ROYAL COLLEGE OF PHYSICIANS OF IRELAND

National Immunisation Advisory Committee

RECOMMENDATIONS

COVID-19 VACCINATION FOR THOSE AGED 12-15 YEARS

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18.08.2021

About NIAC

NIAC membership includes representatives from the RCPI, its Faculties and Institutes, the RCSI, the ICGP, 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 meets to consider new evidence about vaccines and provide advice to the Chief Medical Officer and the Department of Health (DOH). The Department and the Minister for Health make policy decisions on vaccines which are implemented by the HSE.

EXECUTIVE SUMMARY

These recommendations reflect a dynamic vaccination programme strategy. Scientific evidence about COVID-19 vaccines is continuously evolving and being refined. Recommendations may be updated when more information becomes available.

NIAC reviews available evidence and international practices, and engages with the HPRA, DOH, NPHET modelling team, HPSC and other stakeholders, as necessary.

In forming recommendations and advice, NIAC weighs the potential risks of vaccine associated harm against disease related risks, both to the individual and the community. NIAC also considers other disease mitigation strategies including availability of other vaccines.

SARS-CoV-2 infections in those aged 12-15 years are usually asymptomatic or mild. Hospitalisation rates, rates of ICU admission are very low; COVID-19 related death is rare. The risk of hospitalisation is higher in those with underlying chronic medical conditions and can approach that of older adults with risk conditions. This does not exclude the possibility of severe COVID-19 developing, even in the previously healthy child.

Multisystem Inflammatory Syndrome in Children (MIS-C), also termed Paediatric Inflammatory Multisystem Syndrome (PIMS), may very rarely occur following asymptomatic or unrecognised COVID-19 infection in children, including in those without a comorbid condition.

There remains considerable uncertainty regarding the risk of developing persisting symptoms following SARS-CoV-2 infection i.e., long COVID. There is considerable heterogeneity in the reports. Overall, although long COVID does not appear to affect young people with the same frequency as reported in adults, for some, return to prior health status can take weeks to months.

mRNA vaccines are proven effective in preventing COVID-19 in this age group. While it can be hoped that reduction in infection and prevention of symptomatic disease will impact the rates of sequelae, it is not yet known whether vaccination will prevent MIS-C, nor is it know what the impact on long COVID will be.

Vaccination in those 12-15 years is associated with short lived, self-limited side effects. Rare cases of myocarditis and pericarditis following mRNA vaccines have been reported. Myocarditis and pericarditis can occur in all age groups unrelated to vaccines or to COVID-19 but a higher than expected rate has been reported in the US, predominantly in males aged 30 years and under following the second dose of mRNA vaccine. Data is limited on those 12 to 15 years of age, however the highest reporting rate in the US has been in males aged 12 – 17 years. Most cases are self-limited and resolve with symptomatic treatment. Further follow-up of those affected is required to determine if there are longer term sequelae.

The decision whether or not to recommend COVID-19 vaccines to young people aged 12 -15 years is a complex balance of benefits, and risks informed by ethical considerations.

RECOMMENDATIONS FOR THOSE AGED 12 – 15 YEARS

1. All those aged 12 to 15 years should be offered an mRNA vaccine to protect themselves from frequent mild or very rare severe COVID-19 and its consequences (e.g., long COVID, MIS-C).
2. Those with underlying medical conditions, those living with a younger child with complex medical needs, or with an immunocompromised adult are strongly encouraged to accept vaccination as soon as it is offered.
3. Before vaccination, they and their parents/guardians should be informed of the benefits and risks of vaccination, the risks of COVID-19 to their age group and the uncertainties (e.g., frequency, duration, and outcome of COVID-19 and of vaccine side effects).

The decision to accept, refuse or defer vaccination should be respected.

INTRODUCTION

NIAC has previously issued recommendations for COVID-19 vaccination for all those aged 16 and older. The paper provides recommendations for those aged 12-15 years as two COVID-19 vaccines are now authorised for this age group.

COVID-19 INFECTION IN IRELAND

In Ireland, the incidence of COVID-19 has recently been increasing significantly. By 19 July 2021, the 7-day average was 1022 cases per day and the 14-day incidence was 230/100,000. The median age of cases is now 23 years of age. The current growth rate is estimated to be +3.5% per day (+2.4 to +4.5%), the reproduction number between 1.1-1.3 and a doubling time of 15 – 29 days.

The primary focus of the vaccination programme remains the prevention of severe COVID-19 disease, hospitalisation, and death. The threat of the Delta variant with the increased transmission risk gives urgency to safely accelerate the vaccination roll-out and to ensure that those who are most at risk are protected. Along with completing vaccination in those aged 16 years and older and continuing public health and social measures, extending vaccination to include younger cohorts could help achieve these objectives.

