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Overall mortality and causes of death during the COVID-19 pandemic and vaccination campaign in Germany (REVIEW)

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ABSTRACT

This analysis investigates mortality and relevant causes of death in Germany between 2019 and 2023, focusing particularly on the consequences of the SARS-CoV2 pandemic and mass vaccination campaigns.

Official, freely accessible annual statistics and government reports were used as sources to provide an overview of how the annual raw data has developed.

No `excess mortality` due to the pandemic in 2020 was detected that exceeded the level of the increase in deaths during the 2015 flu epidemic. The years following the pandemic were characterised by widespread vaccination with spike-based mRNA-vaccines and basic immunisation rates exceeding 70%. Contrary to expectations, however, overall mortality increased by 3.797% in 2021 and by a further 4.31% in 2022 compared to the previous year. This represented an increase of 8.85% and 13.54% respectively compared to the pre-pandemic year. Even though the profile of the Covid-19 disease became less dangerous in the 2021 vaccination year and in the years that followed, the number of recorded deaths from the disease rose alarmingly (to 183.74% in 2021).

The available data suggest that overall mortality increased in 2021 and 2022, although the number of recorded Covid-19 deaths began to decline as early as 2022. There was a shift in the spectrum of causes of death, with an increase in fatal cardiovascular diseases, mental illnesses, and disorders of the nervous and digestive systems, and a decrease in respiratory diseases.

Given the profound mode of action of spike-based mRNA vaccines and their considerable potential for side effects, it is reasonable to suggest that they may contribute to the multifactorial causes of increased mortality.

Keywords: SARS-CoV2-spikes, Covid-19, spike-based mRNA-vaccines, mortality, causes of death

Introduction

The Covid-19 pandemic and how to deal with it still poses a challenge. In addition to expanding our understanding of the modes of action of SARS-CoV2 spike proteins and their consequences, attention is turning to the impact of infection and vaccination on annual mortality rates and, where applicable, changes in the statistics of causes of death.

SARS-CoV2 spikes are essential viral glycoproteins that play a key role in attaching to host cells, thereby triggering subsequent reactions. The initial attachment occurs between the receptor-binding domain (RBD) of the S1 subunit of viral or vaccine spikes and the Angiotensin-Converting-Enzyme 2 (ACE2)-receptor, which is widely distributed throughout the human body. The most important physiological function of ACE2 is to break down the Renin-Angiotensin-Aldosterone System (RAAS) effector angiotensin II (Ang II) into Angiotensin 1-7 (Ang 1-7), thereby limiting the harmful properties of Ang II. However, ACE2 loses its ability to metabolise Ang II when it is downregulated by spikes. The resulting accumulation is a major cause of various SARS-CoV2-induced extrapulmonary organ dysfunctions, as well as numerous side effects of spike-based mRNA-vaccines, primarily in the cardiovascular system. These include vasoconstriction, ischaemia, sudden cardiac arrest, hypertension, increased sympathetic tone, cardiomyopathy, stroke, endothelial dysfunction, and blood clotting disorders etc. Further spike effects (cell fusion, binding to heparan sulphate, activation of Toll-like receptor 4), synergisms (increase in Des-arg9-bradykinin, catecholamines) and impairment of amino acid absorption in the intestine complement and multiply the already adverse effects of spike-induced downregulation of ACE2 on tolerability [1-3].

To date, the involvement of the nicotinic cholinergic nervous system in SARS-CoV2 pathophysiology[4] has largely been ignored, despite it being responsible for adverse reactions that are not typically associated with conventional vaccines. These reactions include changes in taste and smell, general fatigue, neuropsychiatric disorders, cognitive impairment, brain fog, memory lapses and memory loss, neuroinflammation, unusual muscle disorders, and vegetative symptoms. This also applies to disorders with a delayed onset and long-lasting effects (long-Covid; post-vaccine syndrome)[5-7]. The interaction partners are the spike RBD protein, a neurotoxin-like protein or other spike protein fragments, and various n-cholinergic receptors. These receptors' function is inhibited in competition with physiological ligands [8-12]. Synergisms with Ang II's inflammatory-immunological effects, which could have fatal consequences, are possible but would still need to be verified clinically.

