

DIABETES MELLITUS (UN)MET CARE IN THE CZECH REPUBLIC IN THE COVID-19 PANDEMIC (ECONOMIC DATA ANALYSES BY CZECH HEALTH INSURANCE COMPANIES FROM 2016 UNTIL 2020)

DIABETES MELLITUS (NE)ODLOŽENÁ PÉČE V ČESKÉ REPUBLICE V PANDEMII COVID-19 (ANALÝZY EKONOMICKÝCH DAT ČESKÝCH ZDRAVOTNÍCH POJIŠŤOVEN OD ROKU 2016 DO ROKU 2020)

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ABSTRACT

The aim of the paper is to map and explain the consequences of the COVID-19 pandemic on the (un)met care in diabetes mellitus in the Czech Republic in the period between March and December 2020. The significance of the verification stems from the fact that more than 900 thousand Czech people (8.5% of the population) suffer from diabetes and unmet care may result in inadequate glycemic control, increased morbidity and mortality, and higher incurred costs of outpatient care, emergency room visits, hospitalization and managing complications of diabetes. The paper analyzes economic data of three Czech health insurance companies from 2016 until 2020, concluding that diabetic care in the period from March to December 2020 was unmet. However, the volume of unmet care was not higher in regions with characteristically worse availability of healthcare. In terms of health absorption, the volume of diabetes care in-

creased slightly in the summer months, but in the autumn and in the second wave of COVID-19 measures the values dropped to the level of 2016.

Keywords: *diabetes, diabetic healthcare, COVID-19 unmet care*

JEL Classification: *I12, I18*

1 INTRODUCTION AND BACKGROUND

The purpose of this study is to examine the impact of the external factor (COVID-19) on the performance of the healthcare system. The methodological basis is the concept of a dynamic system (Prigogine et al., 2001).

Each system, in general, tends towards balance (stability). In the case of social systems, they are set up to meet the set goals (or activities). The real degree of fulfilment of goals indicates the stability of the system and its functional efficiency. However, in some cases, the system may malfunction. This is reflected in the fact that the system does not meet the set objectives and does not necessarily perform the expected activities. System malfunctions can be caused by two types of negative factors. The first are internal negative factors. These are factors that are related to the “internal state” of the system. Externally, we observe this negative effect as a loss of functionality and a loss in the performance of the system. This loss of functionality can be caused mainly by the following factors: insufficient professional capacity of the system management to perform activities, insufficient number of executive staff and its low qualification readiness, limited financial resources for performing activities, etc.

External influences can also have a negative effect on the system’s performance. These are events that are usually unforeseen. They are emergent in nature, which means that they appear suddenly. Such effects on the functioning of the system are usually very negative. They can lead to system instability and even disintegration (bifurcation – see Prigogine et al., 2001). In reality, the negative influence of internal and external factors usually has a negative synergistic effect. There is a multiplication of the negative effect, which is reflected in a drastic decline in system performance.

In our study, we will focus on one of the dynamic systems, which is the healthcare system in the Czech Republic. We will examine the impact of the influential negative factor, the COVID-19 pandemic, on the performance of this system.

We will examine the performance of the healthcare system in the case of healthcare related to diabetes mellitus. We will monitor the effect of this negative factor on the deferred care indicator. The key thesis is that the healthcare system will lose its functionality if we notice that there is deferred patient care. By deferred healthcare we mean a negative change in the condition (i.e., the difference) between the original plan (number) of treated patients and between the real (reduced) condition of treated patients due to the influence of the negative factor.

Formally expressed:

$\Delta N = PN - RN$, where

ΔN - Deferred care (number of patients)

PN - Planned care (number of patients)

RN - Real care (number of patients treated in reality)

Deferred healthcare ΔN (number of untreated, originally planned patients) is the difference between PN (planned care measured by the number of patients) and RN (real care measured by the number of patients treated).

Deferred care is an indicator of system malfunction. It signals a loss of functionality, non-fulfilment of set goals. Functional correction requires investigating the causes of system efficiency loss.

Healthcare systems are facing challenges in dealing with the COVID-19 pandemic and are therefore much analyzed from the pandemic preparedness and the pandemic governance point of view (Blumenthal et al., 2020 - Garrafa et al., 2020).

