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METHODOLOGICAL CHALLENGES OF REGIONAL RESEARCH ON TOURIST TRAFFIC. A PROPOSAL FOR A SYSTEMIC SOLUTION FOR THE PODKARPACKIE PROVINCE

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Abstract

Research on tourist traffic is a major methodological challenge because a potential respondent is on the move and difficult to capture. There is a need to identify both tourists and one-day visitors. It is important to know motives for their arrival, forms of their stay, assessments of individual components of the tourist offer or consumer loyalty. In 2020, the Podkarpackie Province resumed the idea of regional research on tourist traffic. The aim of this article is to present the methodology of cyclical research of tourist traffic in the Podkarpackie Province. It uses the experience gained during the pilot studies conducted in 2020. The methodology and measurement tool contribute to the standardisation of tourism research in Poland at the provincial level. The proposed solutions activate and integrate various environments into the development of tourism in the region. They allow observation of changes in the structure of tourist traffic and evolution of tourists' opinions and expectations. On the other hand, they are flexible in order to respond to changes in tourism. The solutions suggested in the methodology are to provide comprehensive and unique data which will facilitate an effective tourism policy at the regional level and can be used by businesses in the tourist industry.

Key words

methods • regional research • tourist traffic • Podkarpackie Province • Poland • COVID-19 pandemic • applied geography

Introduction

A thorough examination and understanding of tourist traffic contributes to the development of an appropriate management plan for regions and tourist destinations (Benkhard, 2018). It also enables meeting the current needs of tourists and allows for quick recognition of new trends and directions in tourism. The characteristics of this traffic should, therefore, include the identification of the characteristics of travellers, the direction and route of their journey along with the sequence of stops and – very importantly – attempts to identify the reasons and motives for visiting a particular place or region. The development of new methods in tourism studies is sometimes treated as one of the most important challenges for tourism research. This type of research is necessary for the development of strategic and planning documents, marketing and promotion activities in the development of tourism, tourist-destination management and tourism policy (Więckowski & Saarinen, 2019).

In the first definitions of the concept of tourism, it was identified with travel undertaken for pleasure, leisure or treatment. Later definitions emphasise its social and economic aspect, the movement in space and the objectives pursued during travelling. Thus, tourist movement can be understood as a phenomenon of a socio-economic nature, the essence of which consists of travel undertaken for leisure, cognitive, health and entertainment purposes (Gołembski, 2002). Tourist traffic refers to the spatial distribution of tourists and reflects their travel patterns in a specific region (Degen, 2014). Understanding the spatial distribution of tourists can provide practical implications for tourism practitioners in terms of resource allocation, infrastructure construction, and effective tourism planning at the destination (Ma & Wu, 2004; Zhong et al., 2019).

The research on tourist traffic is, therefore, a unique methodological challenge because, by definition, a potential respondent is on the move and difficult to capture. Official

statistics refer only to tourists, i.e. visitors using the accommodation facilities (only those to be reported to the Statistics Poland). Various attempts are made to estimate the traffic of one-day visitors (based on, for example, counting gates in national parks, the number of admission tickets sold, the number of tourists at tourist information points, monitoring in restaurants or in the areas with tourist attractions) (Kruczek, 2016). Therefore, the collected data includes the number of tourists, time and place of their stays, which finally allows for determining which tourist attractions generate the most interest.

In recent years, answers to many unknowns have also been provided by new methods and sources of knowledge about the movement of tourists through analyses of water (meters) and energy consumption, waste production, traffic intensity (sensors), parking meters (Ślusarz et al., 2019), or data based on the use of second and third generation mobile phone technology (Ratti et al., 2006; González et al., 2008; Alejziak, 2009; Piechota, 2014; Benkhard, 2018). There has been considerable interest in tourist traffic sampling through GPS¹ (Mckercher & Lau, 2008) and Bluetooth technologies (Stange et al., 2011; Versichele et al., 2012). However, these methods have certain limitations related to network coverage and the ownership of the information obtained, and, furthermore, their acquisition is associated with high costs (Yang et al., 2017). They also do not provide relevant socio-demographic or psychographic data.

Social media (Shao et al., 2017) which are increasingly popular, especially among young users (Huang & Wong, 2016), are another source of data on the movement and behaviours of tourists in recent years. While there are many advantages attributed to this method of obtaining tourist information (e.g. low cost), it possesses numerous difficulties including too much data making it difficult to extract specific information (Sakaki et al., 2010) and limitations in spatio-temporal

¹ Global Positioning System

irregularity (Agichstein et al., 2008). Unfortunately, there are still incomplete statistics and estimates which cover only selected behaviours and actions of visitors. Above all, there is a noticeable lack of answer to the fundamental question, namely why tourists and one-day visitors decide to choose a particular region, province or city? The lack of data on the differences in behaviour due to age, gender or leisure activities is still unsatisfactory. These issues are often speculative, as are the motives for visiting a given place.

Therefore, one of the most important challenges in researching tourist traffic is to identify both one-day visitors and tourists. Worthwhile emphasising is the analysis of the relationship between the two categories of travellers – in quantitative terms (proportions between these categories), but also the motives for visiting, forms of stay, assessments of individual components of the tourist offer or consumer loyalty. In this case, questionnaire research allows for learning about opinions, beliefs, stereotypes – in short, the whole sphere of emotions which determine particular actions and consumer choices. Such was the aim of the authors of *Methodology of Cyclical Research on Tourist Traffic in the Podkarpackie Province*.

The methodology was prepared under exceptional conditions related to the COVID-19 pandemic – unpredictable and difficult for the tourism industry (Gierczak-Korzeniowska et al., 2021; Goschin & Constantin, 2021). The team of authors, acting under conditions of deep uncertainty for the functioning of the tourism industry and in close cooperation with PRTO, wanted to provide the most accurate information, thus proposed a completely new – to the authors' knowledge – interesting and innovative solution for this type of research consisting of a question where the respondents chose the most preferable pattern (Oppermann, 1995; Chan et al., 2002; Lohmann & Zahra, 2010) of spatial tourist traffic in the province from among graphic representations.

Therefore, the aim of this article is to present the methodology of cyclical research

on tourist traffic in the Podkarpackie Province. The basis for this publication was *Methodology of Cyclical Research on Tourist Traffic in the Podkarpackie Province* (Szpara et al., 2020a) and *A Report on the Research on Tourist Traffic in the Podkarpackie Province in 2020* (Szpara et al., 2020b). The authors also reviewed the national and world literature relating to the discussed issue.