Based on current knowledge, it seems highly plausible that these simplified, profound modes of action are responsible for numerous complications of Covid-19, including multi-organ failure and death, and that they can have an exacerbating effect in patients with pre-existing morbidity. Similar, and sometimes serious, symptoms were expected from the start of the vaccination campaign since the spike S1 subunit was chosen as the antigen for developing spike-based mRNA-vaccines.

This analysis aims to establish whether the SARS-CoV2 pandemic resulted in a significant increase in total annual mortality, also known as 'excess mortality', in Germany, and/or if there were changes in the recorded causes of death.

However, there is no generally accepted definition of 'excess mortality', either absolute or relative, with which to quantify this. Assessment is subjective and depends on many factors, such as the definition of connection with or causation by Covid-19, the comparison period, comparison with other pandemics, consideration of longer-term mortality trends, observed vs. expected calculations, changes due to virus mutations, regional differences, implementation of preventive measures, age dependence, ethnic origin, comorbidity, natural causes of death, cause of death coding, payment of death certificates, public perception etc. Complicated statistical calculations that suggest accuracy but do not take all possible influences into account do not reflect reality. For this reason, the following information refers to adjusted statistical data on annual overall mortality in Germany, which is publicly available. These figures largely correspond to the number of SARS-CoV2-related deaths recorded by the Robert Koch Institute (RKI)[13].

Unlike information about deaths resulting from the virus, there is very little reliable information about deaths related to mRNA-vaccines. The official, updated statistics on causes of death in Germany do not include a category for vaccine-related deaths. Inconsistent information can be found in the safety reports of the Paul Ehrlich Institute (PEI)[15, 16]. The European Medicines Agency's (EMA) pharmacovigilance database, EudraVigilance, lists deaths and fatal side effects reported from European countries, but not specifically from Germany.

As spontaneous reports are subject to various influences that can lead to under-reporting and there is a lack of evidence from large-scale, comparative clinical trials, it is only possible to speculate about the extent of vaccine-related deaths.

Methods

This analysis is based on adjusted data from official, freely accessible annual statistics and government reports [13-18, 20, 21, 28, 29]. The empirically obtained data were presented in tabular form using descriptive statistics.

As there is no universally accepted definition of `excess mortality`, influencing factors are often not considered, the reference period is set arbitrarily and assessments are subjective, such results are generally questionable. The following analysis therefore refers exclusively to adjusted, empirically obtained raw data on annual overall mortality, as well as statistics on causes of death. Official reports, current scientific literature and the authors' own analyses from previous years were used as a basis for discussion.

Results

Following a period of relative low between 2000 and 2005, with an annual overall mortality rate of 10.1–10.2 per 1,000 inhabitants, this figure increased in Germany until 2022, reaching 12.7 per 1,000 inhabitants (an increase to approximately 125%)[18]. This trend was similar to, but more pronounced than, the increase observed between 1950 and 1970/75, when the rate rose from 10.9 to 12.6 per 1,000 inhabitants (an increase to approximately 116%). This period included the Hong Kong flu years 1968–70.

The 2015 flu season was characterised by moderate influenza activity, with 1.069–1.126% of the population affected. This corresponded to an increase of 56,844 deaths compared to the previous year, leading to a significant increase of 5.33%. This occurred despite a vaccination rate of 28–48% in the particularly vulnerable over-60 age group [17].

MORTALITY IN THE COVID-19 PANDEMIC YEAR 2020

In 2020, the year of the Covid-19 pandemic, the number of deaths (relative to the total population) rose by 4.867% compared to the previous year, in 2021, the year of vaccination, by 3.797%, and in 2022 by 4.31% (see Table 1).

Over the course of 2020 as a whole (according to Fig. 3 in [19]), significantly more people over the age of 60 were affected (weekly maximum of approx. 5,500 vs. approx. 175 for those under 60).

During the pandemic in 2020, a total of 985,572 people (4.867% of the population) died, which was an increase of 46,052 compared to 2019 (see Table 1). It should be noted that 2019 was a year of particularly low mortality, with 15,354 fewer deaths than in the previous flu year, 2018.

For the first time, 38,510 deaths of people who tested positive for SARS-CoV2 were recorded, corresponding to 0.0463% of the population.

Already in the pandemic year 2020, there was an increase in deaths due to cardiovascular diseases (6,790 cases), mental illnesses (1,774 cases) and diseases of the nervous system and gastrointestinal tract (see Table 3).

