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Timeliness, granularity and frequency of official statistics

Granular and timely data – statistical response to growing user needs

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Summary

This document discusses the challenges facing the official statistics due to the growing dynamics and complexity of decision-making processes, which generate information needs in terms of granularity, timeliness and frequency. The document presents Statistics Poland's approaches to providing information at low territorial levels (capitals of regions, communes, grids), with a high level of thematic detail provided to users in time, while maintaining good data quality.

The document highlights the issues of cooperation with data users, process automation and seeking a balance between granularity and timeliness. It places the role of the official statistics in a larger context of contemporary policy-making process.

The document is presented to the Conference of European Statisticians' session on "Timeliness, frequency and granularity of official statistics" for discussion.



I. Introduction

1. If official statistics is to remain a core pillar of contemporary decision-making processes it has to adopt to rapidly changing environment. However, responding to a wide range of information needs stemming from numerous stakeholders remains a vital issue and poses potential risks. This challenge should be met with a comprehensive and systematic approach to providing the data as quickly as possible and to publish them with adequate granularity. That means, at the adequate territorial levels and with adequate methodological detail and maintaining the highest quality of statistics (achieved by adherence to a rigorous methodology). The document does not address the issue of frequency, because in our opinion it is not a problem. If we decide to carry out a study and there is funding for it in the budget - then we assume that it will be carried out at a given frequency (this does not apply to experimental studies).

2. The paper presents examples of activities aimed at increasing the scope, granularity, and timeliness of data to make them more useful to users. These activities cover many aspects, e.g., development of new statistical methods and data sources, search for innovative solutions to problems and use of new presentation and standardisation tools.

3. At the beginning, it should be emphasised that the granularity of data is particularly important in regard to urban areas, where the intensity and diversity of demographic and socio-economic phenomena is greater than in rural areas. In addition, cities fulfil important socio-economic functions and stimulate the development in their regions.

Identification of needs

4. Actions aimed at determining the required level of granularity of data provided by official statistics should strictly refer to the needs of users. The most important thing is the objective identification of these needs and the assessment of statistical institution's capabilities to meet them. The data that is not needed by anyone is not information; data that are expensive to obtain are not always available for official statistics; outdated data is no longer useful.

5. All these issues seem to be impossible to reconcile. However, proper diagnosis, cooperation with users, rapid response to changes in the environment (including the use of innovative tools and methods) and qualified staff are the key to achieving the intended goal.

II. Description – Examples of activities or good practises

A. Granularity – remote sensing – new data acquisition methods to present more detailed data at low territorial levels

6. Changes in the human environment require new research methods and better tools. If we want to acquire data with greater spatial resolution than before, we need new tools and methods. In the field of Earth Observation (EO), an example of such methods is satellite remote sensing. This belief was expressed in Warsaw Memorandum on Earth Observation for official statistics adopted at the 47th meeting of the Committee for the European Statistical System on 27-28 October 2021¹.

7. The main source of data acquisition is Copernicus project conducted by European Space Agency (ESA). Satellite data are often more accurate than data obtained from statistical surveys and administrative sources. The satellite provides data at a high spatial resolution e.g. Sentinel 2 – 10x10 meters. Moreover, EO data usage generates lower costs and offer better timeliness.

8. The use of satellite data allows for more efficient use of data from administrative sources (e.g. for segmentation of satellite images). In addition, it enables faster acquisition

¹ <https://dgins2021.stat.gov.pl/warsaw-memorandum>

of target data, including acquisition of agricultural and environmental data at a low level of aggregation and in a spatial perspective. In the future, this will reduce the burden on respondents and interviewers by partially excluding topics covered by satellite remote sensing from the surveys.

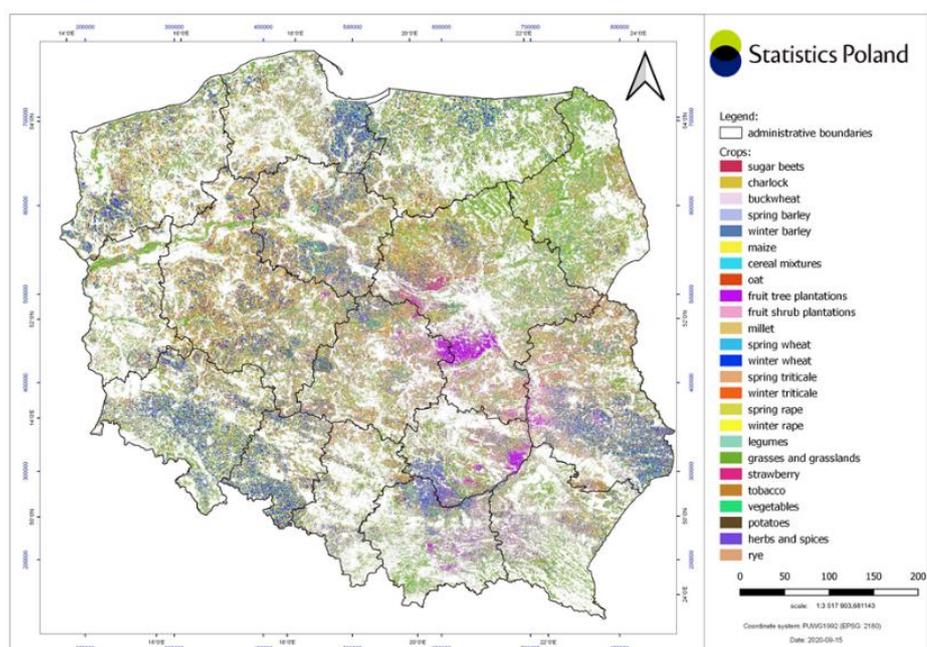
9. Moreover, implementation of remote sensing based data will extend the Statistics Poland capabilities in data presentation (especially in creating maps and charts for selected areas).

