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Research Article

Changes in Statistics of Malignant Neoplasms of Central Nervous System Excluding Brain (ICD-10: C70, C72) In the Lower Silesia Region of Poland in the Years 2006-2012

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Abstract

Epidemiological data concerning malignant neoplasms of meninges and central nervous system parts other than brain in Poland are reported to many medical databases run by various institutions and are incongruent with each other, which makes their practical interpretation highly difficult. Data on registered cases of malignant neoplasms of meninges (C70-C70.9 ICD-10) and of spinal cord, cranial nerves and parts of central nervous system other than brain (C72-C72.9 ICD-10) in the years 2006-2012, made available by public healthcare insurance provider Narodowy Fundusz Zdrowia in Lower Silesia region of Poland (NFZ) and data on new cases from Polish national neoplasms registry Krajowy Rejestr Nowotworow (KRN), were analyzed. The study revealed that those neoplasms are rare in Lower Silesia region of Poland population, number of new cases dropped in the analyzed period, but the NFZ/KRN cases ratio increased significantly especially in case of malignant neoplasms of central nervous system parts other than brain or meninges, which suggests big, and increasing with time, amount of medical procedures needed by those patients. It points at the need of respective adjustment of the level of public financing of treatment of malignant neoplasms of meninges and other central nervous system parts than brain. The study results indicate also that epidemiological reporting system in Poland shall be improved as there is a growing number of Polish physicians who report mainly unspecific broad ICD-10 categories and there are year-to-year alternations of reported numbers of cases that do not have any explanation other than formal shifting in reported ICD-10 categories.

Keywords:
malignant neoplasm; central nervous system; meninges; spinal cord; medical statistics; oncology

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Introduction

The epidemiological data concerning malignant neoplasms of meninges and central nervous system parts other than brain in Poland are reported to many medical databases run by various institutions. It is demanded from all Polish medical professionals that vast data on all cases of cancer are sent to the national neoplasms registry. The respective legal regulation is often disobeyed by physicians overloaded by bureaucratic burdens, but on some occasions one case is reported by several different physicians in a row which is difficult to be detected on a routine basis. Payments to the healthcare providers are made mainly by the Polish public healthcare insurance provider so theoretically this institution shall have the most reliable data on oncologic treatment. Unfortunately, the structure of the databases is mirroring the field of competences of the institution and allows retrieving data rather on medical procedures than on patients' diagnoses. The data from different sources are highly incongruent and in result even interpreting the direction of changes is difficult [1].

The part of medical care and social support system in the Lower Silesia region of Poland that shall be oriented on ageing society and long term care was reported to need adjustments [2]. Availability of trustworthy statistical data concerning those rare conditions is important for long term planning of medical and social financing and development in order to avoid overlooking the existent needs [3]. Although malignant neoplasms of meninges and central nervous system parts other than brain shall be considered rare in comparison to the most common cancers but unfortunately they pose a serious threat as their diagnosis is often delayed, final prognosis is bad [4] and even if the patients show positive response to treatment the results are often crippling and the patients remain dependent on others and thus require medical assistance and supportive care [5].

Materials and Methods

The aim of the study was to estimate yearly current changes in medical statistics of chosen malignant central nervous system neoplasms in the Lower Silesia's population. Data on registered cases of malignant neoplasms of meninges (C70-C70.9 according to ICD-10) and of spinal cord, cranial nerves and parts of central nervous system other than brain (C72-C72.9 according to ICD-10) in the years 2006-2012, made available due to courtesy of the public healthcare insurance provider Narodowy Fundusz Zdrowia in Lower Silesia region of Poland (NFZ), were analyzed. Comparable data on reported new cases of malignant neoplasms of meninges (major group C70 according to ICD-10) and of spinal

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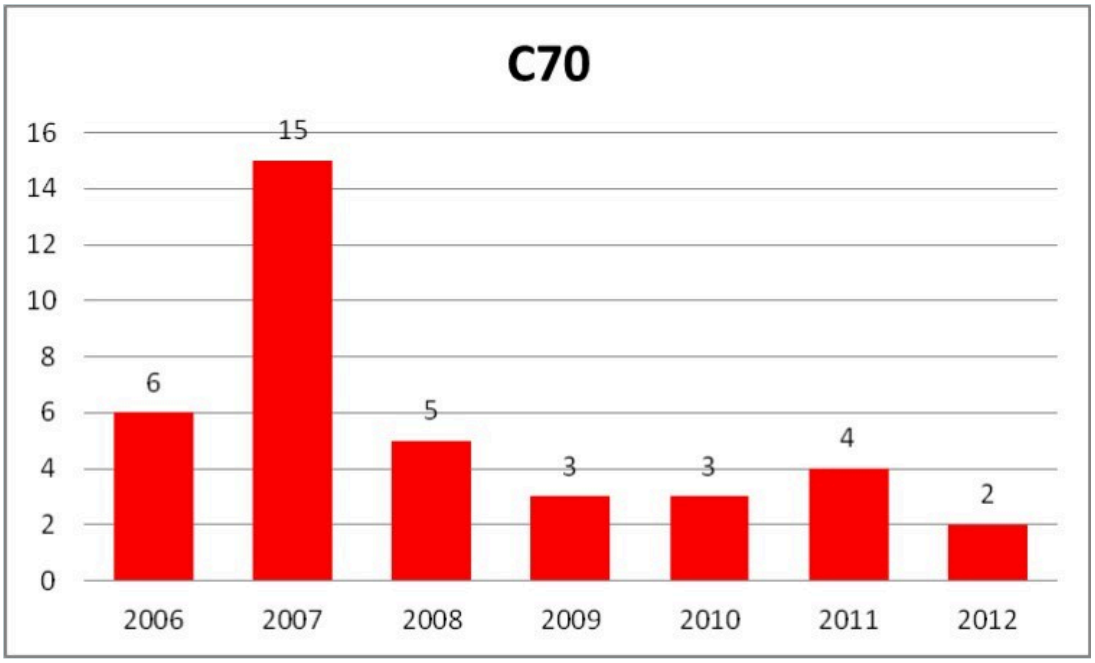


Figure 1. Number of new cases of malignant neoplasms of meninges (main category C70 according to ICD-10, not divided into subcategories) in the Lower Silesia region of Poland reported yearly to the Polish national neoplasms registry KRN in the years 2006-2012.

cord, cranial nerves and parts of central nervous system other than brain (major group C72 according to ICD-10) in the years 2006-2012 in the Lower Silesia region of Poland were also retrieved from the official Polish national neoplasms registry Krajowy Rejestr Nowotworow (KRN). The data were analyzed with Microsoft Office Excel 2007 software. The structure of the available data did not allow performing any broader spectrum data analysis.

Results

The major population characteristics, including age structure, of the Lower Silesia region of Poland did not change in the years 2006-2012 although marked population ageing effect was observed [6]. In the year 2015 the region had 2,9 million inhabitants, 48% of them males [7].