Table 1: Total mortality and deaths from Covid-19 between 2019 and 2023 in Germany

year	population	total deaths/year n_{total} % population *% diff. from previous year* % diff. from 2019	difference in deaths from previous year n_{total}	confirmed Covid-19 deaths/year n_{total} % population % total deaths *% change from previous year* % change from 2020	difference in Covid-19 deaths from previous year n_{total}
2019	83,170,000	939,520 1.13 *- 1.74*	- 15,354	-	-
2020	83,160,000	985,572 1.185 *+ 4.867* + 4.867	+ 46,052	38,510 0.0463 3.907 *100*	+ 38,510
2021	83,240,000	1,023,687 1.23 *+ 3.797* + 8.85	+ 38,115	70,759 0.0850 6.912 *183.74* 183.74	+ 32,249
2022	83,120,000	1,066,341 1.283 *+ 4.31* + 13.54	+ 42,654	52,029 0.0626 4.879 *73.53* 135.11	- 18,730
2023	83,460,000	1,028,206 1.232 *- 3.975* + 9.027	- 38,135	25,679 0.0308 2.497 *49.355* 66.68	- 26,350

Note: all figures are whole numbers/year, decimal numbers or percentages. n_{total} *= total number of cases; sources pl. see references 14, 21.*

In contrast, during the pandemic year (2020), deaths from symptomatically similar fatal respiratory diseases fell by 5,673 and deaths from influenza/pneumonia fell by a total of 2,967 (see Table 2).

Table 2: Deaths due to respiratory diseases, influenza and pneumonia between 2019 and 2023 in Germany

year	deaths due to respiratory diseases / year	difference from previous year	deaths due to influenza / year	difference from previous year	deaths due to pneumonia	difference from previous year
2019	67,021		1,659		18,514	
2020	61,348	- 5,673	1,307	- 352	15,899	-2,615
2021	57,316	- 4,032	38	- 1,269	14,099	-1,800
2022	67,633	+ 10,317	1,741	+1,703	16,757	+2,658
2023	72,502	+ 4,869	1,267	- 474	19,656	+2,899

Note: all values are whole numbers/year; source pl. see reference 14.

MORTALITY IN THE FIRST AND SECOND YEAR OF VACCINATION

In 2021, the first year of mRNA-vaccination, the total mortality rose to 1,023,687 (1.23% of the population, or 8.85% more than in 2019), including 70,759 Covid-19 deaths (32,249 more than in the pandemic year 2020). At the same time, the reduction in deaths from respiratory diseases, influenza and pneumonia continued (4,032 and 3,069 fewer overall than in the pandemic year). The number of influenza deaths fell particularly dramatically to just 38.

The number of deaths from coronavirus among people over 60 followed a seasonal pattern, with weekly peaks of around 5,500 falling to around 1,000 in calendar week 20, then rising to around 2,500 from calendar week 40 onwards. For those under 60, the numbers remained much lower from the start of the vaccination programme (approximately 80 in calendar week 22 rising to approximately 225 by the end of the vaccination year, according to Fig. 3 in[19]).

In 2022, the second year of vaccination with a basic immunisation rate of approximately 76.5% of the population[29], the total number of deaths continued to rise, reaching 1,066,341 (1.283% of the population, or 13.54% compared to 2019), despite the fact that the number of deaths from Covid-19 was already in decline (by 18,730). This decline continued in 2023, with a further decrease of 26,350 to 25,679.

The weekly number of coronavirus deaths among people aged 60 and over ranged between approximately 300 and 1,800, while among people aged under 60 it ranged between approximately 15 and 85, with a maximum of 150 (according to Fig. 3 in[19]). The seasonal pattern was lost.

Conversely, the number of deaths from respiratory diseases increased dramatically by 10,317. This trend continued in 2023 (see Table 2), suggesting that the number of deaths from respiratory diseases and from the novel coronavirus (SARS-CoV2) are developing in opposite directions, at least in part.

The number of deaths from cardiovascular disease rose sharply in the second year of vaccination 2022 compared to 2021 (+17,600), as did the number of deaths from mental disorders (+8,787) and those from disorders of the nervous or gastrointestinal system (+3,502 and +2, 320).

