TeMA

Journal of Land Use, Mobility and Environment

The Times They Are a-Changin' and cities have to face challenges which may not be further postponed. The three issues of the 13th volume will collect articles concerning the challenges that cities are going to face in the immediate future, providing readings and interpretations of these phenomena and, mostly, methods, tools, technics and innovative practices (climate proof cities, zero consumption cities, car free cities) oriented to gain and keep a new equilibrium between cities and new external agents.

TeMA is the Journal of Land Use, Mobility and Environment and offers papers with a unified approach to planning, mobility and environmental sustainability. With ANVUR resolution of April 2020, TeMA journal and the articles published from 2016 are included in the A category of scientific journals. From 2015, the articles published on TeMA are included in the Core Collection of Web of Science. It is included in Sparc Europe Seal of Open Access Journals, and the Directory of Open Access Journals.

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

Vol.13 n.3 December 2020

print ISSN 1970-9889 e-ISSN 1970-9870
University of Naples Federico II

TeMA Journal of
Land Use, Mobility and Environment

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

3 (2020)

Published by
Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"

TeMA is realized by CAB - Center for Libraries at “Federico II” University of Naples using Open Journal System

Editor-in-chief: Rocco Papa
print ISSN 1970-9889 | on line ISSN 1970-9870
Licence: Cancelleria del Tribunale di Napoli, n° 6 of 29/01/2008

Editorial correspondence
Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

The cover image is a photo of the 1966 flood of the Arno in Florence (Italy).

TeMA. Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of transport, land use and environment. Domains include: engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science and complex systems.
With ANVUR resolution of April 2020, TeMA Journal and the articles published from 2016 are included in A category of scientific journals. From 2015, the articles published on TeMA are included in the Core Collection of Web of Science. TeMA Journal has also received the *Sparc Europe Seal* for Open Access Journals released by *Scholarly Publishing and Academic Resources Coalition* (SPARC Europe) and the *Directory of Open Access Journals* (DOAJ). TeMA is published under a Creative Commons Attribution 4.0 License and is blind peer reviewed at least by two referees selected among high-profile scientists. TeMA has been published since 2007 and is indexed in the main bibliographical databases and it is present in the catalogues of hundreds of academic and research libraries worldwide.

TeMA Journal of Land Use, Mobility and Environment

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

3 (2020)

Contents

TeMA Journal of Land Use, Mobility and Environment

TeMA 3 (2020) 427-444
print ISSN 1970-9889, e-ISSN 1970-9870
DOI: 10.6092/1970-9870/7146
Received 3rd September 2020, Accepted 1st November 2020, Available online 31st December 2020

Spatial policy in cities during the Covid-19 pandemic in Poland

Przemysław Śleszyński [a]*, Maciej Nowak [b], Małgorzata Blaszke [c]

[a] Institute of Geography and Spatial Organization
Polish Academy of Sciences, Warsaw, Poland
e-mail: psleszyn@twarda.pan.pl
ORCID: https://orcid.org/0000-0002-1369-6129
* Corresponding author

[b] Department of Real Estate, Faculty of Economics
West Pomeranian University of Technology, Szczecin, Poland
e-mail: maciej.nowak@zut.edu.pl
ORCID: https://orcid.org/0000-0001-8149-8995

[c] Department of Real Estate, Faculty of Economics
West Pomeranian University of Technology, Szczecin, Poland
e-mail: mblaszke@zut.edu.pl
ORCID: https://orcid.org/0000-0001-7806-6710

Abstract
The 'geographic' aim of the study is to find the regularity of the increase in the number of infections in larger cities and their surroundings. The goal related to the science of public policy is to determine the implemented and potential effects related to spatial policy in Polish cities. The geographic part of this publication uses the available data on the development of the number of identified (recorded) infections. The part of the paper related to the accomplishment of the goal covering the sphere of public policy is primarily of an overview nature. It contains the characteristics of the spatial management system in Poland (including tools affecting the broadest impact on urban space) and the introduced and potential changes caused by the pandemic.

Keywords
Spatial policy in Poland; Covid-19; Cities

How to cite item in APA format
Śleszyński, P., Nowak, M. & Blaszke, M. (2020). Spatial policy in cities during the Covid-19 pandemic in Poland. *Tema. Journal of Land Use, Mobility and Environment*, *13* (3), 427-444. http://dx.doi.org/10.6092/1970-9870/7146

1. Introduction

The spread of any infectious disease in the human population has its very important conditions related to the subject of geography studies (Cliff & Haggett, 1989; Wilson, 2010; Meade, 2014). A specific feature of every infectious disease is its spread, i.e. local transmission. Since the SARS-CoV-2 coronavirus is transmitted from person to person by airborne droplets, the development of the pandemic is closely related to social contact models. These in turn depend especially on the natural environment (e.g. climate, orography, hydrography), settlement structure and population density, level of social development (hygiene, epidemiological awareness), lifestyles (including especially models of socio-economic mobility), and finally on the attempts to reduce the virus and disease by state and local government services (Skydsgaard, 2010; Amin, 2020). In each of these conditions, successive cause-effect relationships can be found, in which, from the point of view of geography, the key is the physical, geodetic space and relations between the elements occurring in it.

The spread of an infectious disease is a complicated and complex process, nevertheless, science provides many studies on the regularities of this diffusion, which often allows for an effective limitation of the epidemic growth in a given area (Sattenspiel & Lloyd, 2009). Particularly important are issues of spatial development, i.e. settlement structure, population density, urban forms, communication network (Darch et al., 2018; Carozzi, 2020; Cordes & Castro, 2020; Hamidi et al*.,* 2020). The type of land use and functions and their spatial organization affect population flows, creating a greater or lesser probability of social contacts (Badr et al*.,* 2020; Tammes, 2020).

Although research on the spread of infectious diseases has a very long tradition (Panum, 1846), knowledge of the causes of diffusion and dispersion is still unsatisfactory. Although the fundamental role of social contacts is known, models of human communication on the microscale are less well recognized. So far, this has not been facilitated by the lack of appropriate source data, e.g. on the exact paths of human movement in space and time. However, the development of telemetric tools, e.g. related to the location of cell phones, gives hope for progress in this area as well (Franch-Prado et al., 2020). For example, research is being conducted on land use to indicate their social function (Pei et al., 2014), day and night mobility (Yuan & Raubal, 2012; Śleszyński & Niedzielski, 2018), and the relationship between the type of spatial structures and the intensity of human activity is being sought (Yue et al., 2017). Determining the actual population and their behavior in a given area also results from the needs of spatial planning, including forecasting the optimal infrastructure, especially transport, as well as water and sewage, service networks and others. All in all, the development of telemetric tools indicates promising possibilities of using spatial planning data to improve epidemiological safety.

One of the basic methods is limiting the social contacts, including those related to the prohibition of free movement, and the solutions vary greatly between countries (Chinazzi et al., 2020). If such measures are taken relatively early and consistently, the infection curve becomes more flattened over time and the relevant services have more time to prepare for combat. However, limiting the activity in the long run threatens with serious economic losses in many economic branches (Ascani et al., 2020; Napierała et al., 2020). Therefore, it is crucial to skillfully balance the strength of the introduced restrictions in social contacts against the real epidemiological and general health risks of the population. Moreover, these limitations, both in the short-term and long-term scope, determine the spatial policy. Already at the present stage, there is a discussion to what extent the SAR-CoV-2 pandemic will modify the dimensions of spatial policy, including environmental, transport or public space development issues.

The 'geographic' aim of the study is to find the regularity of the increase in the number of infections in larger cities and their surroundings. Cities, as centers with a high population density and activity, in general, should be primarily exposed to a rapid increase in the incidence, as shown by evidence from around the world in the case of the SARS-CoV-2 pandemic (Cordes & Castro, 2020; Du et al., 2020). Preliminary results in Poland show that this does not have to be the case, or at least it does not apply to the largest agglomerations in the first place (Jarynowski et al., 2020; Raciborski et al., 2002; Śleszyński, 2020), although the associations with

mobility are emphasized in these studies. The intensity of all detected infections in Poland in August 2020 was not uniform and was concentrated in the southern part of the country (Fig.1).

