysis and diagnosis (such as more or less completed reports) developed at a specific point in time, to more sophisticated systems that include dynamic mapping tools, so users can create and download maps, specific information and data in a personalised way.

In terms of the main target of the observatory, the systems range from a more academic approach based on a scientific method that seeks, through research, to visualize results and implement monitoring processes (Spain, England, Netherlands); to systems with specific policy-linked goals (France, Denmark), although some (the case of Ireland) maintain an interesting balance between a research tool and a vehicle for implementing specific policies.

Five different aspects of the methodology should be noted: the spatial variable, the data sources, indicators, the methodology and classification approaches, and validation.

The spatial or geographical representation of the data has limitations and is done in different ways. In all cases a minimum spatial unit is first required. The observatories in the analysis can be divided into three types depending on how their spatial unit is approached. Some use census sectors, postcodes or similar to dump all the data analysis, others use these contours as a starting point to create their own similar units, while others create a grid map system to delimit and represent their UDANs.

Data sources can be said to be the core of an investigation, and the total final output relies largely on their quality, availability, periodicity and explanatory power. The observatories ultimately adapt themselves and their methodologies to the availability of data and seek to apply flexible methodologies that allow modifications in the case of changes in the data sources.

The indicators vary widely among the observatories. This variety is not only due to the data sources, as noted below, but also to how each specific observatory conceives of deprivation. Of course, this is also highly dependent on the specific contexts of each country. Indicators are normally grouped in domains or variables, and these variables can also be classified into two groups based on their importance in the methodology. Some have critical importance in defining and delimiting the UDANs, and others are characterised by their descriptive role.

In general, the observatories follow three methodological stages to process their indicators with a certain degree of rigour. A prior qualitative test is first done to check the quality, availability and periodicity of the datasets. The second stage involves the transformation of the data into indicators to produce rates or proportions, for example. A third step is the standardisation of the indicators to allow their comparison and possible synthetisation.

At this point, observatories can structure their output in several non-mutually exclusive ways. One option is to create composite or synthetic indices, while other is to establish taxonomies or typologies. The French and Danish observatories do not follow these steps and establish their own process.

Finally, validation is a methodological stage aimed at monitoring and assessing that the chosen method and implementation are in line with the observatory's goals. Not every observatory includes this validation process and some place more emphasis on creating an accurate methodology; however, validation checks are highly useful and interesting.

Not all observatories map their information. A difference can be made between those that only allow access to their database and others that also enable the data to be visualised in the observatory itself. The *Observatoire National de la Politique de la Ville* and the *Ghettoliste* do not map their data.

The accessibility to the databases can be classified into three levels: total, partial and not accessible. Some observatories provide access directly, while for others it must be previously requested through other agencies (signing certain requirements in writing). Even so, not all indicators are accessible or downloadable in all the observatories.

Some of the observatories allow users to customise their analysis by means of dynamic plans where the visualised information can be changed or even compared between different references.

9. RECOMMENDATIONS

The Urban Poverty Partnership Final Action Plan 2018[14] Action 2 is defined as *"setting up a European network of National Observatories with experience in Urban Poverty"*. This action is described in full detail in pages 19-21. In particular, two main lines of action are highlighted (p.20):

a) Setting up a European network of national observatories

"Setting up an informal network of existing national observatories of urban poverty/deprived neighbourhoods, designed to exchange visions, ideas, innovative approaches, etc. between the national coordinators of the observatories of urban poverty/deprived neighbourhoods.

For Member States interested in creating a National Observatory, the network of National Observatories could be useful to inform about methodologies and possible obstacles and solutions to establish these observatories".

b) Creating one unique European website functioning as a one-stop shop.

"It would be created by the European Commission in order to make available and easily accessible the statistics elaborated by the National Observatories network (methodologies, tool-kits, indicators, etc. on urban poverty) to local authorities and other relevant actors".

This section includes some suggestions for the further development of both actions, in close relation to Action 3 "Developing data on urban poverty at EU level", which focuses on the necessity to deliver solid statistical data on urban poverty as close to the neighbourhood level as possible.

The suggestions are organised in three headlines:

- Suggestions for setting up a European network of Urban Poverty Observatories.
- Suggestions for improving EU data related to poverty at neighbourhood level.
- Suggestions about a European website functioning as a one-stop shop.

9.1.   Suggestions for setting up a European Network of Urban Poverty Observatories

This report could be understood as a first step in the creation of this European network. The preliminary works carried prior to this report included a mapping of the different initiatives existing in Member States and a contact database.

For the creation of this informal European network the following steps could be taken:

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[14] https://ec.europa.eu/futurium/en/system/files/ged/action_plan_urban_poverty.pdf

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- **Organise an Annual European Seminar about Urban Poverty Observatories**. The first of these Annual Seminars could be dedicated to the presentation of the results of this report.