Among the registered causes of death, hypertension achieved the highest increase in 2022, with a total of 9,046 more deaths than in the pre-pandemic year 2019 (see Table 4).

Table 3: Deaths between 2019 and 2023 in Germany due to cardiovascular disease, malignant neoplasms, mental illness (excluding alcohol or drug addiction), and diseases of the nervous and gastrointestinal systems

year	deaths due to cardiovascular disease / year	deaths due to malignant neoplasms /year	deaths due to mental illness/year	deaths due to diseases of the nervous system / year	deaths due to diseases of the gastrointestinal system/year
2019	331,211	231,318	57,839	34,225	41,421
2020	338,001	231,271	59,613	35,430	42,507
2021	340,619	229,068	59,990	35,778	43,717
2022	358,219	231,533	68,777	39,280	46,037
2023	348,312	230,292	69,445	39,225	45,676

Note: all values are whole numbers/year; source pl. see reference 14

Table 4: Cardiovascular mortality between 2019 and 2023 in Germany

year	deaths due to cardiovascular disease / year	subgroup of deaths due to ischaemic heart disease / year	subgroup of deaths due to hypertension / year	subgroup of deaths due to myocardial infarction /year
2019	331,211	119,082	43,277	44,282
2020	338,001	121,462	47,900	44,529
2021	340,619	121,172	48,861	45,181
2022	358,219	125,984	52,323	46,608
2023	348,312	119,795	50,778	43,839

Note: all values are whole numbers/year; source pl. see reference 14

Between 2019 and 2023, there was no significant change in the total number of deaths from malignant neoplasms (see Table 3). However, long-term changes and shifts within the spectrum cannot be ruled out, and further observation and targeted analysis are required.

Total mortality did not decrease until 2023, when it fell by 3.975% compared to the previous year (based on population figures), following a significant reduction in Covid-19 deaths in 2022. Compared to the pre-pandemic year of 2019, total mortality in 2023 was still 9.027% higher (see Table 1).

COMPARISON OF SUSPECTED VACCINE SIDE EFFECTS AND FATALITIES

Until recently, it was not possible to make any reference to the tolerability of conventional vaccines due to a lack of relevant data. However, since September 2024, this data has been available and enables an initial comparison with the tolerability of the SARS-CoV2 vaccines (see Table 5) over a sufficiently long period of time, with a sufficient number of vaccine doses administered.

Table 5: Comparison of suspected vaccine side effects and fatalities in Germany

	Total number of people affected by side effects	Side effects with fatal outcome	Number of vaccine doses
All those affected by **non-Covid-19 vaccine** side effects between 1 January 2022 and 31 December 2023 [28]	**8,659** (at least 0.008% of those vaccinated) with a total of 26,845 side effects **11.9** of people affected by side effects/day	**74** (0 causal) **0.1/day**	>105,000,000
All those affected by side effects of **Covid-19 vaccines** until 31 March 2023 [15]	**340,282** (at least 0.18% of those vaccinated) with a total of 942,298 side effects **415** of people affected by side effects/day (approximately **35 times** compared to non-COVID-19 vaccines)	**3,315** (127 causal) **4.04/day** (approximately **40 times** compared to non-COVID-19 vaccines)	192,208,062

Note: all figures are whole numbers, decimal numbers or percentages; sources pl. see references 15, 28

Discussion

The increase in the number of deaths during the Covid-19 pandemic in 2020, which was not influenced by SARS-CoV2-vaccination, was lower than that of the 2015 flu season (4.867% vs. 5.33%) with a partially immunised population. This increase is embedded in a slow upward trend in absolute death figures since 2005, analogous to the increase in death rates between 1950 and 1970/75. There were 7,542 more annual deaths than were caused by the pandemic in 2020. This supports the conclusion that the pandemic's impact on mortality was no greater than that of a moderate influenza epidemic in a partially immunised population. This is consistent with the characterisation of SARS-CoV2 as predominantly causing mild-to-moderate respiratory infections with an infection fatality rate (IFR) of less than 0.5% [33-35].

