

THE INFLUENCE OF INNOVATIONS CO-FINANCED FROM THE EUROPEAN UNION FUNDS ON THE DEVELOPMENT OF HEALTH CARE INSTITUTIONS – A REGIONAL APPROACH

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Purpose: The article deals with the subject of innovation in theoretical and practical terms. The aim of the study was to determine the impact of innovations co-financed from EU funds on the development of the health care sector in the Łódź region.

Design/methodology/approach: The article is based on literature studies, the results of literary studies from empirical research and own research of the author. The aim was achieved by the use of CATI technique (*CATI – Computer Assisted Telephone Interview*).

Findings: Innovations in health care institutions are a necessary condition for overcoming the challenges of the contemporary environment. They contribute to the improvement of the quality of provided services, expansion of the examined entities (in terms of medical equipment and infrastructure) and increasing the level of accessibility to medical services.

Research limitations/implications: The primary limitation of the conducted research is the lack of possibility to generalize the results to the entire group of entities operating in Poland. The results may serve as an assessment of the current status regarding the functioning of health care institutions in the Łódź region.

Practical implications: The health level of a society is closely related to the level of economic development. A healthy, capable and long-living society is able to produce more goods and services, which has a direct impact on development, while a high level of development creates the possibility of allocating more resources to the health sector.

Originality/value: This article presents original empirical findings on the sources of funding, types and areas, and effects of innovation ventures in hospitals. The efforts to improve the understanding and implementation of innovation in hospitals are significantly hindered by the lack of solid scientific evidence. Therefore, a framework for further research has been created to confirm the urgent need for directions in the development of innovation in the health sector.

Category of the paper: Research paper.

1. Introduction

In a number of international rankings comparing health care systems, the Polish system takes one of the last places in the European Union. The document "Health at a Glance: Europe 2021", which is the result of continuous and close cooperation between the OECD and the European Commission to improve knowledge on health in individual countries and in the EU as a whole, within the framework of the Commission's cycle "State of Health in the EU", indicates that "the share of GDP dedicated to healthcare in Poland remains low, accounting for only 6.5% in 2020, and per capita funding for health is much lower than the EU average". And according to the "FutureProofing Healthcare" report, Poland was ranked only 25th in the Health Systems Sustainability Index among 28 EU countries. The COVID-19 pandemic has aggravated weaknesses in healthcare systems that existed prior to the outbreak. It has resulted in an increase in patients' health needs, while access to medical services has deteriorated. The current system is not patient-friendly, does not ensure the efficient use of public funds, and creates problems for the managers of health care institutions and the staff employed there. This suggests an urgent need for change in this sector.

The tendency to innovate is now recognised as one of the main attributes of economic competitiveness. According to Romer's new growth theory, technological progress is mainly the result of research and development activity of entities (Romer, 1990). The mentioned activity favours both the innovative activity of the organisation and the ability to incorporate innovations from outside. The innovation of the economy is primarily evidenced by the ability and motivation of organisations to continuously search for and use in practice new concepts, ideas and inventions, the improvement and development of existing technologies in the production and service sector, as well as the introduction of new solutions in management or the development of infrastructure. Numerous empirical studies validate the fact that the activity and level of innovation of organisations depends on both external factors related to the environmental impact (direct impact factors, sectoral factors) and internal factors (identifying resources, competences and motivation to undertake activity in the field of innovation) (NBP Report, 2016; Romanowska, 2016). While innovations can have an impact on improving patient care, it can also improve job satisfaction among medical staff. Research commissioned by the United Nations revealed that during a pandemic, access to health services worldwide decreased by 20% compared to pre-pandemic times (Liberman, 2020).

The aim of the article is to determine the impact of innovations co-financed by the European Union on the development of health care institutions on the example of the Łódź region.

