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**THE MEASUREMENT OF THE INNOVATIVENESS OF HEALTH TOURISM SERVICES
USING AN ADEQUACY MATRIX TITLE OF THE ARTICLE***

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Abstract. The main aim of the article is to identify the optimum measures of the innovativeness of providers of health tourism services. Two detailed objectives were set out: the identification of the measures of innovative activities and the identification of the measures of the effects of innovative activities implemented by respondents. The measurement covered two areas: the involvement in innovative activities and the effects of these activities. Two research hypotheses were verified: Hypothesis 1 – *The optimum measure of the involvement of providers of health tourism services in innovative activities is a separate budget earmarked for the implementation of innovations*; Hypothesis 2 - *The optimum measure of the effects of innovations introduced is a higher number of commercial tourists using the services of a given enterprise*. 438 providers of health tourism services in Poland took part in the research with using methods of a diagnostic survey and a telephone interview. An adequacy matrix was used to analyse the 15 innovation measures selected in an expert (Delphi) survey. As a result five optimum measures were determined, the most important of which was the elaboration of a strategy for introducing innovation and a higher number of tourists as the effect of innovative activities.

Keywords: innovations, service innovativeness, tourism, health tourism

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1. Introduction

Innovativeness is one of the most important management issues. Innovativeness is defined as the ability of organisations, sectors, regions or countries to seek, implement and disseminate innovations, i.e. this means doing something new or introducing significant changes which can be measured and assessed (Hilami, Ramayah, Mustapha, & Pawanchik, 2010). With respect to an organisation, innovativeness involves its ability to place new

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products on the market or to open new markets by combining a strategic orientation with innovative behaviour and processes (Danneels & Kleinschmidt, 2000).

Whereas on the macroeconomic level changes in the innovativeness level of countries and indicators for their measurement have been identified on the lowest levels there is still no uniform catalogue of measures. This issue is particularly complex in the service sector. The research problem addressed in this paper was a search for the measures of the innovativeness of providers of health tourism services. Health tourism is defined as a type of tourism the main purpose of which is to improve or maintain health (Boruszczak, 2010). The measurement difficulties result from the dichotomy of the investigated area made up by the tourism and medical sectors. The tourism sector provides services related to travel, accommodation and visits to tourist attractions, whereas the medical sector renders medical services which are in this case the purpose of a tourist travel.

A group of enterprises which provided health tourism services in Poland was selected for the research. The issues were chosen on the basis of three main premises. Firstly, the growing demand for the development of health tourism services, which is related to the ageing of society and the increasing leisure budget of certain customer groups. This has been indicated by the research done by Deloitte. Although the research covered the United States market, still it may provide guidance for other areas, including the countries of the European Union. As a result of the research, it was diagnosed that the tourism movement related to health tourism doubled in the USA in barely 5 years (from 2007 to 2011). The drivers of changes should be considered to include economic growth and the related higher per capita revenues (Rudawska, 2009).

Secondly, the dynamic development of medical sciences and enhanced international linkages. This development is a consequence of globalisation processes and a changed perception of medicine as no longer only services with healing functions (helping those in need) but also services with modelling and aesthetic functions. This change results from a holistic and optimistic understanding of the term “health”, i.e. a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (according to the World Health Organization (WHO)), ensuring a socially productive life in social, economic and mental terms, also in the spiritual dimension. Responses to the globalisation processes in medical services include e.g. the signing of multilateral contracts on medical care (Reismann, 2010), the liberalization of medical regulations (Lunt & Carrera, 2010; Morgan, 2010) and, in consequence, the efforts taken by certain countries to specialise in health tourism services (Brazil, India, Hungary, Costa Rica).

The third premise encouraging one to address the issue of innovativeness of health tourism is the emerging possibility of co-financing from the European funds (in the programming perspective of 2014-2020) for projects which are most important from the point of view of the social demand and enhanced innovativeness of the economy. The research has an interdisciplinary character and covers two research areas; specifically, medicine and the tourism economy. Therefore, this study is conducted to create a new way of looking at health tourism innovativeness and a method for its measurement. The researchers hope that this study will build foundations for both innovation theory and practice for entrepreneurs operating at the interface between tourism and medicine in order for the results of the research to be applied in their economic activities.

An indication of the measures of the innovativeness of health tourism will contribute to eliminating the existing gap in knowledge. This study is pioneering in character, since the innovation indicators used for health tourism have not been verified and classified to date.

1. Research objectives

The main aim of the research is to identify the optimum measures of the innovativeness of providers of health tourism services.

The detailed objectives were formulated:

- C1.** The identification of the measures of the involvement of providers of health tourism services in innovative activities;
- C2.** The identification of the measures of the effects of innovative activities implemented by providers of health tourism services;
- C3.** An indication of discrepancies occurring between experts' opinions and the market realities in the scope of the assessment of the measures of the innovativeness of providers of health tourism services;
- C4.** The adoption of innovation monitoring targets for the innovation policy of health tourism.

In order to achieve the objectives listed above, the following research questions were formulated:

- What is the innovativeness level of the investigated enterprises?
- What are the optimum indicators used to examine the innovativeness of a selected group of service enterprises?