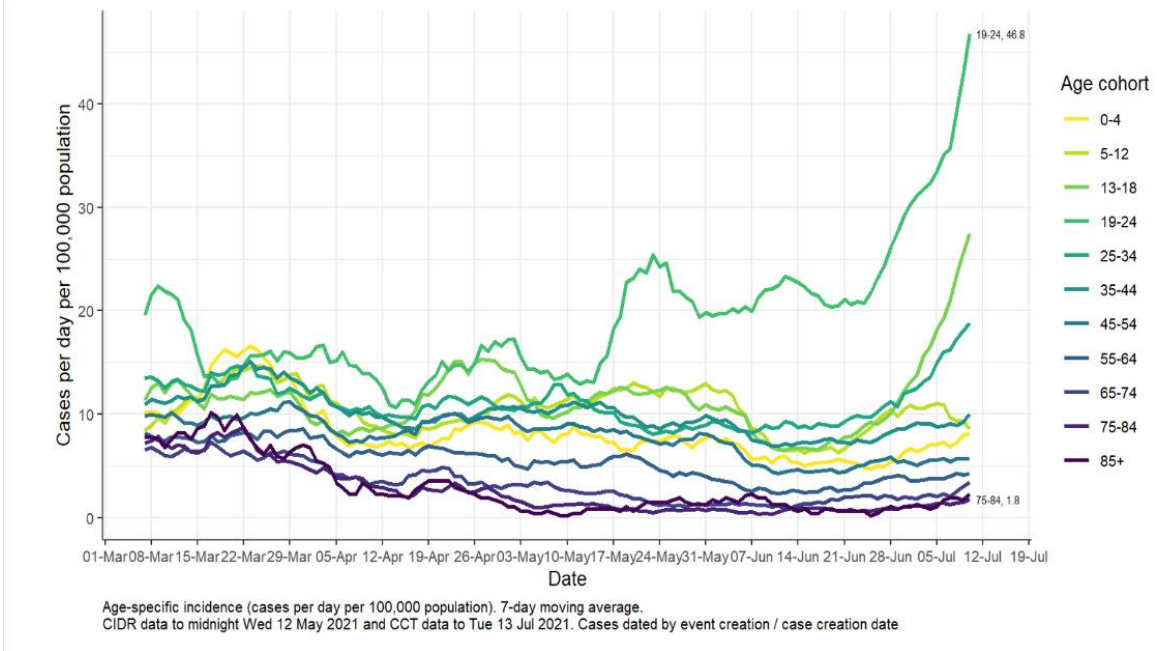
COVID-19 EPIDEMIOLOGY IN ADOLESCENTS AGED 12-15 YEARS

COVID-19 infection rates were declining in those aged 13 – 18 and reached a weekly age specific incidence of 46.6/100,000 by the week commencing 13 July 2021. Since then, with the arrival of the Delta variant, rates in young people have increased. The weekly age specific incidence (ASI) reached 147/100,000 for the week 4 – 10 July 2021 (Table 1), also illustrated in Figure 1 as cases per day, 7 day moving average.

Table 1: Heat map of weekly age-specific incidence rates of confirmed COVID-19 cases per 100,000 population from Week 24 (starting 13 June) to Week 27 (ending 10 July) 2021 Source: NPHET modelling team

Week	Start date	End date	Age Range										
			0-4	5-12	13-18	19-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
24	13/06/2021	19/06/2021	36.5	45.4	46.6	151.9	60.5	50.5	31.0	17.3	9.4	6.6	3.0
25	20/06/2021	26/06/2021	36.5	54.7	57.9	146.4	69.0	52.6	34.8	20.4	14.7	4.6	4.4
26	27/06/2021	03/07/2021	44.6	73.6	86.4	204.1	84.2	60.3	38.8	27.9	14.2	7.6	7.4
27	04/07/2021	10/07/2021	48.0	67.6	147.5	250.0	113.6	63.5	38.2	28.1	14.5	9.2	13.3

Figure 1: Age specific incidence (cases per day per 100,000 population to 13 July 2021) 7 day moving average Source: NPHET modelling team



In the two-week period 7 July to 20 July 2021 there were 12,403 confirmed COVID-19 cases of which 28% (3,054) were aged 0–18 years. Of the total cases:

- 4.3% (533) were aged 0-4 years
- 6.6% (821) were aged 5-12 years
- 17.2% (2,132) were aged 13-18 years (increase by 15% over 7 days)

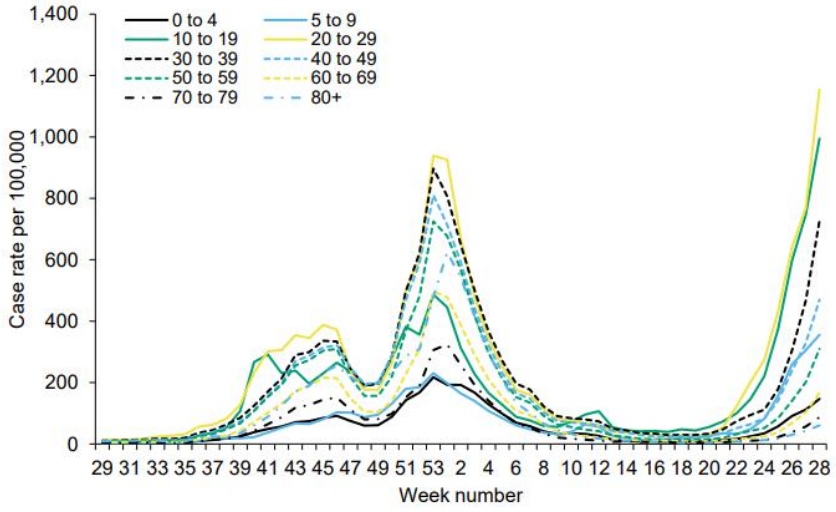
Most cases in children aged 5-18 years are the result of household or out of school social contact. The proportion of COVID-19 cases linked to outbreaks associated with schools is small (14% in those aged 5-12 years and 6% in those aged 13-18 years). As infection rates in adults decrease, the proportion of cases in school children is likely to increase. However, the recent increase in cases in the 13 – 18 and 19-24 year age groups is of concern.

