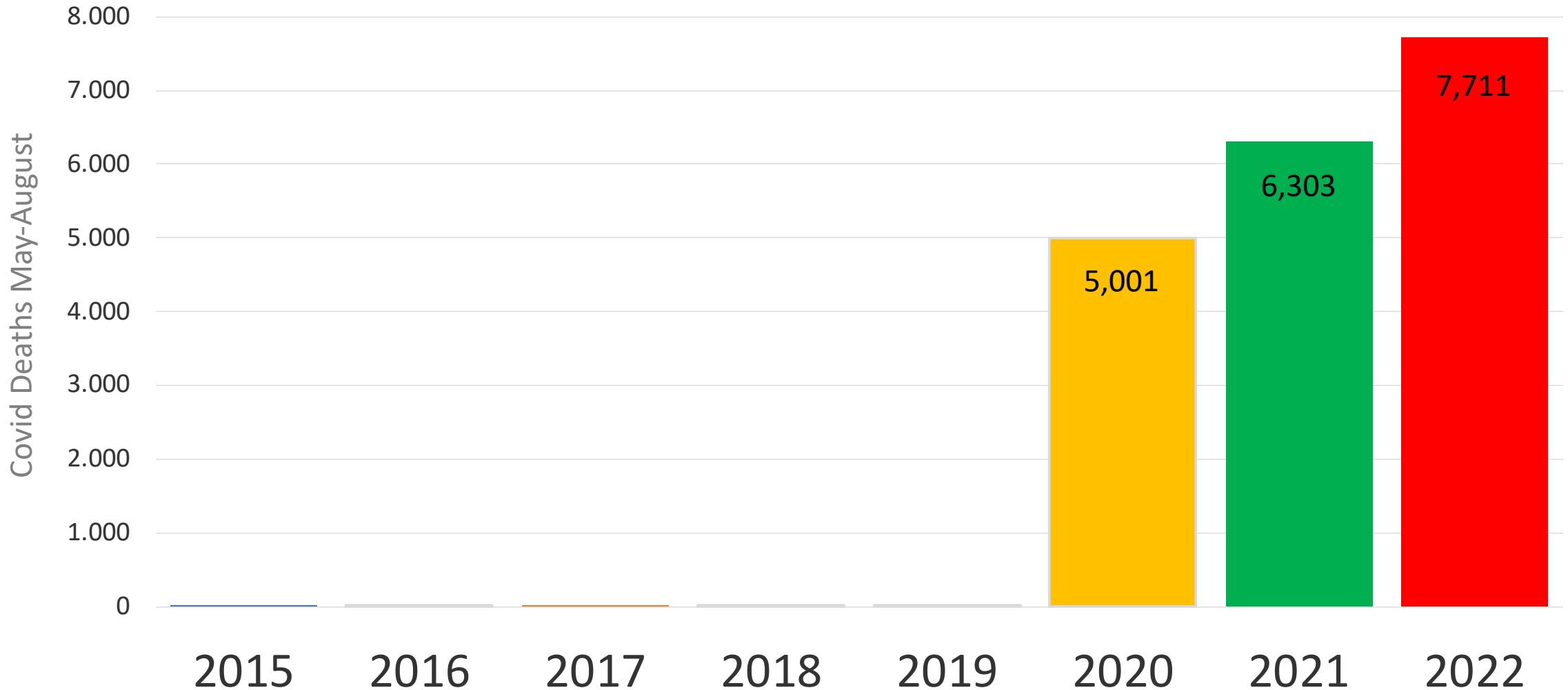


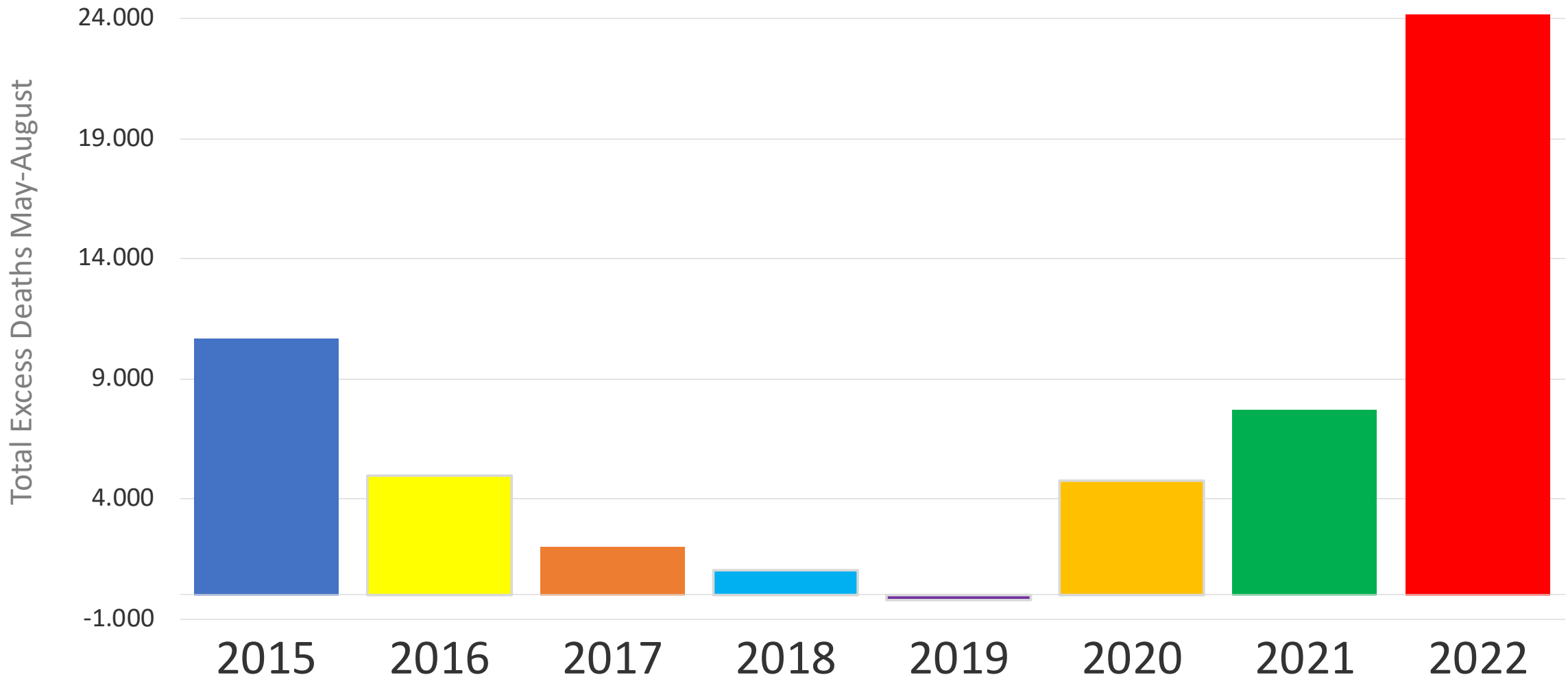
SPAIN: Deaths attributed to COVID

Four months combined: May + June + July + August



