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The dilemmas of healthcare system functioning under conditions of the civilizational turning point

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ABSTRACT

The analyses presented in this study are focused on identifying new trends and challenges in the healthcare sector, primarily stemming from the ongoing global civilizational turning point as a consequence of the fourth industrial revolution, the digital revolution with its unimaginable potential of artificial intelligence. In such conditions, solutions aimed at optimal utilisation of new technologies are particularly crucial, especially those addressing irregularities that result in the wastage of material and intellectual potential in this sector. In the face of almost chronic shortages in healthcare funding sources, characteristic not only for Poland but also for other countries, the rationalisation of the utilisation of available resources becomes of paramount importance. In Poland, this is particularly significant due to relatively low expenditure on healthcare, both in absolute terms and in relation to GDP. This is confirmed by the international statistics presented in the article. In this context, the article highlights selected rationalising directions for changes in the national healthcare system.

Key words: healthcare system, fourth industrial revolution, civilizational turning point, medicalisation, FoMO (fear of missing out), costs of loneliness, AI (artificial intelligence), cyberchondria, denialism

Introduction

Although assessments of the development potential of individual countries and their groupings are generally dominated by an economic approach using primarily the standard measure of gross domestic product (GDP), there is much to suggest that this approach is far from sufficient. In addition, it is an approach that increases the risk of overly superficial or even erroneous assessments. This is because such assessments generally do not take due account of, among others, healthcare issues. This is despite the fact that it may almost be considered a truism to say that it is primarily the health of people that determines their achievements and therefore the achievements of a country. The health of a population determines economic and social progress. At the same time, however, a precise, comprehensive estimate of the impact of a population's health condition on the economic health of the country eludes simple calculations. Such accounts do not usually take into account, in their entirety, the costs associated with negligence in healthcare. It is not possible to enumerate precisely all the individual, economic and social consequences of health deficiencies. Yet it is well known that when health is lacking, wealth does not rejoice, and, in addition, it can make wealth melt away. Polish Renaissance poet Jan Kochanowski (1530–1584) put it extremely aptly centuries ago in his famous epigram titled *On Health* [*Na zdrowie*]: "For all that we possess: Pearls, stones of great finesse, High offices and power – One may enjoy this hour – And so the gifts of youth, And beauty are, in truth, Good things, but only when Our health is with us then. For when the body's weak, The world around is bleak." [Kochanowski 1584, p. 73][1]. Therefore, negligence in the healthcare sphere is one of the worst, most egregious form of negligence, as it is particularly costly and damaging to people and national interest. It is also no coincidence that, already in ancient times, Hippocrates (460–377 B.C.), one of the most prominent pioneers of modern medicine, recognised that "Patient's welfare shall be the supreme law" (*Salus aegroti suprema lex*). In Poland, the right to healthcare stems directly from the right to dignity of every human being, which is, at least technically, the right guaranteed by the Polish Constitution. Hence, healthcare should be one of the priorities in the country's socioeconomic policy.

However, in practice, the proper realisation of the people's constitutional right to healthcare is not only hampered by shortage, but also by wasteful and irrational use of the resources available, which are, unfortunately, still too limited. In addition, such wastage not infrequently occurs under the banner of austerity. One of the most striking manifestations of this is the use, for cost-saving reasons, of outdated, cheapest drugs and medical technologies, rather than more effective, novel and innovative ones. The lower effectiveness of non-innovative medicines makes the resulting reduction in treatment costs quickly turn into increase thereof. Such quasi-savings become extremely costly socially both for patients and for the entire healthcare system, as well as for the entire country, including the economy. Indeed, the lower effectiveness of outdated medicines usually means an increase in the length of treatment, as well as the direct and indirect costs incurred as a result. This generally involves patients' discomfort and a variety of costs encumbering them, wherein many of which, especially those related to discomfort, are difficult to measure and therefore not included in the cost of treatment, although they are greater, the longer treatment lasts and the less effective it is. So this kind of quasi-saving in treatment is socially, economically and individually costly wastage.

At the same time, however, the implementation of the most innovative methods of treatment is generally associated with the need to increase expenditure, which presents a particularly difficult challenge, especially under current conditions of such characteristic incredible dynamism of innovation in medicine. Under such conditions, it is also increasingly important to maintain an optimal balance between the extent of the use of tried and tested and therefore safe "old" medicines and the use of innovative medicines (as discussed hereinafter).

[1] Translator's note: Jarek Zawadzki's translation in *Selected Masterpieces of Polish Poetry*, p. 15.

The analyses presented here are focused on identifying new trends and challenges in the healthcare sector, primarily stemming from the ongoing global civilizational turning point, imposed by the development of digital technologies and artificial intelligence. In particular, solutions aimed at the optimal use of new technologies are important, including primarily solutions to counteract irregularities that result in the wastage of material and intellectual potential in this sector. For in conditions of an almost chronic shortage of funding sources for healthcare, characteristic not only of Poland but also of many other countries, rationalisation of the use of available resources becomes of paramount importance.

This study has been produced in connection with a research project, realised under the Committee for Public Health of the Polish Academy of Sciences [*Komitet Zdrowia Publicznego Polskiej Akademii Nauk*], titled *Polish Health 2.0* [*Polskie Zdrowie 2.0*]. I was invited to participate in this project initially as a reviewer of the expertise titled *Macroeconomic Determinants of Healthcare System Financing. A Few Remarks in the Context of Challenges of the Healthcare System in Poland. Strategic Recommendations for the Years 2023–2027* [*Makroekonomiczne uwarunkowania finansowania systemu ochrony zdrowia. Kilka uwag w kontekście wyzwań systemu opieki zdrowotnej w Polsce. Rekomendacje strategiczne na lata 2023–2027*] by Prof. Krzysztof Opolski, Ph.D., and Marek Zuber, Ph.D. In the next step of the work on this project, my analyses regarding the issues in question were taken into account. However, due to the editorial framework adopted in this project, various abbreviations of these analyses were necessary, including footnotes, bibliographic information, etc.

Therefore, upon the approval of the management of the project in question, I present in this article the full author's version of the text. I would also like to thank Prof. K. Opolski, Ph.D. and M. Zuber, Ph.D., for the opportunity to cooperate and exchange views on the subject matter of the project. This was an important research inspiration influencing the content of this article. It was based on studies of national and foreign reference literature, analyses of empirical data including statistics, expert debates, as well as specialised national and international reports on economic and organisational aspects of functioning of the healthcare sphere.

The healthcare sector in Poland – underfunded and prodigal

There is no shortage of evidence in the scientific world and in the praxis of socioeconomic life that the state and changes of the healthcare sector are synergistically linked to the socioeconomic development and changes in people's quality of life. There are simultaneous feedbacks. On the one hand, the issue of financing the sector in question is particularly important, especially since Poland is characterised by low healthcare expenditure compared to other Western countries – both in absolute terms and in relation to gross domestic product (GDP). On the other hand, there is clear evidence of ineffective management of means at one's disposal and considerable wastage of resources. This is confirmed by national and international statistics (Table 1).

