

Report on excess deaths associated with the COVID-19 pandemic in the Philippines, January 2020 to May 2021

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By Kristine Joy S. Briones and Michael Dominic C. Del Mundo
31 August 2021

Abstract

One of the effects of the COVID-19 pandemic is the increase in the number of excess deaths experienced by the country. From January 2020 to May 2021, the estimated number of excess deaths was 91,024 — around 11% higher than the expected number of deaths under pre-pandemic or "normal" conditions. These excess deaths came from Covid-19 Related Deaths and deaths from all other causes that suddenly increased during the pandemic, such as cardiovascular-related diseases. In particular, a large share of the excess deaths came from the age group 50 years and over and from Luzon, including the National Capital Region. Assuming that the current trends continue, projections show that the excess deaths for the full year 2021 will reach approximately 228,000.

Introduction

The Philippines' Department of Health (DOH) has reported 23,308 COVID-19 deaths in the country from the start of the COVID-19 pandemic in 2020 to May 2021 (11,452 deaths from February to December 2020 and 11,856 deaths from January to May 2021). This number, however, does not entirely reflect the impact of the pandemic on mortality in the country. This report investigates excess deaths in the Philippines from January 2020 to May 2021 using data from the civil registry documents or death certificates issued by the Philippine Statistics Authority (PSA).

¹ This paper is part of the United Nations Population Fund Philippines Country Office project on estimating excess deaths, births, and migration in the Philippines during the COVID-19 pandemic. The authors would like to thank the Philippine Statistics Authority and Dr. Claire Dennis S. Mapa for serving as technical advisor. All remaining errors are authors' own. Corresponding author: kjsbriones@gmail.com

² Source: DOH data drop as of 8 August 2021.

Excess death or mortality is defined as the "mortality above what would be expected based on the non-crisis mortality rate in the population of interest. Excess mortality is thus mortality that is attributable to the crisis conditions" (Checchi and Roberts, 2005). Estimating excess deaths in the Philippines during the pandemic can quantify both the direct and indirect impact of COVID-19. In doing so, besides the confirmed deaths from COVID-19, situations such as the following are taken into consideration: deaths of suspected COVID-19 patients who are either not tested or tested but with inconclusive results, increase in deaths in other causes due to weak healthcare systems, deaths of individuals who avoided or were not able to go to hospitals to get treated or who got less funding for treatment, and decrease in deaths in other causes due to mobility restrictions.

From January 2020 to May 2021, the Philippines registered a total of 919,375 deaths from all causes. During the same period, 55,156 deaths due to confirmed and suspected COVID-19 were also recorded. Confirmed COVID-19 deaths from civil registry documents were 25,167, almost 8% higher than the DOH-reported COVID-19 deaths from January 2020 to May 2021.

Excess deaths or deaths above what is expected from January 2020 to May 2021 are estimated at 91,024. This is 11% higher than the average number of deaths reported from 2015 to 2019. 69% or 63,201 of these excess deaths were recorded between January and May 2021. Without new interventions and if circumstances are unchanged, preliminary projections estimate excess deaths for the whole of 2021 at 229 thousand.

Data

This report uses January 2015 to May 2021 data from civil registry documents or death certificates issued by the PSA. A death certificate shows a deceased individual's cause and date of death and other demographic characteristics. Data used in this report are from death certificates compiled by the PSA up to 5 August 2021. However, 2020 and 2021 figures are provisional and may change when more death certificates for these years are registered.

Within the 2015 to 2020 period, 2019 recorded the highest number of registered deaths of 620,414 (see figure 1). The first year of the COVID-19 pandemic recorded 614,453 deaths from all causes in the country, and this number is 0.96% lower than the previous year.

The monthly death registration data paints a picture of the events in 2020. The first confirmed COVID-19 case in the Philippines was reported on January 30. On February 1, the first COVID-19 death in the Philippines was reported. By March 1, the Philippines had 633 suspected COVID-19 cases. To contain the spread of the virus, the Philippine government placed the National Capital Region on lockdown for one month beginning March 15. The lockdown was extended to other parts of the country by the beginning of April. As seen in figure 2, deaths from all causes declined during these two months. Due to mobility restrictions, registered deaths due to transport accidents went down by 58%, from 2,155 in March to April of 2019 to 912 during the same period in 2020. Additionally, deaths due to assault went down by 46%, from 1,633 to 874 in the same period of comparison (see appendix 1 for more details).

Quarantine measures were slowly relaxed over the following months, with the reimposition of stricter lockdowns on areas where the virus was seen to be spreading fast. July and August recorded the highest deaths in 2020, with a total of 111,323 deaths registered. Higher COVID-19 cases were also reported during these months. The most stringent lockdown was imposed in Cebu City from June to July due to a sudden increase in COVID-19 cases. Metro Manila and other neighboring provinces were also put under the strictest quarantine level in August because of the rise in cases and following the appeal of medical societies in the country.

³ Edrada et al (2020). First COVID-19 infections in the Philippines: a case report. Trop Med Health 2020; 48:21.

Figure 1. Annual number of registered deaths in the Philippines and year-on-year growth rates, 2015 to 2020^4

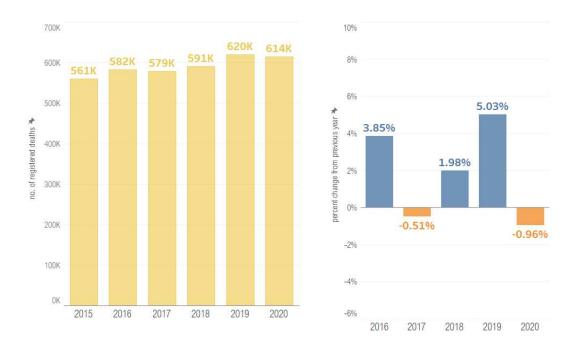
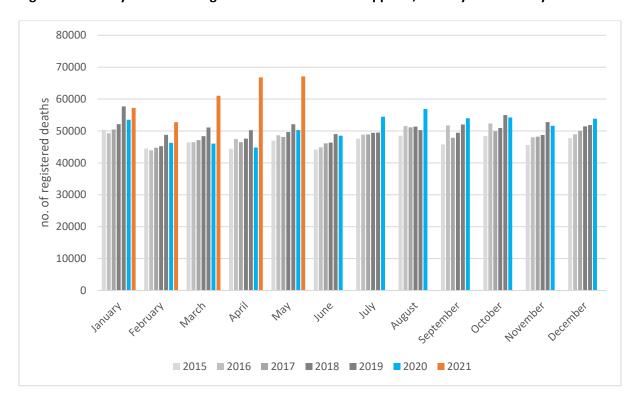


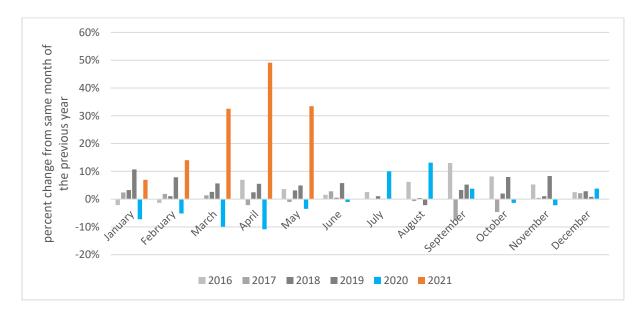
Figure 2. Monthly number of registered deaths in the Philippines, January 2015 to May 2021⁵



⁴ 2020 values are provisional.

⁵ 2020 and 2021 values are provisional.

Figure 3. Month-on-month growth rates of registered deaths in the Philippines, January 2015 to May 2021⁶



The first five months of 2021 show an unprecedented increase in the number of registered deaths in the country (see figure 2). The Philippines has recorded 304,922 deaths from January to May 2021, 17% higher than those recorded in pre-pandemic 2019 (259,963 deaths registered from January to May 2019) or a total of 44,959 more deaths. May 2021 recorded the highest number of fatalities for 2021 so far at 67,099, 29% higher than those reported in May 2019.

COVID-19-related deaths

Following the latest World Health Organization (WHO) guidelines, the PSA included two COVID-related codes on its list of causes of death: "U07.1 COVID-19, virus identified" and "U07.2 COVID-19, virus not identified". "U07.1 COVID-19, virus identified" are deaths where the individual was COVID-19 positive as confirmed by laboratory testing. In contrast, "U07.2 COVID-19, virus not identified" are deaths where the individual was clinically or epidemiologically diagnosed with COVID-19, but laboratory confirmation was inconclusive or unavailable (WHO, 2020).

⁶ 2020 and 2021 values are provisional.

Figure 4. Annual COVID-19 related deaths in the Philippines, January to December 2020 and January to May 2021⁷

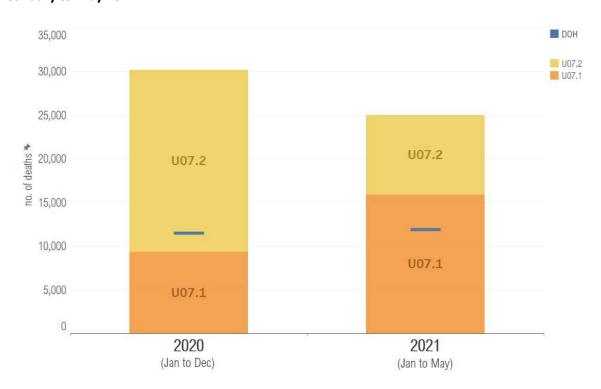
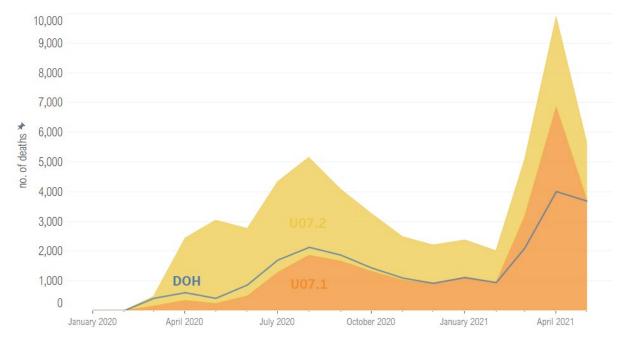


Figure 5. Monthly COVID-19 and COVID-19 related deaths in the Philippines, January 2020 to May 2021⁸



⁷ Data from both PSA and DOH are provisional. DOH data as of August 8, 2021; PSA data as of July 29, 2021.

