

# The economic burden that Respiratory Syncytial Virus (RSV) imposes on Irish hospitals

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## BACKGROUND

Respiratory syncytial virus (RSV) is a common respiratory virus which causes mild, cold-like symptoms in most people, who quickly recover after a week or two [1]. However, the virus can be much more serious, especially for infants, young children, and older adults and can result in a hospital stay [1]. It is highly contagious and can easily spread through contact with contaminated hands, hard surfaces, and other objects [1]. Furthermore, it is a significant cause of infection and outbreaks in hospitals, neonatal units, day units and nursing homes [1].

RSV outbreaks usually occur during the winter months with the highest numbers of infections usually reported in December and January [1]. Normally, the sharp winter RSV peak varies little in timing or size from one year to the next, unlike influenza which is much less predictable in its timing. However, RSV is starting and peaking earlier in recent seasons [1]. This trend was also seen internationally and is a result of the COVID-19 pandemic [1, 3].

## OBJECTIVE

The objective of this study is to give an overall description of RSV related hospitalisations and an estimation of the total healthcare costs in Ireland associated with reported and unreported RSV-related hospitalisations. The burden is estimated across three different age groups (infants aged ≤2 years, older adults aged ≥65 years and other patients (children and adults) aged 3–64 years).

## METHODS

Data for inpatient hospitalisations due to RSV were based on RSV-specific and laboratory confirmed RSV ICD-10 codes (J12.1/J20.5/J21.0/B97.4) for the 2017–2021 period in Ireland [4] and obtained as a special data request from the Hospital Inpatient Enquiry (HIPE) database [2]. Unit costs were based on the cost per day of an inpatient stay from the Healthcare Pricing Office (HPO)'s Activity Based Funding (ABF) 2022 admitted price list for minor respiratory infection (E62B) [5]. The €3,579 cost per case was adjusted in accordance with the ABF's inlier relative value (RV), multi-high per diem RV and inpatient base price, if the average length of stay was ≥19 days [2, 5].

Assumptions from the literature were used to estimate the additional costs associated with unreported inpatient hospitalisations for infants and older adults [6–8]. Most acute bronchiolitis hospital admissions in children are due to RSV [6]. Therefore, additional bronchiolitis ICD-10 codes (J21.1/J21.8/J21.9) were used to capture unreported RSV hospitalisations for infants [2]. Almost 32,000 inpatients were hospitalised in Ireland for respiratory related infections in 2021 [7]. It was assumed that 6.8% of these patients were older adults, hospitalised because of RSV [8].