  For the MS which already have a National Observatory, this could be an opportunity to the National Observatories' coordinators to make face-to-face contacts and exchange information.

  For the MS interested in creating a National Observatory, the network of National Observatories could be useful to inform about methodologies and possible obstacles and solutions to establish these observatories.

  The Seminar could also have a workshop on how to strengthen further collaboration in the future between the Observatories.

  In the next years, the Annual Seminar could be an opportunity to meet and exchange news and methodological developments in the different Member States.

  As there are also other Administrations (regions or cities) which also have developed urban poverty observatories, they could also be invited.

- Create an informal network (mailing list).

- Create a website (one-stop-shop) about Urban Poverty related Observatories. Depending on the economic resources available, this unique website (one-stop-shop) could include:

  - ✓ Only static content (this report, links to the National Observatories in the different Member States, etc.).

  - ✓ Dynamic contents (like news, methodological improvements, new case studies, etc.). This would require extra funding across time to feed the website with new contents.

9.2.   Suggestions for improving EU data related to poverty at neighbourhood level

Although it is not the aim of this report to investigate on how to improve data related to poverty at neighbourhood level (which is more directly connected with Action 3 "Developing data on urban poverty at EU level"), some issues have arisen in the research process.

The question is very complex and there is no much information available, as it is a rather technical issue developed by the internal services of the European Commission (Eurostat, DG REGIO) and the National Statistical Institutes (NSIs) or National Urban Audit Coordinators (NUACs).

The information and ideas provided below have been developed based on the information available from the *"Methodological manual on city statistics 2017 edition"* (EUROSTAT, 2017[15]), and the Eurostat website for *"City statistics (urb)"* [16].

9.2.1. General overview of city statistics/urban audit at European level

According to the *"Methodological manual on city statistics 2017 edition"* (EUROSTAT, 2017), the City Statistics data collection at EU level started at the end of the 1990s in the form of a pilot project, which was followed later by several data collection rounds mainly executed by the National Statistical Institutes (NSIs). These rounds took place in 2003/2004, 2006/2007, 2009/2011, 2012/2013, and 2014/2015 (collecting data for the reference years 2013 and 2014). Currently, the 2016/2018 data collection is ongoing.

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[15] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-17-006

[16] https://ec.europa.eu/eurostat/cache/metadata/en/urb_esms.htm

The City Statistics data collection has been subject to several modifications due to political demand (e.g. Europe 2020 strategy, the revision of the General Regulation for the ERDF European Regional Development Fund) and progress in the European Statistical System (ESS). It has been improved by Eurostat on several occasions in cooperation with DG Regional and Urban Policy (DG REGIO) and the responsible institutions in the participating countries (mainly NSIs). These improvements have led to changes of qualitative (harmonization of methods for the collection of individual variables, allowing a better comparison of variables for the different cities providing them) and quantitative nature (the geographical scope also changed between data collection waves- overall, it covered cities in the EU-28 plus cities in Norway, Switzerland and Turkey-; the number of cities and variables collected also changed from one data collection round to the next, etc.).

The data collections covered a wide range of variables across economic, demographic and social topics, which have been subject to changes from wave to wave reflecting past experience and evolving policy needs.

In 1999, the Commission (DG REGIO) conducted a tentative data collection of comparable variables and indicators for European cities. The purpose of this data collection was to test the feasibility of collecting comparable measurements of the quality of life in European cities. Over the entire EU (EU-15 at the time), around 480 variables were collected for the 58 largest cities –although London and Paris were omitted since they were considered too difficult to cope with in a test phase-.

In the 2014/2015 data Collection phase around 100 variables were collected for the reference years 2013 and 2014. This round introduced several methodological changes (which were decided in order to improve the quality of the data and to reduce the workload for the data providers), among others:

- A reduction in the number of variables,

- The integration of new variables (of importance for EU policy) and their definitions into the data collection,

- The adaptation and harmonisation of variable names and definitions to/with regional and/or national data collections in order to improve data consistency and comparability,

- A new approach regarding the spatial dimension.

Data collected has been used for several reports, among others: *"Quality of life in cities - Perception survey in 79 European cities"* (2013), *"Urban Europe - Statistics on cities, towns and suburbs"* (2016), *"The state of European Cities Report"* (2016). It has also been used to develop GIS (Geographical Information Systems) mapping tools illustrating the different indicators available for European cities.