The low incidence of fatalities and the decreasing risk posed by developing virus mutants over the course of the epidemic were generally doubted. On the other hand, uncritical attention was paid to those propagating the idea of `excess mortality`. However, proponents of 'excess mortality' often use raw data of limited informative value in statistical model calculations and estimates[20], thereby reducing the relevance of the results. The extraordinary reporting requirement for patients with positive SARS-CoV2 pathogen findings and for patients with asymptomatic disease, in contrast to respiratory diseases, for which there is no such reporting requirement, has led to an increase in case numbers and distorted ratios that cannot be corrected retrospectively. As a result, the subset of the number of symptomatic individuals and fatalities due to SARS-CoV2 infection remains unclear. This significantly limits the reliability of the figures on which these statements are based.

Although the extreme prioritisation of the perceived threat posed by the virus, driven by numerous incentives and motivational impulses, and the rapid increase in testing using the inadequately verified PCR technique, probably resulted in many deceased individuals being wrongly classified as '+PCR Covid-19 deaths', the total number of deaths attributed to the virus in 2020 remained comparatively low (n = 38,510).

It is noteworthy that an increase in cardiovascular deaths (6,790 cases) and deaths caused by mental health issues (1,774 cases) was already recorded in the pandemic year 2020. In contrast, fatal respiratory diseases decreased by 5,673 deaths and deaths from influenza/pneumonia decreased by a total of 2,967.

CONSEQUENCES OF THE SARS-COV2-VACCINATION

The mass vaccinations began on 27 December 2020 in Germany. Despite official promises and the expectations they fuelled, the precisely executed mass vaccination campaign - which achieved a basic immunisation rate of around 71% of the population[29] in 2021 - and the continuation of measures to contain the epidemic that began in March 2020 did not lead to a decline in infections or deaths. Within just a few weeks of the start of vaccination, the increase in the number of infected and deceased individuals, as well as numerous reports of sudden deaths, became public[22].

By calendar week 20 of the 2021 vaccination year, the 'infection figures' (including +PCR laboratory findings) were already several times higher than in the previous year, when there was no vaccination. Of particular concern was the finding that, within 81 days (up to 18 March 2021), the number of deaths 'from/with' Covid-19 increased to 44,006 (accounting for around 59% of all deaths from the disease up to that point)[23]. No plausible explanation for these paradoxical findings was provided. Discussions about the vaccine's ineffectiveness were suppressed. The total mortality rate rose to 1,023,687 (1.23% of the population, or 8.85% more than in 2019), including 70,759 Covid-19 deaths (32,249 more than in the pandemic year 2020).

Although the first reports of positive tests and/or cases of Covid-19 after vaccination emerged on 8 January 2021, it took approximately seven months for the term 'vaccine breakthroughs' to appear for the first time. Suddenly, 6,125 breakthrough infections after vaccination became known (RKI weekly report of 21 July 2021). The definition of 'probable' breakthrough infections (SARS-CoV2 infection with clinical symptoms, diagnosed by +PCR or pathogen isolation and observed at least two weeks after complete vaccination) kept the number significantly lower than the rising number of infections (all +PCR cases, regardless of symptoms)[24].

The number of vaccine breakthroughs and their fatal outcomes (0.55–0.88% of those vaccinated in calendar weeks 37 and 44 of 2021) did not trigger a change in the assessment of vaccine efficacy or the calculation of its benefits and risks. However, the fluctuations in efficacy inherent in spike-inducing vaccines, as well as potentially insufficient primary efficacy, would have warranted a targeted re-evaluation. To date, even the explicit references in the approval documents to a possible worsening of Covid-19 disease due to VAED/VAERD ('vaccine-associated enhanced disease', 'vaccine-associated enhanced respiratory disease') have not been clarified. Despite many unanswered questions about the pathomechanism of VAED, it is known that not only the respiratory tract can be affected, but also the cardiovascular system, including cardiogenic shock, the immune system, the haematopoietic system, the kidneys, the gastrointestinal system, the CNS, etc., with fatal outcomes implicit. These symptoms thus correspond to the disproportionately broad spectrum of side effects of spike-based vaccines.

As already mentioned, the number of deaths from Covid-19 rose to an incredible 184% in the 2021 vaccination year (from 38,510 to 70,759), a concrete indication of the existence of a vaccine-induced VAED.

In 2022, the second year of vaccination with a basic immunisation rate of approximately 76.5% of the population[29], the total number of deaths continued to rise to 1,066,341 (1.283% of the population, or 13.54% compared to 2019) despite already declining numbers of Covid-19 deaths (by 18,730), a decline that continued in 2023.

