UGANDA NATIONAL ACADEMY OF SCIENCES

Updated Advisory on the Administration of COVID-19 Vaccine Booster Doses in Uganda

(Ratified Update of the November 21, 2021, Advisory report)

By

UGANDA NATIONAL IMMUNISATION TECHNICAL ADVISORY GROUP (UNITAG)

Sumbitted to the Ministry of Health, Uganda

(Ratified Report of the Interim submitted on March 31, 2022)

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EXECUTIVE SUMMARY

On November 25, 2021, the Uganda National Immunisation Technical Advisory Group (UNITAG) advised against introducing booster doses in Uganda due to a lack of compelling evidence to justify the introduction of booster doses. As more evidence on COVID-19 vaccine supply, vaccination coverage, vaccine characteristics and performance, and the evolving epidemiological situation of COVID-19 both globally and nationally became available, UNITAG reviewed this recommendation to further guide the Ministry of Health (MoH) on the administration of COVID-19 booster doses in Uganda.

Evidence on WHO EUL COVID-19 vaccines with the most data (Pfizer, Moderna, Johnson and Johnson, and AstraZeneca) consistently showed a decline in VE against SARS-CoV2 infection and COVID-19 with time since vaccination and a more significant decline in older adults. More evidence indicated improvement in protection against infection, mild disease, severe disease and death following booster vaccination. On a national level, evidence showed that only 43% of the target 22 million Ugandans aged 18 years and above had been fully vaccinated. However, high-risk group coverage remained insignificant, regardless of having received a substantial number of vaccine doses that would have had about 28,555,400 people fully vaccinated since the start of national vaccinations in March 2021. It was also noted that MoH had prioritised about 500,000 high-risk individuals and critical workers to receive booster doses starting January 2022, of which 5% had already been covered. Indeed, there was evidence of a substantial amount of vaccines still undistributed at the central vaccine stores and more recorded in expiries and vial wastage. This discrepancy Further to note, improvement in coverage among the high-risk groups remained insignificant. Several challenges affecting vaccination coverage and contributing to vaccine wastage and expiries were also analysed.

To support their discussions, UNITAG also considered other factors such as the global guidance on booster doses, current global COVID-19 vaccine supply, and the WHO/SAGE Values Framework for the allocation and prioritisation of COVID-19 vaccination to arrive at the conclusion that although evidence shows waning of protection over time following vaccination with primary series, booster doses are needed to improve protection against infection, symptomatic disease, and death. However, Uganda's primary vaccination coverage improvement remained insignificant since the last UNITAG recommendation on booster doses made in November 2021. Hence, UNITAG made the following recommendations based on the fact that MoH was already administering booster doses:

i. MoH/ UNEPI should provide a booster dose 4-6 months after completing the primary vaccination series to the high-risk/ priority populations as identified by MoH first.
ii. The substantial amount of vaccine doses available in stock should be urgently utilised to complete primary series vaccination of the high risk before they expire.
iii. The MoH/ UNEPI should enhance efforts, including investing more resources in tracing and fully vaccinating the high-risk groups to ensure their protection.
iv. MoH/ UNEPI should ensure adequate and consistent availability of vaccines and close supervision at all facilities, including the private facilities, to improve access to the vaccines and subsequently improve vaccination coverage.
v. MoH/ UNEPI should actively involve and support the various implementing partners in the vaccination process.

BACKGROUND

In February 2022, the Ministry of Health requested the Uganda National Immunisation Technical Advisory Group (UNITAG) for guidance on providing booster doses in Uganda (Ref: ADM:105/309/23).

On November 25, 2021, UNITAG issued an interim advisory report on the introduction of COVID-19 vaccine booster doses in Uganda. UNITAG advised against introducing booster doses in Uganda due to lack of compelling evidence to justify introduction of booster doses. In particular, the available epidemiological data being collected was insufficient to enable a detailed epidemiological assessment of the risk profile of SARS-CoV-2 infection required to determine the need for booster doses in Uganda. Additionally, the data indicated that Uganda was lagging in the primary vaccination series as only 10.4% of the targeted 4.8M high-risk groups, and 8% of the national target (22,000,000 people above 18years) had been fully vaccinated. Moreover, access to adequate evidence on the effectiveness of the primary vaccination series was limited, and national vaccine-specific data was insufficient to provide substantive evidence on vaccine efficacy, effectiveness, and duration of protection of the Covid-19 vaccines introduced in Uganda. Hence UNITAG concluded that prioritising booster doses over breadth in the primary series coverage would be unethical as this would undermine the principle of national equity.

In light of increasing COVID-19 vaccine supply, increased vaccination coverage, emerging evidence on vaccine characteristics, and the evolving epidemiological situation of COVID-19 both globally and nationally, the UNITAG reviewed this recommendation to further guide the Ministry of Health (MoH) on the administration of COVID-19 booster doses in Uganda.