One of these GIS mapping tools developed by Eurostat is *"Regions and Cities Illustrated"*[17] :

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[17] https://ec.europa.eu/eurostat/cache/RCI/#?vis=city.statistics&lang=en
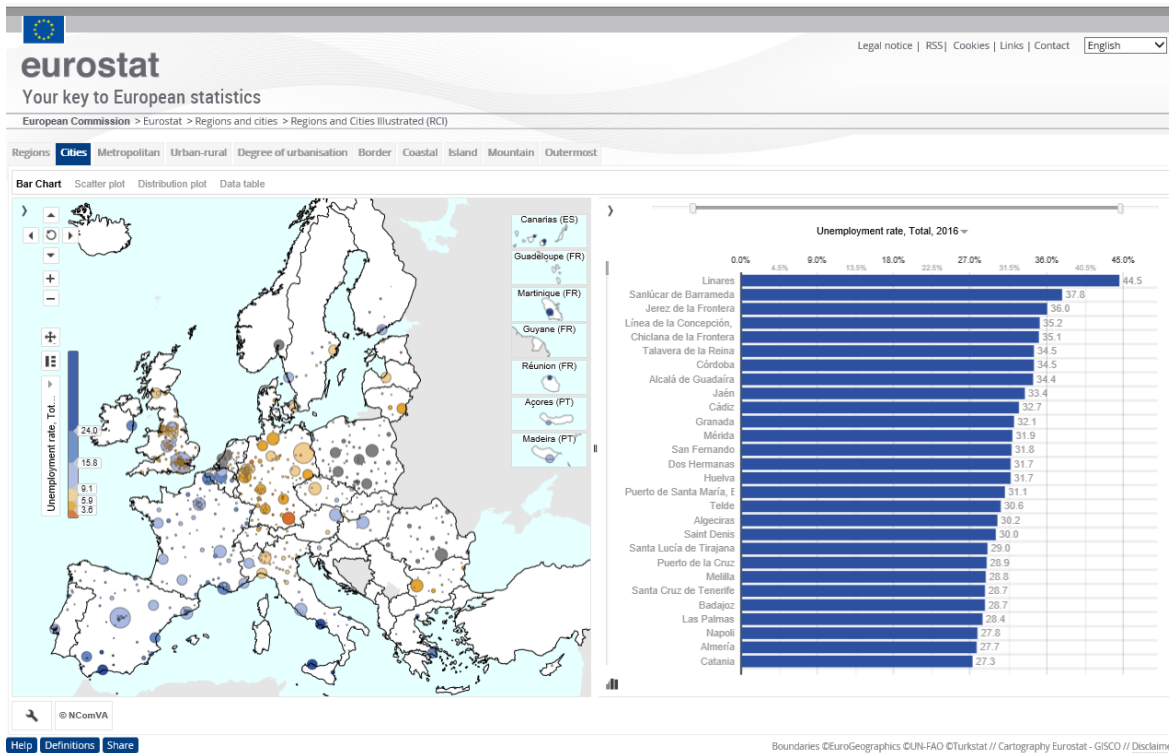
Figure 35. Image of Eurostat "Regions and Cities Illustrated"
Source: https://ec.europa.eu/eurostat/cache/RCI/#?vis=city.statistics&lang=en

Another GIS mapping tool is the "Statistical Atlas. Cities", but it doesn't include data at Sub-City District (SCD) level.
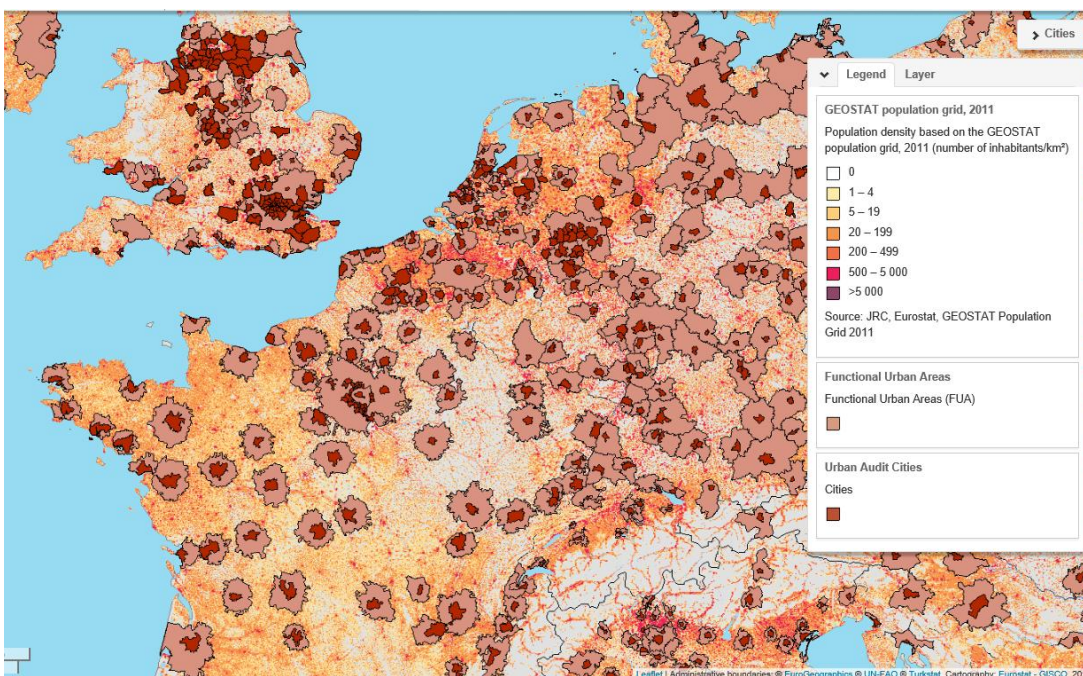
Figure 36. Image of Eurostat "Statistical Atlas. Cities"
Source: http://ec.europa.eu/eurostat/statistical-atlas/gis/viewer/?

