

Predicciones sobre CoViD-19

Manuel Febrero-Bande

Dpt. de Estadística, Análisis Matemático y Optimización
Univ. de Santiago de Compostela

23 de febrero de 2021



DEPARTAMENTO DE ESTATÍSTICA,
ANÁLISE MATEMÁTICA E OPTIMIZACIÓN



- Predicciones

- Predicciones Fallecidos

3 Panorama internacional

Datos

Aplicación Shiny disponible en

<http://modestya.usc.es:3838/covid19prediction/>

Último dato Confirmados CCAA: 21/02/2021

Fuente: https://cnecovid.isciii.es/covid19/resources/casos_tecnica_ccaa.csv

Predicciones:

▶ España

► Andalucía

► Aragón

► Asturias

▶ I. Balears

▶ Canarias

▶ Cantabria

► **Cataluña**

► Castilla-La Mancha

► **Castilla y León**

► C. Valenciana

▶ Extremadura

▶ País Vasco

► Galicia

▶ Madrid

► Murcia

▶ Navarra

► **La Rioja**

► Mod Lineal

▶ Mod NP

► **Mod Aditivo**

	$10^2 \sigma_R^2$			$10^2 \sigma_R^2 (rob.)$			r^2		
Horiz	FLM	NP	SAM	FLM	NP	SAM	FLM	NP	SAM
H1	0.008	0.007	0.007	0.006	0.005	0.006	0.685	0.747	0.699
H2	0.033	0.019	0.031	0.018	0.015	0.019	0.688	0.826	0.707
H3	0.049	0.033	0.046	0.036	0.031	0	0.774	0.852	0.786
H4	0.07	0.052	0.066	0.06	0.051	0.058	0.812	0.865	0.822
H5	0.111	0.09	0.106	0.089	0.08	0.087	0.815	0.855	0.823

Último dato fichero: 21/02/2021.

Tabla Previsión Confirmados: Mod. Aditivo.

Last=21/02/2021

	Last	IA14	IA7	H1	H2	H3	H4	H5
España	3154001	197	66	3158380	3162253	3166964	3170249	3172595
Andalucía	472221	218	71	473106	473935	474973	475782	476243
Aragón	105683	224	79	105833	105963	106110	106216	106317
Asturias	42592	188	61	42699	42787	42895	42970	43003
Canarias	39619	88	33	39739	39845	39948	40037	40124
Cantabria	24356	132	46	24406	24449	24490	24517	24540
Castilla.y.León	204335	216	69	204542	204722	204976	205148	205248
Castilla.La.Mancha	167050	137	36	167127	167213	167316	167357	167370
Cataluña	566583	204	77	567480	568256	569132	569751	570321
Ceuta	4510	279	101	4523	4533	4545	4555	4562
Comunidad.Valenciana	375193	165	45	375472	375847	376182	376374	376399
Extremadura	68764	92	27	68798	68832	68870	68886	68910
Galicia	110403	159	49	110633	110845	111075	111238	111334
Islas.Baleares	55752	94	26	55814	55885	55932	55945	55955
La.Rioja	27359	102	27	27363	27368	27378	27379	27380
Madrid	577054	295	104	578061	578900	579940	580698	581273
Melilla	6812	327	113	6826	6837	6852	6864	6873
Murcia	105678	117	37	105747	105810	105887	105927	105969
Navarra	50976	129	51	51016	51056	51102	51136	51177
País.Vasco	149061	241	87	149350	149570	149864	150093	150284

Cuadro: Previsión Confirmados: Mod. Aditivo - Horizonte 1 – 5 días.

Tabla Ratio Incr. Confirmados: Mod. Lineal.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	0.0017	0.0019	0.0035	0.0047	0.0059	0.0067
Andalucía	0.0022	0.0023	0.0042	0.0057	0.0072	0.0081
Aragón	0.0016	0.0018	0.0035	0.0048	0.0062	0.0071
Asturias	0.0026	0.0024	0.0046	0.0063	0.0076	0.0082
Canarias	0.0030	0.0029	0.0057	0.0083	0.0109	0.0131
Cantabria	0.0018	0.0019	0.0038	0.0052	0.0065	0.0073
Castilla.y.León	0.0014	0.0016	0.0029	0.0039	0.0049	0.0054
Castilla.La.Mancha	0.0008	0.0012	0.0020	0.0026	0.0031	0.0032
Cataluña	0.0016	0.0019	0.0037	0.0052	0.0066	0.0075
Ceuta	0.0030	0.0026	0.0049	0.0071	0.0092	0.0106
Comunidad.Valenciana	0.0012	0.0014	0.0024	0.0031	0.0036	0.0038
Extremadura	0.0008	0.0012	0.0021	0.0027	0.0034	0.0038
Galicia	0.0022	0.0023	0.0043	0.0058	0.0071	0.0079
Islas.Baleares	0.0010	0.0015	0.0029	0.0036	0.0042	0.0044
La.Rioja	0.0006	0.0010	0.0016	0.0020	0.0024	0.0025
Madrid	0.0020	0.0021	0.0039	0.0055	0.0069	0.0079
Melilla	0.0024	0.0022	0.0041	0.0059	0.0077	0.0089
Murcia	0.0009	0.0013	0.0023	0.0031	0.0038	0.0043
Navarra	0.0010	0.0015	0.0028	0.0039	0.0050	0.0059
País.Vasco	0.0021	0.0022	0.0041	0.0059	0.0076	0.0088

Cuadro: Previsión Ratio Incr. Confirmados: Mod. lineal - Horizonte 1 – 5 días.

Tabla Ratio Incr. Confirmados: Mod. No Paramétrico.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	0.0017	0.0032	0.0064	0.0095	0.0126	0.0157
Andalucía	0.0022	0.0040	0.0078	0.0116	0.0154	0.0191
Aragón	0.0016	0.0029	0.0059	0.0089	0.0117	0.0147
Asturias	0.0026	0.0043	0.0085	0.0125	0.0166	0.0206
Canarias	0.0030	0.0041	0.0081	0.0121	0.0161	0.0200
Cantabria	0.0018	0.0030	0.0061	0.0091	0.0121	0.0151
Castilla.y.León	0.0014	0.0030	0.0060	0.0090	0.0119	0.0149
Castilla.La.Mancha	0.0008	0.0024	0.0050	0.0073	0.0097	0.0122
Cataluña	0.0016	0.0028	0.0057	0.0085	0.0113	0.0141
Ceuta	0.0030	0.0046	0.0090	0.0133	0.0176	0.0219
Comunidad.Valenciana	0.0012	0.0030	0.0060	0.0089	0.0118	0.0147
Extremadura	0.0008	0.0021	0.0043	0.0064	0.0085	0.0106
Galicia	0.0022	0.0039	0.0077	0.0114	0.0151	0.0188
Islas.Baleares	0.0010	0.0024	0.0050	0.0074	0.0099	0.0124
La.Rioja	0.0006	0.0021	0.0043	0.0064	0.0085	0.0107
Madrid	0.0020	0.0034	0.0068	0.0102	0.0135	0.0168
Melilla	0.0024	0.0039	0.0078	0.0115	0.0153	0.0190
Murcia	0.0009	0.0022	0.0046	0.0069	0.0091	0.0114
Navarra	0.0010	0.0022	0.0044	0.0066	0.0088	0.0110
País.Vasco	0.0021	0.0035	0.0069	0.0103	0.0137	0.0170

Cuadro: Previsión Ratio Incr. Confirmados: Mod. No Paramétrico - Horizonte 1
- 5 días.

Tabla Ratio Incr. Confirmados: Mod. Aditivo.

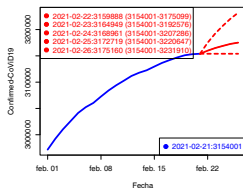
Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	0.0017	0.0014	0.0026	0.0041	0.0052	0.0059
Andalucía	0.0022	0.0019	0.0036	0.0058	0.0075	0.0085
Aragón	0.0016	0.0014	0.0027	0.0040	0.0050	0.0060
Asturias	0.0026	0.0025	0.0046	0.0071	0.0089	0.0096
Canarias	0.0030	0.0030	0.0057	0.0083	0.0105	0.0127
Cantabria	0.0018	0.0021	0.0038	0.0055	0.0066	0.0076
Castilla.y.León	0.0014	0.0010	0.0019	0.0031	0.0040	0.0045
Castilla.La.Mancha	0.0008	0.0005	0.0010	0.0016	0.0018	0.0019
Cataluña	0.0016	0.0016	0.0030	0.0045	0.0056	0.0066
Ceuta	0.0030	0.0028	0.0051	0.0077	0.0100	0.0116
Comunidad.Valenciana	0.0012	0.0007	0.0017	0.0026	0.0031	0.0032
Extremadura	0.0008	0.0005	0.0010	0.0015	0.0018	0.0021
Galicia	0.0022	0.0021	0.0040	0.0061	0.0076	0.0084
Islas.Baleares	0.0010	0.0011	0.0024	0.0032	0.0035	0.0036
La.Rioja	0.0006	0.0002	0.0003	0.0007	0.0007	0.0008
Madrid	0.0020	0.0017	0.0032	0.0050	0.0063	0.0073
Melilla	0.0024	0.0021	0.0037	0.0058	0.0076	0.0089
Murcia	0.0009	0.0007	0.0013	0.0020	0.0024	0.0028
Navarra	0.0010	0.0008	0.0016	0.0025	0.0031	0.0039
País.Vasco	0.0021	0.0019	0.0034	0.0054	0.0069	0.0082

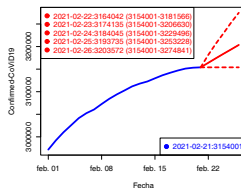
Cuadro: Previsión Ratio Incr. Confirmados: Mod. Aditivo - Horizonte 1 – 5 días.

