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Passive RSV immunisation using nirsevimab in neonatal care: a structured multidisciplinary approach and immunisation data from a Swiss tertiary centre

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Summary

BACKGROUND: Respiratory syncytial virus (RSV) infection is a major cause of severe lower respiratory tract infections in newborns and young infants, especially during the winter season from October to March. In Switzerland, RSV infection represents a leading cause of hospital admissions among newborns. Since October 2024, a long-acting monoclonal antibody, nirsevimab (Beyfortus®), has been available in Switzerland for standard care in newborns.

OBJECTIVES: This paper presents a multidisciplinary, standardised protocol for the administration of nirsevimab, as well as immunisation data from the first season of application in 2024/25 at a tertiary centre in Switzerland.

METHODS: A protocol for implementing the RSV immunisation strategy was developed at University Hospital Zurich by a multidisciplinary team of obstetricians, neonatologists, nurses, from in- and outpatient services. The focus was on prenatal counselling during outpatient consultations as well as inpatient procedures on maternity and neonatology wards. The goal was to provide expectant parents with consistent information by different healthcare professionals. Neonatal immunisation data from the first season in 2024/25 (25 October to 31 March) were retrieved from patient charts (Yes/No) in a retrospective, quality control, observational cohort study. All newborns discharged from the maternity ward or the neonatology unit of our centre were included in the analysis.

RESULTS: The protocol included early and multidisciplinary parental education, offering consistent oral and written information, as well as opportunities to discuss their questions regarding the new immunisation, ensured informed consent and enabled timely administration of nirsevimab by healthcare professionals in the obstetrics and neonatology units. Over the 2024/25 season, 78% of the newborns were immunised before leaving hospital care: 78% (588/758) of newborns discharged home from the maternity ward were immunised and 82% (125/153) of those discharged home from the neonatology unit were immunised.

CONCLUSION: The implementation of passive RSV immunisation was overall successful with an immunisation rate of around 80% for the first season in 2024/25.

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Introduction

Respiratory syncytial virus (RSV) is a ubiquitous seasonal virus and a leading cause of bronchiolitis and pneumonia in infants aged below one year, particularly during the winter season. National and international epidemiological data confirm that RSV contributes to significant paediatric morbidity, accounting for a large proportion of hospitalisations among newborns [1]. The clinical burden and risk of severe RSV infection is particularly high in the first month of life, due to the immature immune system and narrow airways of newborns. Traditionally prevention has relied on hygiene measures and administration of monoclonal antibodies approved for high-risk infants only [2].

The recent development and regulatory approval of nirsevimab (Beyfortus®), a long-acting monoclonal antibody with demonstrated efficacy and safety, provides a transformative opportunity in neonatal infectious disease prevention. Clinical trials and observational studies have demonstrated an up to 80% reduction in severe RSV-related lower respiratory tract infections, 77% fewer hospitalisations and 86% fewer intensive care admissions among infants who received nirsevimab [3–6]. These benefits were consistent across populations, including full-term and preterm infants. Safety data from over 3700 infants showed no increase in adverse events compared to placebo [7].

Based on these findings, the Swiss Federal Office of Public Health (FOPH / *Bundesamt für Gesundheit* [BAG]) and the Federal Vaccination Commission (FVC / *Eidgenössische Kommission für Impffragen* [EKIF]) in collaboration with the various expert societies have recommended among others a routine passive immunisation strategy with nirsevimab for all newborns born between October and March, to be administered within the first week of life or as soon as

possible thereafter [7]. The costs of nirsevimab are covered by mandatory health insurance and embedded within the Swiss Diagnosis-Related Groups (DRG) system [8]. The latter incorporation was confirmed on 5 September 2024, leaving very little time to inform relevant healthcare workers and expectant parents about, and prepare them for, this new passive immunisation option for newborns in the upcoming 2024/25 RSV season. To achieve high immunisation coverage without generating extensive workload in the inpatient setting, clear parental communication and seamless interdisciplinary collaboration were required.

