

Modeled impact of nirsevimab against respiratory syncytial virus (RSV) among French infants experiencing their first RSV season

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INTRODUCTION

- Respiratory syncytial virus (RSV) is a leading cause of acute lower respiratory infection (ALRI) in young children¹, such as bronchiolitis, and is associated with significant morbidity and health care resource utilization (HCRU), especially among infants.
- Nirsevimab is a monoclonal antibody being developed (Ph3 recently completed) for the prevention of RSV-LRTIs. Understanding its health and economic impact under different scenarios is important to determine the optimal implementation strategy to protect all infants entering their first RSV season.

Objective:

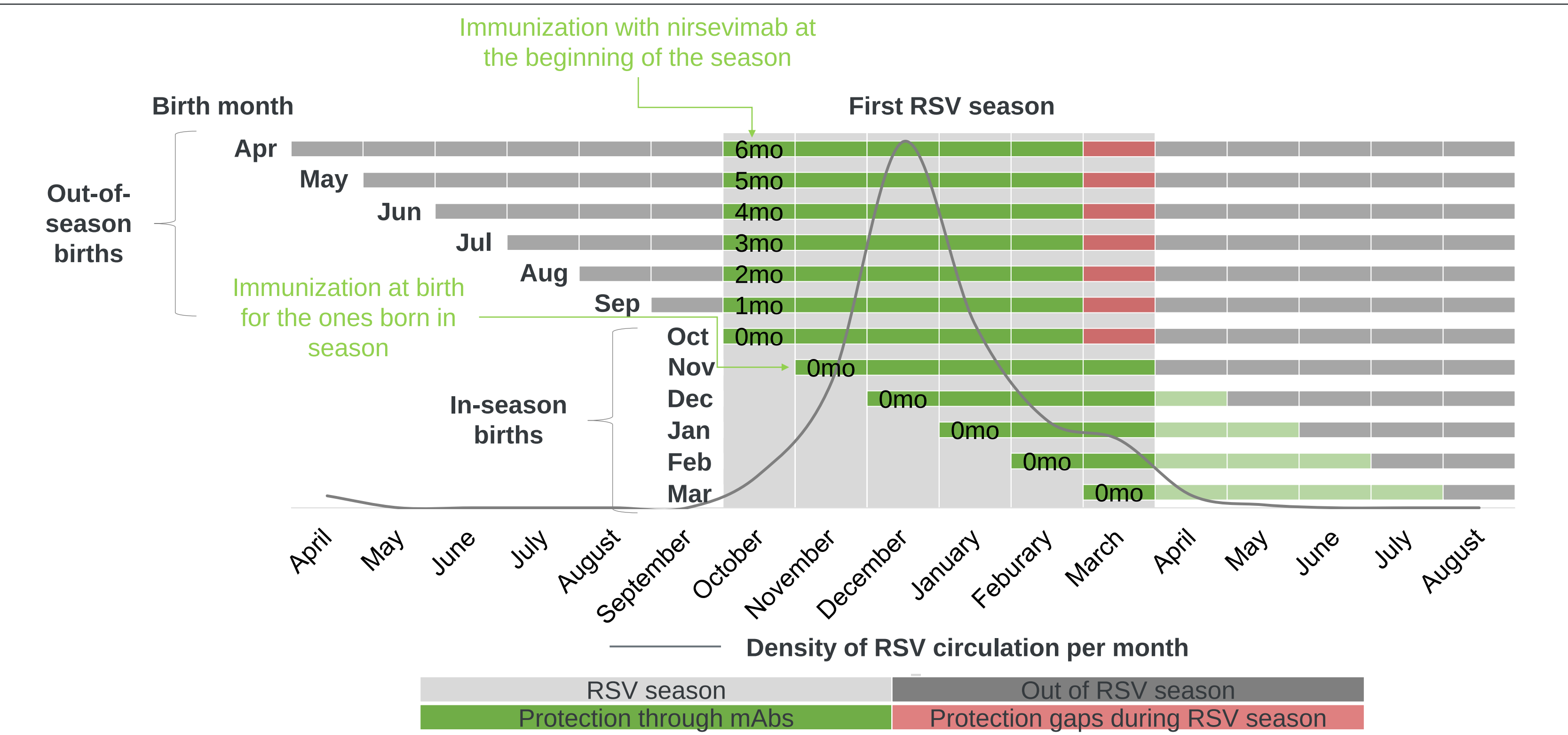
To estimate the potential impact of nirsevimab in a whole annual French birth cohort compared to current standard of practice (palivizumab for restricted subpopulation, and no intervention) and identify the population of interest.