Confirmados: España

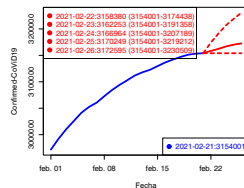
Confirmed:España-FLM



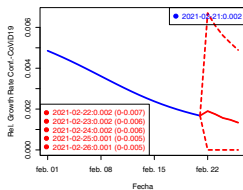
Confirmed:España-NP



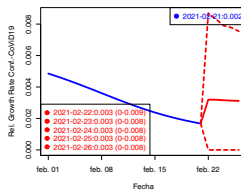
Confirmed:España-SAM



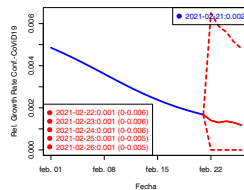
Rel. Growth Rate Conf.:España-FLM



Rel. Growth Rate Conf.:España-NP



Rel. Growth Rate Conf.:España-SAM



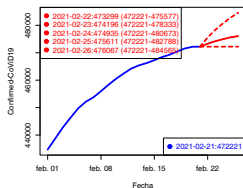
Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

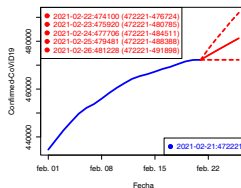
◀ Fallecidos

Confirmados: Andalucía

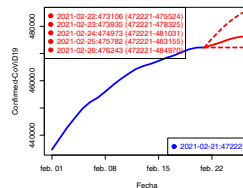
Confirmed:Andalucía-FLM



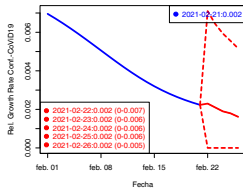
Confirmed:Andalucía-NP



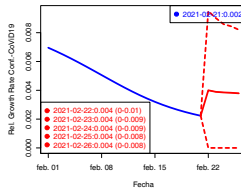
Confirmed:Andalucía-SAM



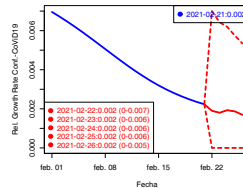
Rel. Growth Rate Conf.:Andalucía-FLM



Rel. Growth Rate Conf.:Andalucía-NP



Rel. Growth Rate Conf.:Andalucía-SAM

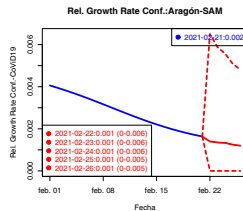
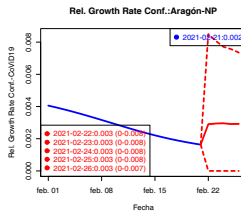
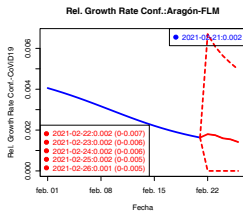
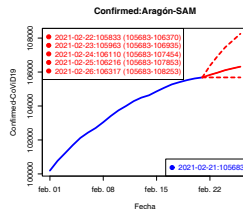
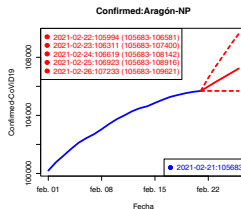
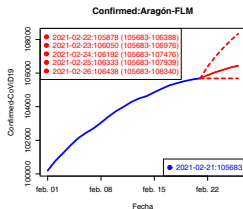


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Aragón

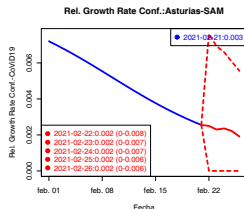
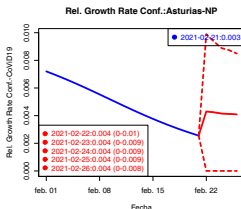
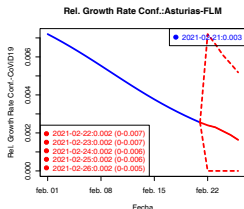
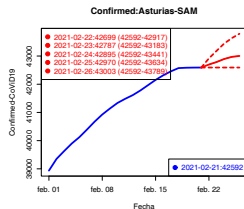
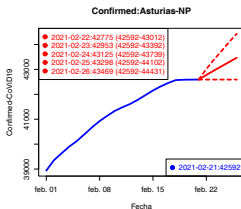
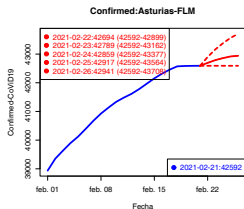


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

← Confirmados

← Fallecidos

Confirmados: Asturias

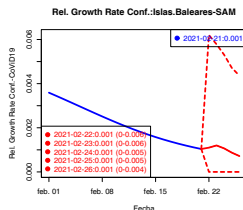
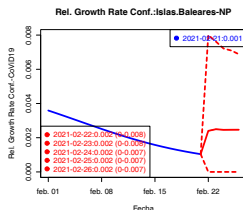
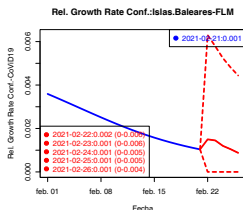
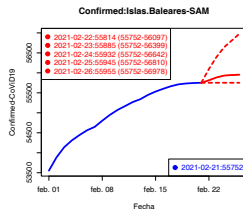
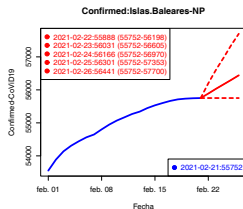
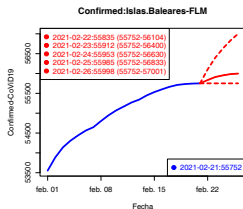


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Islas Baleares

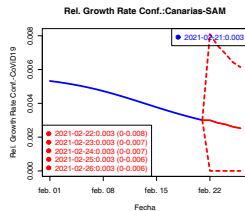
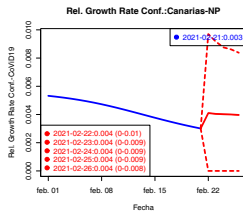
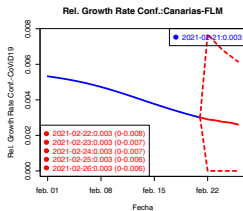
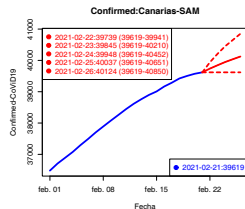
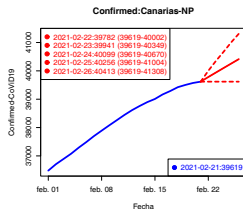
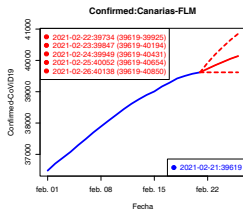


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Canarias

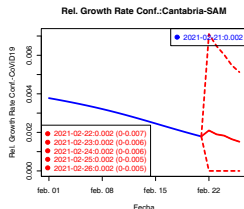
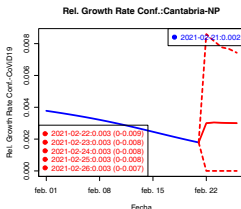
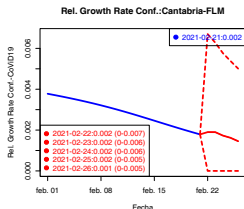
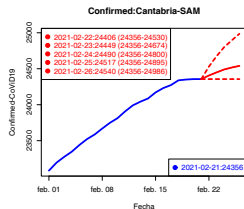
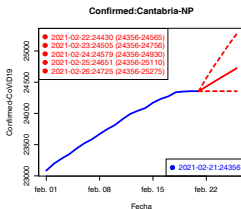
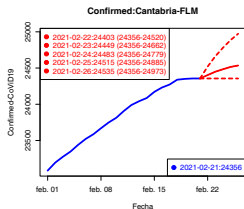