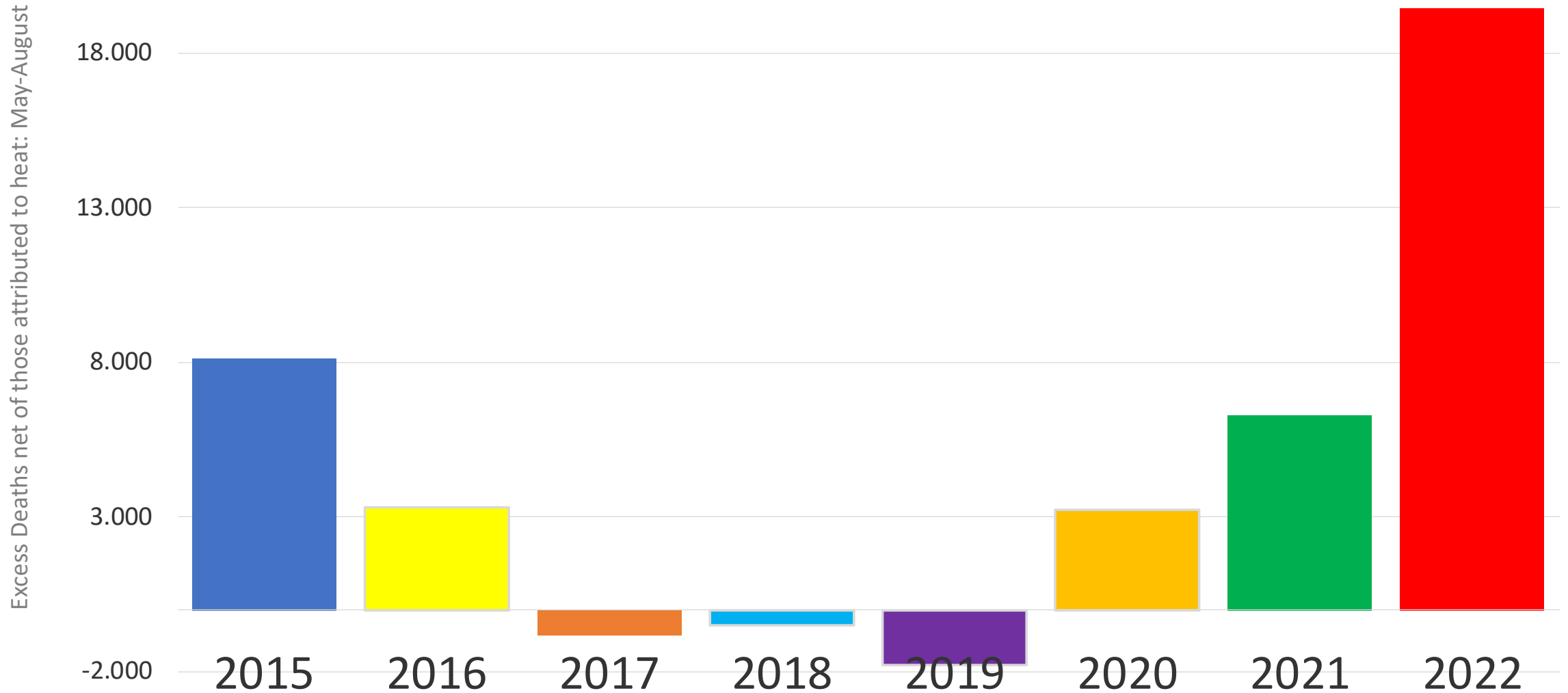
Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

SPAIN: MoMo official Age-adjusted **All Cause Excess Deaths** Four months combined: May + June + July + Aug