METHODS

A static Markov model was developed to estimate RSV-related events and costs in a French birth cohort over their first RSV season.

- Monthly cycles to expose the cohort to differential risk of RSV according to age in months at start of the season and circulating seasonal RSV density.
- French birth cohort stratification to correspond to nirsevimab randomized clinical trial populations (palivizumab eligible, as per recommendations, non-eligible preterm and term infants).
- One administration of nirsevimab.
- Five-month duration of protection with constant efficacy.²
- Seasonal immunization at the start of the season for infants born outside of the season (OoS) and at birth for those born within (WiS) (**Figure 1**).

Figure 1. Immunization Strategy



RESULTS

Figure 2. Current RSV MALRTI burden and related costs over the first season of infants' life – modelled estimates

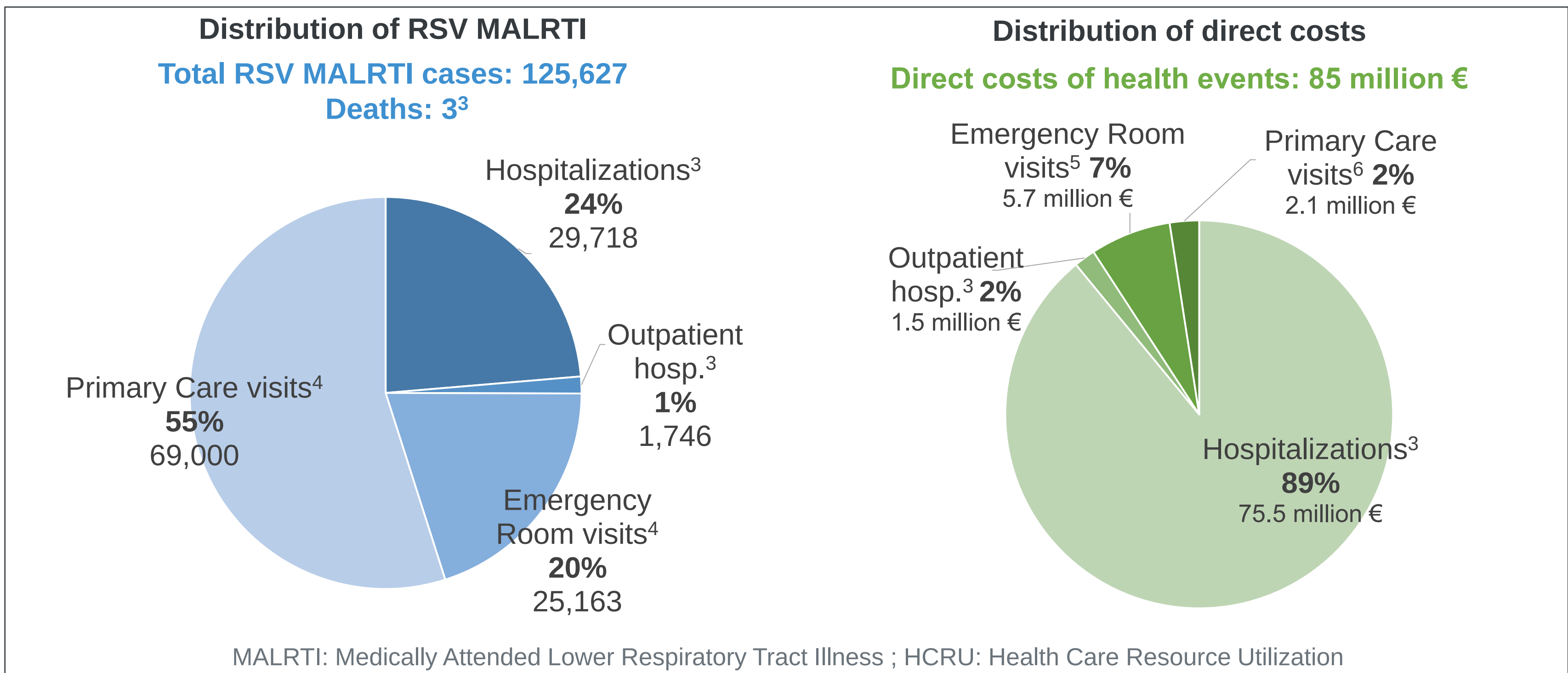


Figure 3. RSV related hospitalization per month of birth over the first season of infants' life – modelled estimates

