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COVID-19 and excess mortality: Was it possible to lower the number of deaths in Slovenia?

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Abstract

This paper presents new data on the age structure of hospitalised SARI (severe acute respiratory infection) patients, with or without COVID-19, broken down by gender, place of infection, and region. The leading hypothesis that COVID-19 deaths are overestimated despite the high share of excess deaths was confirmed, bringing to light the important issue of the demographic breakdown of the population at risk. Thus, the main reason for the decreasing number of COVID-19 deaths is to be sought within the exhausted demographic pool of the elderly population in 2020, when the mortality rate was 19% higher compared to the previous five-year period (2015–2019). Demographic disparities across regions are immense and statistically explain the differences in the "infected versus deceased" ratio. The excess mortality in 2020 was unusually high, but the projected value for 2020 based on the mortality pattern across age groups from 2015 to 2019 contributed up to one-third of the surplus. So, for one-quarter of alleged COVID-19 deaths (roughly 600 out of some 3,300 in 2020), death was expected to take place in 2020 anyway.

KEYWORDS

COVID-19 deaths, excess mortality, age structure, elderly, population projections

1 INTRODUCTION

In the ongoing research into the effects of COVID-19 prevention measures from early 2020, as part of the research programme of the Institute for Ethnic Studies in Ljubljana (Slovenia), we found startling evidence of a changing pattern in the mortality distribution across regions and age groups in Italy (Josipovič 2020a). At that time, the comparison between Italy and Slovenia contributed little towards understanding the nature of the spread of SARS-CoV-2, but it sparked the need for a thorough examination of mortality rates.

The numbers of COVID-19 infections and deaths in Slovenia were exceptionally low in the so-called first wave (late winter/spring 2020), but the government's managed imposition of anti-corona measures was harsh and immediate, resulting in a complete lockdown. The second wave (late autumn/winter 2020) added new evidence to the multitudes of existing data, including the first publishing of preliminary data by the national statistical offices (Statistical Office of the Republic of Slovenia [SiStat] 2021). That allowed for new and more accurate national analyses and international comparisons that were previously unfeasible due to a lack of data, varying methodology on data collecting, and a significant delay in its publishing.

1.1 BROKEN GEOGRAPHICAL SEQUENCE IN THE SPREAD OF COVID-19

One such a comparison between Italy, Austria, Slovenia, and Croatia showed a specific pattern in the spread of SARS-CoV-2 infections and the disease. This formed a sequence of the spread that was not clearly apparent after the first wave (Josipovič 2020b): Italy and Austria faced earlier outbreaks that then spread to Slovenia and Croatia, causing a delayed development in the course of the infection (Josipovič 2020b), although both delays developed different patterns of secondary spread.

Though Austria and Italy both had their own focal areas in the early outbreak (Tyrol ski resort in Austria and Bergamo in Italy), there was little available evidence that could help link these two focal points. Moreover, as further research found traces of the virus in sewage water (Thomas 2020; Black et al. 2021), it appears that the first wave of infections in Europe started independently of that in Asia (China), either almost simultaneously or even earlier. To establish the link between the early spread in Wuhan in December 2019 and the origin of the SARS-CoV-2 coronavirus, an international team of researchers embarked on a thorough investigation.

Another important factor in the changing patterns of the spread of COVID-19 is uneven vaccination among populations. As of March 2021, many states like Japan, South Africa, and New Zealand had not started with wholesale vaccination campaigns, while many European countries short-sightedly teamed up to get the vaccine before other countries, to the extent that the vaccine wasn't always available. Uneven access to vaccines has resulted in significantly differing percentages of vaccinated people across countries, including in Southeast Europe. This is another burning problem as the emergence of new coronavirus strains complicates the target of vaccinating 60–70% of the population to achieve herd immunity (Randolph and Barreiro 2020). This high threshold is sometimes questioned, considering that the influenza vaccine is only

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given to the elderly population (65+) and to those with a compromised immune system, not to the whole population (National Institute for Public Health [NIJZ] 2021). Given the increasing number of strains, the reliability of the approved vaccines has also come into question (Acuña-Zegarra et al. 2021). Calls for the continued application of preventive measures such as wearing masks in closed spaces where air conditioning and distancing is not sufficient are no surprise, as these measures have proven highly effective and cost-efficient while we wait for reliable drugs and vaccines to be invented and sufficiently tested (Ju, Boisvert and Zuo 2021). We should not neglect the mounting evidence on the possible severity of COVID-19[1] and the recurring events even among the young that are different to that of influenza, but there is a lack evidence and attributive medical data on people with or without a severe course of the disease.