Regional research on tourist traffic in the light of world and national practices

The broadly understood tourist potential of the region and the related influx of tourists, as well as the desire to gain a competitive advantage over others, prompt local authorities and government institutions to undertake research on tourism. This is a difficult and demanding undertaking (Matczak, 1992; Finn et al., 2000). It constitutes one of the problematic areas of tourism studies due to the inability to fully register this phenomenon (Lickorish & Jenkins, 1997; Dziedzic, 2010b). Tourism generates mass traffic with a high degree of variability and reacts exceptionally quickly to economic or political changes, while tourist traffic – as Warszyńska (2003: 15-16) writes: “poses many difficulties as the research topic both in terms of source material and methodology”. As a result, it creates many problems for local authorities in implementing tourism policy and burdens the industry with lack of information.

Difficulties and limitations in conducting research on tourism in no way diminish the necessity to conduct it. The legitimacy of undertaking research on tourism is undertaken in their work by, among others, Petrevska and Manasieva Gerasimova (2012), emphasising the importance of the methods used to describe the impact of tourism on regional development in the south-western part of Macedonia. Despite the lack of consensus on the definition of the region and the statistical problems of the research on tourist traffic at the regional level, the need to take such action is also emphasized by Jansen-Verbeke

and Spee (1995). They note that such studies allow for a realistic assessment of the position and potential of individual tourist areas on the European tourism market, as competition no longer exists between countries, but between regions. This, among other things, led to more popularity of publications analysing tourist traffic as a force contributing to the economic growth of the industry. The research of the distances travelled, routes chosen (traffic) and length of stay provides essential data for the creation of services and development planning (Benkhard, 2018). This is confirmed by research on tourist traffic conducted by scientists and other entities which use diverse methodologies (Tab. 1).

One more aspect, rarely mentioned and discussed in the literature, deserves attention in the research on tourist traffic namely which entity or institution is responsible for conducting the research and collecting data. Typically, the entities include university employees (departments) or scientific institutes, inter-university expert teams, regional tourism organisations and departments in local government units. The type of responsible entity determines the nature of the research and has an impact on the practical use of the results. Scientists-experts and representatives of local governments, as well as entrepreneurs, perceive the development of the tourism economy differently. Their knowledge of the broadly understood tourism economy and its challenges is also contrasting. Moreover, differences appear in relation to funds allocated for research. This has an impact on the possibility of selecting specialist companies responsible for field research through a public tendering procedure.

Unfortunately, in the literature on the subject, there are not many works on the analysis of tourist traffic in smaller destinations or regions (Gao et al., 2013; Lew & McKercher, 2002; Zoltan & McKercher, 2015). Typically, the purpose of such research and analyses is to provide the basis for infrastructure development and optimal service design. Moreover, especially in the case of natural areas, this provides a basis for preserving their value

by determining the degree of susceptibility of the areas to tourist traffic and the type of tourists (Manning, 2002).

The analysis of the literature shows that there are significant regional differences both in undertaking such research and in the frequency of its implementation. Moreover, the party commissioning and undertaking such research is an important aspect of tourism research (Fedyk, 2010). For differences in user needs can be observed. Overall, governments are looking for information to help guide macro-scale tourism policy and for guidance on the impact of tourism on a country's economic well-being (Lickorish & Jenkins, 1997). On the other hand, local authorities and regional tourist organizations are interested in data to improve the broadly understood changes in the regional perspective. The industry needs marketing data and guidance on productivity, competition and investment forecasts, as well as qualitative data. And finally, academic centres which perceive research as a natural consequence of the scientific interests of the faculty or research teams, a source of knowledge and an opportunity to verify research methods and techniques.

In Poland, both studies on the methodology of regional tourism research and empirical research were conducted in the interwar period (Alejziak, 2010), exemplified by the work of Leszczycki (1933, after Matczak, 1992). After the war and in subsequent years, the most frequently discussed issues included the measurement of the volume of tourist traffic (including its dynamics); the generic structure (according to forms) of tourist traffic; the duration and frequency of trips, their spatial extent, as well as the seasonality of tourism and the socio-demographic structure of its participants (Alejziak, 2008, 2010).

The nature and specificity of the region and the assumptions of the party conducting the research often influenced the very high methodological divergence of the research and analyses conducted and their results (Wrona, 1983). A significant contribution to the development of tourism research methodology was made by the faculty of the Institute

Table 1. Examples of solutions applied in research on tourist traffic

Research scope	Institution responsible for the research / entity responsible for data collection	Dominating method	Sample selection	Main problem areas	Interesting tool, solutions of organisational, technical, procedural nature	References
Belgium, Ghent	Department of Geography, and Department of Information Technology, Ghent University	Bluetooth tracking (scanners with Bluetooth sensors)	29 locations in and around the historic centre of Ghent. Duration of the research - 15 days in May 2012. Locations include hotels and tourist attractions.	Analysis of the patterns of visits by extracting association rules between tourist attractions. Visualization of the patterns with visit maps.	Non-participatory collection of tourist traffic data via Bluetooth tracking	Versichele et al. (2014)
China, Beijing	William F. Harrah College of Hotel Administration, University of Nevada, Las Vegas, USA; College of Urban and Environmental Sciences, Peking University, Beijing, China	This study used content analysis and a social network analysis method to investigate 500 online travel journals	The original data was collected from 500 travel diaries on six different websites between January 2001 and April 2009. This included 350 English diaries posted by foreign tourists and 150 Chinese diaries by tourists from Hong Kong, Macau and Taiwan. The number of travel journals collected before, during and after the Beijing Olympic Games (before August 2007, from August 2007 to September 2009, and from October 2008 to April 2009) amounted to 160, 177 and 163 respectively.	Collection of user-generated data in order to access tourist routes from the diaries posted after the journey. The purpose of the study is to compare tourist traffic patterns in Beijing during the Olympic Games.	NetDraw, software for social network analysis. This was used to map tourist traffic and attractions visited (travel routes).	Leung et al. (2012)
Malaysia, Malacca	Department of Urban and Regional Planning, University of Technology, Malaysia	Traditional and modern methods of tracking tourists were used. Traditional: participant-observer method, non-participant observation, remote observation, video tracking and time-space budget method. Modern: GPS, mobile phones, land-based tracking technologies known as RF detectors.	No data	The research aimed at determining the potential value of various tracking technologies in the research on tourist traffic in the historic cities of Melaka.	The research offers a systematic review of several technologies tracking tourist traffic. It helps to broaden the knowledge of tourism, as well as improve policy making, planning and management in tourism.	Toha and Ismail (2015)

