

Estimation of the Respiratory Syncytial Virus hospitalization burden in older adults in the Veneto Region, Italy: a modelling study

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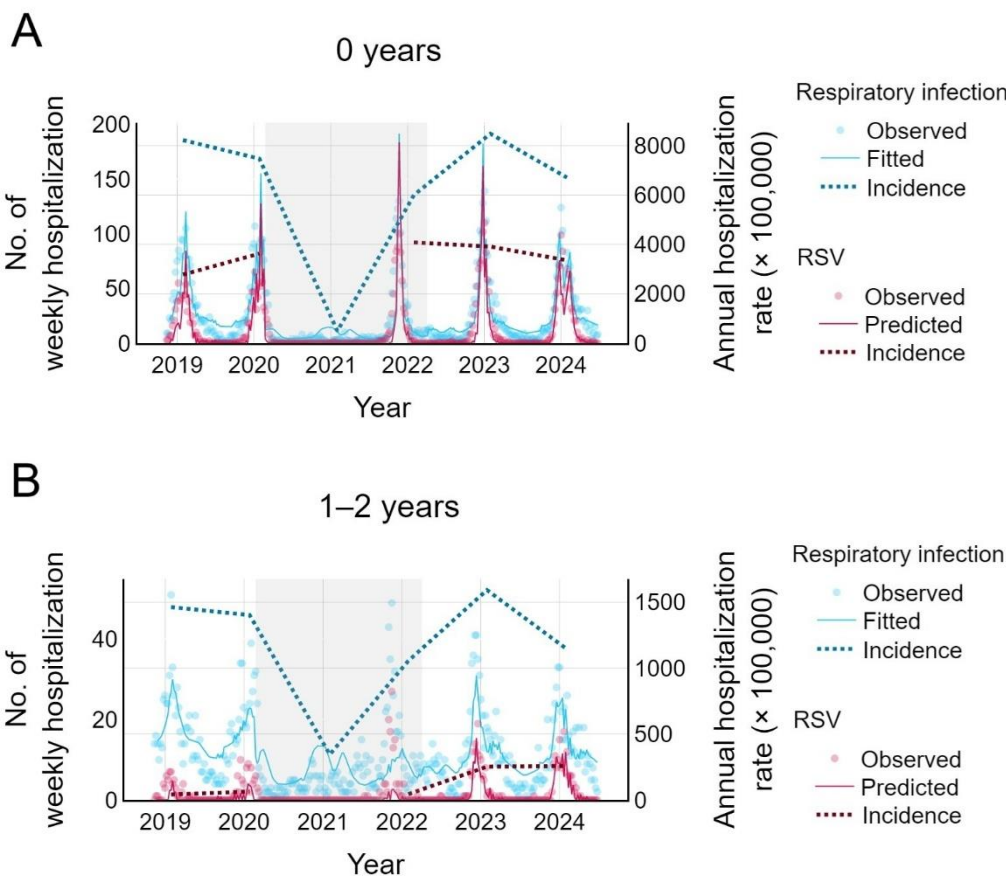
Supplementary materials

Table S1. International Classification of Diseases Clinical Modification (ICD-CM) codes for respiratory-related hospital and emergency department admissions [26–28], with ICD-10-CM to ICD-9-CM conversion.

Diagnosis	ICD-10-CM [36]	ICD-9-CM [37]
Acute URTI	J00, J02-06	460, 462-466
Pneumonia & influenza	J09-18	480-488
Bronchiolitis and bronchitis	J20-21, J40	466*, 490
Unspecified LRTI	J22	519.8*
RSV as the cause of diseases classified elsewhere	B97.4	079.6*

Legend: URTI, upper respiratory tract infection; LRTI, lower respiratory tract infection; RSV, respiratory syncytial virus.