The total number of new cases of malignant neoplasms of meninges (main category C70 according to ICD-10, not divided into subcategories) in the Lower Silesia region of Poland reported to the Polish national neoplasms registry KRN in the years 2006-2012 was 38 and in the beginning of the analyzed period the yearly number dropped significantly, so in the end it reached 33% of the initial value, as it is demonstrated in Figure 1.

The total number of cases of malignant neoplasms of meninges (main category C70 with subcategories according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 was 2.447; the yearly numbers were irregularly alternating through the analyzed period, as it is visualized in Figure 2. The ratio of cases registered by the NFZ to new cases reported to the KRN was 146,5 in the year 2012 in comparison to 50,2 in the year 2006.

There were 1.420 cases of malignant neoplasm of meninges, specified as main category only (C70 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012; the yearly amount of such cases showed significant rising trend and in the year 2012 it was 172,4% of the value from the year 2006, as it is visible in Figure 3.

In the whole analyzed period there were 705 cases of malignant neoplasm of cerebral meninges (C70.0 according to ICD-10) registered by the public healthcare insurance provider NFZ; the yearly number of cases rose temporarily in the years 2008-2009 and then dropped rapidly so in the year 2012 it was 75,5% of the value from the year 2006, as it is demonstrated in Figure 4.

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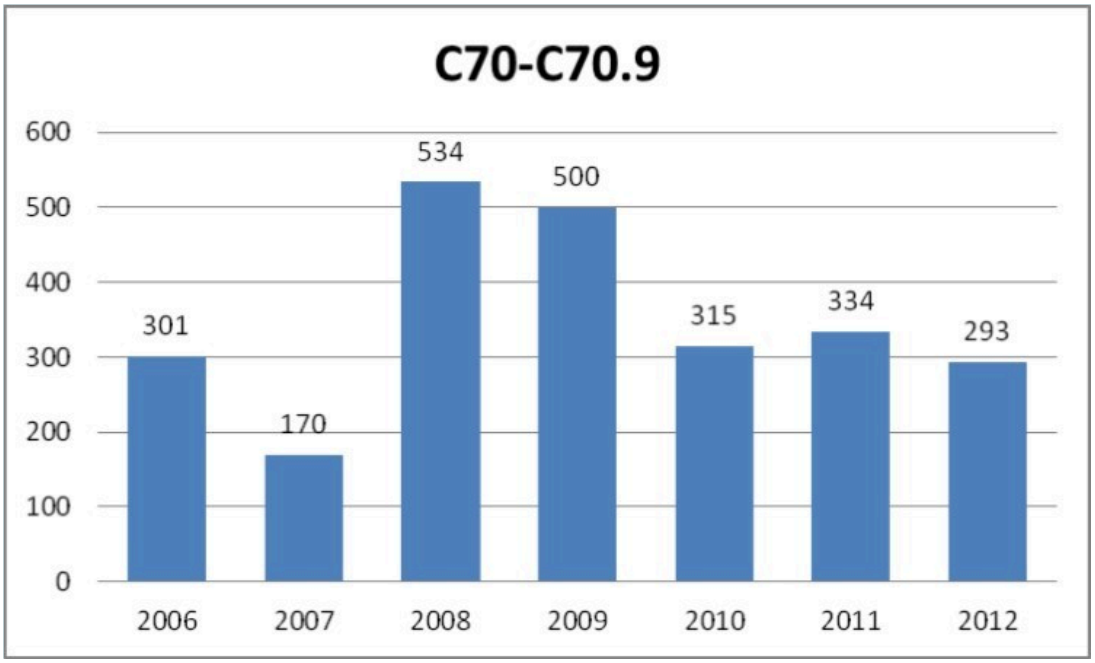


Figure 2. Total number of cases of malignant neoplasms of meninges (main category C70 with subcategories according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

The number of cases of malignant neoplasm of spinal meninges (C70.1 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 was 99; there was a significant dropping trend observed and in the end of the period the yearly number of cases was 38,1% of the initial value, according to Figure 5.

There were 223 cases of malignant neoplasm of meninges, unspecified (C70.9 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 and their yearly

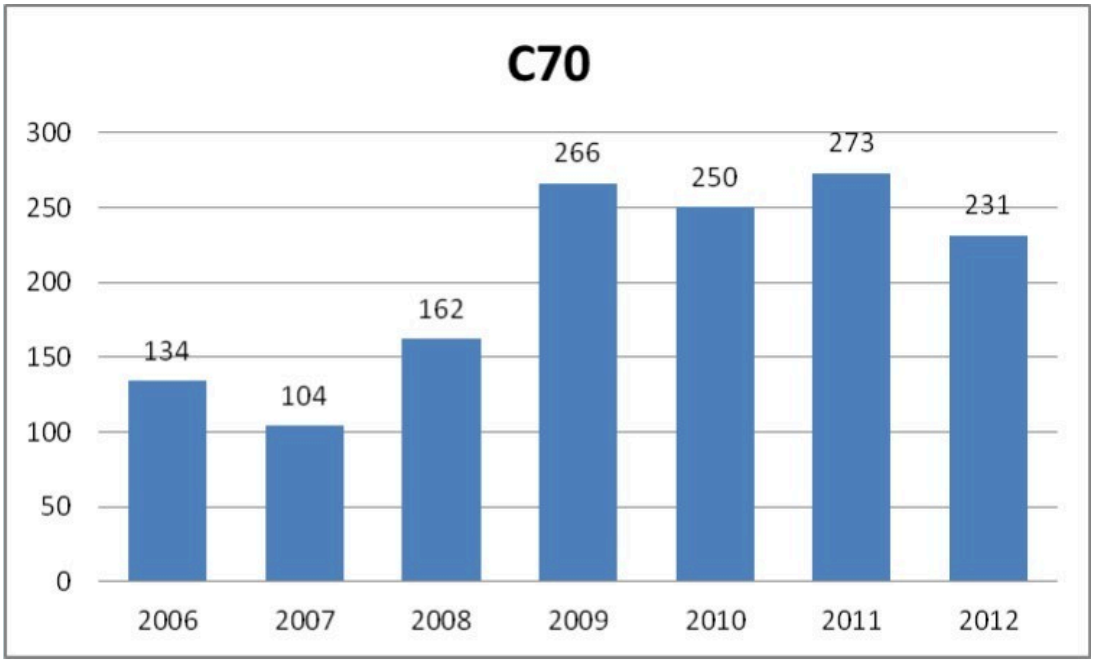


Figure 3. Number of cases of malignant neoplasm of meninges, specified as main category only (C70 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