Delta Variant- EU and the UK

EU/EEA age specific incidence rates in adolescents in most countries are similar to those in young adults (19-24 years). Those aged 24 and under have accounted for an increasing proportion of weekly cases since January 2021. This is as a result of the lower case rates in those aged 60 years and above and increased testing among the 10– 19-year age group.

In England, where over 80% of cases have a variant test, the Delta variant now accounts for approximately 99% of sequenced cases. It is highly transmissible with a 60% increased risk of household transmission. This is likely to have consequences for unvaccinated household or social contacts of those where transmission is ongoing. Most cases are in the unvaccinated 20–29-year age group. The spread of the Delta variant in the UK has been associated with very rapid rise with more than 50% increase in weekly case rates in these younger age groups. (Figure 2).

Figure 2: UK weekly confirmed COVID-19 case rates per 100,000 by age group Source: PHE (data up to week 28, 22 July 2021)



A number of school clusters have been reported in England related to the rise in Delta. While the roll-out of the vaccination programme has meant that a smaller proportion of those infected require hospitalisation, there is a strong correlation between the increasing case numbers and increase in hospitalisations. Evidence from England and Scotland shows an increased risk of hospitalisation due to the Delta variant compared to the Alpha variant.

The crude case fatality rate remains lower for Delta than other variants at present. This in part reflects the age of those infected. However, as mortality rates lag behind case rates, it is too early to provide a formal assessment of the case fatality of Delta, stratified by age, compared to other variants.

Case numbers of the Delta variant have also risen in Northern Ireland. Given cross-border mobility, it was inevitable that an increase in case numbers would be seen in Ireland as is already evident in Donegal with the highest rates of infection at present.

IMPACT OF COVID-19 ON CHILDREN AND ADOLESCENTS

The overall risk of acute severe COVID-19 in young adolescents without a comorbid condition is very low. In Ireland from 1 December 2020 to 6 May 2021, hospitalisation rate for those aged 0-19 years was 27/100,000 and ICU admission rate was 1/100,000. While acute COVID-19 has affected fewer children and adolescents than adults, they have suffered from both the direct and indirect effects of the COVID-19 pandemic.

HIPE data indicates that COVID-19 hospitalisation for those aged 12 – 15 years is rare, 34 admissions in 2020 and 56 in 2021 to date, all of whom survived to hospital discharge. Paediatric ICU admission was extremely rare for this age cohort with less than 5 admissions recorded to date. The low rates of hospitalisation and severe COVID-19 in children and adolescents reported in Ireland is consistent with international experience. Estimated hospitalisation rate in Ireland from March 2020 to 18 July 2021 for those aged 12 – 15 years with confirmed SARS-CoV-2 infection was 0.32%. Internationally, reported hospitalisation rates are 0.1- 2.1% and death rates less than 0.1% (JCVI, CDC, Norway). The attributable hospitalisation rate is likely even lower as some of these were cases detected incidentally during hospitalisation for other causes.

Experience has also shown that the severity of illness, even in those hospitalised, is generally less than adults. In Norway the median length of stay for a hospitalised child or adolescent was 2 days, with 89% discharged within 7 days. Similarly short hospitalisation duration was observed in the US with the median length of stay of 2.4 days (1.1-5.7)

Risk Factors for Moderate and Severe COVID-19 in Children and Adolescents

The overwhelming majority of young adolescents who get SARS-CoV-2 infection will experience a mild self-limited illness. However, severe disease can occur, can require ICU admission, mechanical ventilation and extremely rarely result in death. While the presence of comorbidity

in children and young adolescents is not a risk factor for acquisition of infection (lower rates of infection in these groups are likely related to non-pharmaceutical interventions), those who are hospitalised because of COVID-19 are more likely to have an underlying chronic medical condition.

Risk Factors for Hospitalisation

In the US, 71% of those aged 12 – 17 whose primary reason for hospitalisation was COVID-19 had at least one comorbidity (obesity, chronic lung disease, including asthma, neurological disorder, chronic metabolic condition, blood disorder including sickle cell disease and cardiovascular disease).

In Norway, Stordal et al. reported that chronic comorbidity was a strong predictor of hospital admission (aHR 4.15, 95% CI 2.63-6.56). These included chronic cardiopulmonary conditions other than asthma, cerebral palsy, chromosomal abnormality, cancer, transplantation, immunodeficiency and liver and kidney disorder with a hazard ratio (aHR 3.75 to 34.5). The aHR for asthma was 1.91 (1.05 – 3.49) compared with those with no comorbidity.

Risk Factors for Critical Care or Death

In a systematic review of those hospitalised in the UK, Harwood et al. found that the number of comorbid conditions was associated with increased odds of admission to critical care and death for COVID-19 as the number of comorbid conditions increased. All comorbidities were associated with increased risk, with the exception of asthma. An increase in odds of poor outcomes in COVID-19 was highest amongst those with cardiovascular, respiratory, neurological, and gastrointestinal comorbidities, each increasing absolute risk of critical care by 8-11% and risk of death by 1-3.5%. Neurological and cardiac comorbidities were associated with the greatest increase in odds of severe disease or death. Obesity increased the odds of severe disease and death independently of other comorbidities.

