CHAPTER 20

The Impact of the Coronavirus Pandemic on the Healthcare System in Poland

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Introduction

The COVID-19 pandemic is a turning point in the approach to the health market globally and nationally. It made governments and citizens aware that the health security of a society determines economic security and national security.

The aim of the study is to identify the key changes in the health care system in Poland caused by the pandemic and to determine the prospective implications of the pandemic on the healthcare system in Poland. This impact should be understood in the short term (actions related to the mitigation of the effects of the pandemic) and in the long term (systemic changes that will increase the health safety of society and the effectiveness and resilience of the healthcare system in the future).

The basic research method is a comparative analysis of the Polish health care system against European Union and EEA countries in the period

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V. S. Osipov (ed.), *Post-COVID Economic Revival, Volume II*,
https://doi.org/10.1007/978-3-030-83566-8_20

before and during the pandemic, which will allow for the drawing of postulated conclusions regarding long-term changes to the system in the future.

This study is a voice in the discussion on the assessment of the existing health care system and the necessary changes to this system, so as to increase the quality of medical care, the effectiveness of the public healthcare system, and its resistance to shocks in the future.

Methodology

In the pre-pandemic period, numerous studies by institutions such as the World Health Organization (WHO), Global Health Observatory (GHO), or the OECD (among others) analyzed the state and health care systems globally and in different countries, comparing them and creating indexes that would allow for the creation of an optimal healthcare model (Björnberg & Phang, 2019; Bogoviz et al., 2019; GHO, 2016; Klapkiv et al., 2020; OECD, 2018; Osipov & Skryl, 2021; Yermoshenko & Trynchuk, 2016).

The shock of the pandemic meant that the fight against COVID-19 was carried out in crisis conditions: a lack of preparation, stress, and chaos, as indicated by numerous publications from 2020 and reports (Anderson et al., 2020; EC, 2020; Iyengar et al., 2020; OECD, 2020; OECD/European Union, 2020; Our World in Data, 2021). There was a shared motivation around the world to develop strategies to protect people from the pandemic, to control infections, and to act in due response to a crisis. In addition to daily monitoring of the health situation on a global, regional, and national scale, research was done on the impact of social distancing measures on physical and mental health, and the impact of the pandemic on the quality of health care for vulnerable groups (the elderly, the chronically ill, disabled people) (Douglas et al., 2020; Holmes et al., 2020; Luceño-Moreno et al., 2020; Mental Health Europe, 2020). Research shows that the virus has disproportionately hit older people and those with underlying health conditions. In nearly all countries, at least 90% of COVID-19 deaths were among people aged 60 and over. The COVID-19 pandemic highlighted the shortages of health workers in many countries, and the need for mechanisms to mobilize human resources quickly in times of crisis. These shortages were thrown into sharp relief during the COVID-19 pandemic, when health workers were put under intense pressure. Even so, the health impact reaches well

beyond these numbers. As well as some COVID-19 cases and deaths going undetected, COVID-19 has had a major indirect impact on people that did not contract the virus. For example, people with emergency health needs have sometimes struggled to receive timely acute care, and those with chronic health conditions have faced disruptions to routine care. In addition, the pandemic and the subsequent economic crisis have led to a growing burden of mental ill-health, with emerging evidence of higher rates of stress, anxiety, and depression, compounded by disruptions to health care for those with preexisting mental health conditions (OECD/European Union, 2020).

Another focus of research was the implementation of telemedicine solutions in crisis conditions (Alonso et al., 2021; Colombo et al., 2020; ECDC, 2020; Gadzinski et al., 2020; McKinsey, 2020; Oliveira Hashiguchi, 2020). They indicated that the development of telemedicine applications and e-health services could significantly help in better managing the pandemic and health around the world. In many countries, telemedicine and advanced technologies have been integrated into a wide range of healthcare processes, including diagnosis, disease prevention, treatment, and health research. Telemedicine and e-health technologies help patients who require observation or medical and psychological assistance, reducing their exposure in hospital facilities.