Research scope	Institution responsible for the research / entity responsible for data collection	Dominating method	Sample selection	Main problem areas	Interesting tool, solutions of organisational, technical, procedural nature	References
USA, New York	NSF Spatiotemporal Innovation Center and Department of Geography and Geo-Information Sciences, George Mason University, Fairfax, VA, USA; b Center for Open-Source Data and AI Technologies, IBM, San Francisco, CA, USA; c Department of Geography, University of South Carolina, Columbia, SC, USA	First, the collected geotagged tweets are cleaned to filter out those not posted by tourists. DBSCAN-based clustering The method is adapted to construct tourism graphs based on visited tourist attractions. Thirdly, network analysis methods, spatio-temporal analysis methods, are used to detect tourism patterns including popular attractions.	Collecting tweets via Twitter streaming. API from 1 July 2016 to 30 April 2017. The total number of tweets is 5,019,637 and each tweet contains a user ID, latitude and longitude, date, text and other information. 55,957 tourists posted 258,540 geotagged tweets from New York. To evaluate the accuracy of the detected tourists, 100 tourists were selected to check their Twitter profile manually. The accuracy of human detection was 94%	Understanding the characteristics of tourism; tourism patterns are intended to help travel-oriented businesses and authorities, product development, transportation and development of shopping centres, as well as other accommodation. The following are researched: popular attractions, city centre attractions, popular point-to-point routes and popular excursion routes. A graphical approach to detecting tourist traffic patterns using social media. A method of detecting tourist traffic patterns based on Twitter data.	A graphical approach to detecting tourist traffic patterns using social media. A method for detecting tourist traffic patterns using Twitter data.	Hu et al. (2019)
Poland, Małopolskie Province	Kraków Intercollegiate Team of Experts of the Małopolska Tourist Organisation	desk research and direct interviews	Layered and random	The structure of tourist traffic. Expenditures, the purpose of arrival, opinions on tourist values, tourist infrastructure and the quality of services. Tourist information, the image of the region, promotional activities, the safety of tourists.	Cyclical research (2003-2020), intercollegiate team	Alejski (2009); http://www.mot.krakow.pl/badanie-ruchu-turystycznego.html
Poland, Łódzkie Province	Institute of Urban and Tourism Geography and Regional Tourist Organization of Łódzkie Province	Standardized questionnaire interview (personal interview).	Availability	The structure of tourist traffic Expenditures, the purpose of arrival, opinions on tourist values, tourist infrastructure and the quality of services. Tourist information, the image of the region, promotional activities, the safety of tourists		Alejski (2009); https://www.lodzkie.pl/turystyka/wydawnictwa/badania-ruchu-turystycznego

Research scope	Institution responsible for the research / entity responsible for data collection	Dominating method	Sample selection	Main problem areas	Interesting tool, solutions of organisational, technical, procedural nature	References
Poland, Pomorskie Province	Institute of Tourism (IT) in Warsaw	CATI, CAPI, telephone surveys, secondary data	In nationwide sample research: random sampling, while in research among tourists visiting the region: stratified random and cluster sampling (15 locations)	The structure of tourist traffic Purposes of arrivals, opinions on tourist values, tourist infrastructure, and the quality of services. Tourist information, the image of the region. The size and dynamics of tourist traffic. The survey was conducted in 2008.	Application of various sampling methods to various aspects. Use of data from many different institutions.	Alejziak (2009); https://www.prot.gda.pl/wp-content/uploads/2018/03/Krajowy-Ruch-Turystyczny-w-Wojew%C3%B3dztwie-Pomorskim-Raport-z-Bada%C5%84-Instytut-Turystyki_-PDF1.pdf
Poland, Podkarpackie Province	PROT/certified research company	PAPI, CAWI	stratified random, quota and cluster sampling	organisation of stays, the sources of knowledge about the region's attractions, an opinion on the region's potential	The procedure for selecting sampling locations, tourist traffic patterns, the start of cyclical research	Szpara et al. (2020a)

* Radio Frequency

Source: Own elaboration based on literature review.

of Urban Geography, Tourism and Geoinformation at the University of Łódź (Liszewski, 1991; Matczak, 2004, 2009; Liszewski & Włodarczyk, 2010; Włodarczyk, 2017). Matczak (1990, 1992) made an attempt to methodologically organise research on tourism, emphasising, at the same time, that survey-based research on tourism in reception areas was rarely conducted in Poland.

The development of tourism and the need to meet the needs of both travellers and tourism service providers contributed to an increase in the amount of research into tourism conducted by teams of researchers from various academic centres (Dziedzic, 2010a). One of the most common, combining various sampling methods of tourist traffic, is a collective study by faculty teams from two Krakow-based universities including the University of Economics and the Academy of Physical Education (Borkowski et al., 2009). On the basis of the research conducted in Kraków in 2006 and 2007, this study presents a methodology for estimating the total volume of tourist traffic in the city and the data being used to determine the procedures for further surveys (Alejski, 2010). Cyclical research on tourist traffic in Kraków or the Małopolskie Province was also systematically conducted under the supervision of K. Borkowski (Borkowski, 2018; Borkowski, 2019). In turn, in the Wielkopolskie Province, information on tourism is provided by the Poznań Tourist Barometer, which is an integrated system for monitoring tourism in Poznań and its surroundings (Gonia-Kołodziejczyk & Mazurczak, 2013; Szmatała et al., 2016).

In the Podkarpackie Province, the first comprehensive research on tourism was conducted in 2009 by the researchers at the University of Information Technology and Management in Rzeszów (Szpara, 2011; Szpara et al., 2009). It was repeated in a slightly different approach in 2011. Then, the contractor was SMG/KRC Poland Media S.A. based in Warsaw (Survey, 2011). Irrespective of the regional research on tourism, image research was conducted (*Badanie*, 2018), among others, as well as research on selected problems in the province or its certain regions.