A nationwide prospective observational cohort study of hospitalised children and adolescents in Germany identified pulmonary hypertension, cyanotic heart disease, cardiac surgery, fatty liver disease, epilepsy, and neuromuscular impairment as risk factors for critical care. However, asthma, hypertension, acyanotic heart disease, diabetes, acute leukaemia, and haemolytic anaemia did not appear to be risk factors.

A number of publications (e.g., Duarte-Salles et al., Fernandes et al., Gotzinger et al., Graf et al., Meena et al., Ouldali N et al., Swann et al., Tsankov et al., Ward JL et al. Williams et al.,) reached similar conclusions and reported that the presence of comorbidities was associated with a significantly increased likelihood of more severe disease compared with infected children without a comorbidity. These included immunocompromise, obesity, diabetes mellitus, chronic heart, HIV, kidney, liver, lung, neurological and oncological disease.

Despite high estimates of relative risk, the absolute risk of hospitalisation is low for cases aged below 18 years. However, the predicted probability of hospitalisation for young people in this age group with comorbidities is at least as high as that for people without an underlying condition in some adult age groups.

Overall, the rate of severe illness in children with COVID-19 in the absence of comorbidity is very low compared to adults. This does not exclude the rare possibility of severe illness and the need for critical care in a previously healthy child. There are a number of broad diagnostic categories identified as risk factors for more severe disease. Because of the small numbers of cases with a specific condition, there remains uncertainty as to which conditions carry the greatest risk burden.

Adolescent Pregnancy

Studies are unlikely to have identified pregnancy as a risk factor in those 12-15 years because of the low numbers of pregnancies in these age groups. Pregnancy has been identified as a risk factor for adverse outcome related to COVID-19 in older age groups and COVID-19 vaccination is recommended at the appropriate gestational time.

Multisystem Inflammatory Syndrome in Children (MIS-C)

MIS-C is a rare but serious inflammatory disorder related to prior SARS-CoV-2 infection. The estimated rate in the second wave of the UK pandemic was 5 per 10,000 infected children with a case fatality rate of 1%. There is uncertainty in the estimates as many of the cases present without prior evidence of SARS-CoV-2 infection. Most cases occurred in children aged 1 to 14 years (median age 9 years), in males (59%), and in children who were reported as Hispanic or Black (64%). A recent analysis of 1,733 patients with MIS-C found that older adolescents had the highest proportion of myocarditis, pneumonia, and acute respiratory distress syndrome.

Prolonged symptoms following COVID-19 (long COVID)

The majority of people who develop COVID-19 feel better in a few days or weeks: most make a full recovery within 12 weeks. For some people, including children and adolescents, COVID-19 is associated with symptoms that persist months after the infection. This is sometimes called "long COVID", "post-COVID-19 syndrome" or "post-acute sequelae SARS-CoV-2 infection.

Symptoms vary in number and severity, and may include fatigue, difficulty breathing, cough, chest pain, muscle pain, headache, memory and concentration or sleep problems, anxiety, and depression. Symptoms may worsen after physical or mental activities. There is very little information on the frequency, and duration of long COVID following infection with the Delta variant.

There is wide variation in the reported of long COVID with some suggesting that as many as 42% of patients might be affected. More generally it is estimated that persistent symptoms are experienced by around 10% of patients. There is no evident consensus regarding its frequency or among investigators of long COVID in children (Buonseno et al., Knoke et al., Ludvigsson et al., Osmanov et al., Radtke et al.). Overall, the incidence of persistent symptoms in children and young adolescents appears to be less than in adults but for some, return to normal baseline health status following infection can take months.

Other effects of COVID-19 on Children

While acute COVID-19 has not affected children and adolescents as often as adults, they have suffered significantly from both the direct and indirect effects of the COVID-19 pandemic. Less easily quantifiable than hospitalisations or death, however, are the significant detrimental psychosocial impacts. These include limited access to basic services such as healthcare and child protection, and social isolation due to disruption of school, sports, and social group gatherings. Published studies have highlighted increases in symptoms of anxiety and depression, eating disorders, and increased rates of suicidal ideation and suicide attempts among adolescents during the pandemic.

COVID-19 TRANSMISSION BY ADOLESCENTS

On 8 July 2021, ECDC published a second update on "COVID-19 in children and the role of school settings in transmission" which reviewed available evidence on transmission of COVID-19 by children prior to the emergence of the Delta variant, and the role of schools in the COVID-19 pandemic.

Children do not appear to be the primary drivers of transmission in home or school settings, and often have mild or no symptoms when infected. Several studies do not identify children and adolescents as index cases or identified them as index cases less often than adults with the possibility for onward transmission by children being more likely with increasing age. Secondary infections in school settings are more likely to occur if the index case was a teacher.

However, other studies have shown that onward transmission by adolescents appears to occur as often as by adults in household and community settings, given similar social mixing patterns. Chu et al., in retrospective study of children, aged 7 – 19 years, returning from a camp outbreak, reported household transmission in 18% of cases with a secondary attack rate of 45%. Transmission related to close or direct contact in the household compared to minimal or no contact and resulted in adult hospitalisation in some cases.