⁸ Data from both PSA and DOH are provisional. DOH data as of August 8, 2021; PSA data as of July 29, 2021.

It is important to note that the number of deaths registered under the cause of death code U07.1 may not equal the number of COVID-19 confirmed deaths reported by the DOH. While the DOH regularly updates the number of COVID-19 deaths as laboratory results come in even long after a patient has passed away, the cause of death written on death certificates is not updated or changed once they are issued. Because of this, a suspected COVID-19 case with U07.2 listed as the cause of death will retain the same cause of death even if late laboratory test results show that the individual was COVID-19 positive. Furthermore, the DOH reports only COVID-19 cases and deaths confirmed through reverse transcription-polymerase chain reaction (RT-PCR) test, while the code U07.1 for the cause of death includes those found positive through the antigen test besides the RT-PCR test.

From January 2020 to May 2021, the DOH reported 23,308 deaths due to COVID-19 in the Philippines. Official registered deaths from the PSA, on the other hand, report a higher number of deaths due to COVID-19. Deaths due to COVID-19 (U07.1) from January 2020 to May 2021 was 25,167, around 8% higher than the DOH report. Deaths due to suspected COVID-19 (U07.2) totals 29,989. All in all, the total COVID-19 related deaths from death certificates is 55,156. The breakdown of these numbers is presented in figures 4 and 5. Because of testing limitations at the beginning of the pandemic, a high U07.2 death is observed. Additionally, since symptoms of COVID-19 include Pneumonia and other respiratory system infections, there is also a potential misclassification of the causes of deaths as deaths due to diseases of the respiratory system in 2020 was at 60,230, lower by 37% from the previous year's 95,879 (see appendix 1 for more details). The DOH-reported COVID-19 deaths are higher than U07.1 in 2020, possibly due to the delayed release of COVID-19 test results.

As testing capabilities increased in the country and with the increase in the number of available laboratories for COVID-19 testing, the U07.2 and U07.1 ratio reversed in 2021. The DOH-reported deaths are also lower than U07.1 in 2021. This is possibly due to limited contact tracing capabilities in areas with high COVID-19 cases, particularly in NCR and CALABARZON. Antigen testing has also been made easily accessible to the public and cheaper than RT-PCR testing, and DOH does not track statistics on the former.

Estimating excess deaths

Excess deaths refer to the number of deaths *from all causes* during a crisis above and beyond what we would have expected to see under "normal" conditions (Checchi & Roberts, 2005). The estimation of excess deaths is a more comprehensive measure of the *total* impact of the pandemic on mortality than the confirmed COVID-19 death count alone. In addition to laboratory-confirmed deaths due to COVID-19, excess deaths capture COVID-19 deaths that were incorrectly diagnosed and reported and deaths from other causes attributable to the overall COVID-19 crisis conditions.

In this report, excess death is estimated by taking the difference of the current number of deaths during the pandemic and the average number of deaths during the pre-pandemic years 2015 to 2019. Figure 6 compares the monthly average number of registered deaths from 2015 to 2019 (blue line) and deaths from January 2020 to May 2021 (yellow area). Figure 7 reports the excess death per month or the difference between the current number and average and the percentage change. Looking at the period January 2020 to May 2021, there was a decline in the number of registered deaths in March and April 2020. April reported the highest negative deviation from expected deaths, with more than 2,000 deaths lower than the average, equivalent to -5.2% of expected deaths. There were two prominent peaks. The first was in August 2020, when deaths were around 13% higher than expected, and the second was in April 2021, when deaths were 41% higher than expected. From January 2020 to May 2021, registered deaths totaled 919,375, an 11% upward deviation from expected deaths of 828,351.

Figure 6. Monthly registered deaths from January 2020 to May 20219

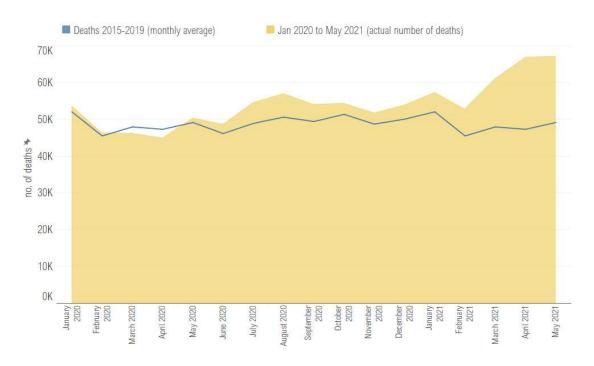
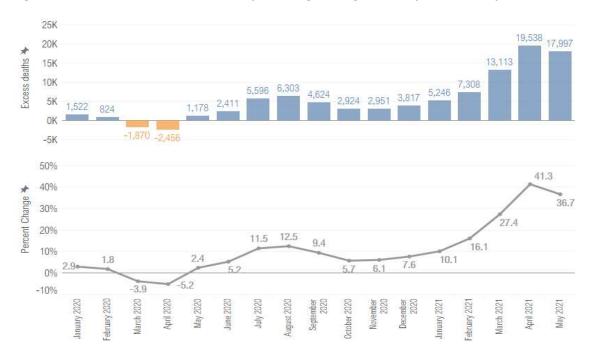


Figure 7. Number of excess deaths and percentage change, January 2020 to May 2021¹⁰



⁹ 2020 and 2021 values are provisional.

 $^{^{\}rm 10}$ 2020 and 2021 values are provisional.

The monthly excess deaths amount to 91,024 excess deaths for January 2020 to May 2021, an 11% deviation from the expected number of deaths. 69% of the excess deaths are from the first five months of 2021 (63,201 for Jan to May 2021; see appendix 4 for more details). When data is disaggregated by sex, it shows that both sexes were affected by the pandemic. Excess deaths on males are equal to 49,530, a 10% deviation from expected deaths, while excess deaths on females are equal to 41,494, a 12% deviation from expected deaths. See appendix 5 for more details.

The pandemic had varying impacts on ages. Since the young were not allowed to go out of their houses during lockdowns, there was a decline in deaths of children, particularly those below five years old. On the other hand, a surge in deaths in July and August 2020 was seen among those aged 50 to 74. The increase in excess deaths from the start of the pandemic until May 2020 was highest between March and May 2021. Most of the victims were the older population. There has been an increase in deaths of more than 75%, particularly in the 70-74 age group. See figure 8 for details.

Figure 8. Percentage deviation of weekly deaths from expected deaths by age group, January 2020 to May 2021

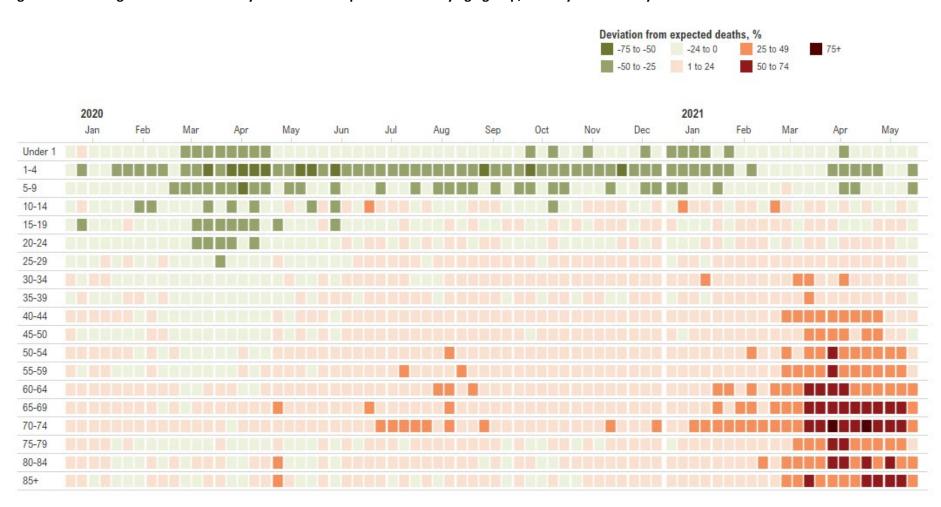
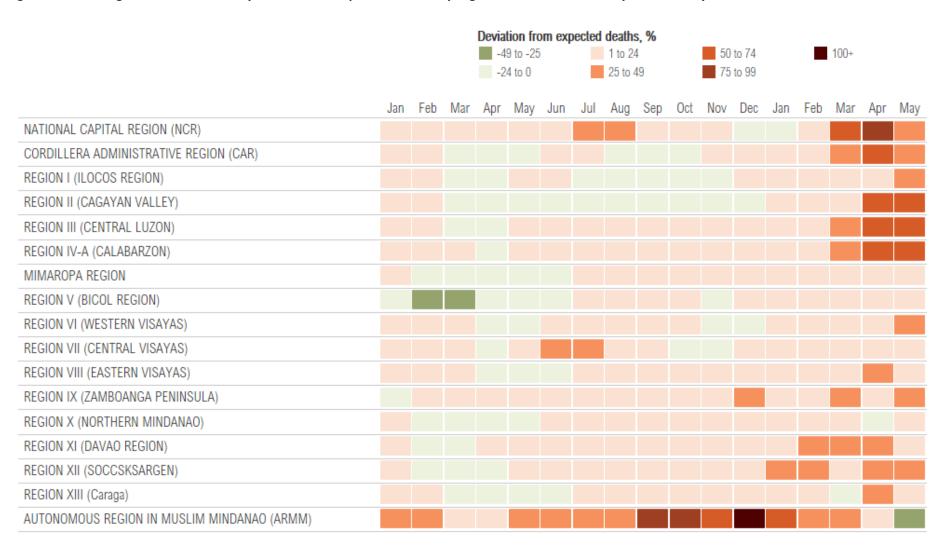


Figure 9. Percentage deviation of weekly deaths from expected deaths by region of residence, January 2020 to May 2021



For January 2020 to May 2021 period, there were 30,715 deaths of children aged four and below, and this number is around 10 thousand lower than the expected number of deaths for this age group in the same period. On the other hand, there were 464,023 deaths of individuals aged 65 and above, 63 thousand higher than the expected number of deaths for this age group.