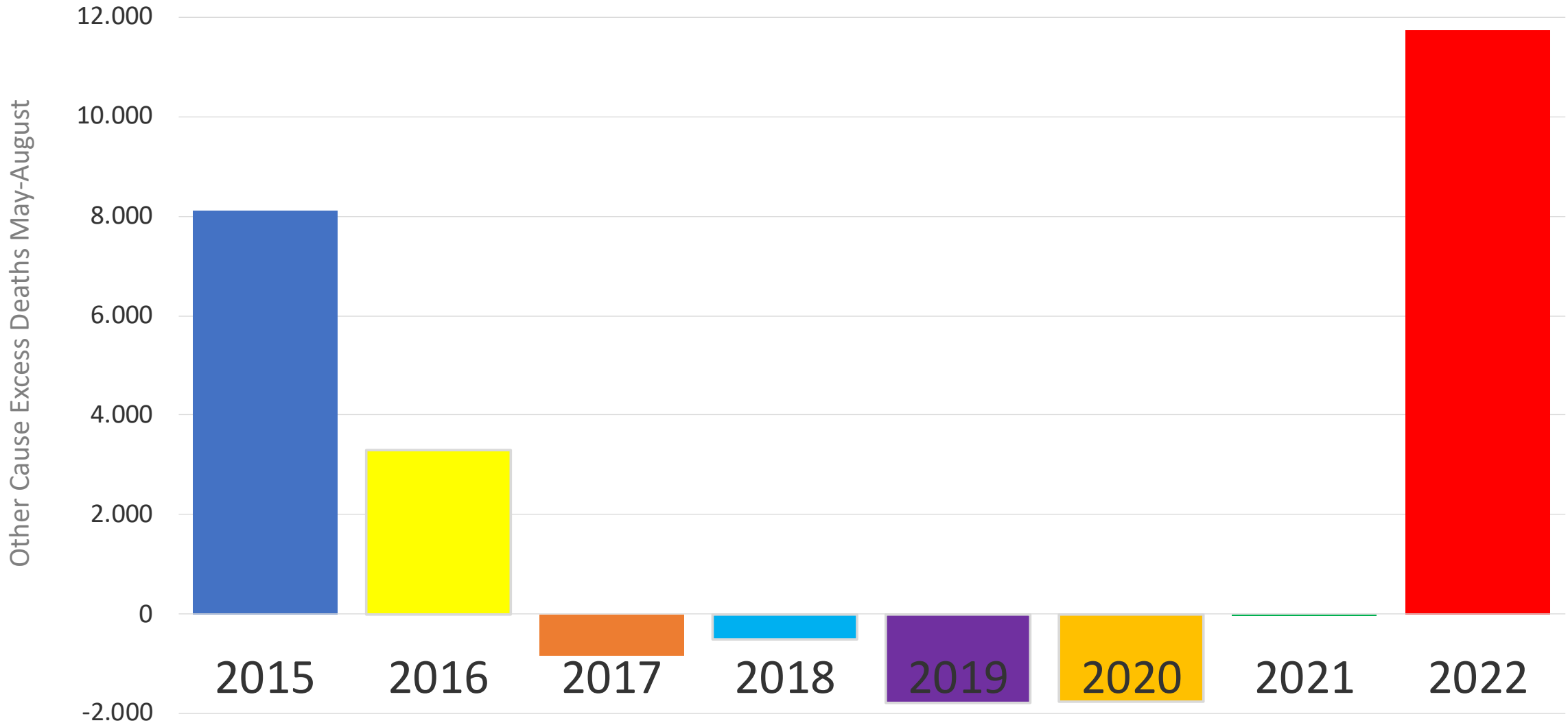
Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

SPAIN: MoMo official Age-adjusted **All Cause Excess Deaths excluding deaths attributed to heat**. 4 months combined: May + June + July + Aug



Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

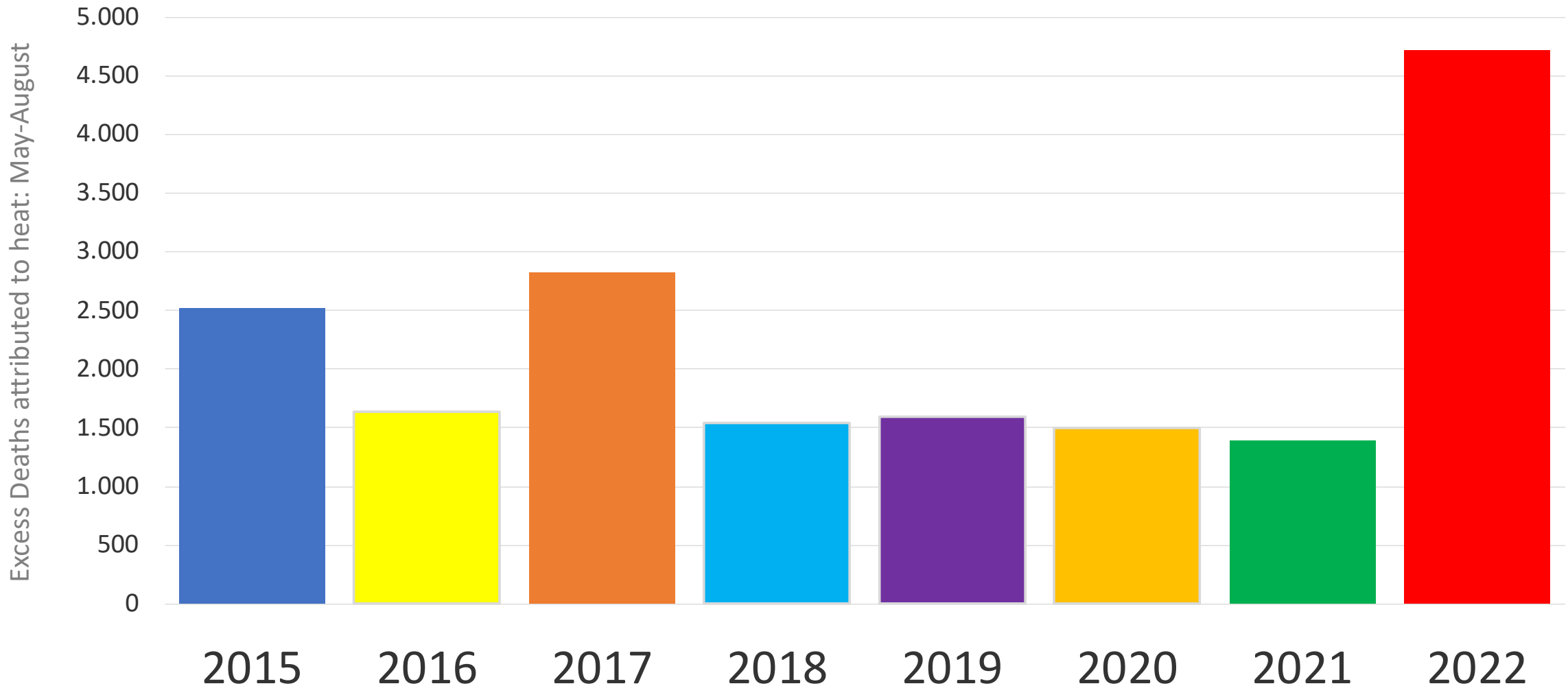
SPAIN: "Other Cause" Excess Deaths: Excess Deaths excluding those attributed to Covid and heat. May + June + July + August combined



Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

SPAIN: Deaths attributed to heat waves

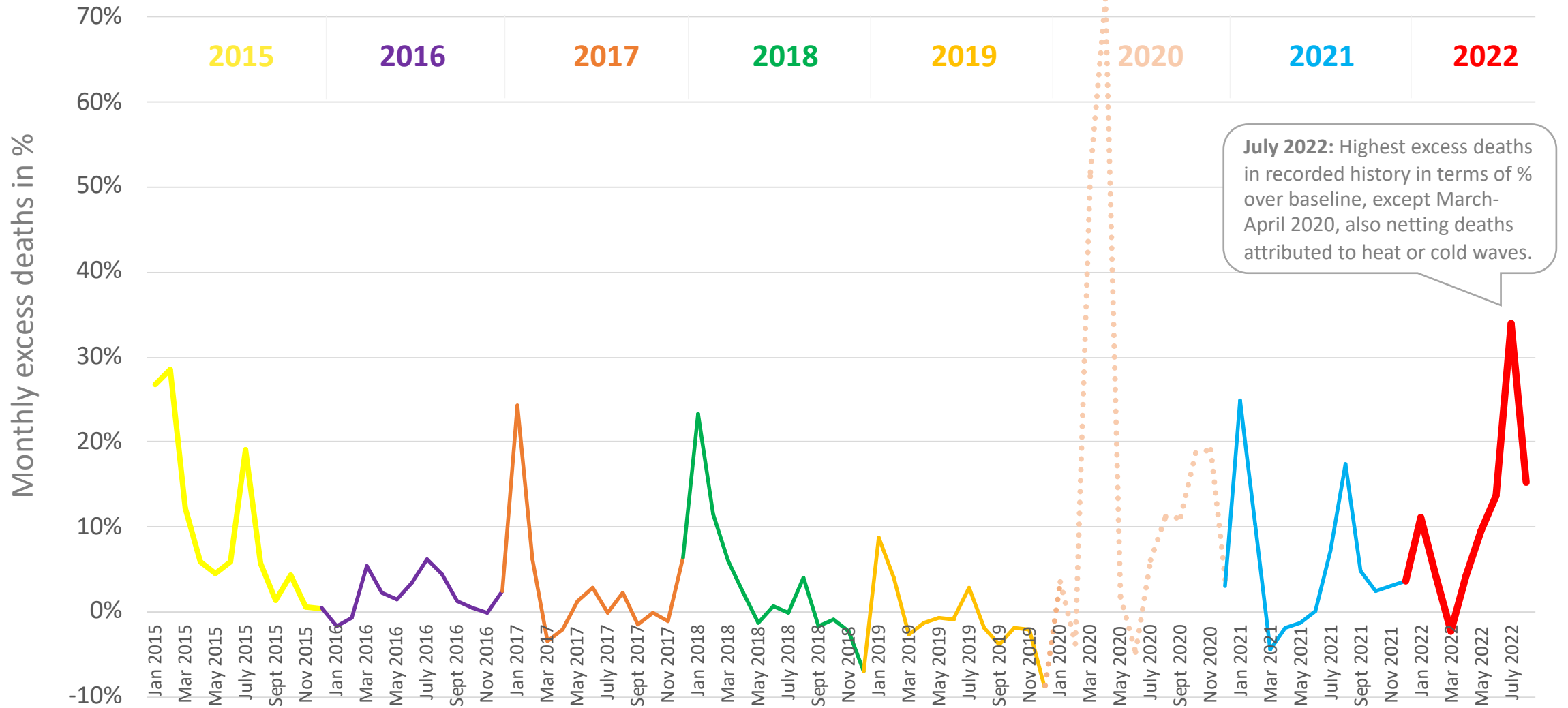
Four months combined: May + June + July + August



Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

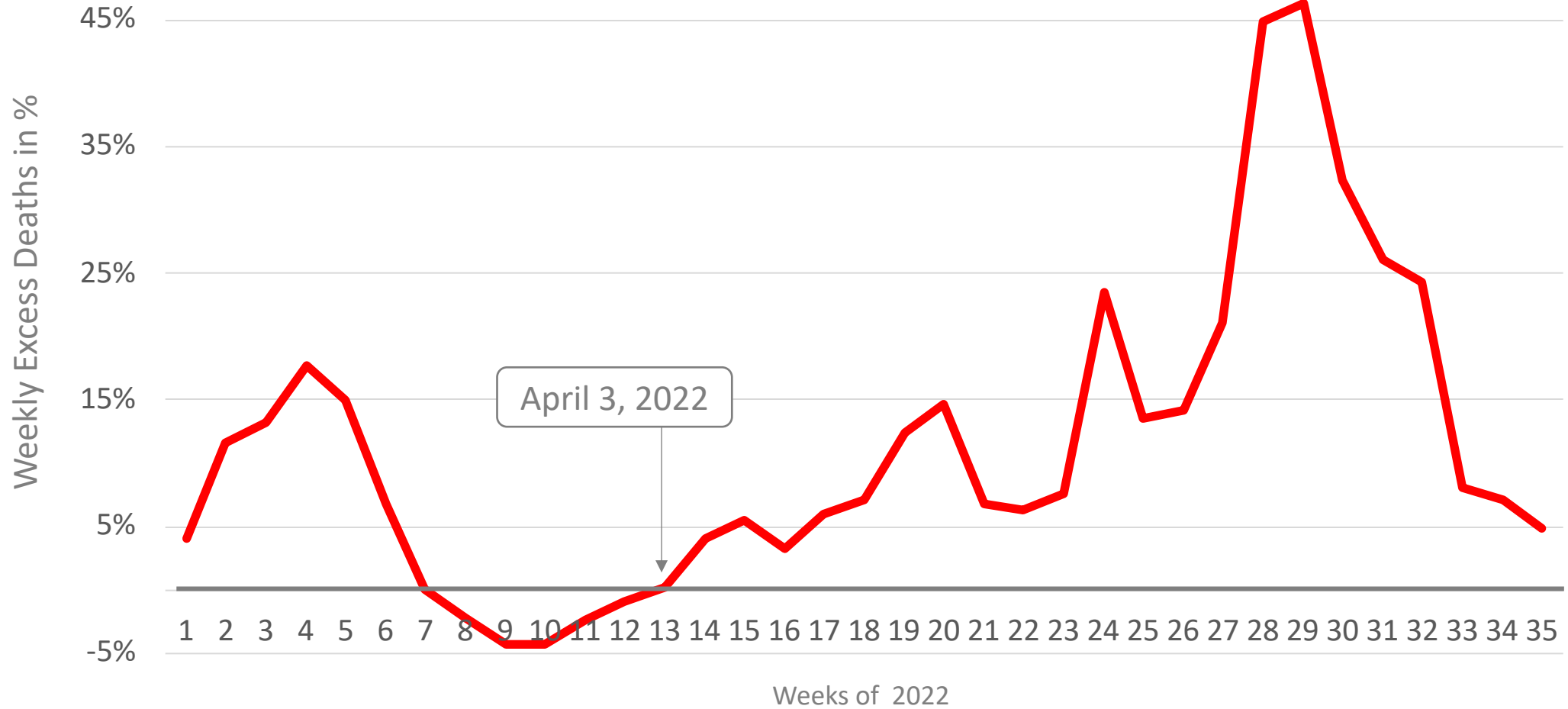
Spain

MoMo Age-adjusted All Cause Monthly Excess Deaths in %



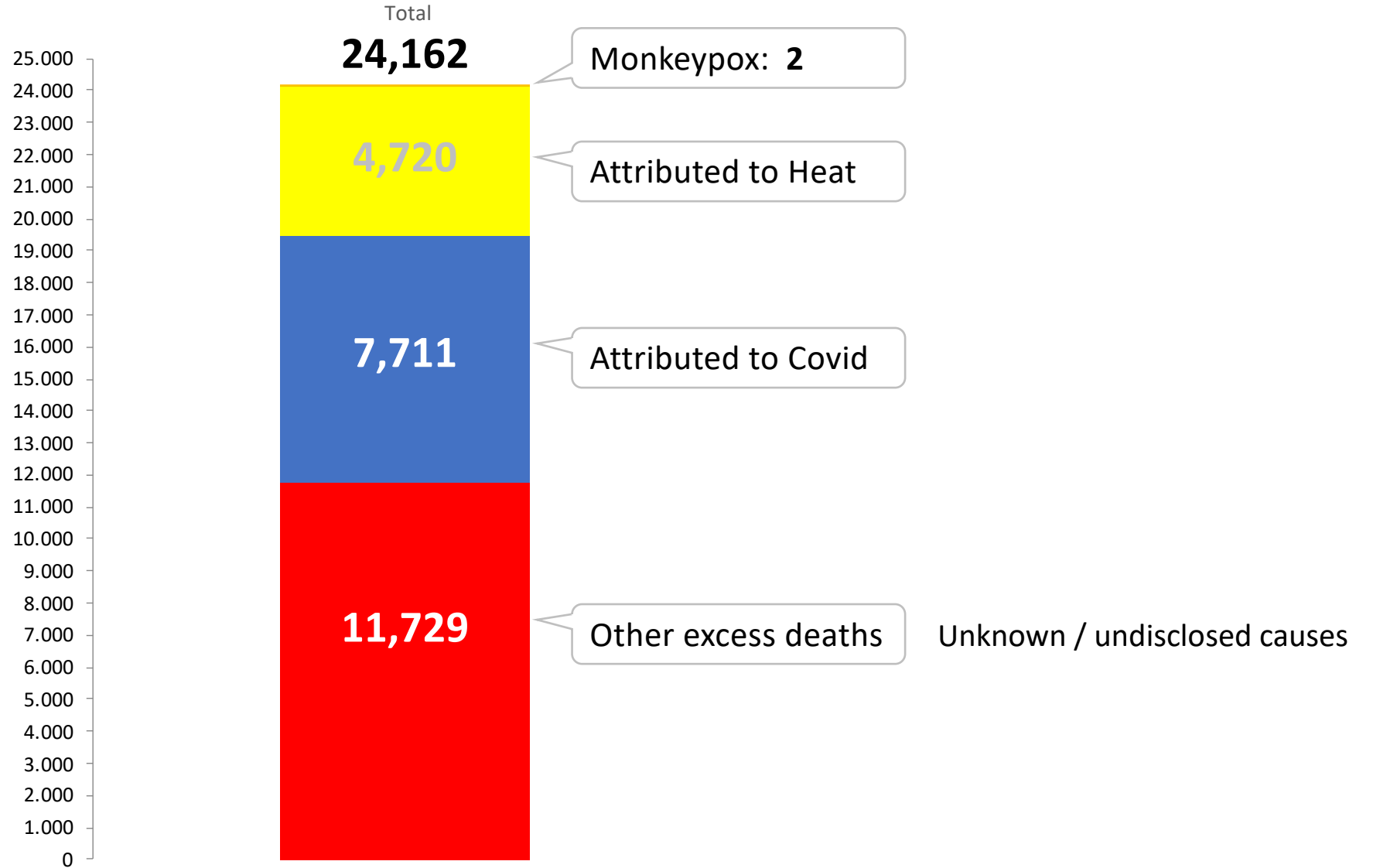
July 2022: Highest excess deaths in recorded history in terms of % over baseline, except March-April 2020, also netting deaths attributed to heat or cold waves.

Spain 2022: Weekly Excess deaths in % (% over MoMo's age-adjusted baseline)



