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Short Communication

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Increase in Neurological Conditions in the German Healthcare System

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Abstract

In Germany, treatments due to neurological disorders are on the rise according to health insurance providers. A parallel trend is observable in other European countries like the UK. To get an overview on the matter, data from the central agency of health insurance in Germany (Kassenärztliche Bundesvereinigung, KBV) have been analyzed regarding the frequency of treatments related to neurological conditions between 2016 and 2022. Data hint to an increase in those treatments in German health insurants. Possible reasons for this have to be assessed.

Abbreviations: Health Insurance; Public Health; Neurological Conditions

Introduction

Currently, there is a rise in the number of treatments regarding neurological conditions in German patients, which could be related to missed check-ups due to covid-lockdowns, as is reported by the German health insurance provider AOK for cancer-related treatments. According to the AOK, a decrease in check-ups and cancer-surgery during the pandemic is currently causing a rise in cancer-treatments (Allgemeine Ortskrankenkasse, [1]). This could also be happening in a similar fashion with neurological conditions. A parallel trend has been noted in the UK [2].

Material and Methods

A more extensive body of data than that of the AOK is available for all German health insurance companies, provided by the KBV [3]. It consists of data collected all over Germany between 2016 and 2022 and can be separated in a) insurants who had been visiting the doctor for any reason since 2016 (69 573 152 individuals) and b) insurants who had been visiting the doctor since 2016 and at the same time had visited the doctor in 2021 with a complication arising from vaccination with the novel coronavirus vaccines (2 468

531 individuals). The latter group can be characterized as the vaccinated group, whereas the first has to be considered as the group with unclear vaccination status, since in Germany it is possible for individuals to be vaccinated against SARS-CoV-2 in vaccination centers without accounting by the KBV. The vaccination campaign in Germany started at the end of December 2020. Since the data arrived in the form of settlements made with the KBV per quarter, it was possible to separate the data into 25 quarters from January 2016 until March 2022, distinguishing 20 quarters before and 5 after onset of the campaign. Statistical analysis was done using Microsoft Excel 2013 and SPSS version 29. Univariate ANOVA was calculated to test for a difference in the number of treatments for neurological conditions before and after onset of vaccination in patients with unclear vaccination status and vaccinated patients next to Pearson's correlation coefficient for time after onset of vaccination and number of treatments related to neurological conditions.

Results

In both groups, the number of treatments regarding neurological conditions increased significantly with $p < 0.001$ when compar-



ing quarters before and after the onset of the vaccination campaign. When comparing correlations, the correlation between number of the quarter and number of neurology-related treatments is strongest in vaccinated patients after the onset of the vaccination campaign and patients with unclear vaccination status before onset of

the campaign, while being weakest in patients with unclear vaccination status after the onset of the vaccination campaign, indicating a stronger increase over time in vaccinated patients after the onset of the vaccination campaign (see Table 1 & 2).

Table 1: Incidence of ICD-10-Codes related to neurological conditions [G-codes) in vaccinated patients and patients of unclear vaccination status during the 20 quarters before and the 5 quarters after onset of the vaccination campaign.

Patient group	N (Quarters)	Arithmetic mean \pm SD before and after onset of vaccination	p-values	Partial η^2
Vaccinated patients (N = 2 468 531)	20 vs. 5	527690.40 \pm 78676.58 vs. 754479.00 \pm 37551.91	≤ 0.001	0.4738
Patients with unclear vaccination status (N = 69 573 152)	20 vs. 5	17640282.70 \pm 2023709.03 vs. 21833668.00 \pm 282308.06	≤ 0.001	0.4809

Table 2: Correlations between time after onset of vaccination campaign measured in quarters and number of neurology-related treatments in vaccinated patients and patients of unclear vaccination status, correlations calculated within 20 quarters before and five after onset of vaccination.