This paper presents a pragmatic implementation report developed at University Hospital Zurich, integrating the RSV immunisation strategy into routine perinatal care, emphasising parental education, interprofessional collaboration and clinical efficiency to minimise administrative burden. Additionally, immunisation data of the first RSV season with nirsevimab, 2024/25, are shown and discussed in detail.

Materials and methods

Multidisciplinary implementation strategy for nirsevimab

The protocol for implementation of the RSV immunisation strategy was developed at University Hospital Zurich by a multidisciplinary and interprofessional team of obstetricians, neonatologists and nurses regarding in- and outpatient services. The goal was to achieve, from the first day of the protocol's implementation, high immunisation rates with nirsevimab for newborns leaving our centre. To this end, we focused on the following:

- Consistent information for the expectant parents by different healthcare workers (doctors, midwives, nurses), based on existing information material, i.e. the fact sheets of the Federal Office of Health [9].
- Consistent information for the expectant parents at multiple time points (prenatally, after delivery at the ward, during the stay at the maternity ward or neonatology).
- Activation of various information channels (oral, written i.e. leaflets, smartphone applications).
- Minimalised use of administrative and time resources for each discipline (especially considering primary information and subsequent questions by parents).
- Clinical efficiency of the workflows of nirsevimab administration (written parental consent).
- Easy access to nirsevimab for parents who had not reached a decision by the time of hospital discharge, by implementing an outpatient consultation at University Hospital Zurich's neonatology department.
- Reduction of workload of paediatric outpatient clinics by implementing an outpatient consultation at University Hospital Zurich's neonatology department for undecided parents (this consideration was made with special regard to the beginning of the programme, where paediatricians in the outpatient practices were responsible for the vaccination of all children born between April and September 2024 in their practice).

Nirsevimab immunisation data for the 2024/25 season

This is a retrospective, quality control, observational cohort study. All newborns born alive at University Hospital Zurich between 25 October 2024 and 31 March 2025, discharged home from the maternity ward as well as all newborns discharged from the neonatology unit in this time period, were offered nirsevimab, and were included in this data analysis. Exclusion criteria included stillbirths, neonatal deaths, newborns receiving palliative care and those transferred to other hospitals for follow-up.

Following the recommendations of the Swiss Federal Office of Public Health / Federal Vaccination Commission, all newborns without contraindications (e.g. haemophilia or thrombocytopenia) were recommended nirsevimab 50 mg intramuscularly in their first days of life (application possible immediately after birth or as soon as possible thereafter).

For newborns discharged home from the maternity ward, data were retrieved every second week from patient charts. For newborns discharged home from the neonatology unit, an overall immunisation coverage was calculated, as the length of stay varied and thus the application of immunisation did not occur in a timely standardised manner. Documented administration of nirsevimab (Yes/No) before discharge was coded. Additionally, maternal vaccination with Abrysvo®, the maternal RSV vaccine, was coded if application occurred between the 32nd and 36th week of pregnancy and at least two weeks before delivery. If Abrysvo® had been given according to the mentioned conditions, nirsevimab was not additionally administered to the newborns and they were coded immunised. Newborns immunised during their first two weeks of life at the outpatient service of University Hospital Zurich's neonatology department, as described in the implementation strategy, were considered 'immunised' for analysis too.

Data were retrieved anonymously from the electronic patient chart KISIM© (version V5.6.0.14, Cistec AG©) and / or Perinat (Klinisches Informationssystem, version 7.0.0.89, © University Hospital Zurich 2025).

Statistical analysis was performed using Microsoft® Excel® for Microsoft 365 MSO (Version 2402 Build 16.0.17328.20550) 64-bit. Categorical data are presented as counts (n) with percentages (%).

This study does not fall within the scope of the Swiss Human Research Act. The study was reported, but approval of the project by a Swiss Ethics Committee was not required as it was designed as a retrospective, quality control, observational study and only targeted anonymous data were obtained (Req-2025-00202).

