

Economics of combined use of Pfizer maternal RSVpreF vaccine and nirsevimab

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Conflicts of interest statements

- Authors have no known conflict of interests.

Methods: Study questions

- Determine the cost-effectiveness of:
 - Nirsevimab in children born to mothers who received RSVpreF at least 2 weeks prior to delivery
 - RSVpreF for pregnant persons who will give nirsevimab to their newborns
- Single individual
- Evaluate by month of year
- Perspective: Societal
- Timeframe: 1 year (1 RSV season)
- Analytic horizon: infant's lifetime
- Discount rate: 3%

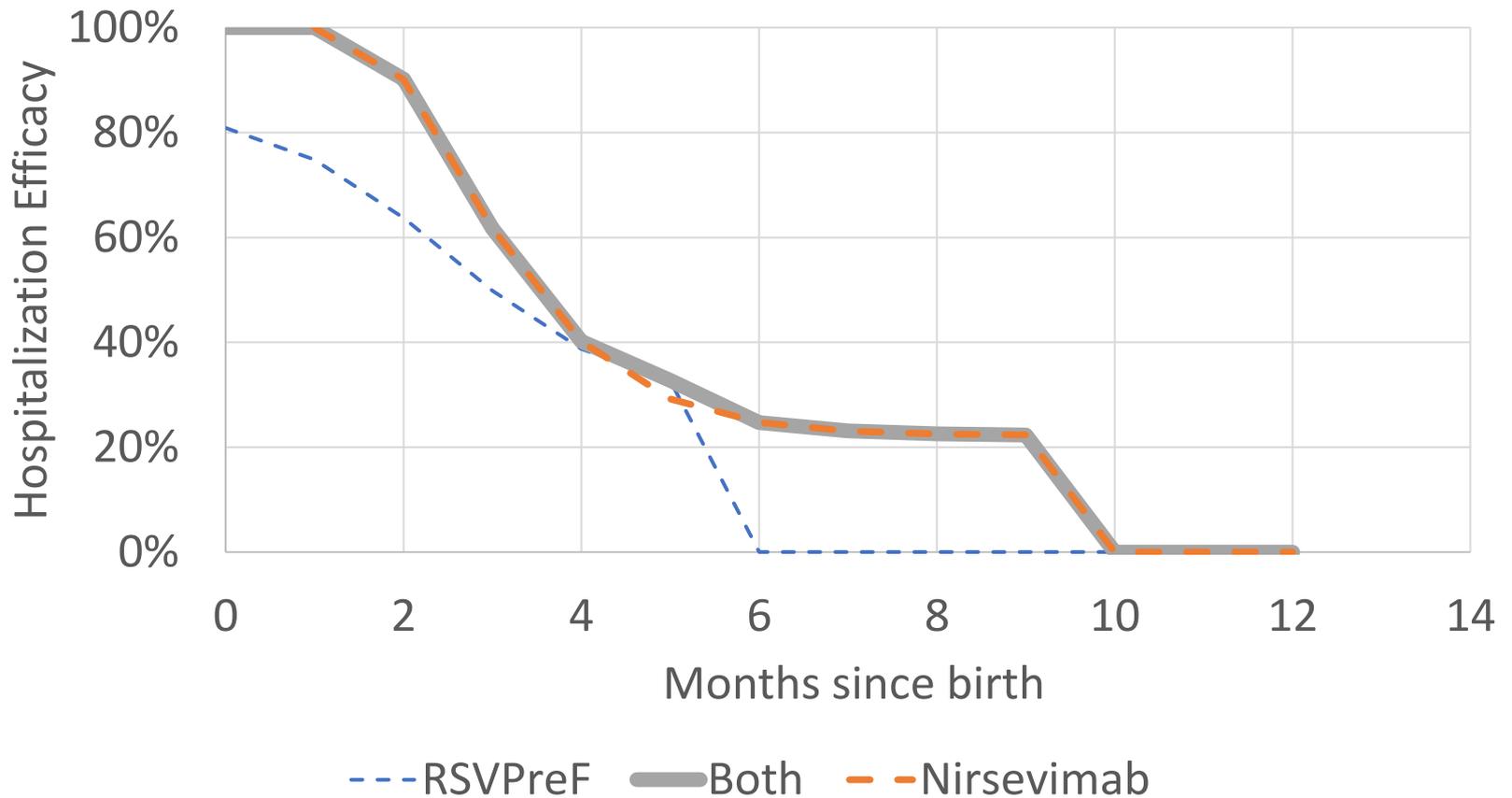
Overview of nirsevimab changes/additions

- Since February
 - Nirsevimab cost \$500/dose
 - Nirsevimab reduces palivizumab use
 - Old base case ICER: \$ 102,805/QALY
 - New base case ICER: \$157,537/QALY

Methods: Intervention effectiveness

- NO evidence of efficacy on the combined use of these products
- Assumption:
 - Efficacy equal to the highest of nirsevimab or RSVpreF:
 - Efficacy would not be higher than from the most effective product