A recent study reported that adults vaccinated with Comirnaty®, who subsequently became infected with SARS-CoV-2 were 40-50% less likely to transmit the virus in a household setting than a non-vaccinated index case.

COVID-19 VACCINE SAFETY AND EFFICACY IN CHILDREN

mRNA vaccines have proven highly effective in adults against the ancestral and alpha SARS-CoV-2 strains. Clinical effectiveness has also been confirmed against the Delta variant. (Table 4).

Table 2. Vaccine Effectiveness (%) against Symptomatic Disease & Hospitalisation with Variants of Concern

Vaccine	Symptomatic Disease				Hospitalisation			
	Alpha		Delta		Alpha		Delta	
	UK[1]	CA[2]	UK[1]	CA[2]	UK[3]	CA[2]	UK[3]	CA[2]
Comirnaty®								
Dose 1	48 (42- 53)	66 (64-68)	36 (23– 46)	56 (45-64)	83 (62-93)	77 (69-83)	94 (46-99)	78 (65-86)
Dose 2	94 (92- 95)	89 (86 -91)	88 (85–90)	87 (64-95)	95 (78– 99)	95 (81-99)	96 (86 –99)	N/A
Spikevax®								
Dose 1	N/A	83 (80-86)	N/A	72 (57-82)	N/A	79 (74-83)	N/A	96 (72-99)
Dose 2	N/A	92 (86-96)	N/A	94 (89-97)	N/A	N/A	N/A	N/A

1. Lopez Bernal JL et al. 2. Nasreen S et al. 3. Stowe J et al.

Both mRNA vaccines are authorised for those aged 12 to 15 years.

On 28 May 2021, the EMA extended the indication for Comirnaty® to include use in children aged 12 to 15 years. The vaccine was already approved for use in adults and adolescents aged 16 and above.

In a study of Comirnaty® in adolescents without evidence of prior infection aged 12 to 15 years, there were no COVID-19 cases in 1,005 participants who received the vaccine, and 16 cases out of 978 who received a placebo. The point estimate for efficacy was 100% (95% confidence interval 75.3, 100.0).

The most frequent adverse reactions in adolescents 12 to 15 years of age were injection site pain (> 90%), fatigue and headache (> 70%), myalgia and chills (> 40%), arthralgia and pyrexia (> 20%). injection site pain or swelling, fatigue and chills (≥10%). Reactogenicity occurred at a slightly higher frequency compared to the adult population. The risk of anaphylaxis was estimated at 0.46 per million doses of vaccine, similar to that for other non-COVID-19 vaccines.

No new safety concerns were observed however, the study size in this age group did not allow detection of rare or very rare adverse events. EMA concluded that the benefit risk balance is considered positive, particularly in adolescent people with comorbidities that increase the risk of severe COVID-19.

On 23 July 2021, the EMA extended the indication for Spikevax® to include use in children from 12 years of age. The vaccine was already approved for use in adults.

In a study of Spikevax® in adolescents without prior infection aged 12-17 years, there were no symptomatic COVID-19 cases in 2,163 participants who received the vaccine and 4 cases out of 1,073 who received a placebo.

The most common adverse reactions in those aged 12 to 17 are similar to those in people aged 18 and above and were injection site pain (> 90%), fatigue and headache (> 70%), myalgia and chills (> 40%), arthralgia and axillary swelling/tenderness (>30%), nausea/vomiting, injection site swelling (>20%), and fever (>10%). These effects are usually mild or moderate and improve within a few days from the vaccination.

The EMA stated for both Comirnaty® and Spikevax® that unfavourable effects are considered acceptable in terms of reactogenicity. No new safety concerns were observed. However, the study size in adolescence did not allow detection of rare adverse events such as pericarditis or myocarditis (see below). They concluded that the balance risk ratio is considered positive, particularly in adolescent people with comorbidities that increase the risk of severe COVID-19. Safety will continue to be assessed.

Myocarditis and pericarditis

In the US, between 1 May and 11 June 2021 there were 323 reports of pericarditis and myocarditis after mRNA vaccine meeting the CDC case definition. The median age was 19 (12 – 29) years, 291 were male and 32 female. The median interval from vaccination to symptom onset was 2 days (range 0−40 days); 92% of patients experienced onset of symptoms within 7 days of vaccination.

Of the 323 reported cases, 309 (96%) were hospitalised. Acute clinical course was generally mild; among 304 hospitalised patients with known clinical outcomes, 95% had been discharged at time of review, and none had died. The highest reporting rates were among males aged 12−17 years and those aged 18−24 years (62.8 and 50.5 events per million second doses of mRNA COVID-19 vaccine administered).

The US Advisory Committee on Immunisation Practices concluded that the benefits of COVID-19 vaccines clearly outweighed the risks of vaccination. They estimated that, in females aged 12-17 years, for each million second doses of vaccine administered, 8-10 cases of myocarditis might be anticipated, but 8,500 cases of COVID-19, 183 hospitalisations, 38 ICU admissions and one death would be prevented. In males aged 12-17 years, for each million second doses of vaccine

administered, 56 -69 cases of myocarditis might be anticipated, but 5,700 cases of COVID-19, 215 hospitalisations, 71 ICU admissions and two deaths would be prevented.