Perez also observed an increase in mortality in 31 European countries in 2022 that could not be attributed to a heatwave. A significant correlation (53%) was found between SARS-CoV2-vaccination rates and mortality[30]. Hegarty confirmed this positive correlation for the period since April 2022 for 28 European countries, and for a large number of non-European countries somewhat later (2024)[31,32].

The absolute increase in deaths from cardiovascular disease between 2019 and 2022 (+27,008), particularly in the categories of hypertension (+9,046), ischaemic heart disease (+6,902) and myocardial infarction (+2,326), the increase in deaths from mental disorders (+10,938), disorders of the nervous system (+5,055) and disorders of the gastrointestinal system (+4,616) is striking (see Tables 3 and 4) and coincides with the peak in overall mortality in 2022 (4.31% higher than in the previous year, at 1.283% of the population, or 13.54% higher than in 2019). While the increase was already pronounced in the pandemic year, there was a sharp rise in the second year of vaccination.

Unlike conventional vaccines, which have mostly local and manageable side effects, spike-based mRNA-vaccines affect almost all organs and organ systems due to their profound mode of action[3, 6]. As no other specific causes are known, the properties of these spike-based mRNA-vaccines, along with their continued widespread use and basic vaccination rate of over 76.5%, must be considered when investigating the reasons for the increase in mortality and changes in the causes of death.

Cardiovascular diseases are the most common cause of death in Germany, accounting for 33.3–35.3% of all deaths, and therefore play a significant role in overall mortality. This is why they should be examined in more detail. In June 2021, specific indications of the potential harmfulness of spike-inducing vaccines to the cardiovascular system emerged from an analysis of the extensive EudraVigilance database of side effects, which is maintained by the European Medicines Agency (EMA)[25]. A subsequent analysis, conducted until 31 July 2023, found that 2,256,505 individuals from European countries had reported adverse reactions to the available vaccines[26]. In 51,740 cases (2.29%), these reactions were fatal.

The following cardiovascular side effects have been reported:

- 56,611 cases of tachycardia, arrhythmia, atrial flutter/fibrillation, bradyarrhythmia (0.35-2.68% fatal)
- 32,358 cases of chest pain (0.62% fatal)

- 27,123 cases of palpitations (0.07% fatal)
- 25,907 reports of increased blood pressure/ hypertension (0.44% fatal)
- 23,775 cases of myo-/pericarditis (1.14% fatal)
- 9,912 cases of coronary ischaemia and myocardial infarction (4.5-21.36% fatal)
- 8,799 cases of hypotension (1.64% fatal)
- 6,496 cases of heart failure (14.61% fatal)
- 5,424 cases of cardiac arrest, sudden cardiac death and death (86% fatal)
- 3,094 cases of extrasystoles (0.13% fatal)
- 1,986 cases of circulatory collapse, shock (10.44% fatal)
- 1,753 cases of ventricular fibrillation or flutter (5.19% fatal)
- 1,119 cases of cardiomyopathy (9.65% fatal)
- 827 cases of impaired impulse formation and conduction (4.59% fatal)
- 325 cases of multiple organ dysfunction or failure (61.85% fatal).

It was impossible to refer to the total number of people vaccinated with spike-based mRNA vaccines because this data was not recorded.

The comparatively high number of unusual and sometimes serious cardiovascular side effects associated with the vaccine should have raised a red flag. But this did not happen. The well-founded, class-specific mode of action of spike-based mRNA-vaccines - spike/ACE2 interaction with RAAS dysregulation and increased angiotensin II, spike-specific effects, synergisms as well as interactions with the cholinergic nervous system [3, 8, 9, 12, 22, 23] - was essentially excluded from the causality assessment. Consequently, the pharmacovigilance authorities were unable to classify the variety of side effects in order to draw relevant conclusions.

No appropriate information was provided on the wide range of harmful effects of angiotensin II, which can trigger vasoconstriction, ischaemia, inflammation, blood coagulation, arteriosclerosis, and fibrotic, proliferative, and immunological effects. Therefore, it is astonishing that typical side effects corresponding to the mode of action have been reported despite the widespread ignorance of the mode of action of these spike-based vaccines and the blind faith in the officially propagated myth of a safe and effective vaccine. These side effects include hypertension, coronary ischaemia, myocardial infarction, sudden cardiac death, arrhythmias, heart failure, thromboembolism and strokes etc. Of particular concern are the 5,424 cases of cardiac arrest and sudden cardiac death.