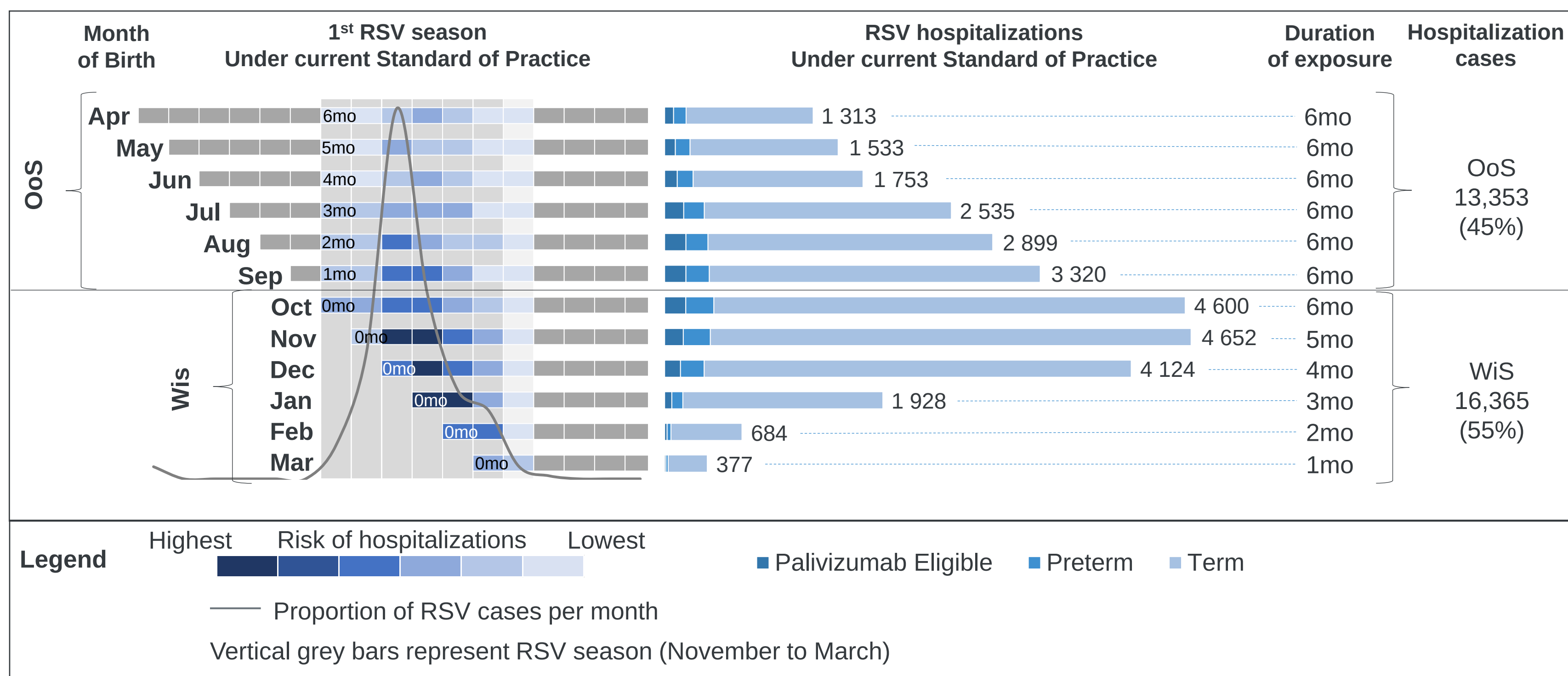
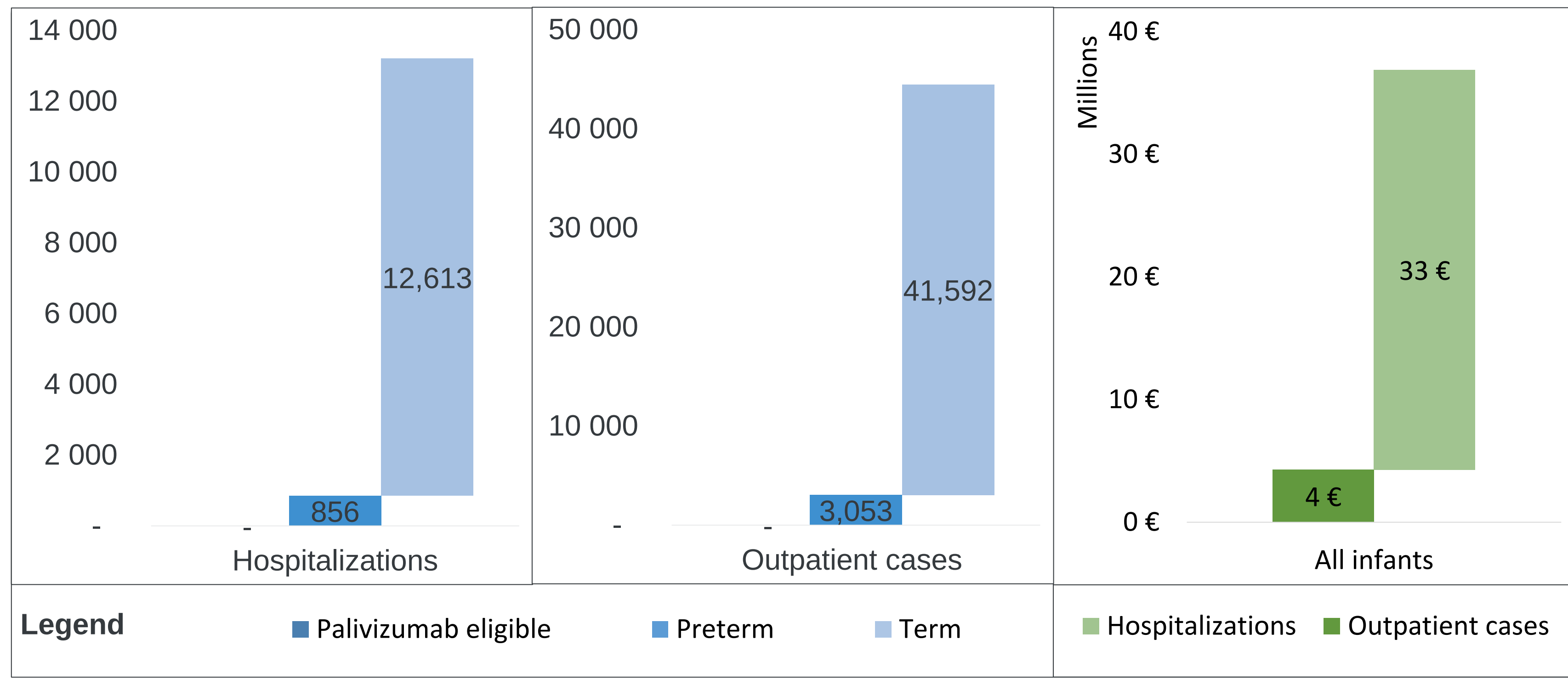


