

4 THE HEALTHCARE SYSTEM AS EMPLOYER

4.1 THE HEALTH OF HEALTHCARE WORKERS

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There have been relatively few studies conducted on the state of health and health behaviour of healthcare workers in Hungary. The existing analyses are usually based on data from survey-based data collection (see, for example, *Rurik–Kalabay*, 2009, *Györffy et al.*, 2012, *Terebessy et al.*, 2016). In this subchapter, we provide a descriptive analysis of the development between 2009 and 2017 of some of the indicators that demonstrate the health behaviour and state of health of physicians and nurses,¹ using the data of the Admin3 dataset compiled by the databank of the Centre for Economic and Regional Studies (KRTK).²

The upper part of *Table 4.1.1* shows the frequency of use of various healthcare services (general practitioner, outpatient care, laboratory testing), as well as the number of days spent in inpatient care by the members of the observed groups. The lower part of the table attempts to grasp the occurrence of certain chronic illnesses. It shows, by various groups, the rate of these groups that take medications belonging to certain medication categories on a regular basis, that is, what is the rate of those among them who purchase these medications at least four times per year. The data is presented by the following groups: the adult population of at least 24 years of age; those working in professions requiring a tertiary educational attainment;³ physicians who are actively working, that is, those who were working as physicians at the time of the observation; the group of former physicians, who worked as physicians for at least a month during the observed period, but no longer work as such, either due to a career change or because they chose to become inactive; finally, the group of nurses and specialised healthcare workers.

The separate examination of active and former physicians aims to uncover the differences that may be observable between those who are still working in healthcare and thus are able to access the services more easily, and those who had left healthcare. The group of former physicians is rather heterogeneous: it includes those who are working in other careers in Hungary, those who are temporarily inactive (on parental leave, for example), and retired physicians as well. However, the shared characteristic of the members of this group is that they used to work as physicians, but are no longer in direct connection to healthcare. This may affect their state of health or health behaviour.

In order to remove the effect of a few observed factors on the frequency of healthcare service use, and on the occurrence likelihood of certain diseases, we have estimated regression models. We compared the adult population and specialised healthcare workers using the subsample of the population of 24 years

1 Those belonging to the following FEOR codes were classified here: nurse, specialist nurse, midwife, general health assistant, health documentary, medical imaging diagnostic and therapeutic equipment manager, medical laboratory assistant, dental assistant, physiotherapy assistant.

2 For a brief description of the database, see the Appendix of *In Focus*. A more detailed description see *Sebök* (2019).

3 As there is no data available on educational attainment, we have considered those working in professions requiring a tertiary educational attainment (main FEOR groups 1, 2 and 3) as possessing such educational attainment. The group of those with a tertiary educational attainment does not include active and former physicians and specialised healthcare workers.

of age or older. We have examined active and former physicians and those with other tertiary educational attainment in separate models, using a subsample of data narrowed down to these three groups. We have examined the annual frequency of the use of the various healthcare services through OLS regressions, and we examined the likelihood of certain chronic and acute diseases through binary outcome probit models. The dependent variables in these models showed whether the individual suffers from the observed chronic illness (that is, whether they have purchased medications belonging to the medication group that is used for treating the given disease at least four times per year). Additionally, we have also run a model that examined the likelihood of whether the individual had a myocardial infarction during the period examined.

Table 4.1.1: The annual average healthcare service use rates of physicians, specialised healthcare workers, those with a tertiary educational attainment, and the adult population, between 2009 and 2017

	24-year-old or older population	Those with a tertiary educational attainment ^a	Active physicians	Former physicians	Nurses and specialised healthcare workers
A) Healthcare service use					
General practitioner (piece)	6.9	4.3	3.1	2.7	5.0
Outpatient care (piece) ^b	7.3	5.8	8.8	7.5	10.2
Laboratory testing (piece)	1.6	1.3	2.1	1.8	2.0
Inpatient care ^c (days)	2.4	0.62	0.85	0.82	0.78
B) The number of those regularly taking certain medications (percentage)^d					
Insulin preparations and oral antidiabetics	6.3	2.3	3.0	2.9	2.2
Medications for hypertension (ATC C02 and C09)	30.1	15.0	20.6	18.4	16.1
Medications for psychotic disorders (ATC N05 and N06)	2.2	2.4	3.6	2.4	3.9
Medications for obstructive airway disease (ATC R03)	1.0	1.0	1.7	1.2	1.4
Antibiotics (ATC J01)	1.7	1.5	8.2	6.3	3.0

^a Excluding physicians and specialised healthcare workers.

^b Excluding laboratory testing.

^c Days spent in inpatient care.

^d At least four purchases per year.

Source: Authors' own calculations based on the Admin3 database.

Explanatory variables included the individual's sex, age, the logarithm of the total of their monthly wages, the logarithm of the total of the time they spent in employment (across all jobs), and year fixed effects. Additionally, in the models examining the behaviour of specialised healthcare workers, a binary variable showed whether the individual was working as a specialised healthcare worker. In the models comparing physicians and those with other tertiary

educational attainment, binary variables showed whether the individual was an active or former physician.

The results of the OLS models that describe the frequency of service use and the estimated coefficients are presented in *Tables 4.1.2* and *4.1.3*, while the results of the probit models and the marginal effects are shown in *Tables 4.1.4* and *4.1.5*.