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Cantabria

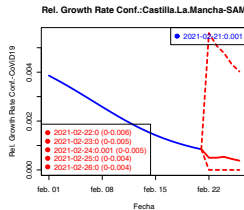
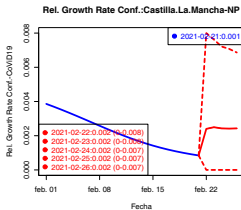
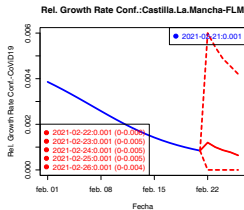
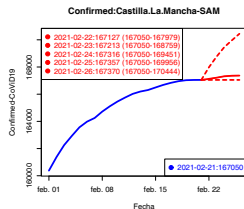
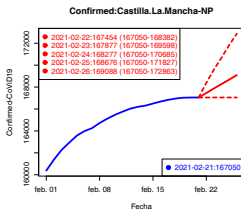
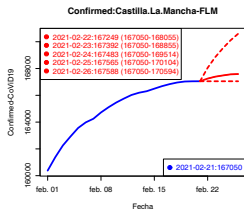


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Castilla-La Mancha

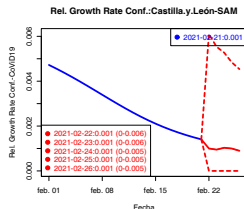
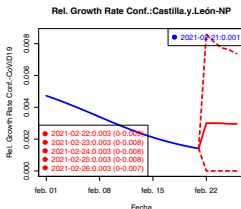
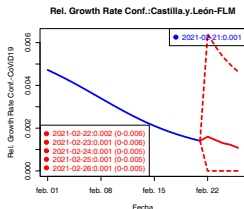
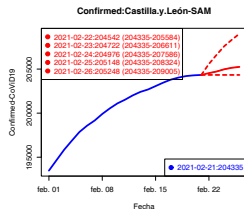
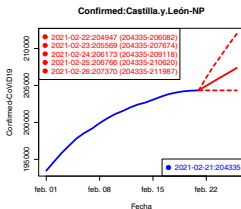
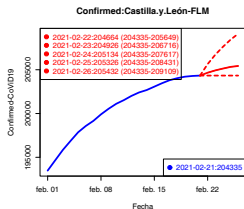


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Castilla y León

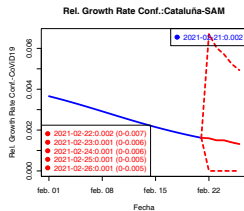
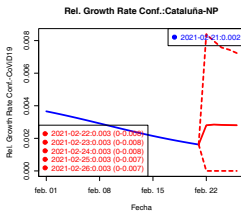
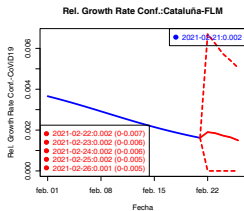
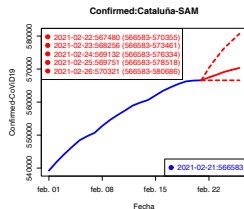
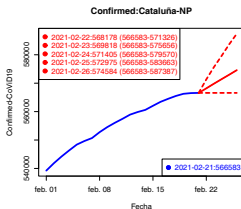
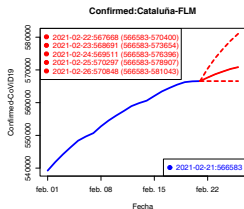


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

← Confirmados

← Fallecidos

Confirmados: Cataluña



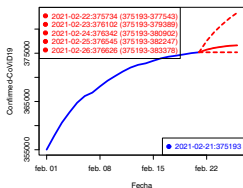
Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

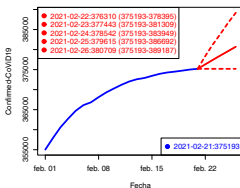
◀ Fallecidos

Confirmados: C. Valenciana

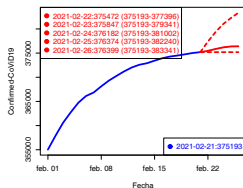
Confirmed:Comunidad.Valenciana-FLM



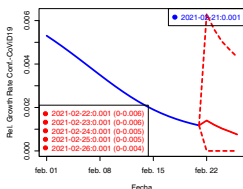
Confirmed:Comunidad.Valenciana-NP



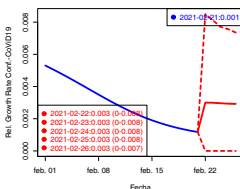
Confirmed:Comunidad.Valenciana-SAM



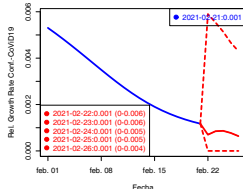
Rel. Growth Rate Conf.:Comunidad.Valenciana-FLM



Rel. Growth Rate Conf.:Comunidad.Valenciana-NP



Rel. Growth Rate Conf.:Comunidad.Valenciana-SAM

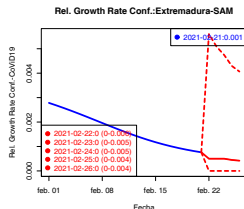
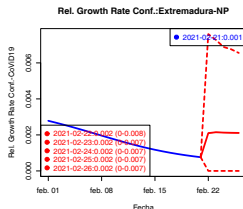
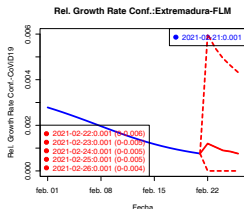
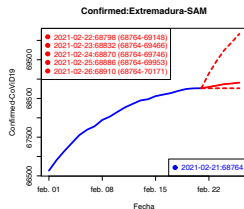
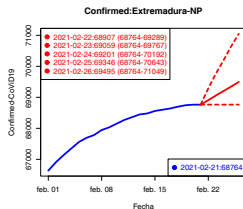
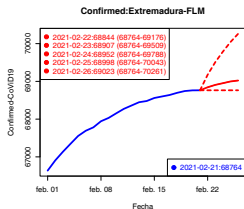


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Extremadura

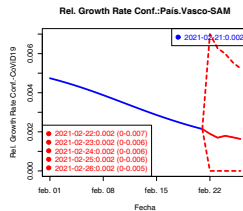
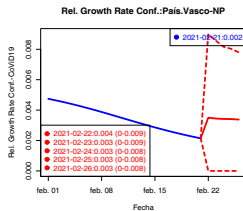
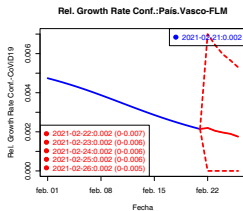
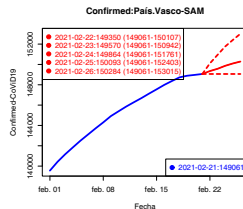
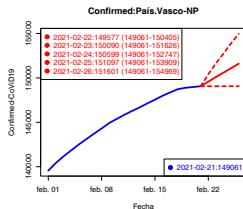
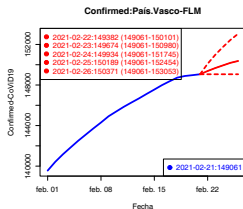


Los valores del Ratio de incremento de H2—H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: País Vasco

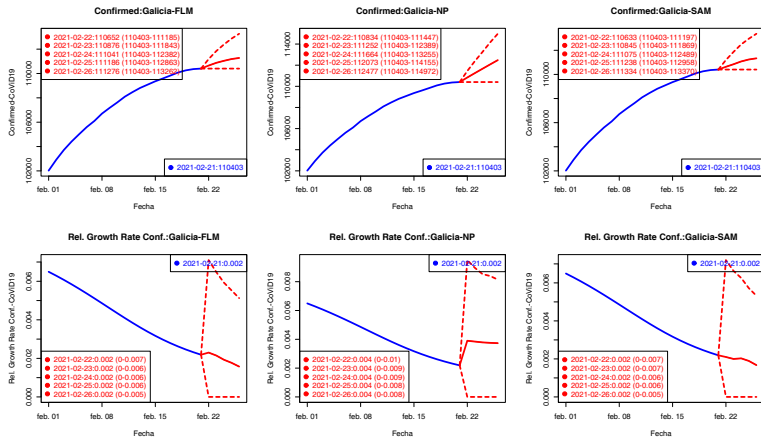


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Galicia

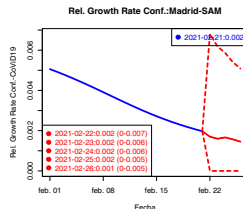
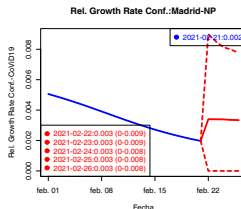
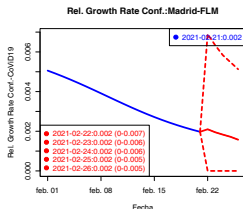
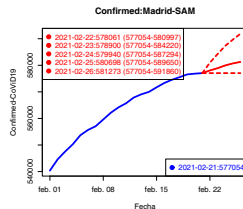
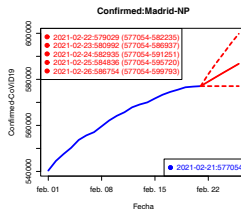
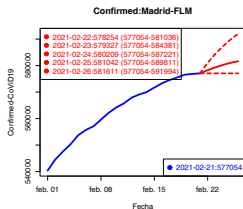