Research into the resilience of health systems has gained importance. Kutzin and Sparkes (2016) have argued that "resilience is not an action to be implemented but rather a dynamic objective of investments and reforms". Hanefeld et al. (2018) developed a "3 + 2" model, covering the three functions of the health system—health information system, funding mechanism, and health professionals—plus two cross-cutting dimensions—values and governance. The OECD report (2020) identifies the core attributes of resilient systems, within the context of tensions between resilience and efficiency. Expert Group on Health Systems Performance Assessment defines three core resilience capacities (absorptive, adaptive, and transformative) and extends it to include a fourth dimension—preventive (i.e., the ability of a health system to anticipate the advent of a shock and create the necessary conditions to minimize its potential future impact). The model takes into account three states: (1) pre-shock state, (2) response to shock, and (3) post-recovery state (hyper-resilient, resilient, partially resilient, brittle) (EU, 2020).

A large group of reports and publications is also devoted to the state's policy, ensuring the economic security of social groups affected by the

pandemic. The socioeconomic impacts have also been dramatic. In the second quarter of 2020, seasonally adjusted GDP fell by 13.9% across the EU compared with the same quarter in 2019. Thanks to the widespread use of various short-term work schemes, employment was comparatively less affected, although there was still a registered decrease of 2.9% over the same period. The COVID-19 pandemic has therefore put an immense strain on European countries, testing the resilience of every country's government and people. (OECD/European Union, 2020).

Results

1. **Polish health care system before the pandemic**

There are public–private health care systems in European countries. Health expenditure by type of financing in 2018 (or nearest year) had the following distribution in the EU 27 and Poland (OECD/European Union, 2020):

- Government schemes: 32% EU 27; 10% Poland,
- Compulsory contributory health insurance: 41% EU 27; 62% Poland,
- Voluntary health insurance: 5% EU 27; 6% Poland,
- Out-of-pocket payments 22% EU 27; 20% Poland.

The healthcare system in Poland is based on universal health insurance. The obligatory health insurance contribution of 9% of earnings is transferred through the Social Insurance Institution (ZUS) to the National Health Fund (NFZ), which finances the health services provided to the insured and reimbursed drugs. In the case of some social groups (e.g., students or the clergy), health insurance contributions are financed from taxes. People insured in the National Health Fund do not incur any other costs of treatment, apart from the insurance premium, unless they want to benefit from commercial treatment themselves. The entities performing medical activities also include medical, dentist, nursing, and midwife practices, pharmacies, and other service providers who provide services under agreement with the NFZ.

Under these conditions, the distribution of publicly available medical services was and remains politically regulated (the list of guaranteed

health services, drugs, and reimbursed treatments), and thus nontransparent and limiting universal access to medical services. The malfunctions of the public health system are solved through supplementary—not complementary—out-of-pocket payments, financing, and private health insurance (Płonka, 2017). The key problem in Poland is one of the longest queues for deficit medical operations in Europe. This situation forces many to choose the fully paid option of financing such an operation without a queue, despite the constitutional right to a free operation. The impossibility of co-payment in Poland, which occurs in many European countries, makes the queues for limited operations and specialist medical consultations longer (Płonka, 2019a).

Poland is also a country that was systematically in one of the last positions in the EHCI index (Table 20.1) compared to other European countries. In 2018, only Hungary and Romania showed a lower index of the index (Björnberg & Phang, 2019). The effectiveness of the Polish health care system was also one of the lowest in the examined European countries (Płonka, 2019b). Selected indicators of the healthcare system in Poland before and during the pandemic, next to the average in the EU and EEA, are presented in Table 20.1.

Comparative data of the public health care system in Poland with the EU average only partially explains the reasons for its low efficiency. The root cause is underinvestment in the system: people-reported quality of health services are in the group's penultimate place, practicing doctors per 1,000 population in last place, and waiting times for surgery are almost always in the last or penultimate place. The shortage of doctors and medical personnel is petrifying queues and overburdening medical personnel, regardless of the pandemic.