## RESULTS

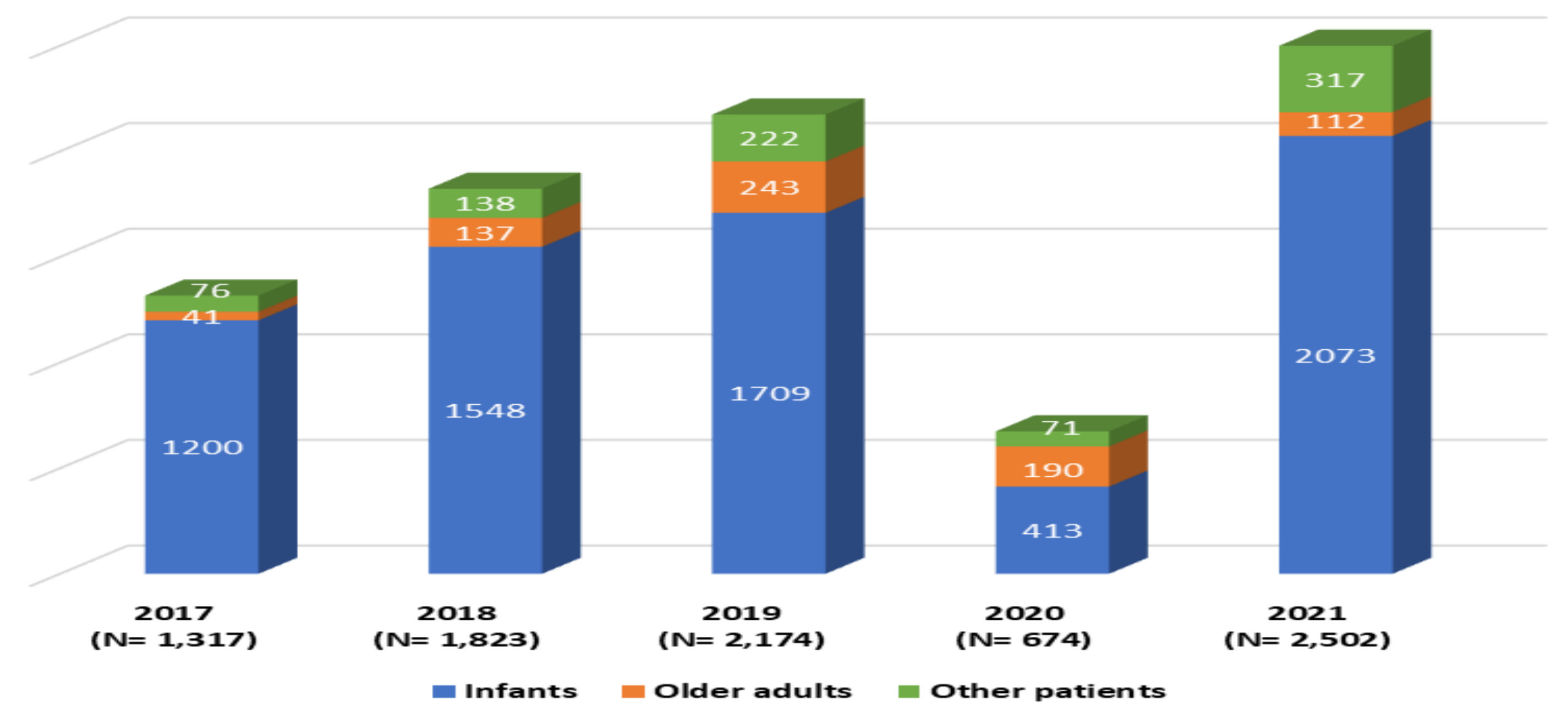
The total number of laboratory confirmed RSV-specific hospitalisations recorded in 2021 was 2,502, which represented a 90% increase from 1,131 hospitalisations in 2017 (Figure 1). However, the number of hospitalisations and subsequent costs were lower in 2020 because of the COVID-19 lock down restrictions in Ireland during that year. Figure 2 shows that, unsurprisingly, that older adults tend to stay longer in hospital than the younger age groups. With the exception of 2020 which is distorted by COVID-19, the average length of stay decreased across all age groups over time.

The cost of RSV-related hospitalisations was estimated at €4,713,543 in 2017, €6,677,742 in 2018, €7,780,746 in 2019, €3,163,512 in 2020 and €8,945,658 in 2021 (Figure 3). The total estimated number of unreported infant and older adult RSV-hospitalisations was 3,101 in 2021, which means that the total annual costs could be as high as €20,051,662 if unreported RSV-related hospitalisations are accounted for (Figure 4).