Characteristics of the research area

The Podkarpackie Province is situated in the south-eastern part of Poland. In its southern part there are the Carpathian Mountains. They are the macro-regions of the Central Beskids and the Central Beskidian Piedmont, located to the north, as well as the Wooden Carpathians. The northern part is covered by the vast Sandomierz Basin. In addition, there are small fragments of Roztocze and the San-Dniester Plateau. The highest peak is Tarnica (1,346 m above sea level) in the Western Bieszczady (the High Bieszczady) and the largest river is the San (Kondracki, 2001; Richling et al., 2021).

Almost 45% of the total area of the province is occupied by protected areas with special natural values, including national parks (2.6%), nature reserves (0.6%), landscape parks (15.4%) and protected landscape areas (26.1%) (Rocznik, 2020). The most important assets of the region include its considerable forest cover (Marszałek, 2020) and natural wealth, especially of the Carpathian Mountains (Więckowski, 2020). The most valuable parts of the borderland's natural environment are protected, including in the Bieszczadzki National Park and the Magura National Park (Więckowski, 2018).

Within the country, the Podkarpackie Province borders with the Lubelskie, Małopolskie and Świętokrzyskie Provinces and across the state border with Ukraine and Slovakia. Multiculturalism is particularly valuable and characteristic of the border area (Skulimowska, 2014). The cultural heritage of the region is an important factor in the development of tourism (Durydiwka, 2011). The wooden churches in Blizne and Haczów and the wooden Orthodox churches in Chotyniec, Radruż, Smolnik and Turzańsk were inscribed on the UNESCO World Heritage List. Valuable and rich exhibitions are presented by numerous museums and open-air museums (e.g. the Rural Architecture Museum of Sanok, the Ignacy Łukasiewicz Museum of Oil and Gas Industry in Bóbrka). In addition, the culinary heritage of the region has great potential (Zieliński, 2019).

Railway, road and air infrastructure, including the motorway and Rzeszów-Jasionka Airport, facilitate access to the region. However, its most attractive, southern part, is less accessible due to poor transport available (Więckowski et al., 2014).

In 2019, the Statistics Poland estimated accommodation capacity in the Podkarpackie Province at 652 establishments (including over 75% open all year round). They offered 35,700 beds (including 27,400 offered all year round). In 2019, 1,297,000 people used them (including 144,100 foreigners) who booked 3,602,100 overnight stays (including 279,100 by foreign tourists). Nearly half of all foreign visitors stayed overnight in Rzeszów, 29.2% of which came from Ukraine. Tourist traffic is concentrated in the southern and south-eastern part of the province (especially in the districts of Bieszczady and Lesko) and in Rzeszów (Turystyka, 2020).

The most important tourist destinations are the Western Bieszczady and the Sanocko-Turczańskie Mountains (Szpara, 2016). Tourists eagerly visit the Bieszczadzki National Park, the largest mountain park in the country. Lake Solina, the largest dam reservoir in the country in terms of volume, is also a valued holiday destination.

The values of the natural environment and cultural heritage of the region create favourable conditions for the development of tourism. Tourists engage in various forms of cognitive tourism, both natural and cultural (including culinary tourism and enotourism, which is important for the region). Various forms of qualified (active) tourism are popular, in particular mountain hiking, cycling and various forms of water tourism. Rural tourism, including agritourism, is particularly important for the region as part of recreational tourism (Durydiwka, 2012), and spa tourism as part of health tourism (Iwonicz-Zdrój, Rymanów-Zdrój, Horyniec-Zdrój, Polańczyk). Business tourism (e.g. Rzeszów) and religious tourism (e.g. Kalwaria Pałacowska, Leżajsk, Dukla, Dębowiec) are also of importance.

The Podkarpackie Province is one of the most important tourist destinations in Poland.

Its southern part, located in the Carpathian Mountains, is especially valuable. During the pilot research on tourist traffic conducted in 2020, measures were taken to verify the correctness of the tool developed for the cyclical research. However, due to the risk of low tourist attendance related to the spring wave of the COVID-19 pandemic, it was necessary to limit the research area to districts with the highest volume of tourist traffic. Therefore, the research was conducted in the Bieszczady and Lesko districts and in Rzeszów (Fig. 1). Sampling points in the districts were selected based on the recommendations of a committee of experts appointed by PROT.

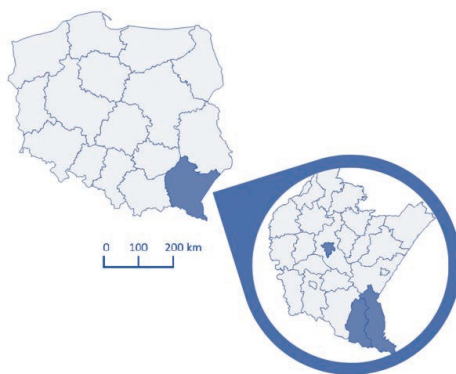


Figure 1. Research area – Bieszczady and Lesko districts and the City of Rzeszów the Podkarpackie Province

Methodics in developing the methodology

It has been 10 years since the first research on tourism in the Podkarpackie Province was conducted in 2009, and subsequently in 2011. It is a very long time for the dynamically changing market of tourist services. In the meantime, various fragmentary studies were conducted. They concerned, for example, a selected region, a group of tourists or a form of tourism. Many of them provided very interesting and valuable information. However, they could not replace comprehensive, regional research into tourism. Both the local

government and research community, as well as many representatives of the entrepreneurs from the tourist sector drew attention to the need to repeat the research and conduct it regularly. This would enable the collection of information on tourism in the Podkarpackie Province, including its spatial diversification and changes over time, which is essential for the tourism industry. Thanks to the initiative of some members, in particular the management of the Podkarpackie Regional Tourist Organisation, it was decided to return to the good practice of regional research of tourism.

The management of PROT appointed a team whose task was to develop a methodology for cyclical research on tourism in the Podkarpackie Province. The team was to be composed of persons who had scientific achievements and experience in scientific research, including research on tourism, knew the specific character of the region, had experience in regional research of tourism and guaranteed an interdisciplinary approach to the problem. Due to the short deadline for the completion of the research and the necessity to operate in pandemic conditions, it was advisable to have a small team who could flexibly adapt to the dates of online meetings. Finally, a team of three experts was chosen, including researchers into socio-economic geography, economics and management, and sociology. They held doctoral degrees and met other established criteria.