Since authorisation, myocarditis and pericarditis have been determined by the EMA as rare events following mRNA vaccines. There were no fatal cases following Spikevax®. There were 5 fatal cases from 145 reports following Comirnaty®, all in adults aged over 50 and associated with advanced aged or with comorbidity. Available data suggest that the myocarditis and pericarditis are similar to the typical course, usually improving with rest or treatment. However, follow up time has been short.

On 9 July 2021, the EMA recommended that myocarditis and pericarditis be added to the product information of Comirnaty® and Spikevax® as very rare adverse reactions (actual frequency unknown). The EMA concluded that the cases primarily occurred within 14 days after vaccination, more often after the second dose and in younger adult men. Rates were similar for Comirnaty® and Spikevax®.

While overall the observed rate of myocarditis was not greater than expected, the rate was higher than would be expected in younger adult males. The observed/expected analysis in the US and Israel also showed a higher rate than expected in younger adult males.

In Ireland, up to 7 July 2021, the HPRA had received 17 reports describing myocarditis and/or pericarditis, of which 11 occurred following mRNA vaccination. In these 11 cases, six occurred after the first dose and five after the second dose, all occurring within 14 days of vaccination. Cases were reported in both males and females, with a median age of 56 years (range 38 to 81). There has been no trend in younger adults or following the second dose, but exposure to mRNA vaccines has been very low to date in this cohort.

In their advice of 15 July 2021 on the vaccination of children and adolescents, JCVI issued a note of caution noting that data on the incidence of these events in younger people are currently limited and the longer-term health effects from myocarditis are not well understood.

In conclusion, very rare cases of myocarditis and pericarditis have been reported following vaccination with mRNA vaccines. The reported outcomes to date have indicated that the event is self-limited, associated with short in hospital stay and no deaths. However, restriction of strenuous physical activity is advised for six months following myocarditis. Longer follow up is required to ensure that there are no unanticipated longer-term sequelae.

INTERNATIONAL RECOMMENDATIONS

ECDC

"The vaccination of adolescents against COVID-19 should be considered in the broader context of the COVID-19 vaccination strategy for the whole population, including its overarching goals, the status of implementation, and its priorities.

The vaccination of adolescents at high risk of severe COVID-19 should be considered a priority, as with other age groups.

The overall direct benefits of vaccinating adolescents will mainly depend on the incidence of SARS-CoV-2 infection and on the prevalence of underlying conditions increasing the risk of severe COVID-19 in this age group.

The individual direct benefits from COVID-19 vaccination in adolescents are expected to be limited in comparison to older age groups.

The overall benefit for the general population of vaccinating adolescents will be proportional to the SARS-CoV-2 transmission within and from this age group.

Given the anticipated reduced individual benefit-risk ratio from COVID-19 vaccination of adolescents compared to older age groups, careful consideration of the epidemiological situation and of vaccine uptake in older age groups should be given before targeting this age group.

It is important to continue to monitor the spread of variants of concern among younger individuals and to continue to assess the actual burden of COVID-19 in younger age groups also in relation to COVID-19 sequelae (e.g., 'long COVID').

Equity issues concerning vaccine availability and access need to be carefully considered when deciding on expansion of COVID-19 vaccination to groups with lower individual risk of severe disease."

WHO

"For children and adolescents COVID-19 is rarely severe. Evidence suggests that adolescents, particularly older adolescents, are as likely to transmit SARS-CoV-2 as adults. WHO recommends that countries should consider using Comirnaty® in children aged 12 to 15 only when high vaccine coverage with 2 doses has been achieved in the high priority groups as identified in the WHO Prioritization Roadmap. Children 12-15 years of age with comorbidities that put them at significantly higher risk of serious COVID-19 disease, alongside other high-risk groups, may be offered vaccination.

While the supply of vaccines is limited, the ongoing priority is to vaccinate those most at risk of serious illness who still have not been vaccinated in many parts of the world: older people, those with chronic health conditions, and health workers.

Most children are at low risk of serious disease and vaccinating them is primarily about reducing transmission, which can also be achieved through public health measures, including physically distancing from others, cleaning hands frequently, sneezing and coughing into their elbow, wearing a mask if age appropriate and avoiding crowded, poorly ventilated spaces".

Table 3: Recommendations for adolescent COVID-19 vaccination by country. Source: DOH/ HPRA (see Appendix 1 for further EU details).

Country	Vaccination recommendations	
	At risk	Universal
Australia	From 16 years	From 40 years
Austria	From 12 years	
Belgium	From 12 years	From 16 years
Bulgaria	From 12 years (recommendation expected this week)	
Canada	From 12 years	
Czechia	From 12 years	
Denmark	From 12 years (not yet started)	
Finland	From 12 years	From 16 years
France	From 12 years	
Germany	From 12 years	From 12 years (with informed consent)
Israel	From 12 years	
Netherlands	From 12 years	
New Zealand	From 16 years	From 16 years
Norway	From 12 years	From 18 years
Spain	From 12 years	From 12 years (to start shortly)
Sweden	From 12 years	From 16 years
Switzerland	From 12 years	
UK	From 12 years	From 18 years
US	From 12 years	

VIEWS OF CHILDREN AND YOUNG ADOLESCENTS

The DOH in conjunction with NIAC commissioned four focus groups, each with six participants aged 13-16 years. In addition, two in-depth one-to-one interviews were conducted with a boy and girl aged 12 years. The focus groups/interviews took place online on 14 and 15 July 2021 and involved children from both urban and rural backgrounds.