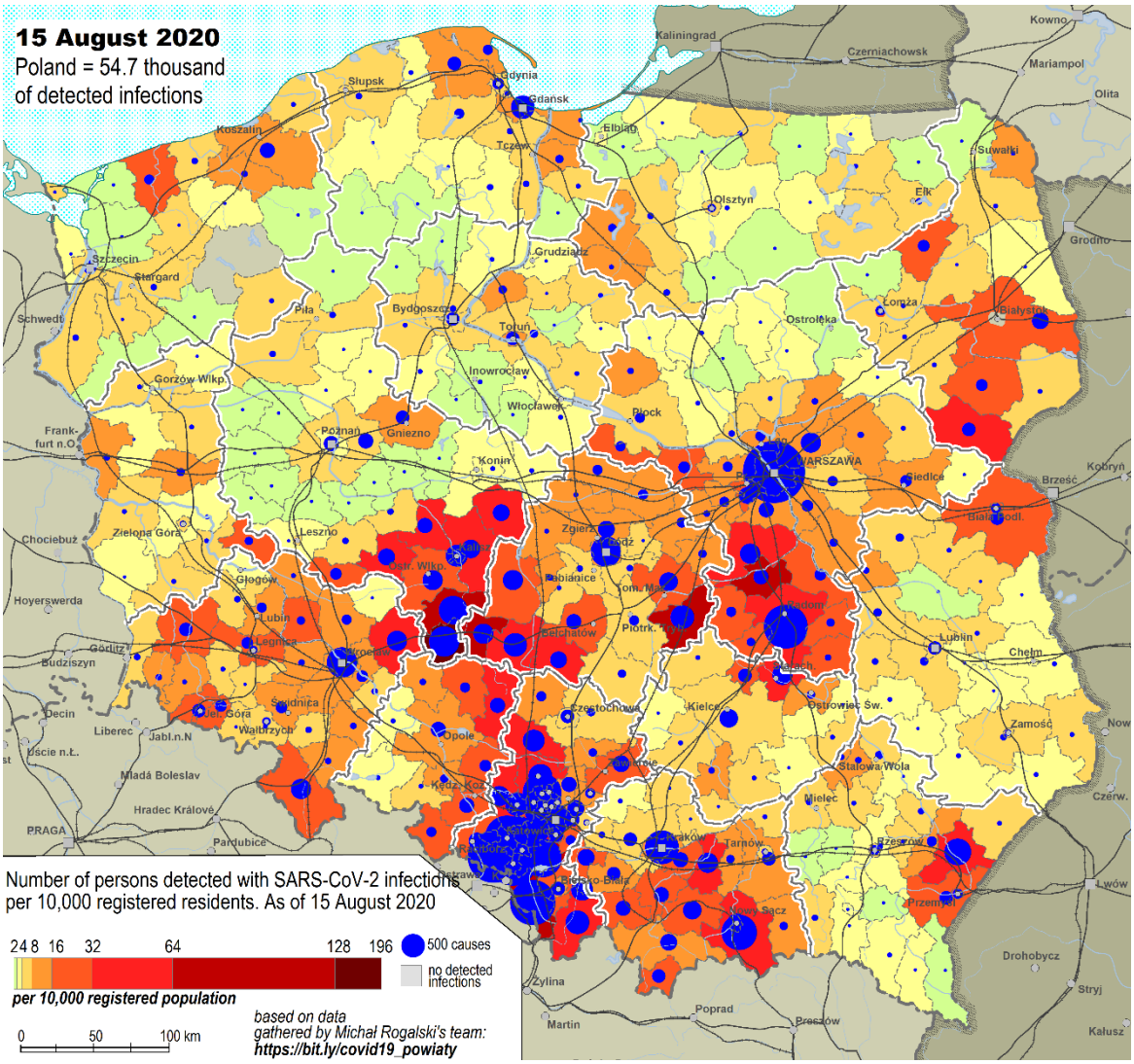

Fig.1 Spatial structure of detected SARS-CoV-2 coronavirus infections in Poland in August 2020

Meanwhile, the goal related to the science of public policy is to determine the implemented and potential effects related to spatial policy in Polish cities. It is a separate, vital context of urban development issues. By March 2020, numerous dilemmas and problems in this area were diagnosed, which were directly translated into the tools of spatial policy. The outbreak of the pandemic contributed to the emergence of new problems and new challenges. In the first place, they come down to typically procedural issues (related to work on individual tools of spatial policy), but they are related to a broader context of issues, including new dilemmas. Regardless of the above, regarding the discussions (especially in world literature) on changes in spatial planning, the direction and scope of potential changes, also in Polish spatial policy tools, should be considered.

2. Methods

The geographic part of this publication uses the available data on the development of the number of identified (recorded) infections. In Poland, in mid-August 2020, the only such database is the information available on the website, collected every day by social effort according to poviats by a team led by M. Rogalski (2020). Until then (mid-August 2020), official data on cases, entered through the National Register of Patients with Covid-19 (Regulation of the Minister of Health, 2020), had not been made publicly available.

It should be emphasized here that data on infections do not represent the entire infected population, since the detection of any disease depends on its correct diagnosis in the population. For Covid-19, it depends primarily on the tests performed. These are in turn performed in those populations where there is a greater likelihood of infection. Due to the transmission of the coronavirus by airborne droplets, tests in Poland were performed mainly in places exposed to more frequent occurrence, i.e. in health and social care facilities (e.g. hospitals, nursing homes) and in these communities (families, workplaces and other concentrations of the population) where infection has already been identified. In contrast, most infected people go through it asymptomatically. Meanwhile, based on screening tests carried out in various places in the country (Krakow, Upper Silesia) (Uniwersytet Jagielloński w Krakowie, 2020), it can be assumed that in Poland only 5-10% of cases are detectable and that in June 2020, already a few percent of the Polish population "encountered" the coronavirus (Lipiec, 2020).

Infection analysis had to be adapted to the available data. The mentioned set of M. Rogalski et al. (2020) by county was used. A poviat is the second level of territorial-administrative division, between a voivodeship and a municipality. There are 380 units, 66 of which are cities with county rights. Bearing in mind the great functional diversity of poviats and the aims of the article, related to urbanization, the division into 6 categories has been proposed (Fig.2):

- 1a: core areas over 250 thousand inhabitants (30 poviats, 23% of the country's population);
- 1b: core areas below 250 thousand inhabitants (28 poviats, 7% of the country's population);
- 2: mixed areas (land poviats with larger city or highly urbanized) (39 poviats, 14% of the country's population);
- 3: land poviats being external zones of types 1a and 1b, mainly "bagel" poviats (68 poviats, 21% of the country's population);
- 4: other more densely populated poviats (over 70 people per 1 km^2) (101 poviats, 20% of the country's population);
- 5: other sparsely populated poviats (less than 70 people per 1 km^2) (105 poviats, 15% of the country's population).

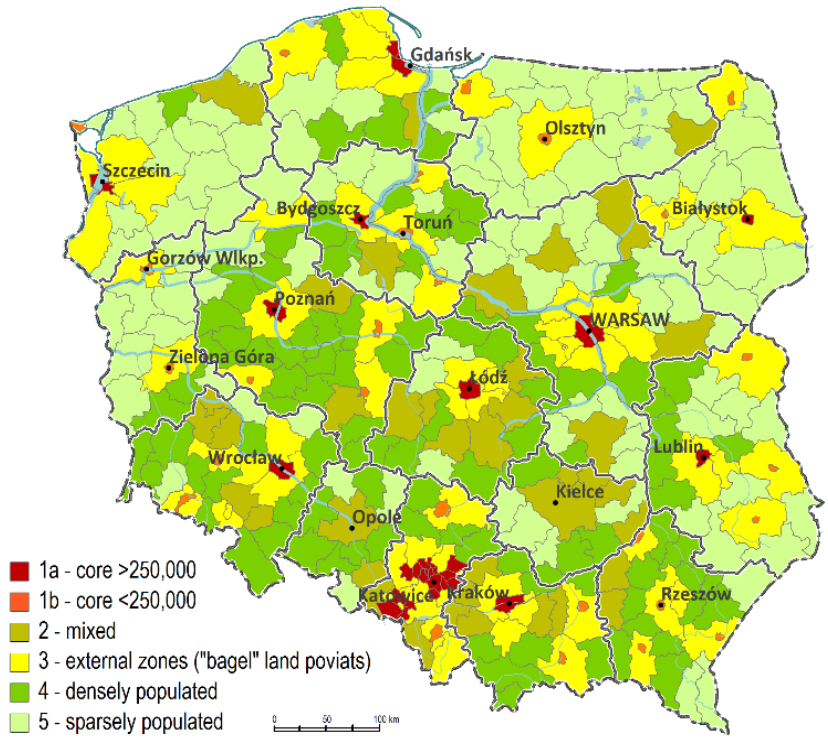

Fig.2 Classification of poviats (counties) used in the analysis

The analysis used aggregation to functional areas of cities (1a+1b), as this type of area, based on everyday functional and spatial relationships (commuting to work, education, personal services, trade, etc.), seems to be the most appropriate field of reference for research on the spread of infectious diseases. In this way, a database was created containing 80 functional areas, consisting of 166 poviats (the largest functional area — Katowice — contained 19 poviats). Due to data availability, it has been divided into six types:
The database designed in this way aggregated data (from the aforementioned M. Rogalski team) from the first 165 days of the pandemic, i.e. for the period March 4 - August 15, 2020.
The part of the paper related to the accomplishment of the goal covering the sphere of public policy is primarily of an overview nature. It contains the characteristics of the spatial management system in Poland (including tools affecting the broadest impact on urban space) and the introduced and potential changes caused by the pandemic. The temporary legal changes related to counteracting the pandemic and their place in the spatial management system are also synthetically characterized. In this respect, reference was also made to the wider, international discussion on the changes introduced by the Covid-19 pandemic, determining changes in urban policy (and, consequently, spatial policy). Face – to – face interviews were also conducted in selected Polish cities.

3. SARS — CoV-2 pandemic in Polish cities and their functional areas

Poland, as a relatively large country, considering European conditions (area 312.7 thousand sq. km, population above 38 million), is administratively divided into 16 voivodeships (corresponding to the NUTS2 regional level and having government and local government administration and management), 380 poviats (self-government) and 2,477 communes (self-government). Among 380 poviats, there are 66 cities with poviat rights, 18 of which are voivodeship capitals (in two voivodeships, they are bipolar systems). However, in communes, i.e., at the local level (LAU2), critical spatial policy actions are taken. The smallest population in cities with poviat status (and urban communes simultaneously) is 36,000 (Sopot), while the largest is 1,791,000 (Warsaw). When it comes to the organization of epidemiological services, the primary institution is the State Sanitary Inspectorate (PIS, familiar name — sanepid) — a specialized entity that performs public health tasks by performing control and supervision over hygiene conditions in various areas of life. The inspection also collects, among others, epidemiological data. PIS has central and local structures. The latter are voivodeship (NUTS2) and poviat (NUTS4) sanitary and epidemiological stations. Besides, there are specialized (border) units. Development of the number of infections in functional areas of larger cities relating to other areas (i.e. before the holiday increase in infections) is presented in Fig.3. Until about May 10, the increase in infections was fairly even in all types of poviats. After that date, there was a fairly rapid increase in infections in the largest cities and agglomerations (over 250,000 inhabitants). As for the smaller cores (below 250,000 inhabitants), the increases compared to the other types were relatively small, very similar to poviats with the lowest population density. The remaining three types (mixed poviats, outer zones of urban poviat towns and more densely populated poviats) showed quite similar increase, especially for types 3 and 4. Such results are not unambiguous and suggest that the increase in infections in Poland was not relating to the degree of urbanization. Nevertheless, if types 1-4 and 5-6 are added together, it turns out that in the functional areas of cities on August 15, the incidence rate per 10,000 population was 16.7, and on the remaining — 11.7. Thus, in the functional areas of cities, the cumulative incidence was over 40% higher.
As shown by more detailed data, this picture was influenced by a higher infectivity rate in the southern part of the country (Fig.4). Particularly high increases occurred in the agglomerations of the Silesia and Lower Poland voivodeships.