In 2015, the variables list to be used for the 2016/2018 data collection was announced and the details on those variables are provided in the "Methodological manual on city statistics 2017 edition" (EUROSTAT, 2017), which is an update of the former "Urban Audit – Methodological Handbook".

A detailed description of the spatial approach and on variables and their definitions is provided in sections 4 and 6 respectively of this manual. Data is collected on several spatial levels:

- Functional Urban Area (FUA) - formerly known as Larger Urban Zone (LUZ), being an approximation of the functional urban zone centred around the city,

- Greater City (formerly Kernel). In some cases, the urban centre stretches far beyond its boundaries. To better capture the entire urban centre, a 'greater city' level (K), has been created. This level was created for some capitals and several other large cities.

- City (C, formerly core city), according to the administrative definition, as the basic level,

- The Sub-City District (SCD) being a subdivision of the city according to population criteria. There are Sub City Districts level 1 and Sub City Districts level 2.

9.2.2. Availability of data for the identification of urban deprived areas and neighbourhoods in city statistics/urban audit EU statistics

There are two requirements for data to be useful for the identification of Urban Deprived Areas and Neighbourhoods (UDAN): being available at neighbourhood level and including variables related to poverty.

As mentioned above, the Sub-City District (SCD) level is the nearest to the "neighbourhood" scale. An illustration of the degree of detail of the Sub-City District (SCD) level can be seen in the image below:
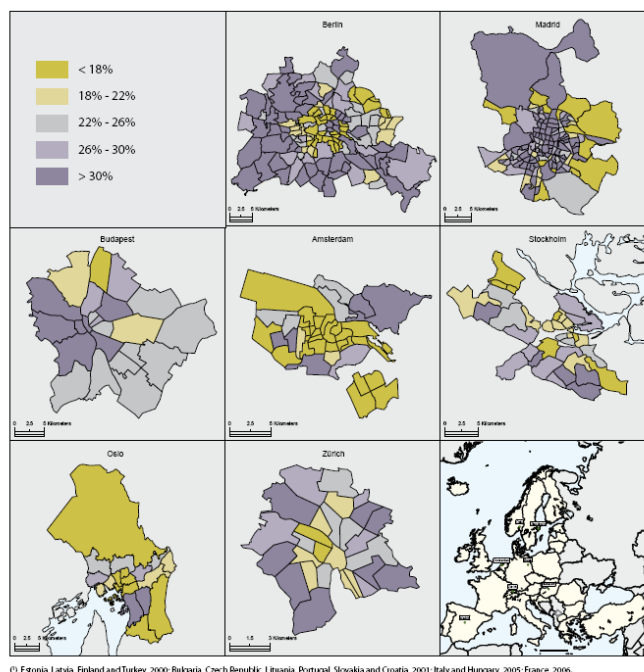
Figure 37. Illustration of the potential of Sub City District (SCD) mapping. Old age dependency ratio in selected Urban Audit cities, by Sub City District (SCD), 2004. (Map created with data from March 2010)
Source:https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=File:Old_age_dependency_ratio_in_selected_Urban_Audit_cities,_by_sub_city_district,_2004.PNG#filehistory.

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The methodological definitions used for the Sub City District (SCD) are described in chapter 4.5 of the manual (EUROSTAT, 2017, p. 15):

"4.5 Definition of sub-city districts

- *The definition of the sub-city districts has not been harmonised, however certain guidelines were adopted.*

- *Sub-city districts shall be defined for all capital cities and for non-capital cities with more than*

- *250 000 inhabitants at the city level.*

- *The definition of sub-city districts for non-capital cities with less than 250 000 inhabitants at the city level is optional.*

- *Sub-city districts should have a population between 5 000 and 40 000.*

- *Sub-city districts shall be internally homogenous in terms of social structure and built environment as far as possible.*

- *In several large cities a subdivision of cities already exists but the units are larger in terms of population then the above-mentioned thresholds. In these cases, an additional sub-city district level can be defined, which corresponds to the established city districts.*

- *Based on the above, sub-city districts can be defined at two levels. Sub city districts level 1 corresponds to the established city districts and level 2 follows the population criteria.*