1.2 HOW TO PROCEED WITH THE ANALYSIS AND WHICH DATA TO INCLUDE

Analyses in various countries show hugely different ratios between the number of hospitalised and severely ill patients on one hand and the number of infected on the other. In addition to various methods of testing and their questioned reliability (rapid tests, RT-PCR tests), there is little room for consistent cross-country comparisons of reliable data. In Slovenia, for example, a positive result from a rapid test needs to be verified with a PCR test. From the beginning of testing with PCR tests, the certified procedure was carried out by 40 amplification cycles (Teršek 2021: 18). But, as claimed by the group of experts challenging the Corman et al. report from April 2020, an RT-PCR (Reverse transcription polymerase chain reaction) procedure may render a significantly higher number of falsely positive results if the number of cycles is higher than 25–30 cycles, or 28 specifically (Borger et al. 2021). Such a discrepancy seriously affects estimates of coronavirus mortality for two main reasons. First, it widens the pool of infected people without COVID-19 symptoms (asymptomatic infections) or with only a few symptoms (oligosymptomatic infections) and thus lowers the fatality of COVID-19 (Wernhart, Förster and Weihe 2020). Second, with such a misleading increase in the supposedly infected population, presumptions of overall immunity as a result of the falsely overestimated spread of unreported and self-cured infections contributes to incorrect presumptions about the severity of the pandemic.

Closely related to the above issue is the unresolved question regarding the effect of vaccination in reducing deaths from the disease. Since many countries introduced wholesale vaccination programmes very soon after the adoption of the first internationally certified vaccines and upon the first deliveries of the vaccine itself, one would assume that vaccination has a direct impact on both the number of infected and the number of deaths (Wintachaia and Prathomb 2021). As the data for Slovenia show, the number of infected remained high despite the increasing share of vaccinated people. While 30-

[1] According to Miša Pfeifer of University Clinical Centre in Ljubljana, some 80% of people infected with SARS-CoV-2 have mild symptoms, with 15% experiencing a difficult course of the disease and 5% having severe symptoms including cytokine storms, which can be instigated by a number of other infections like influenza, pneumonia, and sepsis (Tang et al. 2020).

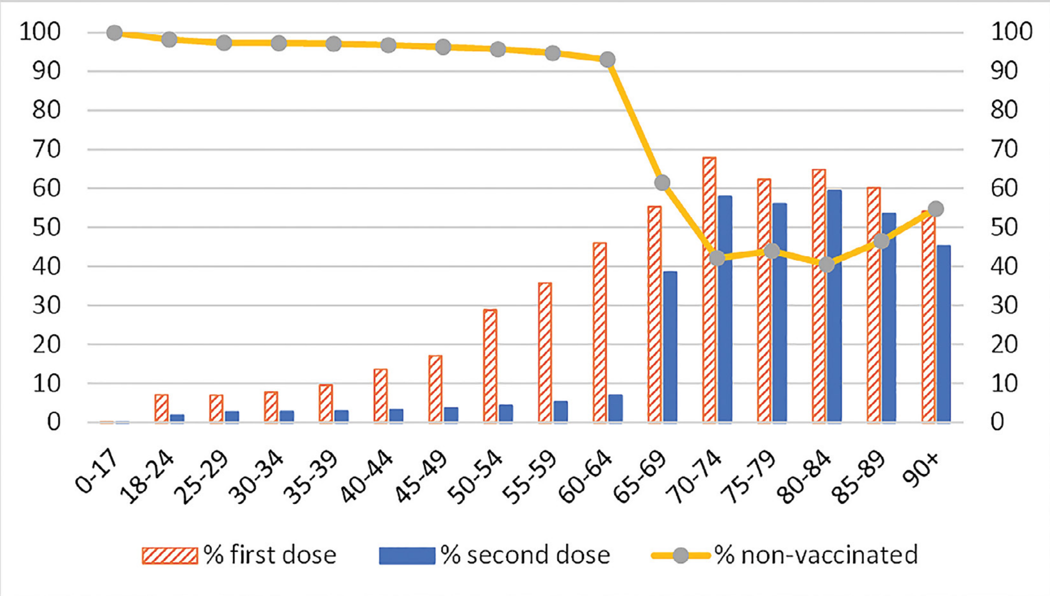

Figure 1. Vaccination by age group in Slovenia, May 13, 2021 (Source: NIJZ 2021)

70% of those in the 50+ age-group had received only the first dose of the vaccine, a much higher percentage of those 70 and over had received the second dose, which was presumably protecting the elderly from both infection and more severe courses of COVID-19 (Figure 1).

