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LEVERAGING TIME-USE DATA TO ESTIMATE MARKET AND NON-MARKET PRODUCTIVITY LOSSES DUE TO RESPIRATORY SYNCYTIAL VIRUS (RSV) DISEASE AMONG ADULTS AGED ≥60 YEARS IN THE UNITED STATES (US)



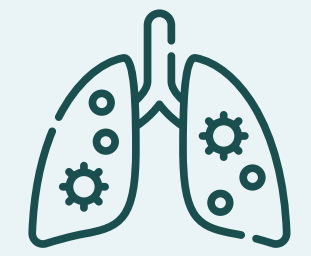
SCAN ME

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#EE331

INTRODUCTION



RSV is a **major cause of acute respiratory infection** among older adults, with clinical and economic **burden increasing with age**.^{1,2}



To capture the broad value for money when **evaluating healthcare interventions**, recent guidelines recommend the inclusion of a societal perspective^{3,4}; however, **indirect costs are often limited to wages lost** due to missed work (market productivity losses).⁵

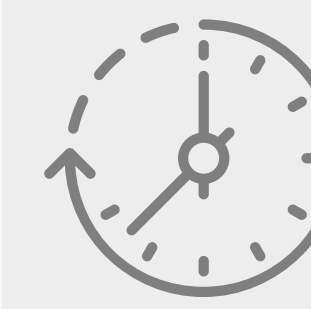


Market losses are **limited to those who remain in the workforce**; yet older adults provide substantial added value to society under the form of non-market productive activities such as **caregiving, household activities and volunteering**, among others.⁶



In this study, we aim to **facilitate more comprehensive economic evaluations for RSV interventions** in older adults by **estimating both market and non-market productivity losses** due to RSV cases and premature mortality in US adults aged ≥60 years.

METHODS



Time losses relevant to RSV were retrieved from literature^{7,8}:

1. Hospitalized lower respiratory tract disease (LRTD) cases: 7 days
2. Emergency department (ED) and outpatient visit cases: 3.3 days
3. Nonmedically-attended cases: 0.5 day (60-64 years) to 1 day (≥65 years)



These time losses were classified as **market, non-market, or non-productive activities**⁹ based on an analysis of American Time Use Survey (ATUS)¹⁰ data.



RSV-specific time losses were **valued at unit costs**, derived from the US Bureau of Labor Statistics¹¹ for market productivity losses, and from Grosse et al.⁹ for non-market productivity losses. Non-productive time was valued at \$0. (*Supplementary material*)



Productivity losses **due to RSV premature death** were included by inflating published estimates⁹ using the gross domestic product deflator.¹²
Note: Productivity growth was not applied when deriving 2022 estimates.



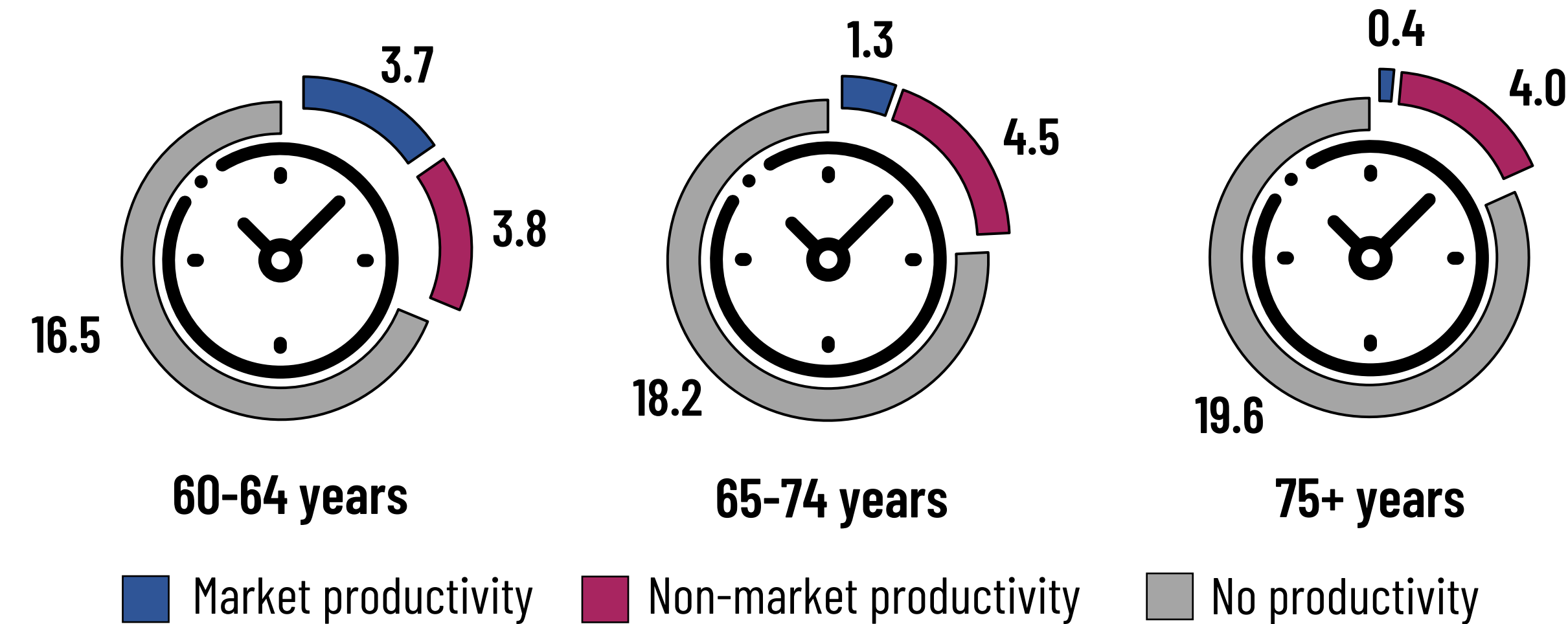
A **Markov model**² was used to estimate annual productivity losses due to RSV disease and premature death in US adults aged ≥60 years.

