2.2 THE CORRELATIONS OF LABOUR MARKET STATUS, THE PREVALENCE OF CERTAIN CHRONIC DISEASES AND HEALTHCARE EXPENDITURE

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In this subchapter we examine the correlations between labour market status, the prevalence of the most common chronic diseases, and healthcare expenditure, on the basis of the 2019 healthcare data reported to the National Health Insurance Fund Administration (NEAK, formerly OEP).[1] We present the rates at which economically active groups are being treated for chronic diseases, the rates of specialised health service utilisation, and the amount the social health insurance fund spends on patients annually.

Data

The persons examined are those of the age group of 20–65, who either have an insured status due to private employment on the basis of the Social Insurance Law (section 5 of the old Tbj. – Act LXXX of 1997 on the eligibility for social insurance benefits and private pensions and the funding for these services), or, having no insurance obligation, have gained eligibility for social insurance benefits by paying a so-called health service contribution (a monthly fee of HUF 7,500, around 20€).

Our investigation focuses on the type of employment (and entitlement) and on educational attainment. We have divided our subjects (a total of 4,469,926 persons)[2] into a total of five groups on the basis of their typical entitlement[3] reported to NEAK: 1) private employment (2,838,212 persons), 2) unemployed or public works employees (129,430 persons) (see subchapter K5.1), 3) individual or joint entrepreneurship (536,628 persons), 4) public service type work, public servants, government officials, law enforcement workers (547,466), 5) those paying a health service contribution (318,190). To this latter group belong those who are not officially employed and have no other status (such as childcare, invalidity, social circumstances, etc.) that would grant them access to the healthcare system. 1,549,226 persons were excluded from the working age population of over six million due to different statuses, such as university students, those on parental leave, those receiving invalidity benefits, the homeless, etc., and those who died during the year.

Complementing this, we have assigned those working within private employment (group 1) and public sector workers (group 4) to three further strata, based on their educational attainment (on the basis of the HSCO code – Hungarian Standard Classification of Occupations – recorded in the declaration): 1) undereducated (HSCO codes starting with 9 or 03; 610,329 per-

1 The Hungarian health care system is based on a compulsory social insurance system with the single payer NEAK providing health insurance coverage for nearly all 10 milion people residing in the country.

2 Due to the impact on healthcare expenditure (*Koczor-Keul,* 2017 and *Fadgyas-Freyler,* 2019) we have narrowed down the study in two ways: on the one hand, we have excluded those who died in the given year, and on the other hand, we have excluded the extremely high expenditures related to blood disorders and hematopoietic diseases, or endocrine and metabolic – rare – diseases.

3 There are altogether approx. 120 different entitlement categories under which access to social insurance services is granted. Even those engaged in gainful activity are classified into different groups by employer. Those who are not working may gain entitlement to healthcare services in other ways. Certain groups are granted access to healthcare via legislation (such as minors, those on maternity leave, pensioners, those in detention facilities), while others are required to pay a certain amount also determined by legislation (a so-called health service contribution) in order to be able to use the services of healthcare service providers without having to pay various fees for them. And those who do not belong to any of the entitlement categories and do not pay their due contribution, either, have a so-called "red flag" status, which service providers are informed of.

sons) 2) secondary educational attainment (HSCO codes starting with 3–8 or 02; 2,196,038 persons), and 3) tertiary educational attainment (HSCO codes starting with 1, 2 or 01; 1,007,930 persons). Finally, we control for the following factors in each analysis: age (by age groups with 5-year differences), sex, and the development/deprivation level of the place of residence,[4] as these factors have an impact on health status and on service utilisation (see *OECD*, 2019; and for the development level of the place of residence, see *Subchapter 2.1*).

Methods

Due to the fact that age, sex and the development level of the place of residence vary significantly within the various entitlement and educational attainment groups, and as these characteristics are known for having a strong impact on service utilisation, we neutralise their impacts through standardisation. To this end, the elements in the various groups are duplicated through random selection in such a way that each entitlement and educational attainment group have the same proportions in terms of age, sex and the development level of the place of residence. We analyse the prevalence rate of diseases, the rate of healthcare utilisation, and the average expenditure per patient in this standardised stock.