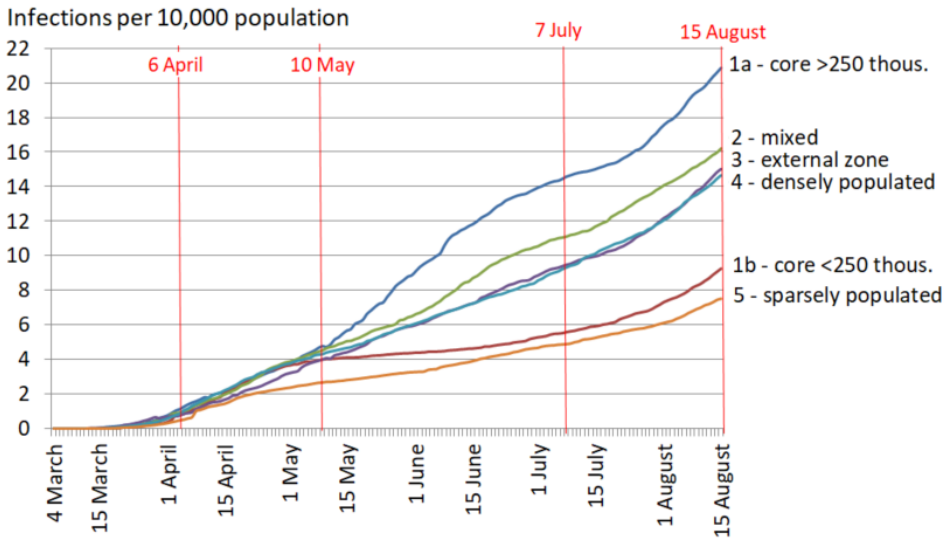

Fig.3 Detected coronavirus infections in Poland in the period March 4 - August 15, 2020 by poviat types

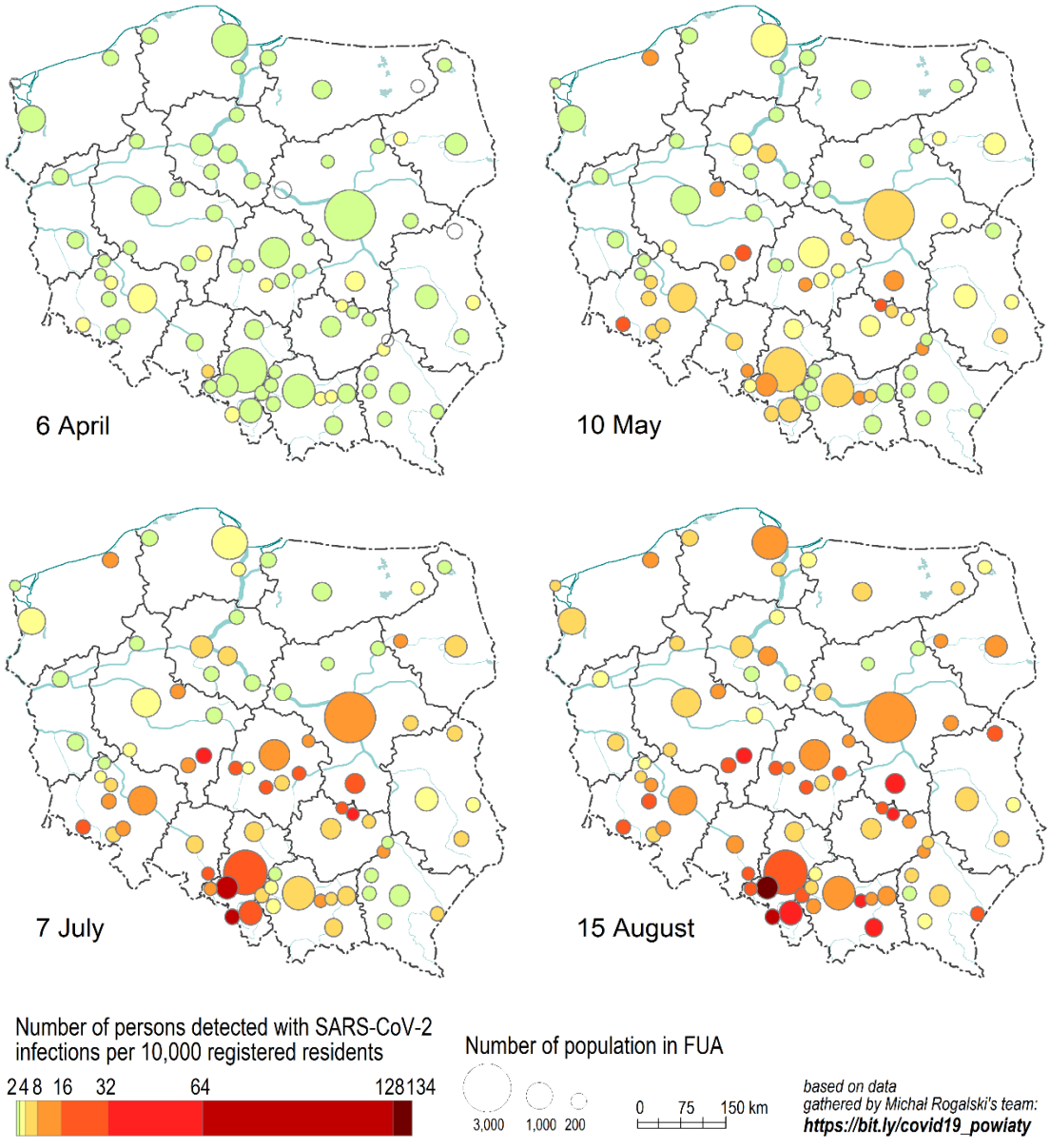

Fig.4 Spatial structure of detected SARS-CoV-2 coronavirus infections in functional urban areas in Poland in August 2020 in selected time periods

Tab.1 presents data for 18 selected functional urban areas — FUA (over 30 infections per 10,000 inhabitants on August 15 or over 500,000 inhabitants). They concentrated 58% of all identified infections (80 FUA's concentrated 73% of all infections). FUA with the highest infection rates are especially Rybnik (133.5 cases per 10,000 population), followed by Cieszyn (89.3), Nowy Sącz (43.4) and Kalisz (42.7). Apart from the Rybnik agglomeration (over half a million inhabitants), these are rather smaller groups. It is worth noting that in virtually all agglomerations, there was a fairly rapid increase in the number of detected infections during the holiday season (July 7 - August 15), but it was generally slower than in the entire country (52%). In Nowy Sącz FUA, this increase was record-breaking (more than fivefold increase in infections) and in FUA's of Bochnia, Krakow and Tri-city, the increase was greater than 100%. It should probably be associated with the transmission of infections through tourist mobility.

No*	Name of functional urban areas	Number of population (thous.)	Number of infections detected (cumulative)				Total infections on 15 August		
			April 6	**May 10**	**July 7**	**August 15**	**domestic share (%)**	**per 10,000 inh.**	**increase between July 7 - August 15 (%)**
1	Rybnik	525	55	694	5,282	7,008	12.2	133.5	32.7
2	Cieszyn	178	51	135	1,207	1,591	2.8	89.3	31.8
3	Nowy Sącz	300	19	52	213	1,303	2.3	43.4	511.7
4	Kalisz	183	46	517	702	784	1.4	42.7	11.7
5	Starachowice	90	7	44	330	368	0.6	40.9	11.5
6	Radom	364	132	533	1,106	1,444	2.5	39.6	30.6
7	Bielsko-Biała	601	27	409	1,493	2,312	4.0	38.5	54.9
8	Bochnia	107	30	139	152	393	0.7	36.9	158.6
9	Sieradz	118	3	16	278	369	0.6	31.3	32.7
10	Katowice	2,406	266	1,577	5,330	7,330	12.8	30.5	37.5
23	Warsaw	3070	454	1,364	2,628	4,262	7.4	13.9	62.2
29	Wrocław	930	246	582	838	1,101	1.9	11.8	31.4
30	Cracow	1,308	197	557	722	1,543	2.7	11.8	113.7
32	Łódź	1,071	142	419	911	1,155	2.0	10.8	26.8
40	Tri-city	1,309	114	435	509	1,100	1.9	8.4	116.1
51	Lublin	566	83	132	198	293	0.5	5.2	48.0
53	Poznań	930	54	176	274	456	0.8	4.9	66.4
58	Szczecin	767	37	133	196	341	0.6	4.4	74.0

* order of infection rates per 10,000 population on August 15, 2020

Tab.1 Infection rate development characteristics in selected functional urban areas in Poland. Source: based on data collected and made available in M. Rogalski's team (2020)

4. Spatial management system and conditions of urban development in Poland

For many years, problems related to the malfunctioning system of spatial management have been the subject of discussion in the Polish literature. To a very large extent, they relate to the development of urban and suburban areas, which is closely related to the course of transformation processes in the countries of Central and Eastern Europe after 1989 (Węcławowicz, 2002; Parysek, 2010). The most serious of them are issues of ineffective management, spatial conflicts, poor quality of settlement, numerous dysfunctions in spatial development and a general lack of spatial order (Markowski, 2010; Parysek & Mierzejewska 2016; Lorens 2017; Komornicki et al. 2018). Recently, attention has been paid in particular to the serious economic (i.e. *de facto* financial) costs of spatial chaos related to the burden on the budgets of households, enterprises or municipalities (Lityński & Hołuj, 2017; Śleszyński et al., 2020), including the area of settlement locations (Krzysztofik et al., 2017; Lorens, 2017; Karwińska et al., 2018; Mantey & Sudra 2019), real estate market (Krajewska & Pawłowski, 2019), inefficiencies in transport (Niedzielski & Śleszyński, 2008; Niedzielski et al.,

2020), as well as environmental and landscape protection (Chmielewski et al., 2018; Giedych, 2018; Szulczewska et al., 2014). It is also associated with the insufficient effectiveness of spatial policy tools (Nowak 2017a). Public authorities (both at the national and, for example, local level) have a problem both with introducing regulations that clearly protect the values of the area related to spatial order, as well as with enforcing the partial ones that are binding. These issues are reflected (to a different extent) also in other countries (Gitundu, 2020; Ida & Ono, 2019; Nadin et al., 2018; Roca et al., 2004; Tan et al. 2010; Acheampong, 2019; Blaas, 2019; Kyvelou & Gourgiotis, 2019.; Sharifi & Yamagata, 2018; Wang, 2019; Kovács et al., 2019). This confirms the thesis about the universal nature of these problems.