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Madrid

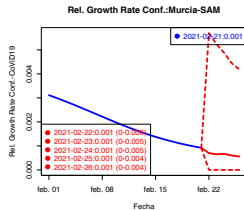
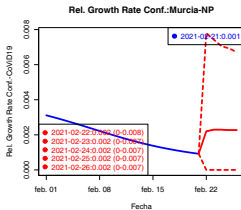
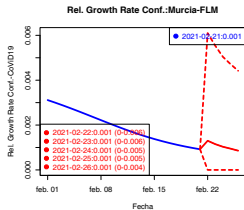
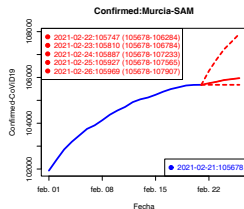
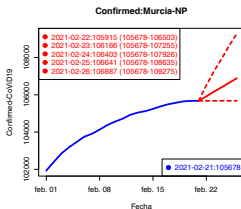
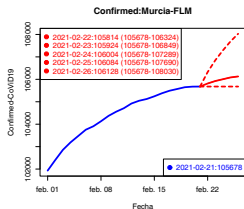


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: Murcia



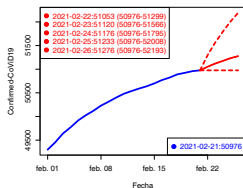
Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

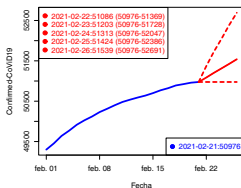
◀ Fallecidos

Confirmados: Navarra

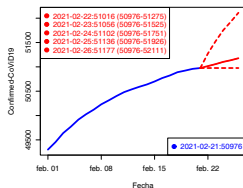
Confirmed:Navarra-FLM



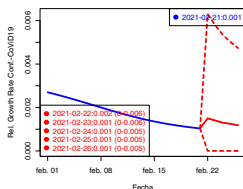
Confirmed:Navarra-NP



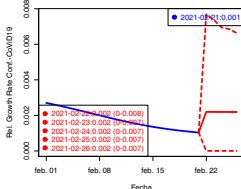
Confirmed:Navarra-SAM



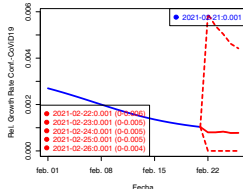
Rel. Growth Rate Conf.:Navarra-FLM



Rel. Growth Rate Conf.:Navarra-NP



Rel. Growth Rate Conf.:Navarra-SAM

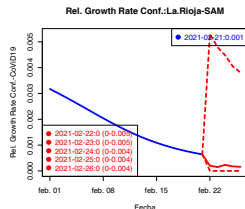
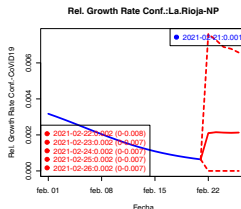
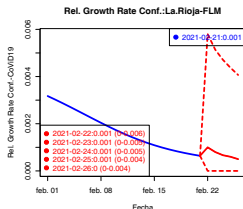
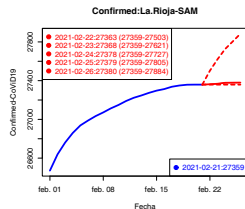
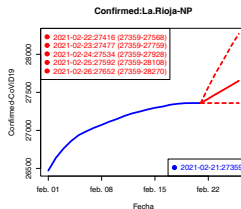
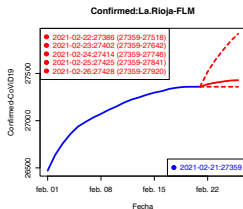


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Confirmados: La Rioja



Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Table of Contents

- 1 Casos Confirmados
 - Predicciones
- 2 Fallecidos
 - Predicciones Fallecidos
- 3 Panorama internacional

Modelos para fallecidos por CoViD-19

Último dato: 21/02/2021 Fuente: https://cnecovid.isciii.es/covid19/resources/casos_hosp_uci_def_sexo_edad_provres.csv

Predicciones:

▶ España

▶ Andalucía

▶ Aragón

▶ Asturias

▶ I. Baleares

▶ Canarias

▶ Cantabria

▶ Castilla-La Mancha

▶ Castilla y León

▶ Cataluña

▶ C. Valenciana

▶ Extremadura

▶ País Vasco

▶ Galicia

▶ Madrid

▶ Murcia

▶ Navarra

▶ La Rioja

▶ Mod Lineal

▶ Mod NP

▶ Mod Aditivo

	$10^2 \sigma_R^2$			$10^2 \sigma_R^2(rob.)$			r^2		
Horiz	FLM	NP	SAM	FLM	NP	SAM	FLM	NP	SAM
H1	0.003	0.003	0.003	0.002	0.002	0.002	0.661	0.634	0.678
H2	0.01	0.012	0.01	0.006	0.006	0.005	0.712	0.677	0.726
H3	0.029	0.032	0.028	0.009	0.013	0.009	0.673	0.641	0.681
H4	0.032	0.038	0.031	0.014	0.02	0.012	0.766	0.727	0.773
H5	0.042	0.052	0.041	0.02	0.031	0.016	0.8	0.758	0.807

Tabla Previsión Fallecidos: Mod. Lineal.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	67247	67374	67476	67575	67628	67638
Andalucía	7960	7981	7997	8008	8016	8016
Aragón	3190	3197	3203	3209	3212	3213
Asturias	1727	1734	1741	1747	1752	1757
Canarias	570	572	574	576	578	580
Cantabria	501	502	503	503	503	503
Castilla y León	6199	6208	6215	6224	6227	6227
Castilla-La Mancha	5504	5512	5518	5523	5525	5523
Cataluña	10048	10057	10063	10072	10073	10073
Ceuta	79	79	80	80	80	81
Comunidad Valenciana	6344	6365	6383	6396	6405	6406
Extremadura	1669	1672	1675	1676	1677	1677
Galicia	2161	2170	2179	2186	2192	2196
Islas Baleares	681	683	684	685	685	685
La Rioja	718	720	721	722	723	724
Madrid	13665	13681	13692	13708	13711	13708
Melilla	65	65	65	66	66	66
Murcia	1414	1420	1426	1430	1433	1434
Navarra	1090	1091	1092	1093	1094	1095
País Vasco	3662	3666	3668	3671	3672	3670

Cuadro: Previsión fallecidos: Mod. lineal - Horizonte 1 – 5 días.

Tabla Previsión Fallecidos: Mod. No Paramétrico.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	67247	67512	67770	68060	68318	68582
Andalucía	7960	8008	8056	8104	8149	8195
Aragón	3190	3202	3213	3226	3237	3249
Asturias	1727	1735	1742	1750	1758	1765
Canarias	570	572	574	577	579	581
Cantabria	501	503	504	506	507	509
Castilla.y.León	6199	6221	6243	6267	6289	6312
Castilla.La.Mancha	5504	5525	5545	5568	5588	5609
Cataluña	10048	10072	10094	10119	10142	10170
Ceuta	79	79	80	80	80	81
Comunidad.Valenciana	6344	6385	6425	6465	6503	6541
Extremadura	1669	1677	1685	1693	1701	1708
Galicia	2161	2176	2191	2205	2219	2233
Islas.Baleares	681	684	686	689	691	694
La.Rioja	718	721	724	727	730	733
Madrid	13665	13703	13739	13780	13818	13860
Melilla	65	66	66	67	67	68
Murcia	1414	1424	1433	1442	1451	1461
Navarra	1090	1093	1096	1099	1103	1106
País.Vasco	3662	3674	3685	3698	3710	3722

Cuadro: Previsión fallecidos: Mod. No Paramétrico - Horizonte 1 – 5 días.

Tabla Previsión Fallecidos: Mod. Aditivo.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	67247	67370	67392	67621	67726	67678
Andalucía	7960	7987	7997	8022	8039	8049
Aragón	3190	3196	3199	3210	3215	3215
Asturias	1727	1734	1738	1749	1753	1756
Canarias	570	572	573	576	578	580
Cantabria	501	502	502	503	504	504
Castilla y León	6199	6207	6207	6229	6237	6230
Castilla-La Mancha	5504	5513	5513	5526	5533	5528
Cataluña	10048	10055	10054	10071	10072	10070
Ceuta	79	79	80	80	80	80
Comunidad Valenciana	6344	6371	6387	6404	6420	6434
Extremadura	1669	1674	1675	1678	1682	1682
Galicia	2161	2171	2178	2186	2193	2202
Islas Baleares	681	683	683	685	686	686
La Rioja	718	720	721	723	725	725
Madrid	13665	13674	13671	13714	13719	13704
Melilla	65	65	66	66	66	67
Murcia	1414	1421	1427	1431	1436	1441
Navarra	1090	1091	1091	1094	1095	1096
País Vasco	3662	3665	3663	3673	3677	3672

Cuadro: Previsión fallecidos: Mod. Aditivo - Horizonte 1 – 5 días.