* Approximate conversion



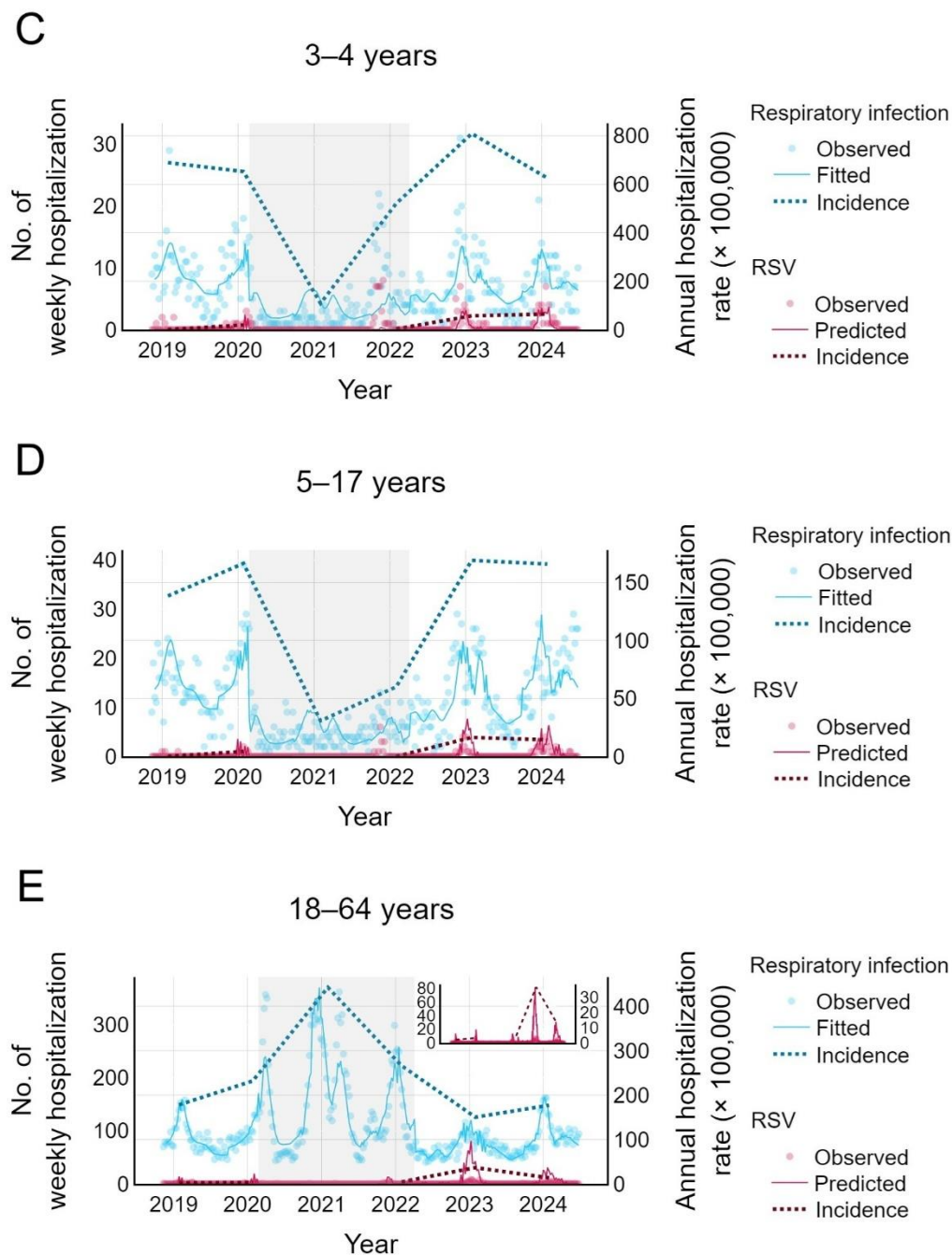


Figure S1. Weekly number of hospitalizations for respiratory infections and respiratory syncytial virus (RSV)-related hospital discharges in the Veneto Region from 2018 to 2024, stratified by age group. Dots represent observed (coded) cases, while the solid line represents model predictions (left y-axis). Annual incidence rates per 100,000 person-years are displayed as dashed lines (right y-axis). Panel E includes an inset (top right) with a zoomed view of the RSV traces. The shaded area approximately corresponds to the COVID-19 acute phase, during which strong public health restrictions were in place in Italy.

Table S2. Absolute number and incidence rate (per 100,000 person-years) of hospitalizations for respiratory infections (RI), with coded versus predicted respiratory syncytial virus (RSV)-attributable cases, by season and age group. Trends in annual incidence rate across the seasons from 2018 to 2024, excluding 2020-21, are expressed as average annual percentage changes (AAPC), with 95% confidence intervals (CI) and p-values from Joinpoint regression analysis.

