National Immunisation Advisory Committee

2025 RECOMMENDATIONS FOR CATCH-UP VARICELLA VACCINATION

NIAC | 18.03.2025

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NIAC membership includes nominees from the Royal College of Physicians in Ireland, its Faculties and Institutes, the Royal College of Surgeons in Ireland, the Irish College of General Practitioners, the National Immunisation Office, the Nursing and Midwifery Board of Ireland, the Infectious Diseases Society of Ireland, the Travel Medicine Society, the National Virus Reference Laboratory and lay members. Meetings are attended by representatives from the Department of Health and the HSE. Representatives of the Health Products Regulatory Agency attend to provide regulatory advice in relation to vaccines.

NIAC considers the evidence about vaccines and provides advice to the Chief Medical Officer and the Department of Health. The Department and the Minister for Health make policy decisions on vaccines which are implemented by the Health Service Executive.

2025 RECOMMENDATIONS FOR CATCH-UP VARICELLA VACCINATION

1. For those born on or after 1st October 2024, NIAC recommends that varicella vaccination is included in routine catch-up schedules for all non-immune* children and adolescents less than or equal to 18 years of age.

    a. A two-dose schedule, with doses given at least four weeks apart is recommended.
    b. For those presenting for catch-up vaccination ≤4 years of age, the second dose should be administered as MMRV, in Junior Infants or age equivalent as part of the Childhood Immunisation Programme.

2. NIAC continues to recommend varicella vaccination for certain at-risk groups, including non-immune women of reproductive age as outlined in Chapter 23 of the Immunisation Guidelines for Ireland. The vaccine should be accessible to all those included in these groups.

3. A catch-up varicella vaccination programme should be considered for children born prior to 1st October 2024, to avoid a significant immunity gap. Several different approaches to varicella catch-up have been taken internationally. One potential approach would be to catch-up all children under 5 years of age now with a single dose of varicella vaccine at the time of the Junior Infant vaccines by giving the combined MMR and varicella vaccine (MMRV) in place of MMR. This strategy would only be effective if it could be implemented quickly. There are alternative strategies that could also be considered, updated Irish seroprevalence data and country specific modelling could help inform the most effective catch-up strategy in the Irish context.

* Acceptable presumptive evidence of immunity against varicella includes at least one of the following: documented evidence of two doses of varicella vaccine given at least four weeks apart or serological evidence of immunity (positive varicella IgG titre) or definite clinical history of varicella infection.

Recommendations may be updated when more information becomes available.

1. INTRODUCTION

In October 2024 varicella vaccine was introduced into the Childhood Immunisation Programme in Ireland. Varicella vaccine is recommended as a two-dose schedule given at 12 months of age and in Junior Infants or age equivalent to all those born on or after the 1st October 2024. Changes to the Childhood Immunisation Programme have implications for catch-up recommendations for children who present late for vaccination. NIAC was asked by the National Immunisation Office (NIO) to consider up to what age varicella vaccination would be included in routine catch-up recommendations of childhood vaccines for those who were born on or after 1st October 2024. To address this question, varicella epidemiology and international practices around varicella vaccine catch-up were reviewed. The evidence reviewed and considerations of the Committee are presented below.

2. EPIDEMIOLOGY

In Ireland, hospitalised chickenpox (varicella) cases are notifiable. Outbreaks are also notifiable regardless of hospitalisation status. Clinical cases of varicella are also monitored through the Sentinel GP surveillance system. Varicella cases and hospitalisations are most common in children aged under 10 years. (Figure 1, Table 1)

Figure 1. Varicella and zoster notifications from sentinel GP sites, 2023. Source: ICGP/HPSC sentinel surveillance.