Results

Multidisciplinary protocol for nirsevimab

The protocol developed at University Hospital Zurich by a multidisciplinary team from obstetrics, neonatology, nursing and outpatient services is schematically shown in figure 1 and its key features are as follows:

Prenatal information and counselling of parents

During pregnancy consultations by obstetricians and/or midwives, all expectant parents are informed about passive RSV immunisation. Printed fact sheets by the Swiss Federal Office of Public Health are included in the maternity documents sent by post to every woman planning to deliver at our centre. Additionally, these fact sheets are placed in the hospital's digital maternity pass/application, available to every woman who has had a consultation at our centre [10].

Delivery and postpartum period in the delivery room

After delivery, however still in the delivery room, midwives reinforce the information about RSV immunisation during the initial newborn assessments (ideally as a reminder with the standardised vitamin K administration). Parents receive an RSV consent form, containing key information about nirsevimab, and are asked to return it signed before the neonatal routine check before discharge from the hospital. The form contains the following options for parents to choose from: "Yes, I want nirsevimab to be administered", "No, I do not want nirsevimab to be administered" or "I have not decided yet".

Maternity ward (postpartum care)

Any remaining parental concerns are addressed by the attending obstetricians and/or nurses/midwives during the daily rounds. Nurses verify that the signed consent form is present at discharge. At the routine neonatal examination by neonatology before discharge (usually day two or three after birth), parents are again informed and asked about their decision concerning nirsevimab administration. If parents agree, nirsevimab is prescribed and documented in the vaccination booklet by the neonatologist and administered by the ward nurses/midwives. If parents decline the nirsevimab administration, a note is made in the report for the paediatrician, asking that the topic be brought up in the follow-up visits. If parents remain undecided, they are referred to the outpatient neonatology clinic (see point 5).

Neonatology unit (inpatient newborns)

Parents of hospitalised newborns are informed about RSV immunisation as part of discharge planning. With consent, nirsevimab is administered prior to discharge.

Outpatient neonatology clinic

For parents who are undecided or prefer more time to consider, an appointment is scheduled with neonatology specialists within the week after discharge. After counselling, if consent is obtained, the immunisation is administered and documented in the child's immunisation booklet.

RSV immunisation data for the 2024/25 season

During the study period, 758 newborns were discharged home from the maternity ward with an RSV immunisation coverage of 78% (n = 588). A further 153 newborns were discharged home from the neonatology unit, of whom 125 were immunised (82%) (figures 2 and 3).

In summary, the overall immunisation rate of all newborns discharged home from our centre was 78%. Four (0.01%) newborns were passively immunised by maternal vaccination (Abrysvo®). A small percentage of all immunisations (1.6% or n = 15) occurred in the outpatient setting.

The monthly immunisation rates of the neonates discharged from the maternity ward are shown in figure 4A. Immunisation rates in the first weeks of implementation were 82%. The highest rates were observed in October 2024 and January 2025 – 82% and 81%, respectively – and the lowest in February 2025 with 73%.

Discussion

This study reports on an interdisciplinary and interprofessional implementation strategy for nirsevimab as well as on the immunisation coverage of newborns born during RSV season 2024/25 at University Hospital Zurich. The immunisation rate was 78% for the newborns discharged from the maternity ward and 82% for newborns leaving the neonatology unit.

Immunisation strategies

The integration of nirsevimab into standard neonatal care represents a major advancement in RSV infection prevention. Real-world data from the previous RSV season have shown that it reduces severe RSV infections and related hospitalisations in infants, with 70–83% efficacy across several RCTs [6, 10, 11]. Unlike vaccines, passive immunisation provides immediate protection, making it particularly valuable for newborns who are at highest risk during their first months of life. Clearly this made the quick implementation of nirsevimab essential; however several challenges were to be expected. First, the particularly short time interval between regulatory approval and financial coverage of nirsevimab in Switzerland and the start of the RSV season made implementation a challenge for all disciplines providing care, whether inpatient or outpatient care. Furthermore, when starting the programme for the newborns, the focus of the paediatricians had to be the catch-up immunisation of all children born between April and September 2024, thus leaving little space for extra consultations of newborns. On the other hand, maternity wards and neonatologists faced the challenge of an additional and potentially time-consuming task, without reimbursement, other than the costs of nirsevimab itself.