Methods: Intervention effectiveness

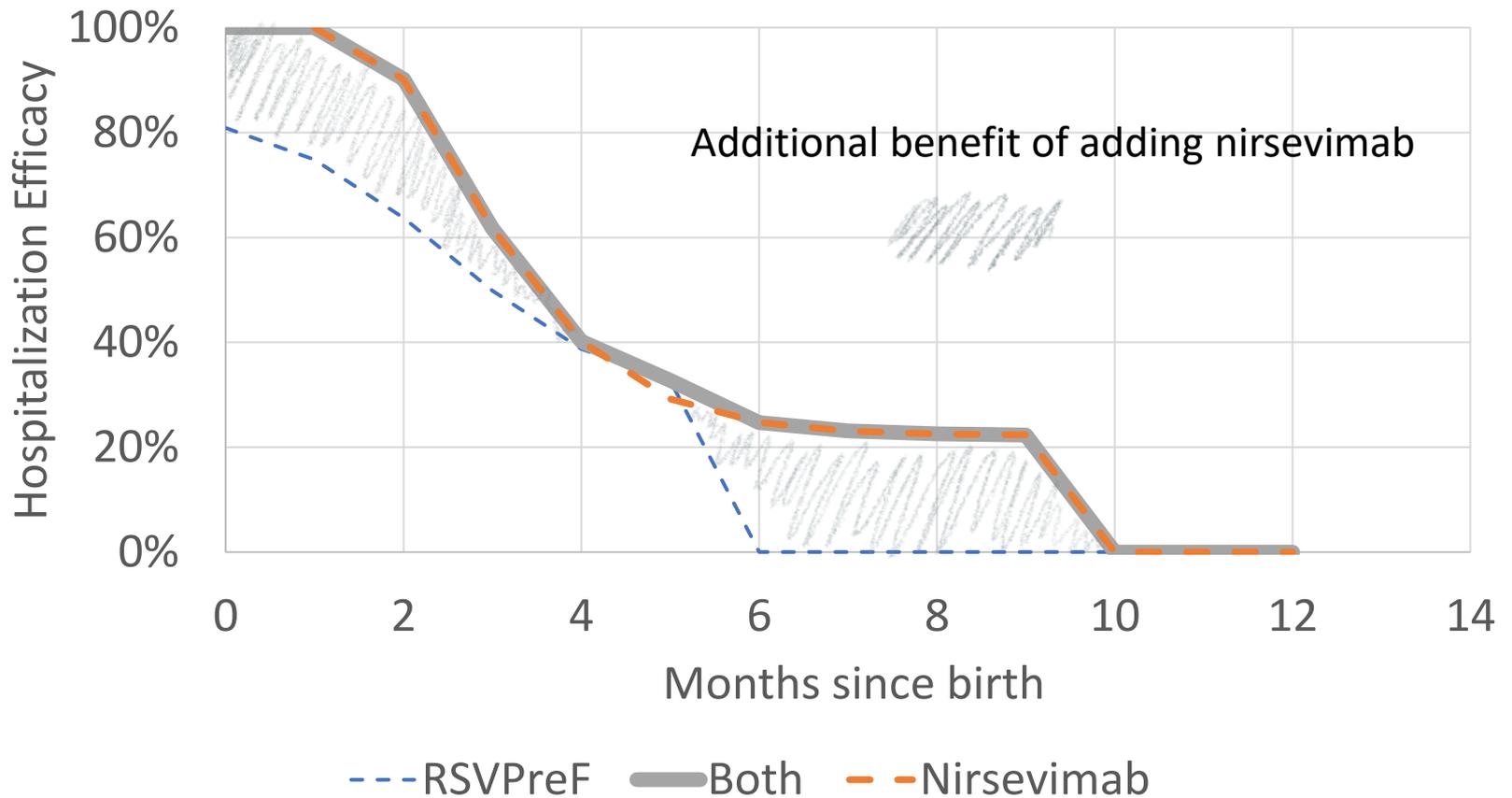


* Assuming administration of nirsevimab at birth

Incremental benefit of adding nirsevimab on top of RSVpreF

- For infants of persons vaccinated with RSVpreF during pregnancy

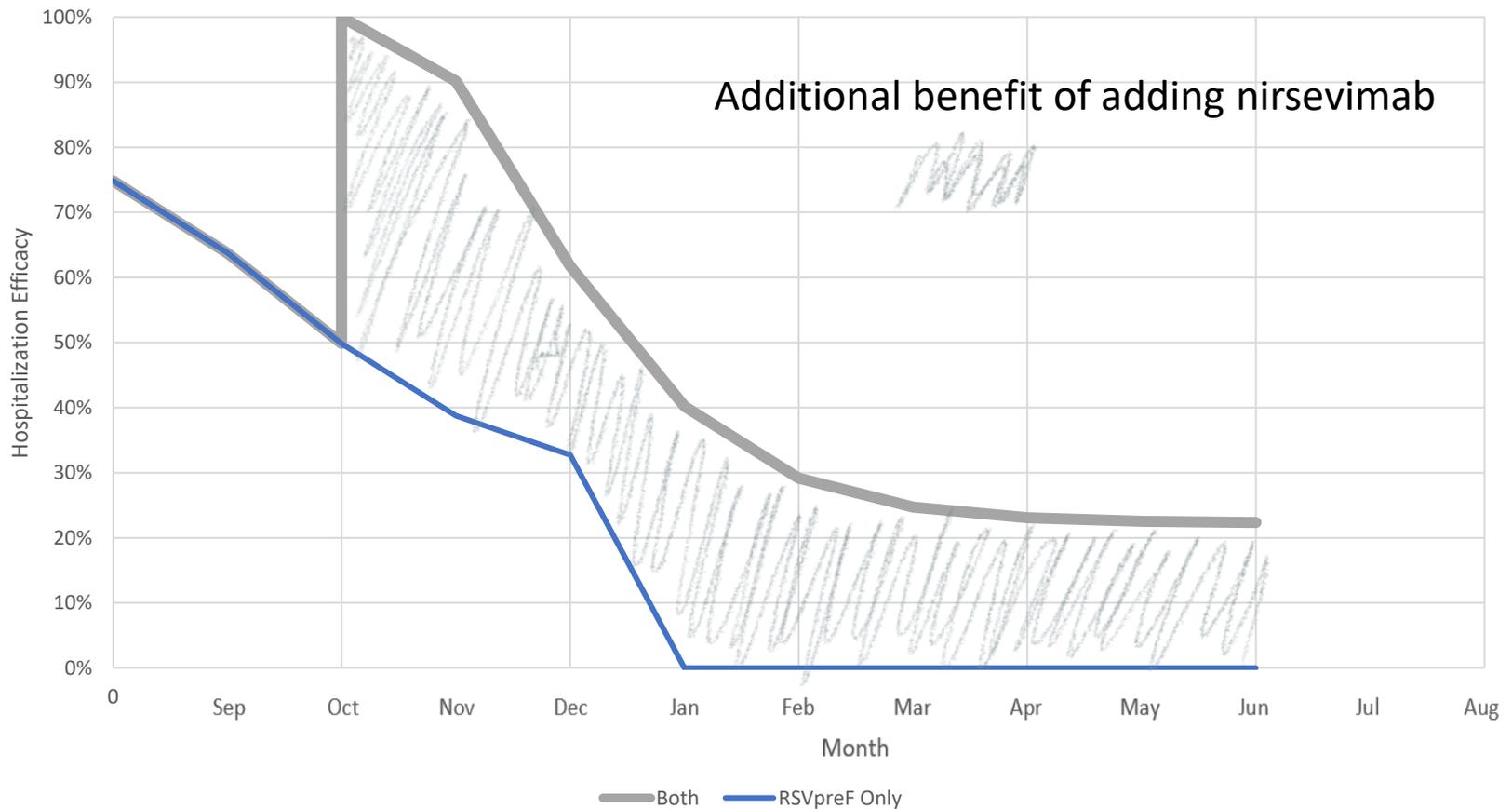
Methods: Intervention effectiveness



* Assuming administration of nirsevimab at birth

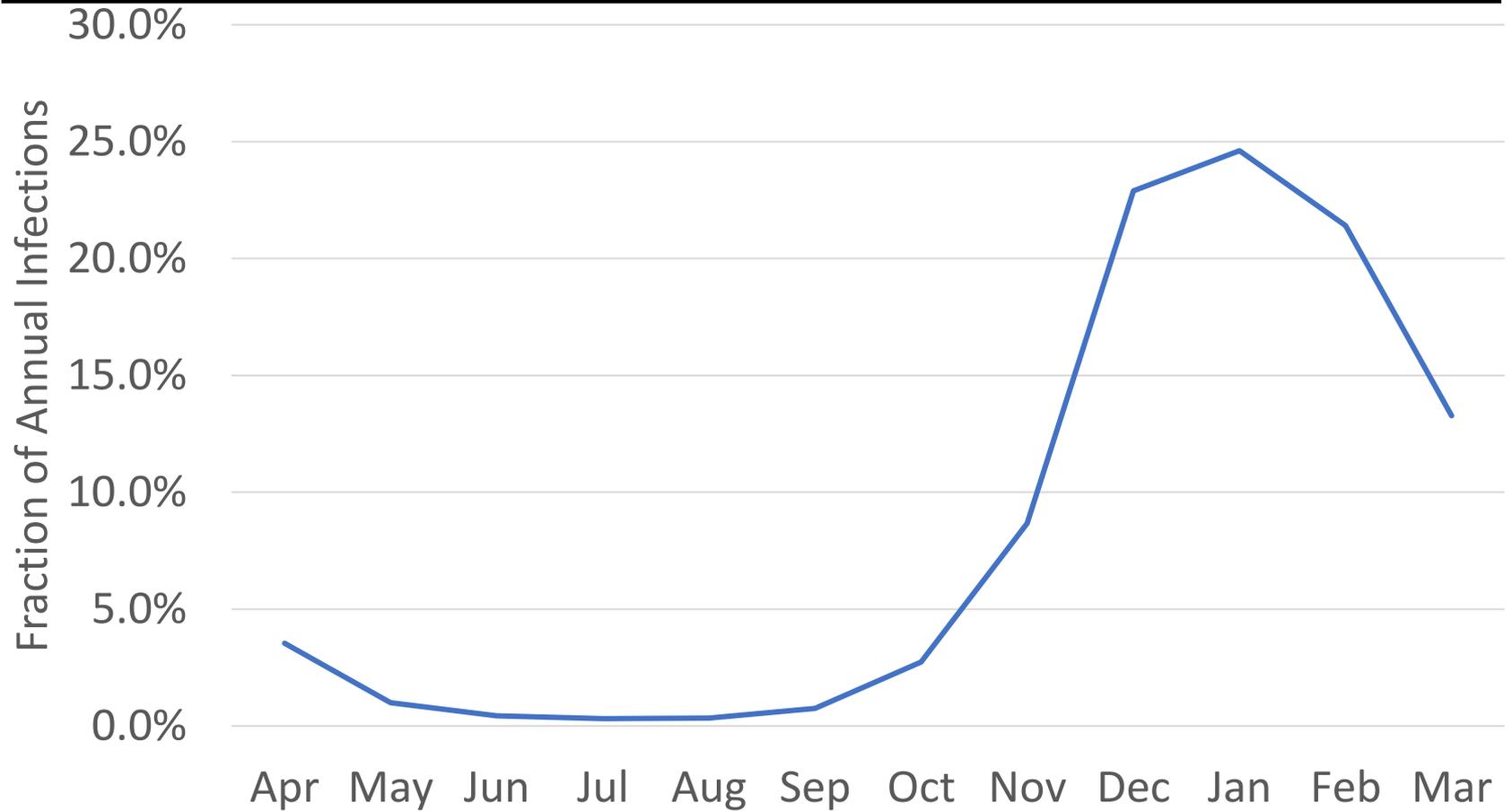
Methods: Intervention effectiveness

Example: Off-peak (Aug) birth

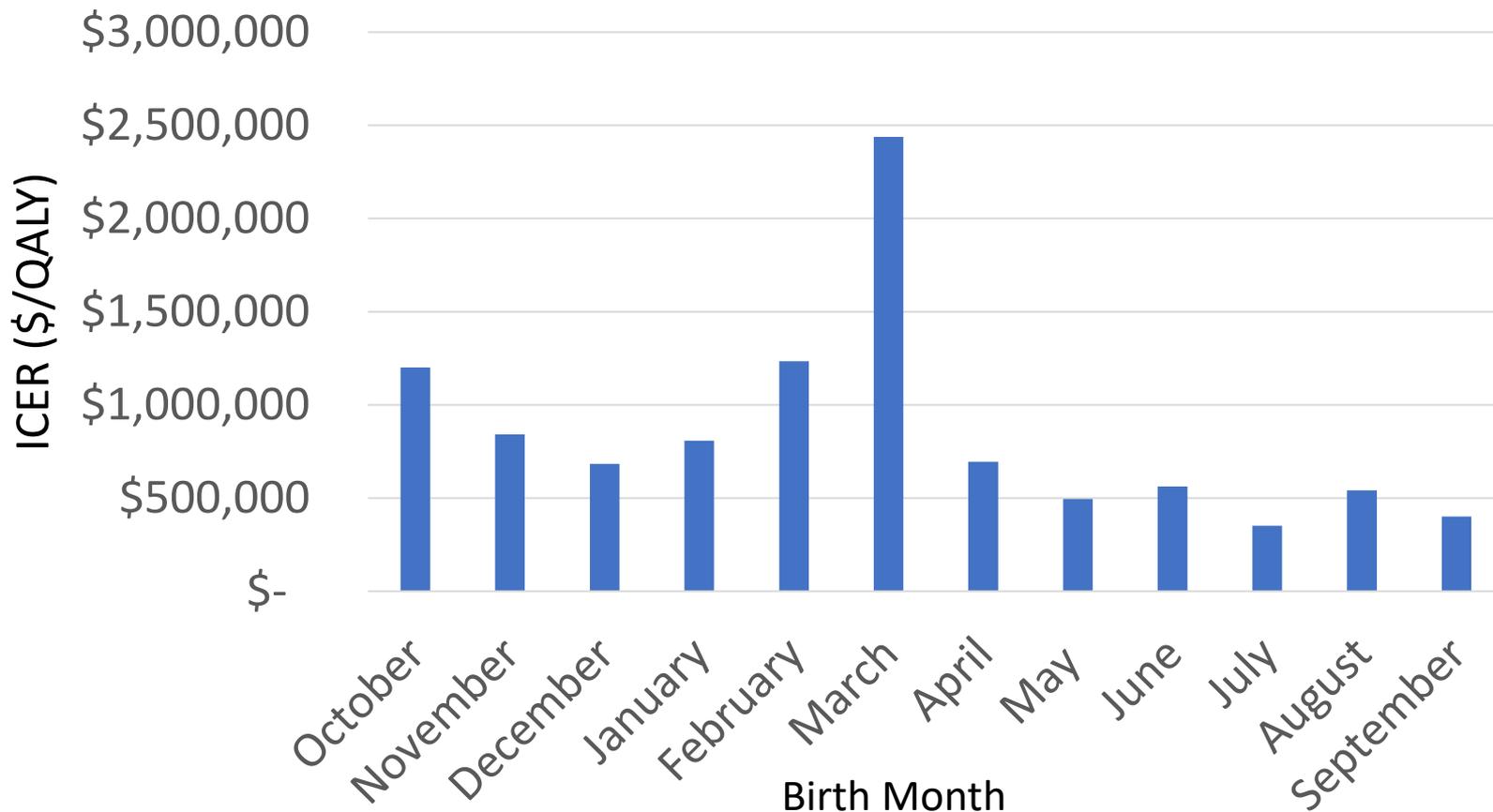


Note: Peak infections are typically Dec-Feb

Reminder: Seasonality



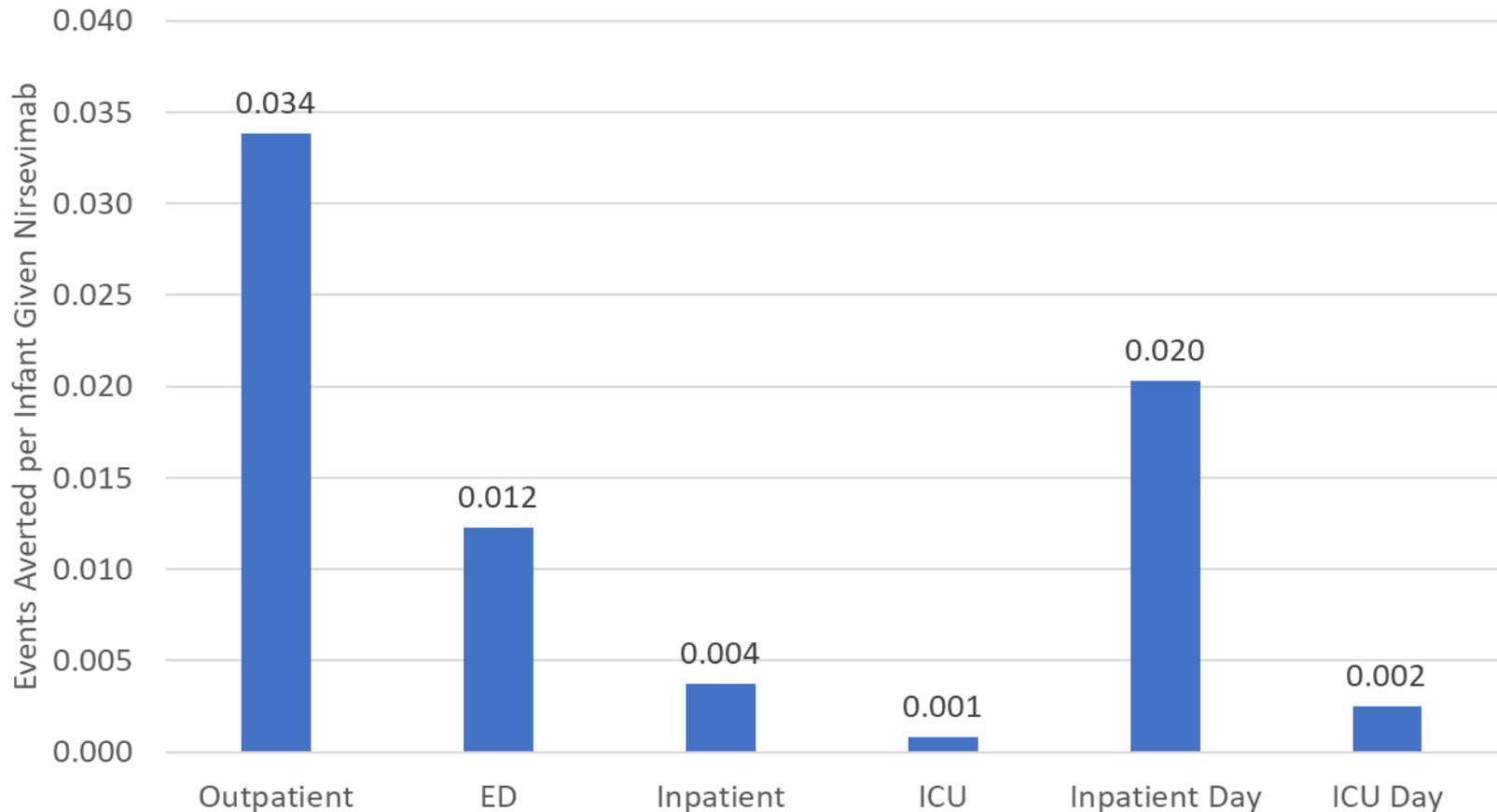
Results: Incremental benefit of adding nirsevimab on top of RSVpreF



Nirsevimab given in Oct-Mar

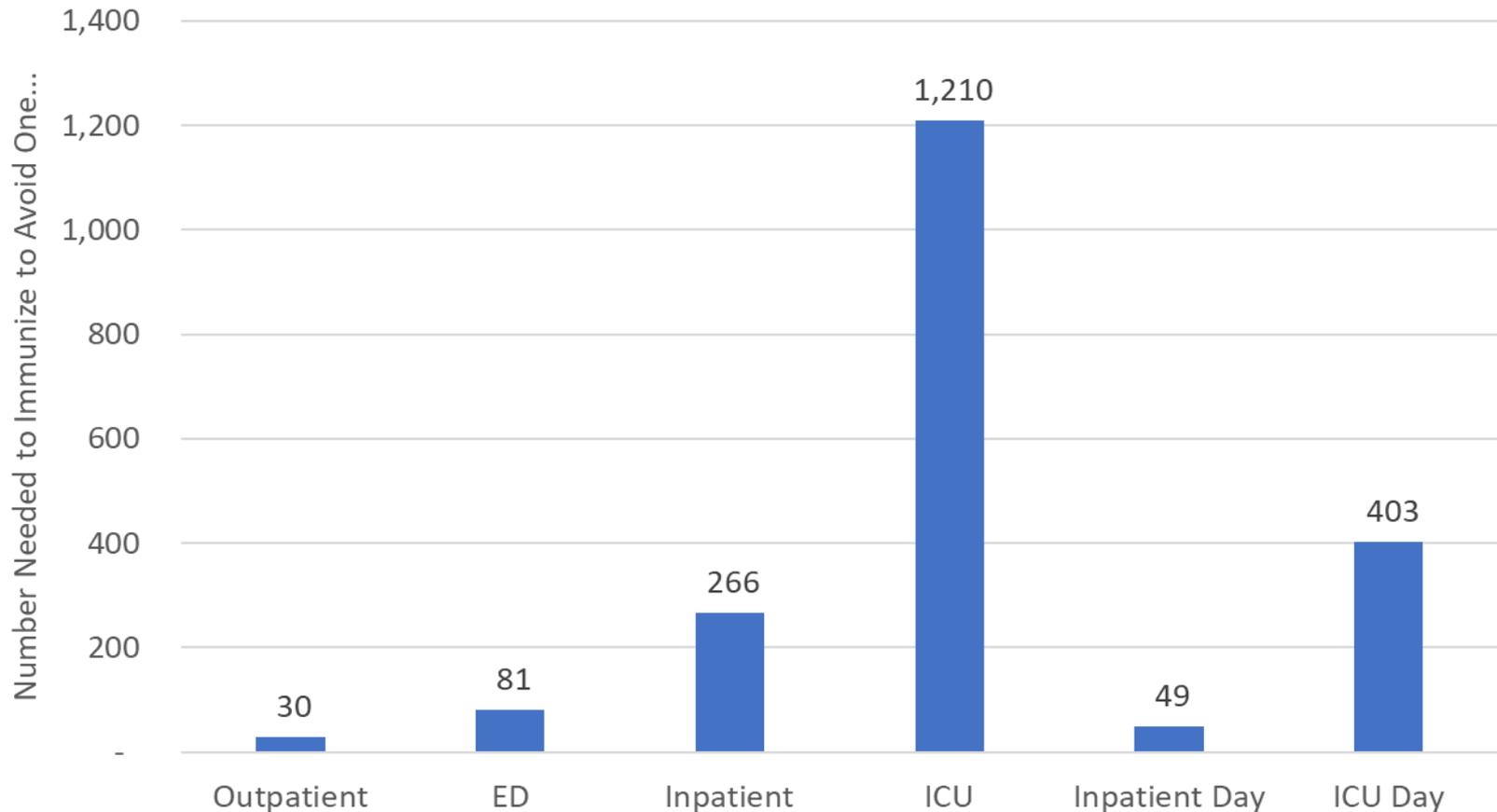
ICER= Incremental cost effectiveness ratio (\$/QALY)

Results: Adding nirsevimab to all infants born to vaccinated mothers



Nirsevimab given at birth for infants born October-March, and in October/November for infants born in April through September

Results: Adding nirsevimab to all infants born to vaccinated mothers



Nirsevimab given at birth for babies born October-March, and in October/November for babies born in April through September

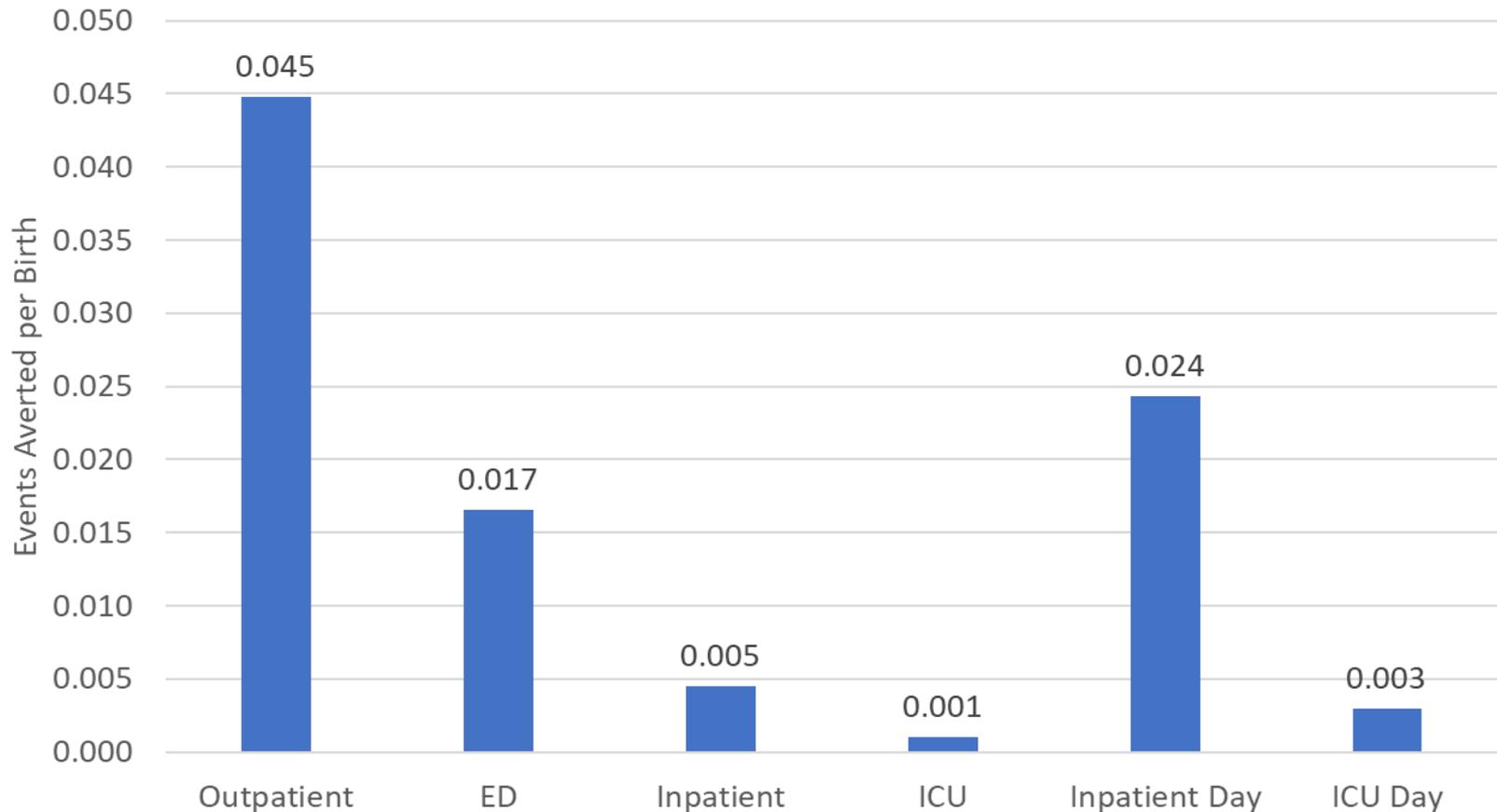
Results: Adding nirsevimab to all infants born to vaccinated mothers