In 2020, there were 944 cities in Poland, including the smallest ones with only about 0.5 thousand residents. All of them were local governments of the third (last) administrative and territorial level (after the voivodeship and poviat) and similarly the third and last level of spatial planning (after national and regional) [1]. At the same time, from this quite numerous group, nearly 1,000 cities, there were 302 urban communes and 642 urban-rural communes. The latter consisted of the city and the surrounding countryside. Although the key document of planning the law in Poland, i.e. the Spatial Planning and Development Act of March 27, 2003 (Journal of Laws of 2003 No. 80, item 717), formally mentions the hierarchy of this planning, in practice, most investments and location decisions and more broadly related to spatial development, are the responsibility of local governments.

Thus, according to the aforementioned Act, in Poland, the tools of spatial policy that determine the direction and scope of urban space development to the greatest extent (adopted at the local level) include:

- studies of conditions and directions of spatial development;
- local spatial development plans.

Studies of the conditions and directions of spatial development are (by definition) directional acts and each commune must pass them obligatorily. These acts determine the future spatial activities in the city, including, among others: directions of changes in the spatial structure, directions and indicators for land development and use (including areas intended for development and excluded from development), areas and principles of environmental protection as well as areas and rules of cultural heritage protection (Nowak, 2020). The studies also contain binding guidelines for local spatial development plans. This second tool of spatial policy, unlike studies, is not obligatory — its adoption in a given area depends on the discretion of the authorities of a given commune.

However, if the local plan is adopted, it will already have binding effects, i.e. contain specific prohibitions addressed directly to property owners and investors. Local plans define in a binding manner the purpose of a given area and the detailed principles of its development and development indicators (such as, e.g. building height, building intensity, or building line). Local plans (valid for over 30% of Poland) may or may not introduce the spatial order. In practice, local plans are also adopted that enable the implementation of buildings isolated from the needs and possibilities of a given area (which, especially through oversupply of construction land, contributes to the deepening of spatial chaos) (Izdebski et al., 2018; Śleszyński et al., 2020).

Moreover, in areas where the local plan has not been adopted, investors may apply for a decision on development conditions. According to the legislator's intentions, it is to be an equivalent of a local plan. Nevertheless, the decision is issued on an individual scale, at the investor's specific request (for whom the protection of spatial order throughout the city is not a priority). Decision on development conditions and land development, of which over 90 %are decisions on development conditions (since 2003, over 2 milion such decisions have been issued in Poland) is not related to other tools of spatial policy, in particular, from the formal and legal point of view, there is no relationship between it and the study of the conditions and directions of spatial development. This leads to the deepening of problems related to spatial chaos (Nowak, 2015; Nowak,

[1] The poviat level in Poland does not have extensive, systemic spatial planning tools, while only quasi-control functions related to issuing the building permits, see Nowak 2020.

2017b). The above issues are very broadly translated into the issues of urban development and urban policy. Urban issues are discussed in detail in Polish literature on the subject (Węcławowicz, 2002; Markowski & Marszał, 2006; Nowak, 2010; Borsa, 2016; Grabkowska, 2011; Sagan & Grabkowska, 2012; Sagan & Grabkowska, 2013; Smętkowski et al., 2008; Szlachta, 2013; Krukowska & Lackowska, 2016; Lorens & Ledwoń, 2018).

5. The Covid-19 pandemic and new context of the discussion on spatial policy in Poland

As the spread of infectious diseases, as stated at the beginning, has a number of significant geographical conditions on various territorial scales, it is worth pointing to them in the broad environmental, settlement and demographic context of Poland. These are the following issues:

a. conducive to the expansion (diffusion) of the virus or posing a particular threat to it:

- several large concentrations of population with the highest population density, where there is a high intensity of commuting (areas in various parts of the Upper Silesian and Rybnik conurbations, as well as the Warsaw, Tri-City, Kraków, Wrocław, Szczecin and Poznań agglomerations);
- high percentage of the elderly population in the centers of large and medium-sized cities, as well as in rural areas, e.g. in the north-eastern part of the country;
- large share of multi-family block buildings in medium and large cities with urban and architectural solutions that are not conducive to maintaining the social distance.

b. unfavorable for virus expansion (diffusion):

- moderate population density in most of the country's territory;
- relatively low, as for developed countries, development of urbanization processes (resulting from the so-called "urbanization delay");
- tendency to disperse buildings;
- high density of the river network and a general shortage of bridges on larger rivers (it was clearly visible during the expansion of infections in late spring in southern Podlasie, when the Bug was the barrier);
- spatial mobility lower than in highly developed countries.

In the literature on the subject, the impact of the pandemic on spatial policy has already been discussed and recognized as a long-term issue (Boschetto, 2020). The factor determining the situation of cities and, consequently, their spatial policy may be, among others, diagnosed problems with food supplies (Benton, 2020). There are also discussions about the typically urban features of a pandemic, but there are problems with their unambiguous separation (Gargiulo et al., 2020). Lai, Leone & Zoppi (2020) indicated several levels in this regard. They distinguished, among others, future spatial contexts in cities, within which physical distance and minimization of social relations are recommended. This limits the formula of functioning many key places in the space, usually associated with public space (but not only). It also makes it necessary to apply (or implement more broadly than before) a few postulates. Among them, the concept of the city-garden was distinguished (see also Sofo & Sofo, 2020), development of urban agriculture, as well as creation of a framework for alternative means of transport (bicycles, scooters, etc.).

Numerous publications (Falchetta & Noussan, 2020; Helm, 2020; Murgante et al., 2020,) emphasize the further need to protect the environment, which is directly translated into spatial policy. Angiello (2020) reminds in this context that the quality of environmental protection influences the degree of Covid-19 spread. The author carries out a broader analysis of the current spatial needs, paying attention to the requirement of the more extensive use of green areas and the development of bicycle infrastructure, and the necessity to reorganize cities so that its movement is as short as possible. Zecca et al. (2020) discussed the latter topic was greater detail paying wider attention to the role of space-time in urban spatial planning, especially in the present

circumstances (also Guida & Caglioni, 2020). At the present stage, diagnoses and directions of activities are formulated in a fragmented manner, however, in the analyzed context, such proposals as strengthening the use of the concept of green infrastructure (Ronchi et al., 2020), implementation of sustainable mobility (UNECE, 2020), modernization (to avoid the overcrowding and excess of services) of transport (Gaglione, 2020), modernization of public facilities, including stadiums, cinemas, places of prayer, as well as deepening social participation (Acuto, 2020; Santoro et al., 2020). Fasolino et al. (2020) emphasize the need for in-depth integration of spatial policy issues and such thematic spheres as medicine, environmental protection, science, psychology and urban sociology. This will allow a wider multifunctionality of the space. Cotella & Brovarone (2020), in turn, reflect on the redefinition of rural areas' role and the possible possibilities and effects of a broader settlement of these areas (which may be the consequences of changes taking place in cities due to the pandemic).

The above discussions are an essential point of reference when discussing the determinants of spatial policy in Poland resulting from the Covid-19 pandemic. In connection with the pandemic, in the sphere of urban spatial policy (regarding the use of spatial policy tools), procedural dilemmas and issues related to the future optimal content of spatial policy tools appeared. The thematic issues related to the former include:

- social participation during a pandemic — and in particular whether (and to what extent) it is possible to computerize the participation (whether it is legal and — more importantly, whether it will not lead to the exclusion of some potential participants);
- speed of adopting/issuing specific resolutions/administrative decisions with direct effects in the sphere of spatial policy. This applies to both the deadlines for issuing specific decisions (decisions on development conditions), as well as the issue of proceeding in the event of a pandemic of projects of local spatial development plans, studies of conditions and directions of spatial development, and even resolutions on determining the location of housing investments (based on the so-called special housing acts);
- contacts between individual public administration bodies during work on specific tools of spatial policy. This applies in particular to the inactivity of some bodies agreeing/issuing opinions on the content of individual projects. In practice, these bodies did not express their position, which was tantamount to tacit approval of the project. In the event of a pandemic, this could block further work on a local plan or study.

The above-mentioned problems have also met with the reaction of the central government, in particular reflected in special acts containing a number of regulations counteracting the effects of the Covid-19 pandemic, the so-called "Anti-crisis shields"2. These broad, extensive "special acts" covered a number of different areas, to some extent also those related to the sphere of spatial policy. Synthetically speaking, the most important changes in this area consisted in:

- "suspension" of deadlines related to administrative proceedings and those related to other activities undertaken by public administration bodies (which also included activities of spatial policy entities);
- excluding from this suspension some activities related to the sphere of spatial policy.