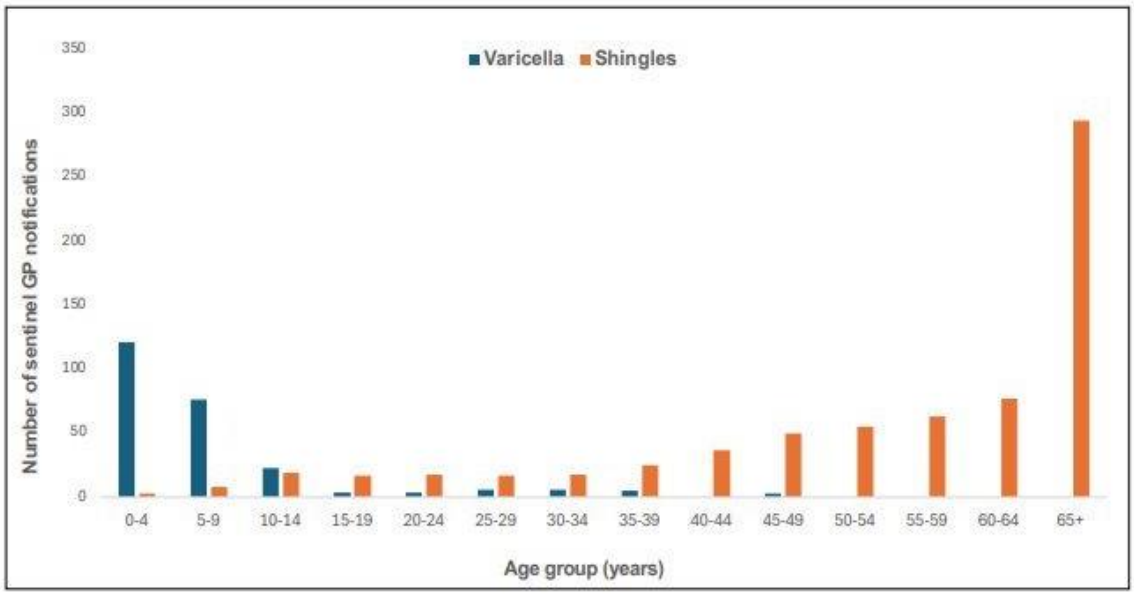

Table 1. Varicella related hospitalisations by age group. Source: HPSC notification data.

	2018	2019	2020	2021	2022	2023	2024*
< 1 year	19	16	1	0	2	14	6
1-2 yrs	16	10	4	1	2	30	3
3-4 yrs	20	13	2	3	6	30	10
5-9 yrs	19	15	5	4	7	29	14
10-14 yrs	0	3	3	6	1	9	10
15-19 yrs	0	3	1	0	2	7	2
20-24 yrs	3	3	0	0	6	3	6
25-34 yrs	7	9	0	5	15	13	5
35-44 yrs	3	8	2	0	9	9	3
45-54 yrs	1	5	0	0	3	4	2
55-64 yrs	2	4	3	2	8	3	6
65+ yrs	9	4	4	2	14	14	11
Total	**99**	**93**	**25**	**23**	**75**	**165**	**78**

*Data for 2024 are provisional and are subject to change

Varicella is typically a benign infection of childhood characterised by a generalised pruritic vesicular rash. However significant complications can occur, including superinfection (usually with Group A *streptococcus*), encephalitis, cerebellitis, stroke, pneumonia, glomerulonephritis, myocarditis, hepatitis and coagulopathy. The risk of complications is higher in infants under one year of age and in those aged 15 years and older, particularly pregnant women and immunocompromised individuals.[1]

Children can develop severe secondary bacterial infections with invasive Group A *streptococcus* (iGAS) post or during varicella infection. In 2022/2023 a national review of cases of 181 notified cases of iGAS infections in children in Ireland was conducted. Clinical data were available for 167 cases. The review found that 47/167 iGAS infections were associated with varicella infection. Of these cases, 9/47 were admitted to paediatric intensive care and 13/47 required surgical intervention. Median age at presentation with varicella related severe iGAS infection was 4.45 years (range 0.6-15 years).[2]