Table 1. The healthcare system in Poland compared to selected OECD countries, 2022

Country	Expenditure per inhabitant (in USD by purchasing power)	Expenditure (%) of GDP	Number of doctors per 1000 inhabitants	Number of nurses per 1000 inhabitants	Number of beds per 1000 inhabitants
OECD	4,986	9.2	3.7	9.2	4.3
Poland	2,973	6.7	3.4	5.7	6.3
Germany	8,011	12.7	4.5	12.0	7.8
Finland	5,599	10.0	3.6	18.9	2.8
Denmark	6,280	9.5	4.4	10.2	2.5
Czechia	4,512	9.1	4.3	9.0	6.7

Source: *Health at a Glance 2023 OECD Indicators*, p. 31

The data in Table 1 confirms that healthcare expenditure in Poland is low both in absolute terms and in relation to GDP. Total expenditure on healthcare (public and private expenditure) accounted for 6.7% of GDP (of which public expenditure is accounted only for 5%) [GUS 2023; *Health* 2023]. This ranks our country in penultimate position among the OECD countries. Only Turkey features a lower level of expenditure in the amount of 4.3% of GDP [*Health* 2023]. The indicators regarding the number of nurses per 1000 inhabitants are also unfavourable. The number of hospital beds is relatively high, but this – combined with the number of doctors per 1000 inhabitants, which is only slightly lower than in other countries – may be deemed as a result precisely of the weakness of the healthcare system. Negligence in this system, including in preventive and outpatient healthcare, generates a greater need for, among others, hospital beds.

Despite Poland's low expenditure on healthcare, manifestations of wastage in this area are unfortunately numerous. The manifestations of this range from wasting doctors' worktime on bureaucratic ordeal and other non-medical work, including reporting, through seemingly cost-saving but in the scheme of things highly cost-intensive treatments, to a prioritisation of official procedures, leading to the erosion of real concern about the patient.

A change that, unfortunately, still cannot wait to be achieved is precisely to move away from the now explicit priority given to bureaucratic procedures, instead of prioritising the welfare of patients and their long-term health benefits and evaluating medical procedures by using indicators not only of treatment but also of lasting cure. It is not uncommon for a patient cured, once the main symptoms of the disease have disappeared, to be left alone without adequate supervision and medical control, which may result in a recurrence of the disease, entailing additional expenditure. The well-being of patients would also be fostered in many cases by facilitating their direct access to medical specialists, without the need to obtain additional referrals, which sometimes is of a purely formal nature and places an unnecessary, additional burden on the healthcare system, absorbing its potential.

Likewise, quasi-savings consisting in using cheaper procedures but not providing satisfactory treatment have a similar effect. Situations of this kind are the result of existing procedures and administrative medical regulations on the one hand, and the shortage of financial resources on the other hand. At the same time, however, it should be noted that the intensification of marketing activities by global pharmaceutical companies, which is so characteristic for today's world, often promotes unjustified depreciation of the qualities of the "old", proven and cheap medicines in favour of the use of new, usually much more expensive ones. In particular, it is essential that, thanks to these safe (side-effect-tested), low-cost medicines, access to treatment for diseases of civilisation (such as arterial hypertension or diabetes) may be secured for all social groups, thus preventing inequalities in healthcare. This is pointed out in many countries in governmental healthcare programmes, but also in reports from specialist medical organisations and societies, including transnational ones. This indicates the complexity of these issues, what sometimes takes on the character of a Gordian knot or a vicious circle. The negative consequences of this are particularly evident in particularly sensitive and underinvested areas, such as, among others, paediatrics and geriatrics, which are linked to one another. Negligence in the first area often results in the need to increase expenditure in the second area, which is further adversely affected by the progressive population ageing.

Such manifestations of the vicious circle are likely to intensify under the ongoing global civilizational turning point. This turning point creates a basis for the emergence of new disease phenomena resulting from, among others, health-related unfavourable changes in people's lifestyles, both in the sphere of households and in work or business models. At the same time, new, usually quite expensive medical technologies are being created as a result of a technological breakthrough. This includes the risk of excessive, costly medicalisation (discussed more in detail hereinafter). All this increases the need for funding in the healthcare sector. In this sense, the sector is a kind of a money pit.

The ineffectiveness of any system generally has to do, among others, with the rules for measuring the achievements made within it. In the medical sphere, the measurement takes into account the medical procedures undertaken and the treatment process, which is self-evident, but little or, if anything, at most indirectly, the lasting effects of treatment and the scale of a recovery are taken into account. Under such conditions, the incentives for prioritising not the procedures but the end results of treatment and cure almost inevitably weaken to a considerable degree. This attests to a confusion between means and goals. The essential goal in such a situation, unfortunately, becomes, first and foremost, the treatment itself rather than the cure. This also has to do with the overall system of measuring socioeconomic achievements.

A measurement issue

The method of measurement is of paramount importance in almost every sphere of socioeconomic life for the rationality of action. People, institutions or enterprises act depending on how they are measured and evaluated.

A measurement issue of socioeconomic and therefore medical achievements is one of the most important issues both in economic theory and in economic praxis. This is because the method of measurement is a key determinant and stimulus of action. It always affects the behaviour of key stakeholders. If the measurement is wrong or incomplete, it may lead to erroneous or socially undesirable behaviours and decisions. It is therefore a systemic issue.

For many decades, gross domestic product (GDP) has been the reigning measure in the measurement of socioeconomic achievements. There is even a kind of fetishisation of this measure. Indeed, it is not uncommon to equate GDP growth, i.e. economic growth, with the socioeconomic development. However, this manifests a confusion of concepts, confusing means with goals, which may – and does – have negative consequences for the effectiveness of actions.

It is therefore a mistake to equate GDP growth with the permanent, sustainable, harmonious socioeconomic development, the pillars of which – besides economic growth – are social and environmental progress. GDP growth alone, without due social (including progress in healthcare) and ecological progress, is wild economic growth, limiting social well-being [Sachs 1996; Stiglitz et al. 2013; Rist 2016; Stiglitz et al. 2019].

In analyses of the measurement of socioeconomic achievements, the order of terminology is therefore important. Ignacy Sachs proposed in the mid-1990s that the term "development" should only be applied to situations where there is simultaneous progress in three dimensions, i.e. economic, social and ecological dimensions. In a situation of increasing measurement absurdities, it is still worth reminding about this. These issues have already been signalled in an article published in the *Mazovia Regional Studies* [Mączyńska 2021b], where a slightly simplified version of the table presented below is shown.

The classification of categories of growth and socioeconomic development proposed by I. Sachs corresponds to the concept of three-pillared sustainable development, as the main direction currently recommended in the programmes of the European Union, as well as in the concept of economics of the new pragmatism by G.W. Kołodko [Kołodko 2014].

The classification presented in Table 2 indicates the threats posed by fetishising economic growth at the expense of social and ecological progress. This leads to various socioeconomic degenerations that are also costly for health.

Much attention is paid to this issue by K. Raworth in her book titled *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* [Raworth 2021]. This British economist proves that the fetishisation of GDP makes that the means to achieve goals, such as GDP, is an end in itself, and the proper goals, i.e. improving people's lives, including protecting their health, social and ecological progress, disappear from the sphere of interests. According to Raworth, this is a kind of a "cuckoo's nest syndrome". Such a "cuckoo" in the economic nest is precisely gross domestic product (GDP). Indeed, GDP growth has transformed itself into the primary objective in socioeconomic policy, displacing the seemingly obvious key objective in democratic countries of improving people's quality of life and social well-being. Healthcare is an integral part of this [Mączyńska 2021b].