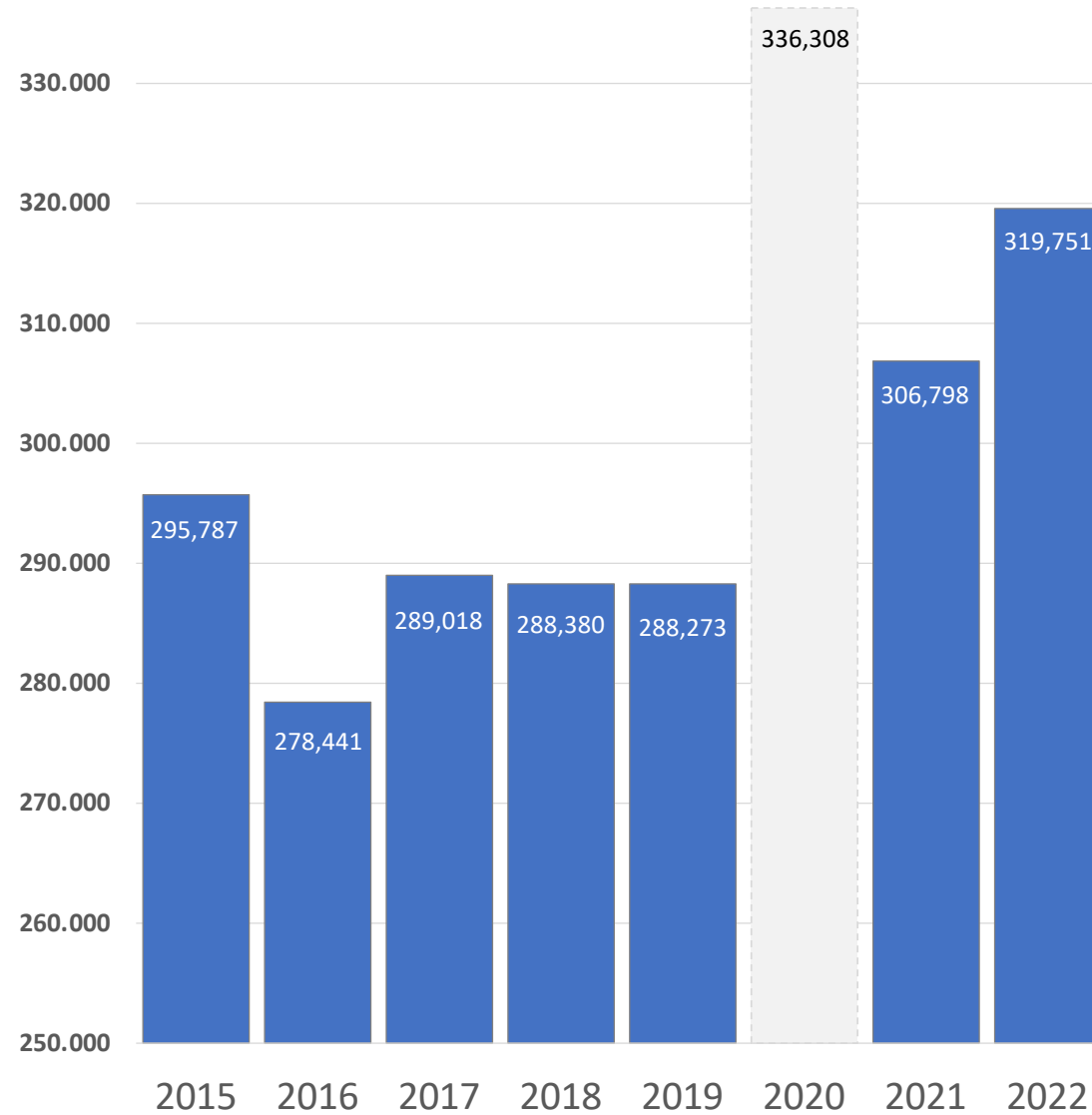
SPAIN

MoMo Age-adjusted Excess Deaths breakdown for the period May - August 2022



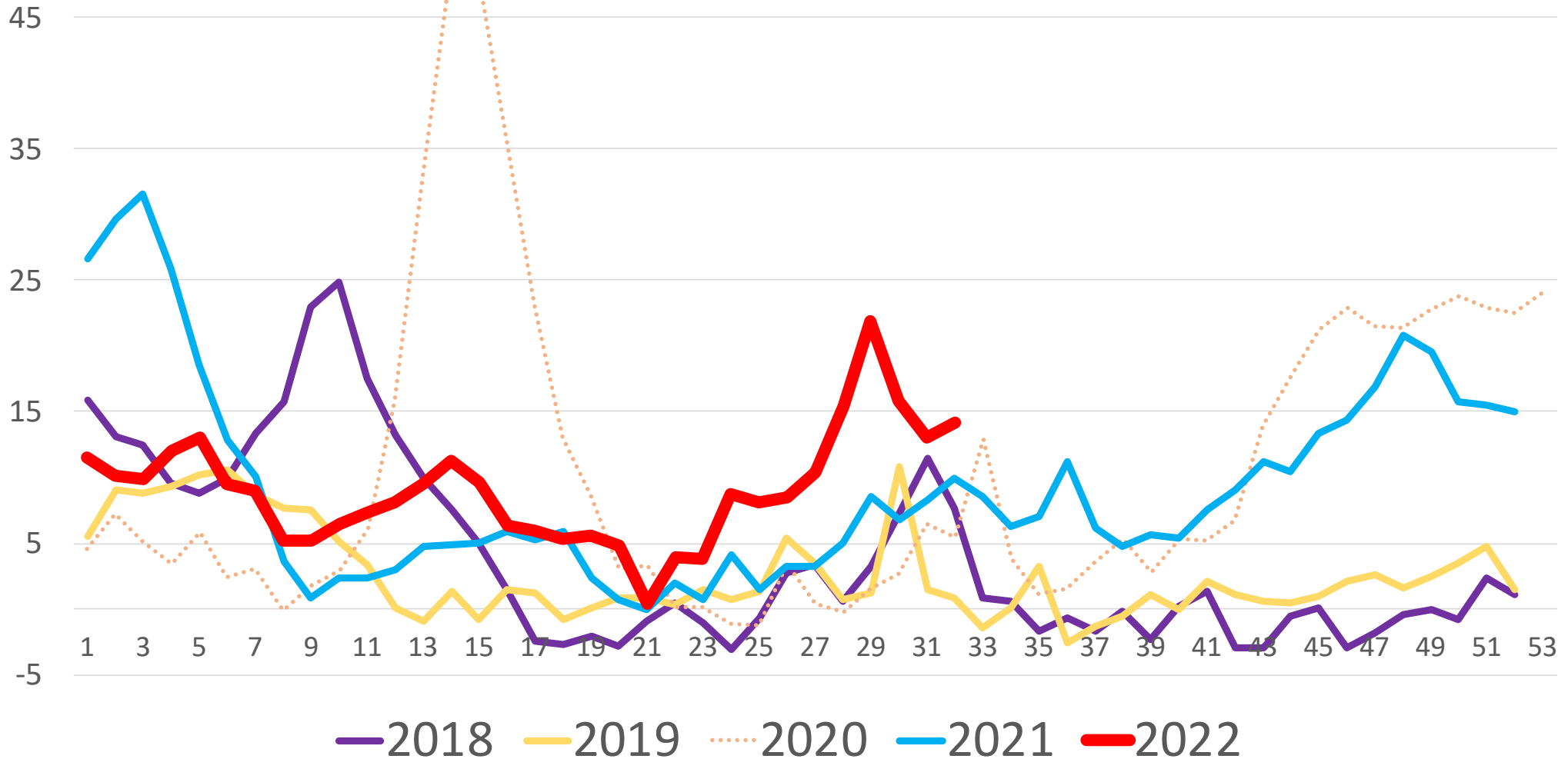
Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