Tabla Ratio Incr. Fallecidos: Mod. Lineal.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	0.0022	0.0019	0.0034	0.0049	0.0057	0.0058
Andalucía	0.0036	0.0027	0.0046	0.0060	0.0071	0.0071
Aragón	0.0022	0.0021	0.0040	0.0059	0.0069	0.0073
Asturias	0.0041	0.0041	0.0080	0.0117	0.0146	0.0172
Canarias	0.0038	0.0035	0.0069	0.0107	0.0138	0.0171
Cantabria	0.0015	0.0017	0.0031	0.0044	0.0049	0.0050
Castilla.y.León	0.0019	0.0015	0.0026	0.0040	0.0046	0.0046
Castilla.La.Mancha	0.0018	0.0015	0.0026	0.0035	0.0038	0.0034
Cataluña	0.0007	0.0009	0.0015	0.0023	0.0025	0.0025
Ceuta	0.0051	0.0056	0.0111	0.0142	0.0184	0.0233
Comunidad.Valenciana	0.0041	0.0033	0.0062	0.0082	0.0096	0.0097
Extremadura	0.0025	0.0019	0.0034	0.0042	0.0048	0.0046
Galicia	0.0053	0.0043	0.0082	0.0114	0.0141	0.0161
Islas.Baleares	0.0021	0.0022	0.0044	0.0059	0.0064	0.0061
La.Rioja	0.0027	0.0021	0.0040	0.0062	0.0074	0.0083
Madrid	0.0011	0.0012	0.0020	0.0031	0.0034	0.0031
Melilla	0.0072	0.0040	0.0071	0.0128	0.0175	0.0227
Murcia	0.0050	0.0042	0.0083	0.0111	0.0133	0.0144
Navarra	0.0015	0.0009	0.0014	0.0027	0.0035	0.0044
País.Vasco	0.0012	0.0010	0.0016	0.0024	0.0026	0.0023

Cuadro: Previsión Ratio Incr. Fallecidos: Mod. lineal - Horizonte 1 – 5 días.

Tabla Ratio Incr. Fallecidos: Mod. No Paramétrico.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	0.0022	0.0039	0.0078	0.0121	0.0159	0.0198
Andalucía	0.0036	0.0061	0.0121	0.0181	0.0237	0.0295
Aragón	0.0022	0.0037	0.0072	0.0113	0.0149	0.0186
Asturias	0.0041	0.0044	0.0087	0.0135	0.0178	0.0221
Canarias	0.0038	0.0039	0.0077	0.0120	0.0158	0.0197
Cantabria	0.0015	0.0031	0.0061	0.0094	0.0125	0.0158
Castilla y León	0.0019	0.0036	0.0071	0.0110	0.0146	0.0182
Castilla-La Mancha	0.0018	0.0038	0.0075	0.0116	0.0153	0.0191
Cataluña	0.0007	0.0024	0.0046	0.0071	0.0094	0.0122
Ceuta	0.0051	0.0039	0.0077	0.0120	0.0158	0.0198
Comunidad Valenciana	0.0041	0.0064	0.0128	0.0191	0.0250	0.0311
Extremadura	0.0025	0.0048	0.0094	0.0145	0.0190	0.0236
Galicia	0.0053	0.0069	0.0136	0.0203	0.0267	0.0333
Islas Baleares	0.0021	0.0038	0.0075	0.0116	0.0153	0.0191
La Rioja	0.0027	0.0041	0.0082	0.0127	0.0167	0.0208
Madrid	0.0011	0.0028	0.0054	0.0084	0.0112	0.0142
Melilla	0.0072	0.0084	0.0169	0.0252	0.0333	0.0415
Murcia	0.0050	0.0068	0.0135	0.0201	0.0265	0.0329
Navarra	0.0015	0.0029	0.0056	0.0087	0.0115	0.0146
País Vasco	0.0012	0.0032	0.0063	0.0099	0.0130	0.0164

Cuadro: Previsión Ratio Incr. Fallecidos: Mod. No Paramétrico - Horizonte 1 – 5 días.

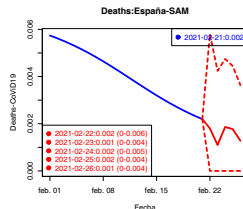
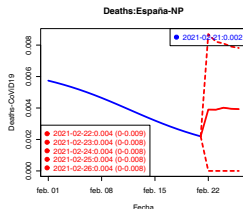
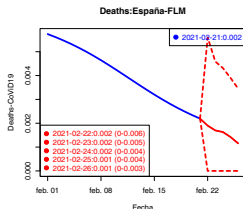
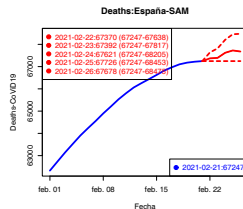
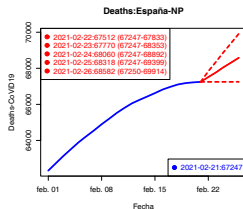
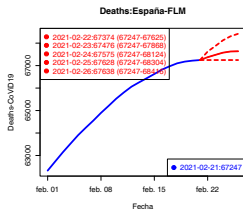
Tabla Ratio Incr. Fallecidos: Mod. Aditivo.

Last=21/02/2021

	Last	H1	H2	H3	H4	H5
España	0.0022	0.0018	0.0022	0.0056	0.0071	0.0064
Andalucía	0.0036	0.0033	0.0047	0.0078	0.0099	0.0112
Aragón	0.0022	0.0018	0.0028	0.0064	0.0078	0.0077
Asturias	0.0041	0.0038	0.0066	0.0129	0.0152	0.0169
Canarias	0.0038	0.0030	0.0058	0.0112	0.0141	0.0169
Cantabria	0.0015	0.0013	0.0020	0.0047	0.0054	0.0052
Castilla.y.León	0.0019	0.0013	0.0013	0.0048	0.0061	0.0051
Castilla.La.Mancha	0.0018	0.0016	0.0016	0.0039	0.0052	0.0044
Cataluña	0.0007	0.0007	0.0006	0.0023	0.0024	0.0022
Ceuta	0.0051	0.0047	0.0077	0.0095	0.0091	0.0165
Comunidad.Valenciana	0.0041	0.0042	0.0068	0.0095	0.0119	0.0142
Extremadura	0.0025	0.0029	0.0037	0.0054	0.0077	0.0080
Galicia	0.0053	0.0045	0.0079	0.0116	0.0150	0.0188
Islas.Baleares	0.0021	0.0025	0.0036	0.0064	0.0074	0.0069
La.Rioja	0.0027	0.0027	0.0039	0.0076	0.0099	0.0101
Madrid	0.0011	0.0006	0.0004	0.0036	0.0040	0.0028
Melilla	0.0072	0.0037	0.0079	0.0134	0.0154	0.0267
Murcia	0.0050	0.0051	0.0094	0.0117	0.0153	0.0193
Navarra	0.0015	0.0010	0.0013	0.0035	0.0050	0.0056
País.Vasco	0.0012	0.0007	0.0003	0.0031	0.0042	0.0028

Cuadro: Previsión Ratio Incr. Fallecidos: Mod. Aditivo - Horizonte 1 – 5 días.