- *For most cities only level 2 is defined, while for some other cities both levels 1 and 2 are defined.*

- *If deemed necessary, it is possible to define a sub-city district without territory (unknown subcity district). This can be used for adjustments in calculating totals of all sub-city districts).*

- *The territory not covered by a City but covered by a Greater City can also be divided into sub-city districts. The same guidelines apply as above".*

Regarding variables related to poverty, the manual also includes an extensive list and description of the indicators available. Currently, information is collected on more than 900 EU cities for which it contains 171 variables and 62 indicators. For the supramunicipal or sub-municipal areas, only part of these indicators are collected. The variables directly related to Poverty are described in section 6.4.3 (Income Disparities and Poverty) of the manual:

Variables:

Code	Label	Required?	Unit of measurement
EC3064V	Share of persons living in households with very low work	Yes	Percentage of total population
EC3065V	Share of persons at risk of poverty after social transfers	Yes	Percentage of total population
EC3066V	Share of severely materially deprived persons	Yes	Percentage of total population
EC3067V	Share of persons at risk of poverty or social exclusion	Yes	Percentage of total population
EC3039V	Median disposable annual household income	Nice to have	Euro
EC3040V	Average disposable annual household income	Nice to have	Euro

Table 11. Income Disparities and Poverty (EC3)
Source: Eurostat, op.cit., 2017, p.35

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As it has been mentioned, the GIS tools currently developed by Eurostat (eg: "Regions and Cities illustrated", "Statistical Atlas. Cities") in relation to the former Urban Audit project (now called "data collection for sub-national statistics (mainly cities)") do not show data at Sub City District (SCD) level.

Nevertheless, for example, in the case of Spain, as shown below, there is some data about poverty (Average annual net household income, Average annual net income per habitant, Average annual income by consumption unit) coming for the Urban Audit available at Sub City District (SCD) level. These data about poverty at SCD level is only available in the Spanish municipalities with more than 250,000 inhabitants.
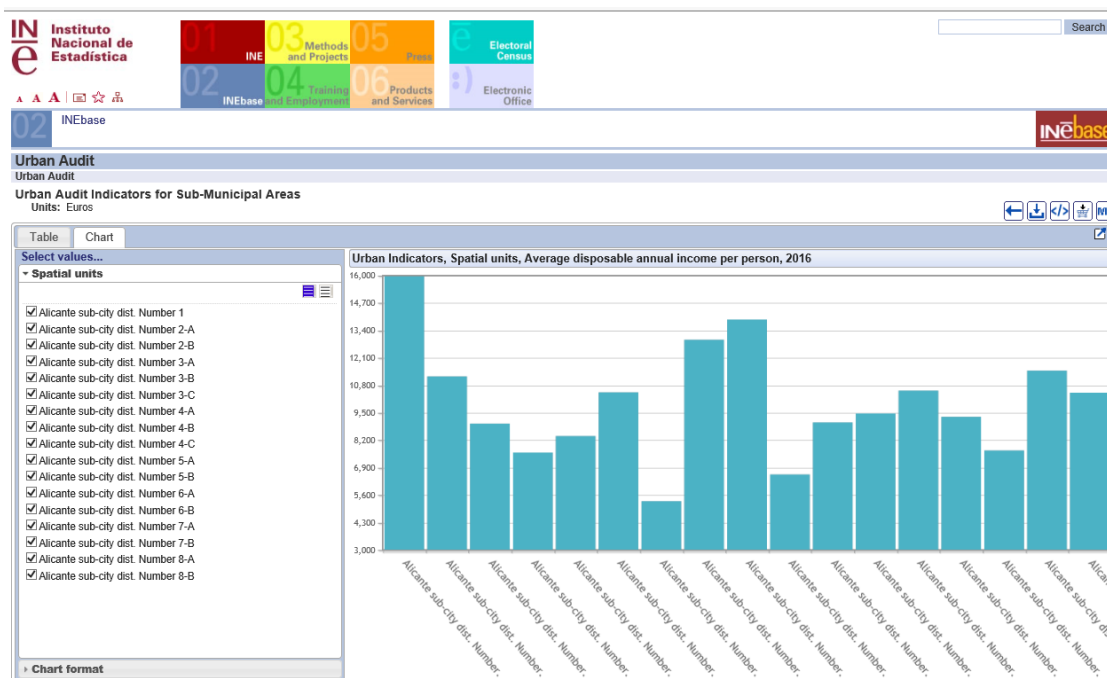
Figure 38. Average annual net income per habitant at Sub City District (SCD) level (Alicante city, Spain). Source: INE (Spanish Statistical National Institute)
Source:https://www.ine.es/ss/Satellite?L=en_GB&c=INEPublicacion_C&cid=1259944561392&p=1254735110672&pagename=Prod
uctosYServicios%2FPYSLayout&param1=PYSDetalleGratuitas&param2=1254736268832&param4=Mostrar

This is just an example that shows that this is information is available to a certain extent, but not used for the moment at EU level.

