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STATISTICAL AND DEMOGRAPHIC SOURCES OF KNOWLEDGE ABOUT SMALL TOWNS – AN OUTLINE

Abstract

- *Goal* – The purpose of this paper is to review the selected statistical and demographic sources of knowledge about small towns based on selected Polish and European examples. Due to the limitations of this article, the text is an outline which requires further elaboration in other publications.
- *Research methodology* – The article is a review paper, so the applied method is desk research on the already existing sources supplemented by the author's own methodological experience.
- *Score/results* – The paper begins with the description of the basic divisions and typologies of sources in social research and then concentrates on existing sources, mainly public statistics in the context of small towns and local communities. It also describes simple methods of usage of basic demographic data stored in Local Data Bank to analyse the dynamics of demographic change in local communities or to prepare quota sample. It also discusses other data repositories provided by Statistics Poland (GUS) and (to lesser extent) Eurostat. In addition, the article proposes to use the results of other research, which, although originally intended for other purposes, may be indirectly relevant to the condition of small towns – studies in commuting within agglomeration.
- *Originality/value* – Although many researchers use data deposited in SP (GUS) repositories, such as the Local Data Bank, there is an apparent shortage of review papers on these issues with methodological inclinations. This article, although in outline form which will be developed in the future, may still help beginning researchers in their search and analysis of statistical sources about small towns and local communities.

Keywords: small towns, statistical sources, data repositories

1. Types of sources in sociological research

A "source" in sociological (or wider: social) research can regard, after Grzegorz Babiński, "any material object that makes it possible to formulate justified conclusions about social reality" [Babiński 1980: 65]. At the same time, the author pointed out the imperfection and imprecision of this definition, noting that in such an approach, a "source" could be almost anything created by man (the entirety of material culture). He eventually focused on texts in written form that record the behaviour or characteristics of individuals and groups. The sources used by social researchers can be divided into *primary* ("raw", unprocessed) and *secondary* (processed to varying degrees).

Primary sources include: diaries and letters, official documents, creative works (artworks, literature, music, etc.), interviews and oral histories, research reports, visual documentation[1]. Examples of secondary sources may include: textbooks, publications that interpret or review research works, literary criticism, reviews of legislation, political commentaries etc. Here, the sources may be selected, compiled, reviewed, interpreted, criticised, decomposed and recomposed, so they lose their primary (firsthand) character.

We can also distinguish between the already *existing sources* (not created by the researcher who uses them, the data were collected and processed by other researchers) and *primary data* or *induced sources*[2] (data collected directly from firsthand experience). The criterion for distinguishing the type of source depends on the role of the researcher – whether he or she participated in creation of the source. Moreover, when any form of selection is involved in the recording or preserving of the collected research material, the material ceases to be primary. It loses "rawness" and in some way is "contaminated" or biased, because it may omit elements that someone else might consider important or relevant [Daniłowicz, 1981: 46]

The methodological literature indicates that "secondary data does not result from firsthand research collected from primary sources, but are the already completed work of other researchers or data collected by an agency or organisation" [Conerly et al, 2021: 52]. We can also divide the existing sources according to the degree of detail and processing: raw/unprocessed vs. processed, e.g. completed survey or census questionnaires (paper forms or databases) vs. census or survey

[1] A comprehensive review of primary sources can be found on the website of Yale University, see: www 1.

[2] There is no good literal translation for the Polish term "*źródła wywołane*". The therm "*primary data*" is the closest in meaning to this concept, see: Babiński, 1980, p. 66

reports and publications [Babiński, 1980, p. 69]. The value of the source is determined by its relevance and credibility. The dimensions of source credibility have been usually identified to consist of *expertise* (or *competence*) and *trustworthiness* [Pornpitakpan, 2004: 244], as well as *good will* [Gass, 2015: 349]. The third axis of classification is the temporal dimension, basing on which, we can differentiate between historical and contemporary sources.

Speaking of statistical and demographic sources, I will focus mainly on *primary sources*, without forgetting that a social researcher's knowledge about small towns and local communities would be far from complete without acquainting with the existing published studies.