The – very often day-to-day – pandemic governance might be opening a gap between the global health security (centred on preventing, detecting and responding to public health threats, particularly by protecting people and societies worldwide from infectious disease threats (Haymann et al., 2015) and universal access to care (Lal et al., 2020). In other words, healthcare systems are forced to make difficult choices between taking care of patients with COVID-19 and maintaining access to other types of care (Webb et al., 2021)

Diabetes mellitus threatens about 422 million people worldwide (over 800 thousand are diagnosed in the Czech Republic) and both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades (World Health Organization, 2021). Diabetes can be treated and its consequences

avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications (World Health Organization, 2021). The three last issues are conditioned to access healthcare services continually. Poor diabetes control has been proven to negatively affect prognosis and promote the risk of infection (Kosinski et al., 2020).

Depending on the type, diabetes, shortens the life expectancy by 30–50 per cent (Rybka, J., 2007). In the Czech Republic, over 800 thousand people suffer from diabetes, of which 97 per cent have diabetes mellitus of type II (DM2). DM2 affects significantly more often overweight and obese people, those whose lifestyle follows irregular and unhealthy diets. The risk of developing DM2 is more than 50 per cent for the offspring of one parent with DM2 and almost 100 per cent for the offspring of two parents with DM2 (Svačina et al., 2010). Diabetes entails, among other things, heart and vascular diseases. Every year, 60,000 Czech people become newly diagnosed with diabetes and 22,000 patients die of incurred complications (Top Class Medical, n. d.). The prevalence of patients with DM2 shows an increasing tendency from 804,987 patients (78 per 1,000 persons) in 2007 to 936,124 (88 per 1,000 persons) in 2017 (Ústav zdravotnických informací a statistiky, 2020). By 2030, there might be up to 1.3 million diabetics in the Czech Republic (Eurozprávy, 2020). The cost of treatment for diabetes takes up to 15 per cent of the amount paid on public health insurance per year, i.e., over 50 billion crowns (Top Class Medical, n. d.).

As it is clear from these statistical data, this is a serious social problem in the solution of which the institute of public policy shall be involved. It is also a problem that has not yet been sufficiently solved.

In this paper, we are interested in the (dis)continuity of accessing care and we concentrate on patients with diabetes in the Czech Republic. As the Czech results of WHO behavioural insights related to a COVID-19 survey (Hnilicová et al., 2021) indicate that 25 per cent of Czech respondents are postponing the medical visits for other than COVID-19 reasons, we suppose that there might be an unmet care in diabetes too. We aim to verify if it was really the case that the diabetes care was postponed. Thus, the aim of the paper is to map and explain the consequences of the COVID-19 pandemic on the unmet care in diabetes mellitus in the Czech Republic in the period between March and December 2020 (i.e., the period from

the very first lockdown until the end of 2020). The paper is an original view of the problem using economic data provided by three Czech health insurance companies funding approximately 70 per cent of diabetes care in the Czech Republic.

We see the benefits of this study in finding answers to these research questions:

RQ1: What was the amount of unmet healthcare with diabetes mellitus during the COVID-19 period of 2020?

RQ2: How significant was regional diversity in postponement of diabetes healthcare?

RQ3: What was the capacity of the system to assimilate or to deal with the problem of unmet care of the Czech healthcare system (i.e., its absorption)? How successful were the providers in compensating the unmet healthcare?

2 MATERIALS AND METHODS

2.1. THEORETICAL AND CONCEPTUAL FRAMEWORK

Accessing healthcare is one of the determinants influencing the health status of a population (i.e., place and style of life, environment, genetics, income, education level). Based on (Eurostat, 2021), barriers to accessing health services include cost, distance, waiting times, lack of cultural sensitivities and discrimination. For non-native speakers, language can be an obstacle when seeking to access services, while barriers to health care may result from poor understanding or a lack of knowledge with respect to a patient's rights and the administrative practices and requirements of health systems (Eurostat, 2021).

One of the measures representing the access to healthcare are the so-called “unmet healthcare needs” that might be – based on (Herr et al., 2014) – defined as the difference between the healthcare services deemed necessary to deal with a particular health problem and the actual services received. Unmet healthcare needs depend on the characteristics of the healthcare system (availability of services, waiting time before receiving care, etc.) and on the circumstances of the individuals seeking care (i.e., socioeconomic status, time constraints) (Herr et al., 2014).

Even in countries where social coverage is broad, social inequalities in health access persist (Van Doorslaer, E., 2006; Eurofound, 2020). More than 3 per cent of the EU population aged 16 and over had an unmet need for a medical exami-

nation or treatment in 2019; the number was 2.4 per cent in the case of the Czech Republic (Eurostat, 2021).