SUMMARY OF EVIDENCE

Duration of protection from primary vaccination series

Recent data on WHO EUL COVID-19 vaccines indicated waning of protection overtime. In particular, a recent systematic review and meta-regression analysis across four WHO EUL COVID-19 vaccines with the most data (Pfizer, Moderna, Johnson and Johnson (J&J), and AstraZeneca (AZ)) by Feikin (2021) showed that vaccine effectiveness (VE) against severe disease decreased by about 8% (95% confidence interval (CI): 4-15%) over six (6) months in all age groups; VE against severe disease decreased by about 10% (95% CI: 6 – 15%) over the same period in adults above 50 years; VE against symptomatic disease decreased by 32% (95% CI: 11 – 69%) for those above 50 years of age. It was noted that if breakthroughs occured in vaccinated persons, in most cases, events were less severe than those in unvaccinated persons. Also, the degree of waning of immunity differed between vaccine products and target populations, circulating viruses particularly variants of concern (VOCs), the extent of prior infection within a community at the time of primary vaccination, the primary vaccination schedule used (i.e. dose interval), and the intensity of exposure were all likely to play a role in the findings on waning of protection but could not be systematically assessed from current studies. Generally, data consistently showed a decline in VE against SARS-CoV2 infection and COVID-19 with time since vaccination and more significant decline in older adults (1-2).

Booster vaccination performance

Evidence indicated improvement in protection against infection; mild disease; severe disease and death following booster vaccination. Both homologous and heterologous booster regimens

are immunologically effective with a similar safety profile to that observed after the second dose in the primary series. Although emerging evidence on booster doses demonstrated an improvement in protection against infection, milder disease, and severe disease and death, it remained limited in follow-up time (Ref 3-7).

Ministry of Health COVID-19 vaccination and implementation plan, 2022

According to the COVID-19 vaccination plan 2022, as reviewed on March 31, 2022, the general objective remained to fully vaccinate 70% of the Ugandan population by the end of 2022. The Ministry aimed to complete the full vaccination of 22M people by the end of June 2022, provide at least one booster dose for 22M persons by the end of 2022, and complete the vaccination of 6.6M people aged 12-17 years by June 2022. It was noted that the plan would be rolled out in a three-phased approach, particularly phase one targeting high-priority groups, while phases two and three would target persons between 18–49-years-old not captured in phase one, children aged 12-17 years, respectively. The rollout further aimed to employ a multi-prolonged approach to secure potent, effective and sufficient quantities of COVID-19 vaccines, and supplies; create a sustained demand to enable the country to mobilise various resources; and rapidly deploy COVID-19 vaccines in areas of high community transmission.

Likewise, MoH had prioritised about 500,000 high-risk individuals and critical workers, including persons above 50 years, health workers, teachers, religious leaders, cultural leaders, security personnel, media, boda riders, drivers and conductors of all transport vehicles, bar and nightclub workers, and vendors, to receive booster doses starting January 2022 when all regions had reached 50% coverage. Subsequently, MoH hoped to maintain implementation strategies based on the availability of resources through the accelerated mass vaccination campaigns (AMVCs), existing static sites and outreaches, integration of COVID-19 vaccination into chronic care clinics and engaging the private health facilities through memorandums of understanding (MoUs) and accreditation processes.

COVID-19 vaccine supply in Uganda

The MoH COVID-19 vaccine logistical supply and forecast as of March 04, 2022, indicated that since the start of national vaccinations in March 2021, Uganda had received 42,128,500 doses of COVID-19 vaccines at the central vaccine stores (CVS). In other words, about 28,555,400 people would have been vaccinated so far. Aggregated in the six (6) COVID-19 Vaccine types currently present in the country, these included; 6,864,960 doses of AZ; 14,982,300 doses of J&J; 4,855,320 doses of Moderna; 11,765,520 doses of Pfizer; 2,060,400 doses of Sinopharm; and 1,600,000 doses of Sinovac. Of these, 27,046,244 doses had been dispatched to districts across the country, leaving a balance of 15,082,256 doses still undistributed at the CVS located at the National Medical Stores (NMS). Moreover, a total of 9,028,850 doses including AZ (600,000), J&J (1,663,200), Pfizer (1,765,650), Sinovac (5,000,000) were being expected and in the pipeline.

Current data on district stock reconciliations as of February 2022 showed that a total of 158,431 doses of AZ had expired by shelf life. While a total of 96,062 doses were recorded in open vial wastage and a total of 865,022 doses recorded in closed vial wastage, most of them were mRNA vaccines, including Moderna (529,431) and Pfizer (203,784), as well as J&J (131,602). The COVID-19 vaccines expiry projection at NMS indicated that 14,880,563 doses of all the

vaccines would expire after October 23, 2022. Specifically, 9,899,750 doses of Moderna, AZ, and Pfizer combined would expire by August 22, 2022.

The MoH highlighted some causes of wastage and expiries: discarding extra doses of vaccines in a vial, wastage due to a limited number of clients against the number of doses per vial, freezing of thawed mRNA doses on delivery to District Vaccine Stores (DVS). In addition, temperature excursions, short shelf-life of vaccines, vaccines that have passed thawed use of date, lack of tracking health facility stocks at the districts and inadequate mobilisation of communities for vaccination contributed to wastage and expiries.