Table 2. Socioeconomic growth versus socioeconomic development

No.	Growth and development categories	Economic sphere	Social sphere	Ecological sphere
1.	Wild economic growth	+	-	-
2.	Socially-friendly growth	+	+	-
3.	Environmentally-friendly growth	+	-	+
4.	Harmonious, sustainable socioeconomic development	+ (a)	+	+

Source: based on I. Sachs, *W poszukiwaniu nowych strategii rozwoju*, Gospodarka i Przyszłość, Warszawa 1996, 1–4, p. 44 (with an author's addendum)

(a) – Given the manifestations of arrogant consumerism posing a threat to the planet, which characterise some countries, especially the wealthy ones, in such cases it would be reasonable to reduce GDP and/or its growth rate, e.g. by reducing the production of various non-essential products, including non-returnable wrappings and containers, in favour of returnable ones[2].

Directing the socioeconomic system towards harmonious socioeconomic development – rather than targeting GDP growth alone – comes into prominence. It is further necessary to orient the socioeconomic system towards renewability, regeneration of resources, instead of plundering exploitation of nature. An agnostic approach to economic growth and a shift to a post-GDP model (Beyond GDP Economy) are thus reasonable counterweight to wild economic growth and almost narcotic growth addiction [Stiglitz et al. 2019].

Although economic growth undergoes more easily to quantitative measurement than socioeconomic development, the measurement of this growth, which is GDP, is characterised by increasing shortcomings. Despite this, this measurement is still even fetishised in practice, unreasonably equated with socioeconomic development. Simply put, GDP is the newly created value in a given year, which consists of wages and profits from commercial, market activities, both legal and illegal, both socially useful and harmful. Such a measurement means that, under current EU regulations, GDP is increased even by such harmful activities as prostitution or drug trafficking (after all, these are commercial activities).

[2] A spectacular manifestation of wastage is the unfortunately developing culture of disposability of using a variety of products, encouraging GDP growth and business profits but destroying our planet. Another such a manifestation is harmful for the planet model of production development of wrappings. Examples of this include the increasingly common use of tiny plastic containers of coffee cream or small paper tubes of sugar. The cost of this type of wrappings exceeds, in some cases, the cost of products that make up their contents (not including the costs resulting from the harmfulness to health of some plastic wrappings). Wrappings add to the value of GDP, although they almost immediately end up on a waste heap. Wrappings of this kind are almost universally used, even at conferences of several hundred people in catering, HoReCa industry, etc. It is a way enforced on buyers, draining their pockets. In this one area alone, i.e. the area of wrappings (not to mention other fields), there is a huge amount of opportunity to rationalise and save potential that may be used for purposes that serve real social well-being.

GDP includes only commercial market transactions. Hence, many useful but unpaid activities are not reflected in GDP. However, socially negative but revenue-generating activities, including those mentioned above, are incorporated into GDP. Under this approach, healthy people, who do not buy medicines and do not use medical services, do not contribute to GDP growth, in contrast to sick people. This mirrors the absurdities of the measure. At the same time, it is clear that such features of measurement do not foster the rationalisation of actions.

This also applies to healthcare, as evidenced by the manifestations of wastage in this sector. In such conditions, systemic solutions aimed at improving the effectiveness, rationality of the use of available resources become a fundamental issue. This requires systemic, including regulatory, changes.

Such a need is highlighted with particular intensity under conditions of the civilizational turning point which the world, including Poland, is currently facing.

The civilizational turning point and its repercussions in healthcare – general remarks

Studies of the reference literature, as well as noticeable, affecting people's health changes in socioeconomic life, including changes in business models and changes in everyday life, indicate that an important background to these changes is the global breakthrough currently taking place, i.e. the civilizational turning point. This breakthrough, is expressed in the transition from an industrial civilisation, into a new, digital, post-industrial, still undefined and variously named civilizational model. This is resulting in profound changes in almost all areas of socioeconomic life, and therefore also in the healthcare sector.

This breakthrough is brought about by the so-called fourth industrial revolution (Revolution 4.0; Economy 4.0; Industry 4.0) with artificial intelligence (AI) representing it. AI is a medium for socioeconomic change with incredible, still underestimated power, resulting from the combination of material-physical, biological and digital potential, based on mathematical algorithms. Furthermore, even more enigmatic fifth industrial revolution is lurking at the gates of the world, for the time being embryonic, which is the subject of laboratory research with a so far almost entirely unimaginable potential of the so-called Artificial General Intelligence (AGI), a government of co-robots, communicating with each other without human intervention. (It is worth recalling here that the first industrial revolution was sparked in the 18th century by the invention of the steam engine and the weaving shuttle, the second – at the turn of the 19th and 20th century – electricity, while the third – in the middle of the 20th century – the invention of the computer. This is put forward, among others, by the founder of the World Economic Forum in Davos, Klaus Schwab, in his book *The Fourth Industrial Revolution* [Schwab 2018]).

Each of the previous three industrial revolutions has essentially changed the world, and generally in a highly turbulent way. Needless to mention that the earlier civilizational turning points, the transition successively from a hunter-gatherer civilisation to an agricultural one and then to an industrial one, also affected the healthcare sphere. It is no different – and much indicates that it will continue to be so – in the case of the current fourth revolution, except that in this case the transformation is incomparably deeper, more extensive and faster. At the same time, there is still not enough imagination to fully assess what further socioeconomic and other consequences new technologies, which are at the root of the civilizational turning point, may generate. This is all the more important because, as historical analyses and publications on civilizational transitions and their health, economic, political, social and cultural consequences prove, such transitions are always accompanied not only by benefits, but also by various threats and abnormalities, including even pathologies and wars [Kleer 2021]. Indeed, almost all technologies, including new ones, have both positive and negative potential, upsides and downsides. The benefits and positive potential of new technologies, artificial intelligence and digitalisation do not eliminate the risk of various associated therewith risks, including the risk of developing new diseases of civilisation, digital abuses, surveillance, dehumanisation, increasing human loneliness, etc. [Mączyńska 2021a].

The civilizational turning point is a kind of an earthquake, shattering old structures and patterns. Developing new ones is a difficult, complex process, requiring time and overcoming barriers resulting from clashing, overlapping old and new patterns of civilisation. Almost everything is changing during the civilizational turning point. This applies to institutional structures, rules of globalisation, functioning and role of a state, models of education, business and work, as well as models of household functioning, people's lives, etc. This creates, especially in the initial phase of transition, a fertile ground for chaos and disorder. The title of Grzegorz W. Kołodko's book *A World in a Predicament* [*Świat w matni*] may be deemed to be the most apt, shortest, synthetic assessment of the current global reality [Kołodko 2022].

At the same time, this situation points out the importance of research on transitions in healthcare forced by the fourth industrial revolution. One may ask a question whether, and to what extent, the fourth industrial revolution and the implementation of artificial intelligence affect and/or will affect the healthcare sector? For the time being, this question is remaining open, as the results of analyses and scientific investigations carried out on this matter are still far from completeness and unambiguity. However, history proves that civilizational turning points have always been associated with profound social and economic changes, especially in the labour market, and this, in turn, also has had an impact on the healthcare sector. One may thus assume that the sector will undergo profound changes this time too. A number of studies conclude that many existing professions will be replaced by professions not yet known today.

The following question arises. Whether twentieth-century economic genius John M. Keynes (1883–1946) was mistaken when, in his essay titled *Economic Possibilities for our Grandchildren* of 1930, he presented a vision of changes in people's living patterns over a period of 100 years, i.e. up to 2030, including a vision of social well-being, freeing humanity from material worries and a vision of a fifteen-hour working week, which may lead to an improvement in people's quality of life and health? [Keynes 2020]. Whether – and to what extent – Keynes was right will soon be proven by 2030, the year of the end of the period covered by his vision. 2030 is therefore, in this case, the step of verification.