Accessing healthcare is obviously influenced by the COVID-19 pandemic. In this regard, access to healthcare is becoming a challenge for many Europeans. Based on the “Eurofound Living, Working and COVID-19 e-survey” (Eurofound, 2020), over 20 per cent of respondents were unable to access a medical examination or treatment during the pandemic. Disruptions to essential healthcare services and unmet healthcare needs were reported by 15.7 per cent of Czech respondents. The main reason (67.1 per cent) for the unmet care in the Czech Republic was that the services were not available because of COVID-19 – this is slightly more than in the EU 27 (61.8 per cent) (Börsch-Supan et al., 2011).

Regarding the unmet care in diabetes, based on the WHO National pulse survey on continuity of essential health services during the COVID-19 pandemic survey (WHO, 2021), around 50 per cent (1st round), 36 per cent (2nd round) of countries report disruption of services to treat diabetes and its complications due to COVID-19. There is no evidence supporting discontinuation of medication prescribed for diabetes; regular intake of antidiabetic drugs and insulin is indicated (Wang et al., 2020).

In the Czech Republic, the Public Opinion Research Centre survey reported that in February 2021, 85 per cent of Czechs were afraid of other than COVID-19 care reduction (it was 72 per cent in December 2020) (Centrum pro výzkum veřejného mínění, 2021). According to the head physician of one of the biggest Czech diabetes centres, patients put on weight (2–3 kg on average) during the 2020 spring lockdown, their diabetes compensation worsened slightly and approximately 10 per cent of them did not want to come for in-person medical visits – this poor medication adherence means a future burden for the Czech healthcare system (ČTK, 2021). Based on (Polonsky et al., 2016), the poor medication adherence is associated with inadequate glycaemic control; increased morbidity and mortality; and increased costs of outpatient care, emergency room visits, hospitalization and managing complications of diabetes.

Regarding the impact of diabetes mellitus, the findings of (Cho et al., 2002), support that both diabetes and myocardial infarction are associated with elevated mortality and having both conditions is particularly hazardous. Longer duration

of diabetes is a strong predictor of death among diabetic men. Furthermore, the risk of death due to diabetes or myocardial infarction was higher in the younger age group than in the older group (Cho et al., 2002).

According to the Quebec Cardiovascular Study (Dagenais et al., 2009), the men with isolated type 2 diabetes and men with isolated cardiovascular disease had similar cardiovascular mortality rates several years after initial diagnosis of either condition. The risk of cardiovascular death was at least 3 to 4 times greater in these two groups than among men with neither cardiovascular disease nor diabetes (Dagenais et al., 2009). These findings underscore the need to prevent and optimally manage diabetes and cardiovascular disease.

Improving the health system's pandemic response and its resilience seem to be the biggest challenges that all systems worldwide are facing. The Czech Republic was not an exception in this regard. As Pažitný et al. (2021) show, the COVID-19 case fatality rate (CFR) explained by the healthcare system type and the system performance is higher in the Visegrad Group than in other European countries.¹ The results also showed that if the country fails to do well in “non-pandemic” times, it will also fail during a pandemic. And vice versa, if a country was good at managing its health system in good times, so it did in bad times. Therefore, if the V4 countries want to increase their responsiveness to manage pandemics like COVID-19, they should focus on improving their healthcare system performance, particularly increasing the following three sub-scores: (1) patient rights, information and e-health, (2) the outcomes and (3) generosity of the healthcare system. The Czech Republic is the best V4 healthcare system's performer, yet it is crucial to search for alternative future strategies for improvement (Pažitný et al., 2021).

2.2. DATA AND METHODS

Regarding the research subject, research goal and research questions, an appropriate research design was chosen. A mix of non-normative and normative methodology was used (Ochrana, F., 2012) and appropriate research methods were chosen (Ochrana, F., 2019). The main research methods cover

¹ The V4 countries were compared to other 18 European countries: Switzerland, the Netherlands, Norway, Denmark, Belgium, Finland, Luxembourg, Sweden, Austria, Island, France, Germany, Portugal, the UK, Spain, Italy, Ireland and Greece.

desk research, content analysis of documents and secondary data analysis. From a methodological point of view, the following steps were taken: in the first step, desk research was performed. The output of this step was the identification of a “white research space” (research subject) and an analysis of the scientific discourse on the issue of unmet healthcare during the COVID-19 pandemic and the impact of diabetes mellitus. The further research efforts were focused on an empirical analysis of data (signal codes) extracted from the databases of three health insurance companies (the General Health Insurance Company – VZP, the Czech Industrial Health Insurance Company – ČPZP and RBP) from 2016 until 2020.