Previous experiences in Switzerland show that vaccine acceptance rates are rather low in comparison to most neighbouring countries [12, 13]. Among 2-year-olds, full coverage of the mandatory vaccines (such as measles and diphtheria, pertussis [whooping cough] and tetanus [DPT]) in Switzerland was reported as under 90%, vs 93% in France and 92% in Italy. Vaccine hesitancy has been reported to be influenced by a complex interplay of emotional, cultural, religious, political, logistical and cognitive factors [12, 14, 15]. While lack of knowledge and insufficient information have been consistently linked to low vaccination rates, particularly in Switzerland, other elements such as trust, personal stories and opportunities for dialogue with peers also play a crucial role [13–16]. Although our study does not allow conclusions to be drawn on the above-mentioned factors, these may still contribute to hesitancy in certain groups of our patients and the 20% of parents who did not accept nirsevimab at our centre. Addressing vaccine hesi-

tancy therefore requires not only factual education but also empathetic and context-sensitive communication strategies. A framework for open, non-judgemental discussion with vaccine-hesitant parents from a trusted resource has been shown to positively influence vaccine acceptance [13, 15].

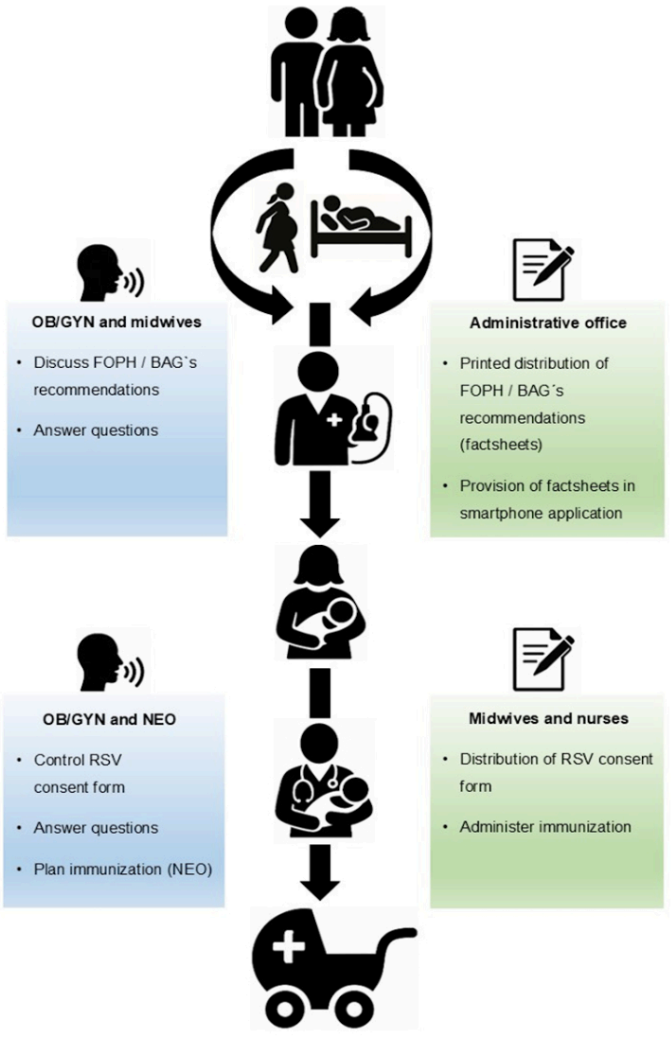
Taken together, a good and quickly conceptualised strategy had to be brought up in order to optimise the implementation of the passive immunisation against RSV for newborns. The introduction of the multidisciplinary and interprofessional strategy at University Hospital Zurich demonstrates how existing clinical routines can be adapted to incorporate new preventive measures without significantly increasing workload for any discipline. Immunisation rates in the first weeks of the programme, as high as 82%, show that the concept was immediately effective. We believe that a key factor in the successful implementation was the early and consistent communication with parents, which fostered understanding and acceptance. Standardised information material endorsed by federal authorities (Swiss Federal Office of Public Health / Federal Vaccination Commission) ensured clarity and coherence across disciplines. Additionally, the interprofessional approach including midwives and nurses might have raised acceptance by the parents. Even though not specifically studied, subjectively the strategy was quickly incorporated into routine standard care at our centre. By embedding the administration of nirsevimab within routine workflows, such as postpartum assessments and discharge planning, the protocol avoided additional strain on staff while maximising immunisation rates. This approach may also serve as a model for introducing future innovations in neonatal care.