Fallecidos: España

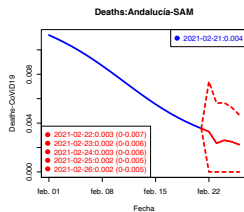
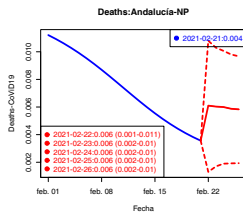
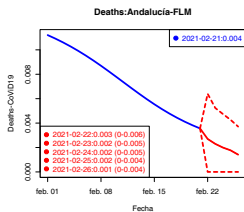
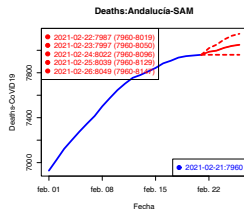
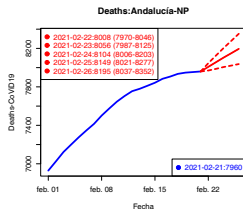
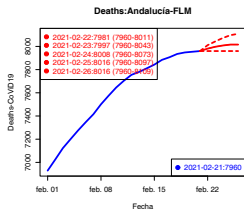


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Andalucía

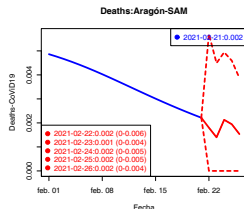
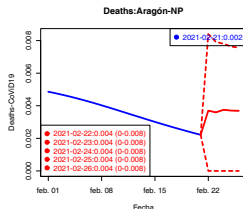
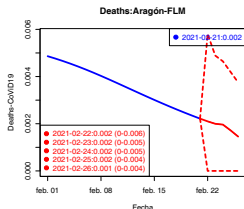
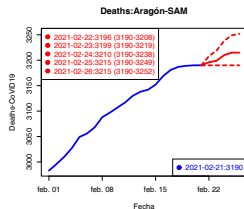
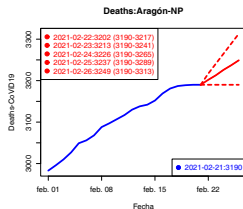
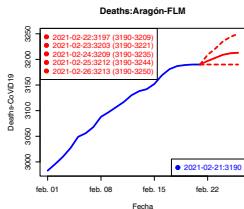


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Aragón

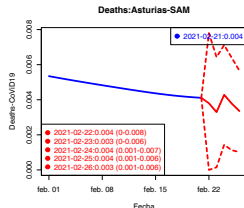
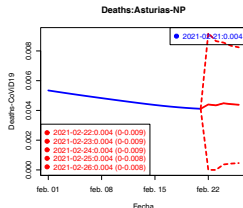
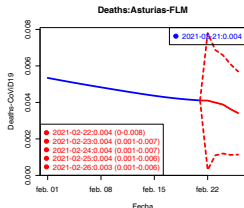
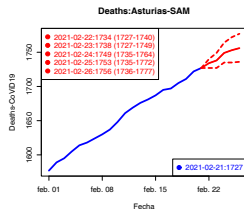
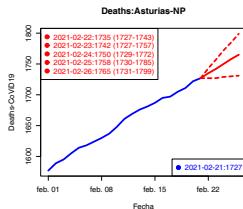
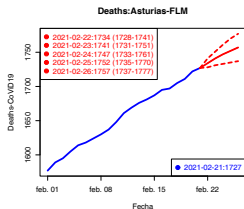


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Asturias

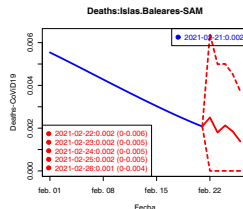
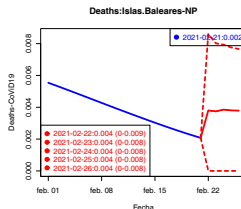
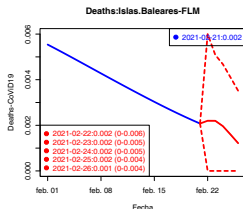
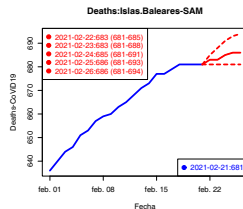
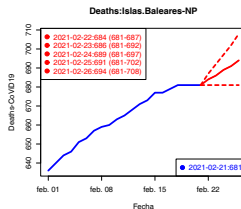
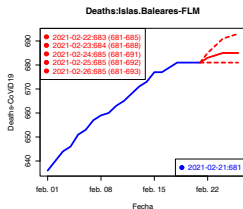


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Islas Baleares

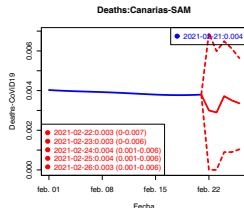
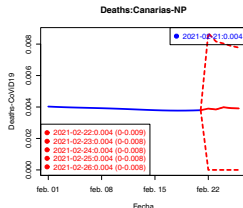
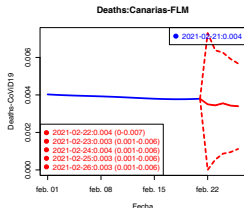
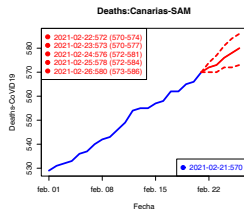
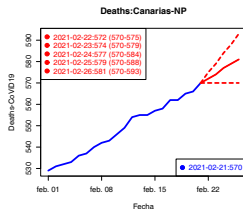
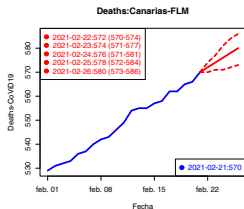


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Canarias

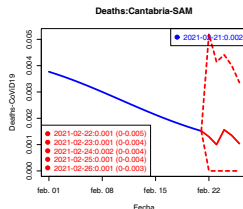
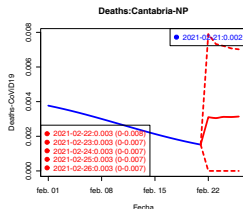
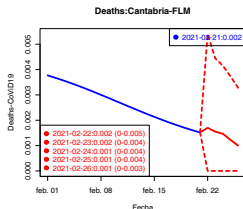
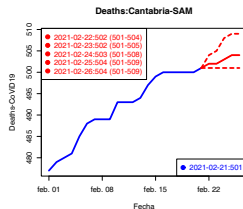
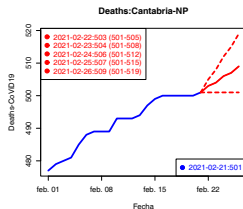
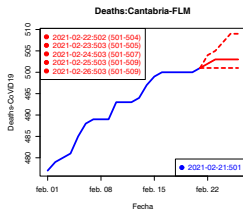


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Cantabria

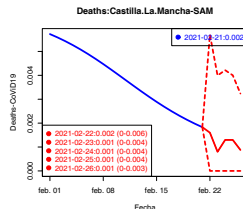
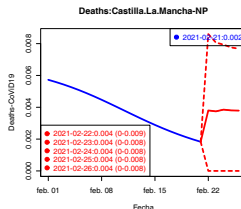
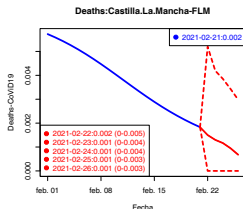
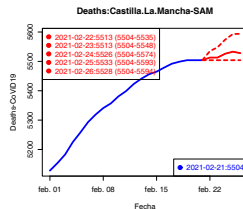
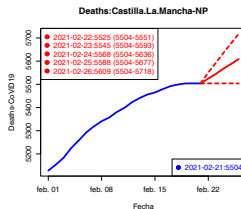
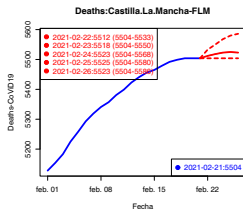


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Castilla-La Mancha

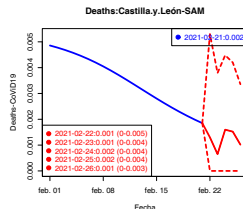
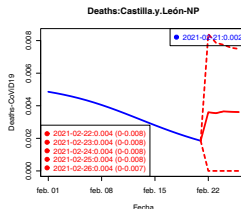
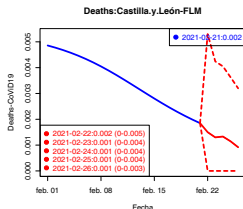
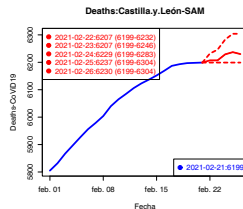
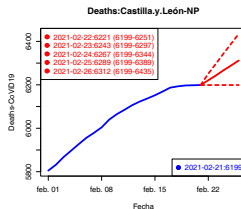
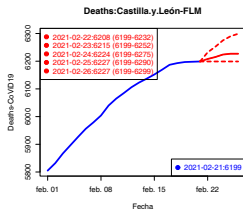


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Castilla y León

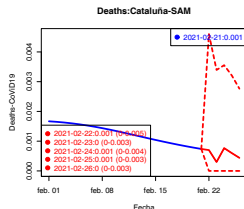
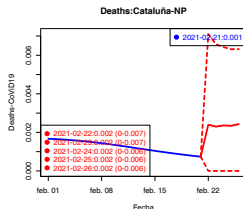
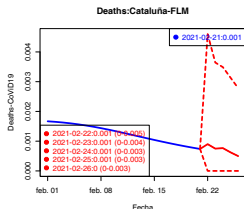
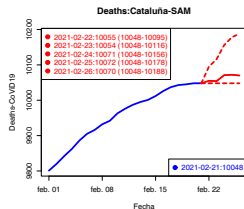
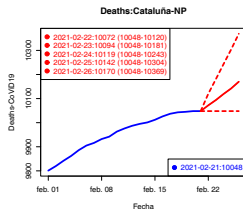
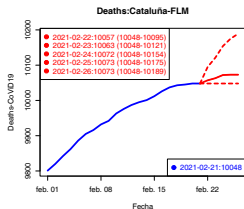