In 2020, 571,000 VZP clients (VZP, 2020), over 85,000 ČPZP clients (ČPZP, 2018) and over 18,000 RBP clients (RBP, 2019) were treated for diabetes. These three health insurance companies fund approximately 70% of all diabetic healthcare.

The care provided by general practitioners is reported by means of signal codes:

Tab. 1 » Signal codes of diabetic care (data from VZP, ČPZP and RBP)

01201 – Care of a Stabilized Compensated Type 2 Diabetic
01298 – Patient Sent to a Diabetologist for a Consultation
01299 – Patient Sent to a Diabetologist for Dispensary
13101 – Glycated Hemoglobin HbA1c Value Less than 5.3%
13102 – Glycated Hemoglobin HbA1c Value 5.3 to 5.9%
13103 – Glycated Hemoglobin HbA1c Value from 6.0% upwards.
01022 – Repeated Comprehensive Examination
81439 – Number of Blood Tests — Serum Glucose
Diabetology centres mainly report:
13021 – Comprehensive Examination by a Diabetologist
13022 – Targeted Examination by a Diabetologist
13023 – Inspection Examination by a Diabetologist
13024 – Diabetic Foot Syndrome Examination
13101 – Glycated Hemoglobin HbA1c Value Less than 5.3%
13102 – Glycated Hemoglobin HbA1c Value 5.3 to 5.9%
13103 – Glycated Hemoglobin HbA1c Value from 6.0% upwards
13051 – Targeted Education by a Diabetologist

13053 – Team Structured Group Education of Diabetics (for a group of a maximum of 6 people after 180 minutes)
13055 – Treatment of a Patient with Diabetic Foot Syndrome
13065 – Measurement of Transcutaneous Oxygen Pressure on One Limb
13024 – Examination of the Risk of Diabetic Foot Syndrome
13077 – Repeated Continuous Blood Glucose Monitoring by Sensor

In the final step, the method of synthesis and generalization was used to formulate recommendations and conclusions.

3 RESULTS AND DISCUSSION

The following section of the paper contains the search for answers to the above established research questions.

RQ1: What was the amount of unmet healthcare with diabetes mellitus during the COVID-19 period of 2020?

In seeking an answer to this research question, we assume that *diabetes care during the period of March until December 2020 was unmet.*

Limitation of provided data

- 1) We encountered a discrepancy in the data. For instance, in the VZP insurance company, there is an increase of 600 per cent in the signal code of 13024 (Diabetic Foot Syndrome Examination) between 2019 and 2020. Diabetic foot reported with 900 people in 2019 was newly diagnosed with 6,000 patients. This is probably either due to a change of definition or payment.
- 2) The signal code of 13053 (Team Structured Group Education of Diabetics) cannot be evaluated due to a very small number of values.
- 3) Likewise, the signal code of 13077 (Repeated Continuous Blood Glucose Monitoring by Sensor) reports a year-on-year increase of 100–200 per cent.

For the above reasons, these signal codes were excluded from the analysis.

In Tables 2, 3 and 4, we observe that there are signal codes that had a year-on-

-year decline in the first two months of 2020. The largest decline (for all but 13022 – Targeted Examination by a Diabetologist) occurred in March and April 2020. In some cases, it was a decrease of up to a third from the previous year.

The deferred examinations resulted in an increase in June and July 2020. In these months, there was the largest increase in the signal code of 13065 – Measurement of Transcutaneous Oxygen Pressure (on one limb).

Tab. 2» Comparison of the volume of signal codes between January and June 2019 and 2020, the Czech Republic in absolute values (sum for VZP, ČPZP and RBP)

Signal Code	Jan	Feb	March	April	May	June
01022	1840	3792	-57407	-82044	-24833	29178
01201	1960	1239	-9635	-11238	-152	4389
13021	-445	-479	-1185	-1322	-779	40
13022	3774	1621	2019	-235	3730	16236
13023	-2728	-1544	-8064	-15517	-8151	-963
13051	3182	2760	-14304	-23067	-2392	15501
13055	-72	-142	-960	-1315	-628	-164
13065	72	77	-20	-28	42	187
13101	-3180	-3815	-10133	-12239	-7307	-4620
13102	-767	-1042	-2430	-2882	-1693	-1136
13103	-1127	-1589	-2891	-3244	-2113	-1266
81439	11654	10254	-222296	-273983	-82382	93306