Varicella seroprevalence in Ireland

A varicella zoster virus (VZV) seroprevalence study was conducted in Ireland as part of a larger European serosurveillance effort (ESEN2) carried out between 1996 and 2003. Seronegativity to VZV was 58.7% at <5 years, 18.3% at 5-9 years, 8.1% at 0-14 years, 5.7% at 15-19 years, and 6.2%

at 20-29 years.[3] It is likely that seronegativity in Ireland in younger children may now be higher than these historic data due to the period of protection during the COVID-19 pandemic restrictions. A retrospective cohort study of Polish children found that children hospitalised with varicella infection in the post-pandemic period (2022 vs 2019) were older (4 years vs 3 years) and sepsis as a complication of varicella was five-fold more prevalent in 2022 than 2019.[4]

A serosurvey of pregnant women conducted in 2002 in the Rotunda Hospital, Dublin found that 11.3% of 7,980 women screened for VZV IgG were seronegative. Seronegativity varied by nationality, 6.9% of Irish and other Western European women were seronegative compared to 19.7% of other women tested who originated from Central and Eastern Europe, Sub-Saharan Africa and Asia.[5]

3. NIAC RECOMMENDATIONS FOR AT-RISK GROUPS

In addition to routine childhood immunisation and immunisation of healthcare workers, NIAC currently recommends varicella vaccine for the following at-risk populations:[6]

- Non-immune close household contacts of immunocompromised patients.
- Some immunocompromised children and adults, e.g., those with lymphocytic leukaemia in remission and bone marrow transplant recipients post immune reconstitution, HIV infected children (CD4 count ≥15%).
- Seronegative children (aged ≥10 years) and adults pre solid organ transplant, if there is a sufficient window pre-transplant to administer a live vaccine.
- Non pregnant women of reproductive age. Those with negative serology should be vaccinated prior to or after pregnancy. Pregnancy should be avoided for four weeks following varicella vaccination.
- Non-immune children in residential units with physical and intellectual disability.

While these recommendations are in place, often these groups have difficulty accessing varicella vaccine as there are no specific funding mechanisms for vaccination of these at-risk groups.

4. VARICELLA CATCH-UP VACCINATION

With the introduction of a universal varicella vaccination programme in Ireland there is a risk of an immunity gap developing due to a decrease in circulating infection. Varicella infection in adolescents and adulthood can be complicated and is particularly problematic in pregnancy due to the risk of congenital and perinatal varicella. Catch-up programmes, implemented around the time or shortly after the introduction of a universal vaccination programme aim to reduce the immunity gap. Due to protection during the COVID-19 pandemic there may be a larger proportion of children aged under 5 years (and even under 10 years) who are non-immune to varicella.

Strategies for varicella catch-up

Two broad approaches to varicella catch-up have been taken by countries at the time of the implementation of a universal childhood varicella vaccination programme. The first is a time limited catch-up programme for all those under a specified age. In the UK, the Joint Committee on Vaccination and Immunisation (JCVI) have recommended catch-up for all those under 6 years of age for a period of 12 months.[7] The cost-effectiveness of a catch-up programme for those aged 6-11 years is under review. In other countries, such as Germany a catch-up for all those under 18 years of age was recommended at the time of implementation of the universal varicella vaccination programme. The second broad approach is to catch-up older children and adolescents who remain non-immune at the time of routine pre-teen or adolescent vaccines. This approach was taken by Australia and New Zealand when universal varicella vaccination was first introduced into their childhood immunisation schedules. This approach is also time limited, with catch-up vaccination occurring for a period of 10-12 years (until the birth cohort eligible for the childhood immunisation programme reach adolescence). (Table 2)

In other countries where varicella vaccination is well established in the childhood immunisation schedule, catch-up recommendations are no longer time limited. Some such countries (e.g., US, Canada, Australia and New Zealand) do not put an upper age limit on varicella vaccination of those who are non-immune, others such as Germany restrict vaccination to those ≤18 years.[8] (Table 3)

In the Irish context, considering the time points of the Childhood Immunisation Schedule, several potential strategies could be considered. The first would be a time-limited catch-up programme for all those under a pre-determined age (e.g., 5 years or 10 years). Varicella related hospitalisations in Ireland are most common in those aged 0-10 years. Seronegativity in this age group may be higher than suggested by historic data due to the period of relative protection during the COVID-19 pandemic. Updated seroprevalence data would help inform the age cut off for such a strategy.