The vaccination drive officially started on 27 December 2020, and by the end of January some 20% of the 80+ age group had received their first dose, which de-

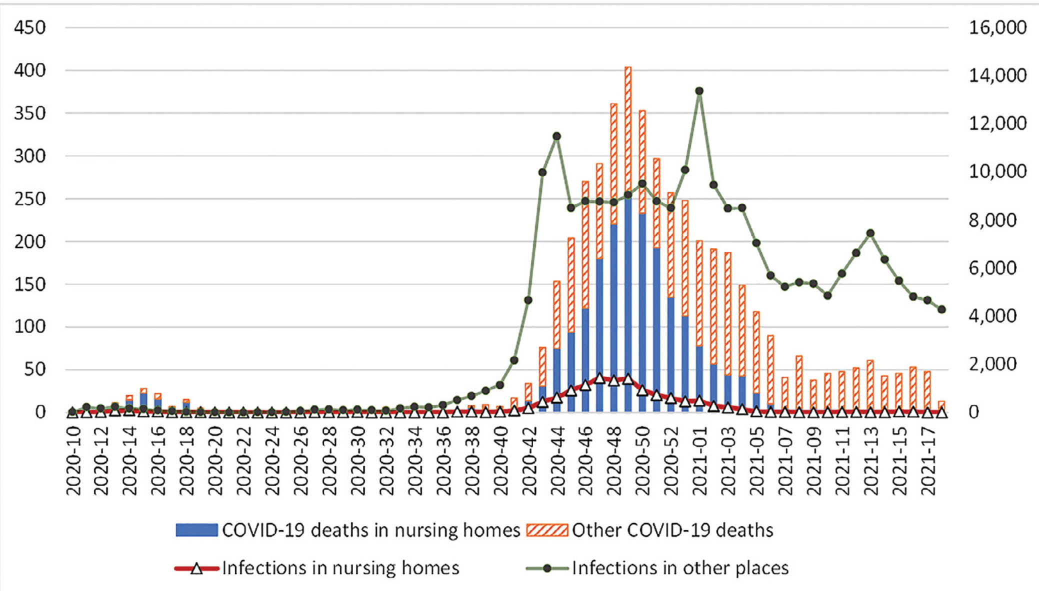

Figure 2. Infections with SARS-CoV-2 and COVID-19 deaths in Slovenia (Source: NIJZ 2021)

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Table 1. Strengths and weaknesses according to type of COVID-19-related quantitative data

Type of data	Strengths (+)	Weaknesses (–)
Number of infections (national certified lab reports to NIJZ)	Real-time publication	Unstable, dependent on PCR cycles
Number of SARI hospitalisations (hospitals report to NIJZ)	Robust, stable	Problems with SARI categorisations, triage, in-house contagiousness, varying protocols for the use of respirators according to hospital, less control over data quality
Number of people hospitalised in intensive care units (ICU) (hospitals report to NIJZ)	Complementary, Categorial to SARI, additional insight into the ratio among the hospitalised	Dates on relocations, inability to categorise the severity of the course of COVID-19, factors affecting the protocols for transferring patients to ICU across hospitals, regions, and countries
Number of COVID-19-related deaths (hospitals report to NIJZ)	Robust, stable	Provisional and preliminary data, the cause of death may vary (w/wo COVID-19; COVID-19-assisted etc.)
Statistics on COVID-19 deaths (NIJZ reports to SiStat)	Statistically significant	Late publication of the official data

pending on the type of vaccine ought to partially protect the most vulnerable against serious courses of the disease. Comparing the data on infections and deaths with the vaccination data showed a rapid decline in the number of deaths from week seven of 2021 on, with the number of infections falling as well. Thus, the straightforward conclusion that vaccinations overwhelmingly contributed to that decline is without sufficient grounds. The share of vaccinated people in the 80+ age-group in week 7 of 2021 was 28% with the first dose, while some 15% had also received the second dose (NIJZ 2021). Speaking of infections, an extraordinary spike appeared in the first week after the new year, but without a significant effect on the number of deceased. This could perhaps be explained by the brief relaxation of restrictions on interregional travel for the purposes of visiting relatives. However, this spike did not produce an additional mid-term rise in the number of infected (Figure 2).

2 AIMS OF THE RESEARCH AND DATA SOURCES

The main research question was how to analyse the rapid spread of COVID-19 and how to establish a valid interpretative framework for so-called excess mortality. To answer the leading research question, we first had to resolve the problem of reliable statistics in order to derive suitable indices. We therefore summarised the main data sources on SARS-CoV-2 and COVID-19-related deaths (Table 1).

2.1 THE RELATION BETWEEN SARI PATIENTS AND CONFIRMED SARS-COV-2 PATIENTS IN 2020

In the first half of October 2020 in Slovenia, the ratio of those who were positive among all people tested for SARS-CoV-2 peaked at 8%, while the same ratio soared to 30% confirmed positive at the end of October. To better understand the highly fluctuating data on infections, we