The team was to produce a document containing the methodology and technical description of the research, including:

- the definition of the main objective of the research and its specific objectives,
- the definition of the scope of the research,
- the operationalisation of basic concepts (according to UNWTO),
- the selection of research methods and techniques
- the development of research tools,
- the determination of the size, structure and the selection method of the sample,
- the determination of data collection points (locations of research).

The work began with a literature review, including an analysis of the methodology of selected research on tourism conducted in Poland so far, especially in the Podkarpackie, Małopolskie, Łódzkie and Wielkopolskie Provinces. Personal experience gained during the research on tourism in the Podkarpackie Province in 2009 was also valuable.

At the conceptualisation stage, the aim of the research and detailed objectives were defined, as well as the scope of the research including quantitative, qualitative, objective, subjective, spatial and temporal. In the process of operationalisation, the concepts used in the methodology were defined and related to the operations, resulting in a plan to obtain information on the variables. Then, the most appropriate research methods and techniques, according to the authors, were selected to be applied at particular stages of the research. A procedure was prepared for determining the size, structure and selection of the research sample, taking into account statistical data published by the Statistics Poland and the opinion of a team of experts appointed by PROT. A tool was prepared consisting of an interview questionnaire and an appendix with a sheet listing travel options. Aggregate indicators and basic statistical analyses were prepared (the amount of the collected data will eventually trigger additional analyses). A pilot study of the tool was planned in order to check the correctness of the adopted assumptions, including, in particular, possible errors in the tool (technical, logical and content-related). In order to reconcile the possibility of conducting the pilot study with the limitations caused by the COVID-19 pandemic, the procedure, to be followed in 2020, was slightly modified. The experience of the pilot study allowed for drawing conclusions which were used to make adjustments to the research procedure and the tool.

As a result, a document was created which presents:

- the main objective of the research and the specific objectives,
- the scope of research,

- the operationalisation of basic concepts,
- the selection of research methods and techniques
- the method of determining the size, structure and selection of the research sample,
- the rules for the piloting the tool in 2020,
- the method of calculating aggregate indicators and basic statistical analyses,
- the tool – an interview questionnaire with guidelines for interviewers.

At all stages of methodology development, the proposed solutions were consulted with the management and the appointed PROT employee. Moreover, the final version of the methodology was consulted with the management of the Statistical Office in Rzeszów who are experts in tourism-related research. Comments and suggestions were carefully analysed and taken into account where appropriate.

The tool – indicators:

The main objective set prior the planned research on tourism in the Podkarpackie Province was to provide reliable data for the rational process of shaping tourism policy in the region and promotional activities conducted by the local authorities and other entities operating in the tourist industry. Therefore, in the first place, it is learning about the structure and estimating the volume of tourist traffic in the Podkarpackie Province. However, it is also important to learn about the opinions and expectations of tourists and one-day visitors on the values and infrastructure of tourism, as well as the quality of tourist services provided.

In practice, this means dividing the questionnaire into two main parts – the first, concerning facts, and the other measuring opinions and beliefs about tourism assets, infrastructure and services as accurately as possible (Fig. 2). The collected factual data, with an appropriate structure of the representative sample, allows to supplement the institutionally collected statistical data on tourism. They also constitute the basis for the construction of basic typologies and

classifications of tourists and one-day visitors due to objective socio-demographic characteristics. Opinions and beliefs provide the context for the visible effects of decisions made by tourists and one-day visitors. Only learning about emotions and beliefs underlying particular choices as to the destination, form of stay, and others, allows for a rational response to the demand and planning further activities in longer time horizons.

Here, it is worth emphasising that a serious limitation for the above assumptions was the length of the questionnaire itself and the average duration of a single sample (as well as the level of complexity of the applied solutions and their friendliness to respondents). The respondents taking part in the research are, by definition, focused on other activities than participating in a complex interview, and are put in a rather unfavourable situation for questioning (while visiting tourist attractions, in informal situations, with family or friends, on holidays). In other words, the standardised interview was planned as short and easy as possible, i.e. simply respondent-friendly, while providing the most cross-sectional data possible.

The factual part of the questionnaire includes a final original solution that aggregates data impossible to capture from indirect data – patterns of stay (Fig. 3). So far, spatial patterns mentioned in the literature (Beeco et al., 2012; Gao & Hsueh, 2014) were developed as a result of the analysis of the information collected from respondents or on the basis of existing data. In the case of the mentioned questionnaire, the nine most probable spatial patterns are presented and respondents in the Podkarpackie Province choose the pattern most similar to their stay pattern from among the graphics presented. From the technical point of view, the solution is that interviewers are equipped with additional sheets with graphics depicting the patterns.

Owing to graphics, the patterns are very clear to the respondents (additionally, the interviewer has also a brief description of each model in case of any questions

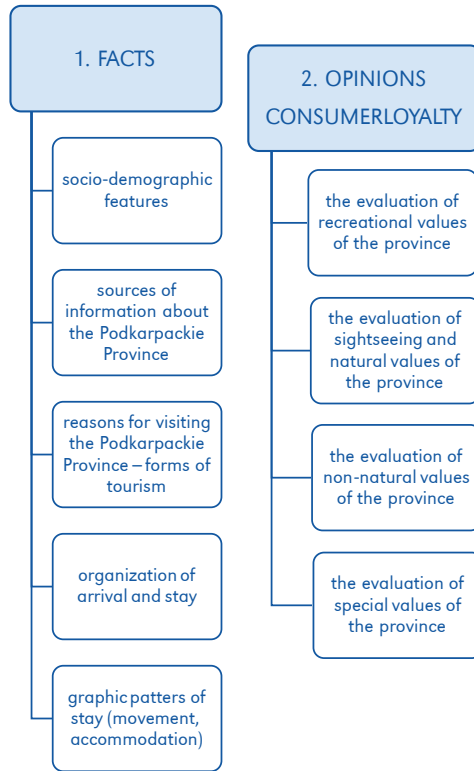


Figure 2. The diagram of the questionnaire design (question logic)

or doubts from the respondents), and, in a short time, they can choose the one which is the most appropriate for them. The information obtained in this way allows to identify the dominant patterns of stays, which, combined with the information on the geographical location of the visited locations, translates into a full understanding of the characteristics of the stay in the Podkarpackie Province. Understanding tourism patterns is important in the process of tourism management as they reflect a set of activities in the tourism industry as to optimise tourist accessibility and facilities (e.g. in public transport), and respond to the needs of urban planners in planning attractions and commercial facilities (Mckercher & Lau, 2008).