RESULTS



- Older adults spent less time performing market vs. non-market productive activities.
- Market productive activities decreased with age, whereas non-market productive activities remained relatively stable throughout the age groups.

Time use by age group in hours per day



RSV-related productivity losses were highest for adults aged 60-64 years and decreased with age; non-market activities contributed substantially to productivity losses across all older adults.

Productivity losses due to RSV URTD case^{8-10,12}

	Market	Non-Market	Total
60-64 years	\$156	\$74	\$230
65-75 years	\$65	\$114	\$180
75+ years	\$17	\$102	\$120

Productivity losses due to RSV LRTD case^{7-10,12}

	Market	Non-Market	Total
60-64 years	\$275	\$130	\$405
65-75 years	\$112	\$195	\$307
75+ years	\$32	\$186	\$218

Productivity losses due to premature RSV-related death^{9,12}

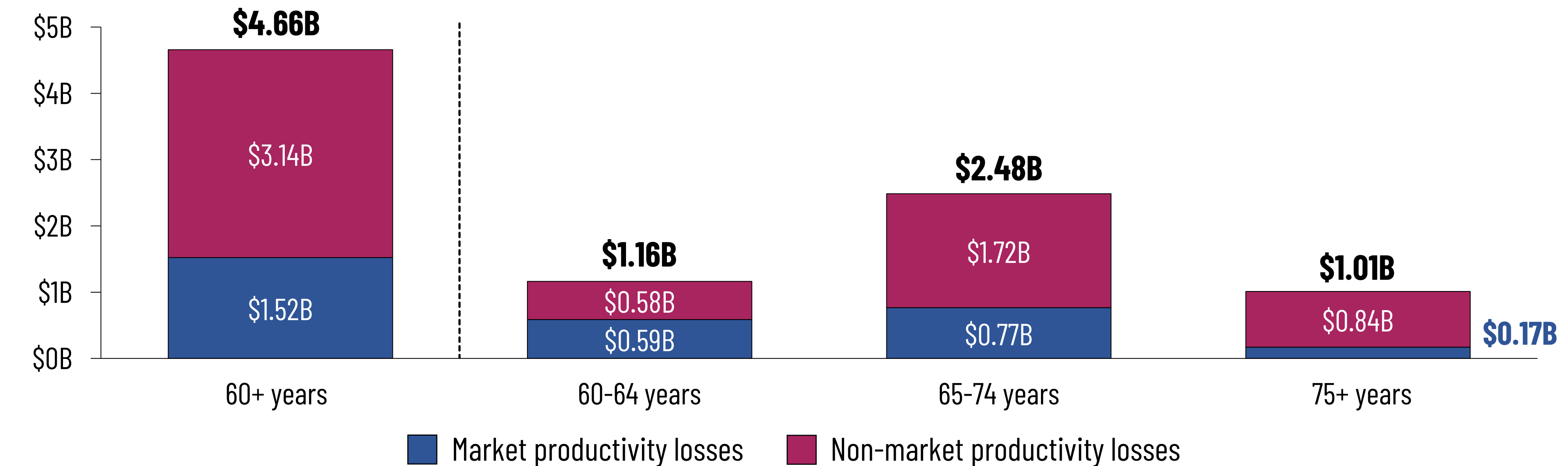
	Market	Non-Market	Total
60-64 years	\$322,286	\$380,945	\$703,231
65-69 years	\$155,004	\$310,438	\$465,441
70-74 years	\$73,002	\$231,650	\$304,651
75-79 years	\$34,391	\$155,016	\$189,407
80-84 years	\$14,921	\$85,933	\$100,853
85-89 years	\$6,745	\$36,867	\$43,612
90+ years	\$2,211	\$8,059	\$10,270