QALYs Gained	Additional Costs	ICER (\$/QALY)
0.000781	\$522.12	\$ 668,735

Notes: Nirsevimab given at birth for babies born October-March, and in October/November for babies born in April through September

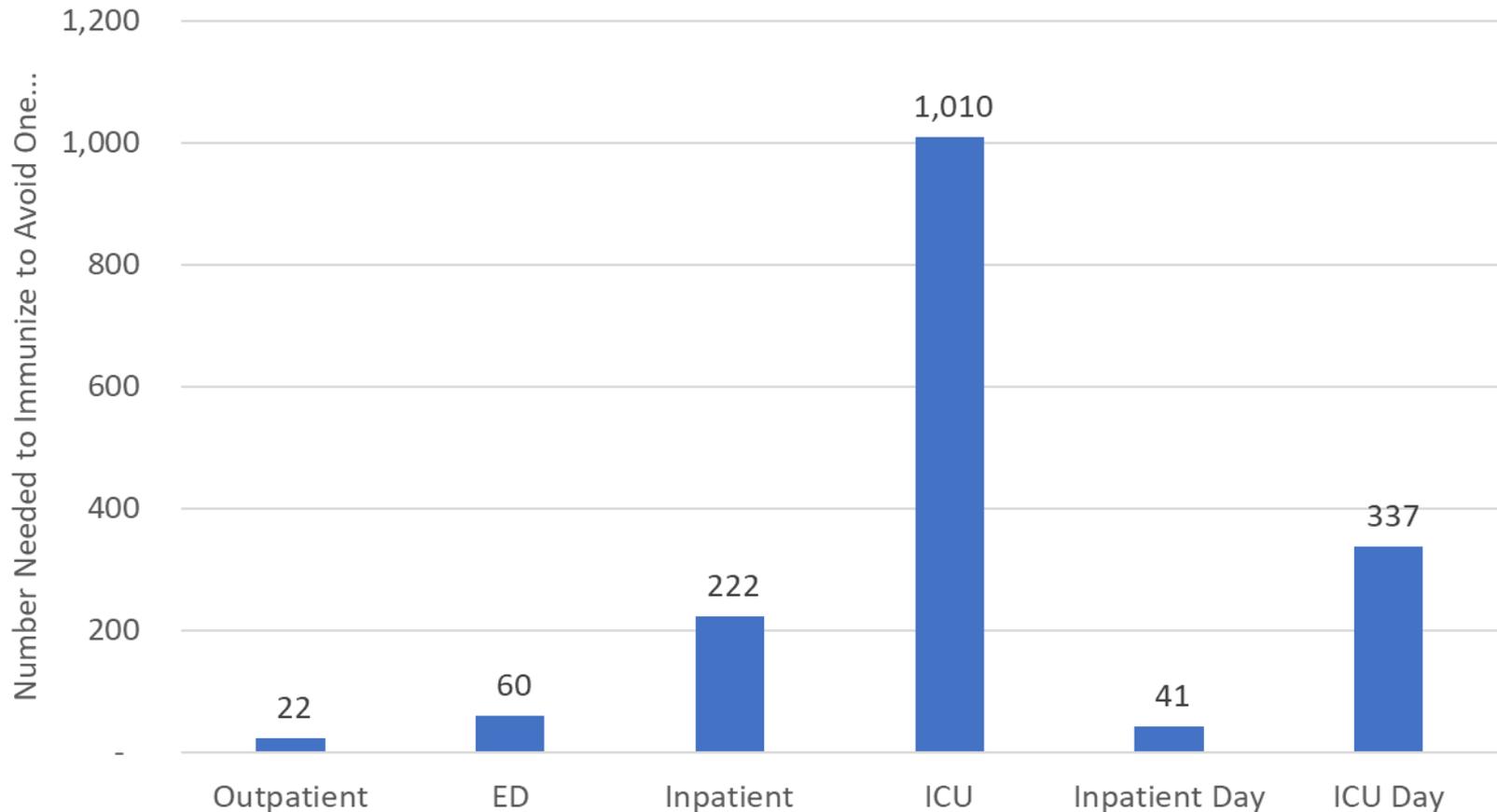
ICER= Incremental cost effectiveness ratio; QALY= Quality-adjusted life-year

Results: Adding nirsevimab only for infants born during Apr-Sept



Nirsevimab given in October/November for babies born in April through September born to mothers who received RSVpreF

Results: Adding nirsevimab only for infants born during Apr-Sept



Nirsevimab given in October/November for babies born in April through September born to mothers who received RSVpreF

Results: Adding nirsevimab only for infants born during Apr-Sept

QALYs Gained	Additional Costs	ICER (\$/QALY)
0.001032	\$502.40	\$486,882

Nirsevimab given in October/November for babies born in April through September born to mothers who received RSVpreF

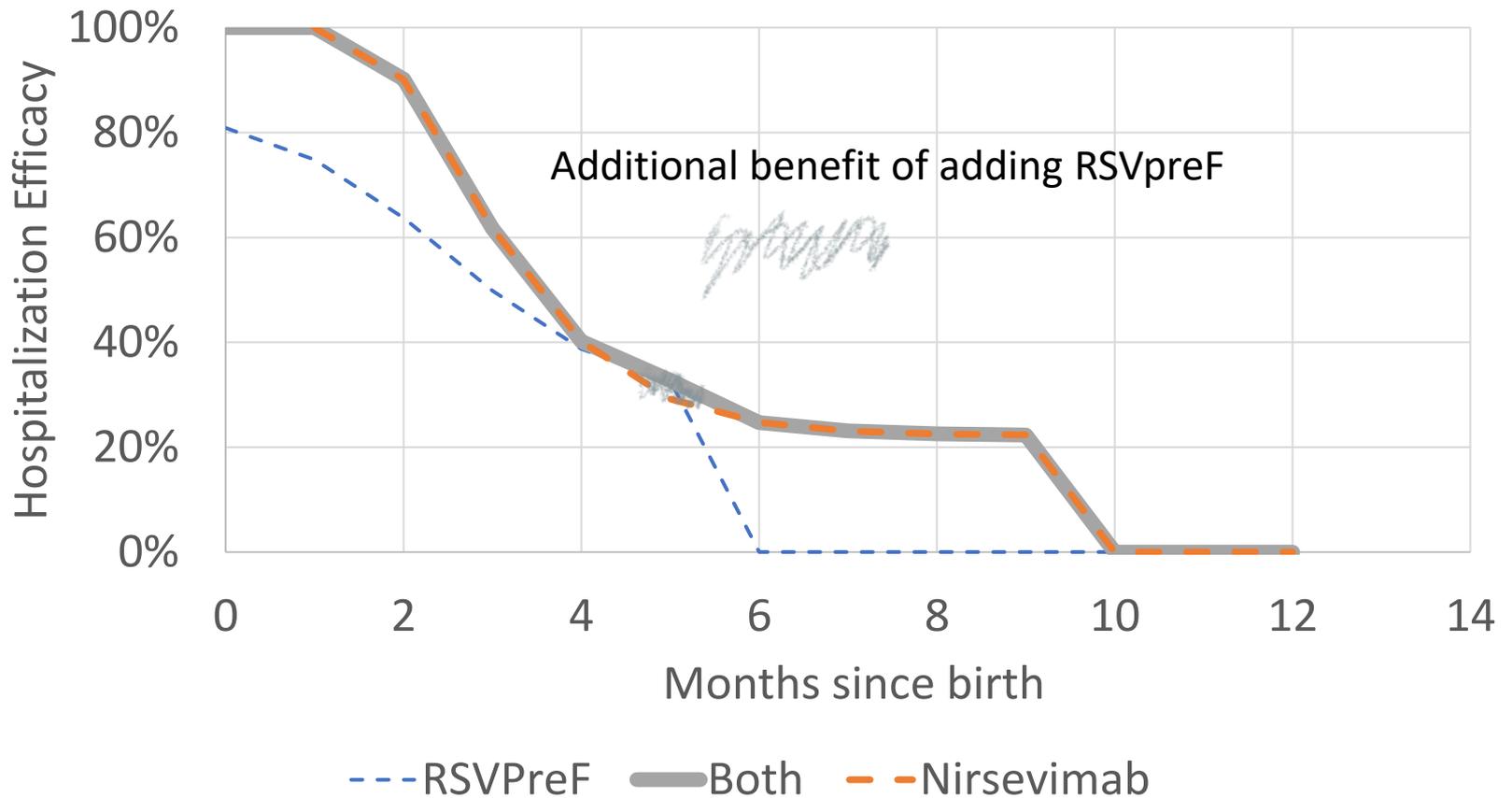
ICER= Incremental cost effectiveness ratio; QALY= Quality-adjusted life-year

Summary: Incremental benefit of adding nirsevimab on top of RSVpreF

- Marginal additional benefit beyond RSVpreF protection
- ICER is very high

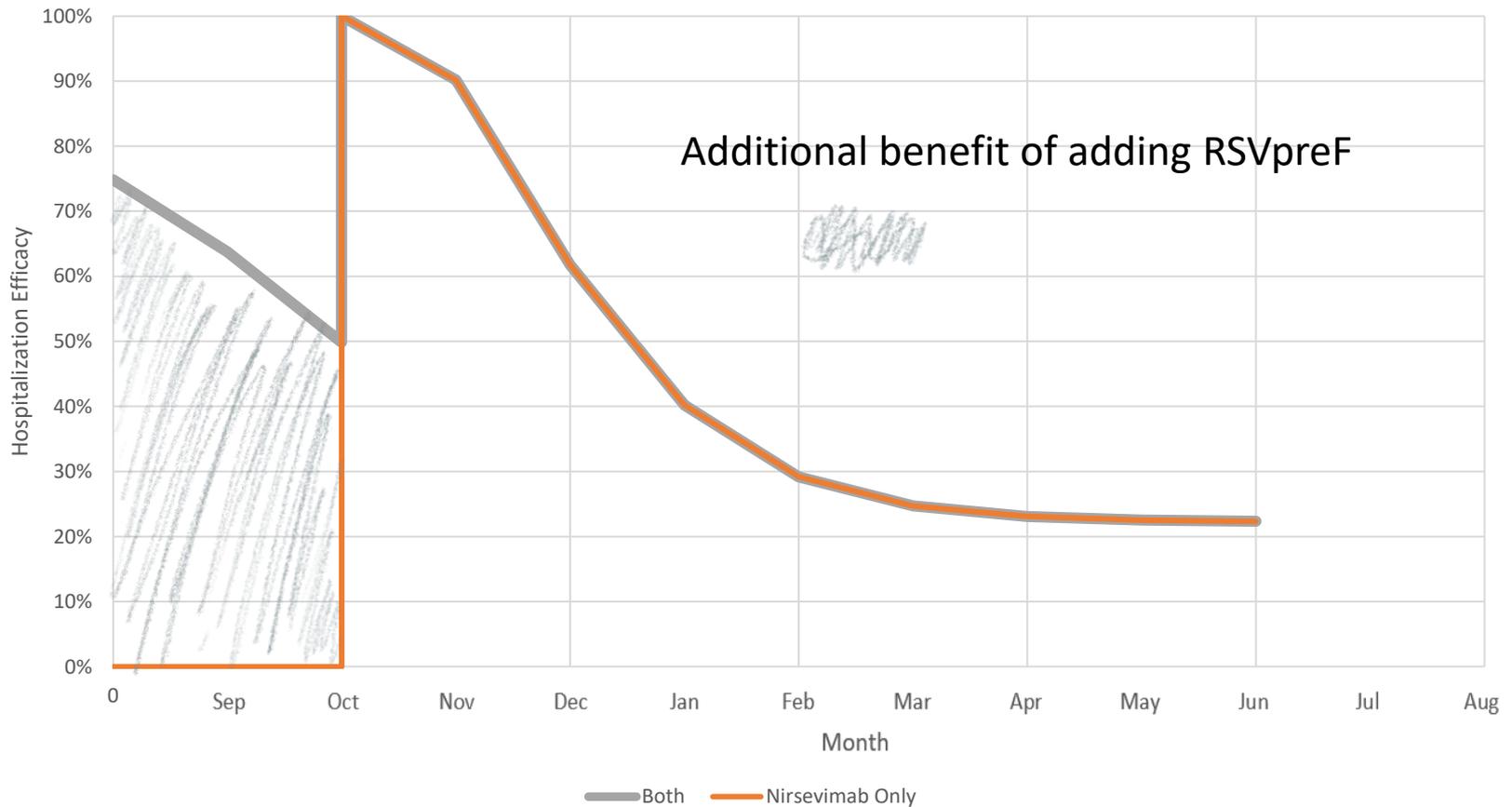
Incremental benefit of adding RSVpreF on top of nirsevimab

Methods: Intervention effectiveness

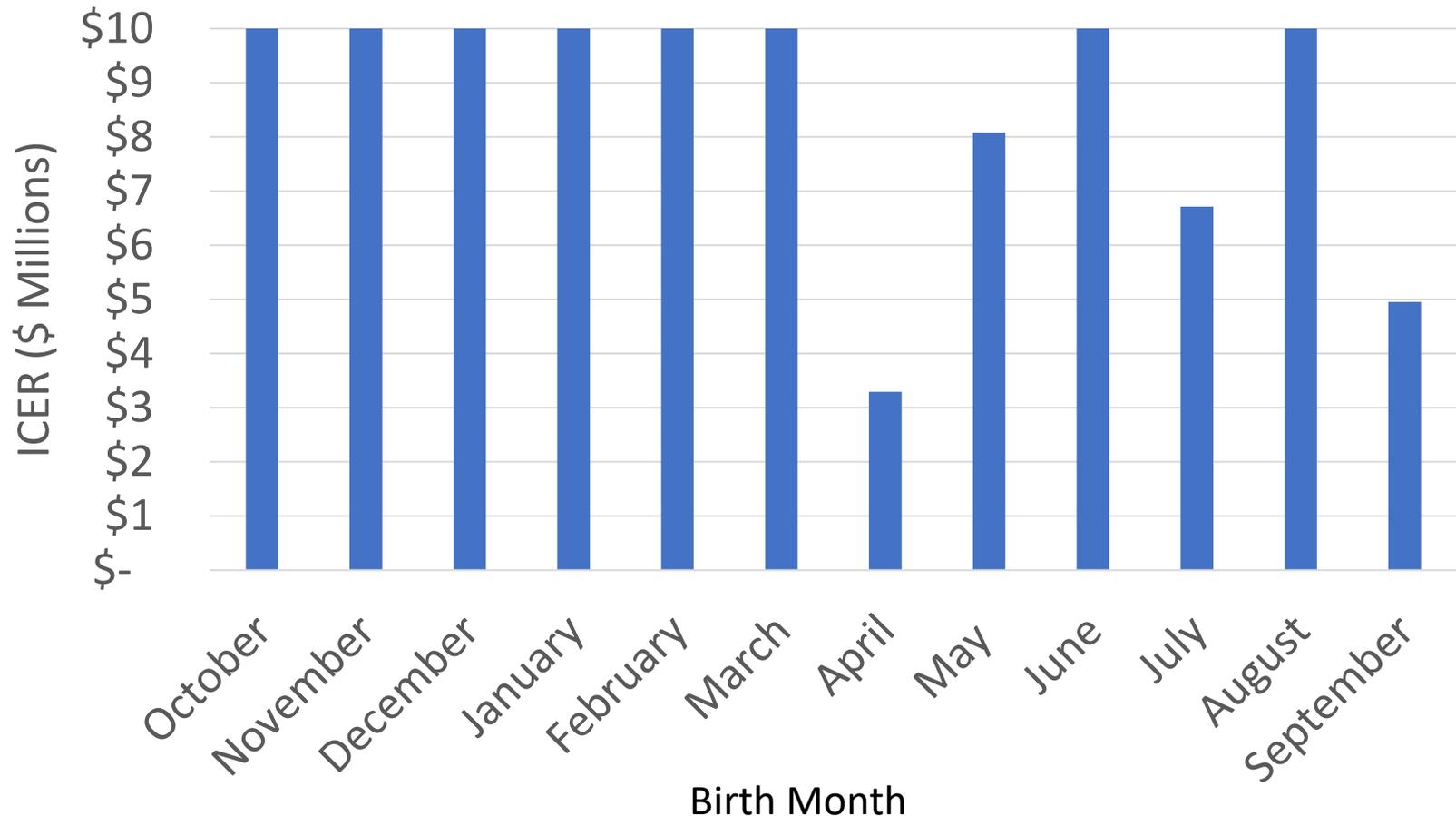


* Assuming administration of nirsevimab at birth

Methods: Intervention effectiveness example: Off-peak (Aug) birth



Results: Incremental benefit of adding RSVpreF on top of nirsevimab



Summary: Incremental benefit of adding RSVpreF on top of nirsevimab

- Very marginal additional benefit beyond Nirsevimab protection
- ICERs are extremely high