First, we scrutinise the rate of morbidity, based on the categorisation used in the general practitioners' indicator system of the Health Insurance Fund (*NEAK,* 2019). We examine the number of known heart disease patients,[5] the number of patients treated for high blood pressure, diabetes, or chronic obstructive pulmonary disease (most prevalent among smokers). We pay special attention to so-called multimorbidity, that is, we examine the number of persons affected by more than one of the above-mentioned diseases. We would like to emphasise that the number of those receiving care is not necessarily the same as the number of ill persons. The number of persons suffering from a given disease (but not receiving regular care) may be substantially higher. The difference between the number of ill persons and of those receiving care can be explained by, among other causes, individual health behaviour (see *Subchapter 2.1,* for example) or unmet healthcare needs (see *Subchapter 2.3,* for example).

Second, we examine how frequently patients use three typical segments of the publicly funded healthcare system: outpatient care, inpatient care, and the supply of medications and medical aids and devices (service utilisation rate).[6] The utilisation rate is influenced both by the health status of the given persons, and by the availability of the publicly funded and the private healthcare systems – the latter may decrease the utilisation of the publicly funded healthcare system, either through medical savings accounts (in certain cases), or through company-financed private health insurance. (Regarding private healthcare, see *Subchapter 2.3.*) We have put special focus on two forms of care: dentistry, and the supply of itemised medications. These, even though they

4 For the development level of the place of residence, we used the composite indicator of the HCSO created for the level of development of municipalities (*HCSO*, 2016), in a total of four categories (those under the age of 40, those between 41–60, those between 61–80, those above the age of 80).

5 Heart disease patient: patients who have had an infarction and/or coronary bypass surgery (CABG) and/or percutaneous transluminal coronary angioplasty (PTCA).

6 The outpatient segment includes specialised outpatient care and laboratory testing, high value diagnostic scans (CT, MRI), dialysis treatments, dentistry, and the transportation of patients. Inpatient care includes any type of hospital stays and related treatments, as well as specialised home care and hospice service. The supply of medications and medical aids and devices includes all prescription therapies (medications, medical aids and devices, health spa services) as well as itemised medications, given to patients as part of their stay at an institution. We do not examine general practitioner care, as the utilisation of that does not generate any additional expenses.

are a part of the above-mentioned larger groups, represent the two extremes of the Hungarian healthcare system: the coverage provided for dental care by the social health insurance fund to the working-age population is extremely limited, resulting in a very high rate of private care utilisation (*Babarczy et al.,* 2016), while the supply of high cost (so-called itemised) medications is a field where care is almost exclusively publicly financed.

Third, we seek to determine the amount the social insurance fund spends on those actually accessing a given segment of the publicly funded healthcare system (insurance fund's expenditure). The amount spent on the population examined is HUF 368.3 billion, which is exactly a quarter of the total patient-related annual expenditure of the Hungarian single payer NEAK.

Results

Morbidity indicators

Table 2.2.1 shows the morbidity indicators by disease groups.

Table 2.2.1: Differences in the morbidity rates of disease groups in the age group of 20–65, by entitlement and educational attainment, 2019

	Hyper-tension	Diabetes	Heart disease	Chronic obstructive pulmonary disease (COPD)	Multi-morbidity
Morbidity per 100 people	17.50	3.20	0.80	0.90	3.10
Divergence of morbidity rates relative to the average of those working within private employment, by entitlement category (percentage)*					
Private employment	0.00	0.00	0.00	0.00	0.00
Public works employee, unemployed	–6.34	–2.67	–3.46	+91.75	+11.28
Entrepreneur	–14.10	–7.00	–3.44	–31.66	–13.86
Public sector	+5.24	–1.74	–6.09	–21.98	–4.93
Those paying a health service contribution	–27.61	–14.60	+7.71	–12.85	–16.15
Divergence of morbidity rates relative to the average of those working within private employment with secondary educational attainment (percentage)*					
Private employment, tertiary educational attainment	–20.14	–22.77	–20.27	–47.63	–30.30
Private employment, secondary educational attainment	0.00	0.00	0.00	0.00	0.00
Private employment, undereducated	–0.13	–3.66	+26.48	+88.90	+14.16
Public sector, tertiary educational attainment	–5.21	–14.01	–13.54	–38.59	–19.40
Public sector, secondary educational attainment	+0.31	–6.64	–5.72	–11.35	–7.19
Public sector, undereducated	+35.96	+30.67	+51.91	+80.76	+50.05

* Based on a database standardised for age, sex and the development level of the place of residence.