2. Literature review

2.1. Innovativeness of service enterprises and its measurement

The concept of innovation brings to one's mind primarily such terms as change, improvement or reform. In the Polish legislation, innovation is defined as an activity related to the preparation and launch of the manufacture of new or improved materials, products, equipment, services, processes or methods intended to be placed on the market or for another use in practice (Ustawa (Act), 2015). Thus, innovation means a technical and organisational change which is expressed by a modification of existing products, practices or processes. The main issues of interest to the researchers in the world who deal with the issues of innovativeness in the economy include:

- innovation policy (Furman, Porter, & Stern, 2002; Grupp & Mogege, 2004; Balezentis, & Balkiene, 2014; Chen, & Nie, 2014; Chen, Nie, & Wen, 2015; Djeri, Armenski, Tesanovic, Bradic, & Vukosav, 2014);
- the innovation drivers in the economy (Hollenstein, 2003; Gault, 2011; Rezk et al. 2016);
- the innovative activity of enterprises (mainly production enterprises) (Tuominen, Rajala, & Möller, 2004; Perunovic & Christiansen, 2005) with particular consideration given to technological progress and R&D expenditure as well as their roles in the innovation process (Aw, Roberts, & Xu, 2011; Urban & Czerska, 2016; Ahmed et al., 2017; Mouraud, 2017; Barberis et al., 2017; Passerini et al., 2017);
- sector-specific research on the innovativeness of the economy (Garcia & Hollanders, 2009; Pauceanu, 2016; Laužikas, et al, 2016);
- the innovativeness of small and medium-sized enterprises (Frel, 2003),
- the innovativeness of tourism enterprises (Hjalager, 2010; Szymańska, 2009, 2013);
- innovativeness in the context of a knowledge-based economy and in the globalisation process (Rycroft, 2003; Ejdyś, Ustinovicus, & Stankevičienė, 2015; García-Fuentes, de Torre, 2017; Zemlickiene, et al. 2016);
- attempts are also taken to seek innovation in different areas of social activity and to link completely different phenomena (Deshpande & Farley, 2004; Ejdyś, 2015) or spatial planning the city (Hajduk, 2015).

Innovativeness in the service sector can be related to both products and the process of providing services, enterprise management, marketing, logistics or relationships with the business environment. Bosworth and Triplett (2007) found that a substantial part of an increase in productivity was a result of innovations introduced in the service sector.

Scandinavian countries were precursors of innovation research; still, it was in Switzerland that in 1999 accurate research was carried out on the innovativeness of the service sector. The Swiss Innovation Survey which gave the results of research at three research centres (in Austria and Switzerland) was presented by Hollenstein (2003). This publication indicated numerous difficulties related to the measurement of innovation in this area. Ulrike de Brentani (2001) indicated the importance of services as a driver of an economic success. But it was not until 2008 that an initiative was launched to combine international efforts within the European Union in the scope of research on the innovativeness of the service sector. Gallouj (2002), Gallouj & Windrum (2009), Gault (2011, 2013) and Hollanders should be regarded as the leading researches on the issues of the innovativeness of services at the international level. The latter two are members of the United Nations University Maastricht Economic and Social Research Institute on Innovation and Technology, specialise in research on service innovativeness and are experts involved in the preparation of a European report on the innovativeness of services. After 2000 Hollanders has been the author or co-author of more than 60 publications. He was also one of the initiators of, and participants in, research on the innovativeness of the service sector in the OECD (inter alia, Kanerva, & Hollanders, 2009). In turn, Gault coordinates the international cooperation in research on the innovativeness of service enterprises. The scope of his interest included, among others, sectoral innovativeness, including that of the aviation and tourism sectors.

Most of research on the assessment of the innovative activity of the service sector uses indicators defined and adopted by the OECD and applied to assess the innovativeness of the economies of the EU countries. It is important to note the Summary Innovation Index (SII) and the European Innovation Scoreboard (EIS). These are indices for which a methodology has been developed and their measurements have been carried out for a dozen years or so, enabling comparative assessments to be performed. The SII index is calculated on the basis of 25 sub-indices representing three areas of innovativeness (Hollanders et. el., 2014):

- enablers; this category includes the main drivers external to the enterprise which affect its innovation processes,
- firm activities; this category includes the areas related to the level of research and development outlays in the private sector, the number of patent rights granted to enterprises, the number of publications arising as a result of cooperation between the private and public sectors,
- innovation outputs, defined on the basis of sub-indices, representing the economic effects of the innovative solutions implemented. They include the number of enterprises which place innovative products on the market or apply innovative production methods, innovative marketing strategies or organisational arrangements, or indicators defining the employment at enterprises in the sectors considered to be innovative, the share of products from the high-tech technology sector in the trade balance, the revenues from the sales of licence and patent rights abroad and the employment in professions requiring expertise.

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The European Innovation Scoreboard (EIS) is an index which is also quite often used in the measurement of the innovativeness of the economy. The measurement distinguishes two areas (Kaźmierczak & Wilińska, 2010):

- the area reflecting expenditure on the innovative activity. The indicators in this area describe the innovation capability of the economy, i.e. its potential to create and commercialise innovations. The indicators distinguished in this area include those that measure financial resources, human resources and the environment which supports the innovative activity;
- the area which describes the results of the innovative activity. The indicators measure the effects of the combination of the creativity of society with financial resources in a specific economic and institutional environment. The measures include research on the areas of the effects of the research and innovative activities and commercialisation of knowledge.

The measurement of the innovativeness of services is a complex issue. On the one hand, most indicators used in official statistical research do not reflect the specificity of the service sector, and, on the other hand, the official indicators refer to the research on the level of the economies and are not suitable for the research on the level of sectors or individual fields, in particular service-based ones. This results from the fact that the research on the innovative activities of production organisations, individual sectors or fields can use statistical measures (e.g. the level of R&D expenditure, the number of patents and licences), while the absence of patents or separate research and development units in service enterprises makes it significantly difficult to assess their innovative activity.