Overall summary: Combinations

- Limitation:
 - No efficacy data for combination of products
- Combinations of RSVpreF and Nirsevimab add marginal effectiveness at very high cost in the general population

Thank You

- Please send comments to:
- dwhutton@umich.edu

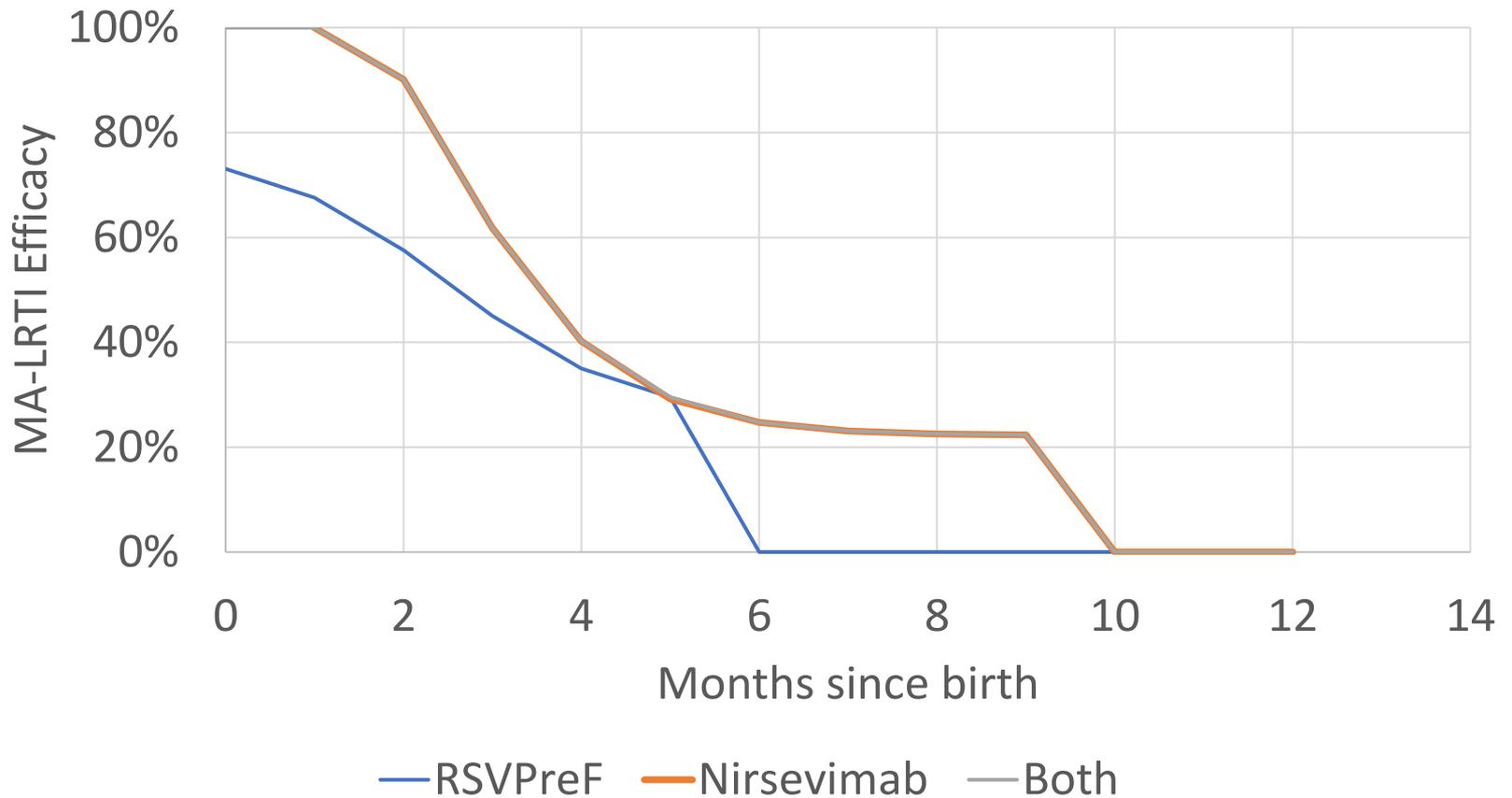
Appendix

Additional Input Assumptions

Methods: Provision of Nirsevimab

- Base case:
 - At birth for those born
 - October 1 – March 31
 - October for those born in
 - April (~6-month visit)
 - June (~4-month visit)
 - August (~2-month visit)
 - November for those born in
 - May (~6-month visit)
 - July (~4-month visit)
 - September (~2-month visit)

Methods: Intervention effectiveness

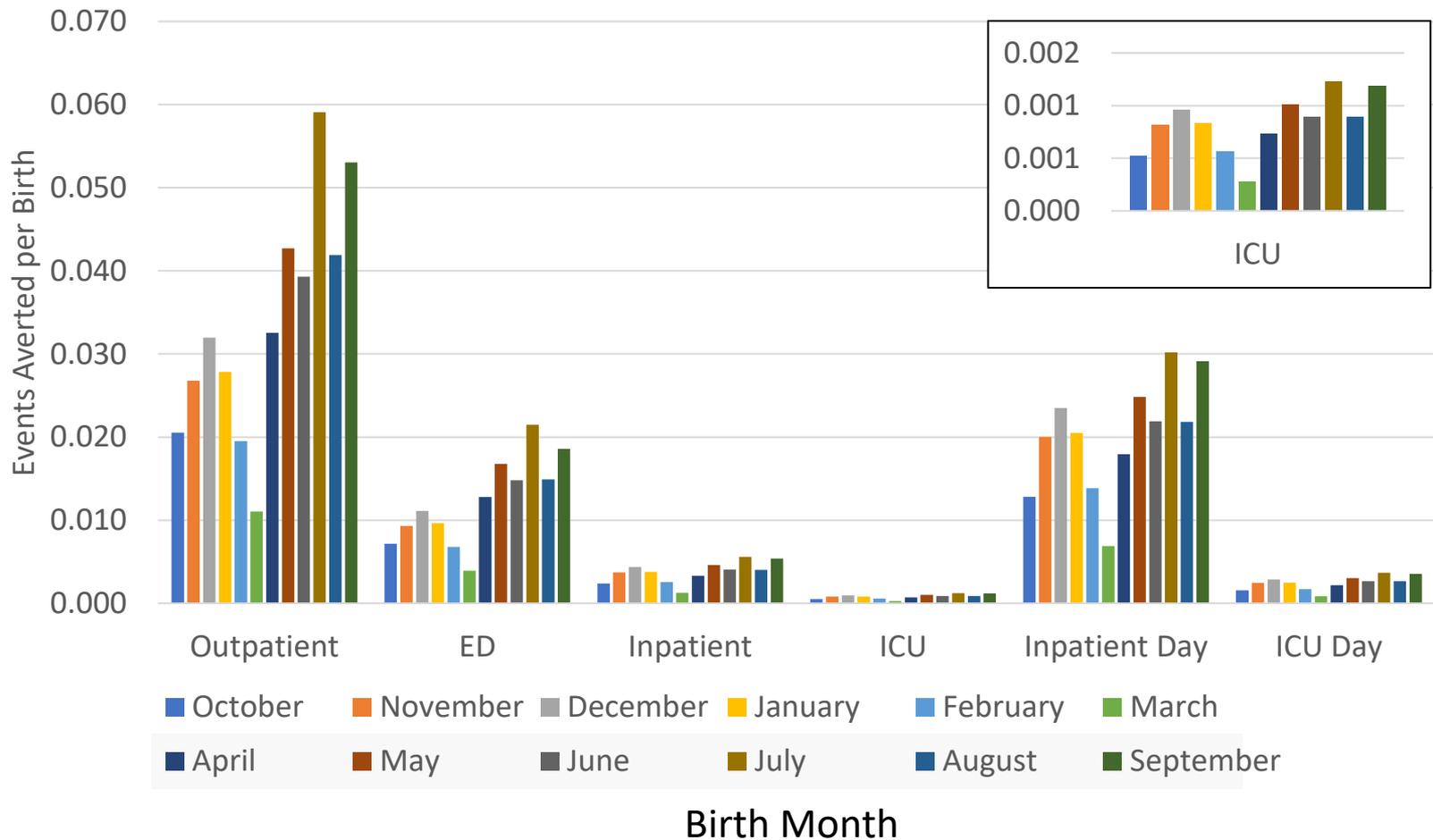


- Assuming Administration of Nirsevimab at birth
- MA-LRTI= medically attended lower respiratory tract infection

Additional combination Results

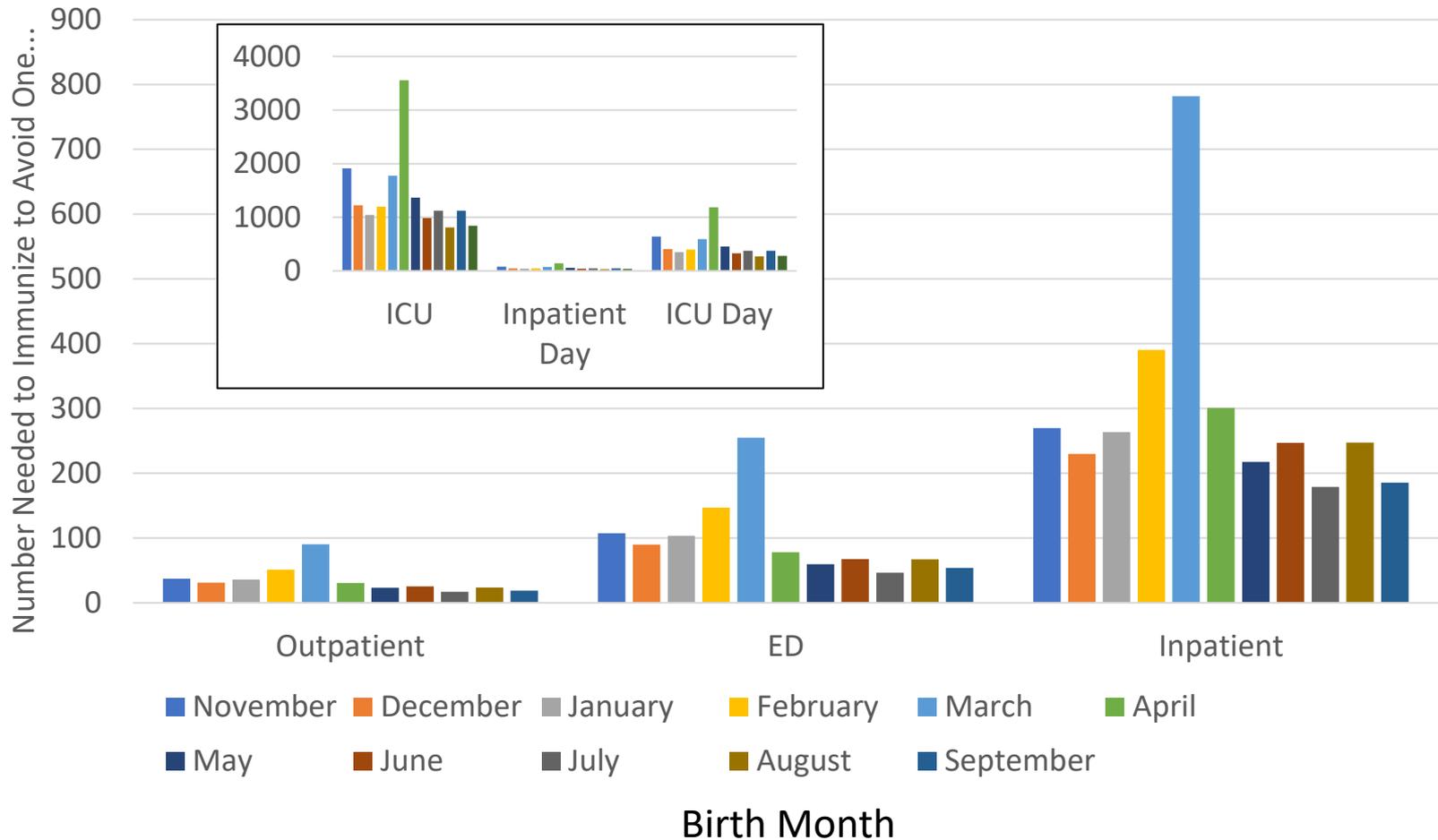
Incremental benefit of adding on
nirsevimab top of RSVpreF

Results: Incremental benefit of adding nirsevimab on top of RSVpreF by month of birth



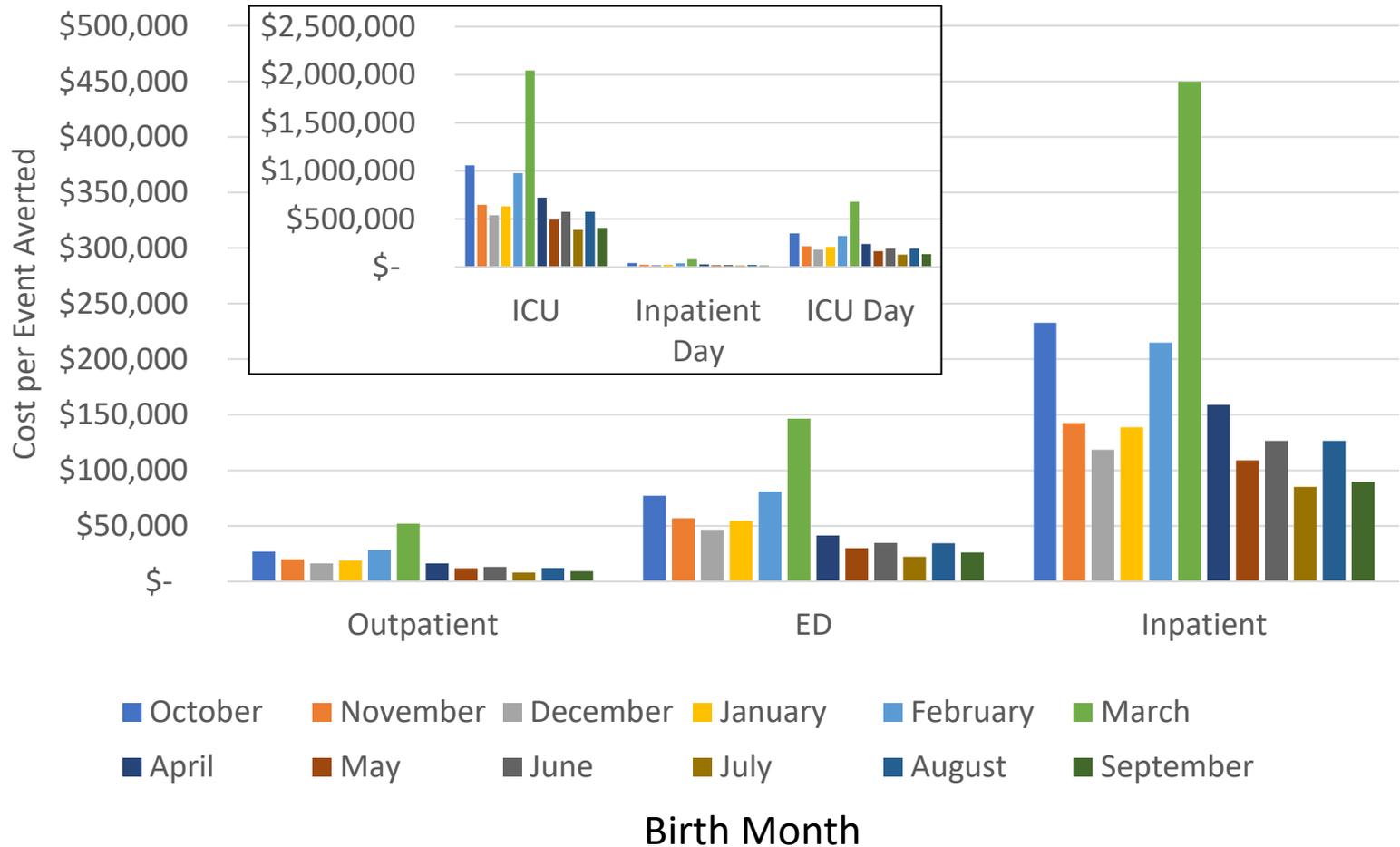
Nirsevimab given at birth for babies born October-March, and in October/November for babies born in April through September