RSV immunisation rates of newborns

Overall acceptance of nirsevimab at our centre was very high (80%). This rate is comparable with the previously reported average overall vaccination rates of 70–90% from Galicia (Spain), France, Luxembourg and the USA for the 2023/24 winter season [3–5, 17]. Most likely, some children were additionally immunised at the paediatrician's practice at the 1-month follow-up.

The reasons for this high acceptance of the passive RSV immunisation of newborns are speculative; however it seems likely that the perceived risk and heightened aware-

Figure 1: Schematic presentation of the passive respiratory syncytial virus (RSV) immunisation strategy for newborns implemented at University Hospital Zurich in inpatients and outpatients during the 2024/25 season, with emphasis on parental information by multiple channels, healthcare workers and time points in pregnancy and postpartum. *FOPH / BAG: Federal Office of Public Health / *Bundesamt für Gesundheit*; ** OB/GYN: obstetrics/gynaecology physicians; *** NEO: neonatology physicians.



ness of contracting RSV can motivate parents to seek immunisation. Previous studies on influenza vaccination found that the immediate risk of illness influenced individuals' perception of vaccine efficacy and decision to vacci-

Figure 2: Inclusions and exclusions of immunisation with nirsevimab during the respiratory syncytial virus (RSV) 2024/25 season in the maternity ward at University Hospital Zurich.

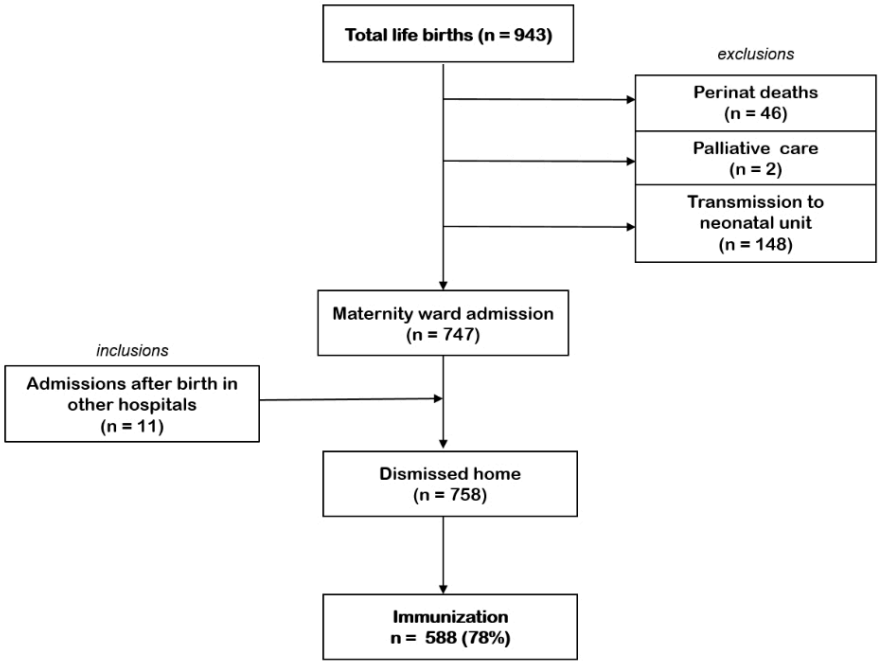
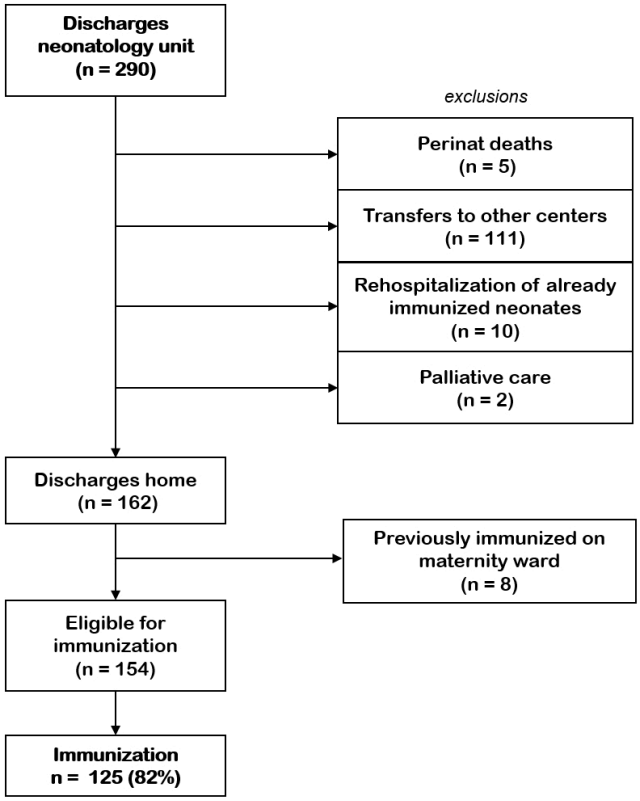