Statistical offices in Poland try to unify the research on the innovativeness of services using statistical indicators, including, among others, those applied by the OECD. Consideration is given to the indicators of innovative activities, the types of innovations implemented and R&D expenditure. A drawback of this research is that the studies on service fields are limited to medium-sized and large enterprises. It is recognised that the problem related to the innovativeness of services arises from the fact that the set of indicators applied to measure innovativeness was originally developed for industrial sectors (Camison & Monfort-Mir, 2012). Given this, certain researchers (Lightfoot, & Gebauer, 2011) propose that the research on the innovativeness of the service sector should be separated from the research on the innovativeness of the production sector. This follows from the fact that the scores for the innovative activity for the whole service sector are underestimated in official statistics (Hollenstein, 2003).

2.2. Health tourism as a research area

The health tourism market based on health resort-based, spa & wellness, aesthetic medicine and medical services (Szymańska, 2015) develops dynamically as a result of the continuously increasing availability of the services listed above as well as cheap and fast means of transport. On the one hand, this relates to changing social needs and lifestyles. The change of lifestyles from passive rest to active one is based on the enhanced awareness of the significance of health in human life and, at the same time, the launch of actions to improve health and to regenerate the physical, mental and spiritual strength stressed by the technicised civilisational development. Active rest often entails preventive rehabilitation delivered by visits to health resorts or relaxing activities during visits at spa and wellness clinics, as well as in recent years even medical services. As a result, health improvement is the purpose of tourist travels and, at the same time, the basis for the development of the health tourism market. The demand for health services has become a global phenomenon related to economic growth, increasingly good education and enhanced revenues (Rudawska, 2009). On the other hand, significant changes can be seen in medicine. A wide offer of high-quality medical services is a response to the globalisation of health services (Lunt & Carrera, 2010; Morgan, 2010). Moreover, the causes of travels for health purposes are considered to include the availability of cheaper, alternative procedures conducted outside of the country of residence (Hazarika, 2010) and the unavailability of services in the country of residence, caused, among others, by procedural barriers to availability and long waiting lists (Burkett, 2007) (in particular, medical services). An important driver of the development of this market is also the incorrect health policy of countries, e.g. 47 million Americans live without health insurance (Amodeo, 2010) and it also results from the signing of multilateral intergovernmental agreements on medical care (Reismann, 2010). Moreover, medical services have gone beyond the traditional perception of medicine based on its healing functions, understood to mean helping those in need, to include modelling or aesthetic functions. Its broader meaning derives from a holistic and optimistic understanding of the term “health”, according to the World Health Organization (WHO, 2016) “a state of complete physical, mental and social well-being, ensuring a socially productive life in social, economic and mental terms, also in the spiritual dimension”. The actors on the health tourism market include not only persons suffering from specific disease symptoms, but also physically healthy persons who wish to change the everyday rhythm of their lives, to experience new challenges or to improve their current health condition. Because of the factors listed above health tourism already develops in more than 35 countries in the world (Amodeo, 2010). The main destination markets are the countries which can ensure care of foreign patients, easy and relatively cheap access to medical procedures, including

cardiological, orthopaedic, dental and plastic surgery procedures (Untii, 2009), as well as health resort-based or aesthetic medicine procedures. E.g. such countries as India, Singapore and Thailand have become world leaders in the field of medical tourism, to control more than 80% of the market (Newswire, 2012). Thailand specialises in aesthetic surgery or sex change, while Singapore attracts patients in the segment of advanced methods for the treatment of circulatory system diseases, neurosurgery or stem cell-based therapy (Newswire, 2012). In conclusion, it can, therefore, be said that the health tourism market develops as it goes beyond the institutional boundaries in the cooperation between tourism and medicine.

2.3. Innovativeness of health tourism and its measurement

Similarly, the research on the innovativeness of the tourism services sector based on such indicators as research and development expenditure, the number of patents granted and the number of product innovations implemented can significantly underestimate the real effects of innovation processes in tourism (Sunbdo, Orfila-Sintes, & Sorensen, 2007). This results from the fact that the indicator of research and development expenditure is not applicable to tourism. The innovation process in these services is based on the creation of values and changes of behaviour and does not include research and development activities. The indicator of the number of patents granted is not applicable, either, since in tourism innovations in the form of industrial inventions represent very rare and single cases. The indicator of the number of product innovations implemented in the tourism sector is hardly identifiable. Innovations often take on the form of a chain and it is difficult to precisely separate product innovations from process ones. Moreover, to a large extent a new value is created in the field of marketing (Sunbdo, Orfila-Sintes, & Sorensen, 2007). The innovativeness of the tourism sector services has been explored only slightly (Szymańska, 2009; Hjalager, 2010; Camison & Monfort-Mir, 2012). Detailed research on the innovativeness of the tourism services indicates that this is a sector with a low innovativeness level (Hjalager, 2002); no research has been carried out, either, to analyse the factors which drive this negative result (Hjalager, 2009). It is believed that the indicator presented in official statistics, e.g. Community Innovation Surveys, often fails to represent the real status of the innovativeness of this sector (Camison & Monfort – Mir, 2012).

Research indicates that the situations where the institutional boundaries are crossed and demolished are a favourable environment for the creation of innovations (Garcia – Altes, 2005). Therefore, innovations in medicine contribute to the growth of tourism and new preferences in the field of tourism affect the search for medical products and their commercialisation. Thus, the development of medicine can be one of the drivers of tourism, while, medical innovativeness can be an indicator for the activities of enterprises operating on the tourism market (Hjalager, 2002). In addition, it is recognised that the innovation capabilities are much greater in larger tourism enterprises and those connected to the web and other horizontal groups (Hjalager, 2002).

The research on the innovativeness of health tourism has been carried since only recently by few researchers and included studies on the innovativeness of the market of health tourism and its forms (Hjalager, 2009; Szymańska, 2013; Szymańska, 2015; Panasiuk, Panfiluk, & Szymańska, 2016; Panfiluk, 2016.) In contrast, the innovativeness of the medical sector has been widely described, mainly in specialist medical journals and also in economic publications. A review of these issues was carried out, among others, in the *Report on the innovativeness of the medical sector in Poland* (2012). The American, Hungarian and French experiences can turn out to be particularly useful in this respect.