A positive direction of change was the fledgling implementation of digital solutions before the pandemic: E-sick leave, e-prescriptions from 2018, e-referral from 2020, and Internet Patient Account (IKP), and electronic medical documentation from 2021. The Internet Patient Account is an integrated tool to facilitate the convenient use of digital services for patients and to organize the previously scattered medical information about the patient's health in one place (information about the patient's past, current, or planned treatment). Electronic medical documentation is an electronic document enabling the recipient to obtain health care of a specific type. It contains the most important data and information about the patient's health, as well as past, current, or planned healthcare services,

Table 20.1 Selected indicators of the health care system in Poland before and during the pandemic, next to the average in the EU and EEA countries, with the highest and the lowest values of the index

No	*Problem*	*Page*	*EU 27*	*Poland*	*The highest and the lowest values of the index, comments*
	Before the pandemic				
1	Health expenditure per capita, 2019, EUR	159 (1)	2,572	1,511	EU (High: Germany, 4,504; low: Romania, 1,292) Switzerland 5,241
2	Health expenditure as a share of GDP, 2019, %	161 (1)	8.3%	6.2%	EU (High: Germany, 11.7%; Low: Luxembourg, 5.4%)
3	People-reported quality of health services, 2016	183 (1)	7.3/10	6.5/10	EU (High: Austria, 8.4; Low: Luxembourg, Greece, 6.0). Poland is ahead of Greece
4	Out-of-pocket spending on health as a share of final household consumption, 2018	207 (1)	3.3%	2.3%	(7.5% Malta; 1.3% Croatia) Poland is in the middle
5	Practicing doctors per 1,000 population, 2018	213 (1)	3.8	2.4	EU 27 (High: Greece, 6.1; Low: Poland, 2.4)
6	Number of doctor consultations per person, 2018	215 (1)	6.7	7.6	EU 27 (High: Slovakia, 10.9; Low: Sweden, 2.7)
7	Practicing nurses per 1,000 population, 2018	219 (1)	8.2	5.1	EU 27 (High: Finland, 14.3; Low: Greece, 3.4)
8	Ratio of nurses to doctors, 2018	219 (1)	2.3	2.1	EU 27 (High: Finland, 4.4; Low: Bulgaria, 1.0)
9	Hospital beds per 1,000 population, 2018	223 (1)	5.0	6.5	EU 27 (High: Germany, 8.0; Low: Sweden, 2.1)
10	Average length of stay in hospital, 2018, days	225 (1)	7.5	7.1	EU 27 (High: Hungary, 9.6; Low: Netherlands, 5.1)
11	Waiting time for cataract surgery, 2019, days	227 (1)	No data	250	EU 27 (High: Italy, 25; Low: Poland, 250)
12	Share of the population aged 65 and over, 1 January, 2019 (%)	231 (1)	20.3	17.7	EU 27 (High: Italy, 22.8; Low: Ireland, 14.1)

(continued)

Table 20.1 (continued)

No	*Problem*	*Page*	*EU 27*	*Poland*	*The highest and the lowest values of the index, comments*
13	EHCI Index, 2018	25 (2)	No data	585	EU (High: Netherlands, 893; Low: Romania, 549) 893 Switzerland
	During the pandemic				
14	COVID-19 confirmed cases (up to end of October 2020 per 1 million population)	30 (1)	14,197	9,552	EU 27 (High: Czech Republic, 31,466; Low: Finland, 2,920)
15	Reported COVID-19 deaths (up to end of October 2020 per 1 million population)	30 (1)	390	148	EU 27 (High: Belgium, 1,015; Low: Cyprus, 30)
16	Excess mortality (March-June 2020 per 1million population)	30 (1)	372	107	EU 27 (High: Spain, 1,021; Low: Bulgaria, 192) Negative rates are indicative of fewer deaths overall between March and June 2020 compared to previous years
17	GDP growth in the second quarter of 2020, compared to first quarter of 2020, %	31 (1)	-11.4	-8.9	EU (High: Spain, -17.8; Low: Finland, 4.4), 19.8, UK
18	Daily number of tests per 100,000 population 30 days after the country recorded 10 deaths per million population (averaged over a week)	36 (1)	86	56	EU (High: Denmark, 250; Low: Bulgaria, 17)
19	Central government additional COVID-19 health spending commitments per capita, 2020 (between March and September 2020) EUR	44 (1)	120	80	EU (High: Germany, 302; Low: Latvia, 21) 446, UK

(continued)

Table 20.1 (continued)

No	*Problem*	*Page*	*EU 27*	*Poland*	*The highest and the lowest values of the index, comments*
20	Total number of vaccination doses administered per 100 people in the total population (9 April 2021), %	(3)	14.59	13.65	EU (High: Hungary, 28.58; Low: Romania, 11.47) 47 UK

Source Calculated by author on the basis of (1) OECD/European Union (2020), (2) Björnberg and Phang (2019), (3) Our World in Data (2021), (accessed 11 April 2021)

including an electronic document enabling the recipient to obtain health care of a specific type.