As a result of procedural changes, in part ad hoc, and in part — relating to the entire spatial management system, new dilemmas have emerged. Generally speaking, they involve introducing a new dilemma to previous discussions. It consists in answering the question of what is more important (under the conditions of a pandemic, but also in other circumstances): protection of key values in the spatial development system, or

[2] See the Act of March 31, 2020 on amending the Act on special solutions related to the prevention, prevention and combating of Covid-19, other infectious diseases and the crisis situations caused by them, and certain other acts (Dz. U. 2020, pos. 568), Act of April 16, 2020 on specific support instruments in connection with the spread of SARS-CoV-2 virus (Dz.U. 2020, pos. 695), Act of May 14, 2020 amending certain acts in the field of protective measures in connection with the spread of SARS-CoV-2 virus (Dz.U. 2020, pos. 875), Act of June 19, 2020 on interest subsidies for bank loans granted to provide financial liquidity to entrepreneurs affected by Covid-19 and amending certain other acts (Dz. U. 2020, pos. 1086).

the speed of implementation of planning procedures (consisting in, for example, ensuring, e.g. at the expense of, full social participation), quick adoption of the local spatial development plan enabling the implementation of investments important from the economic perspective, including the economic crisis. Public authorities have so far given priority to the second of the indicated goals, i.e. the speed of planning procedures.

However, as indicated previously, procedural issues should be considered less important than the attempt to provide a broader response in the sphere of spatial policy to the new situation related to the Covid-19 pandemic. One can wonder to what extent the new situation will force a change in the specific content of spatial policy tools. The first stage should be the obligatory analysis of new spatial conditions and their relationship with the tools of spatial policy (especially studies of conditions and directions of spatial development), obligatory for each commune on a national scale. The analysis in cities should cover at least the following thematic areas:

- new conditions related to the protection of health and guaranteeing the public safety;
- conditions for further integration of development planning;
- deepening the protection of the environment and nature, referring to the degree of implementation of the concept of green infrastructure and the needs (and possible scope) of supporting the development of urban agriculture;
- the scope of necessary changes, especially in the development of public spaces;
- the scope of adapting urban space to possible modification of urban transport.

Most of the indicated issues were also analyzed in the Polish literature on the subject before the pandemic (Kudłacz, 2015; Markowski & Drzazga, 2015; Nowakowska, 2015; Mantey & Kępkowicz, 2018; Szulczewska, 2018; Kojder et al., 2020). It should also be pointed out that the analysis of the indicated problems cannot be tantamount to the necessity to implement the far-reaching changes in each case. Despite the fact that — as indicated above — the literature indicates that the effects of a pandemic will be irreversible in many respects, city authorities need to adapt spatial measures. However, the issues related to the integrated development policy and protection of the environment and nature (in particular the implementation of green infrastructure) are certainly not of such a temporary nature. Creating a framework for an integrated development planning system depends to a large extent on the central authorities (and in Poland, it is implemented to a small extent, which requires a change).

Regarding the protection of environment and nature, the spatial policy tools in force in Poland are in many respects limited, but even in the present conditions, it is possible to implement green infrastructure more widely. It can be concluded that most of such changes in the spatial policy tools themselves do not require implementation overnight, and thus gross simplification of procedures. The problem may be, at most, incidental situations, in which the lack of agreement between the commune authorities and the authorities agreeing certain actions — as it happens now — may prolong. Similarly, one has to consider the undermining of spatial policy tools before administrative courts. These problems, however, relate to local spatial development plans, while the discussion on the directions of changes in the spatial policy and the adaptation of the above-mentioned postulates (specified in local analyses) will relate primarily to studies of the conditions and directions of spatial development.

Referring to previous studies (Śleszyński et al., 2020), it can be indicated that the circumstances related to the pandemic may contribute to the deepening of the costs associated with spatial chaos, examples of which may be the subsequent costs associated with the more frequent pandemic (e.g. in the period immediately after the so-called lockdown) using cars instead of public transport, or the new situation on the real estate market.

At the current stage, it is not possible to obtain comprehensive data on detailed actions (or omissions) related to spatial policy in the context of Covid-19 in all Polish cities. However, face-to-face interviews were conducted

in five cities (voivodeship capitals): Gdańsk and Szczecin (northern part of Poland), Łódź and Toruń (central part of Poland) and Wrocław (south-western part of Poland). The information obtained shows that:

- in some cities, no major challenges and new spatial problems were identified at the administration level. In the area of local spatial development plans, only the need to suspend work on new plans was noted (especially after the stage of making them available to the public, in the context of public consultations - e.g. Gdańsk);
- in a different model of activities, work on local plans continued. In this situation, attempts were made to ensure safety during public consultations. At the same time, new spatial challenges were diagnosed, as evidenced by the commencement of work on changing the existing study of conditions and directions of spatial development (the case of Wrocław).

In the context of the decision on development conditions, some cities did not notice any changes in this regard during the pandemic. However, the situation is varied. It is worth mentioning the example of the city of Łódź, which has detailed information on the number of decisions on development conditions in the subsequent months of 2020. For example, in February there were 205 decisions issued, in March 185 decisions, in April 132 decisions, and in May 209 decisions. At the same time, in the period from March to June inclusive, the number of applications for decisions on development conditions decreased (as compared to earlier and later periods), and the number of cases concerning decisions on development conditions, not examined in the basic period, started to increase.

The dilemmas and the problem related to the Covid-19 pandemic fit more broadly in the European discussion on the directions of spatial policy changes. As indicated above, public authorities' actions in the first months of the pandemic directed towards procedural considerations. Partial reflection concerned only the optimal formula of social participation in spatial planning. It does not change the fact of the developed needs for changes that Polish cities also face. As indicated above, the problem that has already been noticed (and that can be deepened due to the pandemic) is spatial chaos and its very high costs (especially relating to other European countries).

Nevertheless, the directions of changes postulated in the latest literature on the subject may contribute to the reduction of these costs: both in the sphere of environmental protection (green areas, green infrastructure), transport (not only bicycle infrastructure but the increasingly emphasized postulate of more careful consideration of space-time in the spatial policy) and modernization of public facilities. Specific barriers and doubts may appear when discussing the broader development of rural areas. Without denying such a need, one should point out that it may worsen the spatial chaos and increase its Polish reality costs. More comprehensive operations (within which the discussion with new functions/development of rural areas' functions will combine with the context of protection of spatial order and integration of development policies) may block these negative tendencies.

The example of Poland and solutions applied by the public authorities illustrate one more issue. In the current situation, the introduced solutions' quality depends on the moment of their introduction. The legal regulations that entered into force in spring 2020 (and one can assume that the same will apply to the legal rules introduced in autumn 2020) directly respond to the crisis. Their makeshift and the perspective limited to a few subjectively selected issues are noticeable in such a case. On the other hand, however, there is a need to introduce some postulated actions. In this context, the optimal solution seems to be the institutions of informal spatial planning (which individual countries can apply only with an adequate level of social capital).

6. Summary

The conducted analyses confirmed the large scale of problems caused by the Covid-19 pandemic in Polish cities and their functional areas. As far as local spatial policies are concerned, it should be clearly emphasized that new challenges and problems appear to an ever-greater extent. At the present stage, the necessary scope

of changes in the existing studies of the conditions and directions of spatial development and local spatial development plans is still debatable, but there is no doubt that such a reflection should be undertaken (this is reflected in the positions of some municipal authorities, e.g. Wrocław). In the literature on the subject, a wide range of issues has been distinguished in this context. The specific chaos presented in the article, related to procedural dilemmas (and different approaches to these problems in individual cities) is an additional argument in favor of the thesis that a broader reflection in this respect is necessary.

It should also be emphasized that the impact of the pandemic on spatial planning in Poland will be strictly conditioned not only by the specificity of Polish law in this area, but also by the effects caused by long-term negligence in spatial management. What will hinder the optimization of spatial structures in terms of epidemiological safety is the spatial chaos, observed especially in suburban zones. On the one hand, it affects mobility and models of social relations, and on the other hand, it affects ineffective spatial organization of medical services.

The authors see the need (along with access to further data) to continue the analyses. They should cover both the actions of municipal authorities in specific periods of a pandemic (and their direct translation into the use of spatial policy tools), as well as the degree of inclusion of new problems and thematic contexts in local spatial policies.

Also in Poland, there is a need for a broader focus on environmental protection in cities, modification of the transport formula (including public transport), improvement of the development of open spaces, as well as the reflection on urban and rural functions in the context of a pandemic, diagnosed in the literature on the subject. Besides, there is a postulate to increase the resilience of cities (e.g., by shaping the health functions of spatial policy tools, including local plans) and a broader approach to the context of space-time (especially when it comes to the context of moving around the city). In Polish reality, these changes must be coordinated with the concept of reducing the spatial chaos (the lack of such coordination may, in at least some cases, lead to maintaining or even deepening this chaos). Wider use of informal instruments in spatial planning also seems of crucial importance. There is no doubt that (probably not only in the Polish realities) quick legal changes prepared during the crisis do not guarantee the achievement of essential effects from the spatial management system's perspective.

References

Acheampong, R. A. (2019). Historical Origins and Evolution of Spatial Planning and the Planning System in Ghana. In *Spatial Planning in Ghana*, 29-56. Springer, Cham. https://doi.org/10.1007/978-3-030-02011-8_3

Acuto, M. (2020). Covid-19: lessons for an urban (izing) world. *One Earth*. https://doi.org/10.1016/j.oneear.2020.04.004

Amin, H. N. M., & Amin, H. N. M. (2020). Climate Analysis to Predict Potential Spread and Seasonality for Global (Covid-19) in Iraqi Kurdistan Region. *Kurdistan Journal of Applied Research*, 72-83, http://doi.org/10.24017/kjar.