The measurement of the innovativeness of health tourism is particularly important given the fact that this is a new tourism segment whose services develop on the basis of two separate sectors, i.e. tourism and medicine. In this combination, the health tourism segment represents an innovative, specialised form of tourism which counteracts the effect of seasonality and contributes to the growth of the tourism movement. In consequence, it can significantly help stabilise the tourist demand out of season. In conclusion, a distinct shortage of scientific

publications on the innovativeness of health tourism should be noted. Therefore, the exploration of these issues is a pioneering challenge facing researchers.

The following research hypotheses were verified:

Hypothesis 1 - *The optimum measure of the involvement of providers of health tourism services in innovative activities is a separate budget earmarked for the implementation of innovations.*

Hypothesis 2 - *The optimum measure of the effects of innovations introduced is a higher number of commercial tourists using the services of a given enterprise.*

The Figure 1 shows the theoretical framework of the research.

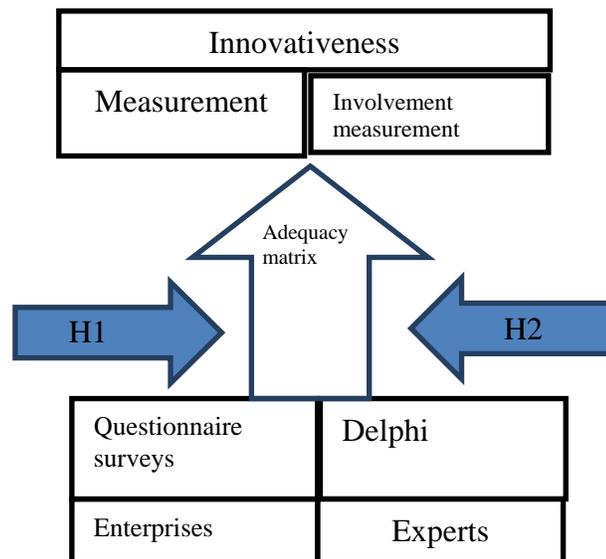


Fig. 1. Theoretical framework of research

3. Research methodology

In order to achieve the preset objectives and verify the hypotheses posed, two types of studies were carried out: qualitative and quantitative surveys. The Delphi and questionnaire methods, which were suitable in light of the research objectives, were applied (Fig. 1).

The respondents, the indicators of their measurement and their significance in the assessment of the innovative activity in health tourism services were identified using the Delphi expert method. The identified indicators were empirically verified by the questionnaire method using the technique of a diagnostic survey.

The application of the Delphi method enabled a synthesis of important knowledge (including undisclosed one) for a given subject (Popper, 2008). Delphi is one of the methods used in the foresight research also in the area of tourism management (Szpilko, 2016). The research was carried out in 2015 in three stages. At the first stage, the implementers' team formulated research theses based on a theoretical analysis of the research literature (Nazarko & Kononiuk, 2013). The second research stage involved the performance of the first round of the Delphi process using electronic CAWI forms. 12 experts representing a field of economic sciences and having scientific achievements in the scope of innovation and the economics of tourism, including health tourism, were invited to

take part in the research. The experts included practitioners. At the third stage, the experts received a form which contained in graphic form the summary results of the first round. In the second round of the survey, the experts could change their minds on a given subject, marking a new answer or reiterating the previous one. As a result of this survey, a set 12 measures was recommended for measuring the innovativeness of health tourism, including: 5 measures of the actions for innovation and 7 measures of the assessment of the innovative actions taken. Moreover, a complementary objective of the Delphi survey was the identification, based on the scientific literature, of the types of providers of health tourism services which must be taken into account in the research on the innovativeness of this sector.

The health tourism providers operating in Poland were empirically verified by the method of a diagnostic survey. In order to determine the size of the research sample, the experts indicated four groups of entities according to the Polish Classification of Activities (PKD, 2014): a) hospitals, physicians' offices (medical practice), the other activities in the scope of health care (excluding providers of health resort-based services), social assistance with accommodation and ensuring a nurse's care, b) health resorts and health resort-based treatment facilities, c) hotels and similar accommodation facilities providing spa & wellness services, d) the activities of travel agencies and intermediaries as well as tour operators.

The size of the investigated population was determined on the basis of data from the Local Data Bank (BDL, 2014) as 241,393 entities. The size of the representative sample was calculated using the calculator of the research sample. The following parameters were adopted for calculating the size of the investigated sample: the confidence level: 0.95, the population size: 241,393, the expected fraction size: 0.5 and the maximum error: 0.05. As a result of the calculations, the minimum sample size was determined as 384 entities.

The research was carried out using a survey questionnaire as a tool in the period from November 2015 to March 2016. Two techniques were applied to collect data: CAWI[†] and CATI[‡]. Following negative verification, 446 entities were ultimately subjected to the research. The most numerous group among respondents consisted of outpatient clinics, private doctors' offices and hospitals (47% respondents). Accommodation facilities providing spa and/or wellness procedures (23%) as well as tour operators and travel agencies and intermediaries (21%) represented a more than twice as small a group. The least numerous respondents' group consisted of health resorts and health resort-based hospitals (9%).