Excess deaths based on the region of residence are presented in figure 9. Central Visayas, where Cebu City is located, saw an increase in deaths in June and July 2020, the period where COVID-19 cases were increasing. NCR saw a significant increase in deaths in July and August 2020. From March to May 2021, almost all regions in Luzon experienced a considerable increase in fatalities. Note that the rise in deaths in ARMM is brought about by the low death registration in the previous years.

Excess death projection

This section estimates the projected weekly excess deaths in the country until 2022. Following Roser, et.al (2020) and using weekly mortality data from the vital registration, the excess deaths during the COVID-19 pandemic in the Philippines is estimated using:

$$Excess\ Deaths\ _{2020week05} = Deaths\ _{2020week05} - Average\ Deaths\ _{2015-2019week05}$$

Data on mortality is usually incomplete in the weeks, and even months, after a death occurs due to delays in reporting. To avoid using incomplete data, information on deaths in the most recent weeks was excluded in the study. Only the death counts until week 52 of 2020 was used for the estimation of excess deaths. Exponential Smoothing was used to project the number of excess deaths to June 2022:

$$x_{t+j} = (\mu_t + \beta_j) + S_{t+j} + \epsilon_{t+j}$$

where x_t is the time series of excess deaths, μ_t is the time-varying average at time t, β is a parameter, S_t is the seasonal component, and ϵ_t is the idiosyncratic error.

Projected deaths at the national level and by sex

Estimated excess deaths from 2020week5 to 2020week52 were calculated using actual mortality data from the vital registration. Excess deaths from 2021week20 to 2022week26 are forecasted.

Figures 10a and 10b show the estimated and projected COVID-19 excess deaths for all age groups by sex in the country. The blue line represents the estimated excess deaths using actual data, while the red line represents the forecasted excess deaths till June 2022. The grey dashed lines represent the upper limit and lower limit of the 95% prediction interval for the forecast.

Both graphs show that the excess deaths for both sexes in the country increased notably (above zero) during the COVID-19 pandemic. It can be observed that there was a sharp increase in the number of excess deaths during the 3rd quarter of 2020, which coincides with the Covid-19 surge in August that the country experienced. Similarly, another spike in the number of excess deaths can be seen in the 2nd quarter of 2021, which also coincides with the surge in Covid-19 cases from late March to April of 2021.

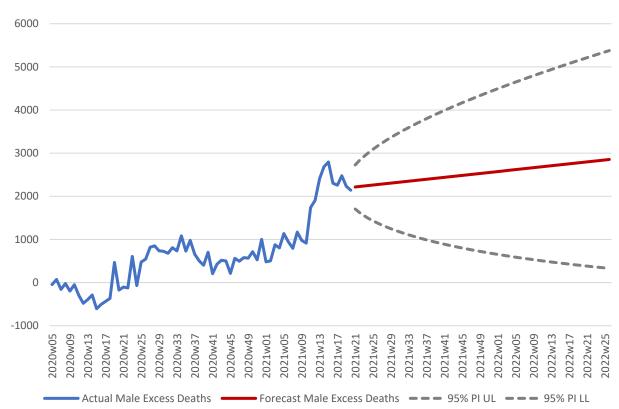


Figure 10a. Actual and Forecasted Excess Deaths of Males, Feb 2020 to June 2022

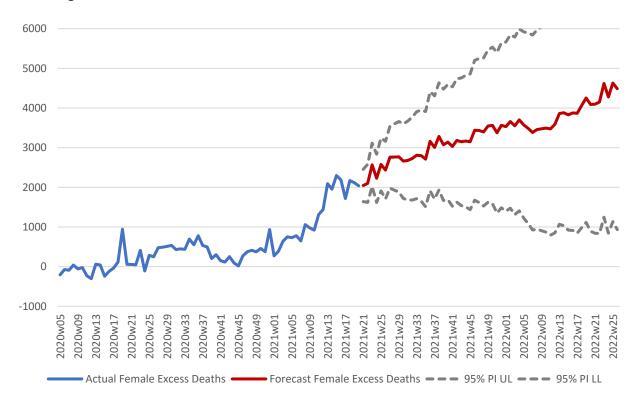


Figure 10b. Actual and Forecasted Excess Deaths of Females, Feb 2020 to June 2022

Likewise, forecasted values of excess deaths for both sexes show no slowdown till 2022. Assuming that the past trend continues and there are no/weak interventions, the number of excess deaths is expected to worsen and will continue to increase until June of 2022 for both males and females.

In summary, the estimated excess deaths for the entire population in 2020 is 26,108, while the projected excess deaths for the whole of 2021 is 228,789. This suggests that if we go on as business as usual and without new interventions, the impact of the pandemic on mortality as measured by the excess deaths would worsen in 2021 and beyond. In addition, the projected excess deaths from January 2022 to June 2022 is 170,907.

When exploring by sex, there are more male excess deaths compared to females. It is evident from Table 1 that more than half of the excess deaths during the pandemic so far are males. In 2020, estimates show that around 56 percent of all excess deaths are males while only around 44 percent are females. However, in 2021, it is expected that the number of males and female excess deaths would be closer at 53 percent and 47 percent respectively. On the other hand, it is forecasted that

there will more female excess deaths (58 percent) compared to females (42 percent) by the first half of 2022 due to the strong increasing trend of female excess deaths in 2021.

Table 1. Estimated and Projected COVID-19 Pandemic Excess Deaths in the Philippines

	Males	Females	Both Sexes
2020 ^a	14,566	11,542	26,108
2021 ^b	107,997	120,792	228,789
2022 ^c	70,548	100,359	170,907

Notes:

Source: Author's Calculations

Projected excess deaths for vulnerable age groups

Covid-19 mortality is particularly strong among vulnerable age groups such as the elderly aged 65 and over. Figure 11 shows how badly the 65 and over group was affected by the covid-19 pandemic. It can be observed that the excess deaths for the senior group in the country increased significantly (way above zero) during the COVID-19 pandemic.

Similar to what can be observed at the national level for both males and females, there was also a sharp increase in the number of excess deaths during the 3rd quarter of 2020 for the senior group, which coincides with the Covid-19 surge in August that the country experienced. Another spike in the number of excess deaths can also be seen in the 2nd quarter of 2021, which also coincides with the surge in Covid-19 cases from late March to April of 2021.

^a estimate of excess deaths from 2020w05 to 2020w52

^b estimate and point forecast of excess deaths from 2021w01 to 2021w52

^c point forecast of excess deaths from 2021w01 to 2020w26

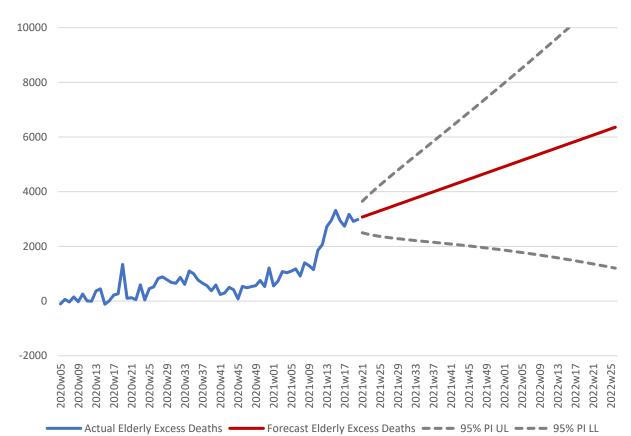


Figure 11. Actual and Forecasted Excess Deaths of 65 years and over, Feb 2020 to June 2022

The increasing trend of excess deaths among the senior group was strong in 2020 and the first half of 2021. The forecasts also reflect that this trend will continue till June 2022 in the scenario of business-as-usual and no or weak interventions are implemented.

The number of excess deaths from the 65 and over is a large contributor to the total count of excess deaths in the country. As shown in Table 2, only 21,194 excess deaths for 65 and over was recorded for 2020. However, it is forecasted to grow to 165,041 for the entire year of 2021 and 146,623 for the first half of 2022.

Table 2. Estimated and Projected COVID-19 Pandemic Excess Deaths for 65 and Over

65 and Over
21,194
165,041
146,623

Notes:

Source: Author's Calculations

Conclusion

Several countries have found themselves adjusting their COVID-19 death counts after reviewing death numbers from civil registry documents. ¹¹ In the Philippines, the DOH-reported number of COVID-19 deaths from January 2020 to May 2021 (23 thousand) is lower than the registered deaths due to COVID-19 (25 thousand). In the first five months of 2021 alone, civil registry documents show that deaths due to COVID-19 from death certificates (16 thousand) are higher by 34% from the DOH data (12 thousand). Additionally, deaths from suspected COVID-19 from January 2020 to May 2021 were almost 30 thousand. This means that from the start of the pandemic up to May 2021, the Philippines recorded 55 thousand COVID-19-related deaths, a far number compared to the DOH-reported COVID-19 deaths of 23 thousand. Given the higher death numbers from death certificates, it might be valuable for the DOH to revisit how it counts the death toll from the pandemic.