SPAIN: Total Observed Deaths Cumulated for January 1 - August 31



EUROPE: EuroMoMo All Cause Deaths Z-scores (all ages)

(EuroMoMo Z-score is a proxy for standard deviation, according to Farrington et al. 1996 method)



SPAIN: MoMo Age-adjusted Monthly Excess Deaths breakdown 2020-2022

SPAIN		MoMo EXPECTED DEATHS (BASE LINE)	MoMo Official All Cause REGISTERED DEATHS	MoMo Official All Cause EXCESS DEATHS	MoMo Official Deaths attributed to temperature (°C) (heatwaves or cold)	MoMo Official All Cause EXCESS DEATHS net of deaths attributed to °C	MoMo Official All Cause EXCESS DEATHS in percentage	MoMo EXCESS DEATHS net of attrib. to °C in percentage	COVID Official Deaths registered as "with" Covid and due to Covid	NON-COVID Excess Deaths due to causes other than Covid and attrib. to °C
Data as of 9 Sept 2022		0	A	B	C	(B - C)	B / 0	(B - C) / 0	D	(B - C) - D
2020	January	41.698	43.172	1.474	86	1.388	3,53%	3,33%	0	1.388
	February	38.122	36.677	-1.445	117	-1.562	-3,79%	-4,10%	0	-1.562
	March	38.601	58.585	19.984	10	19.974	51,77%	51,74%	10.388	9.586
	April	35.223	60.676	25.453	24	25.429	72,26%	72,19%	15.733	9.696
	May	34.642	35.279	637	25	612	1,84%	1,77%	3.049	-2.437
	June	32.438	30.902	-1.536	54	-1.590	-4,74%	-4,90%	601	-2.191
	July	32.899	34.871	1.972	581	1.391	5,99%	4,23%	191	1.200
	August	32.475	36.146	3.671	844	2.827	11,30%	8,71%	1.160	1.667
	September	31.452	34.948	3.496	97	3.399	11,12%	10,81%	3.312	87
	October	33.909	40.236	6.327	10	6.317	18,66%	18,63%	5.413	904
	November	36.001	42.860	6.859	19	6.840	19,05%	19,00%	9.232	-2.392
	December	40.893	42.174	1.281	17	1.264	3,13%	3,09%	5.756	-4.492
	TOTAL 2020		428.353	496.526	68.173	1.884	66.289	15,92%	15,48%	54.835
2021	January	42.116	52.617	10.501	2.019	8.482	24,93%	20,14%	11.651	-3.169
	February	37.179	41.036	3.857	23	3.834	10,37%	10,31%	8.782	-4.948
	March	39.003	37.235	-1.768	48	-1.816	-4,53%	-4,66%	3.039	-4.855
	April	35.531	34.870	-661	9	-670	-1,86%	-1,89%	2.304	-2.974
	May	34.883	34.434	-449	2	-451	-1,29%	-1,29%	1.418	-1.869
	June	32.650	32.687	37	37	0	0,11%	0,00%	603	-603
	July	33.128	35.513	2.385	568	1.817	7,20%	5,48%	1.168	649
	August	32.696	38.407	5.711	788	4.923	17,47%	15,06%	3.114	1.809
	September	31.630	33.128	1.498	49	1.449	4,74%	4,58%	1.473	-24
	October	34.062	34.884	822	0	822	2,41%	2,41%	570	252
	November	36.156	37.252	1.096	4	1.092	3,03%	3,02%	672	420
	December	41.099	42.559	1.460	30	1.430	3,55%	3,48%	2.067	-637
	TOTAL 2021		430.133	454.622	24.489	3.577	20.912	5,69%	4,86%	36.861
2022	January	42.626	47.322	4.696	695	4.001	11,02%	9,39%	5.844	-1.843
	February	37.501	39.084	1.583	215	1.368	4,22%	3,65%	4.389	-3.021
	March	39.144	38.236	-908	44	-952	-2,32%	-2,43%	1.723	-2.675
	April	35.503	36.987	1.484	73	1.411	4,18%	3,97%	1.440	-29
	May	34.824	38.157	3.333	57	3.276	9,57%	9,41%	1.819	1.457
	June	32.735	37.187	4.452	830	3.622	13,60%	11,06%	1.199	2.423
	July	33.404	44.736	11.332	2.223	9.109	33,92%	27,27%	2.602	6.507
	August	33.000	38.042	5.042	1.610	3.432	15,28%	10,40%	2.091	1.341
	September									
	October									
	November									
	December									
	TOTAL 2022		288.737	319.751	31.014	5.747	25.267	10,74%	8,75%	21.107

Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo – Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana> – All data as of Sept 9, 2022.