The digitization of the health care system will increase its transparency and minimize the scope and number of unnecessary medical services. It becomes an important implementation challenge and a problem in the case of the older, nondigital group of patients who most often use medical services.

2. Polish health care system during the pandemic

The COVID-19 pandemic has further exacerbated previous problems related to healthcare in Poland. Poland had more time to prepare for the pandemic, which meant that during the first wave of the coronavirus it obtained more favorable results than the EU average. In the long term, the medical staff shortage has reduced the ability to respond to the epidemic. In crisis conditions, the following actions were taken:

1. mobilizing health care students (medical, nursing, and other),
2. mobilizing retired and nonpracticing health workers,
3. transferring health workers to localities with greater needs.

The pandemic limited access to healthcare for the entire population. In particular, the situation of chronically ill patients, cancer patients, and patients with medical emergencies (silent victims of the pandemic)

has worsened. Access to medical services, including preventive examinations, diagnostics, therapy, and surgical treatment, has significantly worsened (Fałek et al., 2020). The number of benefits in March–May 2020 decreased by 20 to 70% (Infarma, 2021).

During the pandemic, the use of previously introduced e-health solutions increased: e-waivers, tele-consultations, and e-prescriptions. The change in the form of providing medical services from personal to remote enabled their greater availability, which quantitatively accelerated the increase in the number of tele-consultations (Płonka & Stanienda, 2020), but their quality was assessed differently. The respondents ($N = 500$) only understood that in the conditions of a pandemic, tele-consultation is a better solution than the risk of contracting a virus or the lack of advice in the conditions of overloading institutions with patient care (Płonka et al., 2021).

The Polish government released additional resources by offering shielded financial packages that were used to protect jobs and businesses and to enhance health. It is only a short-term solution and the problem of systemic solutions ensuring health and economic security remains open.

Discussions

Proposals for changes in the healthcare system in Poland

The COVID-19 pandemic has revealed the need for deep, long-term changes to the health care system in Poland, including:

1. *Conditions and values based on the concept of Value-Based Health Care* (Porter, 2010):

   Health security should be a priority because it is the basis for sustainable social and economic development and for the stable functioning of the state, economy, and society. Additionally, the system should also be adapted to the conditions of an aging society. A wise investment in the health of citizens leads to the improvement of one of the basic economic resources—human capital.
2. *Increasing the financing of the health care sector*

   Financing the health sector should be seen as an investment in sustainable socioeconomic development. The principles of financing health services should include a complementary system of additional health insurance and the possibility of co-paying patients (direct payments to health services) for some medical services.

3. *Implementation of an integrated medical information and documentation system*

   Computerization, the development of telemedicine solutions, and the use of artificial intelligence in management decisions will enable more transparent and effective information for the patient and medical staff, and the harmonization of internal procedures for medical entities with the procedures of public institutions and the state.

4. *Organization and management aimed at strengthening the system's resilience to shocks*

   "A resilient system (or society) can face shocks and persistent structural changes in such a way that it does not lose its ability to deliver societal well-being in a sustainable way (i.e., deliver current societal well-being, without compromising that of future generations)" (EU, 2020). Monitoring of critical health care resources should be a permanent element of risk management and resource allocation, allowing for risk prediction and developing absorptive capacity, adaptive capacity, and transformative capacity.

Conclusion

Health is a fundamental value both personally and socially. The COVID-19 crisis taught the nation lessons about the imperfections of the Polish health care system when in crisis conditions; this may provide an impulse to carry out thorough corrective changes to the Polish healthcare system in the future.

The COVID-19 pandemic has made the inherent problems clearer than before. The state, the economy, and society are on the verge of a new order, with new values that should constitute the basis for developing the future standards of a post-COVID society.

References

Alonso, S. G., Marques, G., Barrachina, I., Garcia-Zapirain, B., Arambarri, J., Salvador, J. C., & de la Torre Díez, I. (2021). Telemedicine and e-Health research solutions in literature for combatting COVID-19: A systematic review. *Health Technol (Berl)*. https://doi.org/10.1007/s12553-021-00529-7. https://pubmed.ncbi.nlm.nih.gov/33558838/.

Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet, 395*, 931–934. https://doi.org/10.1016/S0140-6736(20)30567-5

Björnberg, A., & Phang, A. Y. (2019). *Euro health consumer index 2018 report*. ISBN 978–91–980687–5–7. https://healthpowerhouse.com/media/EHCI-2018/EHCI-2018-report.pdf.

Bogoviz, A. V., Elykomov, V. A., Osipov, V. S., Kelina, K. G., & Kripakova, L. A. (2019). *Barriers and perspectives of formation of the e-healthcare system in modern Russia*. Springer.

Colombo, F., Oderkirk, J., & Slawomirski, L. (2020). Health information systems, electronic medical records, and big data in global healthcare: Progress and challenges in OECD countries. In R. Haring, I. Kickbusch, D. Ganten, & M. Moeti (Eds.), *Handbook of global health*. Springer. https://doi.org/10.1007/978-3-030-05325-3_71-1.

Douglas, M., Katikireddi, S. V., Martin , M., McKee, M., & McCartney, G. (2020). Mitigating the wider health effects of COVID-19 pandemic response. *The BMJ, 369*. https://doi.org/10.1136/bmj.m1557.

EC. (2020). *Short-term EU health preparedness for COVID-19 outbreaks*. Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. https://ec.europa.eu/info/sites/info/files/communication_-_short-term_eu_health_preparedness.pdf.

ECDC. (2020, June). *Mobile applications in support of contact tracing for COVID-19*. A guidance for EU/EEA Member States.

EU. (2020). Expert group on health systems performance assessment (HSPA), *Assessing the resilience of health systems in Europe: an overview of the theory, current practice and strategies for improvement*, Publications Office of the EU. https://ec.europa.eu/health/sites/health/files/systems_performance_assessment/docs/2020_resilience_en.pdf.

Fałek, A., Janiszewski, R., & Jakubiak, K. (2020). Wpływ epidemii wywołanej wirusem SARS-CoV-2 na system opieki zdrowotnej w Polsce. *Modern Healthcare Institute*. https://farmacja-polska.org.pl/wp-content/uploads/2020/10/raport-KRL-final.pdf?utm_source=mailpoet&utm_medium=email&utm_campaign=raport-wplyw-epidemii-wywolanej-wirusem-sars-cov-2-na-system-opieki-zdrowotnej-w-polsce_220.

Gadzinski, A. J., Andino, J. J., Odisho, A. Y., Watts, K. L., Gore, J. L., & Ellimoottil, Ch. (2020). Telemedicine and eConsults for hospitalized patients during COVID-19. *Urology*, 141/14. https://doi.org/10.1016/j.urology.2020.04.061. Epub 2020 April 21. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7172813/.

GHO. (2016). *Analysis of third global survey on eHealth based on the reported data by countries*. https://www.who.int/gho/goe/telehealth/en/.

Hanefeld, J., Mayhew, S., Legido-Quigley, H., Martineau, F., Karanikolos, M., Blanchet, K., Balabanova, D., et al. (2018). Towards an understanding of resilience: Responding to health systems shocks. *Health Policy and Planning, 33*(3), 355–367. https://doi.org/10.1093/heapol/czx183.

Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Silver, R., & C., . (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *Lancet Psychiatry, 7*(6), 547–560. https://doi.org/10.1016/S2215-0366(20)30168-1.

Infarma. (2021). *Rekomendacje zmian w polskim systemie ochrony zdrowia poprawiające dostęp do świadczeń medycznych dla pacjentów. Wnioski związane z pandemią COVID-19*, Pracodawcy Rzeczpospolitej polskiej, Innowo, Report.

Iyengar, K., Mabrouk, A., Jain, V. K., Venkatesan, A., & Vaishya, R. (2020). Learning opportunities from COVID-19 and future effects on health care system. *Diabetes Metab Syndr, 14*(5), 943–946. https://doi.org/10.1016/j.dsx.2020.06.036. https://pubmed.ncbi.nlm.nih.gov/32599533/.

Klapkiv, Y., Vovk, V., & Klapkiv, L. (2020). Comparative analysis of the health care institutions' competitiveness level. *Montenegrin Journal of Economics, 16*(3), 69–82. https://doi.org/10.14254/1800-5845/2020.16-3.6.

Kutzin, J., & Sparkes, S. P. (2016). Health systems strengthening, universal health coverage, health security and resilience. *Bulletin of the World Health Organization*, 94(1). https://doi.org/10.2471/blt.15.165050.