Angiello, G. (2020). Toward greener and pandemic-proof cities: Italian cities policy responses to Covid-19 pandemic. *TeMA-Journal of Land Use, Mobility and Environment, 13*(2), 271-280. https://doi.org/10.6092/1970-9870/7047

Ascani, A., Faggian, A., & Montresor, S. (2020). The geograpfy of Covid-19 and the structure of local economies: the case of Italy. *Journal of Regional Science*. https://doi.org/10.1111/jors.12510

Badr, H. S., Du, H., Marshall, M., Dong, E., Squire, M. M., & Gardner, L. M. (2020). Association between mobility patterns and Covid-19 transmission in the USA: a mathematical modelling study. *The Lancet Infectious Diseases*. https://doi.org/10.1016/S1473-3099(20)30553-3

Benton, T. G. (2020). Covid-19 and disruptions to food systems. *Agriculture and Human Values*, 1. https://doi.org/10.1007/s10460-020-10081-1

Blaas, W. (Ed.). (2019). *A new perspective for European spatial development policies*. Routledge.

Borsa, M. (2016). Powrót do centrum miasta-siły sprawcze, uczestnicy, motywacje/The Return to the City-centre-Driving Forces, Participants, Motivations. *Studia KPZK*.

Boschetto, P. (2020). Covid-19 and simplification of urban planning tools. The residual plan. *TeMA-Journal of Land Use, Mobility and Environment*, 9-16. http://dx.doi.org/10.6092/1970-9870/6845

Carozzi F. (2020). Urban Density and Covid-19, IZA Discussion Paper, 13440, https://doi.org/10.1016/j.healthplace.2020.102378.

Chinazzi, M., Davis, J. T., Ajelli, M., Gioannini, C., Litvinova, M., Merler, S., ... & Viboud, C. (2020). The effect of travel restrictions on the spread of the 2019 novel coronavirus (Covid-19) outbreak. *Science, 368* (6489), 395-400. http://doi.org/10.1126/science.aba9757

Chmielewski, T. J., Śleszyński, P., Chmielewski, S., & Kułak, A. (2018). *Ekologiczne i fizjonomiczne koszty bezładu przestrzennego Prace Geograficzne,* (Vol. 264). IGiPZ PAN.

Cliff, A. D., & Haggett, P. (1989). Spatial aspects of epidemic control. *Progress in Human Geography, 13*(3), 315-347.

Cordes, J., & Castro, M. C. (2020). Spatial analysis of Covid-19 clusters and contextual factors in New York City. *Spatial and Spatio-temporal Epidemiology*, *34,* 100355. https://doi.org/10.1016/j.sste.2020.100355

Cotella, G., & Brovarone, E. V. (2020). Questioning urbanisation models in the face of Covid-19. *TeMA-Journal of Land Use, Mobility and Environment*, 105-118. https://doi.org/10.6092/1970-9870/6913

Darch, S. E., Simoska, O., Fitzpatrick, M., Barraza, J. P., Stevenson, K. J., Bonnecaze, R. T., ... & Whiteley, M. (2018). Spatial determinants of quorum signaling in a Pseudomonas aeruginosa infection model. *Proceedings of the National Academy of Sciences, 115*(18), 4779-4784, https://doi.org/10.1073/pnas.1719317115.

Du, Z., Wang, L., Cauchemez, S., Xu, X., Wang, X., Cowling, B. J., & Meyers, L. A. (2020). Risk for transportation of coronavirus disease from Wuhan to other cities in China. *Emerging infectious diseases, 26* (5), 1049. http://doi.org/10.3201/eid2605.200146

Falchetta, G., & Noussan, M. (2020) The Impact of Covid-19 on Transport Demand, Modal Choices, and Sectoral Energy Consumption in Europe. Retrieved from: https://www.iaee.org/documents/2020EnergyForumSI.pdf

Fasolino, I., Grimaldi, M., & Coppola, F. (2020). The paradigms of urban planning to emergency-proof. *TeMA-Journal of Land Use, Mobility and Environment*, 165-178. http://dx.doi.org/10.6092/1970-9870/6847

Franch-Pardo, I., Napoletano, B. M., Rosete-Verges, F., & Billa, L. (2020). Spatial analysis and GIS in the study of Covid-19. A review. *Science of The Total Environment*, 140033. https://doi.org/10.1016/j.scitotenv.2020.140033.

Gaglione, F. (2020). Strategies and guidelines for urban sustainability: the Covid-19 effects on the mobility system in Italy. *TeMA-Journal of Land Use, Mobility and Environment, 13*(2), 265-270. https://doi.org/10.6092/1970-9870/7096

Gargiulo, C., Gaglione, F., Guida, C., Papa, R., Zucaro, F., & Carpentieri, G. (2020). The role of the urban settlement system in the spread of Covid-19 pandemic. The Italian case. *TeMA-Journal of Land Use, Mobility and Environment*, 189-212. http://dx.doi.org/10.6092/1970-9870/6864

Giedych, R. (2018). Ochrona przyrody w polityce przestrzennej miast. *Studia KPZK PAN*, 5-252. Retrieved from: https://journals.pan.pl/Content/113372/PDF/Studia+190+-+Giedych.pdf

Gitundu, B.H. (2020). Urban Environment, Sustainability And Climate Change, Critical review of the interaction between urban sprawl and sustainable transportation in cities, Retrieved from: https://s3.amazonaws.com/academia.edu.documents/62952196/Sustainable_Urban_Transport_and_Urban_Morphology20200414-9170-15s75mk.pdf?response-content-disposition=inline%3B%20filename%3DSustainable_Urban_Transport_and_Urban_Mo.pdf (accessed on 23 April).

Gorzelak, G., Jałowiecki, B., & Smętkowski, M. (2009). Obszary metropolitalne w Polsce: problemy rozwojowe i delimitacja. Komitet Przestrzennego Zagospodarowania Kraju PAN. Retrieved from: http://www.euroreg.uw.edu.pl/dane/web_euroreg_publications_files/602/obszary_metropolitalne_w_polsce_problemy_rozwojowe_i_delimitacja.pdf

Grabkowska, M. (2011). Inner-city transformations after socialism. Findings from interviews with new residents of pre-war tenement houses in Gdańsk. Bulletin of Geography. *Socio-economic series, 15*(15), 117-129. https://doi.org/10.2478/v10089-011-0008-7

Guida, C., & Caglioni, M. (2020). Urban accessibility: the paradox, the paradigms and the measures. A scientific review. *TeMA-Journal of Land Use, Mobility and Environment, 13*(2), 149-168. https://doi.org/10.6092/1970-9870/6743

Hamidi, S., Ewing, R., & Sabouri, S. (2020). Longitudinal analyses of the relationship between development density and the Covid-19 morbidity and mortality rates: Early evidence from 1,165 metropolitan counties in the United States. *Health & place, 64*, 102378. https://doi.org/10.1016/j.healthplace.2020.102378

Helm, D. (2020). The environmental impacts of the coronavirus. *Environmental & Resource Economics*, 1. https://doi.org/10.1007/s10640-020-00426-z

Ida, T., & Ono, H. (2019). Urban Sprawl and Local Public Service Costs in Japan. In Advances in Local Public Economics 195-215. Springer, Singapore. https:// doi.org/10.1007/978-981-13-3107-7_11

Izdebski, W., Śleszyński, P., Malinowski, Z., & Kursa, M. (2018). Analiza morfometryczna planów miejscowych w Polsce. *Infrastruktura i Ekologia Terenów Wiejskich*. https://doi.org/10.14597/INFRAECO.2018.2.1.022.

Jarynowski, A., Wójta-Kempa, M., Płatek, D., Krzowski, Ł., & Belik, V. (2020). Spatial diversity of Covid-19 cased in Poland explained by mobility patterns-preliminary results. SSRN 3621152.

Karwińska, A., Böhm, A., & Kudłacz, M. (2018). The phenomenon of urban sprawl in modern Poland: Causes, effects and remedies. *Zarządzanie Publiczne/Public Governance*, (3 (45)), 26-43. https://doi.org/10.15678/ZP.2018.45.3.02.

Kojder, K., Kupiec, M., Baranowska-Bosiacka, I., Nowak, M. (2020). Narzędzia polityki przestrzennej a ochrona zdrowia in M. Nowak (red.) Funkcje narzędzi polityki przestrzennej, *Studia KPZK PAN*, 5/197, Warszawa.

Komornicki, T., Szejgiec-Kolenda, B., Degórska, B., Goch, K., Śleszyński, P., Bednarek-Szczepańska, M., & Siłka, P. (2018). Spatial planning determinants of cohesion policy implementation in Polish regions. *Europa XXI*, *35*, 69-87. https://doi.org/10.7163/Eu21.2018.35.5

Kovács, Z., Farkas, Z. J., Egedy, T., Kondor, A. C., Szabó, B., Lennert, J., ... & Kohán, B. (2019). Urban sprawl and land conversion in post-socialist cities: The case of metropolitan Budapest. Cities, 92, 71-81.

Kowalewski, A., Mordasewicz, J., Osiatyński, J., Regulski, J., Stępień, J., & Śleszyński, P. (2014). Ekonomiczne straty i społeczne koszty niekontrolowanej urbanizacji w Polsce-wybrane fragmenty raportu. *Samorząd Terytorialny*, (4), 5-21.

Krajewska, M., & Pawłowski, K. (2019). Coherent Land Policy and Land Value. *Geomatics and Environmental Engineering, 13*(4). https:// doi.org/10.7494/geom.2019.13.4.33.

Kudłacz, T. (2015). Problems of Integration of Spatial and Socio – Economic Planning on Local Level in Poland (w:) A. Klasik, T. Kudłacz (red.) Integrated Development and Spatial Management of Urban Areas. Polish Experience, *Studia Regionalia* vol. 43/44.

Krukowska, J., & Lackowska, M. (2016). Metropolitalne kolory europeizacji. Instytucjonalizacja współpracy w funkcjonalnych obszarach miejskich w Polsce w świetle nowych instrumentów polityki spójności UE. *Studia Regionalne i Lokalne*, (1 (63)), 82-107.