The results obtained were analysed and assessed in accordance with the research questions presented in the Introduction. The analysis was carried out in a structural approach (the frequency of occurrence). The results obtained were compared using an adequacy matrix. An adequacy matrix is a graphic and tabular tool applied to present dependencies. The present study presents the theoretical and empirical dependencies in the scope of the measurement of the innovativeness of enterprises and the effects of their innovative activities. The graphic and tabular form of the presentation of results shows, on the one hand, the measures of the innovativeness of health tourism recommended by experts and, on the other hand, the empirical results of the measures applied by

[†] At the first stage of the research, 35,000 e-mail addresses were purchased and the link to the questionnaire placed after the link ankietka.pl was distributed, 51 questionnaires were returned until 31 December 2015.

[‡] A telephone interview was carried out by trained interviewers, the students of the Tourism and Recreation 1st degree studies, semester IV, at the Management Faculty of the Bialystok University of Technology. In the course of the interview, the interviewers recorded the answers in the paper version of the questionnaire. After the interview had been carried out the interviewers recorded the results of the questionnaire in the CAWI version. In the course of the interviews, part of respondents expressed their willingness to fill in the questionnaire on their own in the CAWI version. The CAWI version was filled in by a total of 37 entities. As a result of a telephone interview, 373 questionnaires were acquired (representing a return rate of 10%).

providers of health tourism services. The data are presented in a coordinate system where the vertical axis represents the values of the recommended indicators, while the horizontal axis shows the values of the applied indicators. The variable adopted in the theoretical and empirical analysis of the measures and their hierarchisation are the indications from the particular groups of respondents: experts and entrepreneurs. In designing the adequacy matrix, the recommended indicators were placed on the theoretical side, while the indicators implemented in enterprises were featured on the empirical side. In its graphic form, the adequacy matrix is a plot where two axes represent, respectively, the effect of recommendation and the effect of implementation. In turn, in its tabular form, it is a matrix with the dimensions of 3x3 areas which distinguishes three scoring levels of the recommended indicators, i.e. those with low, average and high theoretical significance for the research on the innovativeness of enterprises, and three scoring levels of the recommended indicators, i.e. those with low, medium and high application levels. In order to determine the boundaries between the particular levels, the following values were adopted for the external boundaries: the minimum number of indications (in %) and the maximum of indications (in %), while for the internal boundaries: the average value minus the standard deviation and the average value plus the standard deviation (Fig. 2).

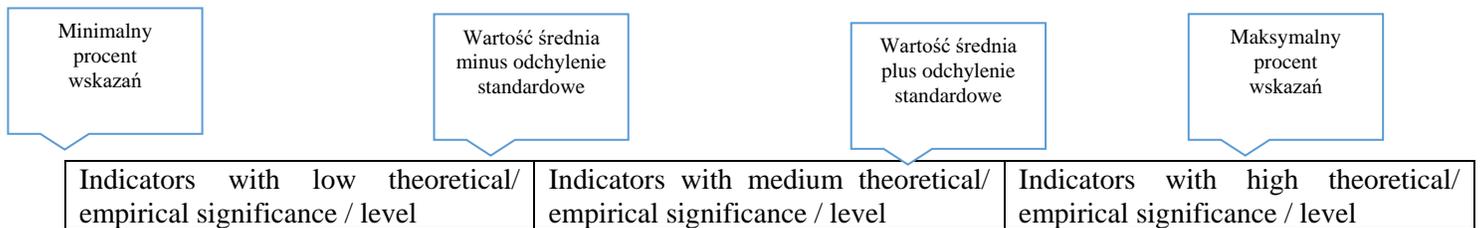


Fig 2. The boundaries between the theoretical and empirical levels in the tabular matrix

Source: K. Dębowska, W. Zalewski (2011). Wielowymiarowa analiza poziomu ubóstwa powiatów województwa podlaskiego [Multivariate analysis of poverty of the Podlaskie province districts. *Ekonomia i Zarządzanie*. Vol. 3, 7-16.

Figure 2 shows the three basic areas which represent the research results. The first area contains indicators with low significance for a given independent variable. In this research, this variable is innovativeness. These indicators are characterised by the minimum percentage of indications. The next area contains indicators with medium significance, calculated on the basis of the difference between the average value and the standard deviation. The last, most important area of the matrix shows indicators with high significance for the independent variable, falling between the average value plus the standard deviation and the maximum percentage of indications. The template of the tabular matrix is illustrated below.

Table 1. The template of the tabular matrix

Indicators with high significance	I C	II C	III C
Indicators with medium significance	I B	II B	III B
Indicators with low significance	I A	II A	III A
	Indicators with low application level	Indicators with medium level	Indicators with high application level

Source: Own work.

The nine-field matrix enables the identification of three types of indicators serving to investigate innovativeness, distinguishing between the recommended indicators and those implemented by enterprises. These are indicator types which indicate:

- high theoretical and empirical balance (the fields marked with the lightest colour: I A; II B; III C);
- medium theoretical and empirical balance (the fields marked with a light grey colour: I B; II A; II C; III B);
- low theoretical and empirical balance (the fields marked with a dark grey colour: I C; IIIA).

A high theoretical and empirical balance occurs when the significance of a recommended indicator assessed on a 3-point scale adequately corresponds to the same application level.

This relates to the situations in which the low significance of the recommended indicator is balanced by the low application level of the applied indicator, the medium significance of the recommended indicator is balanced by the medium application level and the recommended indicators with high significance are balanced by the high application level. The situation which occurs here is the one where the recommended indicators are implemented

by enterprises. This means that these indicators can be used for the general measurement of the level of innovativeness of enterprises. However, a high level of recommendation and application of the indicator applied is most desirable.

A low theoretical and empirical balance occurs in the extreme situations in which the recommended indicators with high significance are used at a low application level and, conversely, the recommended indicators with low significance are used at a high application level. In the former of the cases analysed here, the action strategy should consist in encouraging enterprises to use them. In the latter situation, the action strategy should consist in encouraging enterprises to give up the indicators with low significance for the research on the innovativeness of enterprises. A medium theoretical and empirical balance occurs in the remaining cases of relationships between recommended and applied indicators, as shown in the matrix.