Excess deaths or deaths above what is expected from January 2020 to May 2021 are estimated at 91,024. This is 11% higher than the average number of deaths reported from 2015 to 2019. 69% or 63,201 of these excess deaths were recorded between January and May 2021. Without new interventions and if circumstances are unchanged, preliminary projections estimate excess deaths for the whole of 2021 at 229 thousand.

^a estimate of excess deaths from 2020w05 to 2020w52

^b estimate and point forecast of excess deaths from 2021w01 to 2021w52

^c point forecast of excess deaths from 2021w01 to 2020w26

¹¹ See for example revision in Peru's death numbers: https://www.bbc.com/news/world-latin-america-57307861.

References:

Checchi, F., & Roberts, L. (2005). <u>Interpreting and using mortality data in humanitarian emergencies</u>. *Humanitarian Practice Network*, *52*.

Max Roser, Hannah Ritchie, Esteban Ortiz-Ospina and Joe Hasell (2020) - "Coronavirus Pandemic (COVID-19)". *Published online at OurWorldInData.org*. Retrieved from: 'https://ourworldindata.org/coronavirus'

Appendix 1. Annual number of deaths by cause of death, 2015 to 2020

CAUSE OF DEATH		NO. OF	DEATHS BY	YEAR (Jan	to Dec)			Comparison: e (2015-2019)		Comparison: 2019 vs 2020	
CAOSE OF BEATT	2015	2016	2017	2018	2019	2020	average (2015- 2019)	difference	percent change	difference	percent change
1-001 Certain infectious and parasitic diseases	42,475	44,340	41,099	40,929	42,726	33,002	42,314	-9,312	-22.0	-9,724	-22.8
1-002 Cholera	9	9	10	2	2	0	6	-6	-100.0	-2	-100.0
1-003 Diarrhea and gastroenteritis of presumed infectious origin	3,675	4,801	4,039	3,326	3,335	2,703	3,835	-1,132	-29.5	-632	-19.0
1-004 Other intestinal infectious diseases	595	583	557	517	432	417	537	-120	-22.3	-15	-3.5
1-005 Respiratory tuberculosis	24,644	24,462	22,523	22,103	22,568	18,435	23,260	-4,825	-20.7	-4,133	-18.3
1-006 Other tuberculosis	1,403	1,381	1,263	1,306	1,309	1,021	1,332	-311	-23.4	-288	-22.0
1-007 Plague	3	12	1	0	0	0	3	-3	-100.0	0	
1-008 Tetanus	565	592	552	550	516	498	555	-57	-10.3	-18	-3.5
1-009 Diphtheria	23	31	28	27	29	15	28	-13	-45.7	-14	-48.3
1-010 Whooping cough	5	7	15	9	12	0	10	-10	-100.0	-12	-100.0
1-011 Meningococcal infection	82	85	91	98	105	62	92	-30	-32.8	-43	-41.0
1-012 Septicaemia	7,000	7,021	6,552	6,187	6,173	4,770	6,587	-1,817	-27.6	-1,403	-22.7
1-013 Infections with a predominantly sexual mode of transmission	20	11	9	10	10	16	12	4	33.3	6	60.0
1-014 Acute poliomyelitis	24	22	3	0	3	0	10	-10	-100.0	-3	-100.0
1-015 Rabies	258	229	220	282	283	291	254	37	14.4	8	2.8
1-016 Yellow fever	0	0	0	0	0	0	0	0		0	
1-017 Other arthropod-borne viral fevers and viral haemorrhagic fevers	1,345	1,942	1,586	2,080	2,778	1,017	1,946	-929	-47.7	-1,761	-63.4
1-018 Measles	13	5	21	338	801	51	236	-185	-78.4	-750	-93.6
1-019 Viral hepatitis	838	888	901	1,009	1,061	901	939	-38	-4.1	-160	-15.1
1-020 Human immunodeficiency virus [HIV]	268	349	392	461	878	917	470	447	95.3	39	4.4
1-021 Malaria	19	11	8	7	14	7	12	-5	-40.7	-7	-50.0
1-022 Leishmaniasis	0	1	0	0	0	0	0	0	-100.0	0	

CAUSE OF DEATH		NO. OF	DEATHS BY	YEAR (Jan	to Dec)			Comparison: (2015-2019)		Comparison: 2019 vs 2020		
	2015	2016	2017	2018	2019	2020	average (2015- 2019)	difference	percent change	difference	percent change	
1-023 Trypanosomiasis	1	3	0	0	0	0	1	-1	-100.0	0		
1-024 Schistosomiasis [bilharziasis]	295	318	327	364	368	327	334	-7	-2.2	-41	-11.1	
1-025 Remainder of certain infectious and parasitic												
diseases	1,390	1,577	2,001	2,253	2,049	1,554	1,854	-300	-16.2	-495	-24.2	
1-026 Neoplasms	63,003	64,594	64,125	67,138	68,657	66,252	65,503	749	1.1	-2,405	-3.5	
1-027 Malignant neoplasm of lip, oral cavity and pharynx	2,286	2,406	2,478	2,579	2,673	2,459	2,484	-25	-1.0	-214	-8.0	
1-028 Malignant neoplasm of oesophagus	546	543	472	522	572	436	531	-95	-17.9	-136	-23.8	
1-029 Malignant neoplasm of stomach	1,498	1,604	1,564	1,594	1,576	1,561	1,567	-6	-0.4	-15	-1.0	
1-030 Malignant neoplasm of colon, rectum and anus	6,543	6,593	6,708	7,420	7,731	7,388	6,999	389	5.6	-343	-4.4	
1-031 Malignant neoplasm of liver and intrahepatic bile ducts	6,505	6,814	6,318	6,506	6,401	6,010	6,509	-499	-7.7	-391	-6.1	
1-032 Malignant neoplasm of pancreas	1,734	1,820	1,924	2,032	2,011	2,001	1,904	97	5.1	-10	-0.5	
1-033 Malignant neoplasm of larynx	503	464	483	520	536	494	501	-7	-1.4	-42	-7.8	
1-034 Malignant neoplasm of trachea, bronchus and lung	9,034	9,058	8,945	9,012	9,013	7,745	9,012	-1,267	-14.1	-1,268	-14.1	
1-035 Malignant melanoma of skin	154	132	173	172	183	189	163	26	16.1	6	3.3	
1-036 Malignant neoplasm of breast	7,845	8,436	8,732	9,034	9,437	9,685	8,697	988	11.4	248	2.6	
1-037 Malignant neoplasm of cervix uteri	1,977	2,203	2,145	2,376	2,427	2,391	2,226	165	7.4	-36	-1.5	
1-038 Malignant neoplasm of other and unspecified parts of uterus	1,140	1,120	1,212	1,249	1,318	1,310	1,208	102	8.5	-8	-0.6	
1-039 Malignant neoplasm of ovary	1,730	1,849	1,867	2,056	1,977	2,081	1,896	185	9.8	104	5.3	
1-040 Malignant neoplasm of prostate	2,968	3,043	3,012	3,038	3,200	3,509	3,052	457	15.0	309	9.7	
1-041 Malignant neoplasm of bladder	381	424	430	443	415	408	419	-11	-2.5	-7	-1.7	
1-042 Malignant neoplasm of meninges, brain and other parts of central nervous system	1,595	1,520	1,358	1,375	1,373	1,386	1,444	-58	-4.0	13	0.9	
1-043 Non–Hodgkin lymphoma	1,378	1,451	1,473	1,610	1,518	1,527	1,486	41	2.8	9	0.6	

CAUSE OF DEATH		NO. OF	DEATHS BY	′ YEAR (Jan	to Dec)			Comparison: (2015-2019)		Comparison: 2019 vs 2020		
	2015	2016	2017	2018	2019	2020	average (2015- 2019)	difference	percent change	difference	percent change	
1-044 Multiple myeloma and malignant plasma cell neoplasms	282	284	289	287	355	318	299	19	6.2	-37	-10.4	
1-045 Leukaemia	2,927	3,022	2,979	3,028	3,076	2,799	3,006	-207	-6.9	-277	-9.0	
1-046 Remainder of Malignant Neoplasms	7,689	7,684	8,245	8,601	9,023	8,803	8,248	555	6.7	-220	-2.4	
1-047 Remainder of Neoplasms	4,288	4,124	3,318	3,684	3,842	3,752	3,851	-99	-2.6	-90	-2.3	
1-048 Diseases of the blood and blood forming organs and ceratin disorders involving the immune mechanism	3,709	3,889	4,789	4,657	4,339	4,188	4,277	-89	-2.1	-151	-3.5	
1-049 Anaemias 1-050 Remainder of diseases of the blood and blood forming organs and ceratin disorders involving the immune	2,616	2,858	3,146	3,270	3,344	3,278	3,047	231	7.6	-66	-2.0	
mechanism	1,093	1,031	1,643	1,387	995	910	1,230	-320	-26.0	-85	-8.5	
1-051 Endocrine, nutritional and metabolic diseases	42,728	42,571	41,642	42,654	45,449	51,644	43,009	8,635	20.1	6,195	13.6	
1-052 Diabetes Mellitus	34,050	33,295	30,932	32,106	34,570	39,782	32,991	6,791	20.6	5,212	15.1	
1-053 Malnutrition	2,803	3,218	3,582	3,645	3,827	4,217	3,415	802	23.5	390	10.2	
1-054 Remainder endocrine, nutritional and metabolic diseases	5,875	6,058	7,128	6,903	7,052	7,645	6,603	1,042	15.8	593	8.4	
1-055 Mental and behavioral disorders	503	654	1,433	1,416	1,086	1,324	1,018	306	30.0	238	21.9	
1-056 Mental and behavioral disorder due to psychoactive substance use	242	257	389	357	367	352	322	30	9.2	-15	-4.1	
1-057 Remainder of mental and behavioral disorders	261	397	1,044	1,059	719	972	696	276	39.7	253	35.2	
1-058 Diseases of the nervous sytem	7,565	7,741	8,915	9,185	10,181	8,289	8,717	-428	-4.9	-1,892	-18.6	
1-059 Meningitis	1,607	1,572	1,157	1,079	1,094	687	1,302	-615	-47.2	-407	-37.2	
1-060 Alzheimer's disease	405	411	701	755	855	893	625	268	42.8	38	4.4	
1-061 Remainder diseases of the nervous sytem	5,553	5,758	7,057	7,351	8,232	6,709	6,790	-81	-1.2	-1,523	-18.5	
1-062 Diseases of the eye and adnexa	19	5	45	43	45	54	31	23	72.0	9	20.0	
1-063 Diseases of the ear and mastoid process	38	10	78	93	75	87	59	28	48.0	12	16.0	
1-064 Diseases of the circulatory system	198,077	198,507	196,900	201,483	213,625	225,599	201,718	23,881	11.8	11,974	5.6	