Current COVID-19 vaccination coverage in Uganda

As of March 27, 2022, MoH data showed that only 43% of the target 22 million people above 18 years of age had been fully vaccinated while 68% had been vaccinated with at least one dose. In otherwords, only 21% of the 44.2M Ugandan population were fully vaccinated. Although vaccination coverage had improved since the launch of COVID-19 vaccination on March 10, 2021 following increased availability of vaccines and the launch of AMVCs in October 2021, a significant number of the target population (12.2M) remains unprotected, with 6.8M unvaccinated and 5.4M pending their second dose. Indeed, Uganda was still far from the WHO target for countries to vaccinate 70% of their populations by mid-2022.

Further to note, improvement in coverage among the high-risk groups remained insignificant. In particular, although all health workers (124.4% of the target 150,000) had received at least one dose, only 64.7% (97,135) had been fully vaccinated. Also, while 86.7% (481,749) of the target 550,000 teachers, 74.1% (2,481,233) of the target 3,348,500 elderly above 50years, and 64.6% (161,491) of the target 250,000 security personnel had received at least one dose, only 40.1% (224,897), 19.2% (645,315) and 29.4% (73,470) of the teachers, elderly and security personnel respectively had been fully as of March 27, 2022. Hence, a significant number of the high-risk population remains unprotected.

It was also noted that MoH was already administering booster doses according to the COVID-19 vaccination status report as of March 27, 2022. Specifically, while 18,648,279 total doses had been administered, 37,963 doses were administered as booster doses covering 5% of the 543,963 target/ eligible individuals as identified in the MoH current booster dose guidance.

MoH/UNEPI identified a number of the challenges contributing to the low vaccination coverage that included poor preparations for the campaigns in terms of teaming, access to resources and distribution of logistics; poor mobilisation of the target population, and poor coordination of Local Governments; limited availability of tools for uploading data to the electronic databases; and inadequate involvement of the private sector in COVID-19 vaccination. Although limited vaccine stock at the start of the vaccination in March 2021 was eventually addressed, limited understanding and appreciation of communities for the mix and matching of vaccines remains a challenge.

OTHER CONSIDERATIONS

Global guidance on booster doses

Booster doses aim to restore VE from that deemed as reduced effectiveness or that the primary vaccine received is no longer sufficient. Although both homologous and heterologous booster

regimens are immunologically effective, they should be pursued only when priority risk groups have full access to vaccines to achieve the primary objective of substantially reducing severe disease and mortality (WHO/SAGE guidance for booster doses, December 22, 2021).

Additionally, the WHO roadmap on the prioritisation of vaccine use in situations of limited supply, and the WHO's strategy to achieve global COVID-19 vaccination by mid-2022 recommend that the public health goal for the administration of booster doses should be to reduce deaths and severe disease due to COVID-19, protect the health system, reduce COVID-19 disease burden and viral transmission, and restore social and economic life.

Current global COVID-19 vaccine supply

According to WHO COVID-19 vaccine supply projections, global vaccine supply is significantly increasing and is projected to be sufficient for vaccination of the entire adult population globally, and boosters of the high-risk populations (as defined in the roadmap, in particular older adults and immunocompromised persons), by the first quarter of 2022. However, WHO projections showed that only later in 2022, supply would be sufficient for extensive use of booster in all adults, and beyond, should they be broadly needed.

WHO/SAGE Values Framework for the allocation and prioritisation of COVID-19 vaccination

The WHO/SAGE recommends that countries ensure vaccine access equity and benefit groups experiencing greater burdens from the COVID-19 pandemic. In this regard, the UNITAG's recommended high risk/ priority groups, including health workers, teachers, the elderly, security personnel and persons with comorbidities, remain highly unprotected. Likewise, countries are advised to honour obligations of reciprocity to those individuals and groups who bear significant additional risks and burdens of COVID-19 response for the benefit of society.

CONCLUSION

Based on the preceding evidence, the COVAX WG made the following conclusions:

i. There is no significant improvement in Uganda's primary vaccination coverage since the last recommendation on booster doses made in November 2021.
ii. There is waning of protection from 4 to 6 months following vaccination with primary series hence the need for booster doses.
iii. Booster doses improve protection against infection, symptomatic disease, and death.
iv. Involvement of the private sector would increase access to the vaccines for the people at risk hence increasing vaccination coverage and contributing to reduction of expiries.

RECOMMENDATIONS

Following the above conclusions, UNITAG made the following recommendations based on the fact that MoH was already administering booster doses:

i. MoH/ UNEPI should provide a booster dose 4-6 months after completing the primary vaccination series to the high-risk/ priority populations as identified by MoH first.
ii. The substantial amount of vaccine doses available in stock should be urgently utilised to complete primary series vaccination of the high risk before they expire.

iii. The MoH/ UNEPI should enhance efforts, including investing more resources in tracing and fully vaccinating the high-risk groups to ensure their protection.
iv. MoH/ UNEPI should ensure adequate and consistent availability of vaccines and close supervision at all facilities, including the private facilities, to improve access to the vaccines and subsequently improve vaccination coverage.
v. MoH/ UNEPI should actively involve and support the various implementing partners in the vaccination process.

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