Using the previously mentioned criteria for the division of sources, I will see statistical sources[3] as the *existing sources*, and taking into account the temporal dimension, they could be both contemporary and historical sources.

2. Statistical sources of knowledge at national level – public statistics

I will begin the review of the selected sources with the most accessible ones, namely public statistics provided by the Statistics Poland (GUS)[4]. Just over a decade ago, it offered access only to the processed data published in the form of printed reports, bulletins, or yearbooks. A significant step forward in data accessibility was the launch of the Local Data Bank, which is the largest Polish database on the economy, society, and the environment[5]. A characteristic feature of this database is that it provides data processed only to the extent necessary to present it in tabular form for further independent use. However, when retrieving the desired information from numerous areas and territorial units, the researcher has to be patient, as all data must be downloaded manually.

The table below presents an example of a simple use of data obtained from the Local Data Bank. In this case, it features data comparing the number of inhabitants in two gminas[6] adjacent to the city of Białystok. The LDB includes data

[3] One could also argue about the definition of statistical sources, which, in the broadest sense, would mean nearly anything that can literally be counted and presented in tabular form.

[4] Statistics Poland is the official English name for the Polish national statistical office, which was formerly translated as Central Statistical Office.

[5] See: www 2.

[6] In this paper, I will consequently use the term '*gmina*', which represents the basic level of the three-tier administrative division in Poland. There is no suitable English equivalent for

from 1995, and at the time of writing this article, the most recent data covered 2023 (as of December 31). The data presented here allows us to track changes in the population of the specified gminas over 29 years.

Table 1. Population changes between 1995 and 2023 in selected gminas neighbouring Białystok

Unit name	Year		Difference 2023–1995 [person]	Difference 2023–1995 [%]
	1995	2023		
Choroszcz – gmina	12 272	18 083	5 811	47.35%
Choroszcz – urban area	5 132	6 089	957	18.65%
Choroszcz – rural area	7 140	11 994	4 854	67.98%
Supraśl – gmina	11 207	18 155	6 948	62.00%
Supraśl – urban area	4 552	4 332	-220	-4.83%
Supraśl – rural area	6 655	13 823	7 168	107.71%

Source: the author's own work based on data obtained from Local Data Bank, Statistics Poland (GUS).

As we can see, during the analysed period there was a significant increase in the number of inhabitants in both gminas, especially in rural areas. In the case of the gmina Supraśl, the rural population has doubled. The explanations for this phenomenon are easy to find. Since these gminas border a large city like Białystok, the increase in their population is driven by suburbanisation processes, which involve significant groups of inhabitants moving from the centre of the agglomeration to its outskirts – neighbouring gminas. These simple operations (and many more) on local data can be performed for any territorial unit in Poland. Because of accessibility and simplicity in processing, many researchers reach for such data to conduct analyses and draw their own conclusions. Such analyses mainly concern demographic factors and economic indicators or functional changes within agglomerations [Bogdański, 2021], [Majdzińska, 2022], [Wesołowska, Jakubowski, 2018], [Wiśniewski, 2012], [Wołyniec, 2019].

this word, so '*gmina*' is used in official Statistics Poland documents published in English. The closest word to '*gmina*' is 'municipality', but it does not cover the diversity of territorial units at the basic level. It rather suggests urban units, without sufficiently focussing on rural-urban and rural ones. As of 1 January 2025 there are 2479 gminas Poland (including 302 urban gminas, 718 urban-rural gminas and 1459 rural gminas), see: www 3.

Another example of a simple and useful application of the data contained in the LDB is obtaining the "demographic base" to prepare a quota sample for the local community. Due to personal data protection laws (GDPR), obtaining data to prepare a reliable sampling frame (the list of units or elements within the population on the basis of which we conduct random sampling) becomes problematic and quite expensive. Meanwhile, a well-prepared quota sample (a popular variant of non-probabilistic sampling) under certain conditions can be successfully used as a substitute for probabilistic sampling. A quota sample, which reflects the structure of gender, age and territorial distribution of the population, can be considered "representative" (It best represents the population structure among non-probabilistic samples), although abandoning random sampling results in certain limitations of statistical inference. Nevertheless, quota sample is the non-probabilistic equivalent of the stratified random sample.