LRTD: lower respiratory tract disease; RSV: respiratory syncytial virus; URTD: upper respiratory tract disease; **Note:** Total values may differ due to rounding.

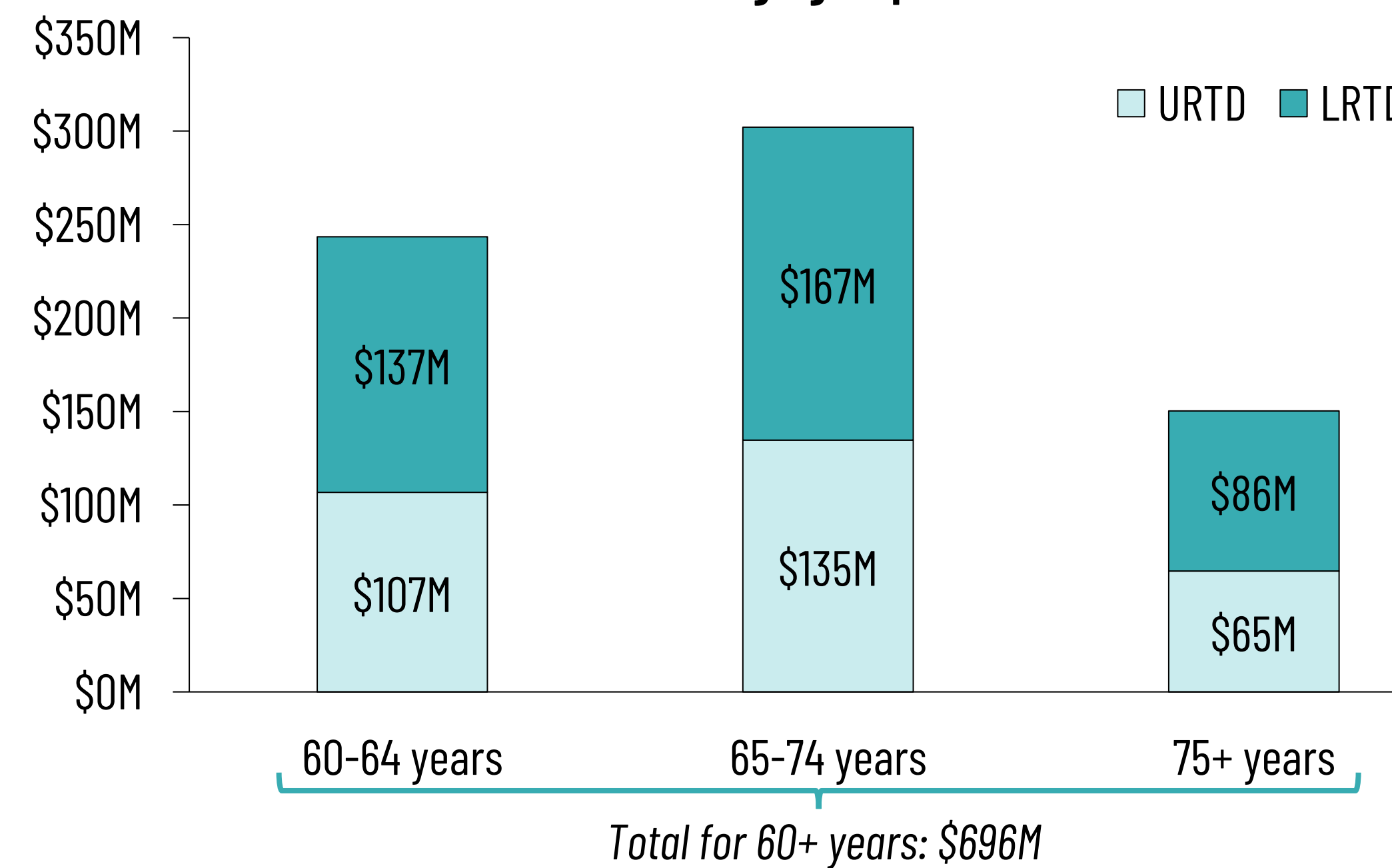