Between 2021 and 2024, the German pharmacovigilance authority responsible, the Paul Ehrlich Institute (PEI), recorded a maximum cumulative total of 3,086 to 3,315 fatal side effects, equating to approximately 1%, compared to 2.29% for the European authority. Through restrictive causality assessment, this figure was reduced to a maximum of 0.0373% (127 cases in 2023) and then to 0.0211% (74 cases in 2024). Approximately two years after the last final safety report in March 2023, deaths without side effects (n = 1,133) were mentioned for the first time without any comment[15, 16].

With few exceptions, there are no explanations of the causes of death. Autopsies, which could have provided relevant information, were not performed. This extremely low side-effect lethality appears neither plausible nor representative.

Until recently, it was not possible to assess the tolerability of conventional vaccines due to a lack of relevant data. However, since September 2024, this data has been available, allowing an initial comparison with the tolerability of the SARS-CoV2 vaccines (see Table 5) over a sufficiently long period of time, with a sufficient number of doses administered.

In terms of the frequency of side effects reported, these were reported 22.5 times more frequently after receiving a dose of a vaccine for the SARS-CoV2 virus (0.18%) than after receiving any of the conventional vaccines (0.008%). Converted to a reporting frequency per day, the difference was approximately 35 times higher. The frequency of side effects with fatal outcomes after receiving a vaccine for a non-Covid-19 disease was approximately 40 times lower than after receiving a vaccine for a Covid-19 disease.

Thus, the significantly poorer tolerability of the mRNA-vaccines used in Germany, as well as the high number of deaths associated with vaccination, were confirmed by comparison with data from a representative population that received conventional vaccines.

Conclusion

The assessment of epidemic/pandemic events should take into account existing trends in annual overall mortality, as well as emerging quantitative shifts in the spectrum of causes of death (e.g. decline in fatal respiratory diseases, increase in cardiovascular deaths, deaths related to mental disorders or diseases of the nervous system or gastrointestinal tract). For example, in Germany, the annual changes in deaths due to respiratory diseases and SARS-CoV2 virus infections developed in opposite directions, a fact that must be taken into account when assessing SARS-CoV2-associated mortality.

In any case, during the 2020 pandemic year, there was no evidence in Germany that the anticipated 'excess mortality' due to SARS-CoV2 infection had materialised. The number of deaths was lower than during the mild flu epidemic in 2015, when the population was partially immunised.

In the years following the pandemic year of 2020, mass vaccination with mRNA-vaccines was commonplace, with basic immunisation rates of over 76.5%. Contrary to expectations, however, overall mortality not only failed to decline, but increased by 3.797% in 2021 and a further 4.31% in 2022 compared to the previous year, and by 8.85% and 13.54% respectively compared to the pre-pandemic year. There was also a shift in the causes of death spectrum, with fatal cardiovascular diseases, mental illnesses, and disorders of the nervous

and digestive systems increasing, while respiratory diseases declined. The number of registered deaths from Covid-19 increased alarmingly (to 183.74% in 2021), which was a paradoxical outcome. No evidence could be found for fictitious constructs such as 'saving lives' or 'avoiding deaths' through mRNA-vaccines.

Although the profile of the disease became less dangerous in the 2021 vaccination year and in subsequent years, despite an increase in laboratory-confirmed cases, and although SARS-CoV2 virus variants could not be used as a possible explanation, because they are generally less dangerous, the novel mRNA-vaccines were not considered to be the cause of the increase in overall mortality. The suspicion of the presence of VAED/VAERD ('vaccine-associated enhanced disease', 'vaccine-associated enhanced respiratory disease') was also not investigated.

However, as no other specific causes are currently known, the widely used spike-based mRNA-vaccines must be included in any explanation for increased mortality and changes in causes of death due to their profound mode of action and comparatively poor tolerability.

Although these vaccines' class-specific mode of action provides a plausible explanation for the increase in cardiovascular deaths, the rise in fatal mental health conditions remains unexplained and requires further research.

Conflicts of Interest Statement:

The author has no conflicts of interest to declare.

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