Luceño-Moreno, L., Talavera-Velasco, B., Garcia-Albuerne, Y., & Martin-Garcia, J. (2020). Symptoms of posttraumatic stress, anxiety, depression, levels of resilience and burnout in Spanish health personnel during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health, 17*(15), 1–29. https://doi.org/10.3390/ijerph17155514.

McKinsey. (2020). *Telehealth: A quarter-trillion-dollar post-COVID-19 reality?* https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-COVID-19-reality.

Mental Health Europe (2020). *Mental health helplines and services during COVID-19*. https://www.mhe-sme.org/library/helplines/.

OECD. (2018). *Health at a glance: Europe 2018, state of health in the EU cycle*, *The OECD Report*. https://www.oecd-ilibrary.org/docserver/health_glance_eur-2018-en.pdf?expires=1618666314&id=id&accname=guest&checksum=19BC4837B3F89FF9C3607FDED6341597.

OECD. (2020). *A systemic resilience approach to dealing with COVID-19 and future shocks*, *OECD. Policy Responses to Coronavirus (COVID-19)*. OECD Publishing. http://www.oecd.org/coronavirus/policy-responses/a-

systemic-resilience-approach-to-dealing-with-COVID-19-and-future-shocks-36a5bdfb/.

OECD, European Union. (2020). Health at a glance: Europe 2020: State of health in the EU Cycle. *OECD Publishing*. https://doi.org/10.1787/82129230-en.

Oliveira Hashiguchi, T. (2020). Bringing health care to the patient: An overview of the use of telemedicine in OECD countries. *OECD Health Working Papers*, 116. OECD Publishing. https://doi.org/10.1787/8e56ede7-en.

Osipov, V. S., & Skryl, T. V. (2021). *Impact of digital technologies on the efficiency of healthcare delivery*. Studies in Computational Intelligence (Vol. 933, pp. 243–261).

Our World in Data. (2021). https://ourworldindata.org/COVID-vaccinations. Accessed 11 April 2021.

Płonka, M. (2017). Prywatne ubezpieczenia zdrowotne a publiczny system opieki zdrowotnej w Polsce. *Annales Universitatis Mariae Curie-Skłodowska. Sectio H, Oeconomia, UMCS Lublin, 51*(6), 321–329. https://doi.org/10.17951/h.2017.51.6.321.

Płonka, M. (2019a). Principle of co-payment for health care—European experience. In Z. Beňová, P. Jančovič, T. Kajánek, M. Karas, J. Szabó, & E. Vlková (Eds.), *Medzinárodné vzťahy: aktuálne otázky svetovej ekonomiky a politiky* (pp. 864–870). Publishing Ekonóm. https://fmv.euba.sk/www_write/files/veda-vyskum/konferencia-smolenice/2019/Smolenice_2019_Final.pdf.

Płonka, M. (2019b). Zależności między poziomem zamożności a poziomem świadczeń opieki zdrowotnej w krajach europejskich. In I. Kwiecień, & P. Kowalczyk-Rólczyńska (Ed.), *Ubezpieczenia. Wyzwania rynku* (pp. 37–47). C.H. Beck.

Płonka, M., & Stanienda, J., (2020). The development of telemedicine in the context of Revolution 4.0 and the COVID-19 pandemic on the example of Poland. 36th International Business Information Management Association Conference (IBIMA). In K. S. Soliman (Ed.), *Sustainable economic development and advancing education excellence in the era of global pandemic*: *Proceedings*, 2897–2908. https://u.pcloud.link/publink/show?code=kZCeIokZrrbe3SiQcHyryACEYOALQ51wpz9X#folder=7802801347.

Płonka, M., Stanienda, J., & Gądek, A. (2021). Medical tele-consultation in the opinion of patients of the medical entity in Poland in 2021. In *37th International Business Information Management Association Conference (IBIMA)* (Working paper).

Porter, M. E. (2010). What is value in healthcare? *English Journal of Medicine, 363,* 26. https://www.vbhc.nl/wp-content/uploads/Porter-What-is-value-in-healthcare.pdf.

Yermoshenko, A., & Trynchuk, V. (2016). Approaches to evaluating the quality of voluntary medical insurance services in Ukraine. *Actual Problems of Economics, 183*(9), 285–293.