Tab. 3» Comparison of the volume of signal codes between July and December 2019 and 2020, the Czech Republic in absolute values (sum for VZP, ČPZP and RBP)

Signal Code	Jul	Aug	Sep	Oct	Nov	Dec
01022	12321	3019	3796	-31796	-41268	-11523
01201	-797	-90	442	-5984	-3834	1035
13021	228	-145	-25	-319	-387	-3
13022	3740	508	1422	-9993	-8414	405
13023	-3204	-4767	-3806	-9194	-7071	-1742
13051	6047	2127	5288	-5107	-4332	2334

13055	-170	-228	-147	-623	-526	-227
13065	14	10	11	-24	41	40
13101	-5503	-6258	-5930	-7291	-5209	-2798
13102	-1625	-1476	-1264	-1328	-1176	-767
13103	-1842	-1741	-1320	-1423	-1256	-623
81439	25532	-572	-6360	-121242	-115765	580

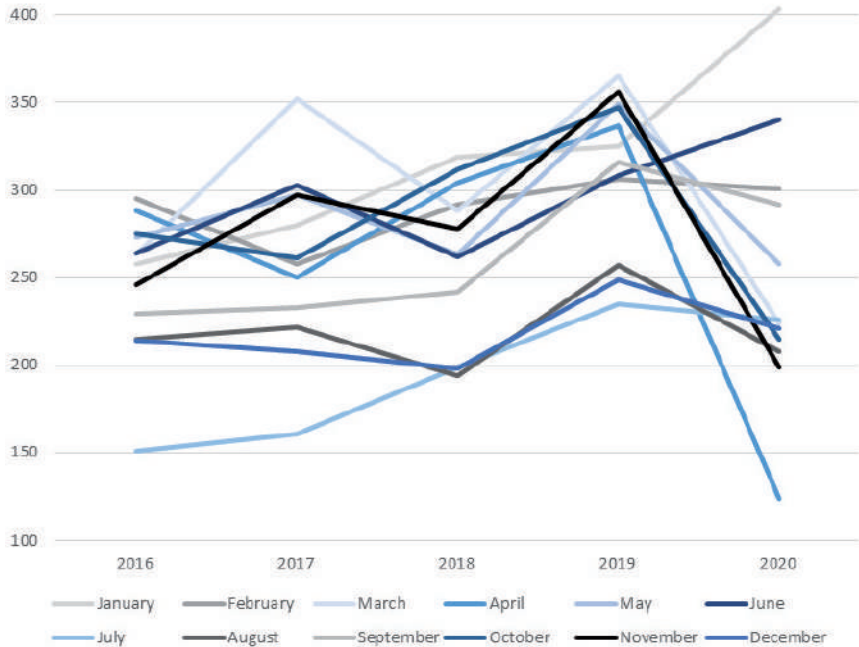
Tab. 4 ▶ Percentage comparison of the volume of signal codes between 2019 and 2020, the Czech Republic (sum for VZP, ČPZP and RBP)

Signal Code	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
01022	102	104	53	31	80	127	114	103	103	75	66	86
01201	108	106	64	56	99	117	96	100	102	79	85	104
13021	87	84	63	55	74	101	110	94	99	88	86	100
13022	105	103	103	100	105	125	107	101	102	86	88	101
13023	92	95	77	56	78	97	90	84	89	75	79	94
13051	106	106	73	54	95	131	114	105	110	91	92	106
13055	97	93	59	45	73	93	92	88	94	75	77	88
13065	134	138	91	87	115	181	106	104	104	93	114	118
13101	80	74	42	31	60	74	62	57	65	54	63	78
13102	80	71	40	27	57	72	55	55	65	59	60	71
13103	79	68	45	33	60	75	59	57	69	65	65	79
81439	102	102	58	45%	84	120	107	100	99	78	78	100

The deficit in the volume of care at the beginning of 2020 can also be seen in Figure 1, which follows the share of cumulated absolute numbers on the y-axis. If the volume of care went up, then that yearly volume was added to the total. And on the contrary, if the volume of care went down, then the annual volume was subtracted from the total.

The sharp decline in the spring months improved in June 2020, but almost no signal code reached the same level against the previous year. The only exceptions were 13065 Measurement of Transcutaneous Oxygen Pressure on One Limb), 13022 (Targeted Examination by a Diabetologist) and 13051 (Targeted Education of Diabetics).