2. Teoretical background

The level of innovativeness of the health care system in Poland is still insufficient, and the reasons for that are varied. In international rankings comparing health care systems, the Polish system takes one of the last places in the European Union. Innovation may be one of the most important tools that can be used to develop the health system. This is due to the fact that through innovations occurs: improvement and modernization of procedures, increase of efficiency, capacity and quality of work, improvement of the form and value of goods and their competitiveness, development and increase of operating skills and work efficiency, elimination of restrictions and mobilization of resources, as well as improvement of working conditions (Ambler, 2004; Baruk, 2013; Pomykalski, 2013; Dąbrowska, 2018; Dejnaka, 2018). Most entities perceive innovation as something both new, which may include new applications of existing tools, and improved, that can simply signify a measurable advance over older alternatives (Matusiak, 2011; Czerniak, 2013; Kalowski, Wysocki, 2015; Sońta-Drączkowska, 2018; Głodek et al., 2018). According to a recent Deloitte research, only half of innovation efforts achieve the desired value, and organisations that are efficient in implementing innovation are characterised by unique features (Bechtel, Kark, Henry, 2021). An analysis of previous research indicates different funding models for innovation programmes, ranging from traditional top-down research and development allocations to bottom-up, immediate or project-based models (Bechtel, Kark, Henry, 2021).

Health care is a global priority, and as Eurostat demonstrates that while health care systems in European Union countries are organised and financed differently, their common goal is universal access to quality services that are accessible to both individuals and society (Eurostat, 2022). In 2015, the new 2030 Agenda for Sustainable Development was adopted, indicating up to 17 Sustainable Development Goals as directions for actions by the international community. Among the 17 goals, one of them concerns the area of health. Research results conducted so far indicate that the level of health of the society is closely related to the level of economic development. A healthy, capable of working and long-living society is able to produce more goods and services, which has a direct impact on development, while a high level of development creates an opportunity to transfer more funds to the health care sector. In 2004, upon joining the European Union, Poland obliged to adapt Polish policy, including health policy, to the provisions of the EU (Karski, 2005). Although health care has the smallest impact on health (10%), health care systems consume approximately 90% of all health care expenditures (Czupryna et al., 2001). Compared to other EU countries, the Polish health care system shows delays in the introduction of modern medical technologies, including the treatment of diseases, above all cancer and cardiovascular diseases. Poor organisation of the health care system does not ensure early detection of a disease. Only some providers, due to the scale of necessary investment outlays, are able to provide a wide range of both diagnostic and

therapeutic tests at the place of providing services. In addition, the scale of financing the health needs, expressed as a percentage of the health system expenditures to GDP, is low in comparison to other European countries. This leads to an insufficient supply of health services in comparison with the justified health needs of the society. The basic objective of the health care system ought to be achieving the maximum health outcome with the effective use of the available resources, which will translate into the prolongation of life in good health of the entire society. Achieving this objective will contribute to the improvement of the quality and availability of services, improve the effects of treatment and result in the increase of patients' satisfaction.

A necessary condition for an effective reform of the system is access to external sources of funding, which can be EU funds. EU funds not only contribute to the achievement of the European Union's development goals and improvement of financing in the area of innovation, but also support the creation of an innovative and competitive health care sector. According to the Europe 2020 Strategy, economic growth is achieved through more effective actions towards innovation. Such an assessment is also presented in the "Innovation Union" initiative – a flagship project implemented under the abovementioned strategy (EC, 2020). This means that efforts to create innovation-friendly ecosystems should be intensified. In 2014-2020, 30% of all funds were allocated to innovation development. The National Smart Specialisations (Krajowe Inteligentne Specjalizacje), which unlocked the innovation potential of European Union regions, contributed to this as well. In the analysed programme period, health innovation was dispersed among many projects requiring coordination of efforts to ensure and monitor their contribution to the health policy objectives contained in the National Strategic Framework – Policy paper for health care 2014-2020 (Ministry of Health, 2015). Innovation in the health sector continues to be an important issue in the next 2021-2027 programme period, where EU innovation priorities are expected to be achieved with a budget of almost €3 billion, an increase of almost €600 million compared to the previous funding period (Większy budżet na innowacje, 2021). However, despite many EU-funded projects in health, regions still differ in the accessibility of services, similar to how basic health indicators vary.

3. Material and methods

The research on the evaluation of the impact of the implementation of innovative projects co-financed by the European Union on the development of the healthcare sector was carried out in 2020 using the technique of computer assisted telephone interviews (CATI). The research was carried out on a sample of N = 45 hospitals operating in the Łódź region. The research scope included inpatient healthcare entities (Table 1 and Table 2), differentiated according to the organisational subordination of the service provider (e.g., the Ministry of Health, Medical

University, Ministry of the Interior and Administration, local government entities – provinces, districts or municipalities, etc.). Entities selected for the research were the beneficiaries of programmes co-financed by EU funds in the years 2014-2020. This selection criterion was intended to ensure the possibility of reaching out to inpatient treatment facilities involved in innovative processes. In view of the above, as well as with a view to obtain from hospitals reliable information and data characterising innovative activities, interviews were conducted with representatives of management staff involved in the implementation of innovative projects.