Season	Age (years)	RI Hospitalizations		RSV Coded Hospitalizations			RSV Predicted Hospitalizations			Multiplicative factor
		n	Rate x 100,000	n	Rate x 100,000	RSV attributable %	n	Rate x 100,000	RSV attributable %	
2018-19	0	1265	8224.64	555	3608.44	43.87	427	2778.46	33.78	0.77
	1-2	474	1463.34	54	166.71	11.39	14	41.82	2.86	0.25
	3-4	238	689.45	6	17.38	2.52	0	0.00	0.00	0.00
	5-17	350	138.39	3	1.19	0.86	0	0.00	0.00	0.00
	18-64	2237	178.07	16	1.27	0.72	26	2.03	1.14	1.60
	65-74	2042	894.84	10	4.38	0.49	31	13.39	1.50	3.06
	75-84	4568	2729.46	11	6.57	0.24	51	30.27	1.11	4.61
	85+	5772	8133.13	3	4.23	0.05	0	0.00	0.00	0.00
2019-20	0	1105	7472.17	591	3996.43	53.48	536	3627.83	48.55	0.91
	1-2	442	1402.95	80	253.93	18.10	20	63.47	4.52	0.25
	3-4	219	652.53	14	41.71	6.39	6	19.11	2.93	0.46
	5-17	418	166.52	5	1.99	1.20	11	4.26	2.56	2.14
	18-64	2913	231.85	7	0.56	0.24	39	3.09	1.33	5.54
	65-74	2250	980.33	9	3.92	0.40	0	0.00	0.00	0.00
	75-84	4232	2484.12	12	7.04	0.28	65	37.91	1.53	5.38
	85+	5159	7131.75	13	17.97	0.25	118	163.35	2.29	9.09
2020-21	0	72	490.88	2	13.64	2.78	-	-	-	-
	1-2	110	345.05	0	0.00	0.00	-	-	-	-
	3-4	37	108.43	0	0.00	0.00	-	-	-	-
	5-17	80	30.73	0	0.00	0.00	-	-	-	-
	18-64	5792	442.43	2	0.15	0.03	-	-	-	-
	65-74	4949	2038.66	2	0.82	0.04	-	-	-	-
	75-84	7062	3925.51	0	0.00	0.00	-	-	-	-
	85+	6138	7875.57	4	5.13	0.07	-	-	-	-
2021-22	0	828	6002.60	510	3697.26	61.59	563	4083.20	68.02	1.10
	1-2	310	1056.19	89	303.23	28.71	13	43.96	4.16	0.14
	3-4	167	520.73	30	93.54	17.96	1	2.95	0.57	0.03
	5-17	148	59.95	14	5.67	9.46	0	0.00	0.00	0.00
	18-64	3324	266.06	12	0.96	0.36	56	4.49	1.69	4.67
	65-74	2485	1047.60	14	5.90	0.56	18	7.51	0.72	1.27
	75-84	4360	2570.27	18	10.61	0.41	78	45.97	1.79	4.33
	85+	4742	6324.92	20	26.68	0.42	22	28.73	0.45	1.08
2022-23	0	1335	8482.77	839	5331.12	62.85	616	3912.40	46.12	0.73
	1-2	510	1592.81	119	371.66	23.33	81	252.94	15.88	0.68
	3-4	285	809.28	34	96.55	11.93	20	57.04	7.05	0.59
	5-17	470	169.16	16	5.76	3.40	45	16.36	9.67	2.84
	18-64	2115	150.17	53	3.76	2.51	516	36.61	24.38	9.73
	65-74	2220	829.52	55	20.55	2.48	147	54.94	6.62	2.67
	75-84	4950	2483.27	82	41.14	1.66	503	252.40	10.16	6.14
	85+	6096	7049.62	82	94.83	1.35	737	852.72	12.10	8.99
2023-24	0	1351	6709.25	823	4087.13	60.92	676	3355.57	50.01	0.82
	1-2	483	1151.75	137	326.69	28.36	108	258.19	22.42	0.79
	3-4	279	625.63	39	87.45	13.98	29	64.41	10.30	0.74
	5-17	601	165.97	26	7.18	4.33	52	14.31	8.62	1.99
	18-64	3290	176.95	30	1.61	0.91	253	13.60	7.69	8.43
	65-74	2698	759.00	35	9.85	1.30	158	44.33	5.84	4.50
	75-84	5560	2077.93	38	14.20	0.68	370	138.19	6.65	9.73
	85+	7217	6221.03	58	50.00	0.80	458	395.18	6.35	7.90
Total		113,748		4572			6864			1.50
AAPC* (95% CI), p-value	0	-1.32 (-8.092; 5.693) 0.715		5.31 (-4.334; 15.852) 0.288			3.91 (-5.312; 13.977) 0.429			
	1-2	-2.60 (-11.919; 7.455) 0.593		15.52 (1.544; 31.440) 0.020			43.74 (4.03; 99.203) 0.025			
	3-4	0.14 (-7.603; 8.137) 0.981		39.92 (-3.179; 103.421) 0.083			47.71 (-43.978; 306.795) 0.521			
	5-17	0.66 (-24.166; 32.638) 0.997		46.40 (20.639; 77.541) < 0.001			39.97 (6.341; 89.073) 0.008			
	18-64	-2.62 (-21.778; 21.126) 0.687		21.60 (-22.272; 89.429) 0.376			61.61 (-9.017; 184.496) 0.096			
	65-74	-2.98 (-12.156; 7.120) 0.465		30.89 (0.178; 70.426) 0.048			31.24 (-12.571; 102.899) 0.288			
	75-84	-3.48 (-11.503; 5.438) 0.362		31.60 (0.848; 70.218) 0.041			45.25 (9.664; 91.214) 0.007			
	85+	-3.78 (-9.677; 2.514) 0.221		68.08 (-4.868; 198.293) 0.078			44.48 (-42.715; 269.949) 0.527			

* Average annual percentage change (AAPC) 2018-2024, excluded 2020-2021 season

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