Figure 4. Prevented RSV MALRTI cases and associated costs with nirsevimab – modelled estimates



RESULTS

Current RSV burden over the first RSV season – modelled estimates

- In the overall population, while hospitalizations represent about 25% of the RSV Medically Attended LRTIs (RSV MALRTIs), the associated costs represent close to 90% of the economic burden (**Figure 2**).
- More than 95% of RSV related hospitalizations and inpatient deaths occur in infants not eligible for palivizumab.
- The model shows that 55% of the RSV related hospitalizations occur in infants born WiS and 45% in those born OoS (**Figure 3**). Considering all RSV MALRTIs, 60% of them occur in infants born OoS.

Nirsevimab impact vs. Standard of Practice – modelled estimates

Considering a theoretical 70%² reduction of RSV MALRTIs in non-eligible to palivizumab preterm and term infants) and non-inferiority to palivizumab in the eligible population:

- Nirsevimab would prevent 58,114 RSV MALRTIs and about 37M€ associated costs.
- All infant immunization would prevent more cases in term infants, being the largest subgroup of the birth cohort (**Figure 4**).

DISCUSSION & CONCLUSION

- Currently, most of the RSV related hospitalizations and inpatient deaths occur in infants for whom no prevention is recommended today.
 - Protection of the whole annual birth cohort with nirsevimab for their first RSV season is critical to achieving optimal levels of protection.
- Considering the age at start of the season, the burden of RSV MALRTI is almost equally distributed between infants born WiS and those born OoS.
 - Likely due to duration of exposure to RSV.
- Additional benefits from a broad protection can be expected
 - Opportunity cost benefit of reduction in hospitalization during the winter season in a resource constrained health service.
 - Impact on quality of life at population level.
 - All infant protection is likely to be a cost-effective strategy.

RSV is a leading cause of hospitalizations in all infants.
All infants need protection from RSV MALRTI.
Nirsevimab is designed to provide protection for all infants.

REFERENCES

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