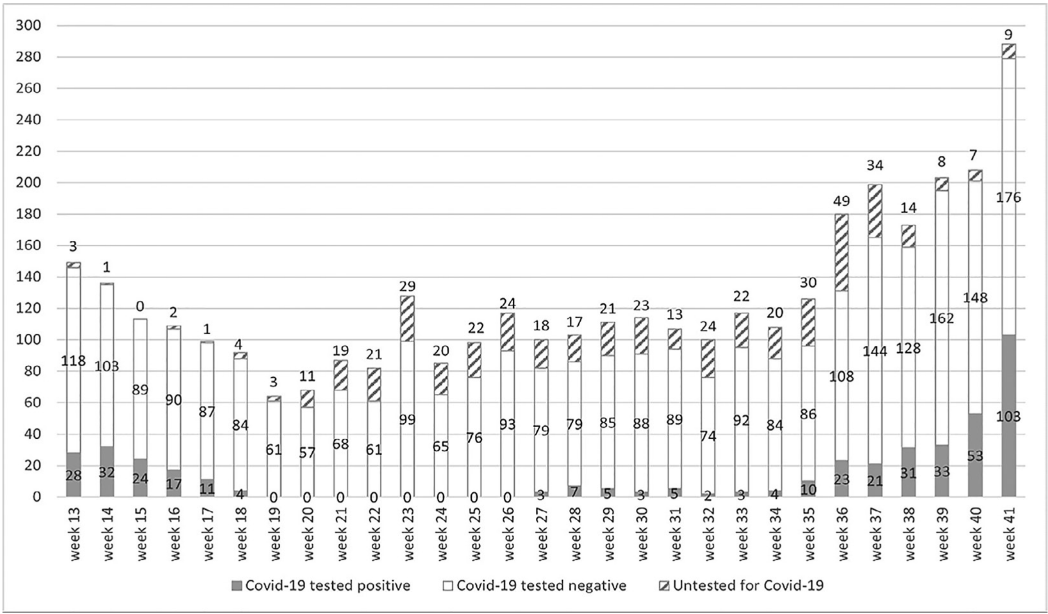

Figure 3. The breakdown of SARI cases in relation to SARS-CoV-2 positive cases in 2020 in Slovenia (Source: NIJZ)

looked at the data regarding hospitalised SARI patients (cf. table 1). These patients are hospitalised for severe acute respiratory infections and should not be confused with patients suffering from COVID-19. The National Health Institute (NIJZ) introduced data on SARI patients as the main pool or macro-group of respiratory patients. But only about 20% of hospitalised SARI patients tested positive for COVID-19 (Figure 3). As such, it seems that the preceding epidemic of unusual respiratory (non-COVID-19) infections lies at the core of understanding the spread of the second wave. Some authors claim that such an increase in hospitalised persons due to unknown or atypical respiratory diseases may have its triggering counterpart back in the early spring lockdown. The imposed measures severely limited people's movement, exposure to fresh air and sunlight, and their synthesis of vitamins. There was also rising fear, uncertainty, and precariousness topped with increasing air pollution that causes oxidative stress etc., which weakened the population's resilience (Nitschke et al. 2020).

With the advent of low temperatures in October (week 36 of 2020), the share of COVID-19 patients among all respiratory infections in hospitals rose from 16.3% to 25.5% by 11 October 2020. Another rapid rise in that ratio to 35.8% occurred from 12 to 18 October 2020, but that was nothing compared to the first week of November, which exhibited a share as high as 81% of COVID-19 positive among all SARI hospitalisations due to high contagiousness within medical facilities in Slovenia (Josipovič 2020b). In contrast, the German average was 58% of COVID-19 cases among SARI patients in week 47 of 2020 (Robert Koch Institute 2020).

The age of patients is critically important. Between 21 September and 18 October 2020, only 5.9% of SARI patients were younger than 45, and only 1% were below 25 years of age. So far, there's a lack of reliable evidence that those below 45 – including children – transfer the in-

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fection to the elderly population. Moreover, there is evidence that children are equally or less prone to spreading the infection than middle-aged or older generations (Jenco 2020; Ghosh et al. 2020).

The breakdown of data by weeks might cause problems in its interpretation, as it does not distinguish between the differing lengths of hospitalisation. Given that the majority of patients stay in hospital for more than a week, it is analytically important to identify people who are hospitalised over multiple weeks. These longer-term or repeat cases should be collected and presented separately. To partially avoid this problem, we calculated mortality over a window of four weeks; the patient is considered to have "died with or because of COVID-19" if they test positive within 28 days of their eventual death. In the month from 19 October to 15 November, during the peak of the second outbreak (second wave), 2,031 SARI patients (43.5% women) with COVID-19 were observed and 368 patients (43.1% women) or 18.1% died. That means roughly one in five or six seriously ill, chiefly male patients dies. Looking at the age groups and sex of these patients, the lethality of the disease becomes clearer. Male patients aged 85 or over have a more than 50% chance of dying if seriously ill, while only around one in three women of the same age will die. This is the most striking sex-dependent differential across all age groups. Other age groups – with the slight exception of the 65-74 age group – are far more balanced. Generally, the chance of dying for SARI patients who test positive for COVID-19 increases with age: two in five for those aged 85+, one in four for 75-84, one in eight for 65-74, and one in 20 for the 55-64 age group. The mortality rate for patients under 55 years of age is exceptionally low (one or two in 100) (Figure 4).