The two parts, the set of factual questions and the other containing opinion questions, determine the main lines of analysis

of statistically significant relationships, on the assumption that the factual information recorded during the research is the basis of the independent variables, causes; while opinions are (assumed) potentially dependent on factual information. Obviously, in the course of the analysis, this does not exclude the verification of the relations between socio-demographic features and travel patterns or the way of travelling, as well as declared funds allocated for the stay in the Podkarpackie Province. Conclusions on this topic will lead to the creation of the main profiles of one-day visitors and tourists spending their time in the Podkarpackie Province. Ultimately – and importantly – this will enable businesses to create personas that will help them better understand their customers (Baker et al., 2014) and enable the customization of their products and services (Cameron et al., 2012).








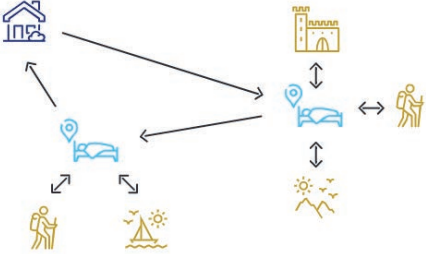

PATTERN OF STAY		RESPONSE RATE
ONE-DAY VISITORS IN 2020		
1. A travel pattern to a single place of stay without an overnight stay		70.6%
2. A travel pattern to several places of stay without overnight stays		28.6%
3. A transit travel pattern with one or more places of stay without overnight stays		0.8%
TOURISTS IN 2020		
4. A travel pattern to a single place of stay with an overnight stay (1 or more)		13.8%
5. A travel pattern to several places of stay with overnight stays		4.3%
6. A transit travel pattern with one or more places of stay with overnight stays		0.6%
7. A travel pattern with a single place of accommodation - the starting point for one-day Trips		68.0%
8. A travel pattern with several places of accommodation - starting points for one-day trips		7.8%
9. A travel pattern to a single place of stay with an overnight stay (1 or more) with attractions visited along the way		5.5%

Figure 3. Patterns of stay according to the distribution of answers of one-day visitors and tourists

Similarly, the internal exploration of potential relationships between individual opinions is intended, by the tool design, to lead to deeper and more detailed generalisations about particular types of ideal day visitors and tourists. The same applies to the internal exploration of potential relationships between individual opinions, which, as intended by the design of the tool is meant to deepen and refine the generalisation of particular types of ideal one-day visitors and tourists.

Therefore, this resulted in specific guidelines on the tourist profile (target, person), diverse needs (depending on a given persona – an ideal type) and the most effective marketing activities. The research is intended to provide empirically verified recommendations for the decision-making process, both in terms of investment, as well as information and promotion.

Sample selection

The assumed research sample has a stratified-quota-random character (Fig. 4). The main strata are groups of districts with the highest, medium and lowest volume of tourist traffic. Within the strata there are 3 sub-strata each – specific districts. Because the main objective of the research is to characterise tourist traffic in the Podkarpackie Province, i.e. from the perspective of the entire region, it is assumed that the number of samples in each stratum is no less than 100. The second condition of the number of samples results from the assumption that there may be a need to compare districts with each other, and, then, fewer samples may lead to statistical over-interpretations. It should be emphasized that in this particular research, it is recommended to compare groups of districts (according to the adopted strata).

In practice, this means that the minimum sample conducted in one edition (one tourist season) cannot be less than 900 respondents. It is worth adding, however, that the Podkarpackie Province is characterised by much more intensive tourist traffic in spring and summer than in winter. If a proportional

distribution were applied, assuming a minimum of 900 respondents in the winter period, it would require several thousands of samples in the spring and summer period. This, in turn, would translate into disproportionately high annual costs of sampling, without a significant positive impact on the quality and reliability of the results obtained. Therefore, an arbitrary division is proposed, creating a burden on the winter period and, at the same time, reflecting the seasonal distribution of tourist traffic in the Podkarpackie Province, i.e. 75% of sampling should be conducted in spring and summer, while a third in winter.

Again, referring to the previously adopted minimum number of respondents in one tourist season, this means that the minimum recommended sample size in a given year should not be less than $N = 2687$, i.e. 1,787 samples in the spring and summer season, and 900 in the winter season (with a confidence level of 95% and a 50% fraction, and for the known number of tourist overnight stays in the Podkarpackie Province – over 1,3 million tourists per year – the maximum error does not exceed 2%). Adopting such proportions allows increasing the research sample depending on the budget capacity of the institutions responsible for the research on tourism in the region, although it is not recommended to obtain more than 5,000 samples in a given year.

Increasing the total number of samples increases the number of samples in a given district (which, in turn, allows for a safer comparison between districts), but, at the same time, increases the costs of the research without significantly improving the accuracy and reliability of the results for the entire province. With the lowest sample level (2,687) the error does not exceed 2%, and with 5,000 samples – 1% (larger numbers do not significantly change this result because each measurement is characterized by error). The error is calculated for the entire sampling pool in a given year (both seasons) for the entire Podkarpackie Province (all the districts included in the research). In order to operate with similar error levels in comparing particular districts, the sample size increases exponentially.