The assessment of accuracy of Keynes' vision is all the more important given that, at the same time, there is no shortage of analyses pointing out phenomena characterising the current reality that are detrimental to people's quality of life and health. This is particularly vividly portrayed by German philosopher of South Korean origin Byung-Chul Han in a book with the symptomatic title *The Burnout Society* [Han 2022].

New trends generated by the fourth industrial revolution will undoubtedly have an impact on people's health and life expectancy, which in turn means new challenges for the healthcare sector. Indeed, there are many indications that artificial intelligence, with its incredible productivity-enhancing potential, will free people from a multitude of jobs, especially routine ones (but not exclusively), while the time it frees up may be used for other purposes, according to preferred living, residential, business and working patterns. At the same time, however, new technologies also have their dark side, including contributing to the development of dehumanising processes that are harmful to people. It should also be noted that the incredible dynamism of digital changes means that in the current reality, all forecasts are unfortunately subject to a high degree of uncertainty and a risk of error.

As a consequence of the development of artificial intelligence, the unprecedented speed of changes in the modern world makes these changes increasingly unpredictable and not always fully comprehensible. It is hard not to agree with prominent researcher on the state and future of the digital world Kevin Kelly, according to whom, in conditions as dynamic as the current changes "we are all newbies" [Kelly 2017]. As a result, there is a growing uncertainty about the shape of the future. This uncertainty refers also to the healthcare sector. This is, among others, uncertainty about the scope and dynamics of new diseases of civilisation.

The growing uncertainty is primarily the result of the turbulent nature of the transition. At present, one crisis is chasing another. Apart from the pandemic crisis, war crisis, climate crisis, food crisis and geopolitical crisis, one may mention the debt crisis, demographic crisis, crisis of the global order (global balance of power), crisis of globalisation, neoliberalism, global elites or immigration crisis.

And this is certainly not a closed list of simultaneously occurring crises in the world today. Indeed, other crisis phenomena are also taking place in many spheres, such as the crisis of unsustainable agricultural systems and food wastage, crisis of labour markets, progressive crisis of social trust, democracy, etc. Under such conditions, the occurrence of crises in healthcare systems is also not surprising [Mączyńska 2021b].

Professor Adam Tooze of Columbia University, who specialises in the study of economic crises, refers to the current global situation as a polycrisis, stressing that even a single crisis is difficult enough to analyse and seek remedies. And when combined with other crises, it is generating infinitely more chaos, because the whole is even more dangerous, more overwhelming than the sum of the parts. As Tooze states, the crises of the last 15 years have been so confusing that it no longer seems likely to point out a single reason thereof and therefore a single solution thereto. "While in the 1980s it was still possible to believe that "the market" would effectively steer the economy, deliver economic growth, resolve contested political issues and win the Cold War, who would make the same statement today?" [Tooze 2023]. Tooze emphasises that there is an ever-stronger sense of overarching global risk reaching the public consciousness. Although history proves that the world has almost never been entirely free of various crises, the crisic thicket is now so tangled that it is difficult, contrary to the previous years, to identify all its reasons, let alone recommend methods of therapy. It is not surprising, then, that under such conditions "sometimes one feels that one is losing one's sense of reality" [Tooze 2022]. It should also come as no surprise that the British publisher of the *Collins English Dictionary* had selected and announced the word permacrisis (permanent crisis) as the word of the year [Schumacher 2022; Assadourian 2023]. This may be deemed a kind of a synthesis of the horrors of 2022, a year of war, inflation and political instability, increased immigration and other misfortunes. With that being said, history proves that crises have never left the health of humanity unaffected [Laeven, Valencis 2008; Mączyńska 2021a].

Multiplication, permanence of crises is accompanied by various controversies concerning the causes of such unfavourable socioeconomic conditions. Although there is now a clear tendency to see the causes of crisis situations primarily in two global cataclysms, namely the COVID-19 pandemic and the war in Ukraine, while relatively little attention is paid to issues of civilizational changes, there is much evidence to indicate that the basic substrate of crisisogenicity is nevertheless the civilizational turning point happening in front of our eyes [Kleer 2021].

The ongoing civilizational turning point explains much of the turbulence in the world. This has been pointed out by a number of researchers, including Francis Fukuyama who in an article under the symptomatic title *The Breakdown of the World* [*Awaria Świata*] warns that "More and more people are realising that modern technology has created something of a monster. It is a system of communication that bypasses once authoritative institutions that create democratic discourse and provide citizens with a common base of reliable knowledge that they might collectively think over" [Fukuyama 2022]. American Professor of Philosophy Massimo Pigliucci speaks in a similar vein in an article whose title speaks for itself *Exit Twitter, exit Facebook to live!* [*Wyjdźcie z Twittera, wyjdźcie z Facebooka, aby żyć!*] [Pigliucci 2022]. History of civilizational changes and the ongoing turning point both confirm that "there is nothing more powerful than an idea whose time has come, and nothing more harmful than a person who still lives by old ideas" [Kiyosaki, Lechter 2002].

The strength of artificial intelligence – positive and negative consequences for human health

Under conditions of the civilizational turning point, a variety of benefits, but unfortunately also abnormalities, threats and risks are manifesting and materialising. They are also revealing themselves quite vividly in the healthcare sphere.

Examples of the benefits of artificial intelligence in healthcare may be multiplied, what exceeds the scope of this paper. The invention of a medical robot is a particularly surprising example of what was done as a part of research carried out by a body of researchers from Stanford University, none of whom were proficient in medicine. The main creator and developer of this research is not a medical practitioner but a software pioneer proficient in the field of autonomous cars – Sebastian Thrun (sic!). As a result of this research, an artificial intelligence-based skin cancer diagnosis system was developed. A robot has been created that can compete with the best dermatologists in terms of a success rate. This illustrates the vastness and unimaginability of the potential of artificial intelligence. It eludes traditional patterns of thinking. The said body applied Convolutional Neural Networks (CNNs) in skin research, using only pixels and disease labels as input – a dataset consisting of 129,450 images. The results were checked by confronting the diagnoses made by the robot with those made by 21 certified dermatologists, i.e. their judgements based on clinical images confirmed by biopsy. The robotic studies involved cases of the most deadly skin cancer, i.e. *melanoma malignum*, and its other milder forms. In each of these cases, the capability of the CNN artificial intelligence system to classify skin cancer at a level of competence comparable to the judgements of the dermatologists was confirmed. At the same time, the inventors of the robot have proven that through mobile devices equipped with deep neural networks the reach of this type of diagnostics may be extended beyond the space of clinics. This may therefore provide cheap, universal access to essential diagnostics care [Esteva et al. 2017].

The benefits of artificial intelligence are increasingly being used in healthcare. Both doctors and patients value the opportunity for remote digital advice, as well as the use of digital tools (also remote) for health state measurement, the opportunity to use digital early warning systems for various health risks. Artificial intelligence may thus not only increase the effectiveness and precision of medical work, but may also – and this is not to be underestimated – unlock space for the professional creativity of medical practitioners.

The benefits and unimaginable potential of artificial intelligence have already born out in its application in almost all areas of socioeconomic life. Sometimes these applications are quite surprising but also inspiring. Singapore, for example, was the first country to implement a robot to replace members of the supervisory board. In China, on the other hand, a robot for detecting bribery had been created and then applied.