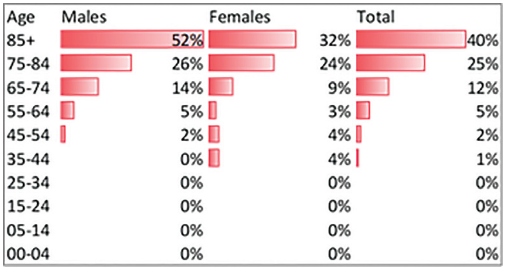

Figure 4. Mortality by age and sex structure of SARI patients who tested COVID-19 positive in Slovenia, 19 Oct to 15 Nov 2020 (Source: NIJZ)

3 GEOGRAPHICAL SCALE MATTERS: REGIONAL DISPARITIES, BORDER AREAS, AND VULNERABILITIES

Given that the majority of new infections within the second wave were expected to stem from nursing homes and hospitals on one hand, and from employment in general (especially industrial workplaces and intensive group work) on the other, it seems geographically illogical to introduce wholesale measures for preventing the spread from a tiny share of the population scattered across the country. On the contrary, geographical scale matters, and it should be included in deciding which measures to impose, especially when it comes to school closures. Those restrictions are no less unjustifiable even if we deduct the infected employees.

According to the NIJZ's November 2020 data, about 15% of infections came directly from cross-border workers, which could include those employed in hospitals, clinical centres, and nursing homes, but without those potentially infected members of their households. These cross-border workers, according to NIJZ, brought COVID-19 primarily from Austria (51%), but also from Bosnia and Herzegovina (13%), Germany (9%), Serbia (7%),

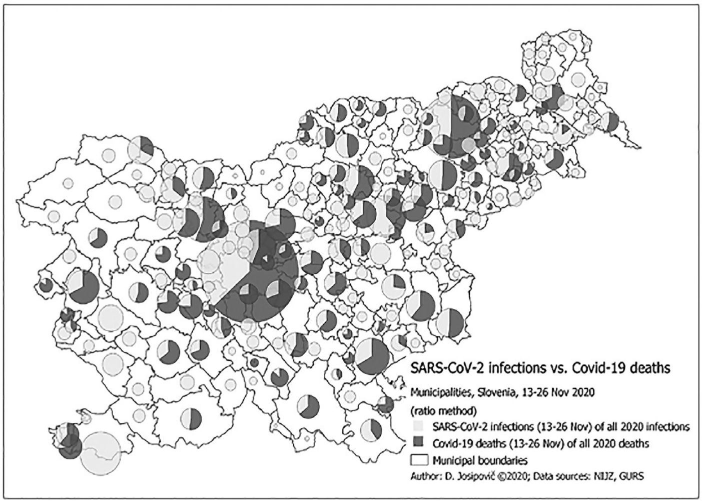

Figure 5. The ratio between SARS-CoV-2 infections and COVID-19 deaths all year, versus a comparison from 13–26 Nov 2020, municipalities, Slovenia (Source: NIJZ)

Croatia (7%), and Italy (4%). The data structure does not allow us to discern the nationality or citizenship of these workers, but from the geographical distribution of infections, it can be gathered that the vast majority of those living along the Austrian border and working in Austria are Slovenian citizens, while others are mainly posted workers, a significant number of them being foreign citizens (Josipovič 2018). Hence, it seems that governments have not recognised the value of a cross-disciplinary framework, nor the importance and effects of the spatial distribution of restrictions. Slovenia is by no means an exception, as it has not collected all the necessary data that more informed European countries have. Austria, for instance, published data gathered from the cluster-inspected transmission of SARS-CoV-2 infections (Josipovič 2020b). So, if the spread is occurring mainly in households, it's worth asking what locking people down to their homes and municipalities, restricting their movement, and imposing curfews does to further hinder one of their basic needs – the necessity to move – and what effect this has on their immunity and psychological makeup.

Another problem is that the Slovenian National Health Institute does not collect and publish locality-sensitive and region-specific data on the sources of infection, which dramatically impact the regional or municipal probability of having contact with infected people and potentially transmitting the virus. To address this problem, municipal-level data should be collected. This would make intraregional disparities more visible, as shown in Figure 5. North-eastern Slovenia and the border regions are much more affected by new COVID-19 cases than the rest of the country, thus confirming the higher exposure of border areas.

A regional perspective of COVID-19 in Slovenia shows that Styria, which has the most daily cross-border commuters, has experienced the most cases and deaths per capita. Other areas very much affected by COVID-19 indicators are municipalities with a large number of nursing homes and hospitals, which are endangered but relatively closed institutions. Here as well, closing municipal boundaries is far from appropriate or effective, as most infections come from patients or employees in nursing homes and hospitals. This makes it easier to control the spread of infections from employees or daily visitors (cf. Anderson et al. 2020).

