Policy Question

The HTAC aims to answer the policy question:

Should the DOH finance ***Moderna as primary series vaccines for the pediatric population ages 6 - 11 years old*** as part of the 2022 COVID-19 Vaccination Program to reduce COVID-19 cases, severe infection, and deaths?

Recommendations *(as of 05 July 2022)*

The HTAC reviewed the evidence on the use of *Moderna* as primary series for the pediatric population ages 6 to 11 years based on the HTAC criteria of (a) responsiveness to disease magnitude and severity, (b) clinical efficacy and safety, (c) affordability, viability, and feasibility, (d) household financial impact, (e) social impact, and, (f) responsiveness to equity.

The overall burden of COVID-19 contributed by children aged 6 to 11 years old cannot be determined as children experience fewer and milder symptoms and asymptomatic presentations leading to less probability of being tested and more unreported cases (WHO, 2021). Evidence for the clinical efficacy of Moderna in children is inconclusive but it can be inferred that this vaccine has a high potential for protection for this population based on immunobridging data young adults ages 18 to 25 years old. Moderna is safe for children 6 to 11 years old based on short term data. Long term safety data is still lacking.

HTAC recognizes that the potential for protection of children will have an impact in terms of supporting the attainment of occupations of children which include social learning achieved through peer interaction. This could also contribute to the improvement of the quality of life within the households when caregivers of children are relieved of the anxiety of dealing with the consequences of COVID-19 infection and sequelae.

However, the HTAC is not recommending additional procurement of Moderna for the implementation of the current primary vaccination series for children aged 6 to 11 years old because of its higher cost relative to a similar product in the market. If existing supplies will be used for the implementation of the primary vaccination series for children aged 6 to 11 years old, then the use of Moderna can be justified.

With regard to the legal requirement of a WHO recommendation for HTAC to provide recommendation to the DOH, the WHO advised HTAD on 04 July 2022 via electronic mail that “countries may also refer the decisions from advanced levels of public health authorities and regulatory authorities.” Without the explicit WHO recommendation on Moderna as primary series for the pediatric population ages 6 to 11 years**, the HTAC cannot release its recommendation** based on the Republic Act no. 11525 otherwise known as the “COVID-19 Vaccination Program Act of 2021.”

Finally, these recommendations are interim and HTAC is actively on the watch for evidence as it is rapidly evolving. We thank you for the opportunity to be of assistance to the Department of Health.

Details of the body of evidence considered by HTAC in assessing *Moderna* as primary series for the pediatric population ages 6 to 11 years can be found below:

Criteria	HTAC Judgment *(as of 05 July 2022)*
What is the magnitude and severity of COVID-19 in children ages 6 to 17 years old? *Is COVID-19 a public health priority?*	The burden of COVID-19 contributed by children aged 6 to 11 years old cannot be ascertained as children experience milder symptoms and asymptomatic presentations leading to less probability of being tested and more unreported cases (WHO, 2021). Local evidence (SALVACION registry) shows that of the 191 children aged 6 to 11 years old who were hospitalized, 53.93% had comorbidities while 46.07% did not have comorbidities. DOH data show that CFR in children ages 6 to 11 years old (6-11 yo: 0.15%; vs <6 yo: 0.67%; 12-17 yo: 0.18%; 18 to 59 yo: 0.78%; >60 yo: 7.53%) is the lowest among age groups. This is similar with US data showing that CFR and ICU admissions in children aged 0-4 years old and adolescents aged 12-17 years old are likely greater compared to that of children aged 5 to 11 years old (US CDC, 2022). Currently, the effect of variants on hospitalization in this age group cannot be established due to limited sequencing capacity in the country. Internationally, studies from the US and UK show varying results. In addition, based on US data, the incidence of MIS-C is highest in the 5-11 age group compared to the other age groups. This is similar to the local data where 12 out of the 26 MIS-C cases (46.15%) reported, were from the 6 to 11 year age group (SALVACION Registry, as of 20 June 2022). Lastly, in terms of post COVID-19 conditions, US data shows that this condition appears to be less common in children than in adults. There are no local studies on POST COVID-19 conditions.
Is Moderna safe and efficacious for the pediatric population ages 6 to 11 years old? *Can Moderna significantly reduce the magnitude and severity of COVID-19 in children ages 6 to 11 years old?*	**Yes,** short-term safety of *Moderna* in children 6-11 years old is acceptable. No case of myocarditis was reported in the clinical trial. Further follow-up data is needed to establish longer-term safety. Currently, there is inconclusive evidence on the clinical efficacy of a 2-dose primary series of *Moderna* (50 mcg per dose) in children aged 6 to 11 years old. However, on the basis of the same Phase II/III trial, the efficacy of 2 doses of 50 mcg of *Moderna* in children can be inferred from successful immunobridging data to young adults ages 18 to 25 years old who had received the 100 mcg dose in the Phase III COVE trial, which showed high efficacy (Creech et al.). Meanwhile, in terms of protection against variants of concerns (VoCs), the efficacy and effectiveness of *Moderna* in children 6 to 11 years old against VoCs cannot be assessed due to lack of studies measuring clinical outcomes. However, immunogenicity outcomes from one study showed that children aged 6 to 11 years old had higher antibody titers against Omicron compared to adults (Girard et al.). In terms of immunogenicity against the Delta variant, data from the Phase II/III trial showed a similar immune response to Delta compared to adults (Creech et al.).