Source: Authors' own calculations on the basis of the 2019 data of the *National Health Insurance Fund Administration* (NEAK).

The first row of *Table 2.2.1* shows the real, population-based average prevalence rates of various diseases. By far the most common of these is hypertension – nearly one in five persons was receiving treatment for this disease.

Over a third of our subjects have diabetes, and the rate of those who have at least two of the four diseases in question (multimorbid patients) was found to be the same. Approximately one percent of the group suffers from a severe pulmonary or heart disease. These figures are especially alarming considering that this is the segment of the working age population that is supposed to be healthy and able to work.

The upper part of *Table 2.2.1* shows, relative to the largest group (those working within private employment), the differences in morbidity rates among the various entitlement categories, standardised for age, sex and the development level of the place of residence. Public works employees and the unemployed seem to be the most unhealthy, as their multimorbidity rate is higher by more than 11 percent. This is brought about mostly by the dramatic rate of COPD, as the other (treated) diseases have a lower prevalence rate in this group compared to those working within private employment. This raises fundamental questions regarding health behaviour, health education and access to the healthcare system. The lowest morbidity rates are observed in entrepreneurs, followed by those paying a health service contribution. There is only one disease where contribution payers have higher prevalence, which is heart disease. We have to emphasise that the prevalence of heart disease is registered on the basis of previous heart attacks or serious heart surgeries and not on the basis of appropriate care (regular intake of pharmaceuticals). This raises serious doubts whether the other – seemingly favourable – values could be a sign of an unmet need (untreated disease). Hypertension occurs at higher rates among public sector workers, however, they are less affected by other diseases.

The lower part of *Table 2.2.1* shows the differences in morbidity by educational attainment in the two biggest groups: those working within private employment, and public sector workers.[7] The data suggest that educational attainment is a key factor. In the case of the undereducated, this can be observed mainly in the increased prevalence of smoking-related COPD, heart disease, and multimorbidity (in the case of COPD, this means a prevalence rate of +90 percent relative to those with secondary educational attainment in both entitlement categories); the undereducated workers of the public sector have a much lower health status. The disease rates of those with tertiary educational attainment are lower everywhere compared to those with secondary educational attainment, and the difference is more substantial in the case of those working within private employment. The indicator values of public sector workers with secondary educational attainment are generally lower than the values of those with secondary educational attainment working within private employment.

7 Public sector workers have a higher average educational attainment than those working within private employment.

Health service utilisation rates

Table 2.2.2 shows health service utilisation rates by type of care.

Table 2.2.2: Differences in the rates of specialised health service utilisation in the age group of 20–65, by entitlement type and educational attainment, 2019

	Inpatient care	Outpatient care	Medications and medical aids and devices	Dentistry	Supply of itemised medications	Any type of care
Rate of service utilisation per 100 people	10.30	70.00	67.00	17.40	0.28	81.30
Divergence of service utilisation rates relative to the average of those working within private employment, by entitlement category (percentage)*						
Private employment	0.00	0.00	0.00	0.00	0.00	0.00
Public works employee, unemployed	+3.04	–4.16	–6.33	+2.39	–46.15	–4.22
Entrepreneur	–4.46	–3.57	–3.41	–13.39	+11.54	–2.46
Public sector	+8.32	+18.68	+9.50	+38.30	+19.23	+11.35
Those paying a health service contribution	–1.12	–18.15	–20.90	–21.13	0.00	–17.19
Divergence of service utilisation rates relative to the average of those with secondary educational attainment working within private employment, by educational attainment and entitlement category (percentage)*						
Private employment, tertiary educational attainment	–9.16	–5.63	–1.02	–30.44	+19.23	–1.39
Private employment, secondary educational attainment	0.00	0.00	0.00	0.00	0.00	0.00
Private employment, undereducated	+2.29	–6.14	–8.64	–3.13	–11.54	–7.00
Public sector, tertiary educational attainment	+6.08	+10.38	+6.59	+4.70	+26.92	+6.69
Public sector, secondary educational attainment	+6.37	+20.39	+7.43	+51.16	+11.54	+11.46
Public sector, undereducated	+11.55	+12.72	+5.80	+25.47	+23.08	+7.06

* Based on a database standardised for age, sex and the development level of the place of residence.