CAUSE OF DEATH		NO. OF	DEATHS BY	YEAR (Jan	to Dec)			Comparison: 2 (2015-2019)		Comparison: 2019 vs 2020	
GROSE OF SERVIN	2015	2016	2017	2018	2019	2020	average (2015- 2019)	difference	percent change	difference	percent change
1-065 Acute rheumatic fever and chronic rheumatic heart diseases	2,073	2,003	2,101	2,112	2,272	1,804	2,112	-308	-14.6	-468	-20.6
1-066 Hypertensive diseases	34,506	33,452	26,471	26,836	27,764	31,695	29,806	1,889	6.3	3,931	14.2
1-067 Ischaemic heart diseases	68,572	74,134	84,120	88,433	97,475	105,254	82,547	22,707	27.5	7,779	8.0
1-068 Other heart diseases	31,729	28,641	22,134	20,042	20,416	20,615	24,592	-3,977	-16.2	199	1.0
1-069 Cerebrosvascular diseases	58,310	56,938	59,774	61,959	63,548	64,236	60,106	4,130	6.9	688	1.1
1-070 Atherosclerosis	1,111	1,315	562	227	246	340	692	-352	-50.9	94	38.2
1-071 Remainder of diseases of the circulatory system	1,776	2,024	1,738	1,874	1,904	1,655	1,863	-208	-11.2	-249	-13.1
1-072 Diseases of the respiratory system	78,859	88,139	87,760	87,720	95,879	60,230	87,671	-27,441	-31.3	-35,649	-37.2
1-073 Influenza	49	56	76	71	58	22	62	-40	-64.5	-36	-62.1
1-074 Pneumonia	49,595	57,809	57,210	56,815	62,719	34,291	56,830	-22,539	-39.7	-28,428	-45.3
1-075 Other acute lower respiratory infections	86	94	102	86	67	115	87	28	32.2	48	71.6
1-076 Chronic lower respiratory infections	23,760	24,365	24,818	24,820	26,576	20,584	24,868	-4,284	-17.2	-5,992	-22.5
1-077 Remainder of diseases of the respiratory system	5,369	5,815	5,554	5,928	6,459	5,218	5,825	-607	-10.4	-1,241	-19.2
1-078 Diseases of the digestive system	22,456	22,803	24,168	24,341	25,165	24,583	23,787	796	3.3	-582	-2.3
1-079 Gastric and duodenal ulcer	5,698	5,537	5,169	5,258	5,437	5,557	5,420	137	2.5	120	2.2
1-080 Diseases of the liver	9,040	8,990	9,425	9,968	10,359	9,824	9,556	268	2.8	-535	-5.2
1-081 Remainder of diseases of the digestive system	7,718	8,276	9,574	9,115	9,369	9,202	8,810	392	4.4	-167	-1.8
1-082 Diseases of the skin and subcutaneous tissue	2,327	2,191	2,803	3,339	3,718	3,638	2,876	762	26.5	-80	-2.2
1-083 Diseases of the muscuskeletal system and connective tissue	2,210	2,580	3,521	3,959	4,358	4,459	3,326	1,133	34.1	101	2.3
1-084 Diseases of the genitourinary system	22,031	23,526	18,759	19,227	20,603	21,623	20,829	794	3.8	1,020	5.0
1-085 Glomerular and renal tubulo-interstitial diseases	3,970	3,767	3,042	3,198	3,388	3,104	3,473	-369	-10.6	-284	-8.4
1-086 Remainder of diseases of the genitourinary system	18,061	19,759	15,717	16,029	17,215	18,519	17,356	1,163	6.7	1,304	7.6
1-087 Pregnancy, chilbirth and the puerperium	1,721	1,483	1,484	1,616	1,458	1,971	1,552	419	27.0	513	35.2

CAUSE OF DEATH		NO. OF	DEATHS BY	YEAR (Jan	to Dec)			Comparison: e (2015-2019)		Comparison: 2019 vs 2020	
	2015	2016	2017	2018	2019	2020	average (2015- 2019)	difference	percent change	difference	percent change
1-088 Pregnancy with abortive outcome	174	147	157	135	122	180	147	33	22.4	58	47.5
1-089 Other direct obstetric deaths	1,431	1,251	1,193	1,230	1,122	1,503	1,245	258	20.7	381	34.0
1-090 Indirect obstetric deaths	109	82	118	192	173	278	135	143	106.2	105	60.7
1-091 Remainder of pregnancy, chilbirth and the puerperium	7	3	16	59	41	10	25	-15	-60.3	-31	-75.6
1-092 Certain conditions originating in the perinatal period	9,831	9,785	11,054	11,768	11,260	9,544	10,740	-1,196	-11.1	-1,716	-15.2
1-093 Congenital malformations, deformations and chromosonal abnormalities	5,138	5,100	5,336	5,415	5,912	4,727	5,380	-653	-12.1	-1,185	-20.0
1-094 Symptoms, signs and abnormal clinical and laboratory findings, NEC	18,659	19,839	20,680	21,918	22,918	26,218	20,803	5,415	26.0	3,300	14.4
1-095 External causes of morbidity and mortality	39,256	44,426	44,646	43,808	42,960	36,351	43,019	-6,668	-15.5	-6,609	-15.4
1-096 Transport accidents	10,033	11,292	11,399	12,536	12,799	8,736	11,612	-2,876	-24.8	-4,063	-31.7
1-096a Land transport accidents	10,012	11,274	11,360	12,487	12,764	8,722	11,579	-2,857	-24.7	-4,042	-31.7
1-096b Water Transport accidents	11	13	26	14	8	1	14	-13	-93.1	-7	-87.5
1-096c Air and space transport accidents	4	4	2	13	3	0	5	-5	-100.0	-3	-100.0
1-096d Other and unspecified transport accidents	6	1	11	22	24	13	13	0	1.6	-11	-45.8
1-097 Falls	2,391	2,780	2,730	3,074	3,144	3,483	2,824	659	23.3	339	10.8
1-098 Accidental drowning and submersion	3,186	3,202	3,810	3,534	3,295	2,760	3,405	-645	-19.0	-535	-16.2
1-099 Exposure to smoke, fire and flames	501	469	446	429	446	333	458	-125	-27.3	-113	-25.3
1-100 Accidental poisoning by and exposure to noxious substances	204	151	386	433	640	629	363	266	73.4	-11	-1.7
1-101 Intentional self-harm	2,481	2,413	2,463	2,984	2,808	4,439	2,630	1,809	68.8	1,631	58.1
1-102 Assault	11,096	14,869	11,845	9,916	8,831	7,064	11,311	-4,247	-37.5	-1,767	-20.0
1-103 All other external causes	9,364	9,250	11,567	10,902	10,997	8,907	10,416	-1,509	-14.5	-2,090	-19.0
1–901 SARS U04						0				0	
Vaping-related disorder U07.0						0				0	

CAUSE OF DEATH		NO. OF	DEATHS BY	Y YEAR (Jan	to Dec)			Comparison: e (2015-2019)		Comparison: 2019 vs 2020	
CAUSE OF BEATH	2015	2016	2017	2018	2019	2020	average (2015- 2019)	difference	percent change	difference	percent change
COVID-19 U07.1-U07.2						30,189				30,189	
COVID-19 Virus identified U07.1						9,317				9,317	
COVID-19 Virus not identified U07.2						20,872				20,872	