So, it seems very important that this question should be further explored with Eurostat and/or DG REGIO.

9.2.3. Suggestions about improving data for the identification of urban deprived areas and neighbourhoods in city statistics/urban audit EU statistics

It seems necessary to clarify with Eurostat/DG REGIO to which extent there is information about poverty accessible for the Sub City District (SCD) level for the European cities. For this, the following actions are proposed:

1. Contact with Eurostat and/or DG REGIO. This could be done by the coordinators of the Urban Poverty Partnership.

2. Contact with National Statistical Institutes (NSIs) in the same direction. This could be done in parallel by the MS participating in the Urban Poverty Partnership (Belgium, France, Spain, Germany, and Greece).

3. Explore with Eurostat and/or DG REGIO the possibilities of improving data for the identification of deprived neighbourhoods and for making it available for European cities.

Depending on the data availability it could be checked if it is possible to include data at Sub City District (SCD) level from the former Urban Audit (now called "data collection for sub-national statistics (mainly cities)") about poverty and other socioeconomic variables related in the existing GIS tools developed by Eurostat (eg: "Regions and Cities illustrated", "Statistical Atlas. Cities"), making a sort of European Observatory of Urban Poverty at EU level. This could be understood as a part of the one-stop-shop mentioned in the Urban Poverty Action Plan.

9.3. Suggestions about a European website functioning as a one-stop shop

It seems that the idea of the one-stop-shop as it currently appears in the Action Plan (page 20) is difficult to implement, as it supposes that the one-stop-shop (website) *"would be created by the European Commission in order to make available and easily accessible the statistics elaborated by the National Observatories network (methodologies, tool-kits, indicators, etc. on urban poverty) to local authorities and other relevant actors".*

In our opinion, there are two different options for the one-stop-shop (website) which should not be mixed:

- The first is the one-stop-shop (website) understood as a focal point of exchanging information about methodologies, tool-kits, indicators, etc. on urban poverty. This is more related to the National Observatories network, for which some ideas have been suggested above.

- The second is the one-stop-shop for mapping data about poverty and other socioeconomic variables related at Sub City District (SCD) level and the possibility of including it in the existing GIS tools developed by Eurostat (e.g.: "Regions and Cities illustrated", "Statistical Atlas. Cities"). This is related with proposal of engagement with Eurostat/DG REGIO.

This platform should facilitate and make scientific and technological information available to local decision makers to solve the specific problems of cities or metropolitan areas. The following are considered essential for this purpose:

- Mapping tools. These are suitable for a first approach and help familiarise the user. They also give a rapid idea of the observatory's objectives and main indicators, and quickly identify significant poverty sites and their territorialisation.

- Free and direct access to the databases and information. Allowing users to design their own plans with the information from the observatories can support important research currently underway. The obligation to cite the data source could have an exponential effect on the dissemination of the observatory itself and its content to civil society. The unrestricted availability of this information can also support and encourage new research in this context.

- Access to the complete methodology or a summary is also useful for researchers and users, in addition to access to the information itself. Videos or manuals on how to use the platform are also helpful for less experienced users or anyone unfamiliar with the way the observatory works.

- Clarity in the preparation of the methodology. Special effort must be made to increase transparency and clarity in preparing the methodology, particularly in regard to the limitations of the approach and in the sequence followed in the research. This also applies to the data sources used by the observatories, which –although they are usually mentioned– are not often comprehensively referenced in technical reports.

This platform must generate and coordinate a continuous research programme on urban issues based on practical and applied experience, relevant to the urban environment and to urban problems. It may be useful to include some other actions implemented in various observatories, such as:

- Offering periodic and annual reports of the information they contain. The updating of the information provided by the observatories ensures visibility for its continued and updated work.

- Ensuring the conservation of the time series, mainly regarding the evaluation, assessment and monitoring of public policy. Each methodological or source change must also guarantee the time series.

- Offering monographic reports. This option is compatible with the presentation of monographic reports derived from observatory data and focusing on different topics to give a more complex view of the various indicators in more specific contexts.

- Improving reports accessibility. Many of the reports wrote by the observatories with technical, sartorial or monographic information are not very accessible. Sometimes it is necessary to request, sometimes are written only in the native language or sometimes they are just in a difficult web location. However, it is possible that the information in the reports could not only be of interest for the country of origin, but still some methodological or approach information may be of interest to the rest.

- Diffusing the capacity of observatories as essential tools in the design, implementation and evaluation of public policies. The direct or indirect application of the indicators in public policies can help consolidate the importance of national poverty observatories. Social policies, physical urban regeneration programmes, and health, environmental and economic policies are considered areas in which it is easy to intervene with the different indicators used in the observatories.