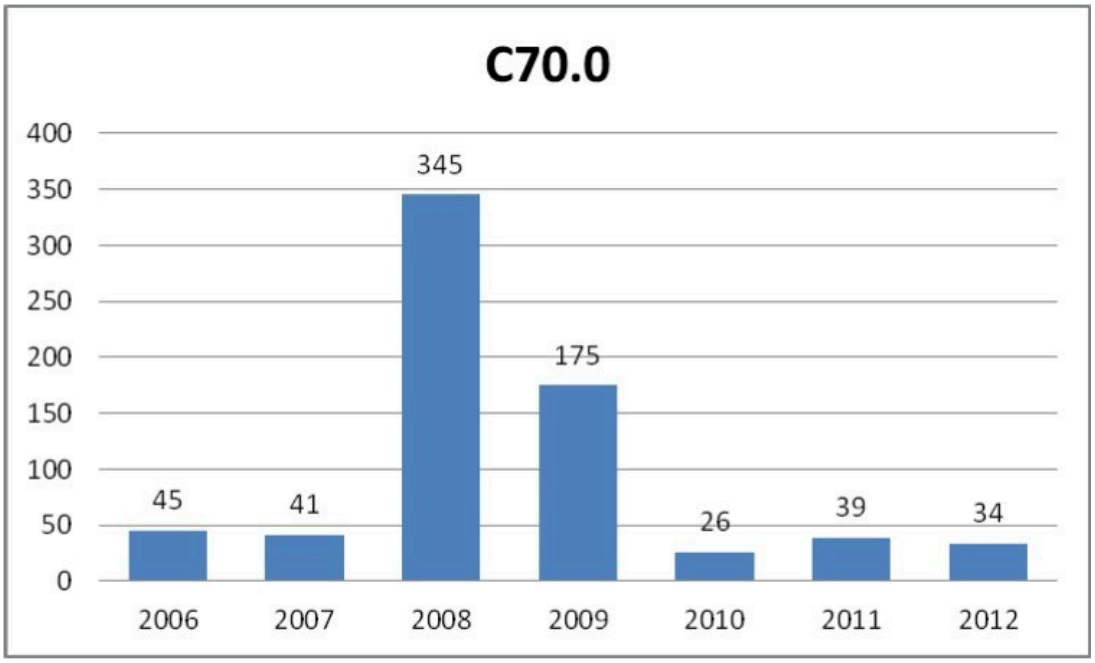


Figure 4. Number of cases of malignant neoplasm of cerebral meninges (C70.0 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

number rapidly dropped in the beginning of the analyzed period to alternate later, so in the year 2012 it was 19,8% of the value from the year 2006, as it is visible in Figure 6.

Figure 7 summarizes the number of cases of malignant neoplasm of meninges (C70-C70.9 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the beginning and the end of the analyzed period; the most reported cases fit into the unspecific categories.

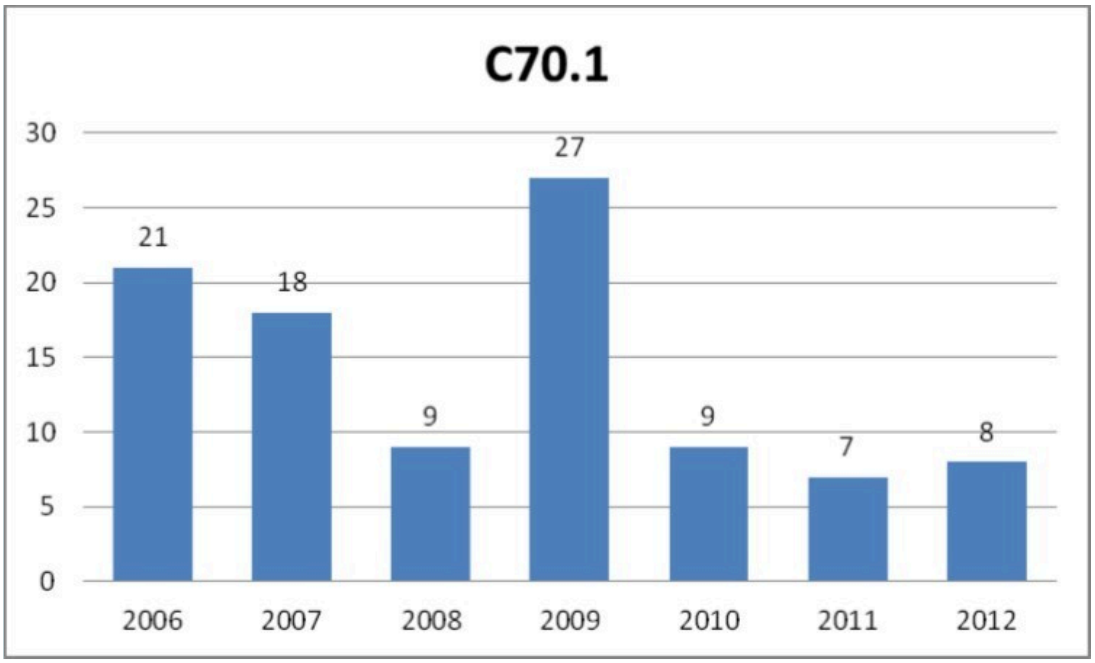


Figure 5. Number of cases of malignant neoplasm of spinal meninges (C70.1 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

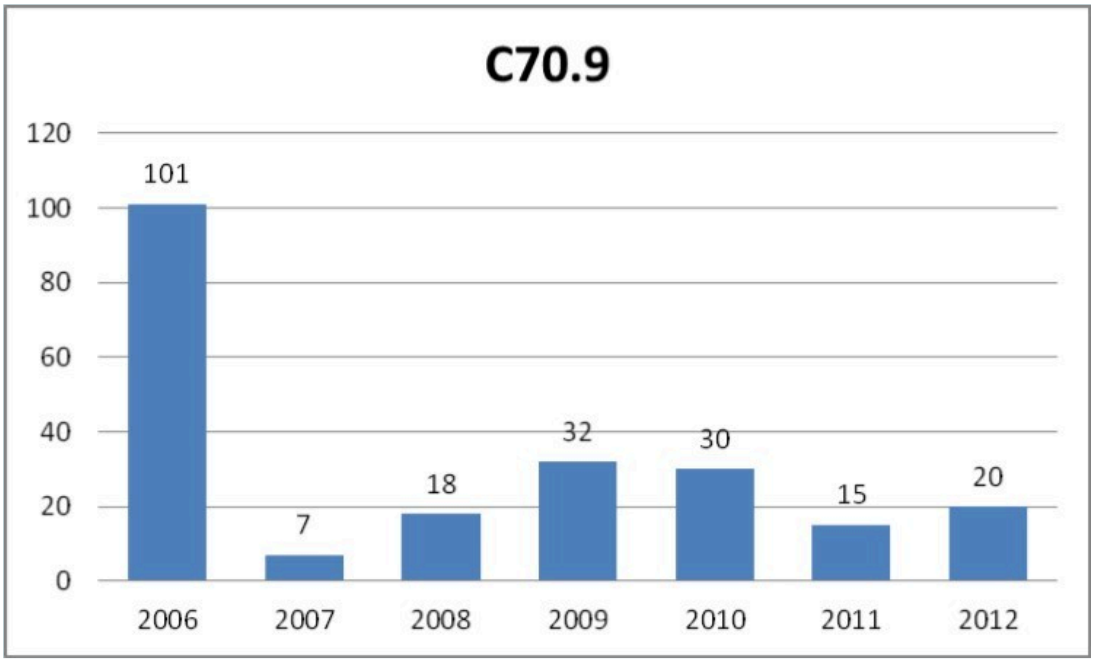


Figure 6. Number of cases of malignant neoplasm of meninges, unspecified (C70.9 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

The total number of new cases of malignant neoplasms of spinal cord, cranial nerves and parts of central nervous system other than brain (main category C72 according to ICD-10, not divided into subcategories) in the Lower Silesia region of Poland reported to the Polish national neoplasms registry KRN in the years 2006-2012 was 55 and the yearly amount of those cases dropped in the analyzed period to reach in the end 50% of the initial value, as it is visualized in Figure 8.