Is Moderna affordable and feasible to use in a national immunization program for the pediatric population ages 6 to 11 years old?	**Yes,** primary series vaccination in children aged 6 to 11 years old using *Moderna* is considered affordable. The HTAC is not recommending procurement of *Moderna* in the implementation of the primary vaccination series for children aged 6 to 11 years old because of its higher cost relative to a similar product in the market. However, at this time that the existing supplies will be used for the implementation of the primary vaccination series for children aged 6 to 11 years old, there will be no additional cost to the government if *Moderna* is used.
Does Moderna reduce out-of-pocket (OOP) expenses of households due to COVID-19?	**Yes**, *Moderna* has the potential to reduce out-of-pocket expenses due to averted costs of isolation and treatment of mild, moderate, and severe COVID-19 in the pediatric population ages 6 to 11 years old. Other non-medical costs, productivity loss of the parents/ caregiver of these children, and treatment cost of other family members within the household who will likely contract COVID-19 further increase the potential of the vaccine to reduce out-of-pocket expenses of households due to COVID-19.
Does Moderna possess the characteristics that are desired by key stakeholders?	**Yes,** on the basis of short-term outcomes, *Moderna* possesses most of the characteristics desired by key stakeholders for its use among children aged 6 to 11 years old. Given that there are no local studies to determine acceptability of vaccination among children 6 to 11 years old, HTAC can only recognize the social impact of vaccination in this age group in terms of supporting the attainment of occupations of children which include social learning achieved through peer interaction. This could also contribute to the improvement of the quality of life within the households when caregivers of children are relieved of the anxiety of dealing with the consequences of COVID-19 infection and sequelae.
Does Moderna reduce or not further add to existing inequities in the health system?	Pediatric vaccination poses inherent challenges because of pre-existing inequities in the healthcare system. These include inequitable access to information and capacity to diagnose co-morbidities in children (e.g., pediatric specialists), inaccessibility to vaccination sites and inadequate logistical capacity, and the general deficiency in infrastructure, transportation modalities, and health human resources across the different areas in the country. These challenges can be translated to opportunities to improve the vaccination coverage of priority groups (e.g., encouraging unvaccinated parents and/or guardians accompanying pediatric vaccinees to get vaccinated as well, improvement of information, education, and communication (IEC) campaigns, and increasing vaccination sites by deploying mobile vaccination teams and utilization of established public-private partnerships with malls, pharmacies, churches, gyms and other establishments as vaccination sites, among others). To ensure the success of the implementation of COVID-19 vaccination for children ages 6 to 11 years old, emphasize must be placed on the importance of free and prior informed consent, supporting the autonomy of parents, guardians, and the pediatric population towards vaccination, and ensuring that IEC materials are accessible and comprehensible (i.e., translated into the local language of the target population) Given that *Moderna* can be stored in 2-8 degrees Celsius for 30 days which is available in most RHUs, this does not aggravate health inequities. However, in terms of long term storage, *Moderna* still requires a low storage temperature, which might pose difficulties in distribution from warehouse to RHUs.

In the development of this recommendation, the HTA Council has appraised and considered the evidence review of the International Vaccine Access Center (IVAC) of the Johns Hopkins Bloomberg School of Public Health and World Health Organization review, COVID-NMA living review and review of global and local data pertaining to the epidemiology of 6 to 11 year-old children with COVID-19.

The HTA Council further emphasizes the need to enforce strict conditions for the emergency use of health products to safeguard against eventualities:

- Transparency and accountability in the processes of allowing emergency use of health products, especially for the public health response;
- Continuous collection of safety and effectiveness data in the context of clinical trials and actual use in the real world;
- Close monitoring of recipients and safeguards for expected and unexpected adverse events that may arise from the use of health products under an EUA;
- National coordination of the emergency use under the Philippine FDA and the DOH;
- Cascading of complete information to vaccinees and healthcare providers on potential risks and benefits, and securing of informed consent with regard to receiving the intervention; and

Finally, the HTAC recommends the conduct of research to address the current gaps in evidence with regard to the use of *Moderna*:

- Real-world effectiveness in the Philippine context particularly focused on the following knowledge gaps:

    - Effectiveness in reducing COVID-19 cases, hospitalizations and deaths, and preventing outbreaks and transmission of disease across the population
    - Effectiveness in reducing asymptomatic infection
    - Duration of protection
    - Impact of the timing and number of doses received
    - Probable need for booster dosing
    - Differences in the effectiveness of the vaccine among special populations (i.e., individuals with comorbidities, immunocompromised patients)
    - Effectiveness of the vaccine against emerging SARS-CoV-2 viral strains
- Continuous safety surveillance and monitoring of all adverse events especially severe allergic reactions, Bell's palsy, serious adverse events such as thrombosis thrombocytopenia syndrome (TTS), myocarditis and other adverse events of special interest (AESI) following vaccination
- Best practices, challenges, and barriers in implementation across different localities
- Monitoring of unexpected or additional costs associated with vaccine implementation.

Current Evidence on *Moderna COVID-19 Vaccine*

The table below summarizes the appraisal of available evidence on *Moderna* based on the HTAC evaluation framework.

In addition, the following appendices are provided for further details:

- Appendix 1: Trends in hospitalization in the Philippines, by age group
- Appendix 2A: Risk of Bias Assessment Methodology
- Appendix 2B: Risk of Bias Assessment Results by HTAC
- Appendix 3: GRADE Table
- Appendix 4: Costing Table