- Informing about methodologies and possible obstacles and solutions to establish new observatories to Member States interested in creating a National Observatory

Another action that should be implemented by the network through the website is to increase the administration's capacity to develop more effective training activities on issues related to urban problems and living conditions in cities. The following actions are recommended:

- Multi-level and cross-cutting policies. These policies should, as far as possible, be multi-level and cross-cutting. The role of the observatory should also be integrated in their formalisation.

- Dissemination of good urban policies / practices that have been successful in combating urban poverty.

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11. ANNEX. SURVEY ABOUT URBAN DEPRIVATION/POVERTY OBSERVATORIES IN THE EUROPEAN UNION

1. GENERAL QUESTIONS

- *Name of the Observatory:*

- *Name translated into English:*

- *Website:*

- *Links:*

- *Institution responsible for/in charge of the Observatory:*

Name and contact details of the person filling the questionnaire:

- *Name:*

- *Position:*

- *Email:*

- *Phone number:*

2. GENERAL PURPOSE

2.1. Please describe briefly the purpose/scope of the Observatory:

2.2. Does it have a legal status? Is it established/mentioned in any law, regulation, Act, etc.?.

3. MINIMUM SPATIAL/GEOGRAPHICAL UNIT

3.1. Which is the "minimum spatial/geographical unit" (intra-city) with statistical information available disaggregated at this level (for example Census Tract, Postal Code, Output Area and LSOA in UK, Census Block Group in the USA, IRIS in France, etc.)?. *Please describe…... (For example: Super Output Areas (SOAs) are a set of geographical areas developed following the 2001 census, initially to facilitate the calculation of the Indices of Deprivation 2004 and subsequently for a range of additional Neighbourhood Statistics (NeSS). The aim was to produce a set of areas of consistent size, whose boundaries would not change (unlike electoral wards), suitable for the publication of data such as the Indices of Deprivation. They are an aggregation of adjacent Output Areas with similar social characteristics. Lower Layer Super Output Areas (LSOAs) typically contain 4 to 6 OAs with a population of around 1500. Middle Layer Super Output Areas (MSOAs) on average have a population of 7,200. The hierarchy of Output Areas and the two tiers of Super Output Areas have become known as the Neighbourhood Statistics Geography).*

3.2. Who and How defines these "geographical/spatial units"? Which is its primary purpose? *Please describe…. (For example, in France, IRIS are defined as follows:* https://www.insee.fr/en/metadonnees/definition/c1523*)*

3.3 Are the boundaries of these spatial units fixed along time or can they be subject to modification? *Please, describe… (For example, in some countries, Census Tracts should be between a minimum and a maximum population threshold. Then, if the population of a Census Tract changes between successive Censuses, and goes up or down this threshold, the spatial delimitation of the Census Tract may be redefined, and the geographical/spatial units can be splitted, amalgamated or adjusted)*

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4. DATA SOURCES

4.1. Which is the source/sources of statistical information for the indicators used in the Observatory? *(For example: National Population and Housing Census, etc.)*

4.2. Is the provider of the statistical data the same public authority responsible for the Observatory? *(For example: the data can be provided by the National Statistical Office and the Observatory may be responsibility of one Ministry).*

4.3. How often are the data updated? *(For example, National Housing and Population Censuses are only updated over a period of 10 years but sectorial reports linked to vulnerability studies are periodically uploaded).*

4.4. Is there a combination of data coming from different sources? *Please, describe it*

5. METHODOLOGY: INDICATORS

5.1. Please select putting in bold or underlining the Domains/Topics covered by the indicators included in the Observatory:

- *Income:*   *Yes/No*

- *Sex, age and marital status:*   *Yes/No*

- *Nationality, Ethnicity:*   *Yes/No*

- *Family type:*   *Yes/No*

- *Private households:*   *Yes/No*

- *Housing conditions:*   *Yes/No*

- *Social class and socio-economic group:*   *Yes/No*

- *Educational level:*   *Yes/No*

- *Disability, carers and general health:*   *Yes/No*

- *Occupation, employment:*   *Yes/No*

- *Motor car availability, PC ownership:*   *Yes/No*

- *Crime Domain:*   *Yes/No*

- *Environmental conditions:*   *Yes/No*

- *Others (Please, indicate it):*

5.2. Please provide a list (copy & paste, or attach a file) or a link to the list of Indicators included in the Observatory (if possible, in English and related to the previous Domains/Topics):

5.3. Family/Household/Personal Income Indicators.

5.3.1. Do you have indicators about Income at the "minimum spatial unit" referred in question 3? (For example: Family income, Household income, Personal income, etc.)