Fig. 1» Cumulative volumes of signal codes between 2016 and 2020, the Czech Republic (sum for VZP, ČPZP and RBP)



We conclude that the diabetic care during the COVID-19 period of 2020 was unmet. The care was limited in the spring months of 2020. This slump did not catch up with any of the monitored medical procedures by the end of 2020.

RQ2: How significant was regional diversity in postponement of diabetes healthcare?

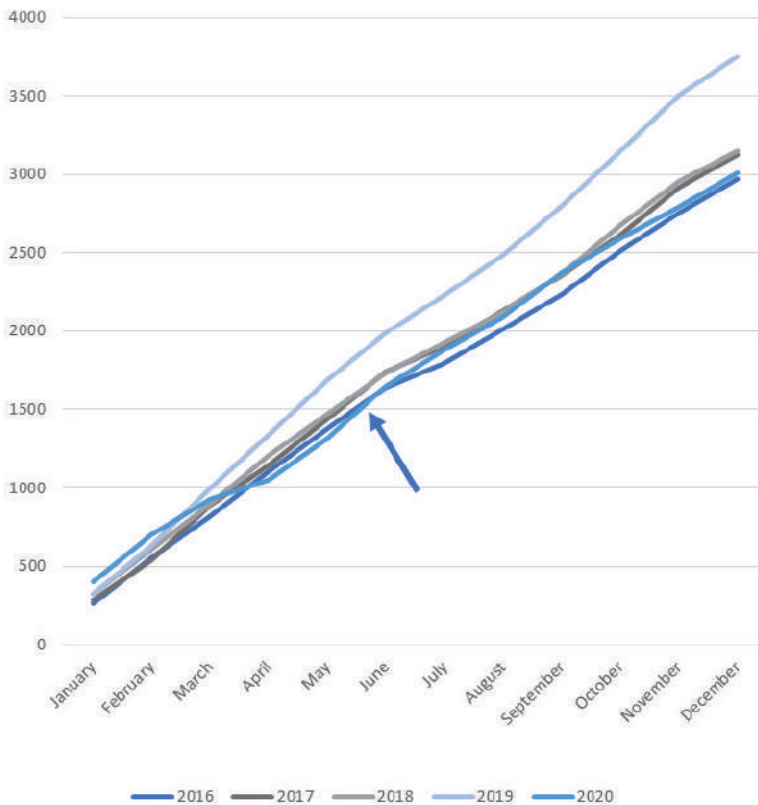
In finding the answer to this research question, we are interested in the influence of local diversity on postponement of healthcare mainly in the border regions of the Czech Republic such as the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions that are generally known as regions with poorer health care access.

Figure 2 shows the development of the volume of signal codes of 01298 (Patient Sent to a Diabetologist for a Consultation) and 01299 (Patient Sent to a Diabetologist for Dispensary). January and June 2020 are the only months when the volume grew.

On the contrary, a decline in March and April and then in November and December is observed. As in the first hypothesis, the most significant decrease is in April, when the values were 36 per cent in 2019, the decrease in March and October amounted to 61 per cent of the previous year, in November it was 56 per cent of the previous year. In both cases (the spring and autumn of 2020), a reduction in care due to anti-coronavirus measures is apparent.

Except for January 2020, the monthly values remained under the level of 2019. The most significant increase is apparent from June until September 2020 when the healthcare volume gradually reached the levels of 2018. At the end of the year, the volumes fell to the level of 2016.

Fig. 2» Development of the volume of signal codes of 01298 and 01299 from 2016 to 2020 in absolute values, the Czech Republic (sum for VZP, ČPZP and RBP)