10. Examples of the use of remote sensing data (satellite/EO) in Statistics Poland are:

- identification of crop species, information on the growth rate of crops and their growth conditions e.g. amount of water in the soil;
- identification of green areas and determination of the quality of plants in these areas.

Figure 1

Preliminary estimation of the main agricultural and horticultural crops in 2020 based on satellite image analysis



B. Granularity and timeliness – the City Statistics Application – a new way of providing detailed data on time

11. Numerous users need short-term detailed data for highly urbanised areas. Therefore we provide dedicated tool called City Statistics Application. It allows timely access to automatically generated ready-to-use reports (analyses, charts, tables). The report is available in a short period after data collection and comprises data on labour market, wages and salaries, industry, construction, housing, internal trade and economic entities. Data concern 18 capitals of regions (representative survey). This is a result of compromise between capabilities (lower levels) and user expectations.

12. A standardised and coherent presentation enables comparison between individual cities. Data are provided for the current year and 2 years back.

C. Granularity – development of assumptions for new delimitation of territorial units: division into 4 groups of rural areas (so far there was only 1 group)

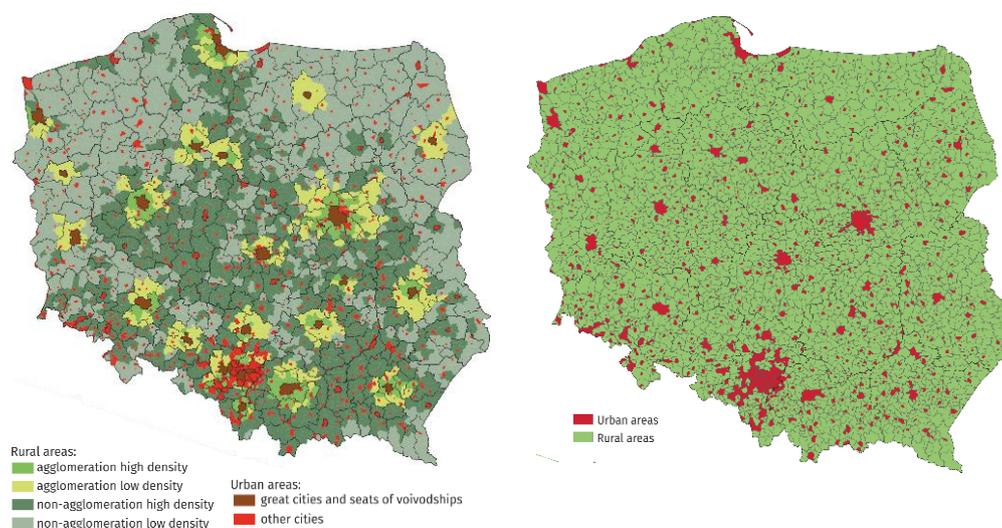
13. Delimitation of Rural Areas (DOW) was developed to provide more detailed presentation of rural areas.

14. More than 93% area of Poland are rural communes, which are inhabited by 40% of Poland's population. Existing dichotomous division of communes into urban and rural ones resulted from the application of legal criteria. The demographic and economic diversity of rural areas was not taken into account. Therefore, it was necessary to develop a new delimitation for statistical purposes. "Agglomeration" type communes have a close relationship with the core city with their services, workplaces etc. "Non-agglomeration" communes are characterised by low population density. They are often peripheral and have many social and infrastructural problems.

15. Therefore, a new delimitation of rural areas has been developed in order to enable better presentation of the specific characteristics of communes and (especially) rural areas.

Figure 2

Delimitation of rural areas in 2022 (left) and urban and rural areas according to administrative division of the country in 2022 (right)



16. The new delimitation divides rural areas into 2 main groups (agglomeration and non-agglomeration) and high and low density subgroups. It enables the analysis of social-economic and demographic phenomena in a cross-section. That allows rural areas to be described in detail. Such a classification also provides necessary information for deeper analysis of the causes and effects of demographic and socio-economic phenomena, taking into account their spatial diversity.