Results: Incremental benefit of adding nirsevimab on top of RSVpreF



Nirsevimab given at birth for babies born October-March, and in October/November for babies born in April through September

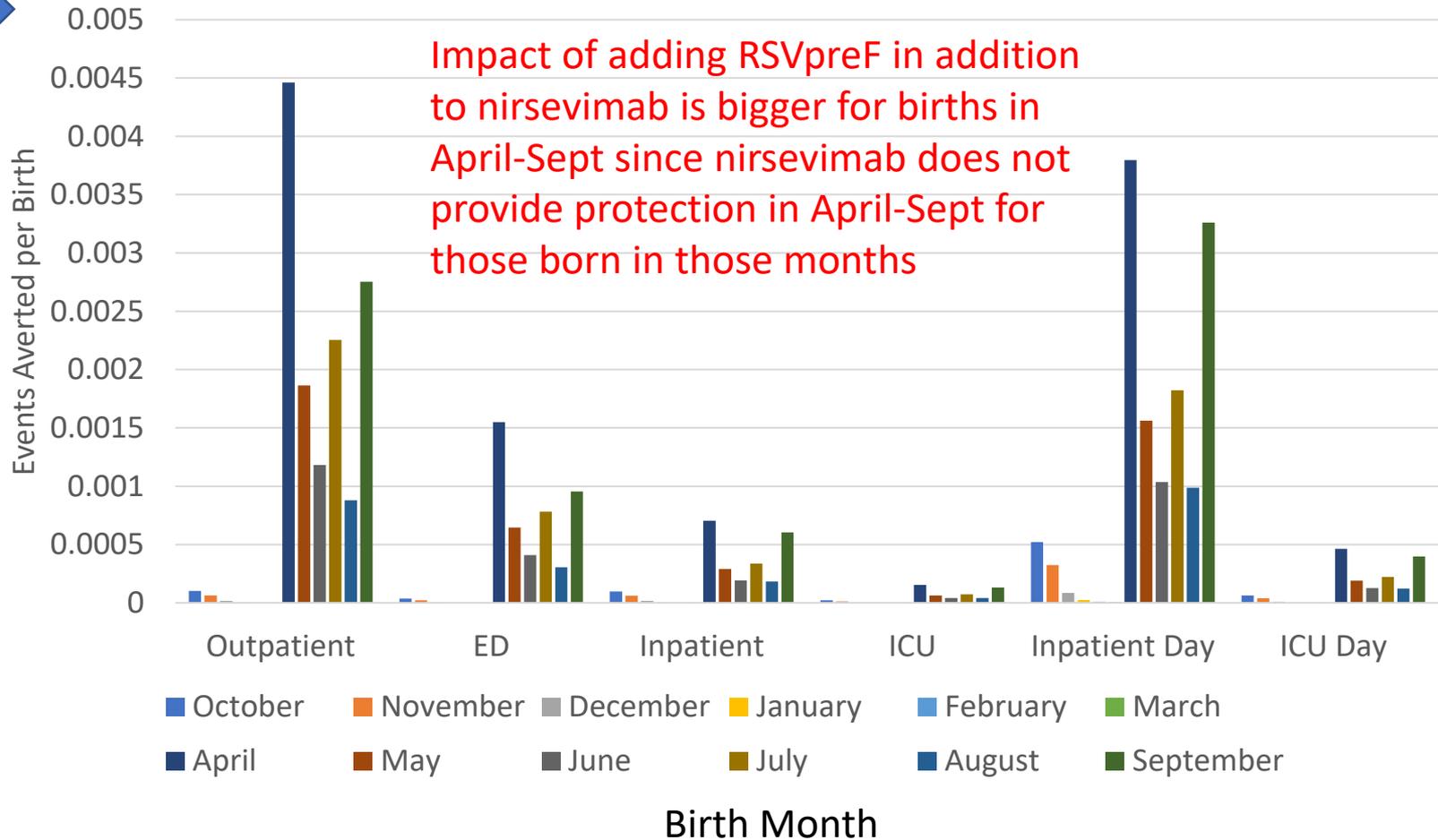
Results: Incremental benefit of adding nirsevimab on top of RSVpreF



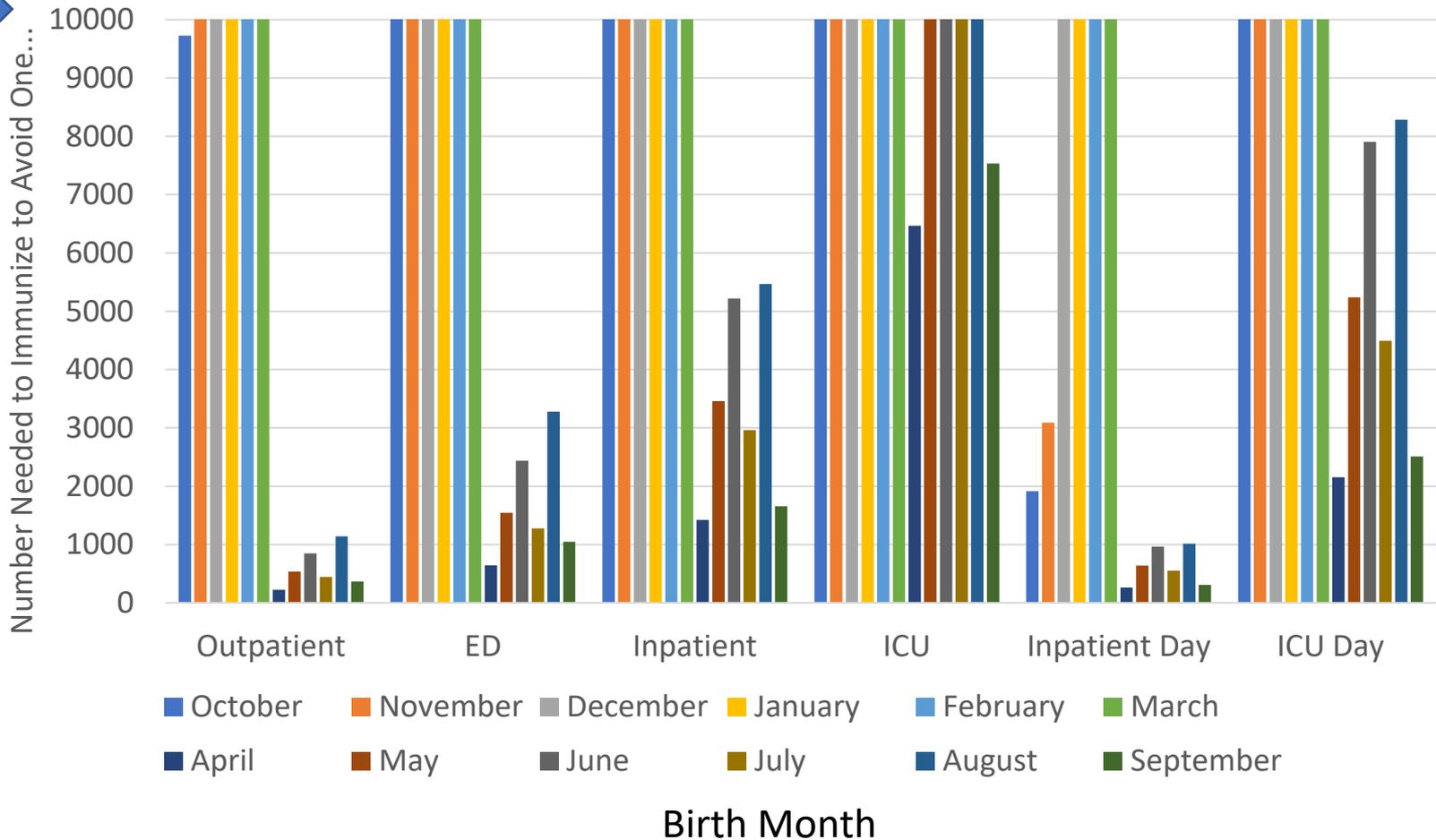
Nirsevimab given at birth for babies born October-March, and in October/November for babies born in April through September

Incremental benefit of adding RSVpreF
on top of nirsevimab

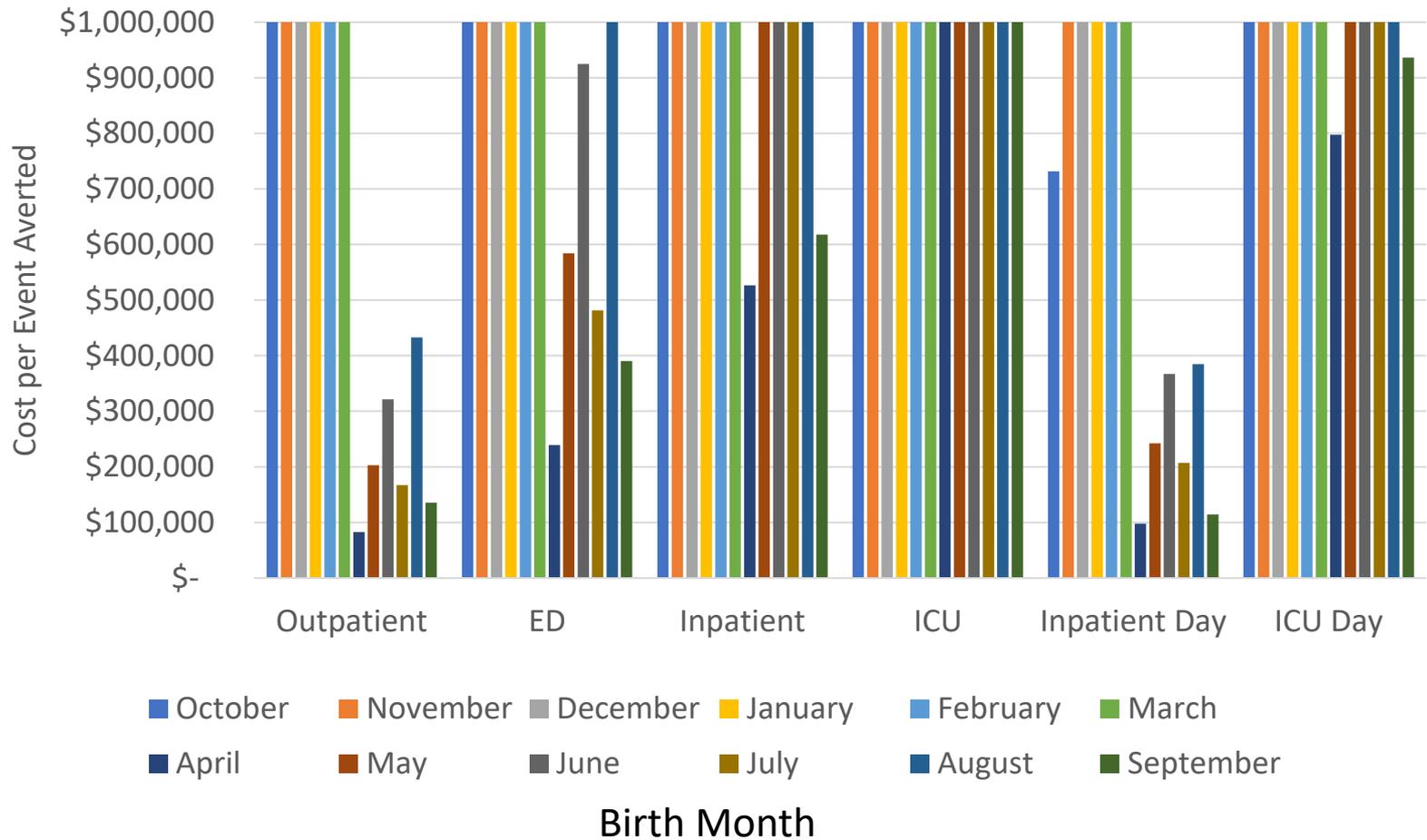
Results: Incremental benefit of adding RSVpreF on top of nirsevimab



Results: Incremental benefit of adding RSVpreF on top of nirsevimab



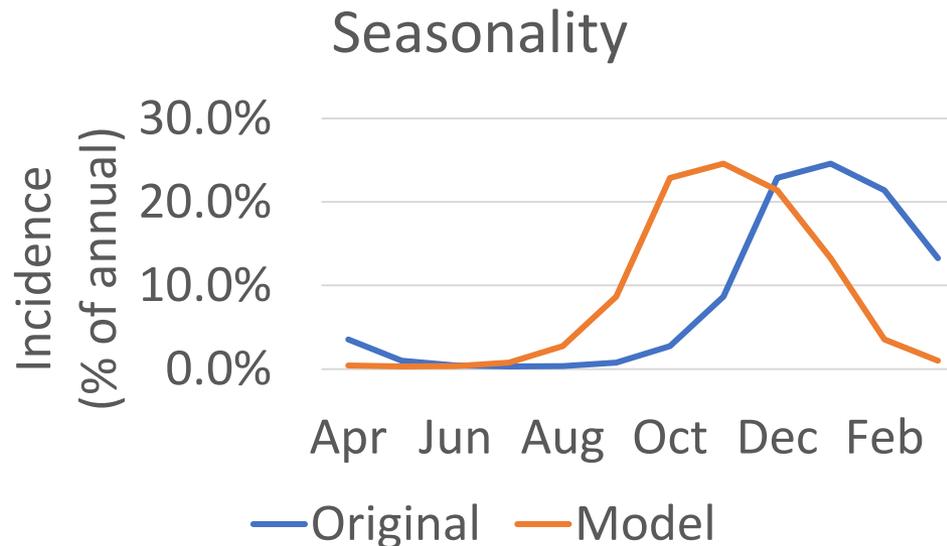
Results: Incremental benefit of adding RSVpreF on top of nirsevimab