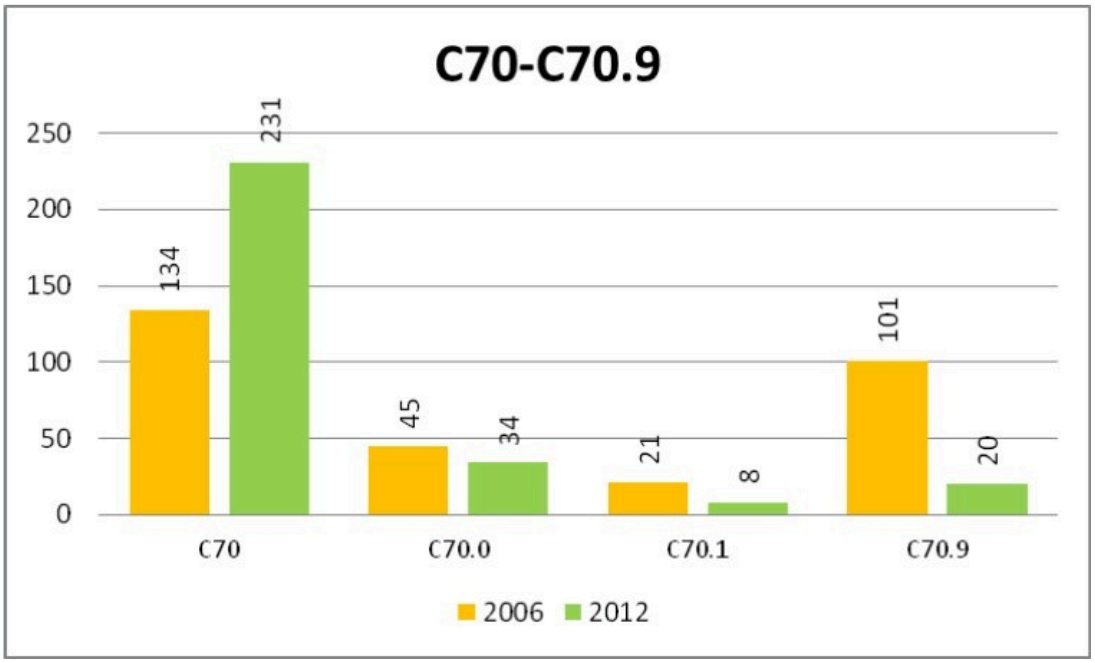


Figure 7. Number of cases of malignant neoplasm of meninges (C70-C70.9 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006 and 2012.

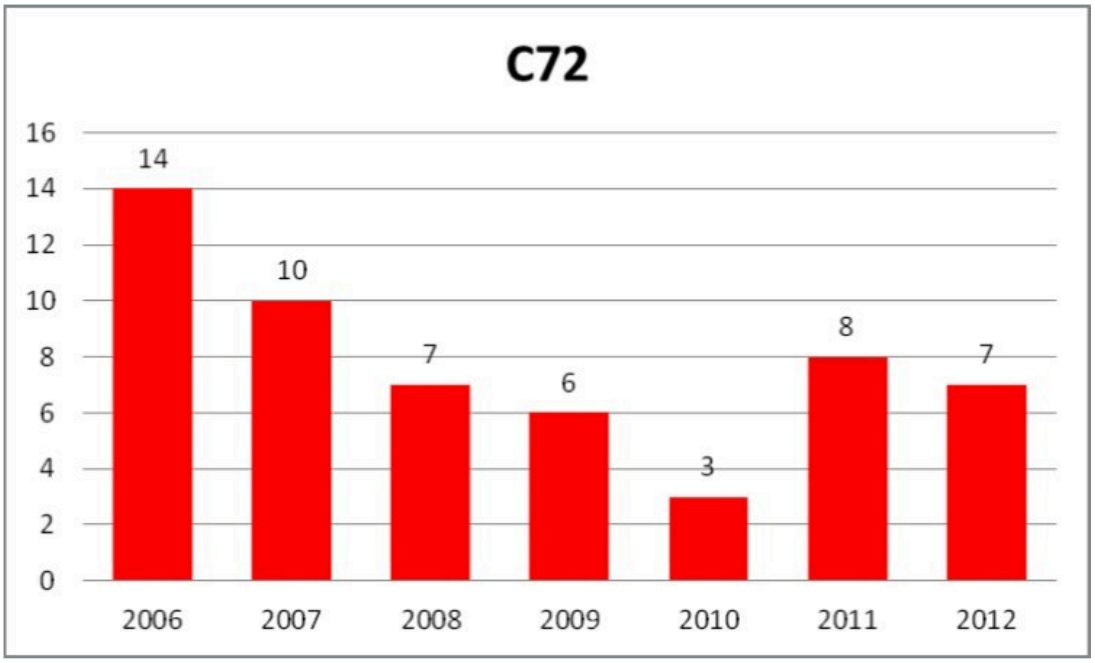


Figure 8. Number of new cases of malignant neoplasms of spinal cord, cranial nerves and parts of central nervous system other than brain (main category C72 according to ICD-10, not divided into subcategories) in the Lower Silesia region of Poland reported yearly to the Polish national neoplasms registry KRN in the years 2006-2012.

At the same time, the total number of cases of malignant neoplasms of spinal cord, cranial nerves and parts of central nervous system other than brain (main category C72 with subcategories according to ICD-10) registered by the public healthcare insurance provider NFZ was 3.577 and the yearly number rose rapidly in the first years of the analyzed period to stabilize later, as it is demonstrated in Figure 9. In the year 2006 the yearly number of cases was 192,7% of the value from the year 2006. The ratio of