D. Granularity – Public Services Monitoring System – new sources and new indicators

17. Public Services Monitoring System (SMUP)² was launched as a response to the lack of data on public services. Local government units – communes, and districts are responsible for providing tangible and intangible goods for local communities. Public officials need precise data for managing, data for benchmarking and optimising quality and effectiveness of services. System was built as a totally new approach initiative – in collaboration with self-governments' experts and practitioners who participated at each stage of iterative process. Thanks to their experience and knowledge we have elaborated totally new indicators. This brought about the necessity to explore new sources of data and

² The purpose of Public Services Monitoring System (SMUP) is to provide local government units, businesses and the public with information necessary for a comprehensive assessment of services provided at the local level. The base of this information will be the resources of public statistics as well as the data collected by the administration in many dispersed sources. The system is intended to organise them and enable access to high quality data on public services for all interested users of the system in the form of indicators presented at communes level.

<https://smup.gov.pl/?f=f>

to further enhance cooperation with data gestors e.g. ministries, central offices and other administration units.

18. The example of this cooperative approach is the publication of ready-made datasets prepared by the Ministry of Finance on Public Services Monitoring System website. The data describe financial situation of local government units. Thanks to close cooperation between the project partners and the Ministry of Finance, data in cross-sections not yet published by public statistics was made available.

Figure 3

Example of an indicator for a selected local government unit in the Public Services Monitoring System



19. Key methodological assumption of SMUP is the comprehensive assessment of each of the public services. For this reason, the indicators refer to four basic dimensions of public service description:

- Quantity, e.g.: length of cycle paths in km per 100 km²;
- Quality, e.g.: number of sewerage network failures per 1 km of sewerage network;
- Accessibility, e.g.: price per 1 m³ of water for households;
- Financial efficiency, e.g. budget expenditures on pre-school education per 1 child in units run by the given local government unit.

20. Finally SMUP was launched as the tailor-made system and, we hope, it meets the needs of the data users.

E. Granularity – Employment in the National Economy – change in the structure of data sources

21. Statistics Poland in 2023 is changing the existing structure of data sources in the “Survey on Employment in the national economy”, increasing the use of administrative data sources.

22. The data on the number of employed persons will no longer be based on reports of national economy entities, which vary in terms of frequency, scope of entities surveyed, method of conducting, timing of data release, and level of territorial division.

23. A new approach to classifying employed persons in the national economy relies mainly on information available from administrative sources. It enables the acquisition of detailed and consistent data on all employed persons in the national economy.

24. Increasing the share of administrative sources in the “Survey on Employment in the National Economy” allows to provide users with additional, hitherto unavailable information on the employed, without introducing significant changes in the survey methodology.

25. The new approach brings some important benefits for users. First of all the information is more detailed. Data is supplemented with new breakdowns presenting the number of employed persons, e.g. by age and place of residence. Furthermore, data concerns employed persons in all entities of the national economy, including small entities (first published in May 2023). Temporal granularity has also improved as the data is published on a monthly basis.

III. Challenges and opportunities

26. The discussion on the position of official statistics on granularity, timelessness and frequency should be carried out at two levels - the narrower, operational level and in the broader context related to human resources, finance and organization.

27. Highly specialized staff, adequate financing and good organization make the operational activities outlined in the article proceed faster and at the highest quality. A systemic approach to the organization is crucial when it comes to using of technology, planning and implementing of development activities. Adequate level of financing, in turn, is required to ensure remuneration and the purchase of modern technologies. However, all this is not possible without a highly skilled workforce that is ready for changes beyond the existing traditional statistical production. The ability to adapt to changing circumstances and to react quickly to changes and to implement them are highly desirable qualities. Recruiting and retaining such staff is undoubtedly a difficult matter, but not unattainable.

28. The Data Science Academy (ADS), established at the Statistics Poland, is the answer to these challenges. The academy is a capacity building programme for the organisation in the area of data science. The project aims to increase the use of non-statistical data sources in the production of official statistics.

29. The primary goal of Data Science Academy is to build a modern organization capable of anticipating and meeting rapidly changing information needs.

30. Thanks to the Academy we increase integration of administrative and big data sources in the production of statistics – experimental and official. We also improve competences in data science – use new data sources, methods, tools and techniques. But first of all we build community – enhance collaboration, knowledge sharing, experience exchange, mentoring, facilitate access and exchange of information – develop an internal communication platform (“campus”).

31. Highly qualified staff able to take advantage of the benefits of technology and science is an opportunity for official statistics. This provides an opportunity to develop and meet the needs of the public in this area.

IV. Conclusions and recommendations

32. The discussion about timeliness and frequency of the surveys should take into account the needs of the recipients. Cooperation with them would help in determining what they care most about in a given area, what can be left out – in terms of data detail, and what is worth speeding up. The next step should be to evaluate our capabilities to address these needs and choose the approach, methods and tools to be used.

33. Taking all this into account, it’s important to remember that official statistics play an active role in providing fundamental data for evidence-based decision making. Therefore, supporting policy formulation, implementation and monitoring with independent and methodologically rigorous data is a key component of evidence-based policymaking and our most important task.

34. In the examples quoted in the document, there are no areas where data quality would be sacrificed in favour of speeding up publication or increasing granularity. It’s quite the opposite. We are looking for sources, methods and tools that introduce changes expected by the data users, while maintaining high methodological standards.