The adequacy matrix is used to investigate the theoretical and empirical correlations between the indicators for the measurement of the involvement of enterprises in innovative activities and to examine the level of their application at enterprises. 5 indicators to choose from were proposed here. The adequacy matrix is used to investigate the theoretical and empirical correlation between the indicators of the assessment of enterprises' innovative activities and also to show their application in practice by entities in their assessment of enterprises' innovative activities. Here, the experts adopted 7 categories of indicators.

In the present research, two types of adequacy matrices were elaborated (in graphic and tabular forms) for the two abovementioned types of indicators for the measurement of the innovativeness of health tourism services. They were:

- the indicators for the measurement of the involvement of enterprises in innovative activities (5 categories of indicators),
- the indicators of the assessment of the effects of enterprises' innovative activities (7 categories of indicators).

The research covered innovative activities carried out for 3 years, i.e. in the period from 2013 to 2015.

4. Research results and findings

4.1. The involvement of enterprises in innovative activities

The adequacy matrix elaborated for the measurement of the involvement of enterprises in innovative activities contained five categories, specifically:

- the elaboration of the development strategy providing for innovations;
- the expenditure on the implementation of own research and development work;
- a special budget for the implementation of innovations;
- the financial resources for training recalculated per employee in a year;
- the establishment of a work post / unit responsible for the collection of market information.

Fig. 3 shows the results obtained for one of the preset objectives (C1) and the first hypothesis (H1).

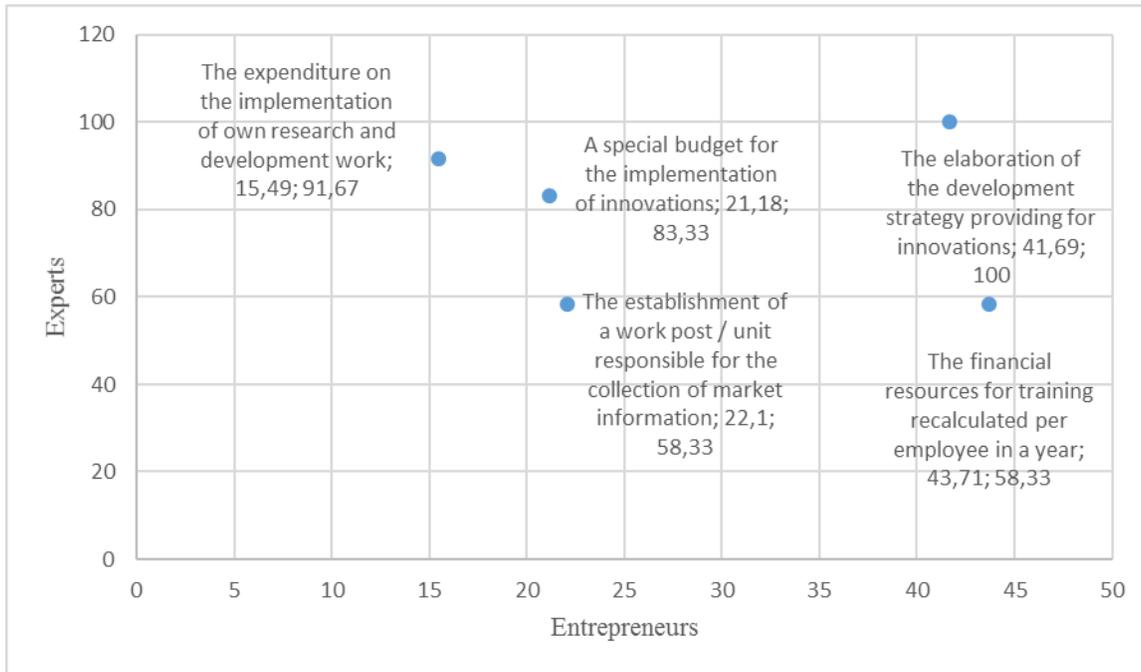


Figure 3. A graphic theoretical and empirical adequacy matrix of the indicators for the measurement of the involvement of providers of health tourism services in innovative activities

Source: Own elaboration based on the results of quantitative (questionnaire) and qualitative (Delphi) surveys.

In the experts' opinion, in the research on the innovativeness of health tourism enterprises the following was significant for the measurement of the involvement of enterprises in innovative activities: the elaboration of the development strategy providing for innovations (100% of indications), a separate special budget for the implementation of innovations (83.33%) and the expenditure on the implementation of research and development work (91.67%). The indicators: the financial resources for training recalculated per employee in a year (58.33%) and the establishment of a separate work post / unit responsible for the collection of market information (58.33%) were slightly less significant.

It followed from the respondents' statements that in the period from 2013 to 2015 innovations were implemented by 359 entities, representing 82% of the investigated entities. 152 respondents (i.e. 35%) admitted that they did not apply any indicators for the measurement of innovativeness. In the remaining group of enterprises, 44% had separate financial resources for employee training and 42% of entities had their development strategies providing for innovations. Every fifth investigated entity (22.18%) had a separate work post or unit responsible for the collection of market information and a separate special budget for the implementation of innovations. The smallest number of entities (15.49%) reported their expenditure on the implementation of own research and development work.

The detailed results of the research shown in Fig. 3 are presented in the tabular matrix below (Table 2).