SPAIN: MoMo Age-adjusted Monthly Excess Deaths breakdown 2015-2019

SPAIN		MoMo EXPECTED DEATHS (BASE LINE)	MoMo Official All Cause REGISTERED DEATHS	MoMo Official All Cause EXCESS DEATHS	MoMo Official Deaths attributed to temperature (°C) (heatwaves or cold)	MoMo Official All Cause EXCESS DEATHS net of deaths attributed to °C	MoMo Official All Cause EXCESS DEATHS in percentage	MoMo EXCESS DEATHS net of attrib. to °C in percentage
Data as of 9 Sept 2022		0	A	B	C	(B - C)	B / 0	(B - C) / 0
2015	January	37.777	47.856	10.079	270	9.809	26,68%	25,97%
	February	33.385	42.903	9.518	152	9.366	28,51%	28,05%
	March	35.143	39.410	4.267	16	4.251	12,14%	12,10%
	April	32.125	34.044	1.919	5	1.914	5,97%	5,96%
	May	31.616	33.042	1.426	98	1.328	4,51%	4,20%
	June	29.613	31.361	1.748	164	1.584	5,90%	5,35%
	July	30.038	35.789	5.751	1.797	3.954	19,15%	13,16%
	August	29.668	31.382	1.714	462	1.252	5,78%	4,22%
	September	28.738	29.112	374	63	311	1,30%	1,08%
	October	30.886	32.249	1.363	7	1.356	4,41%	4,39%
	November	32.550	32.754	204	5	199	0,63%	0,61%
	December	36.699	36.858	159	12	147	0,43%	0,40%
	TOTAL 2015		388.238	426.760	38.522	3.051	35.471	9,92%
2016	January	39.535	38.870	-665	194	-859	-1,68%	-2,17%
	February	36.211	35.965	-246	441	-687	-0,68%	-1,90%
	March	36.698	38.653	1.955	176	1.779	5,33%	4,85%
	April	33.448	34.186	738	24	714	2,21%	2,13%
	May	32.853	33.364	511	2	509	1,56%	1,55%
	June	30.783	31.861	1.078	70	1.008	3,50%	3,27%
	July	31.277	33.233	1.956	881	1.075	6,25%	3,44%
	August	30.914	32.309	1.395	687	708	4,51%	2,29%
	September	29.936	30.336	400	621	-221	1,34%	-0,74%
	October	32.224	32.408	184	3	181	0,57%	0,56%
	November	34.133	34.114	-19	47	-66	-0,06%	-0,19%
	December	38.716	39.699	983	119	864	2,54%	2,23%
	TOTAL 2016		406.728	414.998	8.270	3.265	5.005	2,03%
2017	January	40.200	49.953	9.753	1.478	8.275	24,26%	20,58%
	February	35.601	37.803	2.202	77	2.125	6,19%	5,97%
	March	37.512	36.187	-1.325	60	-1.385	-3,53%	-3,69%
	April	34.302	33.574	-728	10	-738	-2,12%	-2,15%
	May	33.776	34.173	397	56	341	1,18%	1,01%
	June	31.687	32.569	882	1.000	-118	2,78%	-0,37%
	July	32.208	32.184	-24	791	-815	-0,07%	-2,53%
	August	31.837	32.575	738	976	-238	2,32%	-0,75%
	September	30.824	30.378	-446	42	-488	-1,45%	-1,58%
	October	33.140	33.086	-54	57	-111	-0,16%	-0,33%
	November	35.017	34.604	-413	52	-465	-1,18%	-1,33%
	December	39.627	42.119	2.492	592	1.900	6,29%	4,79%
	TOTAL 2017		415.731	429.205	13.474	5.191	8.283	3,24%
2018	January	32.853	40.487	7.634	215	7.419	23,24%	22,58%
	February	36.067	40.243	4.176	893	3.283	11,58%	9,10%
	March	37.930	40.213	2.283	273	2.010	6,02%	5,30%
	April	34.707	35.457	750	4	746	2,16%	2,15%
	May	34.212	33.800	-412	0	-412	-1,20%	-1,20%
	June	32.070	32.286	216	111	105	0,67%	0,33%
	July	32.529	32.489	-40	125	-165	-0,12%	-0,51%
	August	32.127	33.405	1.278	1.307	-29	3,98%	-0,09%
	September	31.149	30.613	-536	85	-621	-1,72%	-1,99%
	October	33.591	33.263	-328	12	-340	-0,98%	-1,01%
	November	35.615	34.789	-826	26	-852	-2,32%	-2,39%
	December	40.380	37.534	-2.846	42	-2.888	-7,05%	-7,15%
	TOTAL 2018		413.230	424.579	11.349	3.093	8.256	2,75%
2019	January	41.616	45.217	3.601	1.138	2.463	8,65%	5,92%
	February	36.793	38.239	1.446	192	1.254	3,93%	3,41%
	March	38.652	37.609	-1.043	62	-1.105	-2,70%	-2,86%
	April	35.250	34.771	-479	13	-492	-1,36%	-1,40%
	May	34.643	34.386	-257	2	-259	-0,74%	-0,75%
	June	32.462	32.212	-250	203	-453	-0,77%	-1,40%
	July	32.969	33.874	905	1.087	-182	2,75%	-0,55%
	August	32.556	31.965	-591	302	-893	-1,82%	-2,74%
	September	31.498	30.308	-1.190	25	-1.215	-3,78%	-3,86%
	October	33.922	33.259	-663	0	-663	-1,95%	-1,95%
	November	36.018	35.260	-758	0	-758	-2,10%	-2,10%
	December	40.968	37.383	-3.585	0	-3.585	-8,75%	-8,75%
	TOTAL 2019		427.347	424.483	-2.864	3.024	-5.888	-0,67%

Source: Official data from the Government of Spain. Excess Deaths: MoMo. https://momo.isciii.es/panel_momo/#section-momo
 Covid Deaths: Ministry of Public Health, as reported by Expansión: <https://datosmacro.expansion.com/otros/coronavirus/espana>
 All data as of Sept 9, 2022.

If Covid deaths in Spain in July 2022 had been equal to those in May 2022 (or even equal to July 2021), the cumulative deaths attributed to Covid for the period May-August 2022 would still be the highest.

SPAIN		COVID Official Deaths registered as "with" Covid and due to Covid	COVID as if July 2022 were equal to May 2022
Data as of 9 Sept 2022			
2020	May	3.049	3.049
	June	601	601
	July	191	191
	August	1.160	1.160
	May-Aug 2020	5.001	5.001
2021	May	1.418	1.418
	June	603	603
	July	1.168	1.168
	August	3.114	3.114
	May-Aug 2021	6.303	6.303
2022	May	1.819	1.819
	June	1.199	1.199
	July	2.602	1.819
	August	2.091	2.091
	May-Aug 2022	7.711	6.928