^{*} Data as of July 29, 2021

Appendix 2. January to May number of deaths by cause of death, 2015 to 2021

CAUSE OF DEATH				HS BY YEA	AR (Jan to	May)			arison (Jan to e (2015-2019)		Comparison (Jan to May): 2019 vs 2021	
CAOSE OF SEATH	2015	2016	2017	2018	2019	2020	2021	average (2015- 2019)	difference	percent change	difference	percent change
1-001 Certain infectious and parasitic diseases	17,056	17,129	16,273	16,562	17,766	14,258	12,563	16,957	-4,394	-25.9	-5,203	-29.3
1-002 Cholera	2	4	6	0	1	0	0	3	-3	-100.0	-1	-100.0
1-003 Diarrhea and gastroenteritis of presumed infectious origin	1,442	1,915	1,685	1,433	1,501	1,139	1,220	1,595	-375	-23.5	-281	-18.7
1-004 Other intestinal infectious diseases	241	219	192	235	163	167	137	210	-73	-34.8	-26	-16.0
1-005 Respiratory tuberculosis	10,187	9,825	9,044	9,294	9,452	8,260	6,953	9,560	-2,607	-27.3	-2,499	-26.4
1-006 Other tuberculosis	582	584	560	561	547	439	409	567	-158	-27.8	-138	-25.2
1-007 Plague	0	1	0	0	0	0	0	0	0	-100.0	0	
1-008 Tetanus	222	265	241	226	229	191	181	237	-56	-23.5	-48	-21.0
1-009 Diphtheria	7	11	9	10	9	4	10	9	1	8.7	1	11.1
1-010 Whooping cough	2	4	8	5	8	0	0	5	-5	-100.0	-8	-100.0
1-011 Meningococcal infection	37	32	27	45	41	24	29	36	-7	-20.3	-12	-29.3
1-012 Septicaemia	2,836	2,545	2,600	2,618	2,570	1,987	1,852	2,634	-782	-29.7	-718	-27.9
1-013 Infections with a predominantly sexual mode of transmission	8	4	2	5	7	6	3	5	-2	-42.3	-4	-57.1
1-014 Acute poliomyelitis	6	9	1	0	1	0	0	3	-3	-100.0	-1	-100.0
1-015 Rabies	117	88	95	119	107	117	138	105	33	31.2	31	29.0
1-016 Yellow fever	0	0	0	0	0	0	0	0	0		0	
1-017 Other arthropod-borne viral fevers and viral haemorrhagic fevers	283	480	479	432	757	452	384	486	-102	-21.0	-373	-49.3
1-018 Measles	8	1	3	83	698	46	5	159	-154	-96.8	-693	-99.3
1-019 Viral hepatitis	336	366	353	396	457	372	300	382	-82	-21.4	-157	-34.4
1-020 Human immunodeficiency virus [HIV]	100	119	169	209	335	385	182	186	-4	-2.4	-153	-45.7
1-021 Malaria	9	4	4	4	2	1	1	5	-4	-78.3	-1	-50.0
1-022 Leishmaniasis	0	1	0	0	0	0	0	0	0	-100.0	0	

CAUSE OF DEATH		NO.	OF DEAT	HS BY YEA	R (Jan to	May)			arison (Jan to e (2015-2019)	• •	Comparison (Jan to May): 2019 vs 2021		
	2015	2016	2017	2018	2019	2020	2021	average (2015- 2019)	difference	percent change	difference	percent change	
1-023 Trypanosomiasis	1	0	0	0	0	0	0	0	0	-100.0	0		
1-024 Schistosomiasis [bilharziasis]	141	131	155	146	154	136	133	145	-12	-8.5	-21	-13.6	
1-025 Remainder of certain infectious and parasitic diseases	489	521	640	741	727	532	626	624	2	0.4	-101	-13.9	
1-026 Neoplasms	25,454	26,632	26,249	27,425	28,539	27,234	25,863	26,860	-997	-3.7	-2,676	-9.4	
1-027 Malignant neoplasm of lip, oral cavity and pharynx	897	1,012	1,037	1,081	1,109	1,051	935	1,027	-92	-9.0	-174	-15.7	
1-028 Malignant neoplasm of oesophagus	228	232	188	193	244	195	197	217	-20	-9.2	-47	-19.3	
1-029 Malignant neoplasm of stomach	614	674	649	616	619	632	579	634	-55	-8.7	-40	-6.5	
1-030 Malignant neoplasm of colon, rectum and anus	2,605	2,734	2,735	3,037	3,190	3,096	2,889	2,860	29	1.0	-301	-9.4	
1-031 Malignant neoplasm of liver and intrahepatic bile ducts	2,626	2,802	2,595	2,639	2,678	2,556	2,313	2,668	-355	-13.3	-365	-13.6	
1-032 Malignant neoplasm of pancreas	711	728	817	822	816	869	773	779	-6	-0.7	-43	-5.3	
1-033 Malignant neoplasm of larynx	229	186	207	220	224	222	149	213	-64	-30.1	-75	-33.5	
1-034 Malignant neoplasm of trachea, bronchus and lung	3,764	3,819	3,638	3,786	3,795	3,310	2,810	3,760	-950	-25.3	-985	-26.0	
1-035 Malignant melanoma of skin	57	50	64	68	81	77	74	64	10	15.6	-7	-8.6	
1-036 Malignant neoplasm of breast	3,173	3,371	3,587	3,661	3,948	3,793	3,947	3,548	399	11.2	-1	0.0	
1-037 Malignant neoplasm of cervix uteri	763	874	887	999	983	974	958	901	57	6.3	-25	-2.5	
1-038 Malignant neoplasm of other and unspecified parts of uterus	445	446	495	529	610	549	519	505	14	2.8	-91	-14.9	
1-039 Malignant neoplasm of ovary	693	747	751	876	823	797	827	778	49	6.3	4	0.5	
1-040 Malignant neoplasm of prostate	1,153	1,198	1,223	1,201	1,328	1,363	1,451	1,221	230	18.9	123	9.3	
1-041 Malignant neoplasm of bladder	158	165	178	193	172	173	142	173	-31	-18.0	-30	-17.4	
1-042 Malignant neoplasm of meninges, brain and other parts of central nervous system	672	694	561	579	562	556	540	614	-74	-12.0	-22	-3.9	
1-043 Non–Hodgkin lymphoma	517	588	586	652	621	652	582	593	-11	-1.8	-39	-6.3	

CAUSE OF DEATH		NO.	OF DEAT	HS BY YEA	AR (Jan to	May)		•	arison (Jan to e (2015-2019)	• • •	Comparison (Jan to May): 2019 vs 2021		
	2015	2016	2017	2018	2019	2020	2021	average (2015- 2019)	difference	percent change	difference	percent change	
1-044 Multiple myeloma and malignant plasma cell									_			4-4	
neoplasms	117	139	103	109	146	116	124	123	220	1.0	-22	-15.1	
1-045 Leukaemia	1,223	1,201	1,225	1,225	1,306	1,166	1,006	1,236	-230	-18.6	-300	-23.0	
1-046 Remainder of Malignant Neoplasms	3,097	3,093	3,412	3,465	3,672	3,593	3,530	3,348	182	5.4	-142	-3.9	
1-047 Remainder of Neoplasms	1,712	1,879	1,311	1,474	1,612	1,494	1,518	1,598	-80	-5.0	-94	-5.8	
1-048 Diseases of the blood and blood forming organs and ceratin disorders involving the immune mechanism	1,453	1,499	1,950	1,826	1,840	1,630	2,067	1,714	353	20.6	227	12.3	
1-049 Anaemias	1,038	1,091	1,334	1,326	1,438	1,268	1,377	1,245	132	10.6	-61	-4.2	
1-050 Remainder of diseases of the blood and blood forming organs and ceratin disorders involving the immune mechanism	415	408	616	500	402	362	690	468	222	47.4	288	71.6	
1-051 Endocrine, nutritional and metabolic diseases	17,378	16,921	16,945	17,534	18,795	19,166	24,604	17,515	7,089	40.5	5,809	30.9	
1-052 Diabetes Mellitus	13,815	13,213	12,596	13,072	14,288	14,768	18,719	13,397	5,322	39.7	4,431	31.0	
1-053 Malnutrition	1,101	1,262	1,466	1,502	1,562	1,555	2,168	1,379	789	57.3	606	38.8	
1-054 Remainder endocrine, nutritional and metabolic diseases	2,462	2,446	2,883	2,960	2,945	2,843	3,717	2,739	978	35.7	772	26.2	
1-055 Mental and behavioral disorders	205	257	577	583	467	491	668	418	250	59.9	201	43.0	
1-056 Mental and behavioral disorder due to psychoactive substance use	106	113	150	136	152	122	176	131	45	33.9	24	15.8	
1-057 Remainder of mental and behavioral disorders	99	144	427	447	315	369	492	286	206	71.8	177	56.2	
1-058 Diseases of the nervous sytem	3,090	3,037	3,587	3,747	4,235	3,576	3,542	3,539	3	0.1	-693	-16.4	
1-059 Meningitis	663	650	471	458	472	290	259	543	-284	-52.3	-213	-45.1	
1-060 Alzheimer's disease	171	153	303	314	380	388	473	264	209	79.0	93	24.5	
1-061 Remainder diseases of the nervous sytem	2,256	2,234	2,813	2,975	3,383	2,898	2,810	2,732	78	2.8	-573	-16.9	
1-062 Diseases of the eye and adnexa	10	1	18	21	18	22	32	14	18	135.3	14	77.8	
1-063 Diseases of the ear and mastoid process	12	1	30	38	37	32	45	24	21	90.7	8	21.6	
1-064 Diseases of the circulatory system	84,459	83,866	82,174	83,863	90,183	87,826	109,410	84,909	24,501	28.9	19,227	21.3	