Table 2. A tabular theoretical and empirical adequacy matrix of the indicators for the measurement of the involvement of enterprises in innovative activities

Theoretical recommendations

Max. 100

97.52	Indicators with high significance		The elaboration of the development strategy providing for innovations	
59.14	Indicators with medium significance	The expenditure on the implementation of own research and development work	A special budget for the implementation of innovations	
Min. 58.33	Indicators with low significance		The establishment of a work post responsible for the collection of market information	The financial resources for training recalculated per employee in a year
		Indicators with low application level	Indicators with medium application level	Indicators with high application level
	Min. 15.49	15.90	41.77	Max. 43.74

Empirical results

Source: Own elaboration based on the results of quantitative (questionnaire) and qualitative (Delphi) surveys.

The application of the matrix indicated that the measure of a special budget for the implementation of innovations demonstrated a high theoretical and empirical balance, although it had medium significance for the measurement of innovative activities. A medium theoretical and empirical balance was demonstrated by the indicators of the elaboration of the development strategy providing for innovations, the expenditure on the implementation of own research and development work and the establishment of a work post / unit responsible for the collection of market information. In the experts' opinion, the indicator of the elaboration of the development strategy providing for innovations had high significance for the measurement of innovativeness and a medium application level. In the experts' opinion, the indicator of the expenditure on the implementation of own research and development work had medium significance for the measurement of innovative activities and a low application level. In the experts' opinion, the establishment of a work post responsible for the collection of market information had low significance for the measurement of innovative activities and a medium application level. A low theoretical and empirical balance was demonstrated by the indicator of the financial resources for training recalculated per employee in a year and was characterised, at the same time, by low significance for the measurement of innovative activities. In market realities, it was applied relatively often and its application level was high.

4.2. The assessment of the innovative activities of enterprises

Another investigated area was the assessment of the innovative activities of the surveyed enterprises. The adequacy matrix elaborated for the assessment of the effects of enterprises' innovative activities contained seven categories of indicators (Fig. 4):

- employees' higher productivity;
- lower costs of the provision of services;
- the registration of a trade name or trade mark;
- higher revenues from the sales of services;
- the limitation of the seasonality of tourism;

- a higher number of tourists visiting a given area in a year.

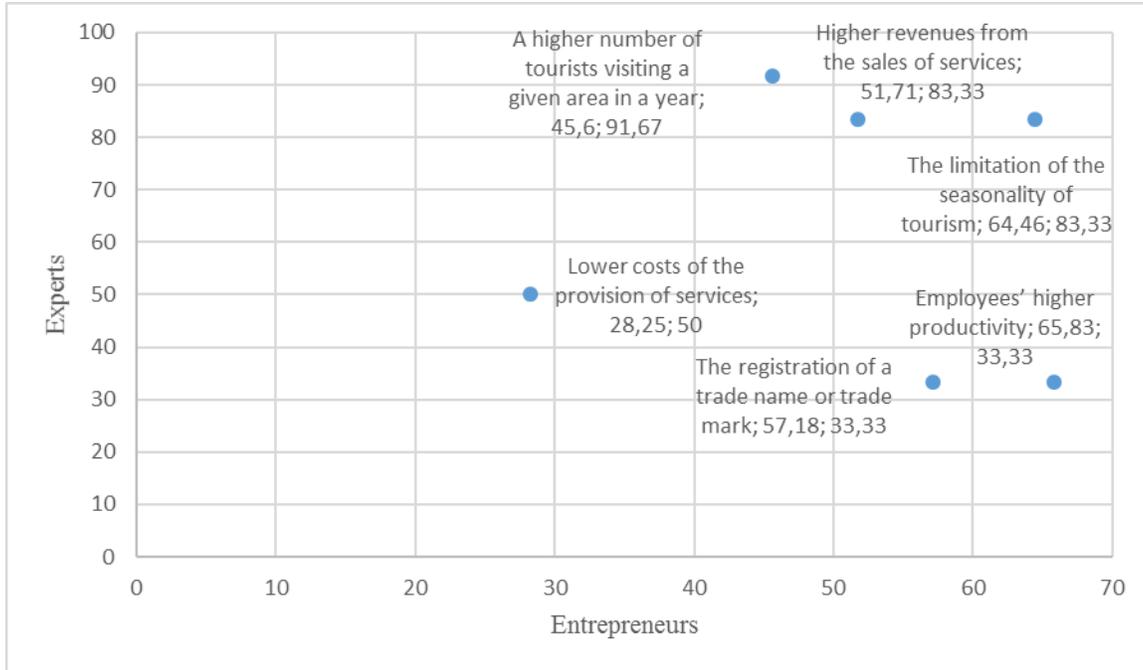


Fig. 4. A theoretical and empirical adequacy matrix of the assessment of the effects of innovative activities at providers of health tourism services

Source: Own elaboration based on the results of quantitative (questionnaire) and qualitative (Delphi) surveys.

In the experts' opinion (Fig. 4), the indicators with high significance for the measurement of the effects of innovative activities carried out by health tourism enterprises included the following indicators: a higher number of tourists visiting a given area in a year (91.67% of indications), higher revenues from the sales of services (83.33% of indications) and the limitation of the seasonality of tourism (83.33%). The experts recognised that such indicators as the registration of a trade name or trade mark (66.67% of indications each), lower costs of the provision of services (50.00% of indications) and employees' higher productivity (33.33% of indications) had slightly lower significance for the measurement of the effects of innovative activities.

Entrepreneurs' opinions did not always coincide with practice. Empirical studies showed that enterprises assessed the effects of the innovative activities implemented on the basis of the following measures: a higher number of tourists visiting a given area in a year (45.6%), higher revenues from the sales of services (64.46%), the limitation of the seasonality of tourism (51.71%), the registration of a trade name or trade mark (66.67% of indications), lower costs of the provision of services (28.5% of indications) and employees' higher productivity (65.83% of indications). Detailed results are shown in Table 3.