Krzysztofik, R., Kantor-Pietraga, I., Runge, A., & Spórna, T. (2017). Is the suburbanisation stage always important in the transformation of large urban agglomerations? The case of the Katowice conurbation. https:// doi.org/10.7163/GPol.0082

Kyvelou, S. S., & Gourgiotis, A. (2019). Landscape as Connecting Link of Nature and Culture: Spatial Planning Policy Implications in Greece. Urban Science, 3(3), 81. https:// doi: doi.org/10.3390/urbansci3030081

Lai, S., Leone, F., & Zoppi, C. (2020). Covid-19 and spatial planning. *TeMA-Journal of Land Use, Mobility and Environment*, 231-246. https://doi.org/10.6092/1970-9870/6846

Lipiec A., 2020. Coronavirus: Research from Krakow shows how many people can be asymptomatically infected, Medonet.

Lityński, P., & Hołuj, A. (2017). Urban sprawl costs: The valuation of households' losses in Poland. *Journal of Settlements and Spatial Planning, 8*(1), 11-35. https:// doi: 10.24193/02JSSP012017

Lorens, P. (2016). Kształtowanie programów rewitalizacji miast w kontekście współczesnych przemian społeczno-ekonomicznych, doktrynalnych i prawnych. *Biuletyn Komitetu Przestrzennego Zagospodarowania Kraju* PAN. Retrieved from: https://journals.pan.pl/Content/100740/PDF/03+-+Piotr+Lorens+1.pdf

Lorens, P. (2017). Trends and problems of contemporary urbanization processes in Poland." Spatial Planning and Urban Development in the New EU Member States. *Routledge*, 109-126, Retrieved from: https://www.routledge.com/Spatial-Planning-and-Urban-Development-in-the-New-EU-Member-States-From/Altrock-Guntner-Peters/p/book/9780754646846 (accessed on 22 April).

Lorens, P., & Ledwoń, S. (2018). Delimitacja obszaru rewitalizacji na przykładzie Lokalnego Programu Rewitalizacji Miasta Wejherowa. *Studia Komitetu Przestrzennego Zagospodarowania Kraju* PAN, 107-132. Retrieved from: https://journals.pan.pl/Content/113337/PDF/6+-+Lorens%2C+Ledwo%C5%84+1.pdf

Mantey, D., & Kępkowicz, A. (2018). Types of public spaces: The polish contribution to the discussion of suburban public space. *The Professional Geographer, 70*(4), 633-654. https://doi.org/10.1080/00330124.2018.1443475

Mantey, D., & Sudra, P. (2019). Types of suburbs in post-socialist Poland and their potential for creating public spaces. *Cities*, 88, 209-221. https:// doi: 10.1016 / j.cities.2018.11.001

Markowski, T., & Marszał, T. (2006). *Metropolie, obszary metropolitalne, metropolizacja: problemy i pojęcia podstawowe. Polska Akademia Nauk*. Komitet Przestrzennego Zagospodarowania Kraju.

Markowski, T. (2010). Planowanie przestrzenne i instrumenty jego realizacji w świetle teorii ułomnych rynków,[w:] Zarządzanie rozwojem przestrzennym miast. *P. Lorensa, J. Martyniuk-Pęczek, Wydawnictwo Urbanistyka, Gdańsk*.

Markowski, T., & Drzazga, D. (2015). Koncepcja systemu zintegrowanego planowania rozwoju w Polsce (założenia i zasady kierunkowe budowania systemu)/The Concept of Integrated Planning System in Poland.(Assumptions and Principlesfor Development of Planning System). *Studia KPZK*.

Markowski, T. (2016). Kapitał terytorialny jako cel zintegrowanego planowania rozwoju. *Mazowsze Studia Regionalne*, (18), 111-119. http://doi.org/10.21858/msr.18.08

Murgante, B., Balletto, G., Borruso, G., Las Casas, G., Castiglia, P., & Dettori, M. (2020). Geographical analyses of Covid-19's spreading contagion in the challenge of global health risks. *TeMA-Journal of Land Use, Mobility and Environment*, 283-304. http://dx.doi.org/10.6092/1970-9870/6849

Nadin, V., Fernández Maldonado, A., Zonneveld, W., Stead, D., Dąbrowski, M., Piskorek, K., … & Münter, A. (2018). COMPASS – Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe Applied Research 2016-2018 Final Report, ESPON, Luxembourg, Retrieved from: https://www.espon.eu/planning-systems

Napierała, T., Leśniewska-Napierała, K., & Burski, R. (2020). Impact of Geographic Distribution of Covid-19 Cases on Hotels' Performances: Case of Polish Cities. *Sustainability, 12*(11), 4697. https://doi.org/10.3390/su12114697

Niedzielski, M., & Śleszyński, P. (2008). Analyzing accessibility by transport mode in Warsaw, Poland. *Geographia Polonica, 81*(2), 61-78. ISSN 0016-7282

Niedzielski, M. A., Hu, Y., & Stępniak, M. (2020). Temporal dynamics of the impact of land use on modal disparity in commuting efficiency. *Computers, Environment and Urban Systems, 83*, 101523. https://doi.org/10.1016/j.compenvurbsys.2020.101523

Nowak, M. J. (2010). Polskie obszary metropolitalne-problemy definicyjne. *Samorząd terytorialny*, (3), 18-28.

Nowak, M. (2015). Bezpośrednie instrumenty zarządzania przestrzenią w dużych miastach i metropoliach/Direct Spatial Management Instruments in Large Cities and Metropolises. *Biuletyn KPZK*.

Nowak, M. J. (2017a). *Niesprawność władz publicznych a system gospodarki przestrzennej*. Komitet Przestrzennego Zagospodarowania Kraju PAN.

Nowak, M. J. (2017b). The Stakeholders and Municipal Authoritiesin the Spatial Competition. Biuletyn Polska Akademia Nauk. *Komitet Przestrzennego Zagospodarowania Kraju*, (265), 22-35.

Nowak, M. (2020). Planowanie i zagospodarowanie przestrzenne. Komentarz do ustawy i przepisów powiązanych. Wydawnictwo CH Beck, Warszawa.

Nowakowska, A. (2015). Zintegrowane plany rozwoju–w stronę terytorialno-funkcjonalnego podejścia do rozwoju jednostki terytorialnej. In Nowakowska A., (ed.), *Nowoczesne metody i narzędzia zarządzania rozwojem lokalnym i regionalnym, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2015*. Wydawnictwo Uniwersytetu Łódzkiego.

Panum P.L. (1846). Measels in the Faroe Islands, Virchows Archiv für Pathologie und Medizin, 1, pp. 492-512.

Parysek, J. J. (2010). Urban policy in the context of contemporary urbanisation processes and development issues of Polish cities. *Journal of Urban and Regional Analysis, 2*(2), 33-44.

Parysek, J. J., & Mierzejewska, L. (2016). Spatial structure of a city and the mobility of its residents: functional and planning aspects. Bulletin of Geography. *Socio-economic Series, 34*(34), 91-102. http://dx.doi.org/10.1515/bog-2016-0037

Pei i in., 2014, A new insight into land use classification based on aggregated mobile phone data, *International Journal of Geographical Information Science*, 28, 9, s. 1988-2007. https://doi.org/10.1080/13658816.2014.913794

Raciborski, F., Pinkas, J., Jankowski, M., Sierpiński, R., Zgliczyński, W. S., Szumowski, Ł., ... & Gujski, M. (2020). Dynamics of Covid-19 outbreak in Poland: an epidemiological analysis of the first two months of the epidemic. *Polish Archives of Internal Medicine*. http://doi.org/10.20452/pamw.15430

Regulation of the Minister of Health of April 7, 2020 on the National Register of Patients with Covid-19, Dz.U.2020.625.

Roca, J., Burns, M. C., & Carreras, J. M. (2004). Monitoring urban sprawl around Barcelona's metropolitan area with the aid of satellite imagery. In XXth ISPRS CONGRESS. Istanbul, Turkey 12-23. Retrieved from: https://www.researchgate.net/profile/Josep_Roca3/publication/228912339_Monitoring_urban_sprawl_around_Barcelona's_Metropolitan_Area_with_the_aid_of_satellite_imagery/links/54e2d5680cf296663797a7d0.pdf

Ronchi, S., Arcidiacono, A., & Pogliani, L. (2020). Integrating green infrastructure into spatial planning regulations to improve the performance of urban ecosystems. Insights from an Italian case study. *Sustainable Cities and Society*, 53, 101907. https://doi.org/10.1016/j.scs.2019.101907.

Rogalski M., 2020, Internet database of Covid infections by voivodeship and county, updated daily. Retrieved from: https://docs.google.com/spreadsheets/d/1ierEhD6gcq51HAm433knjnVwey4ZE5DCnu1bW7PRG3E/edit?usp=sharing

Sagan, I., & Grabkowska, M. (2012). Urban regeneration in Gdańsk, Poland: Local regimes and tensions between top-down strategies and endogenous renewal. *European Planning Studies, 20*(7), 1135-1154. https://doi.org/10.1080/09654313.2012.674347

Sagan, I., & Grabkowska, M. (2013). Negotiating Participatory regeneration in the post-socialist inner city. The Routledge Companion to Urban Regeneration, Michael E. Leary, John McCarthy Ed., Routledge.

Santoro, S., Melone, M. R. S., & Camarda, D. (2020). Building strategic scenarios during Covid-19 lockdown. *TeMA-Journal of Land Use, Mobility and Environment, 13*(2), 229-240. http://dx.doi.org/10.6092/1970-9870/6917

Sattenspiel, L., & Lloyd, A. (2009). *The geographic spread of infectious diseases: models and applications* (Vol. 5). Princeton University Press.