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

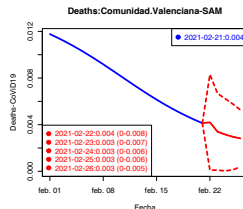
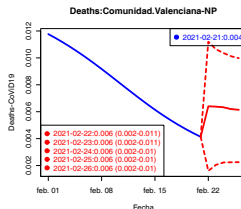
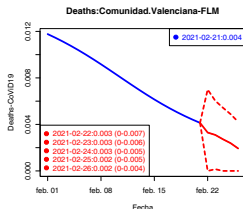
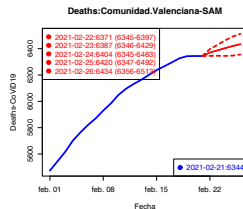
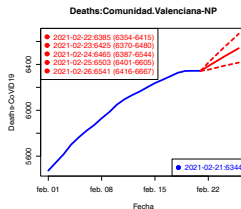
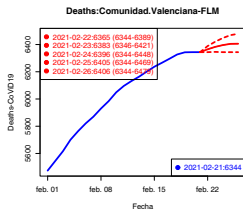
◀ Fallecidos

Fallecidos: Cataluña



Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

Fallecidos: C. Valenciana

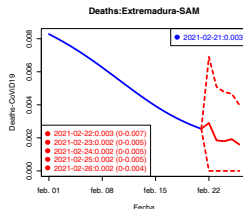
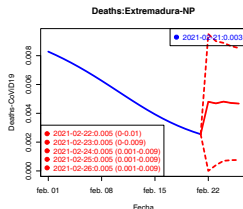
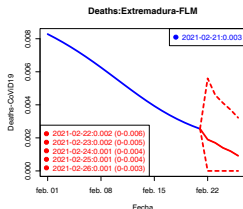
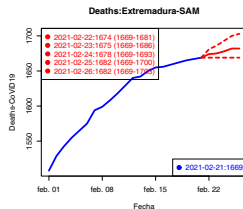
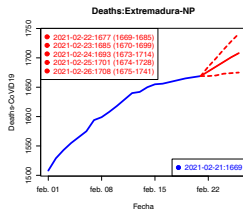
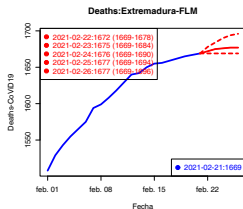


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Extremadura

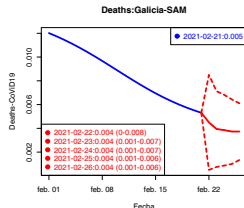
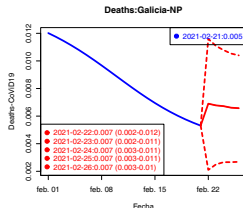
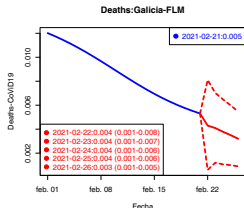
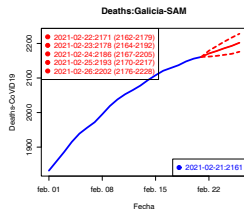
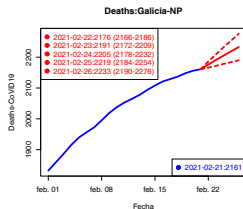
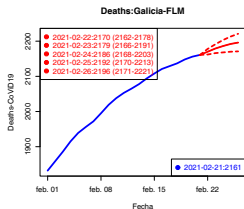


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Galicia

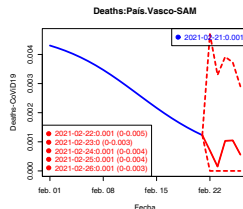
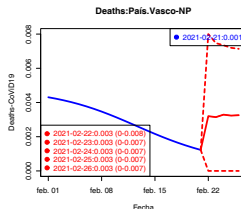
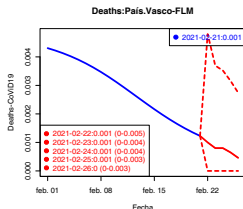
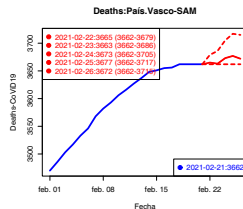
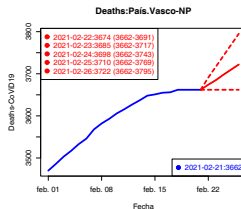
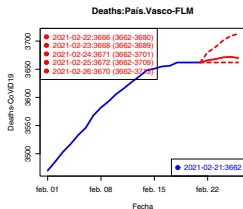


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: País Vasco

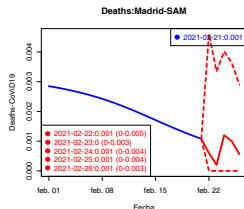
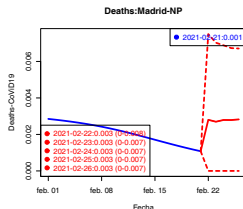
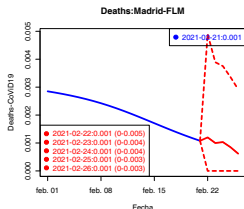
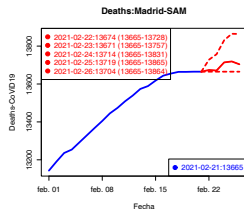
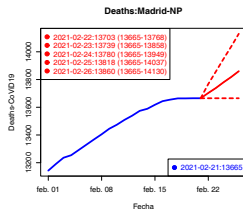
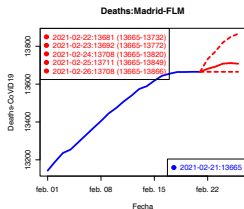


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: Madrid

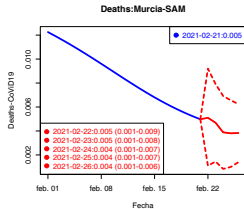
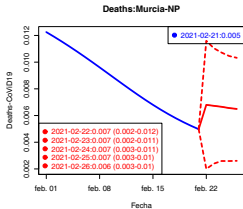
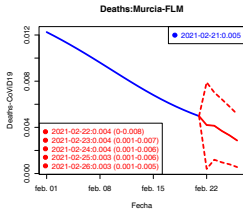
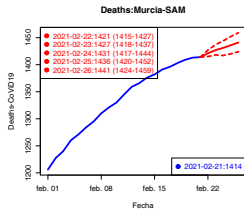
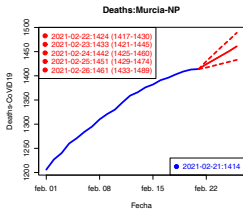
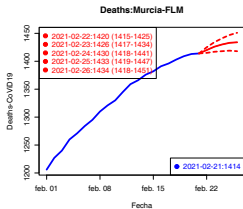


Los valores del Ratio de incremento de H2-H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

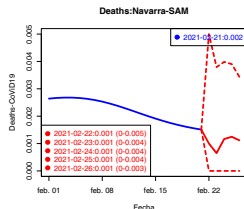
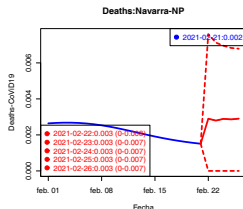
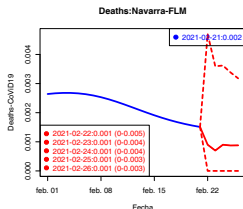
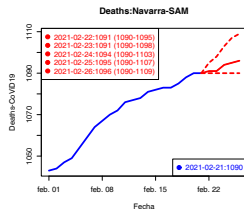
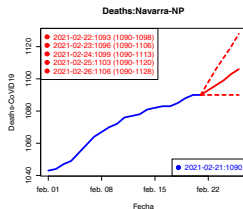
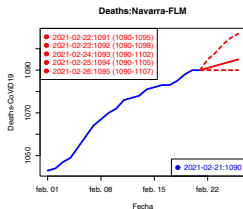
◀ Fallecidos

Fallecidos: Murcia



Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

Fallecidos: Navarra

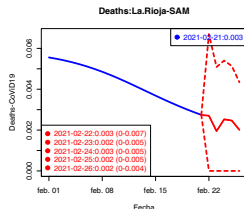
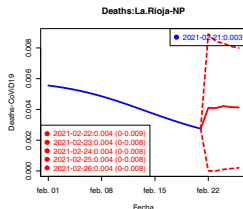
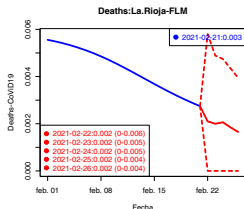
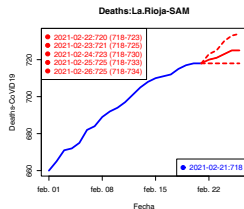
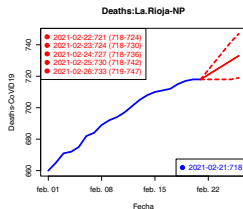
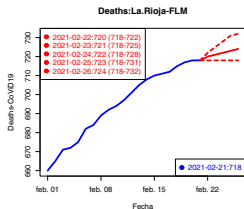


Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

◀ Confirmados

◀ Fallecidos

Fallecidos: La Rioja



Los valores del Ratio de incremento de H2–H5 están rescalados a H1 para su comparación gráfica.