Results: Adding RSVpreF

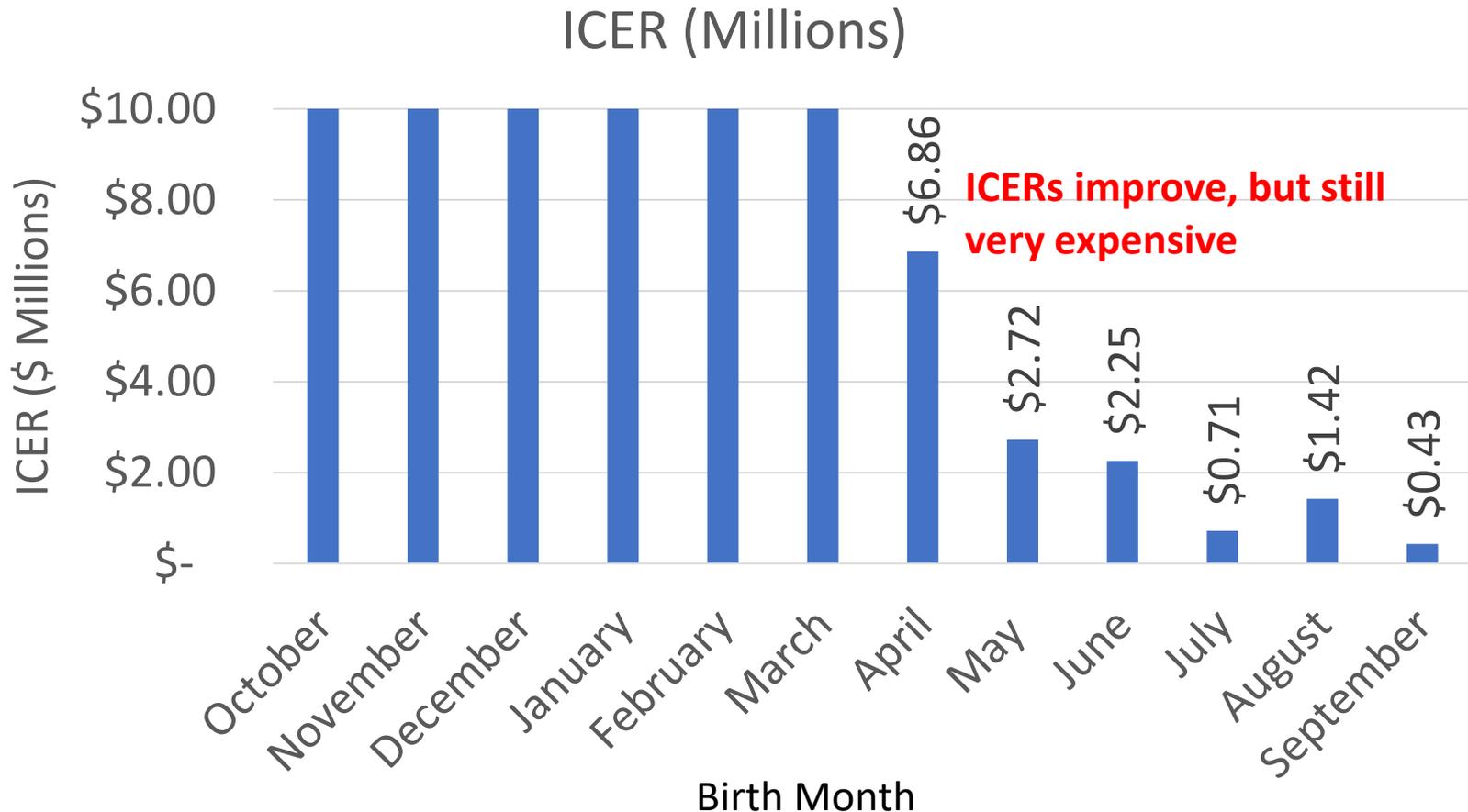
What if RSV season is early?

- Scenario:
 - RSVpreF provided in off-peak
 - RSV season starts 2 months early
 - Nirsevimab still provided in October



Results: Adding RSVpreF

What if RSV season is early?



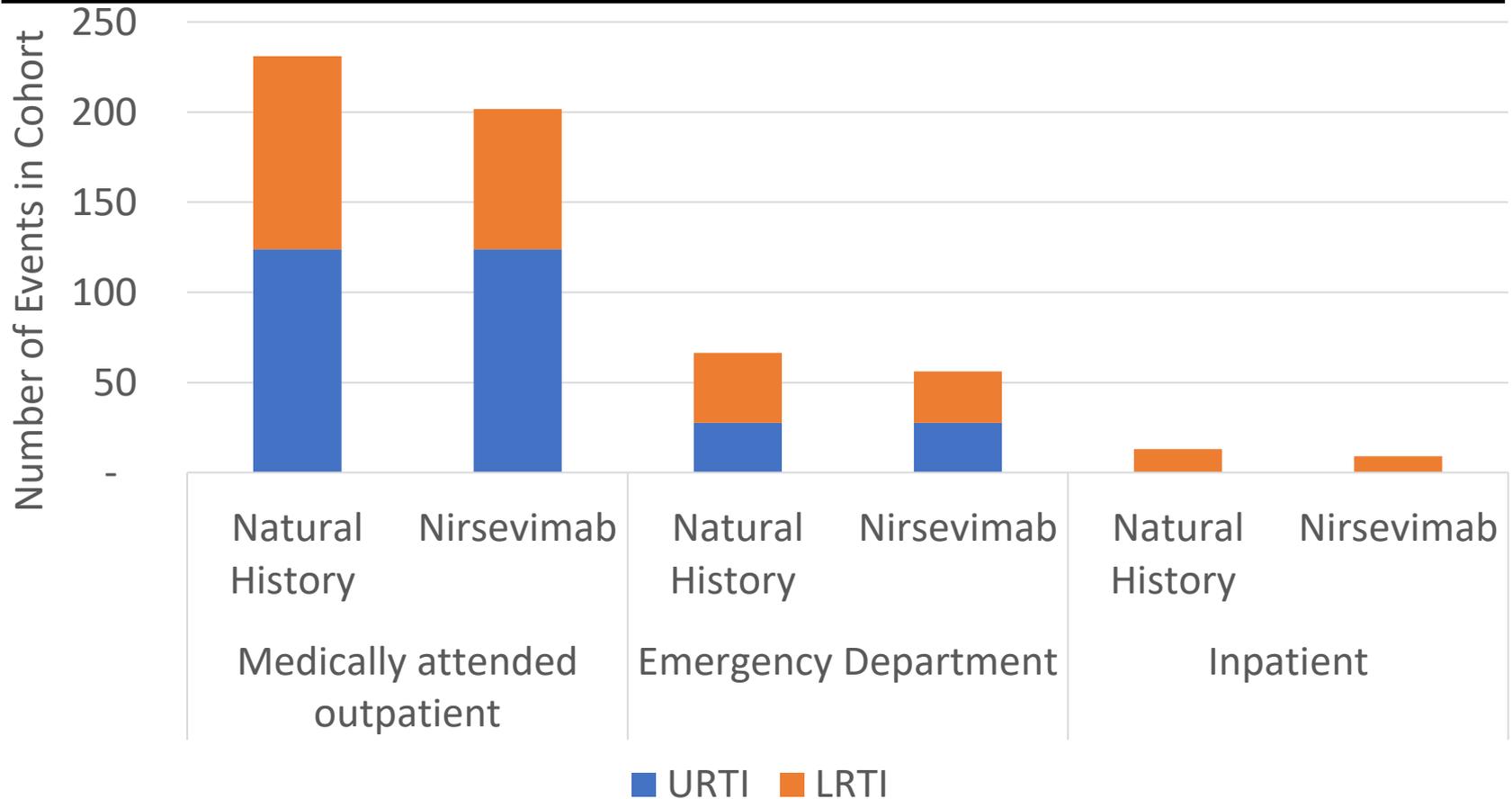
ICER- Incremental cost-effectiveness ratio

Nirsevimab base case
update

Nirsevimab results: Base case

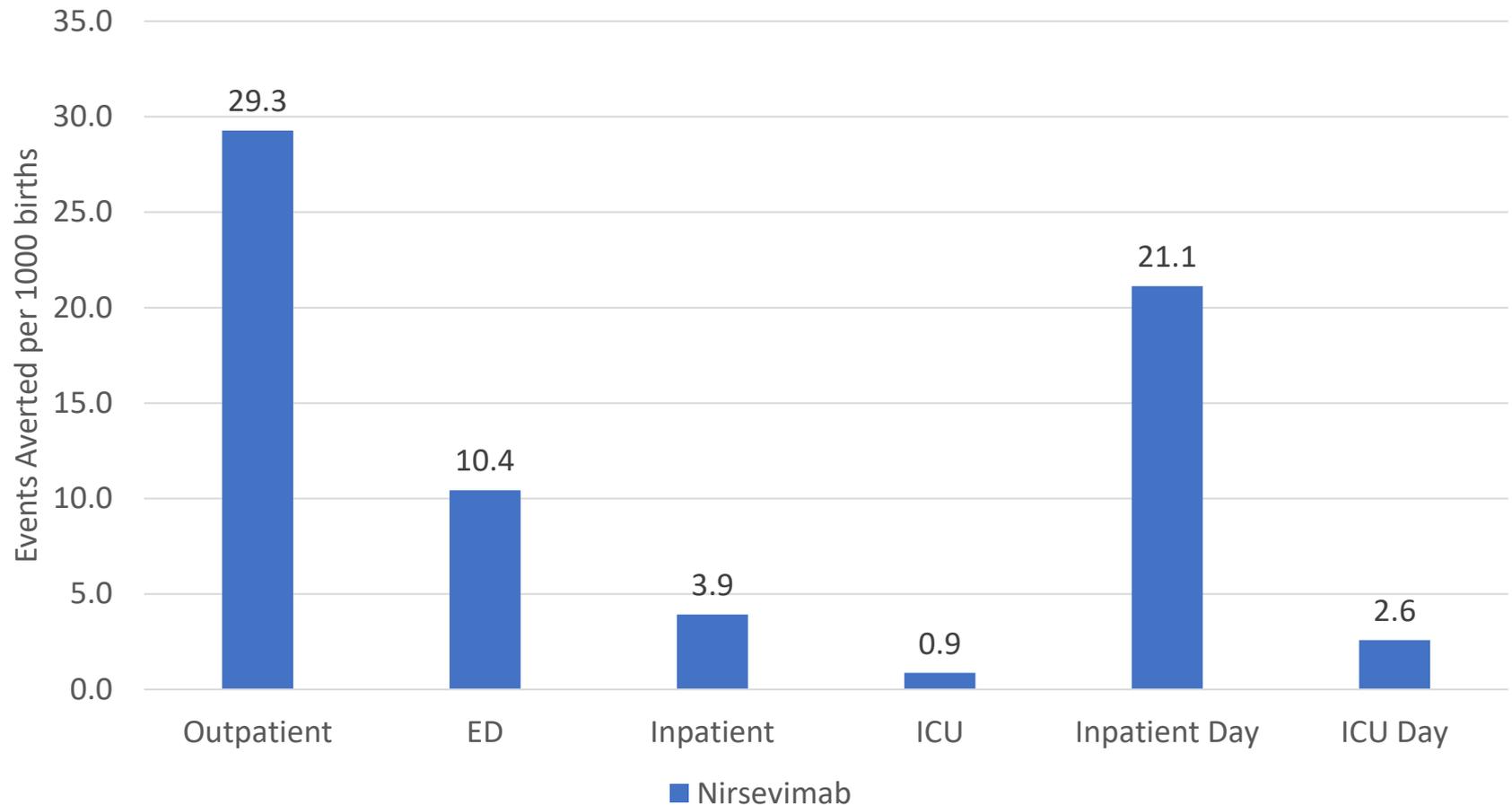
- Base case:
 - Population of 1,000 births
 - 50% uptake in the nirsevimab group
 - First RSV season
 - \$500/dose
 - Nirsevimab only impacts LRTI

Results: Health outcomes

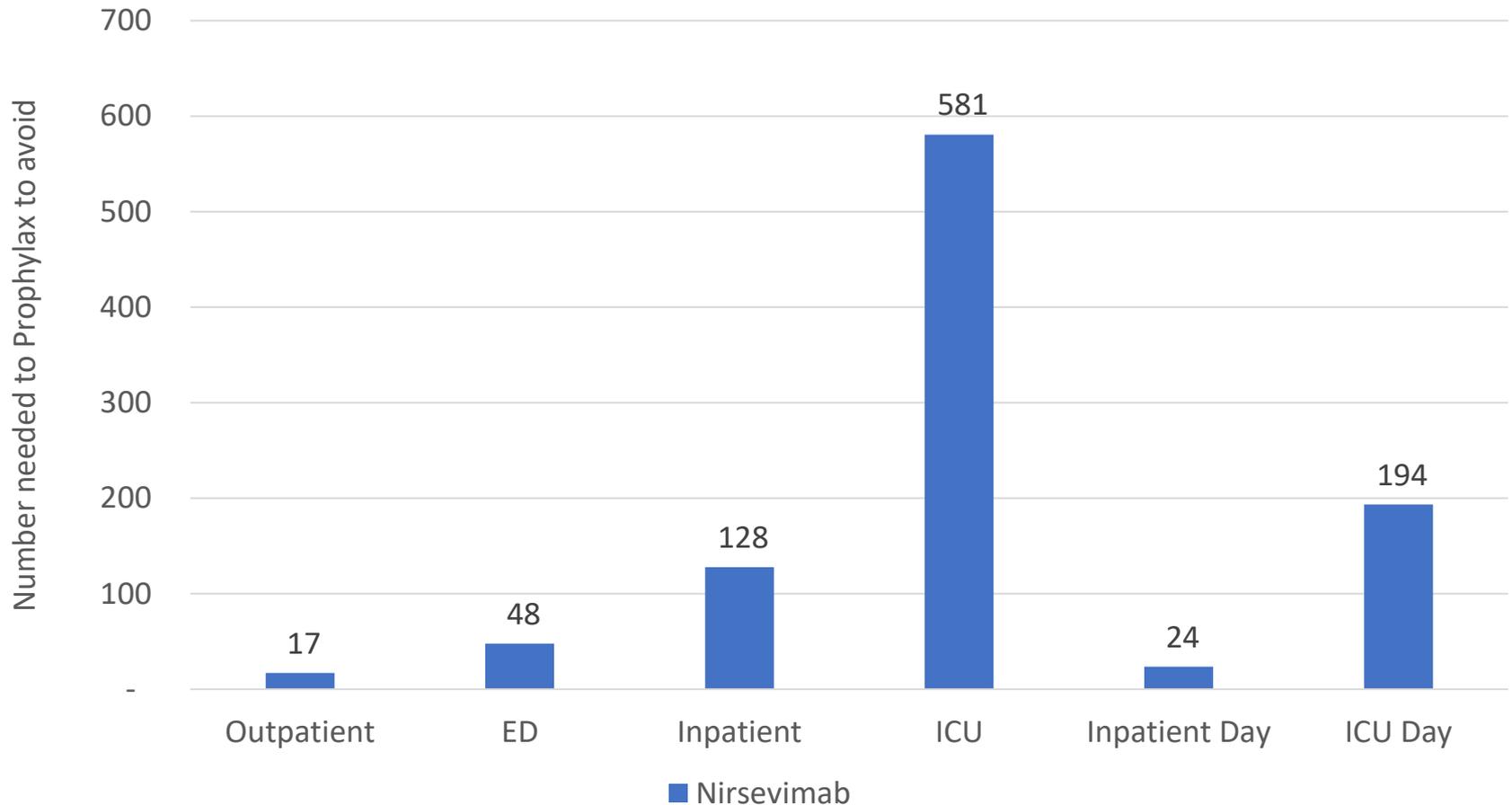


Cohort: 1,000 nirsevimab and 1,000 natural history, assuming 50% uptake in nirsevimab group
URTI- Upper respiratory tract infection; LRTI- Lower respiratory tract infection