Tables below show the simplest method for preparing quota sample for any Polish territorial unit (gmina, powiat, voivodeship) in less than thirty minutes, basing on LDB data and spreadsheet (Excel, Calc or similar software). The first step involves obtaining the data from LDB and exporting it to *.xls file. After few modifications of the table we receive the structure of the population by gender and age (Table 2).

Table 2. Structure of adult population in Choroszcz in 2023

Age cohorts (groups)	Gender		Total by age
	males	females	
18–19	50	55	105
20–24	141	149	290
25–29	172	141	313
30–34	197	189	386
35–39	229	252	481
40–44	260	242	502
45–49	267	240	507
50–54	229	212	441
55–59	189	169	358

Age cohorts (groups)	Gender		Total by age
	males	females	
60–64	211	185	396
65–69	166	225	391
70 and more	289	490	779
Total by gender	2400	2549	4949

Source: the author's own work based on data obtained from Local Data Bank, Statistics Poland (GUS).

The second step is to calculate the proportions of each gender-age cohort in relation to the total population of the territorial unit (here a town) This can be written as fraction or percentage (Table 3).

Table 3. Proportions of gender-age cohorts in relation to total adult population in Choroszcz

Age cohorts (groups)	Gender		Total by age
	males	females	
18–19	1.01%	1.11%	2.12%
20–24	2.85%	3.01%	5.86%
25–29	3.48%	2.85%	6.32%
30–34	3.98%	3.82%	7.80%
35–39	4.63%	5.09%	9.72%
40–44	5.25%	4.89%	10.14%
45–49	5.40%	4.85%	10.24%
50–54	4.63%	4.28%	8.91%
55–59	3.82%	3.41%	7.23%
60–64	4.26%	3.74%	8.00%
65–69	3.35%	4.55%	7.90%
70 and more	5.84%	9.90%	15.74%
Total by gender	48.49%	51.51%	100.00%

Source: the author's own work based on data obtained from Local Data Bank, Statistics Poland (GUS).

The final step is to multiply the proportions of the gender-age groups by the sample size assumed by the researcher (in this example it is 500). The obtained numbers should be rounded to integers (Table 4). In some cases, in the column "total by age group" the value does not correspond to the sum of the number of men and women in that age group. This is due to rounding separately for gender groups and separately for the sum of men and women in a given age group. The resulting matrix table indicates exactly how many individuals from each gender-age group should be invited to the survey so that the sample reflects the population structure by gender and age.

Table 4. Quota sample by age-gender cohorts for the town Choroszcz

Age cohorts (groups)	Gender		Total by age
	males	females	
18–19	5	6	11
20–24	14	15	29
25–29	17	14	31
30–34	20	19	39
35–39	23	26	49
40–44	26	25	51
45–49	27	24	51
50–54	23	21	44
55–59	19	17	36
60–64	21	19	40
65–69	17	23	40
70 and more	29	50	79
Total by gender	241	259	500

Source: the author's own work based on data obtained from Local Data Bank, Statistics Poland (GUS).

This type of survey sampling is commonly used by various researchers due to its simplicity and low cost. Moreover, the data as shown in this example may

be used to prepare a post-stratification weights when random sample does not reflect the distribution of some known variables in the population [Glasgow, 2005], e.g. the fractions (proportions) of gender-age cohorts in the sample significantly differs from those in the population. In such case, it is necessary to use a precise population structure (e.g., obtained from the LDB) to calculate post-stratification weights in statistical software (e.g. SPSS or R), which will adjust the distribution of key variables in the sample to match the population characteristics.

A major help in navigating SP (GUS) data was the launch of the API (*application programming interface*). This term refers to "the method of communication between IT systems that simplifies the automatic selection and retrieval of data. By enabling data to be easily imported into one's own IT environment, the efficiency of data processing and the creation of applications, analyses, and visualisations is improved" [GUS, 2025a]. Currently SP offers seven API services that allow efficient navigation through its databases. Additionally, the website https://dane.gov.pl provides various datasets (including demographic ones) for independent download and usage. Although using an API requires some IT skills and knowledge, for researchers already familiar with this, it simplifies and automates the process of data retrieving for further processing and presentation in tabular or graphical form (charts, maps).