- 25% of productivity losses due to RSV occur in adults aged 60-64 years.
- 67% of productivity losses result from disruptions in non-market productive activities.

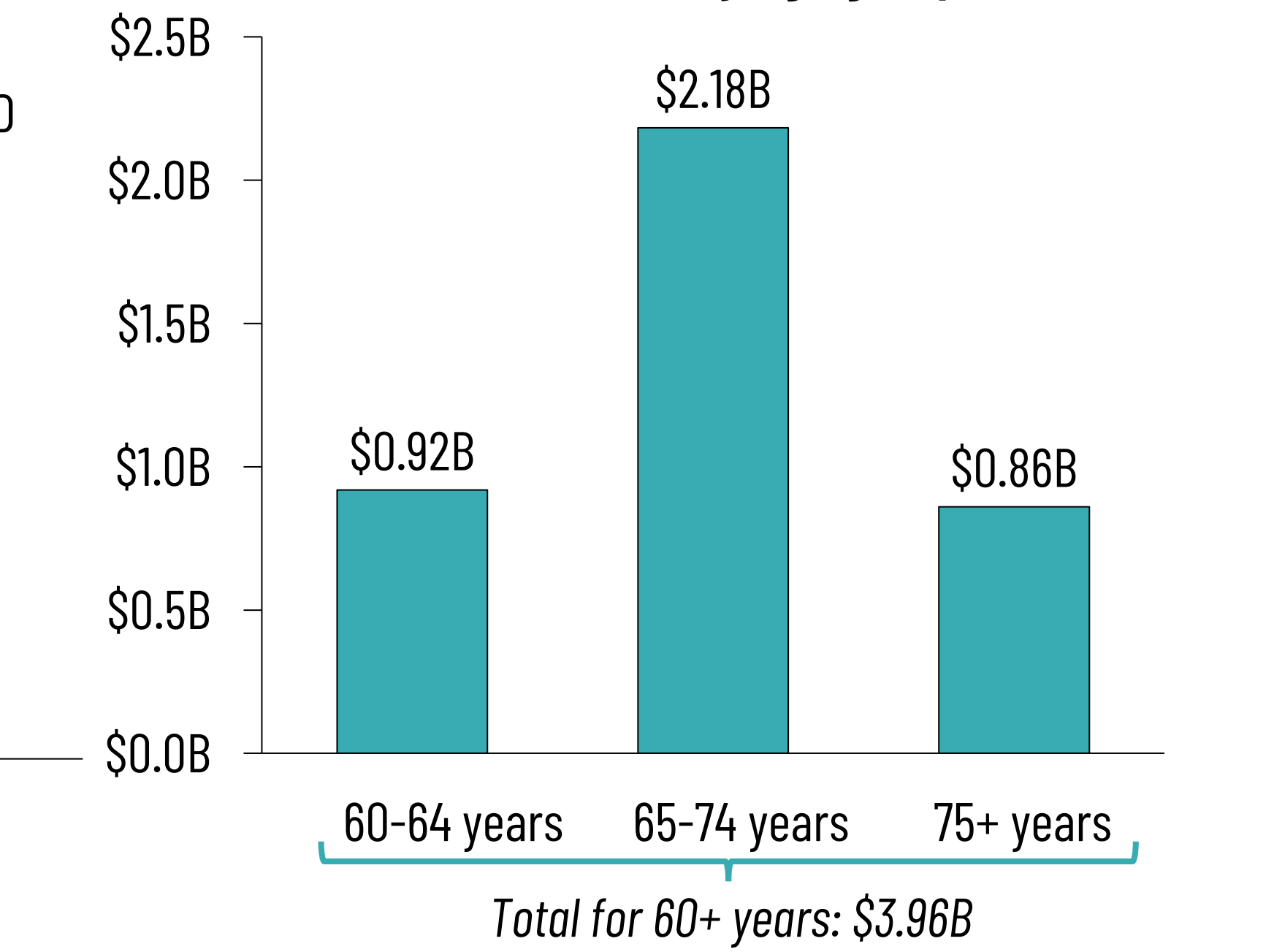
Total annual RSV-related productivity losses, by age group