Table 3. A tabular theoretical and empirical adequacy matrix for the balancing of the assessment of the effects of the innovative activities carried out at the examined enterprises.

Theoretical recommendations

Max. 91.67

89.67	Indicators with high significance		A higher number of tourists visiting a given area in a year	
45.44	Indicators with medium significance	Lower costs of the provision of services	The registration of the trade name or trade mark, the limitation of the seasonality of tourism	Higher revenues from the sales of services
Min. 33.33	Indicators with low significance		Employees' higher productivity	
		Indicators with low application level	Indicators with medium application level	Indicators with high application level
	Min. 28.25	38.18	64.16	Max. 65.83

Empirical results

Source: Own elaboration based on the results of quantitative (questionnaire) and qualitative (Delphi) surveys.

Using a theoretical and empirical adequacy matrix in tabular form, it was found that such factors as the registration of a trade name or trade mark and the limitation of the seasonality of tourism demonstrated a high theoretical and empirical balance. They had medium significance for the measurement of the effects of innovative activities. A medium theoretical and empirical balance was demonstrated by all the other investigated measures, i.e. a higher number of tourists visiting a given area in a year, lower costs of the provision of services, employees' higher productivity and higher revenues from the sales of services. In turn, in the experts' opinion, a higher number of tourists visiting a given area in a year had high significance for the measurement of the effects of innovation, although in practice its application level was a medium one. In the experts' opinion, another factor, specifically: lower costs of the provision of services, had medium significance for the measurement of the effects of innovative activities, while, at the same time, its application level was a low one. In the experts' opinion, still another factor, i.e. higher revenues from the sales of services, had medium significance for the measurement of the effects of innovative activities, although its application level was a high one. In the experts' opinion, the last of the measures considered, i.e. employees' higher productivity, had low significance for the measurement of the effects of innovative activities, with a medium level of its application by enterprises (Table 3).

5. Limitations, discussion and conclusion and recommendations

Based on the research results, recommendations can be drawn up and objectives can be laid down for monitoring the innovation policy of health tourism.

5.1 Limitations

In the course of the research certain limitations occurred. They were caused by the need to formulate the drivers (measures) of innovativeness which were patterned on the previous studies, mainly dealing with service enterprises. Given that this research is *in statu nascendi*, other, more precise groups of indicators should be added to the proposed two groups of them. Action should be launched to assess customers' opinions on the innovations introduced.

5.2 Discussion

In accordance with expectations, as a result of the research on the innovativeness of health tourism, the financial effects gained by introducing innovations turn out to be most important among the measures of the effects of this activity. Our research confirmed the thesis put forth by Sundbo, Orfila-Sintes, & Sorensen (2007) that the innovativeness of the tourism services sector should not be assessed on the basis of such indicators as the expenditure on the implementation of own research and development work and the number of patents granted. Instead, more detailed research should assess innovations in terms of linkages (processes) in chain form.

In turn, it is difficult to agree with Hjalager (2002) that tourism services, in particular providers of health tourism, represent a low level of innovativeness; quite on the contrary, since 82% respondents implemented innovations over 2 years.

The research is novel in character; therefore, undoubtedly one needs to agree with the opinions of Szymańska (2009) that the issues of innovativeness of health tourism has been explored only slightly.

The results of the present research confirm the earlier conclusions of Garcia-Altes (2005) that the combination of tourism and medicine, i.e. activities going beyond sectoral boundaries, are a favourable environment for creating innovations.

5.3 Conclusions

As a result of the implementation of the present research, the main goal and detailed objectives were achieved. The measures of the assessment of the level of the involvement of providers of entities in innovative activities as well as the measures of the assessment of the effects of innovative activities were identified.

Hypothesis (H1), providing that the optimum measure of the involvement of providers of health tourism services in innovative activities is a separate budget earmarked for the implementation of innovations, was verified negatively. It had medium significance for the measurement of the drivers of enterprises' innovative activities, although the experts recommended its use. In contrast, the other hypothesis (H2), indicating a higher number of commercial tourists as the best measure of the effect of the innovations implemented, was confirmed.

The application of an adequacy matrix enabled the experts' opinions to be confronted with market realities in respect of the innovativeness of providers of health tourism services. Using the matrix important conclusions could be drawn. First of all, the elaboration of the development strategy providing for innovations was a measure with high significance. And although it was recommended by the experts for the measurement of the drivers of innovative activities, it was not implemented correctly by enterprises.

Three measures should be applied in the measurement of the effects of innovative activities:

- the limitation of the seasonality of tourism. The recommended indicator was correctly implemented by enterprises. It had medium significance for the measurement of the effects of innovative activities;
- the registration of a trade name or trade mark. The recommended indicator was correctly implemented by enterprises. It had medium significance for the measurement of the effects of innovative activities;
- a higher number of tourists visiting a given area in a year. This was an indicator with high significance for the measurement of the effects of innovative activities. The recommended indicator was not correctly implemented by enterprises.

5.4 Recommendations

Two measures of the involvement of entities in innovative activities should particularly be recommended for further research on innovativeness:

- the elaboration of the development strategy providing for innovations;
- the separation of a special budget for the implementation of innovations.

In the category of the assessment of the effects of enterprises' innovative activities, the following measures are recommended:

- the limitation of the seasonality of tourism;
- a higher number of tourists visiting a given area in a year;
- the registration of a trade name or trade mark.

In the scope of the monitoring of the innovation policy of health tourism, it is recommended that support should be given to the elaboration of the development strategies providing for innovations and enterprises should be encouraged to prepare and implement them.

In conclusion, it should be recognised that the research results make a contribution to economic sciences, particularly to innovation theory and innovation management. Given the specific results which it proved possible to formulate, they should be applied in economic practice by providers of health tourism services when they implement

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