Among the APIs available from SP, the following can be distinguished:

- Publication Data Store [Składnica Danych Publikacyjnych]: Provides access to the full informational scope of public statistics, including data and metadata in a consistent data structure, which can be browsed by variables and indicators.
- Knowledge Databases [Dziedzinowe Bazy Wiedzy]: A statistical data platform offering access to a wide set of continuously updated socio-economic and the environmental information.
- REGON: A continuously updated database of information about entities in the national economy.
- TERYT: Contains current and archival information about the territorial division of the country, including territorial units, localities, and streets.
- Local Data Bank [Bank Danych Lokalnych]: The largest database in Poland on the economy, society, and the environment.
- SDG Platform [Sustainable Development Goals]: Used to monitor the sustainable development goals of the 2030 Agenda.
- STRATEG System: Supports the process of monitoring development and evaluating the outcomes of actions taken within the framework of cohesion policy. It presents indicators for measuring the objectives outlined in Poland's and the EU's strategic and programmatic documents.

If the researcher needs only a limited number of variables and territorial units for comparisons, using an API may not be practical and necessary. However, when analysing larger sets of variables and territorial units (e.g., comparing all gminas[7] in the country), the use of API can yield significant benefits by reducing the time required for data retrieval and aggregation.

Thanks to data obtained from SP APIs portals like *Polska w liczbach*[8] operate, offering tabular and graphical data visualisations. However, these are not official sources of statistical information, because they are a private initiative. It is also more difficult to verify their reliability and credibility due to the very limited methodological description and usually no review and external supervision.

3. Eurostat and DEGURBA

Eurostat, the statistical office of the European Union based in Luxembourg, is responsible for producing European statistics in line with the established rules and principles. Its mission is to deliver high-quality statistical information to the European Union, facilitating meaningful comparisons between countries and regions. Each EU Member State designates a National Statistical Institute (NSI) to oversee and coordinate all national-level activities related to the development, production, and dissemination of European statistics. The NSI also serves as the primary contact point for Eurostat on statistical matters [GUS, 2025b].

Parallel to Eurostat's and national statistical offices' publications, some other documents of the European Institutions may be interesting and useful in the context of (small) towns analysis, e.g. technical papers created tor usage by EU's agencies [Lecomte, Dijkstra, 2023].

In order to make international comparisons, strict terminology should be used, as different countries may have various definitions of rural areas, towns and cities for historical and cultural reasons.

In one of the papers about small towns in the European Union we can read that "Without a clear pan-European definition of a town, it is impossible to assess their importance or role in regional development. Fortunately, the Degree of Urbanisation (DEGURBA) level 2, as endorsed by the UN Statistical Commission

[7] The basic unit of the administrative division in Poland is called "gmina".
[8] See: www 4.

in 2020, includes a simple and clear definition of two types of towns: dense and semi-dense towns (…). The Degree of Urbanisation relies on different types of 1 km^2 grid cell clusters. By definition these clusters are independent from any existing administrative unit" [Lecomte, Dijkstra, 2023: 2].

The *Degree of Urbanisation* identifies the following types of settlements:

- Cities, which have a population of at least 50,000 inhabitants in contiguous dense grid cells (>1,500 inhabitants per km^2);
- Dense towns, with a density of more than 1 500 inhabitants/km^2 and a population between 5 000 and 50 000;
- Semi-dense towns within a population over 5000 and a density of at least 300 inhabitants/km^2 provided they are located at more than 2 km from cities or from dense towns and are not contiguous with a city or dense town;
- Rural areas, which consist mostly of low-density grid cells (<300 inhabitants per km^2). [Lecomte, Dijkstra, 2023: 2], [Dijkstra et. al., 2020].

The methodological principles of this classification are presented in a special handbook, which precisely describes the rules of procedure that allow international comparisons [Eurostat, 2021].