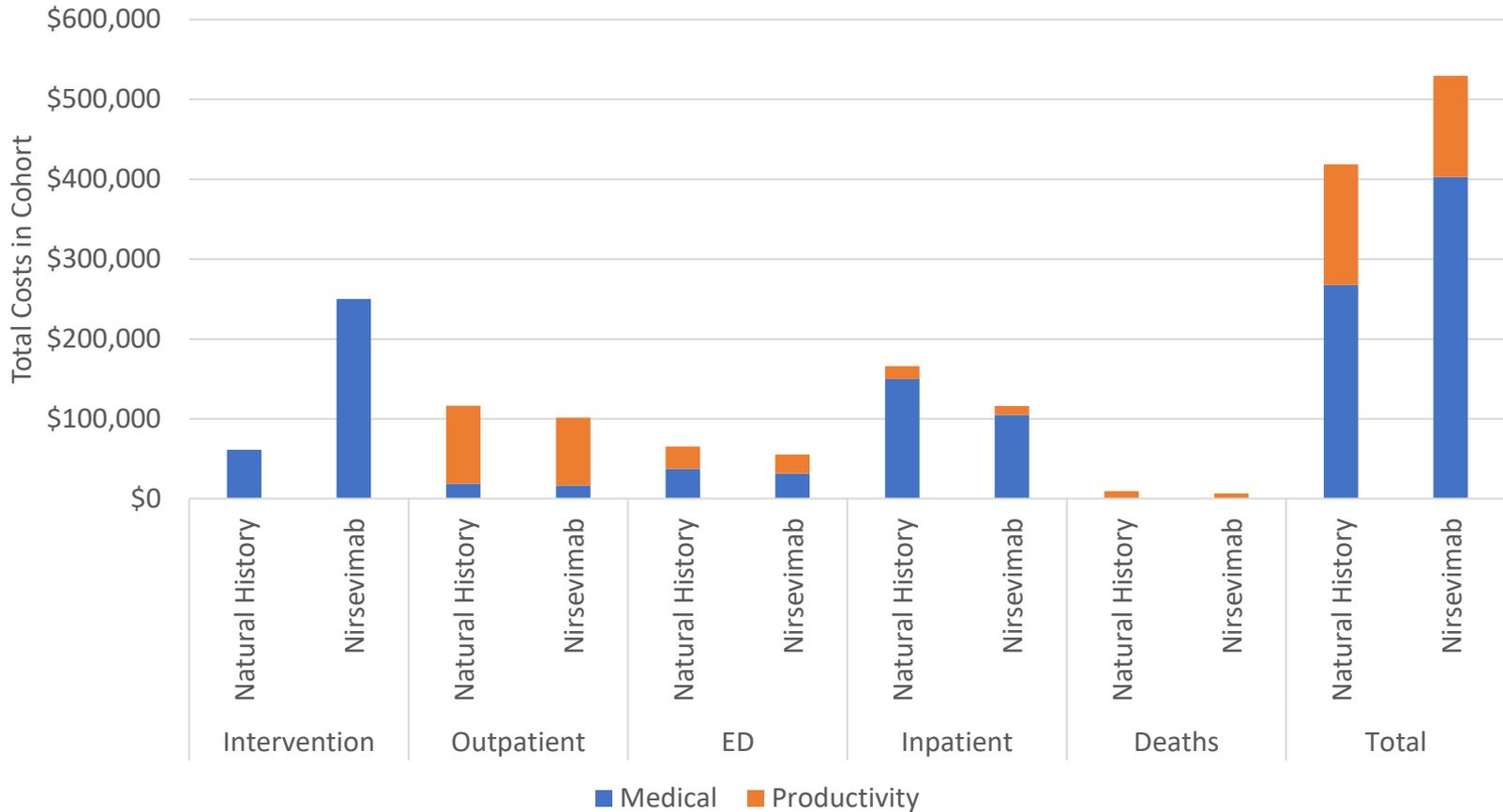
Results: Health outcomes



Results: Health outcomes



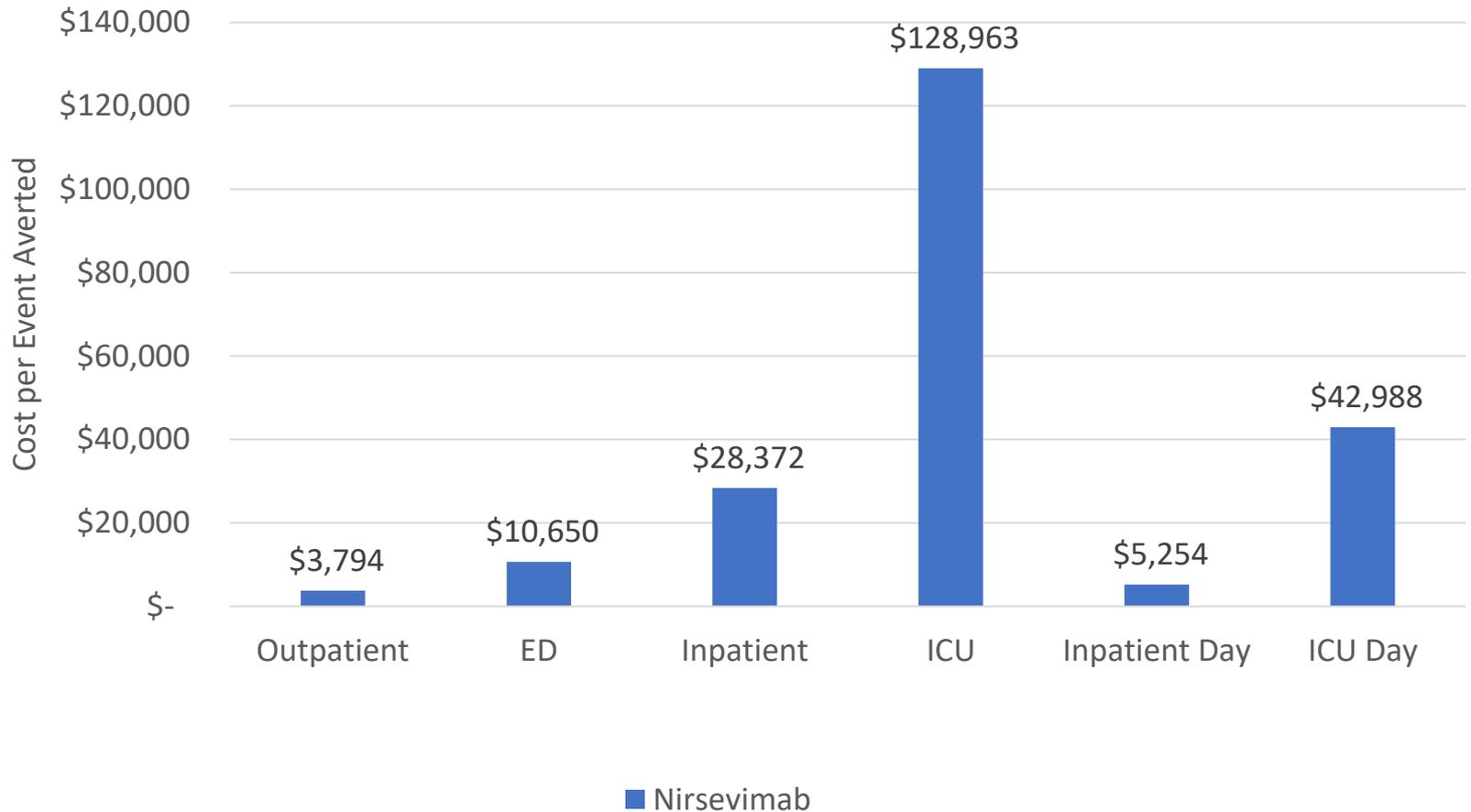
Results: Costs



Cohort: 1,000 births, assuming 50% uptake in nirsevimab group

Base costs of nirsevimab: \$500/dose, Cost of palivizumab for high-risk included in "Natural History"

Results: Health outcomes

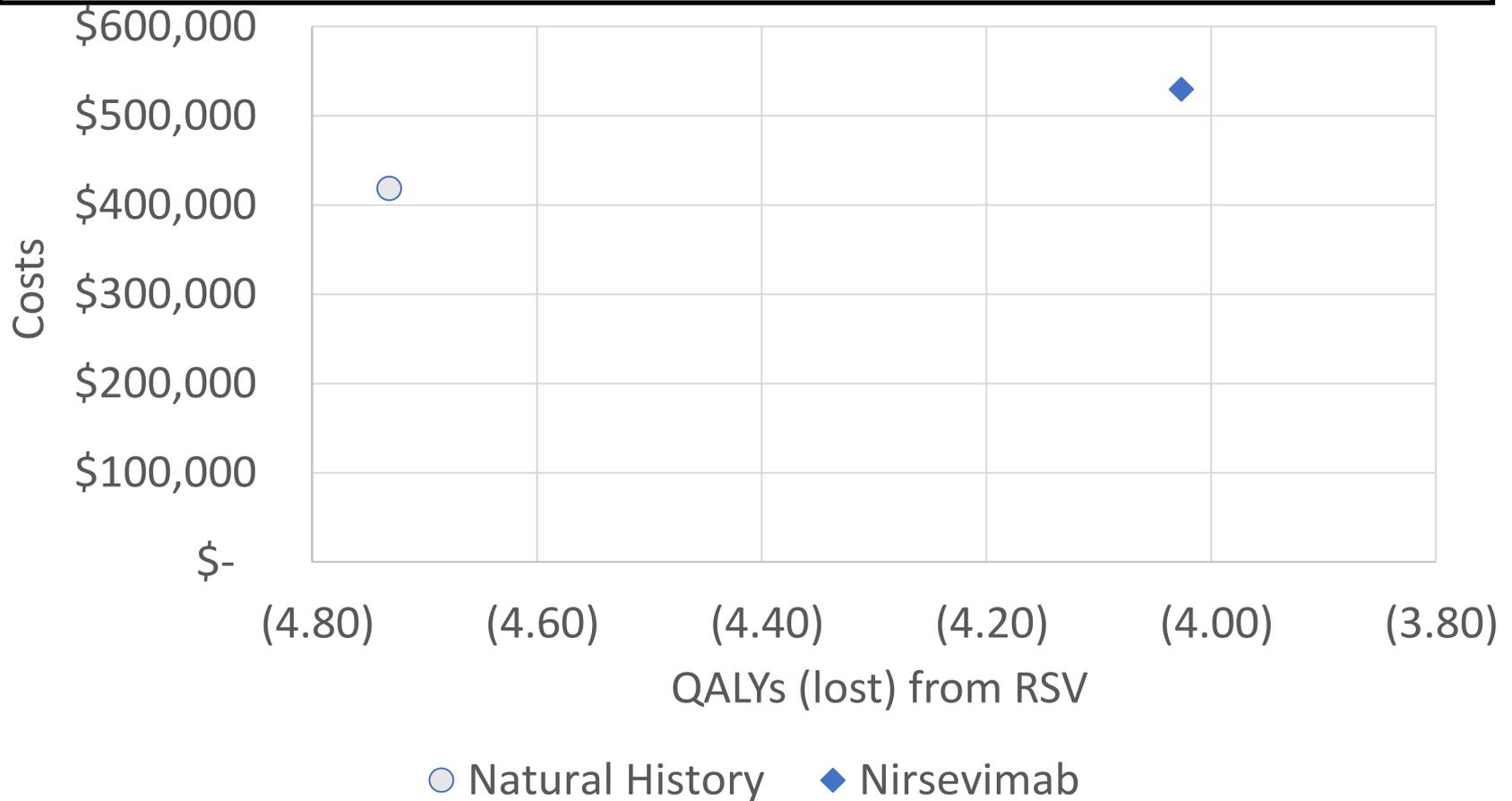


Results: QALYs lost

	Adverse Events	Outpatient		ED		Inpatient		Deaths	Total		Grand
		Child	Caregiver	Child	Caregiver	Child	Caregiver	Child	Child	Caregiver	Total
Natural History		1.95	0.98	0.90	0.45	0.22	0.09	0.15	3.22	1.51	4.73
Nirsevimab	0.01	1.70	0.85	0.76	0.38	0.15	0.06	0.10	2.73	1.29	4.03

Cohort:1,000 births, assuming 50% uptake in nirsevimab group

Results: Cost-effectiveness



Cohort: 1,000 births, assuming 50% uptake in nirsevimab group

Base costs of nirsevimab: \$500/dose, Cost of palivizumab for high-risk included in "Natural History"

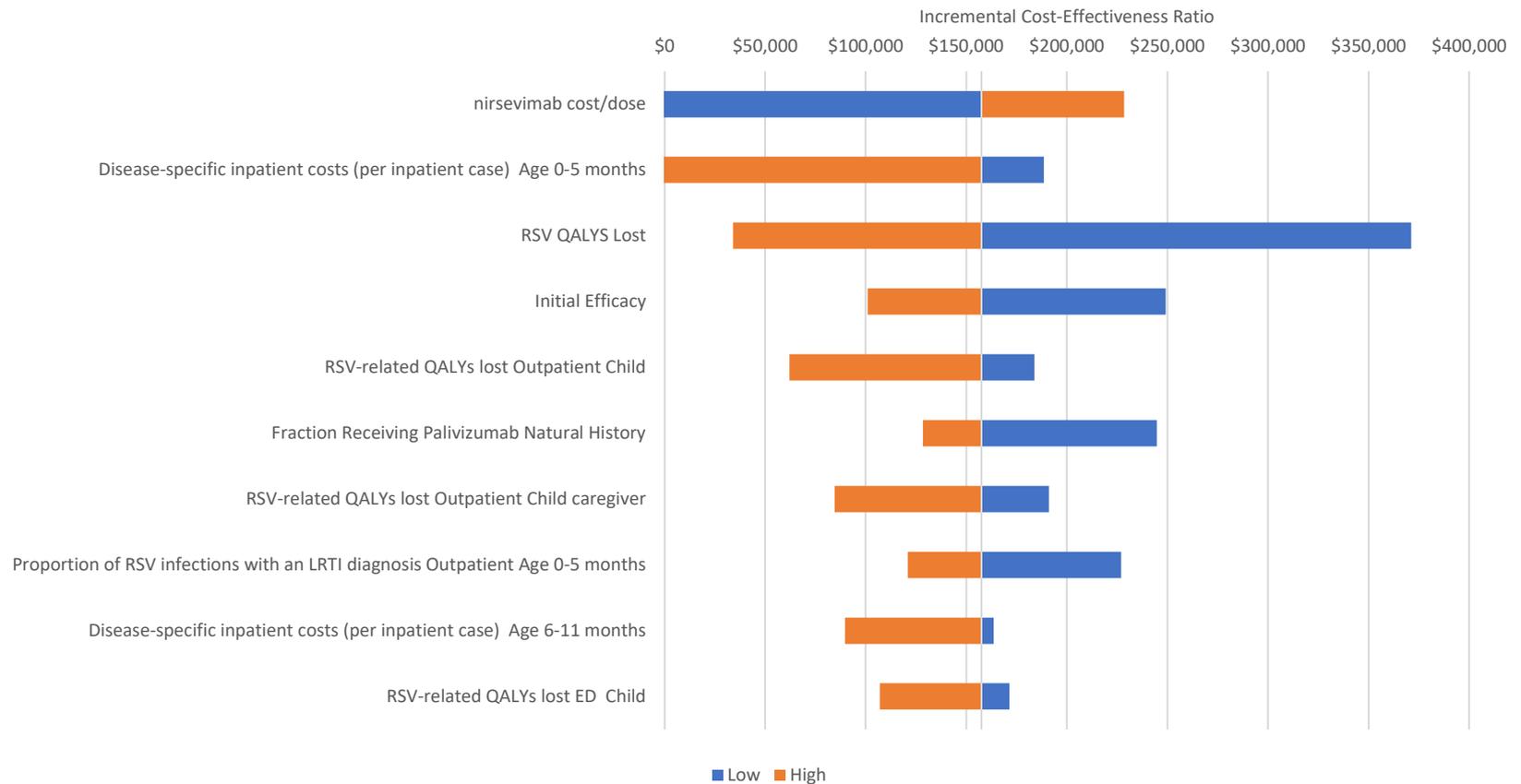
Results: Cost-effectiveness

Overall	Costs (\$)	QALYs	ICER (\$/QALY) Vs. NH
Natural History	418,556	4.73	
Nirsevimab	529,597	4.03	157,537