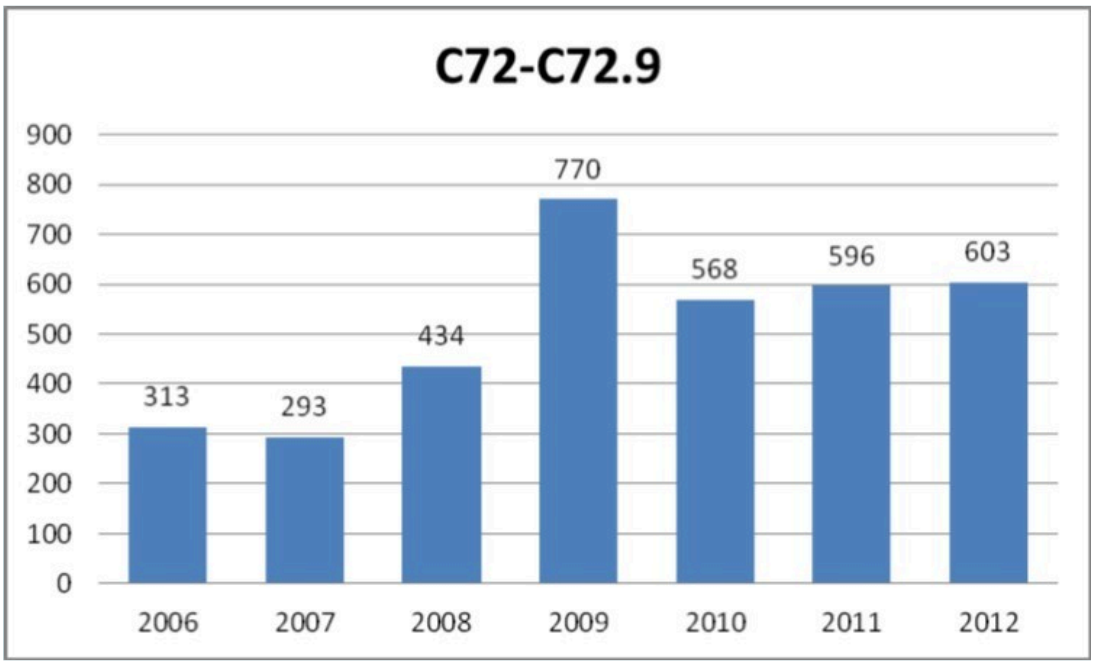


Figure 9. Total number of cases of malignant neoplasms of spinal cord, cranial nerves and parts of central nervous system other than brain (main category C72 with subcategories according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

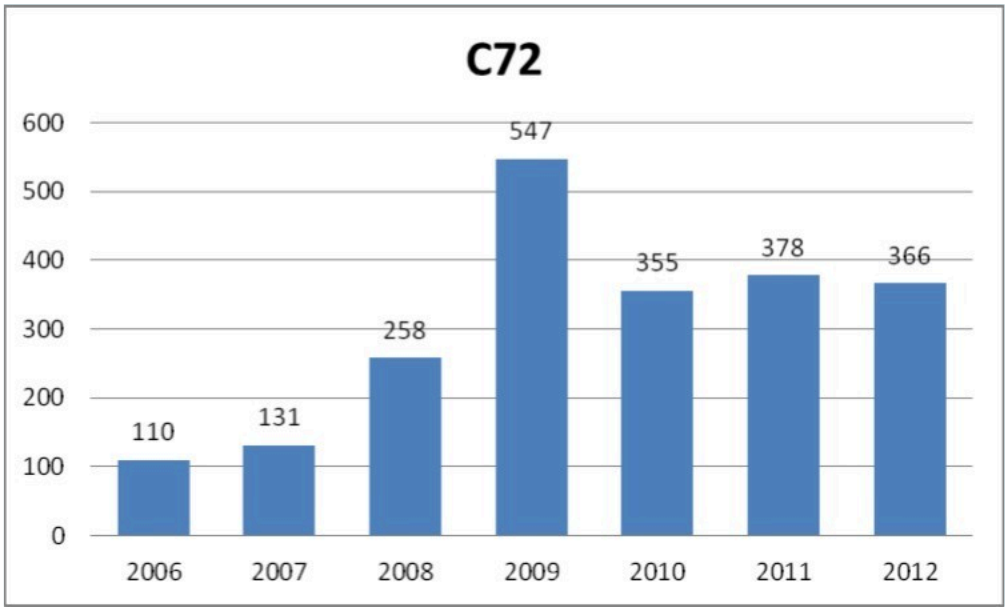


Figure 10. Number of cases of malignant neoplasm of spinal cord, cranial nerves and parts of central nervous system other than brain, specified as main category only (C72 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

cases registered by the NFZ to new cases reported to the KRN was 86,1 in the year 2012 compared to 22,4 in the year 2006.

The number of cases of malignant neoplasm of spinal cord, cranial nerves and parts of central nervous system other than brain, specified as main category only (C72 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 was 2.145; the yearly changes were similar to those described previously: their yearly number rose rapidly until the year 2009 and then dropped slightly to stabilize in the subsequent years, as it is visible in Figure 10. In the end of the analyzed period the yearly number of cases was 332,7% of the initial value.

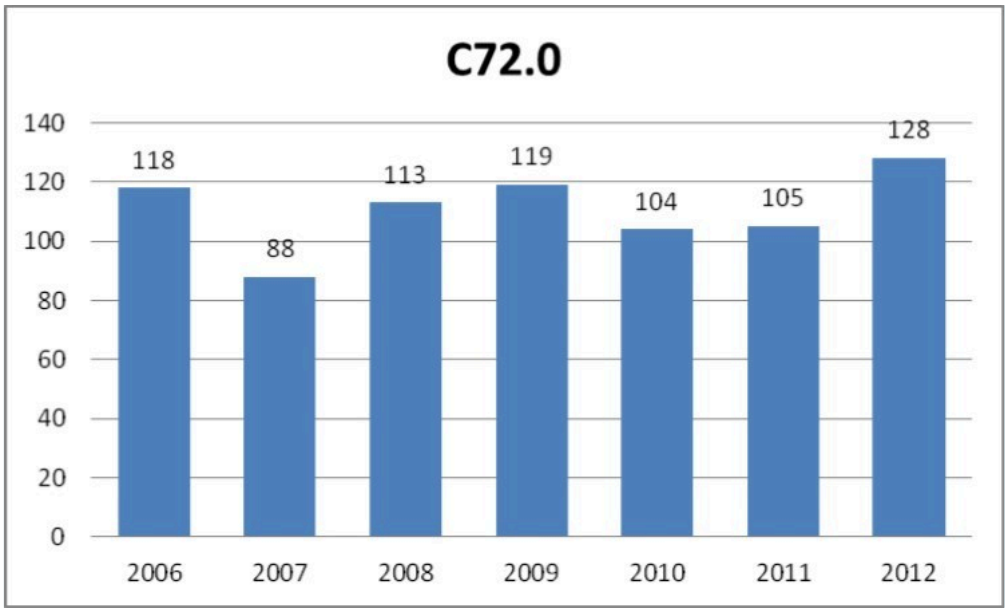


Figure 11. Number of cases of malignant neoplasm of spinal cord (C72.0 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