5.3.2. Which institution provides this indicator at national level?

5.4. Indicators about Nationality/Ethnic origin.

5.4.1. Does the Observatory include Indicators about Nationality/Ethnic origin? (*Please, indicate it*)

5.4.2. Is there any legal provision forbidding or restricting the dissemination on data about Nationality/Ethnicity? (If yes, indicate reference)

5.5. Basic/Priority Indicators.

5.5.1. Is there a set of Basic/Priority Indicators for the identification of deprived areas? (*Please, indicate it*)

5.5.2. How have these Basic/Priority Indicators been selected?

5.5.3. Is this Basic/Priority set of Indicators related to any definition of poverty/deprivation? (*Please, indicate it*)

5.6. Have there been any changes in the list of indicators used in the Observatory along time?. *(For example, in France there used to be a set of 5 basic indicators (unemployment, low education, single family parents, etc.) which was recently changed to one single indicator: family income. In the UK different methodologies -Townsed, Carstairs,etc.- have been used in different periods.).*

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6. METHODOLOGY: COMPOSITE INDICATORS/CLASSIFICATION OF DEPRIVED NEIGHBOURHOODS / CONTEXTUALIZATION OF DEPRIVATION

6.1. Is there a composite indicator of "deprivation"? *(For example, a "Global or Synthetic Index of Deprivation", combining different indicators). Please, describe it.*

6.2. How is it calculated? How has this composite indicator been developed/chosen?

6.3. Is there a graded classification of deprived neighbourhoods at national level according to a range/score/scale? *(For example, using quintiles or deciles, etc.).*

6.4. Is it possible to compare the data of each "minimum spatial unit" (neighbourhood, Census Tract, etc.) with the national/regional averages?

6.5. Is there any sort of "list/catalogue" of deprived neighbourhoods identified by the Observatory? *(For example, in France there is a list of ZUS: Zones Urbains Sensibles).*

6.6. In that list/cathalogue of deprived neighbourhoods does the Observatory clasificate the Poverty Urban in any taxonomy (like tipology, origen, morphology…)?

7. TECHNICAL ISSUES

7.1. Name of GIS (Geographical Information System) software used:

7.2. Is it free software? Is it especially developed for the Observatory? Is commercial software under license/contract?

7.3. Interactive Mapping (Please answer Yes or No, as appropriate):

- *Is it possible to make maps showing indicators in a fixed year?*
- *Is it possible to make evolution maps (showing evolution of indicators in a period of time)?*
- *Other (please, describe it):*

7.4. Products available. Please answer Yes or No, as appropriate, and describe (if necessary):

- *On line GIS (Geographical Information System) based visualization/mapping tool:*
- *Periodical Report (indicate temporality):*
- *Monographic Reports:*
- *City/Regions Reports:*
- *Others:*

7.5. Customization by users.

7.5.1. Is it possible for cities/researchers, etc. to download a "shape" with the "minimum spatial units" in order to make their own maps?

7.5.2. Is it possible for cities/researchers, etc. to download the indicators (for example EXCEL or CSV format) for each "minimum spatial units" in order to make their own maps?

7.5.3. If it is not possible to download it from the web, there are other ways to request it? (For example: it can be requested by official registration if it is linked to public investigations)

8. RESOURCES

8.1. Does the Observatory directly elaborate all the documents or does it have external collaborators (other organizations, associations, companies or others)? (Explain the specific case)

8.2. Human resources/ team working in the Observatory (Please describe in terms of full employed persons/year):

8.3. Please, describe (approximately) the total annual funding dedicated to the Observatory:

9. RELATIONSHIP BETWEEN THE OBSERVATORY AND URBAN REGENERATION POLICIES/PROGRAMMES

9.1. Does the Observatory have any relationship with any national policies to fight against urban poverty/deprivation? Please, answer Yes or No, as appropriate:

- *With Social Policies (For example, deprived areas identified by the Observatory have special public investment to support social policies: eg. education: more teachers; Roma or migrants: integration programmes, etc.).*

- *With physical urban regeneration programmes: (For example: deprived areas identified in the Observatory receive extra funding for urban regeneration- more public investments in buildings' retrofit, hosing, public spaces, etc.).*

- *With health policies.*

- *With environmental policies.*

- *With economic policies (For example, there are special benefits (in taxes, etc) to set up new enterprises settled in deprived neighbourhoods).*

- *Other (please, describe):*

9.2. Rate the following statements, as they best describe your country (1 less agree and 5 more agree)

- *National authorities use the Observatory to select priority deprived areas to be beneficiaries of urban regeneration.*

- *Local authorities (municipalities) can use the Observatory as a tool to help them identifying deprived areas and ask national/regional authorities for public investment.*

- *National authorities launch open calls for local authorities in order to select deprived areas to be beneficiaries of public funding and the indicators in the Observatory are used as the main criteria for selection.*

- *Other (describe):*

9.3. Please, give us a description of the uses of the Observatory to support decision making in urban regeneration policies/programmes at national scale.

Please, insert here any further general comment or aspect about your Observatory that you would like to highlight:

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