An alternative approach would be to catch-up all children aged under 5 years now with a single dose of varicella vaccine at the time of the Junior Infant vaccines by giving the combined MMR and varicella vaccine (MMRV) in place of the MMR vaccine. However, this would only be an effective strategy if it could be implemented quickly to capture most children born between March 2020 and 30th September 2024.

The final potential strategy would be an adolescent catch-up programme such as the strategies employed by Australia and New Zealand. In the Irish context, varicella vaccine could be given in the first year of second level school as part of the existing schools programme, catching up non-immune adolescents at the time of their adolescent vaccines. This strategy would likely rely on parental recall as serological testing would not be practical. Parental recall has been demonstrated in several studies to have a good positive predictive value (>90%), but poor

negative predictive value (30-40%), however there are no adverse effects associated with varicella vaccination in the setting of prior immunity.[9 10]

Table 2. International catch-up recommendations at the time of implementation of varicella vaccination into national childhood immunisation schedules.

Country	Catch-up recommendations	Notes
Germany[8]	All non-immune children and adolescents ≤18 years	
UK[7]	All children ≤5 years Non-immune children 6-11 years under review	Advised catch-up over a period of 12 months
Australia[11]	All those non-immune aged 10-13 years	School based catch-up 2006-2017
New Zealand[12]	All those non-immune aged 11 years	Introduced alongside routine childhood vaccination in 2017
Finland[13]	All non-immune children ≤12 years	

Table 3. Catch-up recommendations in countries with long standing national varicella vaccination programmes.

Country	Catch-up recommendations
Germany[8]	All non-immune children and adolescents ≤18 years
US[14]	All non-immune children, adolescents and adults
Canada[15]	All non-immune children, adolescents and adults
Australia[16]	All non-immune children, adolescents and adults
New Zealand[12]	All non-immune children, adolescents and adults

5. DISCUSSION

Varicella zoster virus infection causes morbidity in children and adults. NIAC recommends catch-up of routine childhood vaccines for those who present late for vaccination or enter the Irish system late. Catch-up schedules for those presenting late for vaccination are set out according to age bands in Chapter 2 of the Immunisation Guidelines for Ireland. The upper age limit for catch-up of specific vaccines depends on the epidemiology of the infection the vaccine prevents. For example, catch-up against haemophilus influenza B is recommended for those presenting for catch-up vaccination under 10 years of age, when there is the greatest risk of invasive infection, whereas MMR vaccine is recommended for all unvaccinated individuals regardless of age. Varicella infection can be more severe in adults and adolescents than in younger children and poses risks during pregnancy to both mother and baby. For these reasons, NIAC recommends that for those born on or after the 1st October 2024, varicella vaccine is included in routine catch-up schedules for all those ≤18 years of age. This upper age limit may be reviewed according to changes in varicella epidemiology over time following the introduction of the universal childhood programme.

Separately, NIAC continues to recommend varicella vaccination for certain non-immune at-risk groups, including non-immune women of reproductive age as outlined above and set out in Chapter 23 of the Immunisation Guidelines for Ireland. It is important that varicella vaccination is accessible for all persons included in these at-risk groups. The lack of clear funding mechanisms for at-risk groups is currently a barrier to vaccination.

Finally, in addition to routine catch-up recommendations for those eligible for the Childhood Immunisation Programme, there is the question of catch-up of those born prior to 1st October 2024. To avoid an immunity gap, NIAC recommends that a catch-up strategy be considered for this cohort, particularly in the context of the recent period of relative protection during the COVID-19 pandemic which has likely resulted in a larger proportion of non-immune young children. One potential approach would be to catch-up all children under 5 years of age now with a single dose of varicella vaccine at the time of the Junior Infant vaccines by giving the combined MMR and varicella vaccine (MMRV) in place of MMR. This strategy would only be effective if it could be implemented quickly. Alternative approaches, or future catch-up programmes could be informed by updated seroprevalence data and country specific modelling to ensure the most effective use of resources.

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