However, the benefits of artificial intelligence may not obscure the fact of its dark sides, including threats to people's health. For artificial intelligence as a technology is just a tool, it may be used correctly or incorrectly. A tool like a knife, can save a life, but it can also kill, cause harm. This also applies to digital technologies. Among others, these technologies are characterised by a significant risk of increasing dehumanisation processes. In fact, this is not a new problem. For technological dehumanisation has already been warned against many decades ago by prominent intellectuals. This has already been warned against, especially in the context of morality and ethics, by Albert Einstein, who in 1946, in a letter to another intellectual Otto Juliusburger, wrote: "I am convinced that the appalling moral decline we are witnessing today is the result of the mechanisation and dehumanisation of our lives – the pernicious by-products of a scientific-technical mentality. *Nostra Culpa!*" [Calaprice 2014, p. 373].

Today, this caution is proving somewhat accurate. Dehumanising technologies, dehumanisation of various activities (including those in the healthcare sphere) in an effort to minimise costs, as well as various austerity measures, cuts in state's spending on public purposes, including healthcare, on common welfare, are all factors that frequently make people feel lonely, unhappy, burnt out, unhealthy and often hostile towards themselves. It is also no coincidence that patients often complain that they feel like they are objectified rather than treated humane during medical procedures.

This is why it is so important that Einstein's *Nostra Culpa* (our fault) would not embody. This is all the more important as today's reality is characterised by people's increasing dependence on digital technologies. To make matters worse, artificial intelligence may be (and is) also used for disinformation, in hybrid warfare, cyberattacks, in the mass dissemination of fake news or deepfakes, i.e. the creation of false information, statements and false existences (avatars) attributed to real people. Unfortunately, it appears that artificial intelligence is also fostering the increase in forgery of scientific research results, especially in medicine-related sciences [Oransky, Marcus 2023].

The dark sides of digital technologies become particularly drastic when considered in the context – so characteristic for the digital revolution and the civilizational turning point – of the increase in loneliness syndrome and other illnesses, as well as the associated economic and social, especially health, costs.

One of the more widespread and growing phenomena associated with the overuse of digital technologies is becoming precisely the loneliness of people, their enforced solitude. This is yet another of the many, almost model evidence that modern technologies, despite all their benefits, have their downsides and thus may negatively affect people's health, generating many derivative diseases, harming people, crippling their psyche and body.

A rise in the loneliness syndrome is taking place on a global scale, and on a scale that humanity has never experienced before. This syndrome translates into a series of negative, often dramatically costly economic, social, including health, etc. consequences. This is confirmed by international and national research [Hertz 2020; *Raport* 2022].

There is much evidence nowadays indicating that managerial decisions made at various institutional levels, which are not sufficiently geared towards optimising the use of new technologies, are a key factor in the increase in loneliness syndrome. The question of such optimisation becomes more important, the more negative manifestations of the destructive potential of digital technologies are generated.

The epidemic of loneliness and other digital disorders – new challenges for the healthcare sector

Scientific, empirical research show that under the civilizational turning point, more and more people from different environments and countries are signalling a growing problem of loneliness and anxiety. This is also confirmed by national and international scientific research [Hertz 2020; *Raport* 2022]. The digital technology makes it possible to go for weeks without direct contact with other people. In many spheres, it is possible to receive almost everything one needs for life and work via the Internet, and thus direct human interactions are increasingly limited. In addition, there are many indications that, under such conditions, the risk of increasing loneliness will grow.

In this regard, loneliness no longer remains solely a private problem for those affected. It is becoming a social problem with much wider implications. For the rise of the loneliness syndrome affects negatively not only people's quality of life but also the effectiveness of the economy, functioning of the healthcare sector and even state of democracy. In addition, this is definitely not a complete list of areas affected by the destructive power of loneliness, resulting in various, sometimes dramatic, consequences for people and their life prospects.

This is spectacularly backed by research of British economist Prof. Noreena Hertz, an author of the world's first book to comprehensively address the socioeconomic consequences of loneliness, including, above all, its monstrous costs [Hertz 2020; Mączyńska 2021a][3]. Drawing on research from around the world, Hertz argues that the first two decades of the new millennium has already been characterised by the greatest human loneliness syndrome in history, a syndrome that is, moreover, still surging. At the same time, research has shown that the loneliest generation are young people, the most "digitised" and increasingly losing their ability to interact socially, with surging problems in direct social communication, including reading signals from facial expressions or body language in general. Hence, some of the US universities (including the most renowned Ivy League universities), faced with the clearly revealing social "autism of first-year students", have been forced to launch special courses in students' ability to establish relations directly with others, read facial expressions, etc., courses to restore skills that have been eroded by the overdose of digital technologies. Hertz concludes in this regard that if the mantras of "community", imposed by social media companies were true, the world would be one, big, happy family. This is not the case, however, and the loneliness syndrome, even the loneliness epidemic, is exacerbating. Although as billions of people are connected to the digital world in countless ways, the term "loneliness epidemic" almost sounds like an oxymoron or absurdity, yet it is a reality.

[3] A book titled *The Lonely Century: Coming Together in a World that's Pulling Apart* [2020], Polish translation: *Stulecie samotnych. Jak odzyskać utracone więzi*, 2022, Publishing house: Słowne (formerly Burda Media Polska).

From Hertz's research stems that even before the global pandemic led to the practical implementation of terms such as lockdown or spatial / physical distance (incorrectly referred to as "social" in Polish journalism), loneliness had been well on its way to become the word that best defines humanity in the 21st century. This is linked to the process of disintegration of the "fabric of community" taking place in the modern world, which threatens social relationships and sometimes the quality of personal life.

From this research stems that the detachment from the real world in favour of the digital world, negatively affects not only people's health but also their productivity, which thus inevitably, negatively affects the economy, including a surge in various costs borne by entrepreneurs and the state, whose domain is, after all, public health.

After all, loneliness triggers cumulative stress reactions, weakening the immune system, which increases the risk of diseases, including heart disease (by 29%), stroke (by 32%) and dementia (by 64%). This means an approx. 30% greater likelihood of premature death, including suicide. Research shows that unwanted loneliness is worse for health than the lack of physical exercises and twice as harmful as obesity.

And yet, the analogy between loneliness and hunger is even literal, not just symbolic. For scientists have discovered that loneliness actually triggers the same neural pathways as hunger. This means that the need for interpersonal contact and closeness may be as crucial as the need for food [Hertz 2020]. Against this, current lifestyles are becoming increasingly atomised. Humans, on the other hand, are not made for isolation.

The severity of loneliness causes people to opt for a variety of unremarkable, sometimes extremely dramatic methods of coping therewith. In Japan, for instance, it has become a phenomenon among senior citizens so tormented by loneliness that, avoiding total isolation, they paradoxically choose prison because there they may abide with fellow inmates. Hence, they deliberately commit minor crimes, but serious enough to be imprisoned. Lonely inhabitants of Japan, especially senior citizens, whose households are often equipped with a variety of human-like robots, begin to treat them as loved ones over time, which manifests itself, for instance, by knitting caps for them, and are even willing and attempting to bequeath all of their estate to them.

Hence, companies specialising in "rent-a-friend" – people to talk to, people to accompany on a trip to a cinema, theatre, etc. – develop rapidly. However, research shows that the long-term use of such services, usually quite expensive, not only does not reduce loneliness but quite the contrary – intensifies it and may lead to material degradation [Hertz 2020; Mączyńska 2021].