A consistent theme was the high price the pandemic has exacted in terms of their ability to grow and progress in their lives. The result has been boredom, stress and frustration, and a deep-seated desire to move on from COVID-19 and the restrictions it places on their lives. The general perception was that COVID-19 does not pose a large health risk to young people, and there was low awareness in respect of potential longer-term implications of the disease. There was broad support for making vaccines available to their age group, the principal benefit being the protection that vaccination might afford to others around them. There was an expectation that vaccination might be a step toward getting life back to normal and might facilitate more freedoms in terms of school and social activities. There was some anxiety expressed about the short and long-term effects of the vaccines. They were clear that they need information and support from trusted persons to understand both the process and the benefits of vaccination for them.

Two focus groups and two in-depth interviews were held with parents of 12-16 year olds to assess their views regarding vaccination of this age group. Most of the parents expected that the vaccine would be offered to children and adolescents. There was a strong desire to do the best for their children in making a decision about vaccination, with a higher level of responsibility felt in this regard compared to the decision to take a vaccine themselves. Their key concerns were whether children need the vaccine, and about unknown or potential long-term side effects. The key reasons parents would consider vaccination for their children is to protect their children's health and/or the health of other family members, and to restore continuity to educational and social activities. They wanted sensitivity to their role in choosing what is right for their family, and that there should be no segregation/stigmatisation of children based on vaccination status. There was a wish that their decisions would be respected.

DISCUSSION

In coming to its recommendations, NIAC considered a number of issues including the benefits and risks of the vaccine for this age group, the risks of contracting COVID-19, short- and long-term side effects of infection, national and global equity considerations, and was informed by qualitative research in Ireland.

SARS-CoV-2 infections in those aged 12-15 years are usually asymptomatic or mild. Hospitalisation rates, rates of ICU admission are very low, and COVID-19 related death is very rare. The ECDC highlighted that the risk of hospitalisation is higher in those with underlying chronic

medical conditions and can approach that of adults with risk conditions. This does not exclude the possibility of severe COVID-19 developing, even in the previously healthy child.

Multisystem Inflammatory Syndrome in Children (MIS-C), also termed Paediatric Inflammatory Multisystem Syndrome (PIMS), may very rarely occur following asymptomatic or unrecognised COVID-19 infection in children, including in those without a comorbid condition.

There is considerable uncertainty regarding the risk of developing persisting symptoms following SARS-CoV-2 infection i.e., long COVID. There is considerable heterogeneity in the reports. Overall, although long COVID does not appear to affect young people as often as reported in adults, for some, return to prior health status can take weeks or months.

Although the rates of COVID-19 infection are increasing in those aged 13-18 years, rates of severe disease in healthy adolescents are very low so the benefits of vaccination need to be balanced against the risks of an adverse reaction.

mRNA vaccines are proven effective in preventing COVID-19 in this age group. While it can be hoped that reduction in infection and prevention of symptomatic disease will impact the rates of sequelae, it is not yet known whether vaccines will prevent MIS-C, nor is it known what their impact on long COVID will be.

Vaccination in those 12-15 years is associated with common short lived side effects (e.g., injection site reactions, pain, fever, fatigue). Rare cases of myocarditis and pericarditis following mRNA vaccines have been reported. Myocarditis and pericarditis can occur in all age groups unrelated to vaccines or COVID-19, but a higher than expected rate has been reported in the US, predominantly in males aged 30 years and under, following the second dose of an mRNA vaccine. Data is limited on those aged 12 to 15 years, however the highest reporting rate in the US has been in males aged 12 – 17 years (63 per million second doses). Most cases are self-limited and resolve with symptomatic treatment. Further follow-up of those affected is required to determine if there are longer term sequelae.

The decision whether or not to recommend COVID-19 vaccines to all aged 12 -15 years is a complex balance of benefits and risks, informed by ethical considerations. The benefits are clearer for those who have, or are living with someone, with a medical condition, that puts them at higher risk of a poor outcome should they contract the virus.

As more adults are vaccinated, selective pressure will drive the disease into the unvaccinated, including younger populations. This may result in increased hospitalisations especially in the context of the highly transmissible Delta variant. The potential sequelae of COVID-19 in this group (e.g., long COVID and MIS-C) must be considered in assessing the benefits and risks of offering COVID-19 vaccination to healthy young people.

In the unique circumstances of the pandemic, consideration regarding recommending COVID-19 vaccination to this age cohort must extend to include their physical, psychological, and social well-being. In this context, universal vaccination of those aged 12-15 years offers direct and indirect benefits, e.g., reducing the risk of severe disease, maintaining access to educational opportunities, and facilitating psychosocial development.

The primary benefits of vaccinating healthy 12 – 15 year olds will be normalisation of life, less disruption to educational and social activities and reduced virus transmission to vulnerable household contacts. Reduction of transmission may also impact on the emergence of new variants of concern, which could lead to an increase in severe disease in adolescents in which case the direct benefits of vaccination would increase.

NIAC considers universal access to COVID-19 vaccination for this age group as the most practicable and expeditious way of protecting those most at risk of poor outcomes as a result of COVID-19 as well as providing benefit to other children and adolescents.