Looking at the regional and municipal levels by way of analytical mapping, as shown in Figure 6, knowing the size and infrastructure, number of inhabitants, and specific cultural and historical traits of a given area enables us to establish a pattern of vulnerabilities. Generally, smaller municipalities in border regions are more likely to be home to ethnic minorities, and these have been far more endangered by the closure of municipal boundaries. Aside from reduced possibilities of movement and cross-border communication, the limitations on public services and supplies to smaller and rural settlements meant that residents suffered not only from a psychosocial point of view, but also from the possibility of getting infected, as in the case of cross-border workers.

A municipality-oriented approach paints a different picture regarding COVID-19 deaths. While some areas are significantly more affected, huge areas didn't actually suffer any COVID-19 deaths in November 2020. Among them a problematic situation appears only in border municipalities with nursing homes, and therefore a higher number of infections. While these regions still had a very low overall number of COVID-19 deaths, schools and municipalities remained closed (Josipovič 2020b). Figure 6 clearly shows that smaller municipalities, especially those along the Slovenian national border, have experienced higher rates of local infections, thus suggesting potential transmission because of the lockdown itself.

4 EXCESS DEATHS IN SLOVENIA IN 2020

We found and presented striking differences regarding regional disparities between the ratio of COVID-19 deaths to SARS-CoV-2 infections. This gave rise for further research into this relationship and the age and gender structure of the deceased. There are two major divides within the age structure of the population when speaking about elderly people. The first is the internationally recognised average expected age of transition to retirement (or inactivity), which is around 65 years. But with the increasing mean age of death, the most relevant age group becomes those aged 85 or above. Slovenia is by no means an exception. As seen in Table 2, there has been a tremendous increase in the population aged 65+ over the past five years.

The post-war baby-boom generations are leaving or have left the active working population and are slowly transitioning into retirement. This increase is expected, thanks to the higher proportion of men within the former labour contingent who immigrated from other Yugoslav republics prior to 1991, thus influencing gender differentials. On the other hand, the oldest generations in particular have seen an increase in their life expectancy, so the probability of an increased death rate has risen with every year. The pandemic acted as a trigger for this, but to what extent? To fully appreciate the rising share of elderly people (65+), it's necessary to look at the 85+ age group, which comprises

Table 2. Population by age and gender (65 years of age and over) in Slovenia (SiStat 2021)

	2015H1	2020H1	DIFFERENCE
TOTAL	369,386	424,004	+54,618
MEN	151,416	181,767	+30,351
WOMEN	217,970	242,237	+24,267

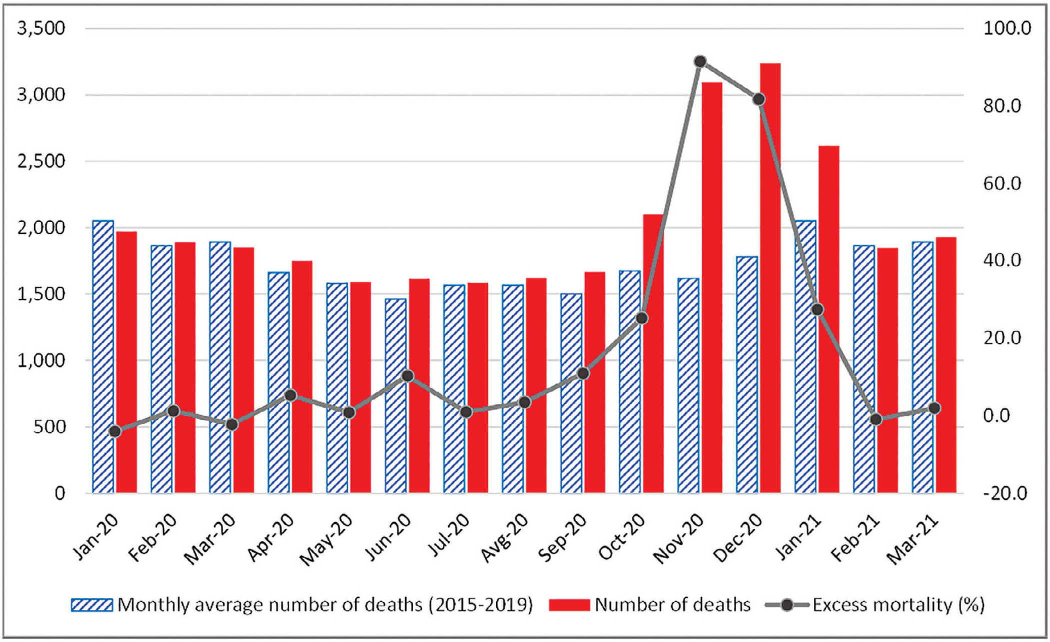

Figure 6. Excess mortality, Slovenia, monthly, January 2020 to March 2021 (SiStat 2021)

one-fifth (11,000 out of 55,000) of the whole increase in the elderly contingent (Tables 2-3).