The surging of loneliness syndrome, while having a negative impact on people's health, also has a negative impact on the economy and thus on the financing of healthcare. According to Hertz, even before the COVID-19 pandemic in the United Kingdom, employers were losing approx. £800 million a year due to employee's sick leaves related to loneliness [Hertz 2020]. It is also no coincidence that former UK Prime Minister Teresa May appointed in 2018 the world's first Loneliness Minister – declaring the "hidden epidemic" affecting 9 million Britons as "one of the greatest public health challenges of our time" [John 2018]. A kind of *à rebours* approach is the institution of the Happiness Research Institute in Copenhagen, which stems, e.g. from the recognition of the importance of people's sense of happiness for the socioeconomic development and its harmonisation and persistence [Daniłowska 2014; The Happiness 2021].

Japan has also opted for a Loneliness Ministry, with the appointment of the first Loneliness Minister in the Japanese government in 2021. The immediate premise for this decision was the increase in suicides in the country during the pandemic. It is significant, however, that the process of surging loneliness syndrome had already been progressing in Japan before the pandemic. The Japanese are particularly affected by it. It is a rich, highly developed country with one of the highest levels of robotisation and artificial intelligence implementation in the world. However, as it turns out, the dynamic progress of digitalisation and artificial intelligence implementation is not leading to a halt in the process of surging loneliness but quite the contrary – is intensifying it. Although, in the digital world, everything is for sale, there are still no sufficiently effective solutions to permanently counteract the surge in loneliness syndrome.

Other unfavourable phenomena for people's health generated as a result of the development of digital technologies and their overdosing, one may mention, for instance, such manifestations of disease phenomena as a surge in anxiety states, psychoses, depression, etc. In addition, there are many other pathogenic conditions, manifestations of syndromes of abnormal use of digital media, including their influence, especially on mental health. The definitions of these conditions have not been standardised yet and not all have been recognised as medical classifications yet. Nevertheless, it is highly likely that such pathogenic phenomena will surge, which may necessitate treating them as medical classifications. This is indicated, e.g. by the surging phenomenon of fear of missing out (FoMO), especially among young people, but also among younger students noted in the reference literature since 2004. It is a syndrome of fear that we might miss something out if access to smartphones or other digital devices and programmes is restricted [Gupta, Sharma 2021]. In addition, from research stems that nomophobia (no mobile phone phobia), defined as the fear of not having access to digital networks, a situational phobia triggered by the unavailability of a smartphone or the thought that one does not have it, cannot use it or might lose it, may be associated with anxiety states, especially among people with high FoMO [Kumar et al. 2021].

At the same time, it cannot be ruled out that digital technologies and artificial intelligence may influence the surging development of the controversial phenomenon of medicalisation and biomedicalisation, i.e. the concept of medical control over all areas of human existence. Nowadays, it has largely to do with the increasing technologisation of the public health sector but also of the private health sector.

Controversial medicalisation

Medicalisation is a concept coined in the 1970s in sociology to explain the problem, identified by sociologists, of applying medical knowledge to cases that are obviously neither medical nor biological [Conrad 1975]. In sociology, medicalisation is most often seen as a form of social control, a kind of "colonisation" of social life by medical practitioners, whereby medical power extends more and more into areas of everyday life, thereby they increasingly subject to medical authority and supervision [White 2002].

Medicalisation is characterised by treating natural physiological processes or natural steps of a human life in terms of medical problems. Thus, medicalisation means encroaching on areas of human existence previously traditionally considered "natural". It encroaches on areas such as childhood, pregnancy, sexuality, trauma or menopause and even death (of which a manifestation may be euthanasia). Non-medical problems in such areas are treated as medical. This is sometimes accompanied by an overmedicalised narrative, affecting people's individual and collective behavioural patterns. This involves the operation of bio-authority mechanisms and the knowledge and authority of experts, playing the role of medical arbiters, as well as the creators or inventors of new afflictions and the artificial multiplication of various dysfunctions. Influencers, who promote, e.g. vitamin drips and dietary supplements, as well as various treatments to maintain youth, counteracting the manifestations of old age, etc., fit the pattern of mechanisms of this type. It involves the development of a culture of self-care, self-awareness of one's own body, but also taming of one's own self, what in publications is defined as healthism. Man's self-imposed quest for the ideal form, the cult of health, is considered by some researchers to be one of the mechanisms of ubiquitous medicalisation [Nowakowski 2015]. Linked to this is the phenomenon of cyberchondria, i.e. an unreasonably heightened worry about the state of health, which is caused, among others, by intensive browsing of online resources of publications and other pieces of information, also of non-medical origin, on this topic. This sometimes translates into distrust towards doctors and even the development of denialism, i.e. the rejection of scientifically verified methods in favour of non-scientific methods. Paradoxically, this also creates a favourable ground for medicalisation [White 2002].

Medicalisation may be generated both as a consequence of new evidence or hypotheses concerning conditions and the development of new drugs or methods of treatment. In sociology, medicalisation is examined in terms of the role and authority of specialists and corporations, as well as consequences thereof for people whose life decisions may depend on the prevailing concepts of health or illness. Thus, medicalisation is also sometimes seen as "pathologisation" or "disease mongering".

Different varieties of medicalisation, mostly overlapping each other, are distinguished in the reference literature. These varieties include discovering new diseases or altering the parameters of existing diseases and improving the natural characteristics of the human body for a specific desired pattern, etc. This obviously results in an increase in the number of patients [Nowakowski 2015].

Medicalisation is thus linked to the increasing monetisation, commodification and commercialisation of medical services.

This manifests itself, among others, in the fact that medical preparations are promoted and sold as consumption goods, which has a number of social consequences, both positive and negative. Upsides ensue, first and foremost, from that in some cases discovering new diseases may foster their treatment, and thus improve people's quality of life. This is all the more important because products made as a result of the development of pharmaceutical research, products introduced by the medical science industry, enable comprehensive health monitoring and create the development of methods of treatment. This is also fostered by digital technologies, enabling the development of comprehensive data banks, increasing the availability of knowledge of new medical discoveries and achievements, not to mention facilitations for patients, such as in the case of Poland – the digital portal Internet Patient's Account (IKP), e-prescriptions, e-referrals, e-sick leaves, e-appointments, etc. The upsides of medicalisation include the accessibility of medical services, while the negative aspects (besides those already mentioned) – the social inequalities surging due to income disparities in terms of such access. Under such conditions, global corporations, often oligopolistic, increasingly control the market of medical services by offering innovative technologies on their terms.

Medicalisation, with its upsides and downsides, is still arousing controversy, both among experts in various fields of science, including medicine, sociology, psychology, psychiatrics, economics, political science, etc., and among ordinary people. Therefore, the need for regulatory barriers to the medicalisation and implementation of demedicalisation processes is indicated. This controversy points out the need for holistic analyses in this field and for research aimed at optimising the medicalisation framework. This is all the more important as opponents of extending medicalisation point out the associated therewith risk of the dominance of expertise, resulting in dehumanisation, objectification and alienation of patients.

The negative impact of profit-driven pharmaceutical companies and their somewhat oligopolistic power is also exposed in debates and disputes about medicalisation. Hence the concept of "medical imperialism" and the corporatisation of the medical system appears in the reference literature. The negative implications of this are extensive, including for healthcare financing [Nowakowski 2015]. The issue of manipulation of people's behaviour is also exposed, especially in relation to medicines, which is presented extremely spectacularly, especially in the chapter "Medicines and food", by two Nobel Prize-winning economists Robert Shiller and Georg Akerlof in a book with the illustrious title *Phishing for Phools: The Economics of Manipulation and Deception* [Akerlof, Shiller 2021].