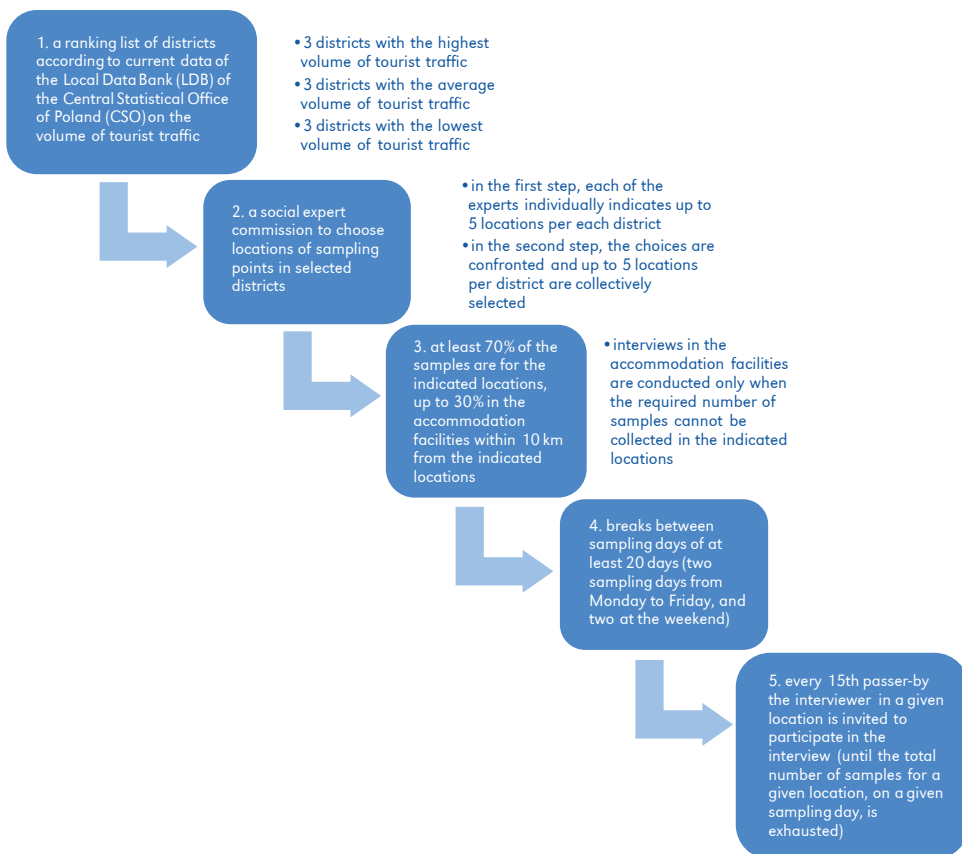


Figure 4. An algorithm for the selection of sampling locations and the research sample

In the group of districts characterised by medium-level tourist traffic, it is allowed to exchange two districts for other two which are important for shaping the tourism policy in the region as suggested by PROT's expert team.

In each of the indicated districts, an equal number of samples is collected in a given season. In the spring and summer season (from 1 May to 30 September), the research sample is 66,5% of the number of samples indicated for a given research year, among respondents over the age of 18. In the winter season (from 1 December to 15 March), the research sample is 33,5% of the number of samples indicated for a given research year, among respondents over the age of 18. The sampling pool to be conducted in a given location

is distributed in such a way that at least four sampling dates are possible in a given season (20-25% of the number of samples in a given sampling pool) with an interval of at least 25 days for the spring-summer season and at least 20 days for the winter season between samplings (two on weekdays from Monday to Friday, two at the weekend from Saturday to Sunday).

The implementation of the pilot study – verification of the methodology

The pilot study of the methodology presented in the article took place in August 2020, in a period of relatively loosened pandemic restrictions for the tourism industry.

Due to this fact, it was finally decided to conduct the research only in the three counties with the highest volume of tourist traffic in 2019 (according to the statistics of the Local Data Bank of the Statistics Poland). In line with the adopted assumptions, the team of experts indicated the following counties: the city of Rzeszów, the county of Lesko and the county of Bieszczady. In the meantime, the Podkarpackie Regional Tourist Organisation appointed a commission which, in the course of consultations and discussions, on the basis of the presented list of counties, indicated the key locations for the implementation of the research:

- for the city of Rzeszów - the Market Square,
- for Lesko district: the Solina Dam, Bieszczady Bicycle Trolleys (Uherce Mineralne), Bieszczady Forest Railway (Majdan), the entrance to the trail on Orłowicz Pass (Wetlina) and the centre of Cisna,
- for Bieszczady district: the ticket office on the trail to Tarnica (Wołosate), the centre of Ustrzyki Dolne, the car park at the entrance to Połonina Caryńska, Wielka and Mała Rawka (Wyżniańska Pass), the centre of Ustrzyki Dolne.

Due to the significantly shortened tourist season, it was also decided that samples would be collected at an interval of at least 5 days (rather than 25 days). These deviations resulted from the concerns for the availability of respondents, and from the length of the tourist season disrupted during the pandemic in the Podkarpackie Province. However, the division into samplings conducted on weekdays and at the weekend was maintained, as well as the requirement to invite every 15th passer-by to participate in the interview in a given location. Because the research was conducted in locations traditionally 'crowded' with tourists, there was no need to search for respondents in the accommodation facilities within 10 km from the indicated locations (all samples were successfully collected in the designated locations).

The interview questionnaire was prepared in two variants including a traditional paper copy (PAPI) and electronic version (TAPI). Ultimately, it was a favourable solution because of significant technical problems (Internet coverage), especially in Lesko and Bieszczady districts, where the paper version proved to be reliable (paper questionnaires constituted 67% of all the collected samples). The most important thing, however, was that the average duration time for a single sample to be collected did not exceed 15 minutes. Given the volume of information collected, this is at least a satisfactory result, considering the circumstances and the respondents. Importantly, the amount of missing data (when the respondents did not want to provide answers) was negligible and did not exceed 5% in the response pool.

Finally, as part of the pilot study, 946 samples were collected in stratified-quota-random sampling. In other words, apart from the main goal of the pilot study, i.e. testing the adopted methodological solutions and the functionality of the tool in terms of logical, content-related and technical errors, in fact the complete data was obtained from a representative sample of tourists at an exceptional historical moment - during the COVID-19 pandemic and the related turbulence in tourism. From this perspective, the results are important, providing direct information on the volume and structure of tourism in the Podkarpackie Province, as well as opinions and beliefs about the tourist values of the Podkarpackie Province formulated by the visitors and tourists to the region.

The pilot study revealed minor technical shortcomings of the questionnaire, whose correction will only enhance sampling in the following edition. Based on the report on the quality of sampling, it can be concluded that the methodological assumptions, especially concerning the research sample, posed no burden or were not circumvented or omitted in field research. The interviewers strictly followed the recommendations, providing complete samples.

The practical aspect and limitations of the proposed methodology

The need for research into tourist traffic stems from several considerations. The movement of tourists and their excessive accumulation in certain places affects the perceived quality of life of the inhabitants of a given region/city and the negative experiences of visitors (UNWTO, 2019). Currently, the detrimental effects of over-tourism can be seen in many areas around the world, hence methods to control and measure tourist traffic are increasing. The multifaceted importance of this type of research can also be attributed to other areas including transport, urban planning, as well as planning and marketing of tourist attractions (Lew & McKercher, 2006; Shoval & Isaacson, 2007).