Figure 3: Inclusions and exclusions of immunisation with nirsevimab during the respiratory syncytial virus (RSV) 2024/25 season in the neonatology unit at University Hospital Zurich.

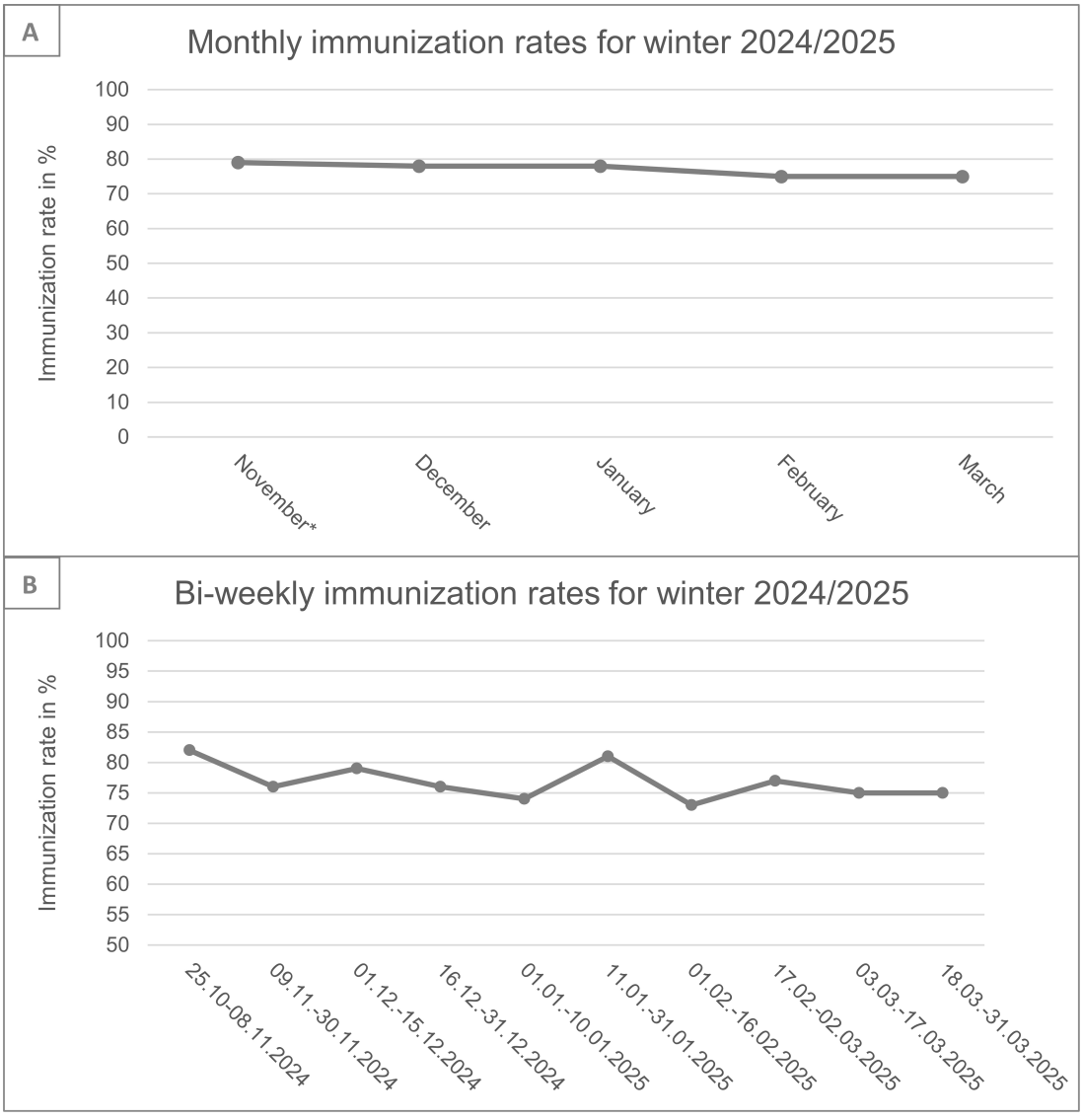


nate [18–20]. Seasonal interest for other vaccines has been shown before. Krasselt et al. [14], for example, showed significantly higher interest in the seasonal tick-born encephalitis vaccine during the spring and summer months. Our results could be partly explained by these influences, as we found particularly high immunisation rates at the beginning of the season and during the peak of RSV in January. Hsieh et. al reported similar observations for the maternal RSV vaccination in the current season [21]. Fewer observed RSV cases in their environments might have led parents to decline immunisation in March. On the other hand, it has been previously observed that health authorities often intensify vaccination campaigns and public messaging during or leading up to peak disease seasons, which affects vaccine uptake and reduces vaccination hesitancy [19, 22]. We cannot rule out the possibility that our campaign was more rigorous at the beginning and during the RSV peak season and that this led to reduced immunisation uptakes.

Strengths and limitations

This study presents an interdisciplinary and interprofessional approach for implementing a new RSV immunisation strategy. Overall, high acceptance and immunisation of nirsevimab was observed. However, the study design does not allow any conclusions to be drawn on the acceptance of the implementation strategy itself; nor did the design compare the strategy with other strategies. Furthermore, no direct correlation can be made with the decreased incidence of severe RSV-related infections or hospitalisations. Further studies, especially emphasising the individual and socioeconomic burden of disease over the next two RSV seasons, are needed to respond to this question. Finally yet importantly, this study does not allow any conclusions to be drawn as to why parents/families accepted or declined immunisation of their newborn. Further research should specifically address vaccine hesitancy and its underlying determinants such as language barriers, parental education and health literacy, prior experiences

Figure 4: Monthly (A) and fortnightly (B) immunisation rates for RSV with nirsevimab or maternal vaccination (Abrysvo®) in newborns discharged home from the maternity ward during the 2024/25 winter season at University Hospital Zurich. * includes immunisations from 28 to 31 October.



with the healthcare system and other relevant sociodemographic variables.

Conclusion

This is a pragmatic report on a feasible multidisciplinary and interprofessional implementation strategy for neonatal RSV immunisation with nirsevimab that had an immediate high immunisation rate. This study further presents an overall successful immunisation rate of nearly 80% for all newborns discharged home from a tertiary centre in Switzerland during the 2024/25 season.

Data sharing statement

All data generated or analysed during this study are included in this article and its supplementary material files. Further enquiries can be directed to the corresponding author.

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Potential competing interests
All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflict of interest related to the content of this manuscript was disclosed.

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