With increasing social problems, including those related to medicalisation, there is an increasing number of publications pointing out the deficiency of systemic solutions, especially regulatory ones, which justifies the need for their change [Sennett 2010; Sandel 2012; Banerjee, Duflo 2019]. Even the very titles of these publications (*vide* References) indicate the necessary and indispensable directions of change. For these publications reveal the pathologies stemming from the still dominant neoliberal model of capitalism, characterised by the market fundamentalism and fetishisation of GDP. On the Polish ground, from a philosophical perspective, Maria Szyszkowska ranks this model highly critically, confronting it with the imperative of eighteen-century thinker Immanuel Kant: "So act that you use humanity, whether in your own person or in the person of any other, always at the same time as an end, never merely as a means." [Kant 1953, s. 6][4]. However, there is no shortage of evidence that this is not always the case.

In this context, M. Szyszkowska extremely critically states that ″We live in Europe under conditions of a neocapitalist economy, i.e. economic neoliberalism. Characteristic for these approaches is the supremacy of corporations over the governments of individual states. Moreover, their aim is to accumulate wealth, so they induce to wars. It is not only the armaments corporations that grow rich, but also the pharmaceutical, clothing and food corporations" [Szyszkowska 2023, p. 106]. Szyszkowska points out that under conditions of neoliberalism, ethics and morality in interpersonal relations are marginalised. She points out that this leads to a lowering of the value of human beings. She notes that it even manifests itself in nomenclature. An example of this is "referring to people as human assets, subject of education or beneficiary – instead of patient" [Szyszkowska 2014, p. 81]. G. Kołodko similarly critically ranks the neoliberal model of capitalism [Kołodko 2022].

Neoliberal degeneration is also attributed to medicalisation. In this regard, it is pointed out that optimising its scope, including through demedicalisation, is becoming a key issue, all the more so as increasing medicalisation is associated with the need to increase financial expenditure on healthcare.

At the same time, this points out the need to optimise the implementation of new technologies and artificial intelligence. Such optimisation should be aimed at such systemic solutions that would foster the formation of broadly conceived antifragility. Antifragility is a direction of change promoted by Lebanese-American academic Nassim Taleb, an author of the acclaimed book *The Black Swan* [Taleb 2020]. According to Taleb, however, the current systemic solutions are predominantly different, they are going rather in the opposite direction, i.e. towards fragility. This is expressed by Taleb's triad: fragility – robustness – antifragility [Taleb 2013]. The symbol of fragility is the Chinese china or the mythical sword of Damocles, while the mythical symbol of robustness is the phoenix reborn from ashes, whereas the symbol of antifragility is the mythical hydra, which, when its head is cut off, grows two or three in its place. Currently, many European Union programmes focus on the need to shape anticrisis robustness (resilience), but according to Taleb's concept, this would not suffice. For antifragility is necessary [Taleb 2013]. In the growing turbulence of the modern world, it is of paramount importance.

[4] Translator's note: Mary Gregor's translation in *Groundwork of the Metaphysics of Morals*, p. 38.

At the same time, it indicates the necessary directions of changes in the healthcare system, including, in particular the shaping of priorities in this sphere and systemic regulations that go hand in hand with them. According to research, this may do more to rationalise not only healthcare, but also the socioeconomic development and effectiveness of resource consumption, as well as to reduce the multiple undesirable side effects of change, than the pursuit of ever greater economic growth – GDP growth. Nobel Prize-winning economist Paul Romer resorting to a culinary metaphor, points out that the right recipes "formulae" are more essential than the process of "more cooking" – i.e. ever greater GDP (economic growth springs from better recipes, not just from more cooking. New recipes produce fewer unpleasant side effects and generate more economic value per unit of raw material) [Lawder 2016]. Whereas these "formulae" are the domain primarily of economists but also lawyers [Łazarska, Miczek 2023].

In February 2020, Romer, in a post on his website, remarks rather waspily about the responsibility of economists for past, present and future socioeconomic events and trends. For those are economists who create various models (including econometric ones) and concepts for shaping socioeconomic systems and the principles, priorities and indicators adopted by them [Romer 2020]. And here Romer uses a rather surprising analogy with obstetrics. Namely, in the 19th century, it was diagnosed that when a doctor assisted at a childbirth, there was an increased likelihood of a patient dying. The reason for this turned out to be trivial. Namely, this was the doctors' failure to wash their hands (sic!). In such a situation, therefore, the choice was left either to exclude doctors from assisting childbirths or to rigorously enforce that they would wash hands. Romer, making use of this example in relation to economists, stipulates that he does not want to suggest societies to get rid of economists, but to pay attention to their "clean hands". Thus, the requirement for economists to reckon with realities, facts, including those that attest to the substantial errors of the economists' environment is of paramount importance. In order for the work and recommendations of economists to be credible, the scientific community of economists must take collective responsibility for – resulting in enormous socioeconomic damage – the errors that may and, unfortunately, do happen to some economists in some of their studies. It is imperative to expose such mistakes instead of being stuck in them, which may stem from various reasons, including narrowly conceived environmental interest [Romer 2016, Romer 2020]. The foregoing applies to the healthcare environment, which points out simultaneously the necessary directions of change in this matter [Mączyńska 2020].

Necessary directions of change in the healthcare system in Poland

Under conditions of the current civilizational turning point, brought about by the fourth industrial revolution, with its as yet not fully recognised, still developing potential of artificial intelligence, in almost every sphere of activity, thus also in the healthcare sphere, it is necessary to fulfil at least the following three conditions – *conditiones sine quibus non* – in order to function rationally and cope with turbulent changes:

1. Optimal usage of potential of the fourth industrial revolution, including digital technologies and artificial intelligence so that use their assets to the greatest possible degree, eliminating simultaneously, or at least minimising, their drawbacks.
2. Shaping antifragility.
3. A change of priorities in the state's socioeconomic policy and in the healthcare system in favour of directing them towards quality of life and people's health, as well as implementation of the necessary changes in legislation, principles and procedures at respective institutional decision-making levels serving satisfaction of these conditions.

Under conditions of the fourth industrial revolution and the boom of the development of artificial intelligence, it is particularly important – and worth repeating – to optimise the use of the potential of these technologies, while at the same time limiting their negative impact, above all on people's health in order to counteract such unfavourable phenomena for people's health as the epidemic of loneliness, FoMO syndrome or nomophobia, as well as excessive medicalisation. In a situation of almost chronic underfunding in the healthcare sector, counteracting overmedicalisation is all the more important as it is a costly phenomenon in terms of both public and individual expenditure, and, additionally, not always favourable for health improvement.

The three conditions listed above are *conditiones sine quibus non*, but at the same time directional in nature. Their implementation must consist of a complex mix of different specialised processes, in addition to continuous processes rather than one-off actions. These processes are, unfortunately, usually combined with the need to increase expenditure on healthcare financing. Meeting this requirement is, however, particularly difficult, especially as, according to research conducted by Krzysztof Opolski and Marek Zuber, given the current realities in Poland, it is difficult to assume that even in a situation of economic growth and the associated increase in people's wealth, it will be possible to ensure satisfactory results in terms of increasing expenditure on healthcare, just contenting oneself with the health insurance in its present amount [Opolski, Zuber 2023].

