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Rise in Tumor-Related Treatments within the German Health-Insurance System

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Abstract

In Germany, cancers are on the rise according to health insurance providers. 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 cancer-related treatments between 2016 and 2022. Data hint to an increase in cancer-related treatments in German health insurants. Reasons for this could be missed check-up appointments due to lockdowns or other covid-related interventions.

Keywords: Cancer; Tumor; Neoplasms; Health insurance; Public Health

Introduction

Currently, there is a rise in cancer-related treatments 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. 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]. The report made by the AOK has to be viewed in a broader context. Some studies e. g. also found facemask- [2] or vaccine-related cancers [3, 4]. Further, a more extensive body of data is available for all German health insurance companies, it is provided by the KBV [5]. 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 cancer-related treatments 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 cancer-related treatments and plotting of cancer-related treatments in both patient groups over time.

Results

In both groups, cancer treatments increased significantly with $p < 0.001$ when comparing quarters before and after the onset of the vaccination campaign. When comparing graphs of both groups, it is clear that the increase is less pronounced in the group with unclear vaccination status (Table 1). When comparing correlations, the correlation between number of the quarter and number of cancer treatments is strongest in vaccinated patients after the onset of the vaccination 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 (Table 2). The stronger increase in vaccinated patients can also be seen when graphically depicting the number of cancer-related treatments in both groups over time (Figure 1).

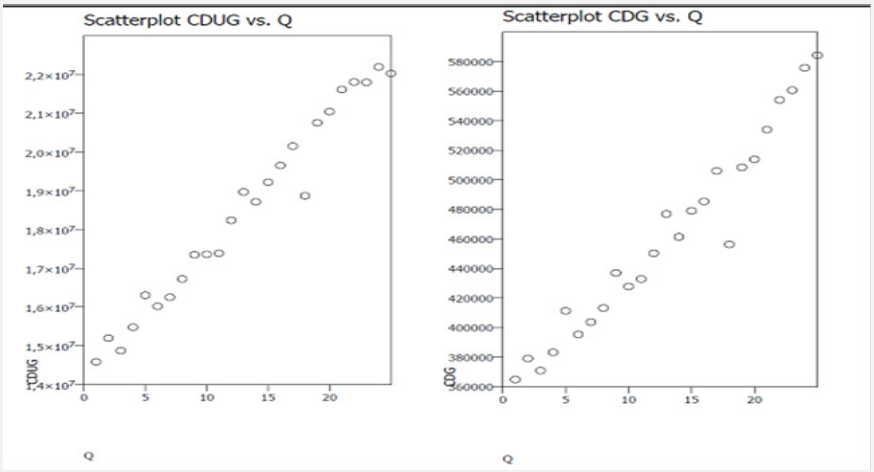

Figure 1: Increase in cancer treatments in patients with unclear vaccination status (left) and vaccinated patients (right) over the 25 quarters.

Table 1: Incidence of ICD-10-Codes related to Cancers (C- and D-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 ± SD before and after onset of vaccination	p-values	Partial η^2
Vaccinated patients (N = 2 468 531)	20 vs. 5	437809.30 ± 47380.67 vs. 561787.60 ± 19611.58	≤ 0.001	0.582
Patients with unclear vaccination status (N = 69 573 152)	20 vs. 5	17656496.10 ± 1972708.96 vs. 21886733.00 ± 225517.92	≤ 0.001	0.4912

Table 2: Correlations between time after onset of vaccination campaign measured in quarters and number of cancer-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*	Patients with unclear vaccination status**
Pearson-coefficient before and after onset	0.960 vs. 0.990	0.980 vs. 0.850
p-value (2-tailed)	≤ 0.001 vs. ≤ 0.002	≤ 0.001 vs. ≤ 0.066***
N (Quarters)	20 vs. 5	20 vs. 5

*N = 2 468 531 **N = 69 573 152 ***Tendency

Discussion

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 cancer treatments in patients with unclear vaccination status. However, 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 the mandated wearing of facemasks in Germany.

Conclusion

There is a strong increase in cancer-related treatments in Germany which can only in part be attributed to facemasks and lockdowns. 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 factors (e.g. stress due to job loss, [6]) could be involved.

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