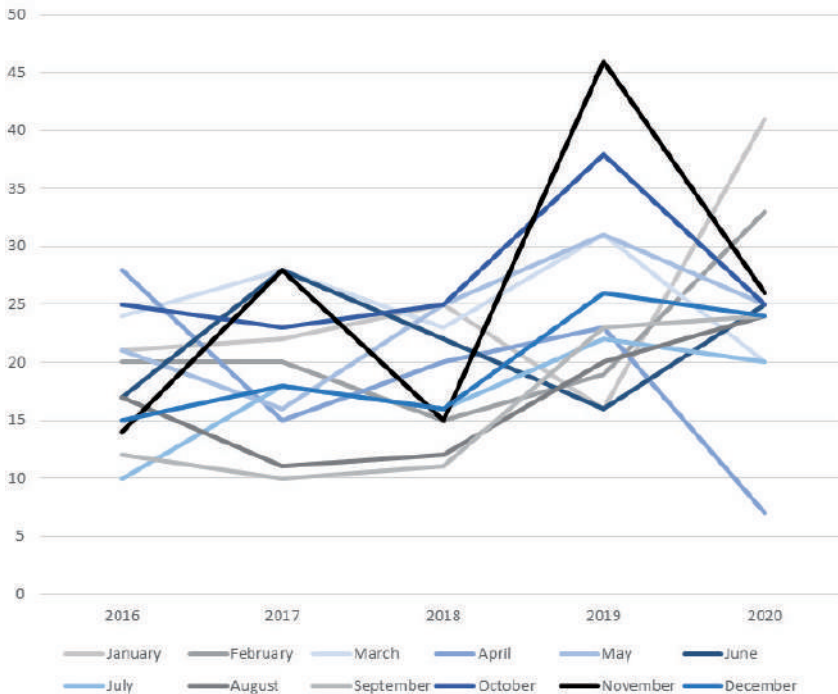


This hypothesis can be evaluated reliably using the ČPZP and RBP data, but to a very limited extent using the data of VZP. We separated the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions from the ČPZP and RBP data. Owing to a very low number of observations, the results and interpretations need to be approached with caution.

Figure 3 illustrates the development of the volume of care represented by signal codes of 01298 and 01299 in the years 2016 to 2020 for the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions (sum for ČPZP and RBP). As in previous cases, we observe that most of the months of 2020 reported a declining trend.

Compared to the Czech Republic as a whole, the volume of signal codes in January, February, June, August and very slightly also in September reported growth dynamics. It was usually higher than the entire Czech Republic dynamics. However, it is necessary to realize that, for instance, January grew by 150 per cent, but the reason may be that January 2019 was very weak.

Fig. 3» Development of the volume of signal codes of 01298 and 01299 from 2016 to 2020, the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions (sum for ČPZP and RBP)



If the cumulative data are considered, the beginning of 2020 showed a continuation of the trend from the end of 2019, when the volume of care was growing significantly. There is an increase in focused codes for three months (February, May and June 2020). The trend slowed down in March and April and resulted in a convergence of 2019. However, the year 2020 dropped to the level of 2019 only due to low volumes in November and December.

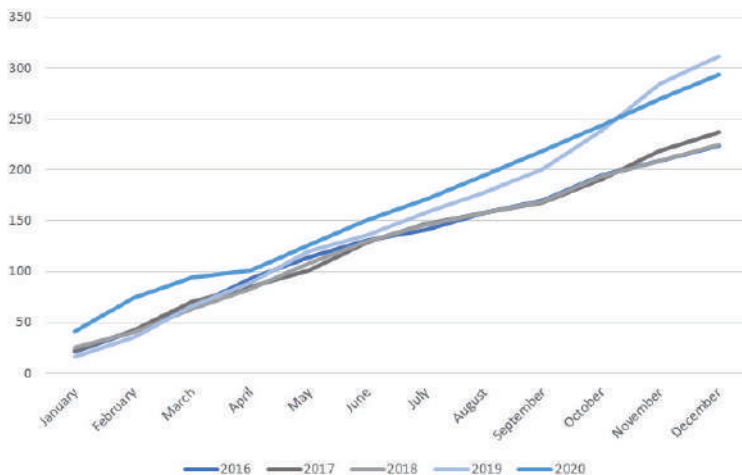
Overall, the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions achieved worse results than the Czech Republic as a whole in 2020 (the decrease in the total volume of provided care for the Czech Republic amounted to 20 per cent against 2019), but the year-to-year decrease was lower (only 5.5 per cent).

It can be assumed that the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions had good health awareness in 2019 and thanks to this they transferred good results to 2020 and then the decline was not as significant as for the entire Czech Republic.

For the period from March to December 2020, the decrease was 26 per cent for the Czech Republic and 20 per cent for the selected regions, which proves that the overall decrease did not occur to the same extent as in the Czech Republic as a whole.

Based on the above findings we reject the hypothesis. The unmet care was not higher in regions with a characteristically worse availability of care compared to the whole of the Czech Republic.