Table 3. Population aged 85 years and over by gender in Slovenia, 2015-2020 (SiStat 2021)

Year	Total	Males	Females
2015	43,382	10,990	32,392
2016	46,171	12,076	34,095
2017	48,288	12,911	35,377
2018	50,395	13,635	36,760
2019	52,276	14,326	37,950
2020	54,136	15,236	38,900

In just a five-year period, the number of 85+ men increased by roughly 50% to 15,000, while the number of 85+ women went up some 22% to 39,000. Thus, the gender gap is narrowing, notwithstanding that we're dealing here with a highly vulnerable and fragile population, and the situation may change at any moment, as it did with the excess deaths of some 3,000 in 2020 (Figure 6). Or, as Danilo Dolenc from the National Statistical Office recently said:

> Most people die in the winter, the fewest in the summer months. In October 2020, we recorded 24% more deaths, and for the first time, excess mortality differed markedly from the average of the past five years. … In the last 20 years, most residents of Slovenia (2,425) died in January 2017, when the seasonal flu, which was spread all over Europe in the winter of 2016/17, reached its peak in Slovenia. Before the COVID-19 epidemic, 29 January 2017 was the only day when the number of deaths in one day exceeded a hundred (101) (Dolenc 2020).

When considering the harshness of the pandemic in 2020, one could not only observe the steep rise in the number of deaths (+3,303 or 16% more than in 2019), but also the significant fall in the number of live births (-965 or 5% fewer than in 2019),

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which is an extension of the natural decrease (Table 4). Thus, the pandemic and all of the measures that came with it affected family planning processes and people's reproductive goals.

Table 4. Natural change of population in Slovenia, 2018–2020 (SiStat 2021)

	2018	2019	2020*
Live births	19,585	19,328	18,363
Deaths	20,485	20,588	23,891
Natural increase	-900	-1,260	-5,528
Natural increase per 1,000 population	-0.4	-0.6	-2.6

(*provisional data)

But how can we analytically define "excess deaths," and how can we identify the share of COVID-19 deaths within this surplus? Excess deaths in Slovenia are defined as a yearly surplus value compared to a given three-to-five-year average. The expected age structure of the deceased should therefore be compared to the average gain or surplus within each age group. Only thus can excess deaths be clearly attributed and interpreted. The next step is to compare excess mortality with COVID-19 mortality. If the input data are reliable, the majority of variance in the distribution of excess mortality by age should be explained as COVID-19 deaths.

We accordingly regrouped the age-specific mortality rates and compared the two averages (2017-2019 and 2015-2016) to assess the age-specific differentials. Figure 7 shows striking features with a negative change (increased mortality) specifically in the 85+ and, remarkably, the 65-69 age groups. Most other age groups expressed positive change (decreased mortality), or at least a lack of change.

Based on the data presented in Figure 7, we identified a 3.9% increase in "natural" mortality in 2020 (excluding the effect of COVID-19 deaths), since the raw data for specific age groups were not available. The

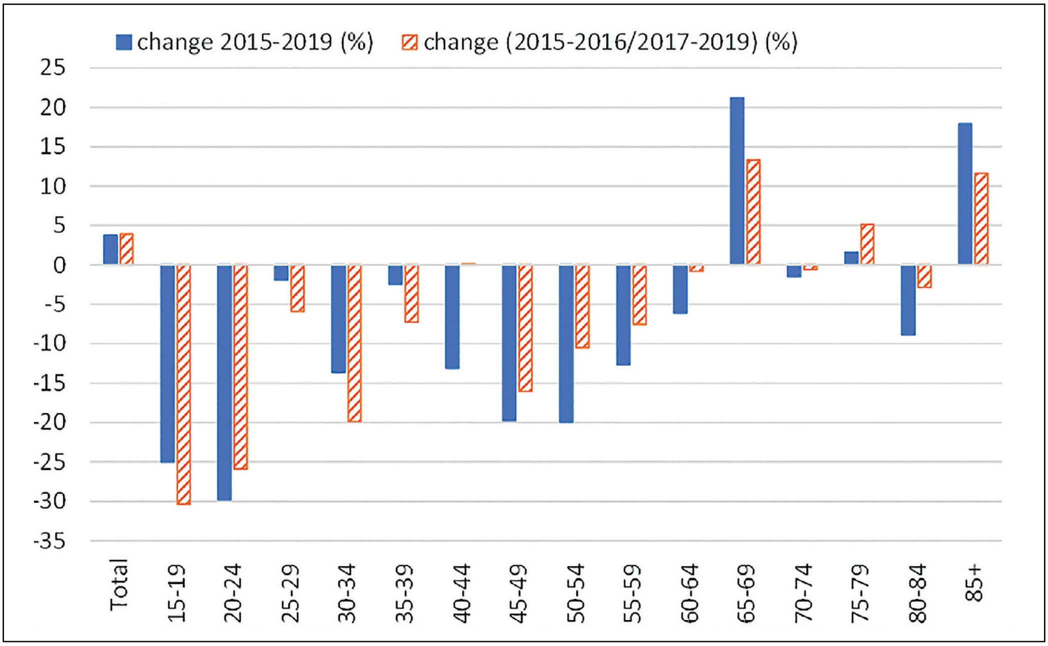

Figure 7. Age-specific changes in the mortality pattern, 2015-2019, Slovenia (source: SiStat 2021)