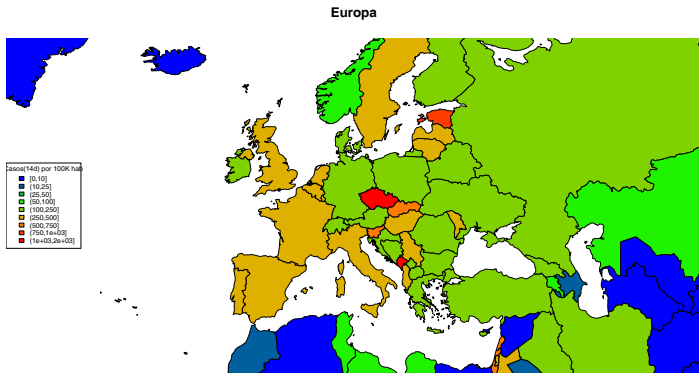
◀ Confirmados

◀ Fallecidos

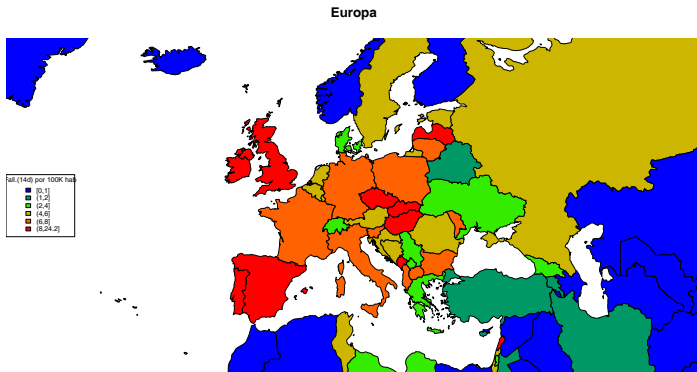
Table of Contents

- 1 Casos Confirmados
 - Predicciones
- 2 Fallecidos
 - Predicciones Fallecidos
- 3 Panorama internacional

Europa: Incidencia Acumulada (14d) por 100K hab.

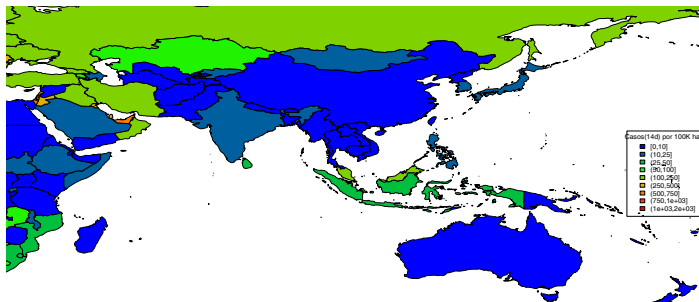


Europa: Fallecidos (14d) por 100K hab.



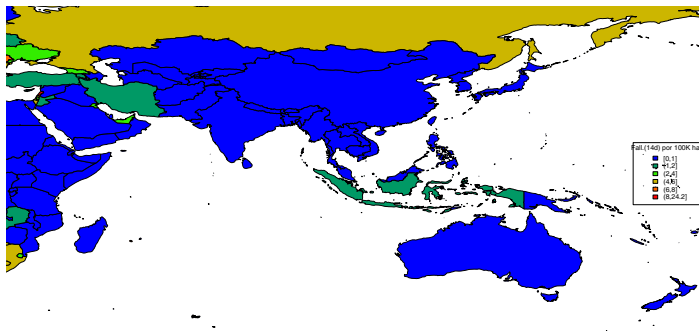
Asia y Oceanía: Incidencia acumulada (14d) por 100K hab.

Asia y Oceanía



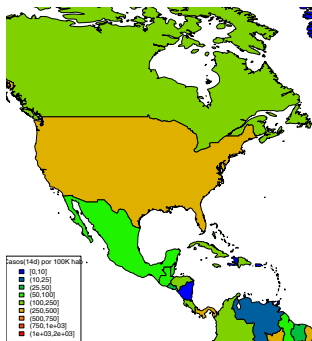
Asia y Oceanía: Fallecidos (14d) por 100K hab.

Asia y Oceanía

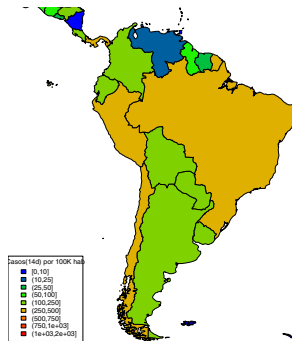


América: Incidencia acumulada (14d) por 100K hab.

América del Norte

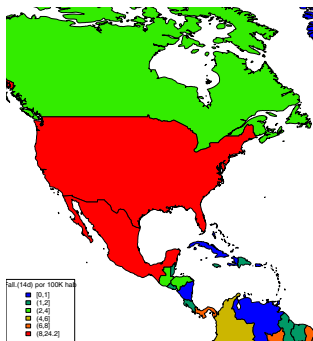


América del sur

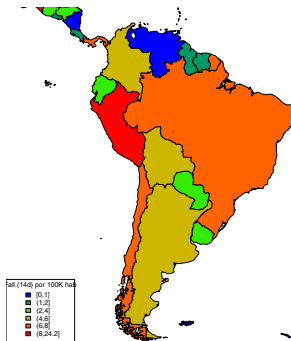


América: Fallecidos (14d) por 100K hab.

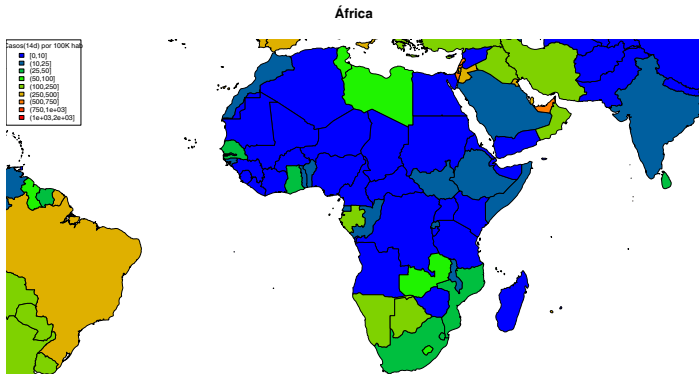
América del Norte



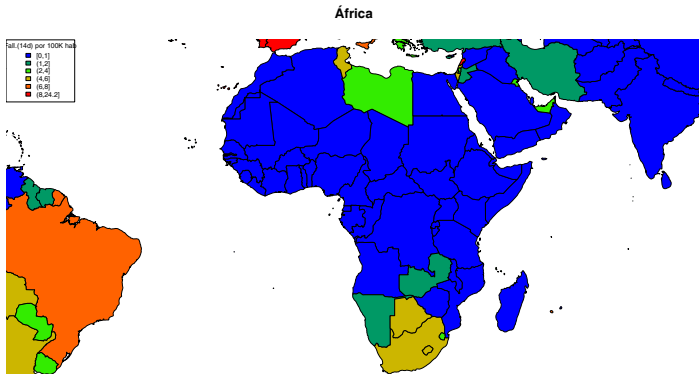
América del sur



África: Incidencia acumulada (14d) por 100K hab.



África: Fallecidos (14d) por 100K hab.



Breve descripción del Modelo de predicción

Objetivo: Predecir ratio de incremento de casos confirmados a 1–5 días: $r^{(k)}(t) = \frac{x_{t+k} - x_t}{x_t + 1}$

Información usada: Pasado de esta variable suavizada (retardo 1) durante los últimos 21 días: $R^{(1)} = \{r^{(1)}(-21), \dots, r^{(1)}(0)\}$.

Datos para alimentar el modelo: https://github.com/CSSEGISandData/COVID-19/tree/master/csse_covid_19_data/csse_covid_19_time_series/. Algunas series de tiempo (como el Diamond Princess) son filtrados por inconsistencia, presunta falta de veracidad o por valores anormalmente bajos. En la predicción final se reconstruye el número de casos esperado.

Se construyen tres modelos funcionales de la regresión general: $r^{(k)}(0) = f(R^{(1)}) + \epsilon$ donde la diferencia radica en la forma de la función f

- Lineal: $f(R^{(1)}) = \int_{-21}^0 R^{(1)}(t)\beta(t)dt$
- NP: f es una estimación no paramétrica tipo núcleo.
- SAM: f es una combinación aditiva de funciones suaves de las componentes principales funcionales.

Para el objetivo de predecir el ratio de incremento de fallecidos, se usa además del pasado de la propia variable, el ratio de incremento pasado de casos confirmados.