## CONCLUSION

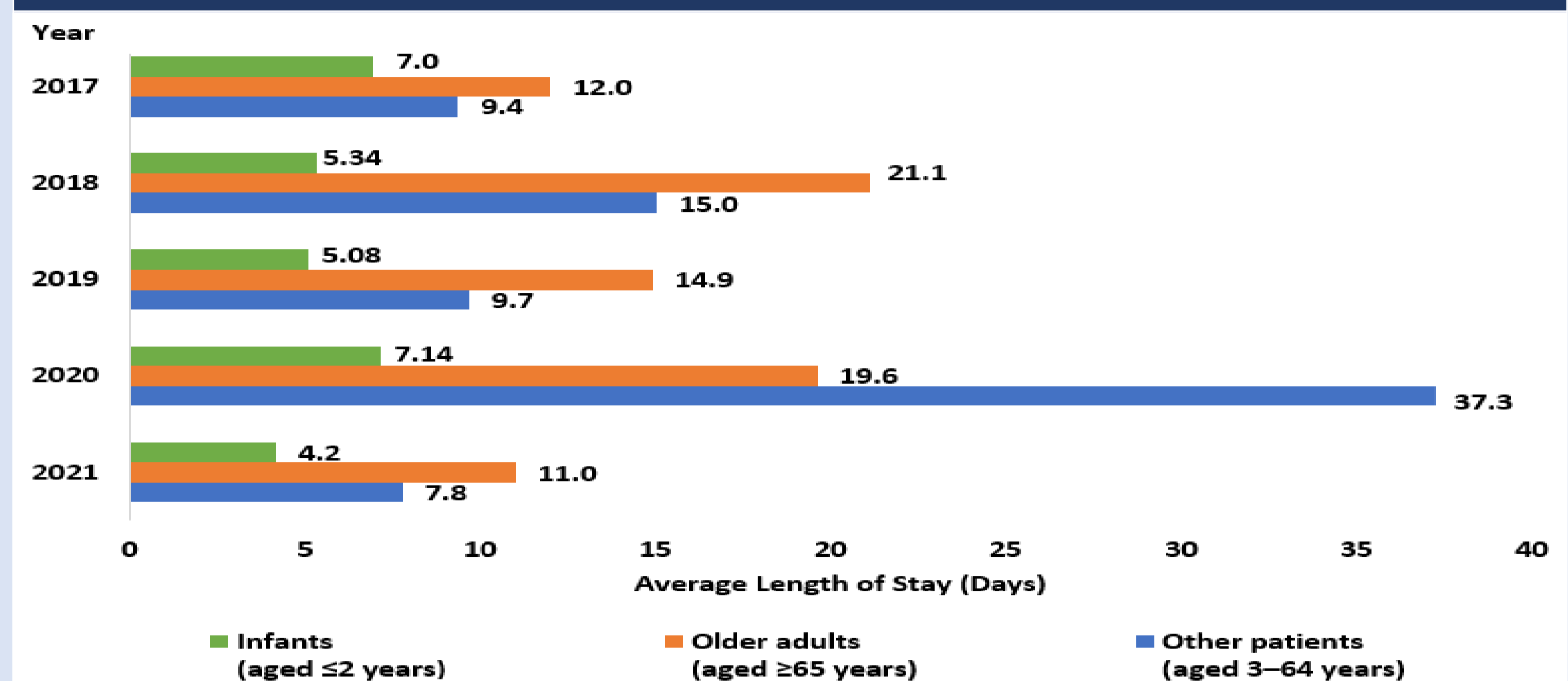
RSV imposes a significant cost burden on Irish hospitals, which has almost doubled since 2017. However, there is some uncertainty concerning this burden due to the under-reporting of RSV. Therefore, further research and studies are required to gain a truer understanding of RSV in Irish hospitals to inform future policy decisions.

Figure 1: Number of inpatient hospitalisations by age group (2017–2021)



Source: Activity Based Funding (ABF) Admitted Price List (2022).

Figure 2: Average length of stay (no. of days) by patient group (2017–2021)



Source: Hospital In-Patient Enquiry (HIPE) Special data request (2023).

Figure 3: Total costs associated with RSV related hospitalisation in Ireland (2017–2021)

Year	Patient group	Average length of stay	Annual inpatient cost	Resource use (no. of patients)	Associated costs	Total Annual Costs
2017	Infants	7.0	€3,579	1200	€4,294,800	€4,713,543
	Older adults	12.0	€3,579	41	€146,739	
	Adults	9.4	€3,579	76	€272,004	
2018	Infants	5.3	€3,579	1548	€5,540,292	€6,677,742
	Older adults	21.1	€4,697	137	€643,548	
	Adults	15.0	€3,579	138	€493,902	
2019	Infants	5.1	€3,579	1709	€6,116,511	€7,780,746
	Older adults	14.9	€3,579	243	€869,697	
	Adults	9.7	€3,579	222	€794,538	
2020	Infants	7.1	€3,579	413	€1,478,127	€3,163,512
	Older adults	19.6	€3,898	190	€740,575	
	Adults	37.3	€13,307	71	€944,810	
2021	Infants	4.2	€3,579	2073	€7,419,267	€8,954,658
	Older adults	11.0	€3,579	112	€400,848	
	Adults	7.8	€3,579	317	€1,134,543	

Sources: Activity Based Funding (ABF) Admitted Price List (2022) and Hospital In-Patient Enquiry (HIPE) Special data request (2023).

Figure 4: Total costs (including unreported inpatient hospitalisations) associated with RSV related hospitalisation in Ireland (2017–2021)

Year	Inpatient hospitalisations	Patient group	Average length of stay	Annual inpatient cost	Resource use (no. of patients)	Costs
2021	Reported	See Figure 3				€8,954,658
		Unreported	Infants	4.2	€3,579	949
		Older adults	11.0	€3,579	2152	€7,700,533
<b>Total inpatient costs (inc unreported) associated with RSV in patients</b>						<b>€20,051,662</b>

Source: Activity Based Funding (ABF) Admitted Price List (2022) and Hospital In-Patient Enquiry (HIPE) Special data request (2023).

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