"provisional" number of deaths (23,891) was reduced by the "expected" number (in accordance with the age-specific mortality trends from 2015-2019) of 21,391 "usual" deaths in 2020. The difference of 2,500 deaths may thus be ascribed to premature deaths resulting from COVID-19, since all other deaths were expected within the already augmented number. Otherwise, COVID-19 would have been affecting mortality rates in the years prior to 2020. Due to scarce evidence, this would be highly unlikely. However, the difference between the 2,500 excess deaths identified by this analysis and the official number of COVID-19 deaths supplied by the NIJZ in 2020 (3,126) is quite high. The NIJZ figure of COVID-19 deaths, which exceeds the projected value by 626 or almost exactly one-quarter (25%), seems exaggerated. There are many possible reasons of such a discrepancy. One might be due to the notorious number of cycles in RT-PCR tests. As mentioned earlier, some researchers claim that beyond a margin of 30 cycles, the RT-PCR procedure increasingly produces false positive results (Borger et al. 2021), yet the actual number remained 40 cycles.

Despite the introduction of vaccination in the elderly population (above 80 years of age) early in January 2021, the following four-month period, during which those people received the second of the two advised doses (with three weeks or more between the two or more dosages depending on the type and manufacturer of the vaccine), paints a rather confusing picture. Despite a sharp decline and no newly discovered cases of SARS-CoV-2 in nursing homes, the overall number of infected people remained stagnant. On the other hand, the number of hospitalised SARI cases fell to an average of 40 per day in the two-week period from 8 to 21 February 2021, while at the same time the number of COVID-19 positive among them decreased (–40% or 23.7 fewer patients per day). However, the mortality was still high: one death per every four hospitalised with COVID-19. As such, scrutinising age-specific rates is necessary.

5 CONCLUSION

This paper presents new data on the age structure of hospitalised SARI (severe acute respiratory infection) patients, with or without COVID-19, broken down by gender, place of infection, and region. The leading hypothesis that COVID-19 deaths are overestimated despite the high share of excess deaths was confirmed, bringing to light the important issue of the demographic breakdown of the population at risk. The analyses confirmed 2,500 excess deaths, taking into account mortality trends within the last five-year period (2015-2019). That difference may be ascribed to premature deaths resulting from COVID-19. Given that the official number of COVID-19 deaths published by the National Health Institute in 2020 was 3,126, it appears the official figure is exaggerated by around a quarter (626 deaths or as much as 25%) compared to the projected value based on recent trends. On the other hand, the NIJZ number of COVID-19 deaths fits like a glove with the provisional "excess" deaths provided by the National Statistical Office (3,126 versus 3,301). This clearly shows that there are flaws in the stated number of COVID-19 deaths, since they do not include the effect of the aging population and rising numbers of both genders in the oldest generations.

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COVID-19 i prekomerna smrtnost: Da li je bilo moguće smanjiti broj umrlih u Sloveniji?

Sažetak

Rad predstavlja nove podatke o starosnoj strukturi hospitalizovanih pacijenata sa teškom akutnom respiratornom infekcijom, sa ili bez virusa COVID-19, prema polu, mestu infekcije i regionu. Potvrđena je glavna hipoteza da su smrtni slučajevi od bolesti COVID-19 precenjeni uprkos velikom udelu prekomerne smrti, pri čemu se u prvi plan postavlja važno pitanje demografskog kontingenta rizičnog stanovništva. Prema tome, glavni razlog koji sugeriše da je neophodno umanjiti zvaničan broj umrlih od bolesti COVID-19 treba tražiti u iscrpljenom demografskom segmentu starijeg stanovništva, čiji je mortalitet u 2020. godini bio za 19 procenata viši u poređenju sa prethodnim petogodišnjim periodom (2015–2019). Demografske razlike između regiona su ogromne i statistički se podudaraju sa razlikama u odnosu „zaraženih naspram preminulih”. Prekomerni mortalitet u 2020. godini bio je neobično visok, ali je projektovana vrednost za 2020. godinu, zasnovana na prethodnom petogodišnjem (2015-2019) obrascu mortaliteta prema starosnim grupama, doprinela trećini tog viška. Zaključak je da se za četvrtinu navodnih smrtnih slučajeva od bolesti COVID-19 (otprilike 600 od oko 3.300 u 2020. godini) očekivalo da će se dogoditi u 2020. godini.

KLJUČNE REČI

umrli od bolesti COVID-19, prekomerna smrtnost, starosna struktura, stariji, projekcije stanovništva