Annual productivity losses due to acute RSV URTD/LRTD, by age group



Annual productivity losses due to RSV-related death, by age group



CONCLUSIONS

- ✓ In addition to clinical and direct medical cost burden, RSV causes nearly \$4.7 billion in productivity losses among US older adults annually (out of the total \$7.4 billion societal cost of RSV²).
- ✓ Capturing both market and non-market productivity losses more comprehensively reflects older adults' value to society, with non-market productivity losses estimated at approximately \$3.1 billion.

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+ SUPPLEMENTARY MATERIAL

Inputs: Unit costs of RSV time losses and assigning daily activities to different types of productivity

Hourly costs applied to acute RSV incurred time losses^{9,11,12}

	60-64 years	65+ years
Market productivity	\$34.98	\$31.56
Non-market productivity	\$16.03	\$16.03

Assigning daily activities to different types of productivity losses, based on data from the American Time Use Survey (ATUS)^{9,10}

Activities	Hours spent by activity (per 24h)			Market productivity	Non-market productivity	No productivity
	55-64 years	65-74 years	75+ years			
Personal care activities	9.35	9.52	10.07			✓
Eating and drinking	1.19	1.26	1.39			✓
Household activities	2.05	2.56	2.35		✓	
Purchasing goods and services	0.86	0.96	0.86		✓	
Caring for and helping household members	0.13	0.13	0.14		✓	
Caring for and helping nonhousehold members	0.36	0.37	0.17		✓	
Working and work-related activities	3.69	1.31	0.35	✓		
Educational activities	0.03	0.02	0			✓
Organizational, civic, and religious activities (excluding travel)	0.41	0.48	0.52		✓	
Leisure and sports	5.57	6.92	7.6			✓
Telephone calls, mail, and e-mail	0.18	0.21	0.26			✓
Other activities, not elsewhere classified	0.18	0.25	0.31			✓

Data are based on annual 2016 estimates; Activities include travel, unless otherwise noted.

Markov model results: RSV cases and deaths

Annual number of RSV cases and deaths estimated by the Markov model

RSV-URTD			RSV-LRTD	
	Medically-attended	Non-medically attended	Medically-attended	Non-medically attended
60-64 years	117,514	347,150	172,195	165,742
65-74 years	189,784	560,645	278,095	267,672
75+ years	136,599	403,531	200,162	192,660

RSV deaths	
60-64 years	1,307
65-69 years	3,058
70-74 years	2,493
75-79 years	3,191
80-84 years	1,975
85-89 years	1,130
90+ years	766

Additional results

RSV-related productivity losses by age group, type of productivity loss, and RSV disruption

	60+ years	60-64 years	65-74 years	75+ years
RSV URTD cases				
Market	\$ 130,988,261	\$ 72,467,725	\$ 49,091,840	\$ 9,428,696
Non-market	\$ 175,203,567	\$ 34,282,051	\$ 85,646,872	\$ 55,274,643
Total	\$ 306,191,828	\$ 106,749,777	\$ 134,738,712	\$ 64,703,339
RSV LRTD cases				
Market	\$ 166,261,244	\$ 92,819,070	\$ 60,959,227	\$ 12,482,946
Non-market	\$ 223,440,442	\$ 43,909,591	\$ 106,351,019	\$ 73,179,832
Total	\$ 389,701,686	\$ 136,728,661	\$ 167,310,247	\$ 85,662,779
RSV-related death				
Market	\$ 1,225,674,449	\$ 421,153,070	\$ 656,018,208	\$ 148,503,171
Non-market	\$ 2,736,805,220	\$ 497,807,513	\$ 1,526,897,125	\$ 712,100,582
Total	\$ 3,962,479,668	\$ 918,960,583	\$ 2,182,915,333	\$ 860,603,753
RSV LRTD+URTD and death				
Market	\$ 1,522,923,954	\$ 586,439,865	\$ 766,069,275	\$ 170,414,813
Non-market	\$ 3,135,449,229	\$ 575,999,155	\$ 1,718,895,016	\$ 840,555,057
Total	\$ 4,658,373,182	\$ 1,162,439,020	\$ 2,484,964,292	\$ 1,010,969,871

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DISCLOSURES

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