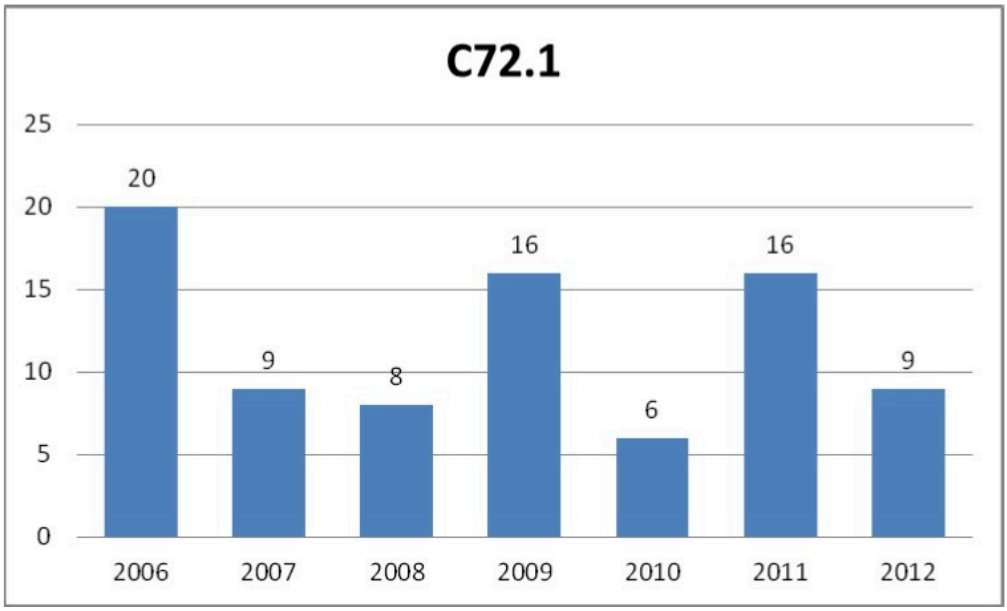


Figure 12. Number of cases of malignant neoplasm of cauda equina (C72.1 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

There were 775 cases of malignant neoplasm of spinal cord (C72.0 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 and the yearly amount alternated from year to year; in the year 2012 it was 108,5% of the value from the year 2006, as it is visualized in Figure 11.

Cases of malignant neoplasm of cauda equina (C72.1 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 reached 84 and their yearly number demonstrated a dropping trend, the year 2012 reaching 45,0% of the year 2006 value, according to the data in Figure 12.

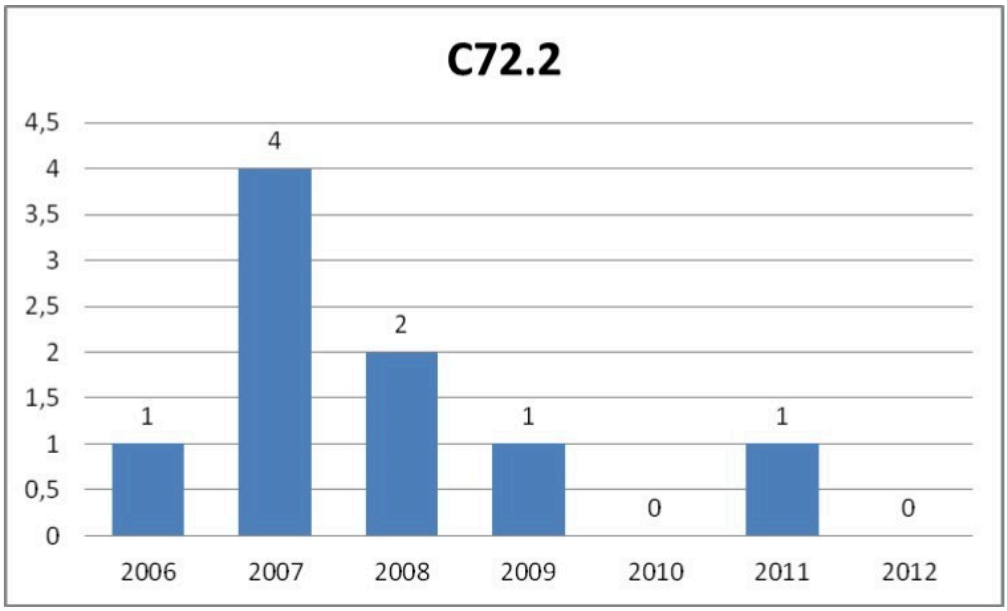


Figure 13. Number of cases of malignant neoplasm of olfactory nerve (C72.2 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

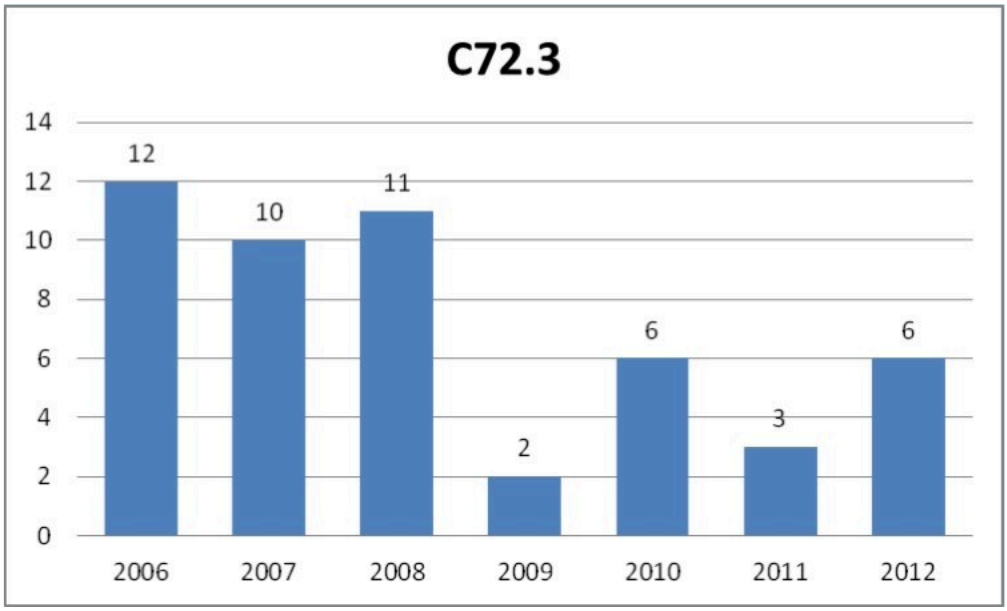


Figure 14. Number of cases of malignant neoplasm of optic nerve (C72.3 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

Malignant neoplasm of olfactory nerve (C72.2 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 cases were scarce as there were only 9 of them and their amount dropped to null in the year 2012, as it is visible in Figure 13.

There were a total of 50 cases of malignant neoplasm of optic nerve (C72.3 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 and the yearly numbers showed a dropping trend, reaching in the end of the analyzed period 50% of the initial value, consistently with Figure 14.

The number of cases of malignant neoplasm of acoustic nerve (C72.4 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012 was alternating as it is visible in Figure 15; the total number of cases in the analyzed period was 36.