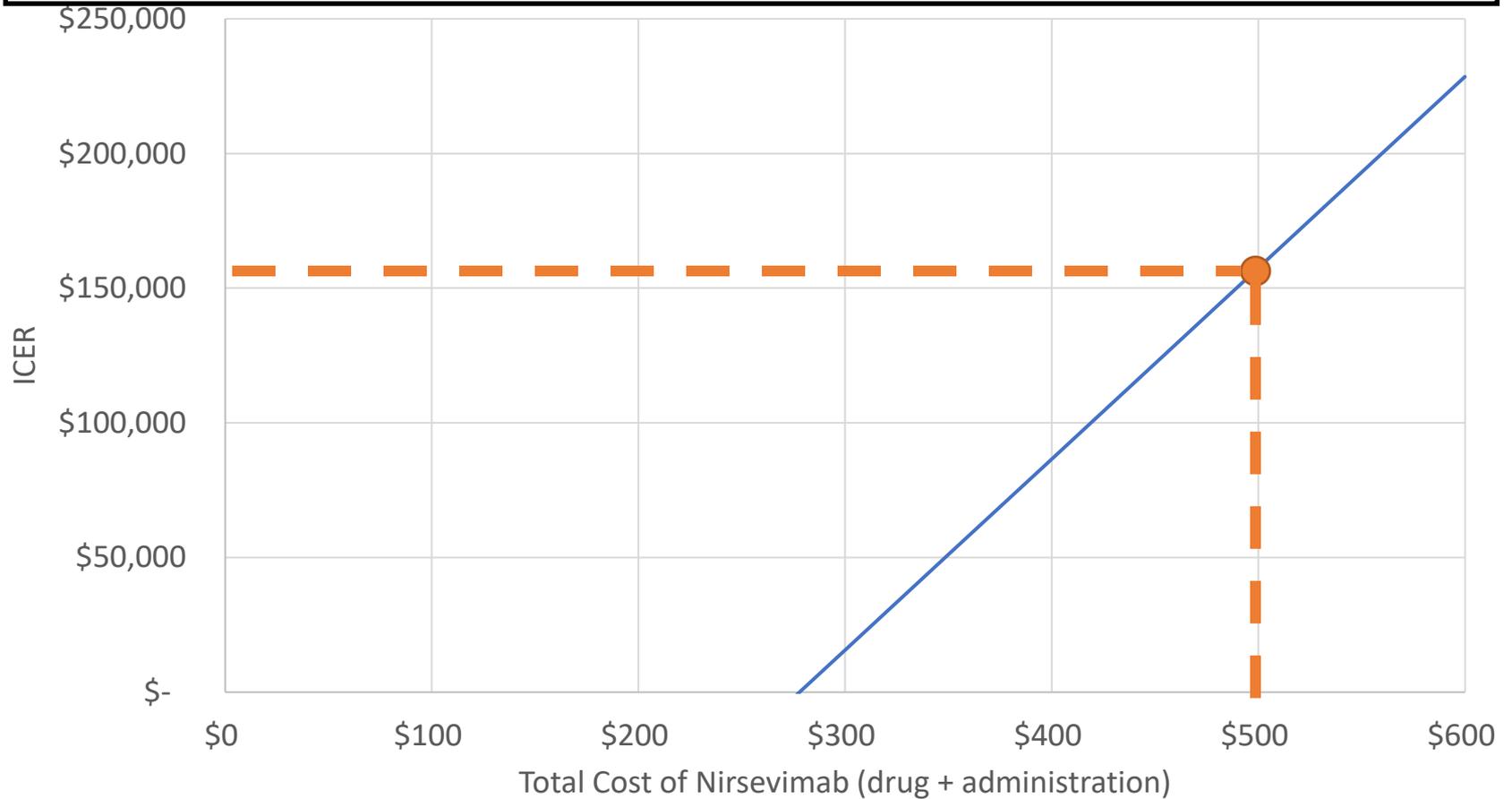
Cohort:1,000 births, assuming 50% uptake in nirsevimab group

Base costs of nirsevimab: \$500/dose, Cost of palivizumab for high-risk included in “Natural History”

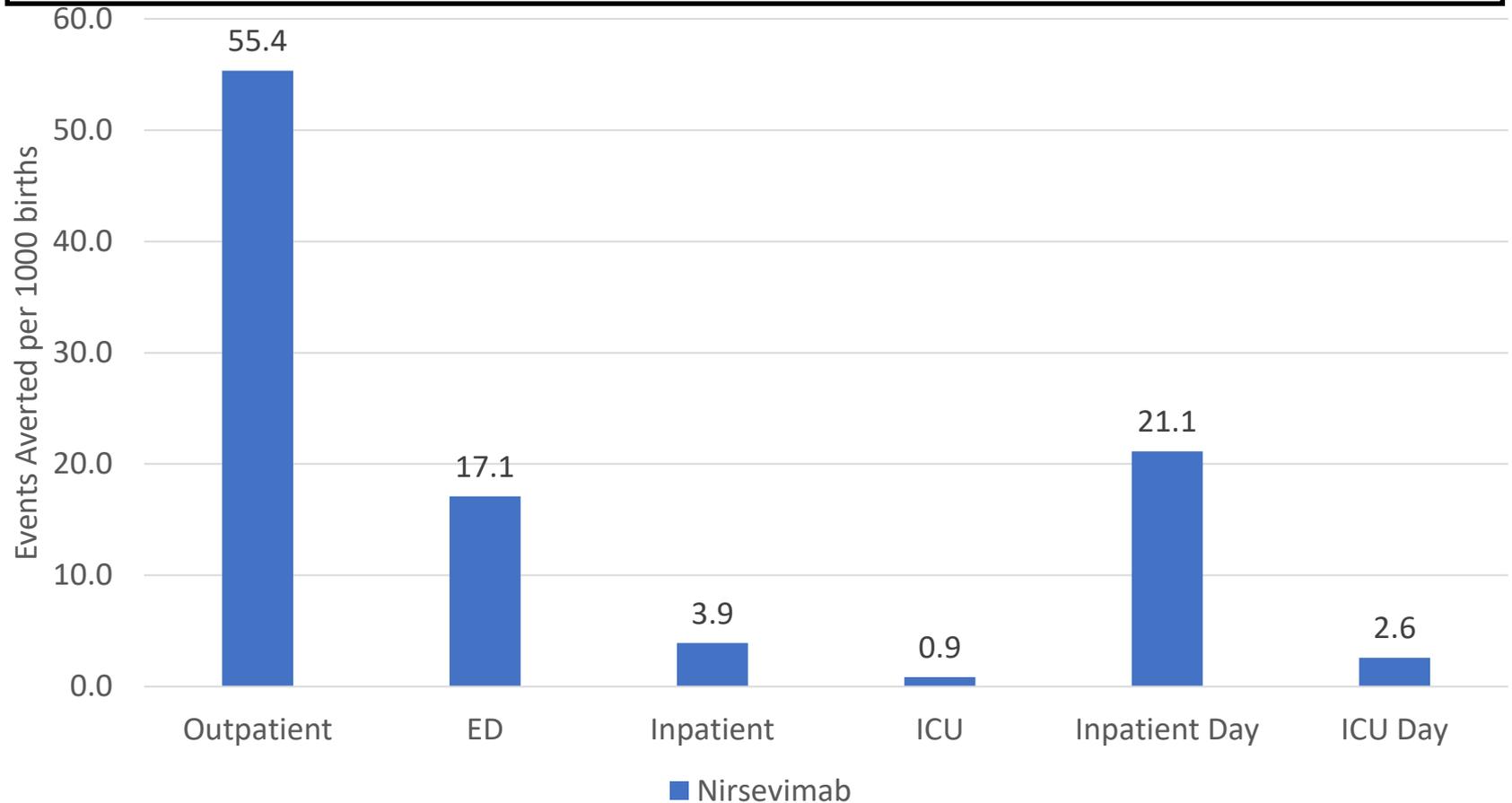
Sensitivity: Tornado nirsevimab



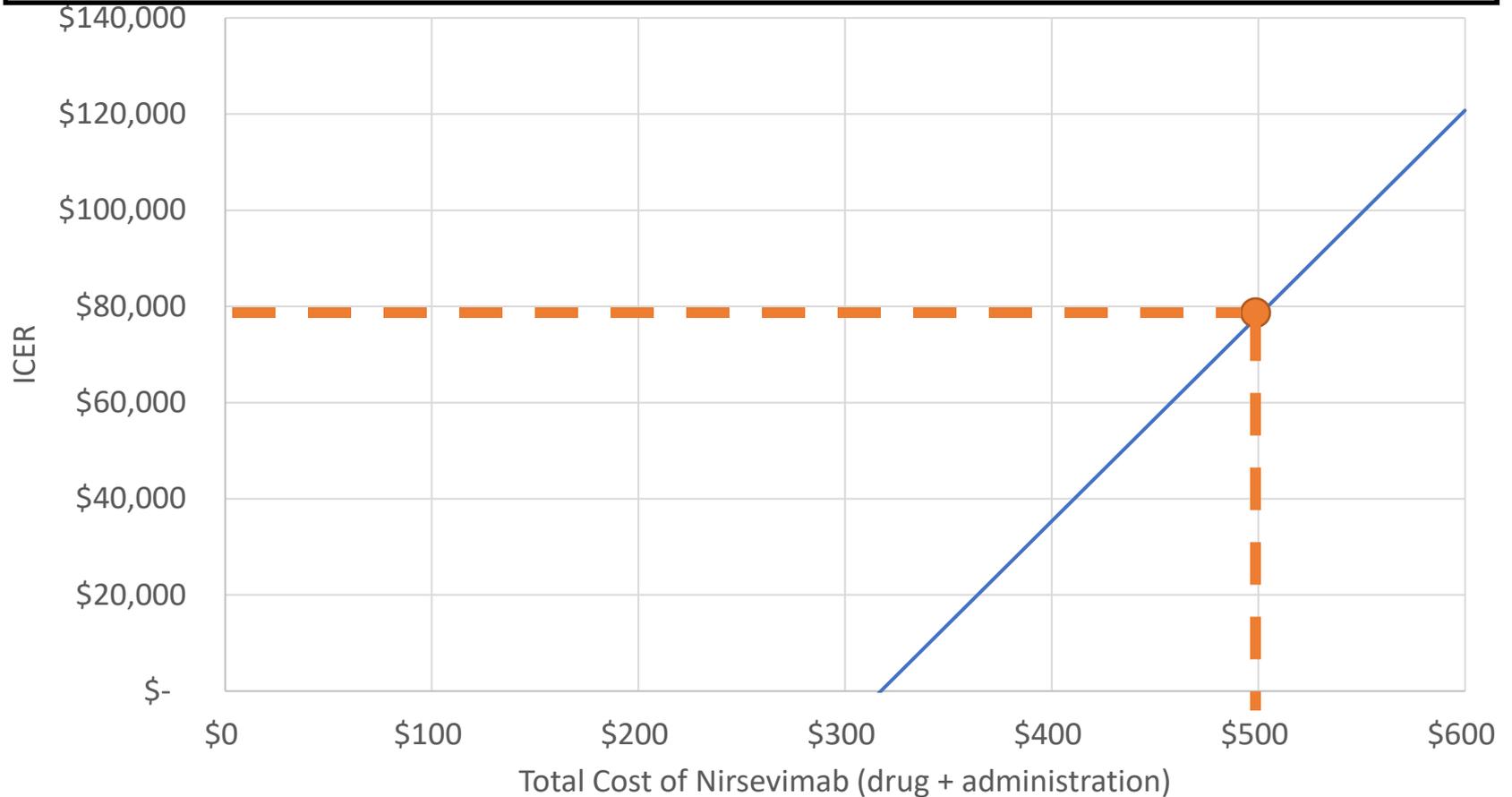
Sensitivity: Cost nirsevimab



Scenario: Upper respiratory infection effect



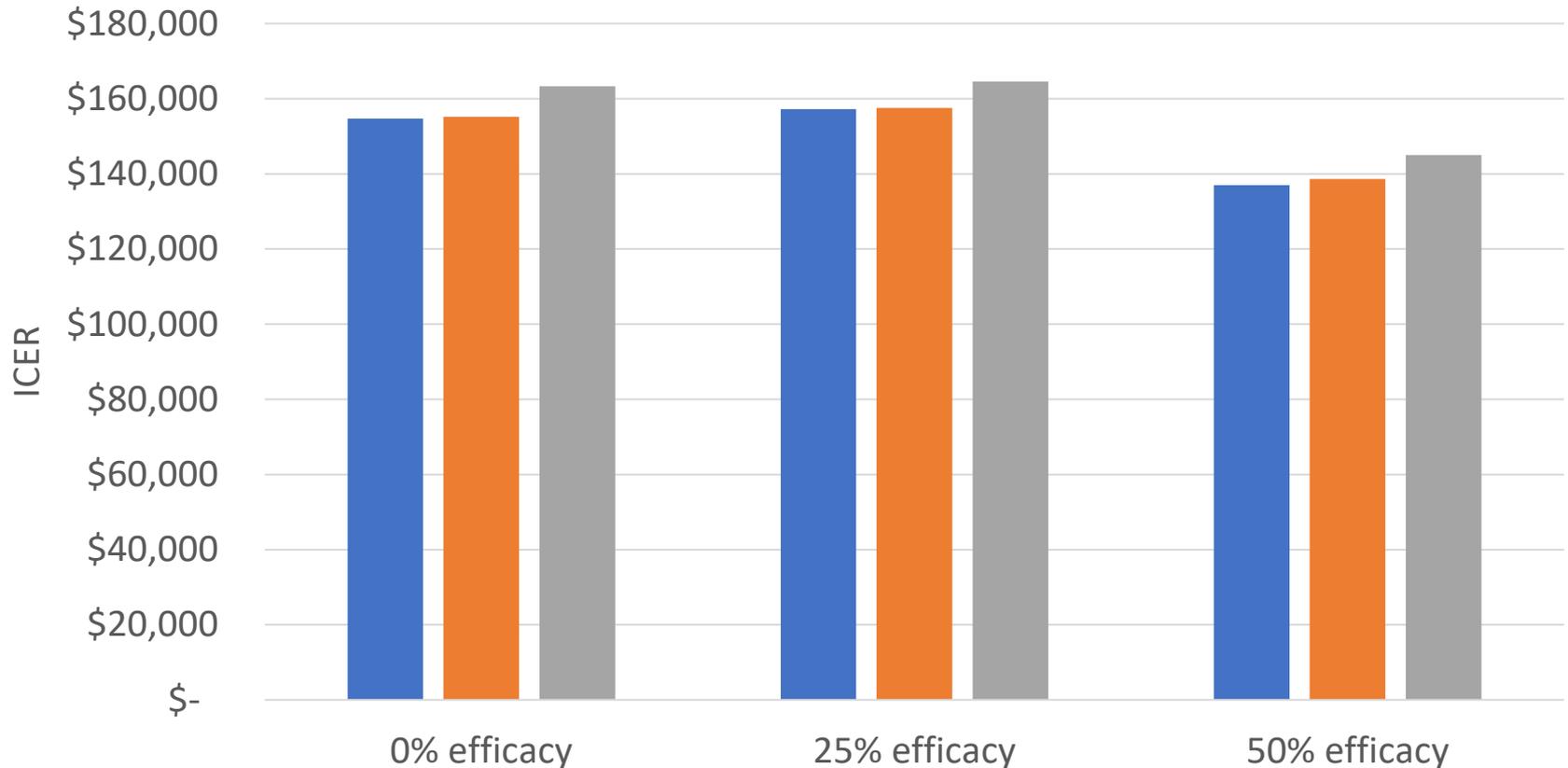
Scenario: Upper respiratory infection effect



Scenario: Timing analysis

- Cost-effectiveness of an infant receiving nirsevimab as a newborn in
 - Oct-Feb
 - Oct-March
 - Oct-April
- With varying efficacy in months 6-10
 - 0%
 - 25%
 - 50%

Scenario: Timing and efficacy in months 6-10



Cohort: 1,000 nirsevimab and 1,000 natural history, assuming 50% uptake in nirsevimab group

Base cost of \$500/dose

ICER = Incremental cost-effectiveness ratio

■ Oct-Feb ■ Oct-Mar ■ Oct-Apr

Slightly lower ICERs for Oct-Mar