CAUSE OF DEATH		NO.	OF DEAT	HS BY YEA	AR (Jan to	May)		•	arison (Jan to e (2015-2019)	• • •	Comparison (Jan to May): 2019 vs 2021	
	2015	2016	2017	2018	2019	2020	2021	average (2015- 2019)	difference	percent change	difference	percent change
1-065 Acute rheumatic fever and chronic rheumatic												
heart diseases	921	828	865	888	971	760	737	895	-158	-17.6	-234	-24.1
1-066 Hypertensive diseases	15,065	15,362	11,092	11,072	11,741	12,321	15,290	12,866	2,424	18.8	3,549	30.2
1-067 Ischaemic heart diseases	28,441	29,532	34,491	36,338	40,844	40,152	53,024	33,929	19,095	56.3	12,180	29.8
1-068 Other heart diseases	14,131	12,649	9,248	8,591	8,677	8,072	10,130	10,659	-529	-5.0	1,453	16.7
1-069 Cerebrosvascular diseases	24,610	24,059	25,388	26,098	27,060	25,679	29,382	25,443	3,939	15.5	2,322	8.6
1-070 Atherosclerosis	538	555	411	86	116	150	150	341	-191	-56.0	34	29.3
1-071 Remainder of diseases of the circulatory system	753	881	679	790	774	692	697	775	-78	-10.1	-77	-9.9
1-072 Diseases of the respiratory system	33,248	34,855	34,785	36,531	40,430	29,917	23,911	35,970	-12,059	-33.5	-16,519	-40.9
1-073 Influenza	16	12	24	21	30	9	7	21	-14	-66.0	-23	-76.7
1-074 Pneumonia	20,872	22,726	22,492	23,660	26,456	18,151	12,986	23,241	-10,255	-44.1	-13,470	-50.9
1-075 Other acute lower respiratory infections	29	41	51	34	20	47	30	35	-5	-14.3	10	50.0
1-076 Chronic lower respiratory infections	10,077	9,836	10,062	10,417	11,320	9,437	8,763	10,342	-1,579	-15.3	-2,557	-22.6
1-077 Remainder of diseases of the respiratory system	2,254	2,240	2,156	2,399	2,604	2,273	2,125	2,331	-206	-8.8	-479	-18.4
1-078 Diseases of the digestive system	9,391	9,341	10,019	10,032	10,507	9,640	10,640	9,858	782	7.9	133	1.3
1-079 Gastric and duodenal ulcer	2,409	2,239	2,095	2,190	2,309	2,193	2,427	2,248	179	7.9	118	5.1
1-080 Diseases of the liver	3,786	3,692	3,913	4,077	4,326	3,850	4,046	3,959	87	2.2	-280	-6.5
1-081 Remainder of diseases of the digestive system	3,196	3,410	4,011	3,765	3,872	3,597	4,167	3,651	516	14.1	295	7.6
1-082 Diseases of the skin and subcutaneous tissue	970	817	1,080	1,303	1,493	1,475	1,491	1,133	358	31.6	-2	-0.1
1-083 Diseases of the muscuskeletal system and						4 ===					•	
connective tissue	829	1,008	1,400	1,570	1,773	1,735	2,105	1,316	789	60.0	332	18.7
1-084 Diseases of the genitourinary system	9,187	9,665	7,623	7,753	8,520	8,416	9,350	8,550	800	9.4	830	9.7
1-085 Glomerular and renal tubulo-interstitial diseases	1,796	1,457	1,219	1,294	1,389	1,309	1,250	1,431	-181	-12.6	-139	-10.0
1-086 Remainder of diseases of the genitourinary system	7,391	8,208	6,404	6,459	7,131	7,107	8,100	7,119	981	13.8	969	13.6

CAUSE OF DEATH		NO.	OF DEAT	HS BY YEA	AR (Jan to		arison (Jan to e (2015-2019)	Comparison (Jan to May): 2019 vs 2021				
	2015	2016	2017	2018	2019	2020	2021	average (2015- 2019)	difference	percent change	difference	percent change
1-087 Pregnancy, chilbirth and the puerperium	675	589	547	601	602	668	493	603	-110	-18.2	-109	-18.1
1-088 Pregnancy with abortive outcome	70	64	63	61	56	65	49	63	-14	-22.0	-7	-12.5
1-089 Other direct obstetric deaths	550	488	438	438	459	515	373	475	-102	-21.4	-86	-18.7
1-090 Indirect obstetric deaths	53	34	36	74	71	85	67	54	13	25.0	-4	-5.6
1-091 Remainder of pregnancy, chilbirth and the												
puerperium	2	3	10	28	16	3	4	12	-8	-66.1	-12	-75.0
1-092 Certain conditions originating in the perinatal period	3,600	3,667	4,335	4,406	4,303	3,493	3,265	4,062	-797	-19.6	-1,038	-24.1
1-093 Congenital malformations, deformations and chromosonal abnormalities	1,992	1,976	2,213	2,133	2,444	1,845	1,970	2,152	-182	-8.4	-474	-19.4
1-094 Symptoms, signs and abnormal clinical and laboratory findings, NEC	7,484	7,946	8,494	9,075	9,569	9,809	13,992	8,514	5,478	64.3	4,423	46.2
1-095 External causes of morbidity and mortality	16,254	16,669	18,706	18,013	18,442	13,615	15,412	17,617	-2,205	-12.5	-3,030	-16.4
1-096 Transport accidents	4,135	4,725	4,707	5,265	5,493	3,346	4,073	4,865	-792	-16.3	-1,420	-25.9
1-096a Land transport accidents	4,124	4,719	4,694	5,245	5,471	3,342	4,062	4,851	-789	-16.3	-1,409	-25.8
1-096b Water Transport accidents	5	6	6	6	3	0	3	5	-2	-42.3	0	0.0
1-096c Air and space transport accidents	3	0	2	11	2	0	8	4	4	122.2	6	300.0
1-096d Other and unspecified transport accidents	3	0	5	3	17	4	0	6	-6	-100.0	-17	-100.0
1-097 Falls	974	1,083	1,089	1,272	1,341	1,268	1,691	1,152	539	46.8	350	26.1
1-098 Accidental drowning and submersion	1,298	1,363	1,709	1,586	1,499	939	1,295	1,491	-196	-13.1	-204	-13.6
1-099 Exposure to smoke, fire and flames	269	205	182	196	220	152	133	214	-81	-38.0	-87	-39.5
1-100 Accidental poisoning by and exposure to noxious		72	454		222	224	242	4.42	474			
substances	86	73	151	176	222	221	313	142	171	121.0	91	41.0
1-101 Intentional self-harm	1,024 4,611	1,010	1,015	1,195	1,229	1,568	1,612	1,095	517	47.3	383	31.2
1-102 Assault		4,367	5,290	3,826	3,978	2,692	2,497	4,414	-1,917	-43.4	-1,481	-37.2
1-103 All other external causes	3,857	3,843	4,563	4,497	4,460	3,429	3,798	4,244	-446	-10.5	-662	-14.8
1–901 SARS U04	0	0	0	0	0	0	0		0		0	

CAUSE OF DEATH		NO.	OF DEAT	HS BY YEA	AR (Jan to	May)			arison (Jan to : (2015-2019)	Compariso May 2019 vs	/): [`]	
CAGSE OF SEATH	2015	2016	2017	2018	2019	2020	2021	average (2015- 2019)	difference	percent change	difference	percent change
Vaping-related disorder U07.0	0	0	0	0	0	0	0		0		0	
COVID-19 U07.1-U07.2	0	0	0	0	0	5,933	24,967		24967		24,967	
COVID-19 Virus identified U07.1	0	0	0	0	0	732	15,850		15850		15,850	
COVID-19 Virus not identified U07.2						5,201	9,117		9117		9,117	

^{*} Data as of July 29, 2021

Appendix 3. Monthly COVID-19 related deaths, January 2020 to May 2021

Year	Month	DOH	U07.1	U07.2	U07.1 + U07.2
2020	January	0	0	1	1
	February	1	0	1	1
	March	414	145	319	464
	April	605	345	2,093	2,438
	May	414	242	2,787	3,029
	June	863	493	2,269	2,762
	July	1,700	1,285	3,057	4,342
	August	2,130	1,866	3,276	5,142
	September	1,869	1,666	2,413	4,079
	October	1,440	1,315	1,944	3,259
	November	1,096	1,034	1,436	2,470
	December	920	926	1,276	2,202
2021	January	1,115	1,114	1,253	2,367
	February	945	942	1,063	2,005
	March	2,105	3,162	1,903	5,065
	April	4,005	6,868	3,007	9,875
	May	3,686	3,764	1,891	5,655
2020 (Jan-Dec)		11,452	9,317	20,872	30,189
2021 (Jan-May)		11,856	15,850	9,117	24,967
Jan 2020 to May 2021		23,308	25,167	29,989	55,156

^{*} DOH data as of August 8, 2021; PSA data as of July 29, 2021.

Appendix 4. Excess deaths, number and percent deviation from expected, January 2020 to May 2021

Date	monthly average 2015-2019	actual number of deaths	difference	percent change
Jan-20	51,995	53,517	1,522	2.93
Feb-20	45,454	46,278	824	1.81
Mar-20	47,911	46,041	-1,870	-3.90
Apr-20	47,258	44,802	-2,456	-5.20
May-20	49,102	50,280	1,178	2.40
Jun-20	46,107	48,518	2,411	5.23
Jul-20	48,859	54,455	5,596	11.45
Aug-20	50,565	56,868	6,303	12.46
Sep-20	49,371	53,995	4,624	9.37
Oct-20	51,316	54,240	2,924	5.70
Nov-20	48,675	51,626	2,951	6.06
Dec-20	50,016	53,833	3,817	7.63
Jan-21	51,995	57,241	5,246	10.09
Feb-21	45,454	52,762	7,308	16.08
Mar-21	47,911	61,024	13,113	27.37
Apr-21	47,258	66,796	19,538	41.34
May-21	49,102	67,099	17,997	36.65
2020 (Jan to Dec)	586,630	614,453	27,823	4.74
2021 (Jan to May)	241,721	304,922	63,201	26.15
Jan 2020 to May 2021	828,351	919,375	91,024	10.99

^{*} PSA data as of August 5, 2021.