Table 1.

Number and structure of hospitals surveyed by owning authority

Owning authority	Number of hospitals where research was carried out	%
Ministry of Health, Ministry of the Interior and Administration	3	6,67%
Medical University	7	15,56%
Provincial-level local government	16	35,55%
District- and municipal-level local government	19	42,22%
TOTAL	45	100%

Source: author's own research.

Table 2.

Number and structure of hospitals surveyed by type of activity. Source: author's own research

Type of hospital activity	Number of hospitals where research was carried out	%
Mono-specialist	4	8,88%
Multi-specialist	41	91,12%
TOTAL	45	100%

4. Results and discussion

In the context of innovation implementation in inpatient healthcare institutions in Łódź region, it is worth emphasising that the initiators of innovation processes were mainly hospital managers, although local self-government authorities as founding authorities of hospitals also had a marginal share in inspiring such activities.

The entities indicated the Regional Operational Programme of Łódzkie Voivodship as the dominant source of financing regarding this area (68.6% of indications). This programme influenced the improvement of research and development facilities supporting innovative activities of healthcare entities, contributing to investments in the infrastructure of functioning of medical institutions and support for innovative medical services. Healthcare institutions also benefited from financing available under national programmes. 14.3% of hospitals benefited from the Knowledge, Education, Development Programme, and 11.4% from the Infrastructure and Environment Programme. The least reported source of funding for inpatient institutions

was the Accessibility Plus for Health Programme (5.7%). The low use of funds from the Accessibility Plus for Health Programme may be due to insufficient outreach to the programme's target groups. Moreover, the measures provided in the Accessibility Plus for Health Programme were also implemented under other programmes (Figure 1).

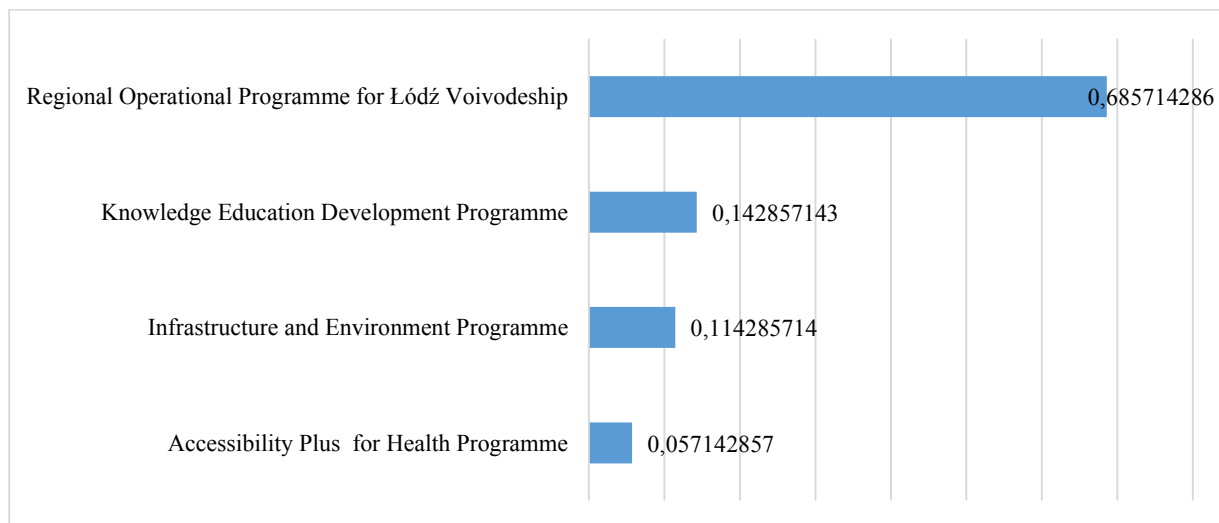


Figure 1. Sources of funding for innovative activities of inpatient healthcare institutions in the Łódź region in the years 2014-2020. Source: author's own research.