	Vaccinated patients (N = 2 468 531)	Patients with unclear vaccination status (N = 69 573 152)
Pearson-coefficient before and after onset	0.970 vs. 0.980	0.980 vs. 0.950
p-value (2-tailed)	≤ 0.001 vs. ≤ 0.003	≤ 0.001 vs. ≤ 0.014
N (Quarters)	20 vs. 5	20 vs. 5

Discussion

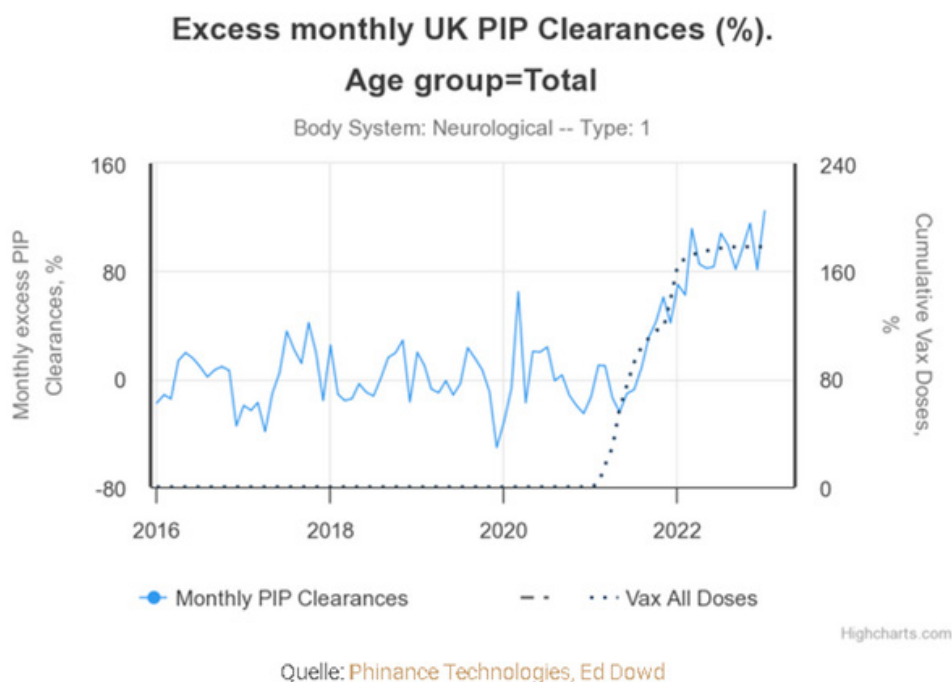


Figure 1: Excess monthly PIP clearances and possible relation to vaccine doses in the UK, taken from <https://phinancetechnologies.com/HumanityProjects/PIP%20Analysis-Systems.htm>, 8th of August, 2023.

It is understood that due to the pandemic and lockdowns, there were fewer physician visits over time, which could explain the weakening of the correlation between quartile and number of treatments in patients with unclear vaccination status [1]. However, this indicates that these patients already had a high number in neurological conditions, but these were outnumbered by the treatments of these conditions in vaccinated patients, and so far there is no obvious explanation for the stronger correlations between quarter after onset of the vaccination campaign and number of cancer treatments in vaccinated patients, except for perhaps the novel coronavirus vaccines, since both patient groups were subject to lockdowns and all their negative side-effects in Germany [4]. The findings are in line with data from the UK, which show an increase in Personal Independence Payments (PIP) that seems to be related to administered vaccine doses in the UK (see figure 1), which are disbursed to persons in need of assistance with their daily lives due to health impairments [2]. It has to be mentioned that the rise in PIP Clearances starts in 2021, the year after the first lockdowns were implemented (Figure 1).

Conclusion

There is a strong increase in treatments of neurological conditions in Germany which can only in part be attributed to lockdowns, especially since the increase is stronger in the vaccinated group. Also, there is an increase in PIP clearances which seems to

be time-related to vaccine doses administered in the UK. Further research is needed to determine whether the novel coronavirus vaccines might be a factor regarding the rise in cancers in Germany, or what other underlying factors in the vaccinated group could be involved.

Acknowledgement

None.

Conflict of Interest

The author declares no conflict of interest.

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