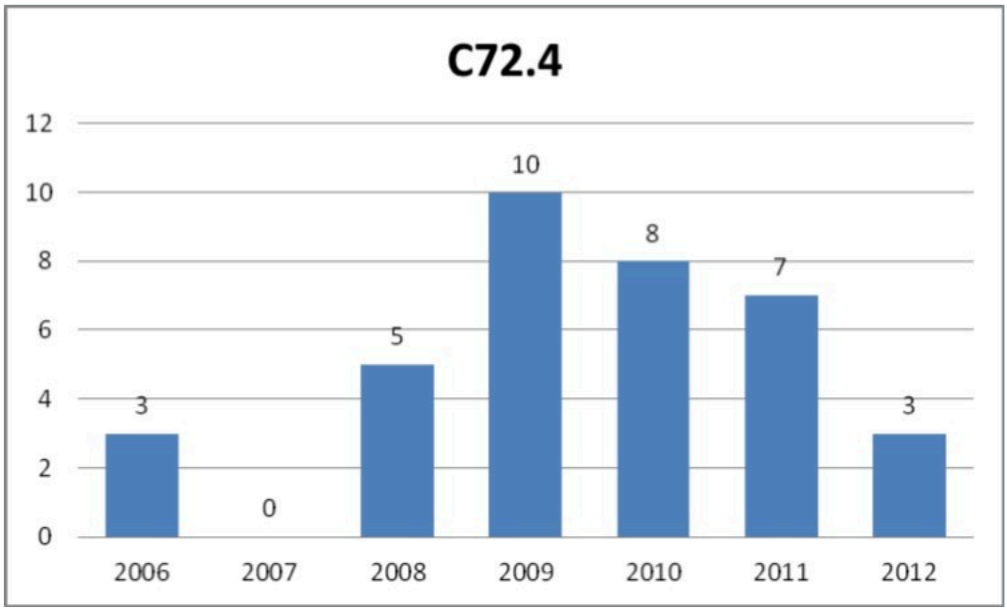


Figure 15. Number of cases of malignant neoplasm of acoustic nerve (C72.4 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

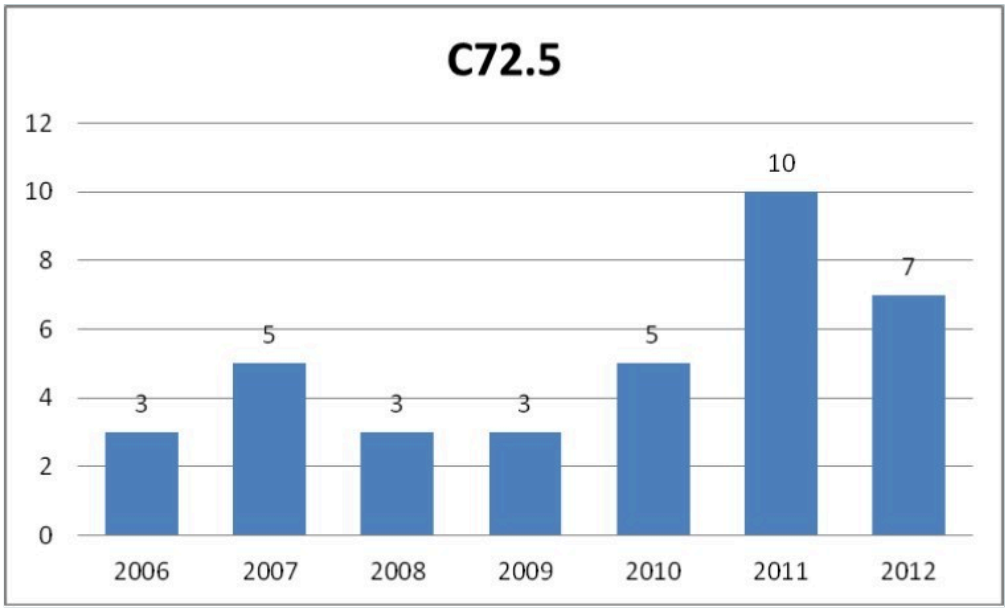


Figure 16. Number of cases of malignant neoplasm of cranial nerves other than olfactory, optic or acoustic nerve and of unspecified cranial nerves (C72.5 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

According to the data in Figure 16, the number of cases of malignant neoplasm of cranial nerves other than olfactory, optic or acoustic nerve and of unspecified cranial nerves (C72.5 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012 demonstrated a rising trend and in the year 2012 it was 233,3% of the year 2006 value, with the total number of cases reaching 36.

There were a total of 105 cases of malignant neoplastic overlapping lesions of brain and other parts of central nervous system (C72.8 according to ICD-10) registered by the public healthcare insurance

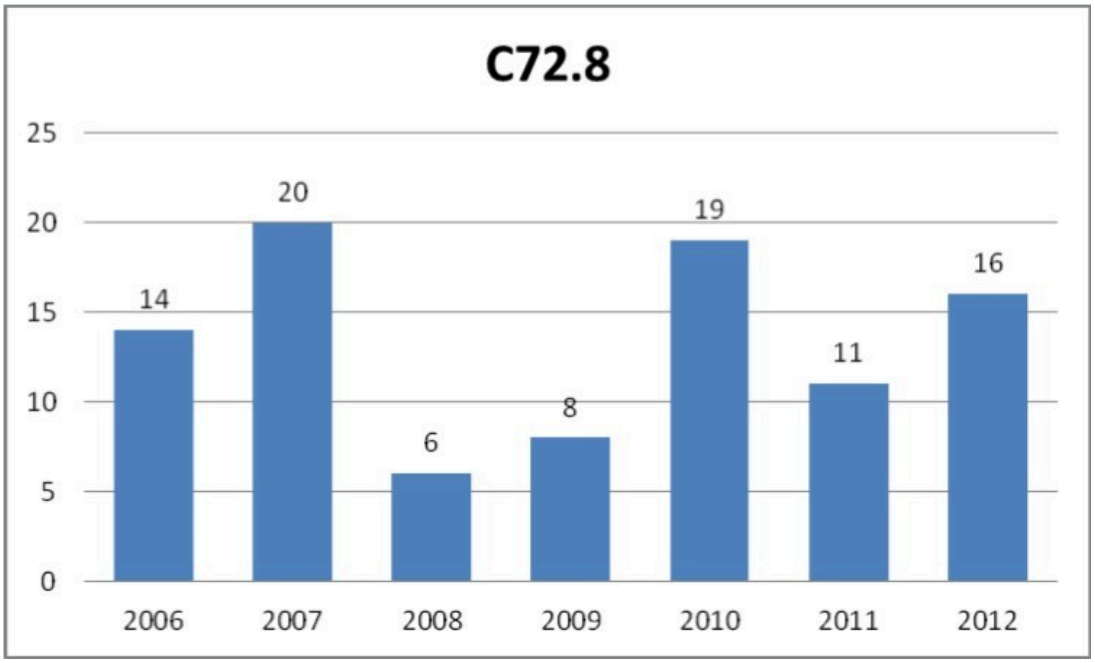


Figure 17. Number of cases of malignant neoplastic overlapping lesions of brain and other parts of central nervous system (C72.8 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