While there is no strict statistical distinction between "town" and the "city", here it is assumed that a "town" is a unit with a population between 5 000 and 50 000 inhabitants, while larger ones fall into the category of "city". It is worth noting that most Polish researchers consider a small town to be one with population lower than 20 000. What is more, the DEGURBA framework does not consider as "towns" units with population below 5 000, thus many smallest towns are excluded. This is important because, according to the DEGURBA criteria, not political or cultural factors but demographic ones (such as population and density) on a square kilometre grid determine the classification of the area.

As the authors of the mentioned paper noted, regional centres are mostly cities. About half of cities in EU are regional centres and only about 4% of towns are one of them. They are mostly located in remote areas [Lecomte, Dijkstra, 2023: 15]. In 2018 about 21,4% of EU population lived in towns (5 000–50 000 inhabitants) [Lecomte, Dijkstra, 2023: 5].

The factors considered by the authors in their analysis of European towns and cities are:

- Population density
- Access to primary schools
- Access to healthcare (average time to the nearest healthcare facility)

- Access to public transport
- Passenger rail performance and road performance
- Towns as regional centres

The differences between EU countries considering the enlisted factors are often significant. These kinds of papers were created directly to assist European institutions in their internal policy, identifying areas of special concern and facilitating these institutions to focus on cohesion policy. Nevertheless, such comparisons between Member States or regions provide insights into the situation and condition of local communities, identifying more- or less-developed areas and those on the verge of exclusion. It is therefore a useful source of information for the social researchers.

4. Studies on commuting within agglomerations – integrating own research with secondary data analysis

Studies on commuting to work within agglomerations and regions are particularly interesting from the perspective of understanding the condition of small towns and local communities. While such studies primarily focus on the attractiveness of the central city as a destination for car commuters, they also provide valuable insights into the gminas that serve as sources of these commutes and, potentially, small towns located within them. This is therefore indirect inference.

For gminas adjacent to a large city, suburbanisation is a significant process stimulating the frequency of commutes. However, in such studies, it is not feasible to rely solely on the *existing data*. For some time, commuting to work fell out of the focus of public statistics, but this changed when SP resumed such studies in 2006, utilizing for analysis data from the POLTAX tax system [Kruszka, 2010]. The 2011 Census also included questions on commuting to work [GUS, 2014], as did the most recent edition in 2021 [GUS, 2024].

In the meantime, in 2016, SP conducted a separate study on commuting, providing results on both national and regional scale. Basing on this data, other researchers carried out their own analyses and comparisons. Particularly noteworthy is the work of R. Szmytkie and D. Sikorski, who focused on the role of small towns (with populations of up to 20 000) within the commuting system. Among other findings, they observed that over the years, the number of gminas serving as places of residence has gradually increased, while the number of units functioning as workplaces has declined [Szmytkie, Sikorski, 2022]. Although the

researchers focused on commuting to the agglomeration centre, their findings may be useful from the perspective of studying the condition and role (function) of small towns in the regional and national settlement network.

In situations where "external" statistical data is lacking (as it was until the mid-2000s), researchers often turn to alternative methods, frequently conducting their own surveys. This approach was adopted by the authors of a comparison of commuting models in Warsaw and Białystok. On the one hand, they used data collected in the Warsaw Traffic Survey from 2005[9], and on the other, they referred to SP (GUS) commuting studies from 2006, while also adopting their own questionnaire [Rosik et al., 2010]. Thus, it is possible to effectively use both existing and primary ("induced") data, considering the limitations within each and the availability of data collection methods. While the purpose of the previous studies may have been different, a secondary analysis of such sources may provide relevant conclusions.

5. Conclusions

The article outlines the selected statistical and demographic sources about small towns, focusing on contemporary ones and on those available in electronic form of digital repositories. Although statistical and demographic yearbooks are still being published, in most research situations it will be more convenient to use the Local Data Bank or another statistical database. Moreover, the retrieval of such data can be further accelerated and automated by using API. A noteworthy conclusion is certainly to highlight the possibility of combining research perspectives and using primary and secondary sources as well as induced and existing sources. Even if the purposes behind the development of the latter were different from ours, their analysis can still provide us with useful information.

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