Appendix 5. Excess deaths by sex, number and percent deviation from expected, January 2020 to May 2021

MALE FEMALE

			!/\LL			I EIVIAEE					
Date	monthly average 2015-2019	actual number of deaths	difference	percent change	Date	monthly average 2015- 2019	actual number of deaths	difference	percent change		
Jan-20	29,815	30,698	883	2.96	Jan-20	22,180	22,819	639	2.88		
Feb-20	26,026	26,533	507	1.95	Feb-20	19,428	19,745	317	1.63		
Mar-20	27,475	26,143	-1,332	-4.85	Mar-20	20,436	19,898	-538	-2.63		
Apr-20	26,974	24,953	-2,021	-7.49	Apr-20	20,285	19,849	-436	-2.15		
May-20	28,138	28,046	-92	-0.33	May-20	20,964	22,234	1,270	6.06		
Jun-20	26,479	28,023	1,544	5.83	Jun-20	19,627	20,495	868	4.42		
Jul-20	28,057	31,480	3,423	12.20	Jul-20	20,802	22,975	2,173	10.44		
Aug-20	28,962	32,782	3,820	13.19	Aug-20	21,603	24,086	2,483	11.49		
Sep-20	28,307	30,908	2,601	9.19	Sep-20	21,064	23,087	2,023	9.61		
Oct-20	29,249	31,313	2,064	7.06	Oct-20	22,067	22,927	860	3.90		
Nov-20	27,873	29,796	1,923	6.90	Nov-20	20,801	21,830	1,029	4.95		
Dec-20	28,862	31,043	2,181	7.56	Dec-20	21,153	22,790	1,637	7.74		
Jan-21	29,815	32,793	2,978	9.99	Jan-21	22,180	24,448	2,268	10.23		
Feb-21	26,026	30,038	4,012	15.42	Feb-21	19,428	22,724	3,296	16.96		
Mar-21	27,475	34,649	7,174	26.11	Mar-21	20,436	26,375	5,939	29.06		
Apr-21	26,974	37,664	10,690	39.63	Apr-21	20,285	29,132	8,847	43.62		
May-21	28,138	37,315	9,177	32.61	May-21	20,964	29,784	8,820	42.07		
2020 (Jan to Dec)	336,219	351,718	15,499	4.61	2020 (Jan to Dec)	250,411	262,735	12,324	4.92		
2021 (Jan to May)	138,428	172,459	34,031	24.58	2021 (Jan to May)	103,293	132,463	29,170	28.24		
Jan 2020 to May 2021	474,647	524,177	49,530	10.44	Jan 2020 to May 2021	353,704	395,198	41,494	11.73		

^{*} PSA data as of August 5, 2021.

Appendix 6. Point Forecast and 95% Prediction Intervals for Female Excess Deaths (2021w21 to 2020w26)

	Point Forecast	95% PI LL	95% PI UL	_		Point Forecast	95% PI LL	95% PI UL		Point Forecast	95% PI LL	95% P
2021w21	2,216	1,705	2,727		2021w41	2,439	889	3,990	2022w09	2,663	531	4,796
2021w22	2,227	1,620	2,834		2021w42	2,451	866	4,035	2022w10	2,674	517	4,832
2021w23	2,238	1,549	2,928		2021w43	2,462	844	4,080	2022w11	2,685	503	4,868
2021w24	2,249	1,486	3,013		2021w44	2,473	822	4,124	2022w12	2,697	490	4,903
2021w25	2,261	1,430	3,091		2021w45	2,484	801	4,167	2022w13	2,708	477	4,939
2021w26	2,272	1,379	3,164		2021w46	2,495	781	4,210	2022w14	2,719	464	4,974
2021w27	2,283	1,332	3,234		2021w47	2,507	761	4,252	2022w15	2,730	452	5,008
2021w28	2,294	1,289	3,300		2021w48	2,518	742	4,294	2022w16	2,741	440	5,043
2021w29	2,305	1,248	3,363		2021w49	2,529	723	4,335	2022w17	2,753	428	5,077
2021w30	2,316	1,210	3,423		2021w50	2,540	705	4,376	2022w18	2,764	416	5,111
2021w31	2,328	1,173	3,482		2021w51	2,551	687	4,416	2022w19	2,775	404	5,145
2021w32	2,339	1,139	3,539		2021w52	2,562	670	4,455	2022w20	2,786	393	5,179
2021w33	2,350	1,106	3,594		2022w01	2,574	653	4,495	2022w21	2,797	382	5,213
2021w34	2,361	1,075	3,647		2022w02	2,585	636	4,534	2022w22	2,808	371	5,246
2021w35	2,372	1,045	3,699		2022w03	2,596	620	4,572	2022w23	2,820	360	5,279
2021w36	2,384	1,017	3,750		2022w04	2,607	604	4,610	2022w24	2,831	350	5,312
2021w37	2,395	989	3,800		2022w05	2,618	589	4,648	2022w25	2,842	339	5,344
2021w38	2,406	963	3,849		2022w06	2,630	574	4,685	2022w26	2,853	329	5,377
2021w39	2,417	937	3,897		2022w07	2,641	559	4,722				
2021w40	2,428	913	3,944		2022w08	2,652	545	4,759				

Appendix 7. Point Forecast and 95% Prediction Intervals for Female Excess Deaths (2021w21 to 2020w26)

	Point Forecast	95% PI LL	95% PI UL		Point Forecast	95% PI LL	95% PI UL		Point Forecast	95% PI LL	95% PI UL
2021w21	2,047	1,641	2,453	2021w41	3,030	1,524	4,535	2022w09	3,475	907	6,044
2021w22	2,100	1,621	2,579	2021w42	3,183	1,626	4,740	2022w10	3,494	870	6,118
2021w23	2,568	2,023	3,114	2021w43	3,149	1,540	4,757	2022w11	3,474	794	6,154
2021w24	2,228	1,620	2,836	2021w44	3,167	1,507	4,827	2022w12	3,588	852	6,325
2021w25	2,577	1,910	3,245	2021w45	3,149	1,437	4,860	2022w13	3,861	1,068	6,654
2021w26	2,435	1,710	3,160	2021w46	3,440	1,676	5,203	2022w14	3,882	1,032	6,731
2021w27	2,761	1,981	3,542	2021w47	3,433	1,617	5,248	2022w15	3,827	920	6,734
2021w28	2,763	1,928	3,598	2021w48	3,396	1,529	5,264	2022w16	3,878	913	6,842
2021w29	2,770	1,881	3,659	2021w49	3,546	1,626	5,466	2022w17	3,866	844	6,888
2021w30	2,659	1,718	3,601	2021w50	3,562	1,590	5,535	2022w18	4,064	984	7,143
2021w31	2,678	1,684	3,672	2021w51	3,376	1,350	5,401	2022w19	4,253	1,115	7,391
2021w32	2,726	1,680	3,772	2021w52	3,564	1,485	5,642	2022w20	4,088	892	7,285
2021w33	2,810	1,713	3,908	2022w01	3,531	1,399	5,663	2022w21	4,098	842	7,354
2021w34	2,799	1,650	3,948	2022w02	3,660	1,474	5,845	2022w22	4,152	837	7,467
2021w35	2,712	1,512	3,911	2022w03	3,551	1,311	5,791	2022w23	4,620	1,246	7,994
2021w36	3,162	1,911	4,413	2022w04	3,701	1,408	5,995	2022w24	4,280	846	7,714
2021w37	3,005	1,703	4,306	2022w05	3,574	1,226	5,922	2022w25	4,629	1,135	8,123
2021w38	3,284	1,931	4,636	2022w06	3,487	1,084	5,889	2022w26	4,487	932	8,041
2021w39	3,074	1,670	4,477	2022w07	3,382	925	5,840				
2021w40	3,141	1,687	4,596	2022w08	3,458	945	5,971				

Appendix 8. Point Forecast and 95% Prediction Intervals for 65 and Over Excess Deaths (2021w21 to 2020w26)

				_								
	Point Forecast	95% PI LL	95% PI UL			Point Forecast	95% PI LL	95% PI UL		Point Forecast	95% PI LL	95%
2021w21	3,074	2,499	3,649		2021w41	4,227	2,085	6,369	2022w09	5,380	1,681	9,07
2021w22	3,132	2,456	3,808		2021w42	4,285	2,068	6,501	2022w10	5,438	1,656	9,21
2021w23	3,189	2,420	3,958		2021w43	4,342	2,051	6,634	2022w11	5,495	1,631	9,35
2021w24	3,247	2,391	4,103		2021w44	4,400	2,033	6,767	2022w12	5,553	1,606	9,50
2021w25	3,305	2,365	4,245		2021w45	4,458	2,016	6,900	2022w13	5,611	1,580	9,64
2021w26	3,362	2,341	4,383		2021w46	4,515	1,998	7,033	2022w14	5,668	1,554	9,783
2021w27	3,420	2,320	4,520		2021w47	4,573	1,979	7,167	2022w15	5,726	1,527	9,92
2021w28	3,478	2,300	4,655		2021w48	4,631	1,960	7,301	2022w16	5,783	1,500	10,0
2021w29	3,535	2,282	4,789		2021w49	4,688	1,941	7,435	2022w17	5,841	1,472	10,2
2021w30	3,593	2,264	4,922		2021w50	4,746	1,922	7,570	2022w18	5,899	1,444	10,3
2021w31	3,650	2,247	5,054		2021w51	4,803	1,902	7,705	2022w19	5,956	1,415	10,49
2021w32	3,708	2,230	5,186		2021w52	4,861	1,882	7,840	2022w20	6,014	1,386	10,64
2021w33	3,766	2,214	5,318		2022w01	4,919	1,861	7,976	2022w21	6,072	1,357	10,78
2021w34	3,823	2,198	5,449		2022w02	4,976	1,840	8,113	2022w22	6,129	1,327	10,93
2021w35	3,881	2,182	5,580		2022w03	5,034	1,818	8,250	2022w23	6,187	1,297	11,07
2021w36	3,939	2,166	5,712		2022w04	5,092	1,797	8,387	2022w24	6,245	1,266	11,22
2021w37	3,996	2,150	5,843		2022w05	5,149	1,774	8,524	2022w25	6,302	1,235	11,3
2021w38	4,054	2,134	5,974		2022w06	5,207	1,751	8,663	2022w26	6,360	1,203	11,51
2021w39	4,112	2,118	6,106		2022w07	5,265	1,728	8,801				
2021w40	4,169	2,101	6,237		2022w08	5,322	1,705	8,940				