The answer to such a motivated approach to innovative activities is the nature of the implemented innovations described by their type.

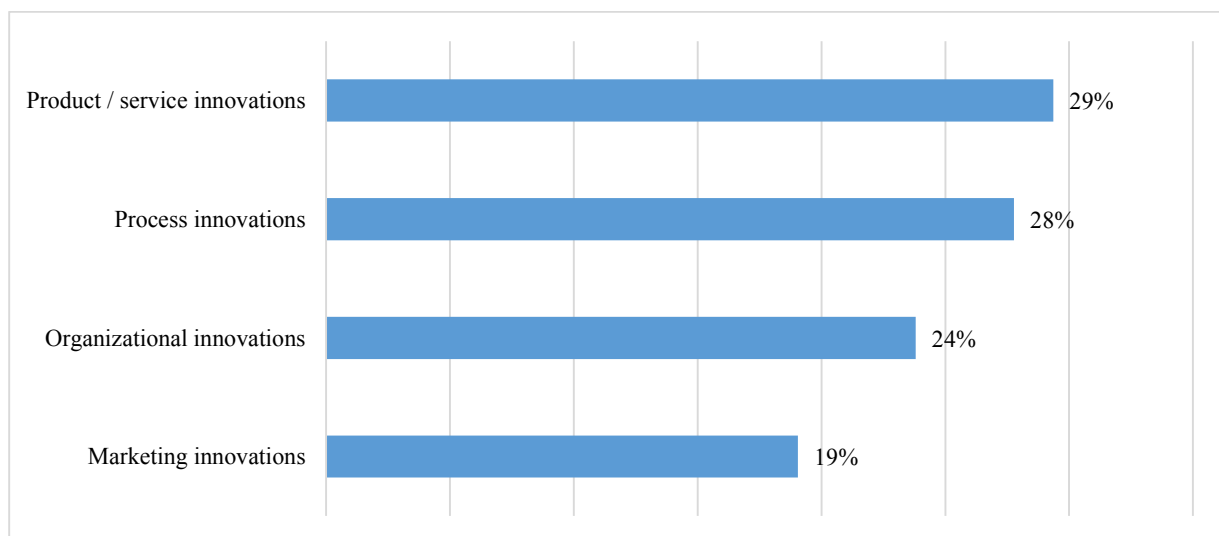


Figure 2. Types of innovations implemented in inpatient healthcare institutions in Łódź region in the years 2014-2020. Source: author's own research.

The conducted research indicates that the most frequently implemented innovations were broadly understood product/service or process improvements (Figure 2). They constituted almost 30% and 28% respectively. Organizational innovations also constituted a relatively large percentage of answers (nearly 24% of indications). Marketing innovations were selected by 19% of entities.

More detailed information on the type of innovation is presented in the table indicating the areas of activities included in particular categories (Figure 3). Among product and service innovations, investments in modern medical equipment for diagnostics, treatment and emergency services are predominant (39.3%).