However, the appropriateness of undertaking such research is not always commensurate with the ease of its development. The complex nature of tourism (McKercher, 1999) and, at the same time, the difficult choice of ways to 'track travellers' from traditional to modern methods (Lau & McKercher, 2006; Connell & Page, 2008), translate into a methodological diversity of the research conducted. This raises the question how the methodology and research should be designed to ensure their long-term use and the fullest possible picture and specificity of tourist traffic in the region? Where does the key to success lie and is it at all likely?

When assessing the applicability and limitations of the proposed methodology, the following issues should be considered. Firstly, the methodology was prepared based on the specificity of a given region, i.e. its administrative structure (the division into districts) and its tourist characteristics (e.g. the type and nature of tourist infrastructure). Therefore, the results of the research may have unique features which are characteristic for the region. However, this does not limit the universality and applicability of the research after its minor modifications. The presented

methodology can be successfully applied in other regions. Secondly, being aware that the research on tourist traffic involves a huge collection of data, the authors prepared a useful tool which, in a short period of time (thanks to the appropriate construction of questions), can provide a lot of valuable information necessary for the decision making on tourism policy. This is important because problems with data sources are commonly observed, especially the wide variety of available databases, including their spatial and temporal inconsistency. Third, the methodology is based on field research where human intervention is often required. As emphasised by Hu et al. (2019), collecting data, cleaning them, identifying models, sometimes helping to clarify uncertainties is extremely important for the correctness of the obtained data. This is a traditional method to a large extent, as mentioned by Hartmann (1988), Kemperman et al. (2009), although when implemented there is the possibility of using modern technology, including tablets or computers. Finally, an interdisciplinary team worked on the methodology, which often resulted in different interpretations of certain notions and phenomena, as well as reactance. Ultimately, a creative concept emerged from this diversity and an emulation of beliefs when all points of views were taken into account.

The methodology presented was labour-intensive, as it was assumed that it would be used in cyclical research with a direct comparison of the results to previous years. In the case of questionnaire-based research, there is a temptation to construct sets of questions in response to the current needs of decision-makers, without a longer-term vision of how the information obtained will be used. It quickly becomes difficult to compare successive editions of the research because each time the questionnaire is constructed in a different way and the research is conducted according to different guidelines. Thus, current information from a given year is obtained, but reporting on possible trends and changes is impossible. So, the solution is the need to develop a methodology

for cyclical research with a questionnaire to be used consistently for at least several years. In subsequent years, corrections or supplements to the proposed questionnaire are possible because of the changes in the current situation or trends in tourism, but the two main sets of questions including facts and opinions will remain unchanged, so that they can bring invaluable knowledge of how the province is perceived by tourists in subsequent editions.

A significant advantage of the discussed methodology is that it contains a practical application of data which are not included, for example, by the Statistics Poland, such as the evaluation of tourist services or the category of travellers like one-day visitors. On the other hand, the selection of districts for the research, especially those with the lowest volume of tourist traffic, may provide an impulse for remedial action. Finally, the practical nature of the analysed methodology is confirmed by the fact that it was prepared as requested and in cooperation with institutions responsible for tourism policy and influencing the development of the tourist economy in the region.

Several limitations can also be identified in relation to the prepared methodology. First of all, the research disturbs tourists who are busy sightseeing. Therefore, the refusal to complete the questionnaire may be a disadvantage of such activities. Prior to field research, the interviewers need to be trained, however, the full completeness and correctness of the data obtained may not be satisfactory. Finally, changes and new trends in travel styles, tourist behaviour or technology may result in the modification of the questionnaire.

Final considerations

It should be emphasised that the proposed solutions are in line with the future paths to the development of tourism in the CEE countries and refer to the research tasks indicated in the literature (Więckowski & Saarinen, 2019). The methodology and measurement

tool developed for the Podkarpackie Regional Tourism Board contribute to the standardization of the research on tourist traffic in Poland at the provincial level. The review of solutions the authors conducted, which are used in other provinces, shows significant differences in the scope of topics or the creation of research samples. Each research independently constitutes an extremely valuable resource of knowledge on the characteristics of tourism in a given region. However, it is difficult to compare results between provinces, and often even the scope of changes in the questionnaires or a sampling method within a given province prevent comparisons over time.

The cross-sectional structure of the questionnaire proposed for the Podkarpackie Regional Tourism Board enables measurements and comparisons in seasonal terms and between particular editions of subsequent sampling years. Thus, it is possible to describe changes in the structure of tourist traffic and possible evolutions in the opinions and expectations of tourists. The introduction of spatial models of tourist traffic to the questionnaire will translate into a description of changes in tourist behaviour over the years, which, in turn, will enable the construction of forecasting models over time.

It should be emphasised that any attempts to measure tourist traffic based on objectified external data (the counting gates mentioned in the text, the load on electricity grids or sewage network, the traffic recorded on the mobile network) have the advantage that they allow obtaining cross-sectional information without directly involving the tourists themselves. However, in order to be able to understand the perspective of tourists surveyed, it is required to perform a secondary comparison of the results obtained with the tourist values and resources of the area. In other words, through such sampling, we know a relatively accurate answer to the question "How much?". However, without asking the tourists what, in their opinion, determined their particular tourist choices, the question of why they decided to visit a particular place still remains a matter of conjecture.

According to the authors, this is the advantage of the research conducted directly among tourists and one-day visitors. Such data obtained are not able to compete with objective statistical data, or with the comprehensive existing data describing the scale of the intensity of tourist traffic. Any estimates based on questionnaire surveys remain only estimates, as accurate as the randomness and representativeness of the chosen research sample. However, they are indispensable when the goal is to understand the more complex reasons why tourists and one-day visitors came to a particular place at all. Thus, the above-mentioned concept is the only sensible solution when the goal is to aggregate subjective motives for visiting – when we should see a tourist destination through the eyes of tourists and wish to promote the destination in a way that is understandable and attractive to them.

In the entire proposed methodology, the key element is the mechanism of district selection, which, based on the annually verified popularity ranking of all the districts, allows to spot changes in the trends of tourist destinations in the Podkarpackie Province. In other words, the trends may change, in subsequent years completely new destinations may appear on the map of the Podkarpackie Province and, owing to the adopted algorithm of proceedings, it will be reflected in the research. Therefore, decision-makers will have the latest information explaining particular behaviour of tourists. Promotional activities will be able to react to the desirable expectations on an ongoing basis, better targeting particular categories of tourists.

Editors' note:

Unless otherwise stated, the sources of tables and figures are the authors', on the basis of their own research.

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