Fig. 4» Development of the cumulative volume of signal codes of 01298 and 01299 from 2016 to 2020, the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions in absolute values (sum for ČPZP and RBP)



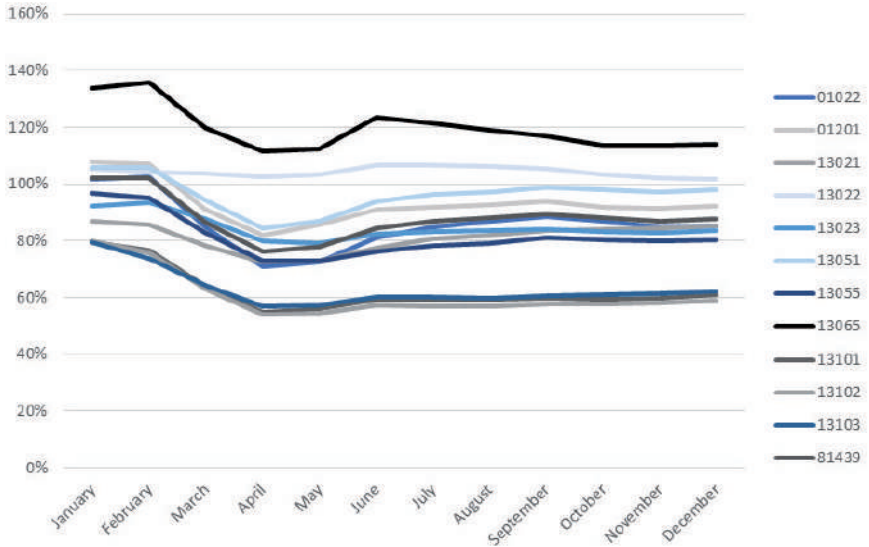
RQ3: What was the capacity of the system to assimilate or to deal with the problem of unmet care of the Czech healthcare system (i.e., its absorption)? How successful were the providers in compensating the unmet healthcare?

In finding the answer to this research question, we assume that *healthcare providers made maximum use of the summer months of 2020 to compensate for the unmet healthcare*. We are building on a previous finding (see Figure 2) that showed the development of the Czech Republic as a whole. Based on this data, we must reject the hypothesis. Compared to 2019, there was an increase in the summer months, but the difference in June was only 10%.

The cumulative data in Figure 5 prove that at the beginning of 2020, especially because of January, the trend fell beyond 2019, which was already very strong compared to previous years. As early as March, however, the imaginary lead from the initial months was erased probably due to restrictions, and the year 2020 thus dropped in the first half of the year to the level of the years of 2016–2018.

The amount of care increased slightly in the summer months, but in the autumn and the second wave of COVID-19 measures, the values fell again and the year 2020 ended up with the values at the level of 2016. Interestingly, the code 13022 (Targeted Examination by a Diabetologist) was almost unchanged in the critical period. Since we do not have qualitative data, we may suppose very carefully that the healthcare might have been (at least partially) provided by means of telemedicine.

Fig. 5» Percentage development of the cumulative volume of signal codes of 01298 and 01299 from 2016 to 2020, the Czech Republic (sum for VZP, ČPZP and RBP), 100% on this graph responds to 2016



4 CONCLUSIONS

The results show that diabetes care in the period from March to December 2020 was not fulfilled. The sharp decline in the spring months resulted in an increase in June and July 2020, but almost no signal codes reached the same volume as in the previous year. If we consider the cumulative data, the beginning of 2020 showed a continuation of the trend from the end of 2019, when the volume of provided care grew significantly. The trend slowed in March and resulted in the convergence of 2019. Although the Ústí nad Labem, Karlovy Vary and Moravian-Silesian Regions achieved worse results in 2020 than the Czech Republic as a whole (the decrease for the entire Czech Republic was 20 per cent compared to 2019), the annual decrease was only 5.5 per cent. In terms of health system absorption, the volume of diabetes care increased slightly in the summer months of 2020, but in

the autumn and during the second wave of anti-Covid measures the volume of provided care fell to the level of 2016. The analysis of the case of diabetes mellitus showed a negative impact of the destabilizing external factor of COVID-19 on the functionality of the healthcare system in the Czech Republic. The system evidently lost its expected performance, which was reflected in deferred healthcare. The negative impact was investigated only in connection with diabetes mellitus. It can almost certainly be stated that this loss of functionality of the healthcare system also applies to other types of emergency health care in the Czech Republic. It is confirmed that the healthcare system is a typical dynamic social system. This means that emergent, unexpectedly occurring destabilizing factors will continue to appear in the future. These cannot be predicted in most cases (in their specific form). However, we should respond to this in health policy by shaping the healthcare system as an adaptive system and by developing appropriate adaptive strategies at all levels of healthcare management, considering the variability of the environment and the influence of destabilizing emergence factors, and subsequently to be able to respond to these variable situations effectively.

ATTACHMENTS

VZP, ČPZP and RBP monthly signal codes from 2016 until 2020

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