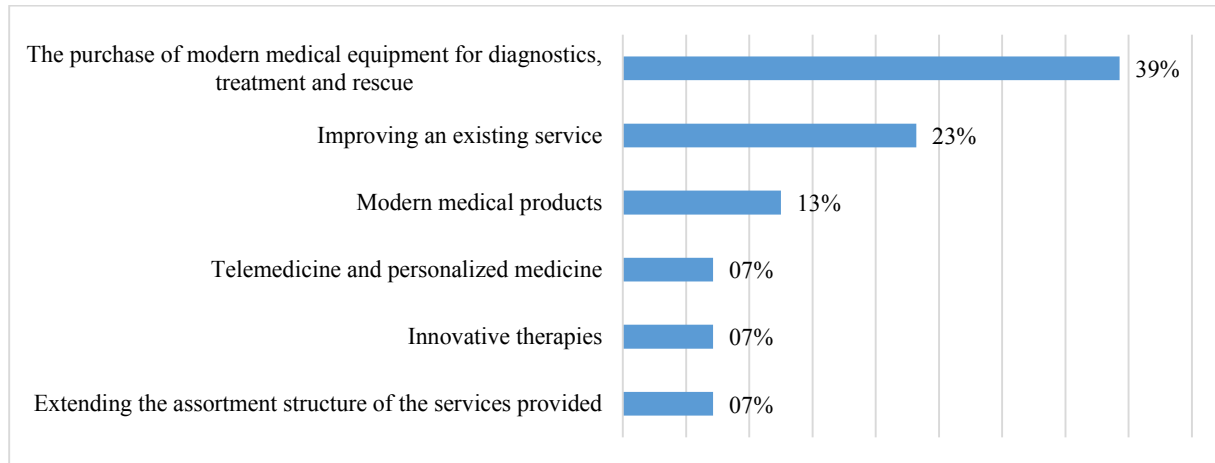


Figure 3. Areas of implementation of product/service innovations in inpatient treatment institutions from Łódź region in the years 2014-2020. Source: author's own research.

Therefore, it is possible to discuss the development of hospitals' services on the basis of technology acquired through projects, which was not previously present in the equipment of a given institution, or was outdated or insufficient in number. Some projects also involved the improvement of already existing services (23.2%). Hospitals focus either on obtaining existing technologies (modern medical equipment) from the external sources and using them for their own needs, or on developing and improving the services already provided in the hospital. It is worth emphasising that only one in five hospitals invested in the purchase of modern medical devices under projects financed from EU funds, which may be conditioned, among other things, by procedural and legal issues related to the lack of a clear and orderly procedure for including new technologies in the guaranteed range of benefits.

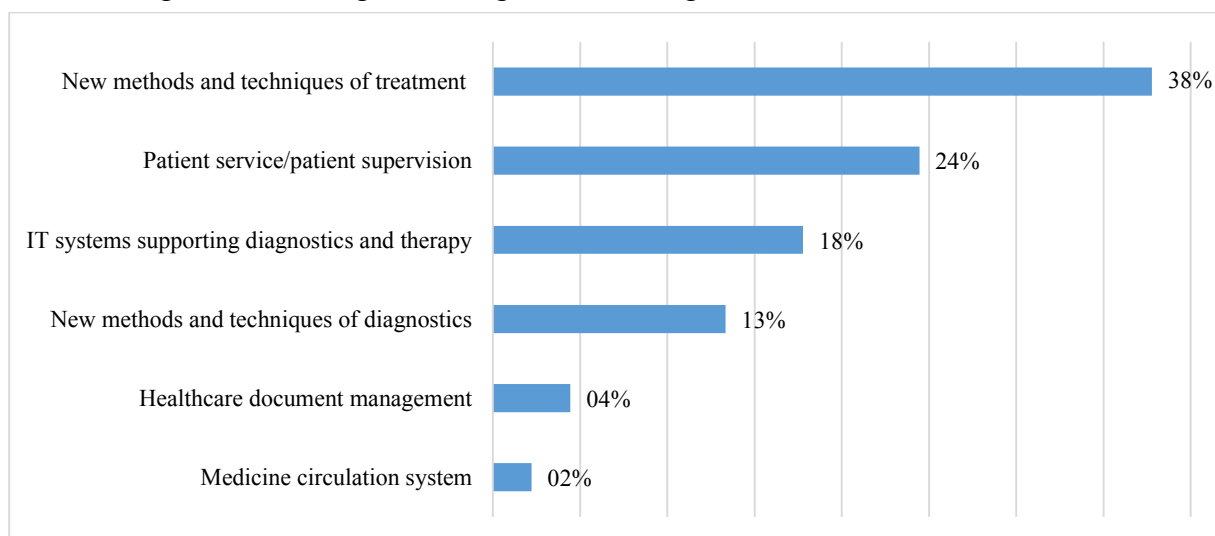


Figure 4. Areas of implementation of process innovation in inpatient healthcare institutions in Łódź region in the years 2014-2020. Source: author's own research.

In the case of the relatively most frequently indicated process innovations (Figure 4), approximately 38% are new methods and techniques of treatment, while about one third of the cases are activities leading to improvements in the process of patient service/supervision. A significant group also includes activities in the field of diagnostics in the broad sense. These are both new diagnostic methods and techniques, as well as improvements in diagnosis and therapy using IT systems. Many hospitals indicated the implementation of e-services as an innovation which improved the accessibility, quality and effectiveness of healthcare services provided and enabled integration with other IT systems. The outbreak of the coronavirus has increased the demand for electronic and online services. One of the examples – Electronic Platform for Collection, Analysis and Sharing of digital Medical Records, or P1 Project (Elektroniczna Platforma Gromadzenia, Analizy i Udostępniania zasobów cyfrowych o Zdarzeniach Medycznych; Projekt P1) – is the implementation of IT systems aimed at streamlining processes related to the planning and delivery of healthcare services, monitoring and reporting on their implementation, access to information on provided services and publishing information in the area of healthcare. The launch of subsequent public services within the P1 Project is a continuation of a long-term perspective of expanding access to public services provided via electronic means.