In such a situation, it is of paramount importance to improve the effectiveness, rationality of use of available means. This is all the more important given that Poland – as has already been emphasised – features both low expenditure on healthcare, and distinct manifestations of ineffective management and wastage of these means.

The shortage of financial means in the healthcare sector is a complex and difficult problem, all the more so because the dynamism of technological change and novel, ever-improving but also increasingly expensive treatment methods mean that the healthcare system has an indication of a kind of a money pit.

Under such conditions, it is all the more important not only to make rational use of available resources, but also to acquire additional sources of funding for this sector. One such solution is the establishment of the Hospital Fund recommended by the authors of a study on the subject – Krzysztof Opolski and Marek Zuber. However, this does not exhaust the possibilities and legitimacy of creating other dedicated funds, including those raised by means of crowdfunding, i.e. financing or co-financing by a community [Opolski, Zuber 2023]. However, the success of solutions of this type absolutely requires a concurrent rationalisation of the use of already available resources in the healthcare system.

Rationalisation of the healthcare system, especially in adapting to the challenges presented by the civilizational turning point taking place under the influence of the fourth industrial revolution and shaping of a new economy, require systemic changes, including regulatory and organisational ones. The main directions of these changes are presented in an enumerative manner hereinafter, although this is certainly not a concluding list.

- Departing from the currently clear priority for overly bureaucratic procedures, instead of prioritising patient's welfare.
- Relieving doctors of non-medical work, including reporting-related, which may foster better use of medical expertise and thus increase the effectiveness of treatment. This is more valid given that non-medical work, as well as some computer-technical work may be carried out in the majority by accordingly digitally trained support personnel. Such a burden shift would at the same time enable the rationalisation of remuneration expenditure. For remuneration of non-medical staff is in principle lower than those of doctors.
- Increasing the significance of cure rates relative to treatment rates in the medical achievement measurement system, which would provide an important incentive to increase the quality of medical activities.
- Strengthening action for the key role that preventive medicine may play. With the increased rank of preventive medicine, the healthcare system would inherently be geared towards long-term outcomes, which would imply a preference for the use of modern, highly effective methods and measures, enhancing the lasting effects of treatment, treating the causes of conditions rather than just their manifestations. A high rank of preventive medicine and expenditure savings would translate into a reduction in the negative intensity and consequences of diseases for economy, thus becoming a dynamising factor for economic growth and improving people's quality of life.
- Treating healthcare in terms of a social investment, rather than solely as an expense that burdens state and self-government budgets. This would favour a priority for modern, the most effective treatment methods. This is all the more important given that outdated methods – which must be emphasised once again – usually have a negative impact on the results of treatment and in the final, full account, they increase costliness. They make the treatment process longer and / or cause the disease to relapse. In turn, this increases the total cost of treatment, reducing its effectiveness. Therefore, the greater the scale of the "short blanket" phenomenon in the healthcare system, the more insightful analyses of effectiveness and efficacy of treatment methods are necessary, taking into account a comprehensive account, i.e. including cost accounting and externalities and thus the full, complete cycle and outcome of treatment.

- Developing and rationalising of the health education system, both at academic and other levels.
- Creating a full-scale, specialised centre for comprehensive analyses of the effectiveness of the use of healthcare funds, analyses in terms of improving patients service and the comprehensive effects of their treatment, as well as improving the overall situation in the healthcare sector.
- Developing research and analyses in the form of both case studies and aggregate analyses, as well as international benchmarking. Such analyses should also address the existing procedures applied in healthcare facilities in terms of their legitimacy. For there is much to suggest that some of these procedures and regulations shaping them not only fail to counteract wastage of means held at the disposal of the healthcare sector, but actually encourage it. This approach is about treating, not curing, what is a denial of rationality.
- Closely linking the directions of the evolution of the healthcare system with the results of comprehensive analyses of the effectiveness and rationality of spending means on this matter, analyses taking into account long-term cost accounting and externalities. Without such an account, it is difficult to hope for a reduction in the tensions and imbalances that currently are characterising this sector. Within the long-term cost accounting and externalities, it is necessary to treat expenditure on healthcare as an investment and a necessary factor for GDP growth and the country's socioeconomic development, including the maintenance of strategic manufacturing potential. This is particularly important in view of such unfavourable current and predicted demographic processes, including Poland's shrinking population and the progressive population ageing.
- Shaping the innovative healthcare system. This is of paramount importance, as it is the kind of a system that ensures, first and foremost, the most effective treatment of patients and relatively sustainable treatment outcomes. With that being said, it is a system that does not allow potential, including doctors' work time, to be wasted on bureaucratic ordeal. At the same time, it is a system that does not allow for pseudo-saving methods of treatment. It is a system based on prioritising patient's welfare, countering overly bureaucratic procedures that lead to the erosion of genuine care of a patient. The innovative system moreover features assigning a key role to preventive medicine. In such a system, health is treated precisely in terms of capital and investment rather than cost. It is an inclusive system, i.e. one that does not leave patients without a chance to access modern treatment. Simultaneously, it is a system in which medicalisation processes are optimised.

Implementation of the recommendations presented is a part of the requirement to optimise the use of potential of the healthcare sector. Such optimisation becomes a prerequisite for sustainable, triple-harmonised progress at a microeconomic level and for socioeconomic development at a macroeconomic level, i.e. development in which economic growth guarantees social and ecological progress, and thus improves people's quality of life and work, shaping social well-being. The question of how to optimise the use of new technologies is all the more important because, in addition to their beneficial and positive transformative potential, they also feature a negative potential, a potential for destruction. As history confirms, this has always been the case and is still the case today.

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Dylematy funkcjonowania systemu ochrony zdrowia w warunkach przesilenia cywilizacyjnego

STRESZCZENIE

Przedstawiane w tym opracowaniu analizy ukierunkowane są na identyfikację nowych trendów i wyzwań w sektorze ochrony zdrowia, przede wszystkim wynikających z dokonującego się obecnie w skali globalnej przesilenia cywilizacyjnego, jako następstwa czwartej rewolucji przemysłowej, rewolucji cyfrowej z jej niewyobrażalnym potencjałem sztucznej inteligencji. W takich warunkach istotne są zwłaszcza rozwiązania ukierunkowane na optymalne wykorzystywanie nowych technologii, w tym przede wszystkim rozwiązania przeciwdziałające nieprawidłowościom, skutkującym marnotrawieniem materialnego i intelektualnego potencjału w tym sektorze. W warunkach bowiem niemal chronicznego niedostatku źródeł finansowania ochrony zdrowia, charakterystycznego zresztą nie tylko dla Polski, lecz także dla wielu innych krajów, fundamentalnego znaczenia nabiera racjonalizacja wykorzystywania dostępnych zasobów. W Polsce jest to szczególnie istotne ze względu na relatywnie niskie nakłady na ochronę zdrowia, zarówno w wymiarze bezwzględnym, jak i w relacji do PKB. Potwierdzają to prezentowane w artykule statystyki międzynarodowe. W tym kontekście w artykule wskazuje się na wybrane racjonalizujące kierunki zmian w krajowym systemie ochrony zdrowia.

Słowa kluczowe: system ochrony zdrowia, czwarta rewolucja przemysłowa, przesilenie cywilizacyjne, medykalizacja, FoMO, koszty samotności, AI, cyberchondria, denializm

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