Source: Authors' own calculations on the basis of the 2019 data of the *National Health Insurance Fund Administration* (NEAK).

According to the upper half of *Table 2.2.2*, more than four-fifths of the persons examined used some type of publicly funded healthcare within the given year. Approximately 10 percent could be found in inpatient care, 67 percent purchased some type of medication or medical aid, and 70 percent appeared in outpatient care. As for dental care, which is unique in terms of access, 17.4 percent of the population could be seen, and 0.28 percent of patients used some kind of itemised medication.

In terms of service utilisation, public sector workers and those paying a health service contribution represent two extremes (see the lower half of *Table 2.2.2*). Public sector workers turn to the public healthcare system at a much higher rate (+11.3 percent) than the average worker that works within private employment. The largest difference can be observed in dentistry (+38.3 percent), followed by the fund for itemised medications (+19.2 percent). Those paying a health service contribution use the public healthcare system at a rate that is well under the utilisation rate of those working within private employment. The largest difference (in a negative direction! a value of

approx. –20 percent) can be observed in the utilisation of dentistry, again, but it is also similar by medications. At the same time, it is quite unexpected that the utilisation of itemised medications by those paying a health service contribution is as high as in the case of those working within private employment. However, utilisation rates are extremely low among public work employees and the unemployed, which is slightly surprising, since they appear in inpatient care at a much higher rate. We should also not forget that according to the findings presented in the previous chapter, their health status is the most unfavourable among all the various entitlement categories.

Analysing the utilisation rates by educational attainment (the lower part of *Table 2.2.2*), what emerges is that the dividing line (unlike in the case of morbidity) is the employment category. Public sector workers use the public healthcare system at a substantially higher rate than those working within private employment, regardless of their educational attainment. The role of educational attainment is not negligible, either: for example, those with tertiary educational attainment get itemised medications at a salient rate, regardless of employment type.

Healthcare expenditure per patient

Our last focus of enquiry was the amount spent on each person by the social health insurance fund. We would like to emphasise that in our calculations we are not using the average annual expenditure per person, but we are dividing the annual total expenditure per fund by the number of patients (service users) that actually use certain types of care (expenditure per actual service user). The difference is shown in the first two rows of *Table 2.2.3*.

In 2019, the health insurance fund spent an average of HUF 82,000 per person on the examined population,[8] which is 56 percent of the average spending (HUF 146,000 per person) calculated for the entire population. The largest share of the expenditure per person is used in the inpatient sector and medications (HUF 31,000 each), but as for the expenditure per patient, it was highest by itemised medications (more than HUF 2 million) and inpatient care (HUF 308,000).

In the case of the expenditure per patient, we have found a rather mixed pattern; no clear trend line can be drawn on the basis of the usual factors (entitlement, educational attainment). The upper part of *Table 2.2.3* shows the impact of the entitlement category on healthcare expenditures. They are not negligible, but the differences are smaller than by utilisation. And also, the pattern differs greatly from that of utilisation. We wish to emphasise that the health insurance fund spends the highest amount (+26 percent) on the very group whose utilisation rate was the lowest (those paying a health service contribution). This may indicate that higher costs are a consequence of previously missed health maintenance and prevention (unmet healthcare need),

8 As a reminder: we have excluded diseases that are extremely rare and have rather high treatment costs from the scope of expenditures to be examined.

but it may also indicate that this group – in case of minor health problems – might rather turn to a private healthcare provider. The expenditure per patient of the unemployed and public work employee group was either similar to those working within private employment (except for itemised medications) or lower. Spending on the outpatient care and medications of public sector workers was higher compared to those working within private employment (and their service utilisation rate was higher, as well). The case of dentistry is different: we see many users from the public sector, but their per capita expenditure is relatively lower.