Based on emerging technology, it can be certain that digital transformation – enabled by radically interoperable data, artificial intelligence (AI) and open, secure platforms – will fuel much of the change in healthcare. In contrast to the current state, it is conceivable that care will be organised around the patient (consumer) rather than around the institutions that run the existing healthcare system. While it is unclear exactly how the future will unfold, one can look at the signals in the market and the forces of change in other industries to begin to paint a picture of the future of health. The future of health should focus on wellbeing and prevention rather than cure. Diseases cannot be expected to be completely eradicated, but the use of actionable health information – based on interoperable data and artificial intelligence – can help identify disease early, enable proactive intervention and improve understanding of disease progression. This can reduce health care expenditure. Technology could also aid in breaking down barriers, such as cost and location, that can limit access to healthcare professionals and specialists.

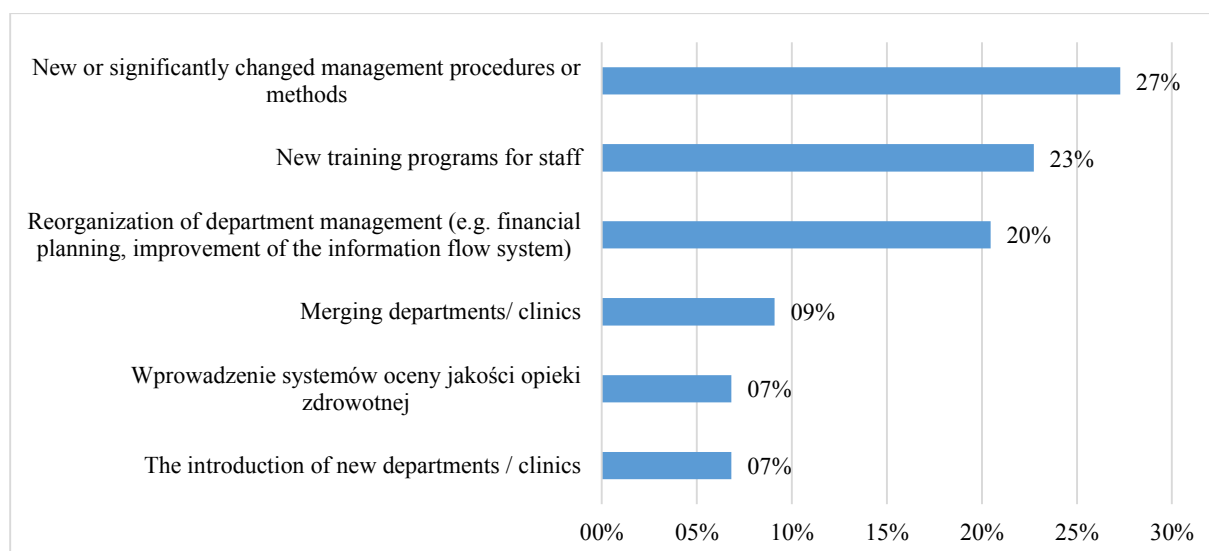


Figure 5. Areas of implementation of organisational innovations in inpatient healthcare institutions in Łódź region in the years 2014-2020. Source: author's own research.

In the area of implementation of organisational innovations in inpatient healthcare institutions in Łódź region in the period 2014-2020, the focus of hospital activities was primarily on changes in procedures or management methods (27.3%), reorganisation of ward management (20.5%) and merging (9.1%) and introduction of new wards and clinics (6.8%), such as e.g., Rapid Diagnostic Unit, Vascular Surgery Unit (figure 5). In addition, investments were made in improving staff qualifications through staff participation in new training programmes (22.7%). Training at this level was intended to initiate change in inpatient healthcare entities and prepare staff to implement innovations. Their main aim was to stimulate cooperation, exchange of experiences, combining skills to achieve a common goal, inspire good practices and awaken a sense of responsibility for implementing innovations.