Nurses and specialised healthcare workers visit their general practitioners less frequently than the rest of the adult population. While active and former physicians visit their general practitioners much less frequently than those with other tertiary educational attainment. Nurses and specialised healthcare workers, as well as active and former physicians use the outpatient care and laboratory testing more frequently than the reference groups used for comparison. Physicians also spend somewhat longer periods in inpatient care than those with other tertiary educational attainment. The reason behind the lower use rate of general practitioner care is presumably the fact that in the case of minor symptoms, both physicians and specialised healthcare workers are capable of establishing a diagnosis and determining the necessary treatment. The difference in outpatient care, laboratory testing and the days spent in inpatient care could be explained by their worse state of health, but also by their behaviour being more health-conscious compared to the other groups.

Table 4.1.2: The use of various healthcare services among specialised healthcare workers, relative to the adult population of at least 24 years of age (excluding physicians)

	Number of visits to the general practitioner (annually)	Number of times outpatient care was used (annually)	Number of times laboratory testing was used (annually)	Days spent in inpatient care (annually)
Specialised healthcare worker, nurse	-0.53*** (0.04)	3.88*** (0.06)	0.74*** (0.02)	-0.04 (0.03)
Number of cases	672,742	672,742	672,742	672,742

Note: OLS regressions. Control variables: sex, age, total of monthly wages (logarithm), total of the time spent in employment, across all jobs (logarithm), year fixed effects. Robust standard errors in brackets.

Significant at the *** 1 percent, ** 5 percent, * 10 percent levels.

Source: Authors' own calculations based on the Admin3 database.

Compared to the total adult population, nurses and specialised healthcare workers are more likely to be taking medications used to treat diabetes and hypertension, as well as antibiotics, and are less likely to be taking medications used to treat psychotic disorders, than the total adult population (*Table 4.1.4*). Active and former physicians are significantly less likely to be regularly taking medications used to treat diabetes and hypertension, compared to those with other tertiary educational attainment who have similar characteristics. Active physicians are more likely to be taking medications used to treat obstructive airway diseases (*Table 4.1.5*).

Table 4.1.3: The use of various healthcare services among active and former physicians, relative to the adult population with tertiary educational attainment

	Number of visits to the general practitioner (annually)	Number of times outpatient care was used (annually)	Number of times laboratory testing was used (annually)	Days spent in inpatient care (annually)
Active physician	-2.26*** (0.04)	3.16*** (0.10)	0.93*** (0.03)	0.12*** (0.04)
Former physician	-2.70*** (0.06)	1.57*** (0.15)	0.51*** (0.04)	0.11* (0.06)
Number of cases	412,754	412,754	412,754	412,754

Note: OLS regressions Control variables: sex, age, total of monthly wages (logarithm), total of the time spent in employment, across all jobs (logarithm), year fixed effects. Robust standard errors in brackets.

Significant at the *** 1 percent, ** 5 percent, * 10 percent levels.

Source: Authors' own calculations based on the Admin3 database.

Table 4.1.4: The likelihood of the occurrence of certain chronic and acute diseases and of taking antibiotics on a regular basis, relative to the adult population of at least 24 years of age (excluding physicians)

	Myocardial infarction	Diabetes	Hypertension	Psychotic disorders	Obstructive airway diseases	Antibiotics
Specialised healthcare worker	0.000 (0.000)	0.002** (0.001)	0.005*** (0.002)	-0.001** (0.000)	0.000 (0.001)	0.012*** (0.001)
Number of cases	672,742	672,742	672,742	672,742	672,742	672,742

Note: Binary outcome probit estimates, marginal effects (dy/dx). Chronic diseases defined on the basis of medication use. Control variables: sex, age, total of monthly wages (logarithm), total of the time spent in employment, across all jobs (logarithm), year fixed effects. Standard errors in brackets.

Significant at the *** 1 percent, ** 5 percent, * 10 percent levels.

Source: Authors' own calculations based on the Admin3 database.

Table 4.1.5: The likelihood of the occurrence of certain chronic and acute diseases and of taking antibiotics on a regular basis, among active and former physicians, relative to those with a tertiary educational attainment who are in employment

	Myocardial infarction	Diabetes	Hypertension	Psychotic disorders	Obstructive airway diseases	Antibiotics
Active physician	0.000 (0.000)	-0.005*** (0.001)	-0.023*** (0.003)	0.001 (0.000)	0.003*** (0.001)	0.059*** (0.003)
Former physician	0.000 (0.000)	-0.007*** (0.001)	-0.040*** (0.004)	0.000 (0.001)	-0.001 (0.003)	0.033** (0.004)
Number of cases	412,754	412,754	412,754	412,754	412,754	412,754

Note: Binary outcome probit estimates, marginal effects (dy/dx). Chronic diseases defined on the basis of medication use. Control variables: sex, age, total of monthly wages (logarithm), total of the time spent in employment, across all jobs (logarithm), year fixed effects. Standard errors in brackets.

Significant at the *** 1 percent, ** 5 percent, * 10 percent levels.

Source: Authors' own calculations based on the Admin3 database.

There was no significant difference between the three groups regarding the likelihood of a myocardial infarction. Whether these differences are explained by differences in the likelihood of disease, the likelihood of the recognition of disease, or the likelihood of following treatment instructions, is yet to be determined through further research.

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