Table 2.2.3: Differences in the expenditure rates per patient in the age group of 20–65, by entitlement type and educational attainment, 2019

	Inpatient care	Outpatient care	Medications and medical aids and devices	Dentistry	Supply of itemised medications	Any type of care
Expenditure per person (HUF)	31,613	18,452	31,053	1,585	5,690	81,117
Expenditure per patient (HUF)	308,203	26,331	46,370	9,118	2,029,433	99,722
Divergence of the expenditure per patient relative to the average of those working within private employment, by entitlement category (percentage)*						
Private employment	0.00	0.00	0.00	0.00	0.00	0.00
Public works employee, unemployed	–1.80	+2.60	–9.02	–7.17	+19.29	–1.45
Entrepreneur	+1.57	+0.33	–0.02	–2.77	–2.19	–0.79
Public sector	–3.31	+9.05	+6.53	–10.72	+7.46	+3.15
Those paying a health service contribution	+17.50	+10.78	+25.97	–3.55	+7.85	+25.70
Divergence of the expenditure per patient relative to the average of those with secondary educational attainment and working within private employment, by educational attainment and entitlement category (percentage)*						
Private employment, tertiary educational attainment	+1.09	+1.14	+16.66	+1.30	+9.35	+2.94
Private employment, secondary educational attainment	0.00	0.00	0.00	0.00	0.00	0.00
Private employment, undereducated	+8.01	+9.71	+16.10	–5.62	+1.05	+15.14
Public sector, tertiary educational attainment	–1.47	+12.82	+22.71	–3.40	+13.92	+11.50
Public sector, secondary educational attainment	–2.45	+9.43	+1.63	–17.80	+5.28	+0.69
Public sector, undereducated	+5.68	+12.18	+37.05	–4.43	+16.93	+21.43

* Based on a database standardised for age, sex and the development level of the place of residence.

Source: Authors' own calculations on the basis of the 2019 data of the *National Health Insurance Fund Administration* (NEAK).

Usually, these differences remain even after controlling for the educational attainment of workers (the lower part of *Table 2.2.3*). Finally, it has also emerged that the expenditure per patient of the undereducated and of those with tertiary educational attainment is higher than that of those with secondary educational attainment.

Summary

In this subchapter we have presented the correlations of labour market status (entitlement) and educational attainment with 1) the prevalence of certain chronic diseases, 2) utilisation of the publicly financed healthcare system, and 3) the expenditure of the social health insurance fund spent on patients.

Three percent of the active, working-age population has at least two chronic diseases. More than 16 percent of this group take medications regularly for hypertension, and 3 percent do for diabetes, as well. Nearly one in 100 of this group received treatment for a severe pulmonary disease. The unemployed and public works employees seem to have a particularly poor health status. As for chronic diseases, educational attainment has the highest impact. We shall not forget that we only see patients in care, but if we were able to estimate those who are in need but not receiving care, these differences would be even more significant.

Analyzing utilisation rates, entitlement has proved to be the most significant influencing factor. Public sector workers turn to the publicly financed healthcare system much more often. Other labour market groups use dentistry and outpatient care to a much lower extent. This is probably attributable to the unknown utilisation rates of private service providers. Public work employees and the unemployed have less access to itemised medications despite the fact that they probably have the worst health status.

We have not found significant differences in the expenditures per patients. Although those paying their own health service contribution use the healthcare system less frequently, when they do, their care is much more expensive.

Significant differences (that are not being discussed here) can be observed between the data of men and women as well, based on all of the examined factors.

Beyond labour market status, there might be other reasons behind the phenomena presented in our analysis. The capacity for self-advocacy, the accessibility of the healthcare system and cultural norms linked to men's and women's roles may be such influencing factors. Presumably, there are people who "land" in the healthcare system late, when their care is much more expensive.

Based on what has been presented, especially in light of the current amendments to the social insurance act of Hungary, further analyses are needed so that we can understand the characteristics of health service contribution payers. It can also be concluded that both primary healthcare and occupational healthcare play important roles in access, coordination of treatments, and in an early enough start to health education.

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