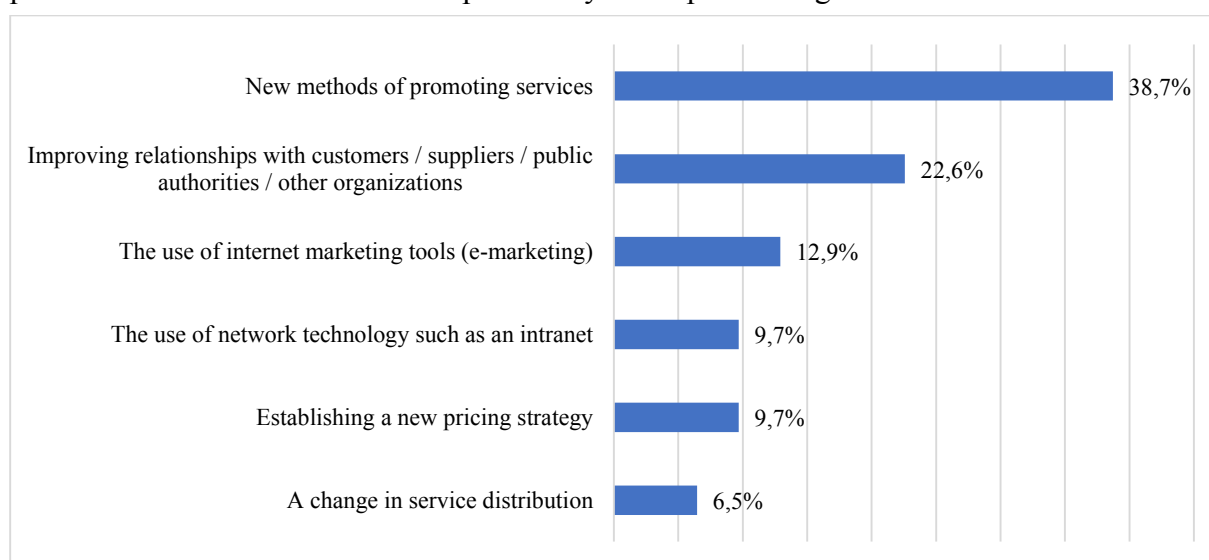


Figure 6. Areas of implementation of marketing innovations in inpatient healthcare institutions in Łódź region in the years 2014-2020. Source: author's own research.

Finally, in the marketing area, the primary focus was on new methods of promoting medical services (38.7%), as well as on improving relations with customers and cooperating entities (22.6%). The use of e-marketing tools defined as strategies and actions supporting the sale of services, products and creating a positive image of a given entity on the Internet was also indicated by the respondents (Figure 6). E-marketing is becoming more and more common due to the constant development of the Internet, technology, through the progress in digitalisation of society and the increasing presence of organisations and potential customers on the Internet.

While the areas of introducing product and process innovations are directly related to the quality and cost aspects of provided medical services, organisational and marketing innovations concern areas other than medical services and are mainly related to improving and enhancing hospital management. The impact of innovations in the context of their content may concern various functional areas of health care institutions. Product and process innovations directly influence the level of basic activities of entities connected with providing medical services. Organisational innovations concern improved methods of organisation and management of health care institutions, while marketing innovations concentrate their attention primarily on the operational level of the institutions' activities regarding new methods of promoting medical services and improving relations with the environment in which the studied entities operate.

The processes of innovation implementation were not without barriers. The presence of barriers in the implementation of innovations was reported by 88% of the institutions participating in the research. The main difficulties were related to the high costs of implementing innovations and the related lack of financial resources. Applying for EU funding itself is, in a sense, a response to this type of barrier. Another critical area related to the implementation of innovations is the issue of cooperation in terms of innovative activities.