Before vaccination, those aged 12-15 years and their parents/guardians should be informed of the benefits and risks of vaccination, the risks of COVID-19 to their age group and the uncertainties e.g., frequency, duration and outcome of COVID-19, and vaccine side effects.

Fairness and equity are cornerstones of the vaccination programme, and universal access may help mitigate health disparities between the vaccinated and unvaccinated.

The issue of universal adolescent vaccination should be considered in the context of national and global vaccine supply issues, and the potential need for a booster vaccination programme. NIAC considers that every effort should be made to meet our ethical obligations in terms of global solidarity through equitable vaccine sharing at the earliest possible opportunity.

RECOMMENDATIONS FOR THOSE AGED 12 – 15 YEARS

1. All those aged 12 to 15 years should be offered an mRNA vaccine to protect themselves from frequent mild or very rare severe COVID-19 and its consequences (e.g., long COVID, MIS-C).

2. Those with underlying medical conditions, those living with a younger child with complex medical needs, or with an immunocompromised adult are strongly encouraged to accept vaccination as soon as it is offered.

3. Before vaccination, they and their parents/guardians should be informed of the benefits and risks of vaccination, the risks of COVID-19 to their age group and the uncertainties (e.g., frequency, duration, and outcome of COVID-19 and of vaccine side effects).

The decision to accept, refuse or defer vaccination should be respected.

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Appendix 1: Information as received re EU National plans for COVID-19 vaccination of 12-15 year olds. Source: HPRA

Member state	National plans for vaccination of 12-15 years old
AT	Vaccination for 12-15 years old children is recommended and available since adoption of the variation procedure, so with beginning of June 2021.
BE	Under discussion for 12-15 Y. Extension of the vaccination to 16-18 Y was decided in June
BG	Vaccination of 12 to 15 is expected to be recommended this week
CZ	Vaccination for 12-15 years old children is available since 01 July 2021.
DE	Vaccination with Comirnaty of 12 - 17 year olds is recommend for individuals suffering from underlying health conditions (list of health conditions accepted in this context is provided in the official recommendation), and possible for all 12-17 year olds with informed consent
DK	The Danish Health Authority recommends that 12-15 years old get vaccinated but the vaccination of the group has not yet started.
EE	Vaccination >12 y is possible for everybody, special active programmes for schoolchildren have not started
ES	The vaccination campaign of this group of age started with those children with high risk factors and international students; however, this is about to change, and the vaccination will be open for all children in this group of age shortly, in some Autonomous Regions it is already possible to book the appointments.
FI	Vaccination of 12-15 years old adolescents with increased risk of severe COVID-19 is recommended.
FR	Vaccination for the 12 to 15 years old is recommended in France since June 2nd, only with the Comirnaty vaccine (Pfizer, extension approved on 28 May). An opening with Moderna will be made as soon as the EMA variation is approved.
HR	The vaccination has not yet started; however, the national Public Health Institute has developed the guidelines for the vaccination in this age group. Priority in vaccination should be given to children aged 12 to 15 who belong to priority groups with regard to their health conditions, following which the vaccination will be available for other children in this age group, as well
IS	vaccination of 12-15 years in Iceland will only be for those with underlying diseases
IT	The vaccination of 12-15 years hasn't started in Italy

LI	We are planning to start the vaccination of children 12-15 years. The date is not yet known.
LT	Vaccination of 12-15 years old has been started from 14 June 2021
LV	Vaccination of 12-15 years old has been started on 2nd of June.
NL	The COVID-19 vaccination program has been opened for the age group 12-18 from the start of July. Before that, only some high risk subgroups in this age group had access to vaccination. The vaccines used for the age group 12-18 are all BioNTech/Pfizer.
NO	Under consideration.
PL	Vaccination with Comirnaty of 12 - 15 years old is recommended by the Polish MoH. Vaccination process has already started.
PT	Under discussion
RO	No specific plans. According to the National Coordinating Committee for Vaccination against COVID-19, in Romania, vaccination was already open to all other age categories for which the vaccines are approved. Also, Romania had already given at least a first dose of Comirnaty to around 100 000 persons in the 16 to 19. Vaccination of 12 to 15 year olds started on June 2nd in the same conditions as for other age categories. As for the previous underage category, written consent for vaccination has to be given by a parent / legal tutor assisting the minor in the vaccination center
SE	Since June 22nd, 2021 Sweden has started to extend offer of vaccination to the ages between 16-17 years old. Adolescents aged 16–17 years may start to be vaccinated once those who are older have been offered vaccines. This means that these vaccinations are likely to start sometime in August 2021. The Public Health Agency of Sweden has also approved the vaccine to children aged between 12-15 years with certain medical conditions.
SI	Vaccination in individuals 12 years of age and older is recommended and available since adoption of the variation procedure
SK	The vaccination of children from 12 years old is ongoing without any restrictions, some children have already received the 2nd dose of the vaccine.

AMENDMENTS & CLARIFICATIONS

03.08.2021: Clarification of Myocarditis rate by gender in COVID-19 VACCINE SAFETY AND EFFICACY IN CHILDREN

17.08.2021: Clarification of hospitalisation and ICU admission rates in IMPACT OF COVID-19 ON CHILDREN AND ADOLESCENTS