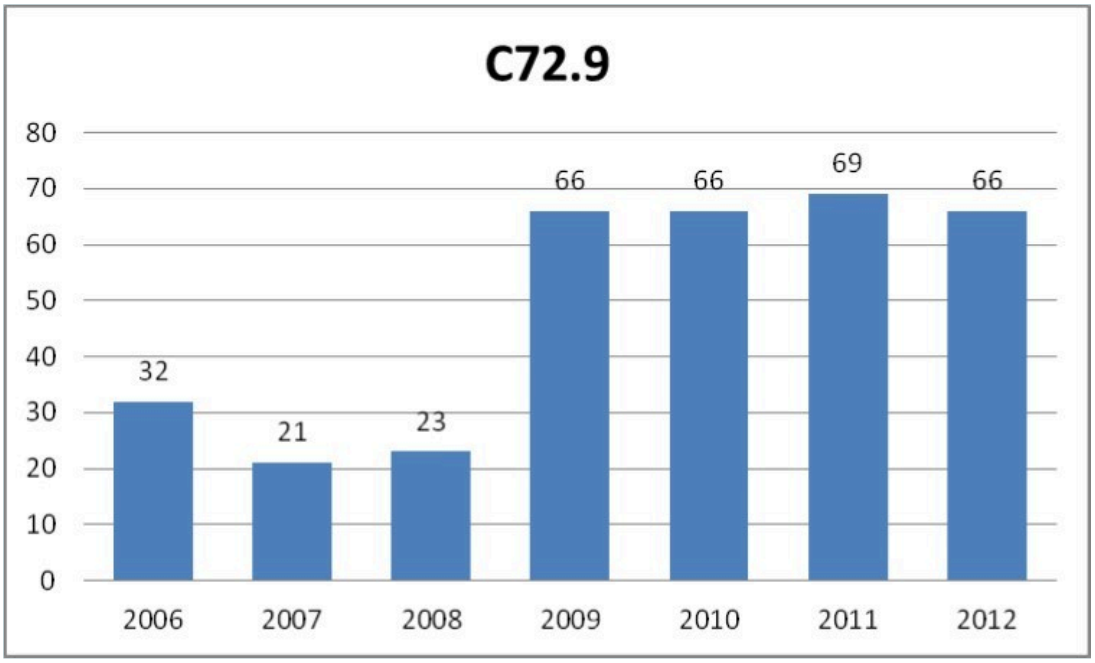


Figure 18. Number of cases of malignant neoplasm of central nervous system, unspecified (C72.0 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006-2012.

provider NFZ in the years 2006-2012 and the yearly amount alternated irregularly; in the year 2012 it was 114,3% of the value from the year 2006, as it is visualized in Figure 17.

The number of cases of malignant neoplasm of central nervous system, unspecified (C72.0 according to ICD-10) registered by the public healthcare insurance provider NFZ in the years 2006-2012 was 343 and the yearly number rose rapidly in the year 2009 to maintain the new level in subsequent years; in the year 2012 it was 206,3% of the value from the year 2006. Figure 18

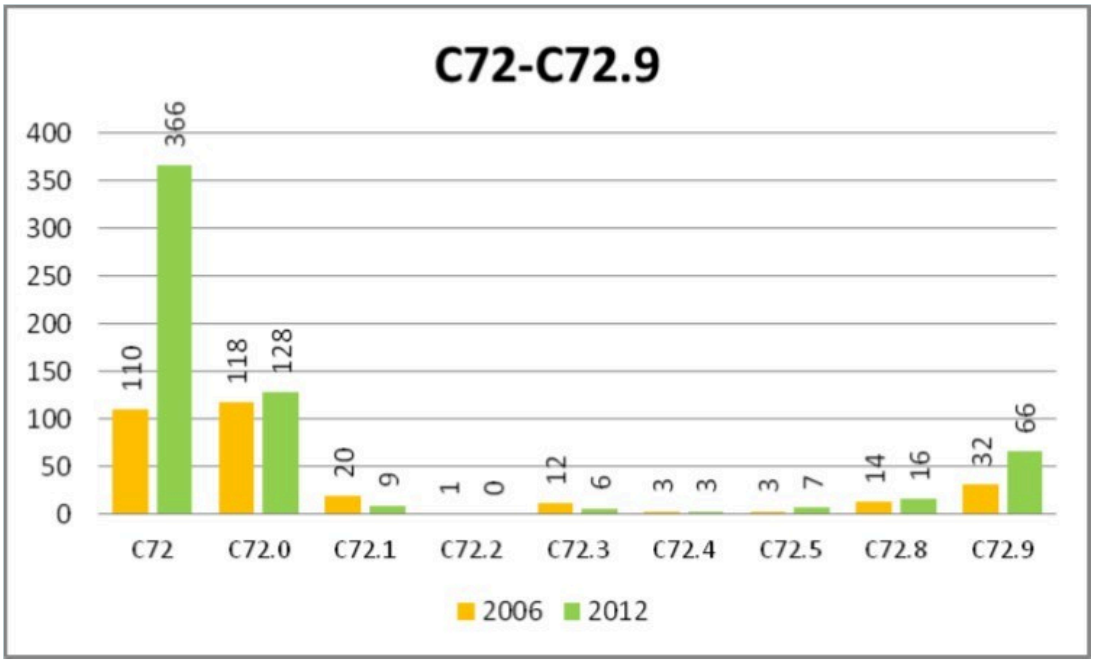


Figure 19. Number of cases of malignant neoplasm of spinal cord, cranial nerves and parts of central nervous system other than brain (C72-C72.9 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006 and 2012.

Figure 19 summarizes the number of cases of malignant neoplasm of spinal cord, cranial nerves and parts of central nervous system other than brain (C72-C72.9 according to ICD-10) registered yearly by the public healthcare insurance provider NFZ in the years 2006 and 2012; the most reported cases fit into the unspecific categories and they demonstrate the biggest rise in number.

Discussion

The results of the study revealed that both malignant neoplasms of meninges and of other central nervous system parts other than brain (C70-C70.9 and C72-C72.9 according to ICD-10, respectively) are rare in the Lower Silesia region of Poland and in both cases the yearly number of new cases reported to national neoplasms registry KRN dropped in the years 2006-2012. In contrast, the yearly numbers of respective cases reported by the public healthcare insurance provider NFZ were many times bigger, and the ratio to new cases reported by the KRN rose, especially in case of malignant neoplasms of central nervous system parts other than brain or meninges. It suggests big and increasing with time, amount of medical procedures needed by those patients. It points at the need of respective adjustment of the level of public financing of the treatment of malignant neoplasms of meninges and especially other central nervous system parts than brain.

The malignant neoplasms of cerebral meninges (C70.0 according to ICD-10) are reported more often than malignant neoplasms of spinal meninges (C70.1 according to ICD-10), most probably due to easier access during ante- and postmortem examination. Among the specific categories of malignant neoplasms of parts of central nervous system other than brain and meninges the biggest number of reported cases was concerning spinal cord lesions (C72.0 according to ICD-10) while the other specific categories were extremely rare.

The study results indicate that epidemiological reporting system in Poland shall be improved in many aspects. Not only is there big and growing number of Polish physicians who report mainly the unspecific broad ICD-10 categories but also there are vast year-to-year alternations of reported numbers of cases that do not have any explanation other than formal shifting in reported ICD-10 categories - as it was in case of malignant neoplasms of cerebral meninges (C70.0 according to ICD-10) - but there are also signs of improvement, like drop in reporting the category malignant neoplasm of meninges, unspecified (C70.9 according to ICD-10). Without adjustments in epidemiological data collection public health activities and planning expenses by the public healthcare insurance provider NFZ and the Polish government will be increasingly inadequate.

Competing Interests

The authors declare no known conflicts of interest.

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