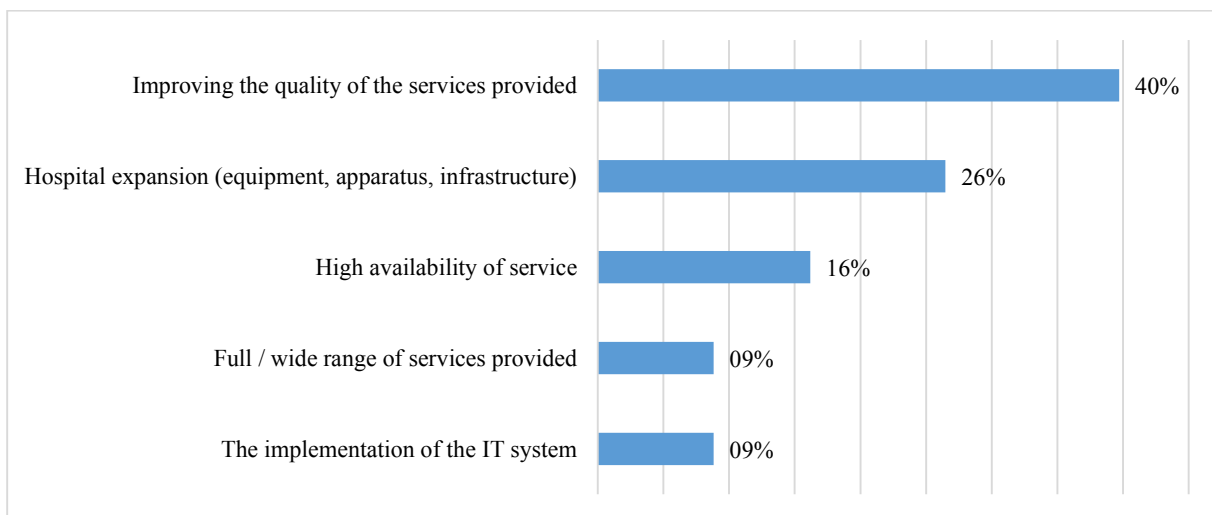


Figure 7. Effects of innovations implemented in inpatient healthcare institutions in Łódź region in the years 2014-2020. Source: author's own research.

The effects of innovations implemented by hospitals include especially improvement in the quality of medical services provided by hospitals (39.7%), expansion of the examined entities in terms of medical equipment and infrastructure (26.5%) and increase in the level of accessibility to medical services (16.2%) (Figure 7). The improvement of the quality of services provided, together with a desire to invest in medical equipment or apparatus, presumably provides opportunities to develop the range of services provided. This results in improved quality of life, more efficient treatment of diseases and their prevention. An important effect reported by respondents is also improvement in the area of operational capabilities related to work efficiency, comprehensive range of services provided and IT systems.

5. Conclusions

Implementation of innovations, as any investment consuming the organization's own resources, is aimed at achieving certain effects both for health care entities, as well as employees, patients, and the entire system. Improved quality, increased efficiency of provided services or reduction in labour costs are some of the effects that can be assumed for the innovative activities of entities.

As the above research suggests, the implementation of innovations in inpatient healthcare institutions in the Łódź region is targeted both at improving health results and the quality of provided services, as well as enhancing the functioning of the entities. This translates into benefits for the entire healthcare system.

The economic and social challenges related to COVID-19 pandemic have led to an acceleration of innovation implementation. The pandemic has aggravated health system weaknesses that existed prior to the outbreak and highlighted the need to recognise health system resilience as an equally important dimension of health system performance along with accessibility, quality of care and efficiency. The research demonstrates an increase in the digitalisation of the system. The COVID-19 pandemic influenced the further development of e-health. Due to the recent developments, nowadays it is possible to use e-referrals, e-referrals or e-prescriptions. The circumstances in which the whole world currently stands are difficult, however, it is also worth noting that they make it possible to accelerate the desired changes in healthcare. Digital solutions and technological innovations have supported the fight against coronavirus and, in the reality of an overburdened health service, have come into widespread use almost overnight.

The implementation of innovations in the health care system is determined greatly by the influence of the environment and the entities operating in it. The fact that hospitals from the Łódź region have implemented innovations so far does not rule out the existence of such plans for the future, which is confirmed by the results of the conducted research. This indicates that

the importance of innovative activities for the development of hospitals is recognised, but it might also be an effect of a step-by-step approach to financing innovations under subsequent projects. Incremental innovations dominate in hospital plans, as the institutions intend to focus mainly on the development of already existing technologies and provided services.

Innovations in healthcare lead to the reconstruction of the healthcare system in order to make it more transparent, provide better satisfaction of patients' health needs, and be financed more efficiently while ensuring the optimal use of resources.

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