Sharifi, A., & Yamagata, Y. (2018). Resilience-oriented urban planning. In Resilience-Oriented Urban Planning, 3-27. Springer, Cham. https://doi.org/10.1007/978-3-319-75798-8_1

Skydsgaard, M. A. (2010). It's probably in the Air: Medical Meteorology in Denmark, 1810–1875. *Medical history*, 54(2), 215-236. https://doi:10.1017/s0025727300006724.

Smętkowski, M., & Gorzelak G. (2008). Metropolis and its Region – New Relations in the Information Economy. *European Planning Studies*, 727-743. https://doi.org/10.1080/09654310802081086.

Sofo, A., & Sofo, A. (2020). Converting Home Spaces Into Food Gardens At the Time of Covid-19 Quarantine: All the Benefits of Plants in This Difficult and Unprecedented Period. *Human Ecology*, 1-9. https://doi.org/10.1007/s10745-020-00150-8

Szlachta, J. (2013). Europejski wymiar polityki miejskiej w Polsce. *Studia KPZK*, 186.

Szulczewska, B., Giedych, R., Borowski, J., Kuchcik, M., Sikorski, P., Mazurkiewicz, A., & Stańczyk, T. (2014). How much green is needed for a vital neighbourhood? In search for empirical evidence. *Land Use Policy*, 38, 330-345. https://doi.org/10.1016/j.landusepol.2013.11.006.

Szulczewska, B. (2018). Zielona infrastruktura-czy koniec historii?. *Studia KPZK*, 189.

Śleszyński, P., Deręgowska, A., Kubiak, Ł., Sudra, P., & Zielińska, B. (2018). Analiza stanu i uwarunkowań prac planistycznych w gminach w 2017 roku. Instytut Geografii i Przestrzennego Zagospodarowania PAN na zlecenie Ministerstwa Infrastruktury i Rozwoju, Warszawa.

Śleszyński, P., Stępniak, M., & Mazurek, D. (2018). Oszacowanie skutków presji inwestycyjnej i nadpodaży gruntów budowlanych w strefie podmiejskiej Warszawy na przykładzie gmin pasma zachodniego= Estimation of the effects of investment pressure and the oversupply of building land in the suburban area of Warsaw as exemplified by the "Western Belt" communes. *Przegląd Geograficzny, 90*(2), 209-240. http://doi.org/10.7163/PrzG.2018.2.2

Śleszyński, P. (2018). Potencjalne koszty odszkodowawcze związane z niewłaściwym planowaniem przestrzennym w gminach, In: Koszty chaosu przestrzennego, *Studia KPZK PAN*, Kowalewski A., Markowski T., Śleszyński P., Ed., 182, 2, Warszawa, 404-424.

Śleszyński, P., Kowalewski, A., Markowski, T., Legutko-Kobus, P., & Nowak, M. (2020). The Contemporary Economic Costs of Spatial Chaos: Evidence from Poland. *Land, 9*(7), 214. https://doi.org/10.3390/land9070214

Śleszyński, P. (2020). Prawidłowości przebiegu dyfuzji przestrzennej rejestrowanych zakażeń koronawirusem SARS-CoV-2 w Polsce w pierwszych 100 dniach epidemii= The regularity of spatial diffusion of recorded SARS-CoV-2 coronavirus infections of the epidemic in Poland in the first 100 days, Czasopismo Geograficzne (in print).

Tammes, P. (2020). Social distancing, population density, and spread of Covid-19 in England: a longitudinal study. *BJGP open, 4*(3), https://doi.org/10.3399/bjgpopen20X101116.

Tan, K. C., San Lim, H., MatJafri, M. Z., & Abdullah, K. (2010). Landsat data to evaluate urban expansion and determine land use/land cover changes in Penang Island, Malaysia. *Environmental Earth Sciences, 60*(7), 1509-1521. Retrieved from: https://link.springer.com/article/10.1007/s12665-009-0286-z (accessed on 1 May).

UNECE (2020). Governments in Pan-European region launch UN Task Force to make post-Covid-19 pandemic mobility more environmentally sound, healthy and sustainable - Retrieved from: https://www.unece.org/info/media/presscurrentpress-h/transport/2020/governments-in-pan-european-region-launch-un-task-force-to-make-post-covid-19-pandemicmobility-more-environmentally-sound-healthy-and-sustainable/doc.html

Uniwersytet Jagielloński w Krakowie, Covid-19: Liczba chorych bezobjawowo jest większa niż sądzono, Retrieved from: https://www.uj.edu.pl/wiadomosci/-/journal_content/56_INSTANCE_d82lKZvhit4m/10172/145226636 (in Polish). https://www.cire.pl/item,202338,1,0,0,0,0,0,wkrotce-kolejne-badania-przesiewowe-wsrod-gornikow-kopalni-chwalowice.html

Ustawa z dnia 27 marca 2003 r. o planowaniu i zagospodarowaniu przestrzennym (Dz.U. 2003 nr 80, poz. 717).

Ustawa z dnia 31 marca 2020 o zmianie ustawy o szczególnych rozwiązaniach związanych z zapobieganiem, przeciwdziałaniem i zwalczaniem Covid-19, innych chorób zakaźnych oraz wywołanych nimi sytuacji kryzysowych oraz niektórych innych ustaw (Dz. U. 2020, poz. 568)

Ustawa z dnia 16 kwietnia 2020 r. o szczególnych instrumentach wsparcia w związku z rozprzestrzenianiem się wirusa SARS-CoV-2 (Dz.U. 2020, poz. 695)

Ustawa z 14 maja 2020 r. o zmianie niektórych ustaw w zakresie działań osłonowych w związku z rozprzestrzenianiem się wirusa SARS-CoV-2 (Dz.U. 2020 poz. 875)

Ustawa z 19 czerwca 2020 r. o dopłatach do oprocentowania kredytów bankowych udzielanych na zapewnienie płynności finansowej przedsiębiorcom dotkniętym skutkami Covid-19 oraz o zmianie niektórych innych ustaw (Dz. U. 2020, poz. 1086)

Van Kempen, R., Vermeulen, M., & Baan, A. (Eds.). (2005). *Urban issues and urban policies in the new EU countries*. Aldershot: Ashgate.

Wang, L. (2019). Changing Spatial Elements in Chinese Socio-economic Fiveyear Plan: from Project Layout to Spatial Planning. Springer Singapore. https://doi.org.10.1007/978-981-13-1867-2.

Weclawowicz, G. (2002). From egalitarian cities in theory to non-egalitarian cities in practice: the changing social and spatial patterns in Polish cities. *Of states and cities*, 183-199.

Wilson, M. E. (2010). Geography of infectious diseases. *Infectious Diseases,* 1055. https://doi:10.1016/B978-0-323-04579-7.00101-5.

Yuan, Y., & Raubal, M. (2012, September). Extracting dynamic urban mobility patterns from mobile phone data. In *International conference on geographic information science*, 354-367. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-33024-7_26

Yue, Y., Zhuang, Y., Yeh, A. G., Xie, J. Y., Ma, C. L., & Li, Q. Q. (2017). Measurements of POI-based mixed use and their relationships with neighbourhood vibrancy. *International Journal of Geographical Information Science, 31*(4), 658-675. https://doi.org/10.1080/13658816.2016.1220561

Zecca, C., Gaglione, F., Laing, R., & Gargiulo, C. (2020). Pedestrian routes and accessibility to urban services: an urban rhythmic analysis on people's behaviour before and during the Covid-19. *TeMA: journal of land use, mobility and environment*, *13*(2). https://doi.org/10.6092/1970-9870/7051

Image Sources

Fig.1: based on data collected and made available in M. Rogalski's team (2020)

Fig.2: based on data collected in IGIPZ PAN

Fig.3: based on data collected and made available in M. Rogalski's team (2020)

Fig.4: based on data collected and made available in M. Rogalski's team (2020)

Author's profile

Przemysław Śleszyński

Professor at the Institute of Geography and Spatial Organization of the Polish Academy of Sciences, member of committees of the Polish Academy of Sciences: Committee of Geographical Sciences PAS (scientific secretary), Committee of Demographic Sciences PAS, Committee on Migration Research PAS and Spatial Management Committee of PAS. Vice-Chairman of the Polish Geographical Society and chairman of its Commission on the Geography of Settlements and Population, member of the Main Urban Planning and Architectonic Commission and the Society of Polish Town Planners, chairman of the Task Committee of the Geographical Olympics. He deals with socio-economic geography and spatial management, including spatial structures of population and enterprises, urban and regional development, migration, transport geography, spatial planning, landscape aesthetics. Author of over 400 works in this field, including more than 20 monographs (including about 100 works in English). Coordinator and participant of several dozen grants and projects, realized for international institutions (among others, ESPON, INTERREG programs) and central and local governmental public entities, including for 15 years coordinator of government reports on the state and progress of planning works in municipalities. He is also the author of the "List of medium cities, losing their social and economic functions" and other solutions, which are included in the key strategic documents of Poland: The Concept of National Spatial Development 2030 (2011) and the Strategy for Responsible Development (2016).

Maciej Nowak

Professor at the West Pomeranian University of Technology, head of the Real Estate Department, member of the Presidium Committee for Spatial Economy and Regional Planning, Polish Academy of Sciences. Author of over 200 works in this field, including more than 30 monographs. Participant of several dozen grants and projects, realized for National Science Center, polish ministries and central institutions and regional/ local governments. Member of government teams developing changes in the spatial management system in Poland. Author of recognized legal commentaries on spatial planning regulations. Legal advisor participating in numerous court and administrative cases related to spatial planning. In the implementation of projects and publications, it has an extensive cooperation with representatives of other countries (including the Czech Republic, Slovakia, Latvia, Ghana and Germany).

Małgorzata Blaszke

PhD in economic sciences, assistant professor at the Department of Real Estate of the West Pomeranian University of Technology in Szczecin, author and co-author of numerous scientific publications related to the real estate market.